# PROJECT MANUAL

# Volume 1 of 2

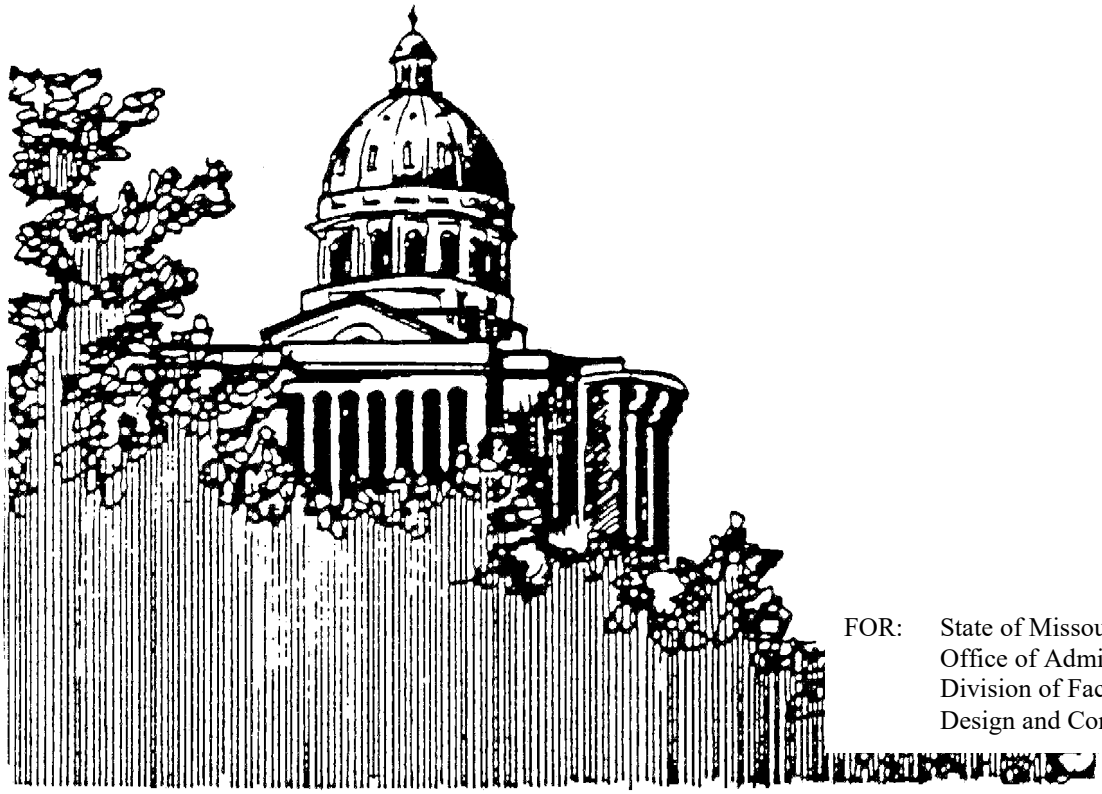
# Rebuild Kitchen & Stabilize Structure Tavern, Arrow Rock State Historic Site

# Arrow Rock, MO

DESIGNED BY: Strata Architecture, Inc.
1701 Oak St. Ste. 100
Kansas City, MO

DATE ISSUED: 5/12/20

PROJECT NO.: X2001-01



FOR: State of Missouri
Office of Administration
Division of Facilities Management,
Design and Construction

**SECTION 000107 – PROFESSIONAL SEALS AND CERTIFICATIONS**

**PROJECT NUMBER:**
Rebuild Kitchen & Stabilize Structure
Tavern, Arrow Rock State Historic Site, Missouri
Project No. X2001-01

**THE FOLLOWING DESIGN PROFESSIONAL HAS SIGNED AND SEALED THE ORIGINAL ARCHITECTURAL DRAWINGS,**

G100, G101, G102, G103, G104, A050, A051, A053, A054, A055, A061, AS100, AS110, A100, A101, A103, A107, A113, A117, A150, A152, A161, A200, A201, A202, A210, A300, A301, A302, A303, A304, A305, A306, A307, A308, A310, A311, A400, A401, A402, A410, A500, A501, A502, A510, A600, A601

**AND IS RESPONSIBLE FOR THE ARCHITECTURAL SPECIFICATIONS,**

011000, 012100, 012300, 012600, 013100, 013200, 013300, 013513.31, 013591, 015000, 017400, 024296, 055119, 061053, 062023, 064116, 070150.19, 071326, 072100, 072500, 072600, 073113, 0745646, 075213, 076200, 077100, 078413, 078443, 079200, 079219, 081113, 081433, 083080, 083113, 085200, 087100, 092116.23, 092900, 093013, 095113, 096400, 096720, 097720, 099113, 099123

**FOR THIS PROJECT, WHICH ARE ON FILE WITH THE DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION:**

05.12.2020

Angie Gaebler, AIA
Strata Architecture Inc.
Owner and Principal in Charge

**SECTION 000107 – PROFESSIONAL SEALS AND CERTIFICATIONS**

**PROJECT NUMBER:**
Rebuild Kitchen & Stabilize Structure
Tavern, Arrow Rock State Historic Site, Missouri
Project No. X2001-01

**THE FOLLOWING DESIGN PROFESSIONAL HAS SIGNED AND SEALED THE ORIGINAL MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS PES100, PM000, PMD050, PMD051, P101, P102, PE500, M101, M102, M103, M104, PM105, M300, ME500, M600, ME601, ED101, ED102, ED103, , E000, E101, E102, E103, E104, EL152, E300, E301, E500 AND E501.**

**AND IS RESPONSIBLE FOR THE MECHANICAL, PLUMBING AND ELECTRICAL SPECIFICATIONS , 220500, 220513, 220519, 220523, 220529, 220548, 220553, 220700, 221116, 221119, 221123, 221123.13, 221126, 221316, 221319, 221323, 221239, 221429, 223400, 224000, 230500, 230513, 230519, 230529, 230548, 230553, 230593, 230700, 232300, 233113, 233300, 233423, 233713, 233723, 234100, 235100, 235400, 236200, 237413, 238239, 239100, 260500, 260504, 260505, 260519, 260526, 260529, 260533, 260543, 260548, 260553, 260573, 260923, 262413, 262416, 262726, 262816, 264113, 264313, 265100 AND 265600.**

**FOR THIS PROJECT, WHICH ARE ON FILE WITH THE DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION:**

STATE OF MISSOURI
BRUCE ELDON HART
NUMBER E-22817
PROFESSIONAL ENGINEER

5/12/20

Bruce E. Hart, PE
W.L. Cassell & Associates, Inc.

**SECTION 000107 – PROFESSIONAL SEALS AND CERTIFICATIONS**

**PROJECT NUMBER:**
Rebuild Kitchen & Stabilize Structure
Tavern, Arrow Rock State Historic Site, Missouri
Project No. X2001-01

**THE FOLLOWING DESIGN PROFESSIONAL HAS SIGNED AND SEALED THE ORIGINAL ELECTRICAL DRAWINGS – FA-001 & F-101.**

**AND IS RESPONSIBLE FOR THE ELECTRICAL SPECIFICATION -- 28 31 11.**

**FOR THIS PROJECT, WHICH ARE ON FILE WITH THE DIVISION OF FACILITIES MANAGEMENT, DESIGN & CONSTRUCTION:**

Cynthia M. Gier, PE
CMG Fire Protection Engineering, Inc.

**SECTION 000107 – PROFESSIONAL SEALS AND CERTIFICATIONS**

**PROJECT NUMBER:**
Rebuild Kitchen & Stabilize Structure
Tavern, Arrow Rock State Historic Site, Missouri
Project No. X2001-01

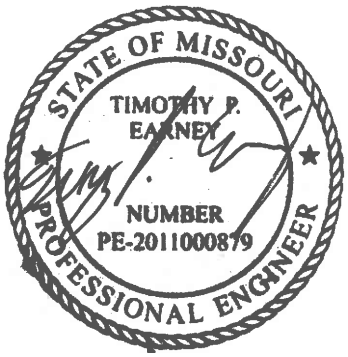
**THE FOLLOWING DESIGN PROFESSIONAL HAS SIGNED AND SEALED THE ORIGINAL STRUCTURAL ENGINEERING DRAWINGS**

**S001 GENERAL NOTES**
**S100 BASEMENT FRAMING PLAN - BASE BID**
**S100A BASEMENT FRAMING PLAN - ALTERNATE 1**
**S101 FRAMING PLAN – BASE BID**
**S101A FRAMING PLAN – ALTERNATE 1**
**S102 ROOF FRAMING PLAN – BASE BID**
**S102A ROOF FRAMING PLAN – ALTERNATE 1**
**S500 DETAILS**
**S510 DETAILS**
**S520 DETAILS**

**AND IS RESPONSIBLE FOR THE STRUCTURAL ENGINEERING SPECIFICATIONS**

**033000 – CAST IN PLACE CONCRETE**
**035413 – GYPSUM CEMENT UNDERLAYMENT**
**051200 – STRUCTURAL STEEL FRAMING**

**FOR THIS PROJECT, WHICH ARE ON FILE WITH THE DIVISION OF FACILITIES MANAGEMENT, DESIGN & CONSTRUCTION:**




5/8/20

Patrick Earney, PE, SE
McClure

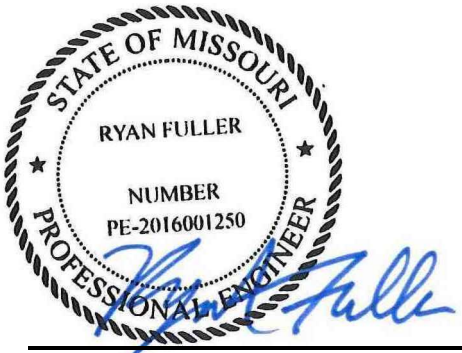
**SECTION 000107 – PROFESSIONAL SEALS AND CERTIFICATIONS**

**PROJECT NUMBER:**
Rebuild Kitchen & Stabilize Structure
Tavern, Arrow Rock State Historic Site, Missouri
Project No. X2001-01

**THE FOLLOWING DESIGN PROFESSIONAL HAS SIGNED AND SEALED THE ORIGINAL CIVIL ENGINEERING DRAWINGS C101, C201, C301, C401, C501, & C601,**

**AND IS RESPONSIBLE FOR THE CIVIL ENGINEERING SPECIFICATIONS 024100, 031000, 032000, 033000, 055200, 311000, 312300, 312313, 312316, 312333, 312500, 321123, 321216, 321300, 321373, 329200, 331000, 333000, & 334000,**

**FOR THIS PROJECT, WHICH ARE ON FILE WITH THE DIVISION OF FACILITIES MANAGEMENT, DESIGN & CONSTRUCTION:**




Ryan Fuller, PE 5/12/2020
McClure

**SECTION 000107 – PROFESSIONAL SEALS AND CERTIFICATIONS**

**PROJECT NUMBER:**
Rebuild Kitchen & Stabilize Structure
Tavern, Arrow Rock State Historic Site, Missouri
Project No. X2001-01

**THE FOLLOWING DESIGN PROFESSIONAL IS RESPONSIBLE FOR THE HAZARDOUS MATERIALS SPECIFICATION:**

028213 ASBESTOS ABATEMENT

**FOR THIS PROJECT, WHICH ARE ON FILE WITH THE DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION:**

Jessica Keeven

CERTIFIED HAZARDOUS MATERIALS MANAGER
JESSICA B. KEEVEN
16637
Certified

Jessica Keeven
SCI Engineering

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**SECTION 000115 – LIST OF DRAWINGS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section provides a comprehensive list of the drawings that comprise the Bid Documents for this project.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 LIST OF DRAWINGS

A. The following list of drawings is a part of the Bid Documents:

| | TITLE | SHEET # | ALL DATED |
|---|---|---|---|
| 1. | Cover | G100 | 05/12/2020 |
| 2. | Sheet Index, Limits of Construction, Notes | G101 | |
| 3. | Wall Types | G102 | |
| 4. | Code and Life Safety Plans | G103 | |
| 5. | UL Construction | G104 | |
| 6. | Demolition Plan | C101 | |
| 7. | Erosion Control Plan | C201 | |
| 8. | Site Plan | C301 | |
| 9. | Grading Plan | C401 | |
| 10. | Utility Plan | C501 | |
| 11. | Details | C601 | |
| 12. | Architectural Site Plan | AS100 | |
| 13. | Alt. #1 Architectural Site Plan | AS110 | |
| 14. | Basement Demolition Plan | A050 | |
| 15. | First Floor Demolition Plan | A051 | |
| 16. | Roof Demolition Plan | A053 | |
| 17. | Demolition Exterior Elevations | A054 | |
| 18. | Demolition Exterior Elevations | A055 | |
| 19. | Alt. #1 First Floor Demolition Plan | A061 | |
| 20. | Overall Floor Plans | A100 | |
| 21. | Enlarged Basement Plan – South | A101 | |
| 22. | Enlarged First Floor Plan – South | A103 | |
| 23. | Roof Plan | A107 | |
| 24. | Alt. #1 Enlarged First Floor Plan – South | A113 | |
| 25. | Alt. #1 Roof Plan | A117 | |
| 26. | Basement Reflected Ceiling Plan – South | A150 | |
| 27. | First Floor Reflected Ceiling Plan – South | A152 | |
| 28. | Alt. #1 First Floor Reflected Ceiling Plan – South | A161 | |
| 29. | Exterior Elevations | A200 | |
| 30. | Exterior Elevations | A201 | |
| 31. | Exterior Elevations | A202 | |
| 32. | Alt. #1 Exterior Elevations | A210 | |

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| 33. | Building Sections | A300 |
| 34. | Building Sections | A301 |
| 35. | Building Sections | A302 |
| 36. | Building Sections | A303 |
| 37. | Wall Sections | A304 |
| 38. | Wall Sections | A305 |
| 39. | Wall Sections | A306 |
| 40. | Wall Sections | A307 |
| 41. | Wall Sections | A308 |
| 42. | Alt. #1 - Building Sections | A310 |
| 43. | Alt. #1 Wall Sections | A311 |
| 44. | Enlarged Plans and Interior Elevations | A400 |
| 45. | Enlarged Plans and Interior Elevations | A401 |
| 46. | Interior Elevations | A402 |
| 47. | Alt. #1 Enlarged Plans and Interior Elevations | A410 |
| 48. | Details | A500 |
| 49. | Details | A501 |
| 50. | Details | A502 |
| 51. | Alt. #1 Details | A510 |
| 52. | Door Schedule and Details | A600 |
| 53. | Room Finish Schedule | A601 |
| 54. | General Notes | S001 |
| 55. | Basement Framing Plan – Base Bid | S100 |
| 56. | Basement Framing Plan – Alternate 1 | S100A |
| 57. | Framing Plan – Base Bid | S101 |
| 58. | Framing Plan – Alternate 1 | S101A |
| 59. | Roof Framing Plan – Base Bid | S102 |
| 60. | Roof Framing Plan – Alternate 1 | S102A |
| 61. | Details | S500 |
| 62. | Details | S510 |
| 63. | Details | S520 |
| 64. | Plumbing & Electrical Site Plan | PES100 |
| 65. | Mechanical & Plumbing General Notes, Symbols Abbreviations | PM000 |
| 66. | Basement Plumbing & Mechanical Demolition Plan | PMD050 |
| 67. | First Floor Plumbing & Mechanical Demolition Plan | PMD051 |
| 68. | Basement Plumbing Plans | P101 |
| 69. | First Floor Plumbing Plan – South | P102 |
| 70. | Plumbing Schedules & Details | PE500 |
| 71. | Basement Mechanical Plan – South | M101 |
| 72. | Basement Mechanical Plan – North | M102 |
| 73. | First Floor Mechanical Plan – South | M103 |
| 74. | First Floor Mechanical Plan – North | M104 |
| 75. | Roof Plumbing & Mechanical Plan – South | PM105 |
| 76. | Mechanical Sections | M300 |
| 77. | Mechanical Details & Control Diagrams | ME500 |
| 78. | Airflow Riser Diagrams | M600 |
| 79. | Mechanical Schedules | ME601 |
| 80. | Basement Electrical Demolition Plan – South | ED101 |
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| 83. | Electrical Symbols, Notes & Light Fixture Schedule | E000 |
| 84. | Basement Electrical Plan – South | E101 |
| 85. | Basement Electrical Plan – North | E102 |
| 86. | First Floor Electrical Plan – South | E103 |
| 87. | First Floor Electrical Plan – North | E104 |

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| 88. | First Floor Lighting Plan – South | EL152 |
| 89. | Electrical Panel Schedules | E300 |
| 90. | Existing and New Addition Riser Diagrams | E301 |
| 91. | Lightning Protection Plan | E500 |
| 92. | Details | E501 |
| 93. | Fire Alarm Plans | F-001 |
| 94. | Fire Alarm Plans | F-101 |
| 95. | Food Service Equipment Floor Plan | Q-FP-01 |
| 96. | Food Service Equipment Spot Electrical Plan | Q-FP-02 |
| 97. | Food Service Equipment Spot Plumbing Plan | Q-FP-03 |
| 98. | Food Service Equipment Hood Drawings | Q-DT-01 |
| 99. | Food Service Equipment Hood Drawings | Q-DT-02 |
| 100. | Food Service Equipment Hood Drawings | Q-DT-03 |
| 101. | Food Service Equipment Elevations | Q-DT-04 |
| 102. | Food Service Equipment Elevations | Q-DT-05 |

**END OF SECTION 000115**

# SECTION 011000 – SUMMARY OF WORK

## 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 WORK COVERED BY CONTRACT DOCUMENTS

A. The Project consists of the J HUSTON TAVERN KITCHEN REBUILD.

1. Project Location: Arrow Rock State Historic Site, Arrow Rock, Missouri.
2. Owner: State of Missouri, Division of State Parks, 1659 E. Elm Street, Jefferson City, MO 65101.
3. Project Management: State of Missouri, Office of Administration, Division of Facilities Management, Design and Construction, Harry S Truman State Office Building, Post Office Box 809, 301 West High Street, Jefferson City, Missouri 65102.

B. Contract Documents, dated May 12, 2020 were prepared for the Project by STRATA Architecture Inc., 1701 Oak Street, Suite 100, Kansas City, Missouri 64108.

C. The Work is to the historic J Huston Tavern in Arrow Rock, Missouri and consists of the commercial kitchen renovation, new addition, and new mechanical systems installation within the historic building.

The Work includes, but is not limited to, the following items and as noted on the Drawings:

1. General Contracting / Coordination of Sub-Contractors,
2. Protection of Historic Finishes
3. Historic Restoration
4. Selective Demolition
5. Asbestos Roofing Demolition and Abatement
6. Asphalt Paving
7. Carpentry
8. Concrete
9. Doors – New, Repair, and Hardware
10. Drywall, Plastering, Sheetrock
11. Earthmoving/Excavating
12. Demolition and Installation of New Mechanical, HVAC Controls, Plumbing, Ventilation, and Electrical Systems
13. Fire Protection
14. Epoxy, Tile, and Wood Flooring
15. Insulation – Building and Mechanical
16. Millwork
17. Structural Steel
18. Kitchen Equipment
19. Select Masonry Wall Repairs and Openings
20. Painting
21. Roofing
22. Sanitary Sewer Modifications
23. Installation of Utilities – Water, Electrical, Propane

24. Windows/Glazing
25. Final Cleaning

D. The Work will be constructed under a single prime contract.

## 1.3 DESIGNER'S ESTIMATE OF CONSTRUCTION COSTS

A. The project designer has prepared a cost estimate. It is intended to provide an indication of the relative range of costs for the overall project. The State of Missouri makes no guarantee regarding the accuracy of the values contained herein nor does the State of Missouri intend to imply that the values are accurate or in any way reflect actual costs required to perform the work represented by the specifications and drawings. The contractor should not rely on this estimate in any way while preparing a bid for this project or otherwise.

B. Base Bid Project Cost Estimate Range: $790,000.00 to $1,100,000.00.

## 1.4 WORK SEQUENCE AND SCHEDULE

A. The Work will be conducted under one contract.

B. The Owner shall approve the final work sequence and schedule.

## 1.5 CONTRACTOR USE OF PREMISES

A. General: During the construction period the Contractor shall have full use of the premises for construction operations as outlined by the Project Area included on the Drawings.

B. Use of the Site: Limit use of the premises to work in areas indicated only. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.

1. Owner Occupancy: While the J Huston Tavern is not occupied, the adjacent sites are occupied by both the Owner and visitors. Allow for Owner occupancy in the remaining areas of the site, including the site adjacent to the Project.
2. Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Owner and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
3. Coordinate all major deliveries with the Owner.
4. Park only in Owner-designated spaces. Contractors, Subcontractors, and all Deliveries shall not park on Main Street. All parking should be behind the Tavern or on Van Buren Street.

C. Use of the Existing Building: Maintain the existing building in a secured and weathertight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period. No entry into the historic Tavern is required except as needed for crawl space access and for limited mechanical and electrical work. Otherwise, the historic Tavern shall be completely sealed off from the immediate kitchen and addition work and no admittance for general workers, storage, or other occupancy shall occur.

## 1.6 OCCUPANCY REQUIREMENTS

A. Full Owner Occupancy: The Owner, surrounding business owners, and visitors will occupy the adjacent existing buildings during the entire construction period. Cooperate with the Owner and surrounding business owners during construction operations to minimize conflicts and facilitate owner and visitor usage of the adjacent buildings and site. Perform the Work so as not to interfere with the Owner's operations.

## 1.7 PROJECT PHASING, SCHEDULE AND OWNER FURNISHINGS

A. This project is to be completed in one phase. The General Contractor shall submit the final project schedule to the Owner for approval prior to initiating work.

B. Existing furnishings, equipment, electronic and personal items are to be removed by the Owner, prior to the start of construction. Existing personal items and furnishings will remain in the historic portion of the Tavern and are to be protected by the General Contractor.

## PART 2 - PRODUCTS (Not Applicable)

## PART 3 - EXECUTION (Not Applicable)

**END OF SECTION 011000**

# SECTION 012100 – ALLOWANCES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section includes administrative and procedural requirements governing allowances.

1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Contract Change.

B. Types of allowances include the following:

1. Weather allowances.

C. Related Sections include the following:

1. Division 1 Section "Contract Modification Procedures" for procedures for submitting and handling Contract Changes for allowances.

### 1.3 WEATHER ALLOWANCE

A. Included within the completion period for this project are a specified number of “bad weather” days (see Schedule of Allowances).

B. The Contractor’s progress schedule shall clearly indicate the bad weather day allowance as an “activity” or “activities”. In the event weather conditions preclude performance of critical work activities for 50% or more of the Contractor’s scheduled workday, that day shall be declared unavailable for work due to weather (a “bad weather” day) and charged against the above allowance. Critical work activities will be determined by review of the Contractor’s current progress schedule.

C. The Contractor’s Representative and the Construction Representative shall agree monthly on the number of “bad weather” days to be charged against the allowance. This determination will be documented in writing and be signed by the Contractor and the Construction Representatives. If there is a failure to agree on all or part of the “bad weather” days for a particular month, that disagreement shall be noted on this written document and signed by each party’s representative. Failure of the Contractor’s representative to sign the “bad weather” day documentation after it is presented, with or without the notes of

disagreement, shall constitute agreement with the "bad weather" day determination contained in that document.

D. There will be no modification to the time of contract performance due solely to the failure to deplete the "bad weather" day allowance.

E. Once this allowance is depleted, a no cost Contract Change time extension will be executed for "bad weather" days, as defined above, encountered during the remainder of the Project.

## 1.4 SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Contract Changes.

B. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

## 1.5 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

# PART 2 - PRODUCTS (Not Used)

# PART 3 - EXECUTION

## 3.1 SCHEDULE OF ALLOWANCES

A. Weather Allowance: Included within the completion period for this Project __12__ "bad weather" days.

**END OF SECTION 012100**

**SECTION 012300 - ALTERNATES**

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 alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Execute accepted alternates under the same conditions as other work of the Contract.

C. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1: Construction of Restroom Addition.

1. Base Bid: Include repairs and installation of siding and all required trim along west wall of the existing kitchen portion of the building, as well as repairs at grade and at the roof and eave where the brick chimney is removed. Mechanical, Plumbing, and Electrical services to prepare for Alternate 1 shall be installed within the basement of the existing kitchen in preparation for future installation in Alternate 1 for a future date. If Alternate 1 is taken, the siding and all required trim and repairs where chimney was removed may be deleted from the bid as part of the Alternate cost.
2. Alternate: Construct new restroom addition west of the existing kitchen. Work will include selective demolition of site and building features, site excavation; concrete footings, sidewalks, and stairs; framing and carpentry; plumbing, ventilation, electrical, and mechanical systems; drywall; painting; epoxy flooring; steel frames, doors, and hardware; restroom fixtures; roofing, gutters, and downspouts; and exterior millwork.

**END OF SECTION 012300**

**SECTION 012600 – 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 1 Specification Sections apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract Modifications.

B. Related Sections include the following:

1. Division 0, Section 007213, Article 3.1 "Acceptable Substitutions" for administrative procedures for handling Requests for Substitutions made after Contract award.

2. Division 0, Section 007213, Article 4.0 "Changes in the Work" for Contract Change requirements.

1.3 REQUESTS FOR INFORMATION

A. In the event that the Contractor or Subcontractor, at any tier, determines that some portion of the Drawings, Specifications, or other Contract Documents requires clarification or interpretation, the Contractor shall submit a “Request for Information” (RFI) in writing to the Designer. An RFI may only be submitted by the Contractor and shall only be submitted on the RFI forms provided by the Owner. The Contractor shall clearly and concisely set forth the issue for which clarification or interpretation is sought and why a response is needed. In the RFI, the Contractor shall set forth an interpretation or understanding of the requirement along with reasons why such an understanding was reached.

B. Responses to RFI shall be issued within ten (10) working days of receipt of the Request from the Contractor unless the Designer determines that a longer time is necessary to provide an adequate response. If a longer time is determined necessary by the Designer, the Designer will, within five (5) working days of receipt of the request, notify the Contractor of the anticipated response time. If the Contactor submits an RFI on a time sensitive activity on the current project schedule, the Contractor shall not be entitled to any time extension due to the time it takes the Designer to respond to the request provided that the Designer responds within the ten (10) working days set forth above.

C. Responses from the Designer will not change any requirement of the Contract Documents. In the event the Contractor believes that a response to an RFI will cause a change to the requirements of the Contract Document, the Contractor shall give written notice to the Designer requesting a Contract Change for the work. Failure to give such written notice within ten (10) working days, shall waive the Contractor’s right to seek additional time or cost under Article 4, “Changes in the Work” of the General Conditions.

1.4 MINOR CHANGES IN THE WORK

A. Designer will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Amount or the Contract Time, on ”Designer’s Supplemental Instructions” (DSI).

1.5 PROPOSAL REQUESTS

A. The Designer or Owner Representative will issue a detailed description of proposed Changes in the Work that may require adjustment to the Contract Amount or the Contract Time. The proposed Change Description will be issued using the “Request for Proposal” (RFP) form. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by the Designer or Owner Representative are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.

2. Within ten (10) working days after receipt of Proposal Request, submit a proposal for the cost adjustments to the Contract Amount and the Contract Time necessary to execute the Change. The Contractor shall submit his proposal on the appropriate Contract Change Detailed Breakdown form. Subcontractors may use the appropriate Contract Change Detailed Breakdown form or submit their proposal on their letterhead provided the same level of detail is included. All proposals shall include:

a. A detailed breakdown of costs per Article 4.1 of the General Conditions.

b. If requesting additional time per Article 4.2 of the General Conditions, 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.

1.6 CONTRACT CHANGE PROCEDURES

A. On Owner's approval of a Proposal Request, the Designer or Owner Representative will issue a Contract Change for signatures of Owner and Contractor on the “Contract Change” form.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REFERENCED FORMS

A. The following forms can be found on our website at https://oa.mo.gov/facilities/vendor-links/architectengineering-forms or https://oa.mo.gov/facilities/vendor-links/contractor-forms:

1. Request for Information
2. Designer’s Supplemental Instructions
3. Request for Proposal
4. Contract Change
5. Contract Change Detailed Breakdown – SAMPLES
6. Contract Change Detailed Breakdown – General Contractor (GC)
7. Contract Change Detailed Breakdown – Subcontractor (SUB)

**END OF SECTION 012600**

**SECTION 013100 – COORDINATION**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1. Coordination Drawings.
2. Administrative and supervisory personnel.
3. Project meetings.

B. Each Contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific Contractor.

C. Related Sections include the following:

1. Division 1, Section 013200 "Schedules" for preparing and submitting Contractor's Construction Schedule.
2. Articles 1.8.B and 1.8.C of Section 007213 "General Conditions" for coordinating meetings onsite.
3. Article 5.4.H of Section 007213 "General Conditions" for coordinating Closeout of the Contract.

1.3 COORDINATION

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, which depend on each other for proper installation, connection, and operation.

B. Coordination: Owner may have additional contractors working on site outside of this contract. It is the responsibility of the General Contractor to coordinate with the other contractors to ensure all trades and scopes of work may be accomplished. All coordination should be through the Construction Representative.

C. Coordination: Each Contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each Contractor shall coordinate its operations with 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. Coordinate installation of different components with other Contractors to ensure maximum accessibility for required maintenance, service, and repair.

3. Make adequate provisions to accommodate items scheduled for later installation.

4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components including mechanical and electrical.

D. 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 and separate Contractors if coordination of their Work is required.

E. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other Contractors 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. Startup and adjustment of systems.

8. Project Closeout activities.

F. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

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

## 1.4 SUBMITTALS

A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

B. Key Personnel Names: Within five (5) working days of starting construction operations, submit a list of key personnel assignments including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

2. Include cell phone numbers for critical project managers and sub-contractors.

## 1.5 PROJECT MEETINGS

A. The Owner's Construction Representative will schedule a Pre-Construction Meeting prior to beginning of construction. The date, time, and exact place of this meeting will be determined after Contract Award and notification of all interested parties. The Contractor shall arrange to have the Job Superintendent and all prime Subcontractors present at the meeting. During the Pre-Construction Meeting, the construction procedures and information necessary for submitting payment requests will be discussed and materials distributed along with any other pertinent information.

1. Minutes: Designer will record and distribute meeting minutes.

B. Progress Meetings: The Owner's Construction Representative will conduct Monthly Progress Meetings as stated in Articles 1.8.B and 1.8.C of Section 007213 "General Conditions".

1. Minutes: Designer will record and distribute to Contractor the meeting minutes.

C. Preinstallation Conferences: Contractor shall conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of Manufacturers and Fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Designer and Construction Representative of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration including requirements for the following:

a. Contract Documents

b. Options

c. Related RFIs

d. Related Contract Changes

e. Purchases

f. Deliveries

g. Submittals

h. Review of mockups

i. Possible conflicts

j. Compatibility problems

k. Time schedules

l. Weather limitations

m. Manufacturer's written recommendations

n. Warranty requirements

o. Compatibility of materials

p. Acceptability of substrates

q. Temporary facilities and controls

r. Space and access limitations

s. Regulations of authorities having jurisdiction

t. Testing and inspecting requirements

u. Installation procedures

v. Coordination with other Work

w. Required performance results

x. Protection of adjacent Work

y. Protection of construction and personnel

3. Contractor shall record significant conference discussions, agreements, and disagreements including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

6. Project name

7. Name and address of Contractor

8. Name and address of Designer

9. RFI number including RFIs that were dropped and not submitted

10. RFI description

11. Date the RFI was submitted

12. Date Designer's response was received

13. Identification of related DSI or Proposal Request, as appropriate

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

**END OF SECTION 013100**

# SECTION 013200 – SCHEDULE – BAR CHART

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section includes requirements for a Bar Chart Schedule for the project construction activities, schedule of submittals, and schedule for testing.

## PART 2 - PRODUCTS – (Not Applicable)

## PART 3 - EXECUTION

### 3.1 SUBMITTAL PROCEDURES

A. The Contractor shall submit to the Designer, within ten (10) working days following the Notice to Proceed, a Progress Schedule including Schedule of Values showing the rate of progress the Contractor agrees to maintain and the order in which he proposed to carry out the various phases of Work. No payments shall be made to the Contractor until the Progress Schedule has been approved by the Owner.

B. The Contractor shall submit an updated Schedule for presentation at each Monthly Progress Meeting. The Schedule shall be updated by the Contractor as necessary to reflect the current Schedule and its relationship to the original Schedule. The updated Schedule shall reflect any changes in the logic, sequence, durations, or completion date. Payments to the Contractor shall be suspended if the Progress Schedule is not adequately updated to reflect actual conditions.

C. The Contractor shall submit Progress Schedules to Subcontractors to permit coordinating their Progress Schedules to the general construction Work. The Contractor shall coordinate preparation and processing of Schedules and reports with performance of other construction activities.

### 3.2 CONSTRUCTION PROGRESS SCHEDULE – BAR CHART SCHEDULE

A. Bar-Chart Schedule: The Contractor shall prepare a comprehensive, fully developed, horizontal bar chart-type Contractor's Construction Schedule. The Contractor for general construction shall prepare the Construction Schedule for the entire Project. The Schedule shall show the percentage of work to be completed at any time, anticipated monthly payments by Owner, as well as significant dates (such as completion of excavation, concrete foundation work, underground lines, superstructure, rough-ins, enclosure, hanging of fixtures, etc.) which shall serve as check points to determine compliance with the approved Schedule.

1. The Contractor shall provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week.

   a. If practical, use the same Schedule of Values breakdown for schedule time bars.

2. The Contractor shall provide a base activity time bar showing duration for each construction activity. Each bar is to indicate start and completion dates for the activity. The Contractor is to place a contrasting bar below each original schedule activity time for indicating actual progress and planned remaining duration for the activity.

3. The Contractor shall prepare the Schedule on a minimal number of separate sheets to readily show the data for the entire construction period.

4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on schedule with other construction activities. Include minor elements involved in the overall sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.

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

6. Indicate the Intent to Award and the Contract Substantial Completion dates on the schedule.

B. Phasing: Provide notations on the schedule to show how the sequence of the Work is affected by the following:

1. Requirement for Phased completion
2. Work by separate Contractors
3. Work by the Owner
4. Pre-purchased materials
5. Coordination with existing construction
6. Limitations of continued occupancies
7. Un-interruptible services
8. Partial Occupancy prior to Substantial Completion
9. Site restrictions
10. Provisions for future construction
11. Seasonal variations
12. Environmental control

C. Work Stages: Use crosshatched bars to indicate important stages of construction for each major portion of the Work. Such stages include, but are not necessarily limited to, the following:

1. Subcontract awards
2. Submittals
3. Purchases
4. Mockups
5. Fabrication
6. Sample testing
7. Deliveries

8. Installation
9. Testing
10. Adjusting
11. Curing
12. Startup and placement into final use and operation

D. Area Separations: Provide a separate time bar to identify each major area of construction for each major portion of the Work. For the purposes of this Article, a “major area” is a story of construction, a separate building, or a similar significant construction element.

1. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
   a. Structural completion.
   b. Permanent space enclosure
   c. Completion of mechanical installation
   d. Completion of the electrical portion of the Work
   e. Substantial Completion

## 3.3 SCHEDULE OF SUBMITTALS

A. Upon acceptance of the Construction Progress Schedule, prepare and submit a complete schedule of submittals. Coordinate the submittal schedule with Section 013300 SUBMITTALS, the approved Construction Progress Schedule, list of subcontracts, Schedule of Values and the list of products.

B. Prepare the schedule in chronological order. Provide the following information

1. Scheduled date for the first submittal
2. Related Section number
3. Submittal category
4. Name of the Subcontractor
5. Description of the part of the Work covered
6. Scheduled date for resubmittal
7. Scheduled date for the Designer’s final release or approval

C. Distribution: Following the Designer’s response to the initial submittal schedule, print and distribute copies to the Designer, Owner, subcontractors, and other parties required to comply with submittal dates indicated.

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

D. Schedule Updating: Revise the schedule after each meeting or other activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

## 3.4 SCHEDULE OF INSPECTIONS AND TESTS

A. Prepare a schedule of inspections, tests, and similar services required by the Contract Documents. Submit the schedule with (15) days of the date established for commencement of the Contract Work. The Contractor is to notify the testing agency at least (5) working days in advance of the required tests unless otherwise specified.

B. Form: This schedule shall be in tabular form and shall include, but not be limited to, the following:

1. Specification Section number
2. Description of the test
3. Identification of applicable standards
4. Identification of test methods
5. Number of tests required
6. Time schedule or time span for tests
7. Entity responsible for performing tests
8. Requirements for taking samples
9. Unique characteristics of each service

C. Distribution: Distribute the schedule to the Owner, Architect, and each party involved in performance of portions of the Work where inspections and tests are required.

**END OF SECTION 013200**

# SECTION 013300 – SUBMITTALS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submittals required for performance of the Work including the following:

1. Online Submittal Procedures and Software
2. Shop Drawings
3. Product Data
4. Samples
5. Quality Assurance Submittals
6. Construction Photographs
7. Operating and Maintenance Manuals
8. Warranties
9. Training

B. Administrative Submittals: Refer to General and Supplementary Conditions other applicable Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:

1. Construction Progress Schedule including Schedule of Values
2. Performance and Payment Bonds
3. Insurance Certificates
4. Applications for Payment
5. Certified Payroll Reports
6. Partial and Final Receipt of Payment and Release Forms
7. Affidavit – Compliance with Prevailing Wage Law
8. Record Drawings
9. Notifications, Permits, etc.
10. MBE/WBE/SDVE Progress Reports.
11. Test Reports (TAB, etc.)

C. The Contractor is obliged and responsible to check all shop drawings and schedules to assure compliance with contract plans and specifications. The Contractor is responsible for the content of the shop drawings and coordination with other contract work. Shop drawings and schedules shall indicate, in detail, all parts of an Item or Work including erection and setting instructions and integration with the Work of other trades.

D. The Contractor shall at all times make a copy, of all approved submittals, available on site to the Construction Representative.

1.3 SUBMITTAL PROCEDURES

A. The Contractor shall comply with the General and Supplementary Conditions and other applicable sections of the Contract Documents. The Contractor shall submit, with such promptness as to cause no delay in his work or in that of any other contractors, all required submittals indicated in Part 3.1 of this section and elsewhere in the Contract Documents. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay. Submittals may be made electronically, as established at the Pre-Construction Meeting.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

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

B. Each drawing and/or series of drawings submitted must be accompanied by a letter of transmittal giving a list of the titles and numbers of the drawings. Each series shall be numbered consecutively for ready reference and each drawing shall be marked with the following information:

1. Date of Submission

2. Name of Project

3. Location

4. Section Number of Specification

5. State Project Number

6. Name of Submitting Contractor

7. Name of Subcontractor

8. Indicate if Item is submitted as specified or as a substitution

9. Indicate General Contractor reviewer (person who reviewed submittal prior to forwarding to the Design Team). This must be completed, or the submittal will be rejected.

C. ONLINE SUBMITTAL PROCEDURES AND SOFTWARE

1. The Contractor shall provide a cloud-based online construction software application to provide a centralized platform for the project management and submittals for this project. Software must be able to provide file structures to download project photographs by date, and provide system to download and upload submittals, RFIs, and project correspondence. The system is intended to be utilized by the contractor(s), Owner, and the Design Team. The system must be set up to notify selected parties of all downloads and e-mail the submittals directly to designated construction team representatives. Only systems that have this capability will be approved for use for the project.

2. Upon completion of the project, the Contractor shall provide a thumb drive or hard drive with all information from the online resource in the applicable resource files with dates. For example:
   a. Shop Drawings
      1) Submittals – including Samples - (# and Date)
      2) Approved Submittals (# and Date)
   b. RFIs
      1) RFI Submittals (# and Date)
      2) RFI Responses (# and Date)
   c. DSIs
      1) DSI Submittal (# and Date)
      2) DSI Responses (# and Date)
   d. RFPs
      1) RFP Submittals (# and Date)
      2) RFP Responses (# and Date)
   e. Correspondence (subject folders)
   f. Photographs
      1) Existing Conditions Photographs / Video
      2) Construction Progress Photographs by Date
      3) Requested Supplemental Photographs by Date
      4) Close-out Photographs by Date
   g. Pay Applications
      1) Submittals by # and Date
      2) Approved by # and Date

1.4 SHOP DRAWINGS

A. Comply with the General Conditions, Article 3.2.

B. The Contractor shall submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.

C. Shop Drawings, where appropriate, may be submitted electronically.

D. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates, and similar drawings including the following information:

1. Dimensions
2. Identification of products and materials included by sheet and detail number
3. Compliance with specified standards
4. Notation of coordination requirements
5. Notation of dimensions established by field measurement
6. Sheet Size: Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8½”x11” but no larger than 36”x48”.

1.5 PRODUCT DATA

A. The Contractor shall comply with the General Conditions, Article 3.2.

B. The Contractor shall collect Product Data into a single electronic submittal for each element of construction or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves. Do not combine submittals from differing specification sections.

1. Mark submittal to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark submittal to indicate the applicable information including the following information:

a. Manufacturer's printed recommendations

b. Compliance with Trade Association standards

c. Compliance with recognized Testing Agency standards

d. Application of Testing Agency labels and seals

e. Notation of dimensions verified by field measurement

f. Notation of coordination requirements

2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

1.6 SAMPLES

A. The Contractor shall comply with the General Conditions, Article 3.2.

B. The Contractor shall submit full-size, fully fabricated samples, cured and finished as specified, and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.

1. The Contractor shall mount or display samples in the manner to facilitate review of qualities indicated. Prepare samples to match the Designer's sample including the following:

a. Specification Section number and reference

b. Generic description of the Sample

c. Sample source

d. Product name or name of the Manufacturer

e. Compliance with recognized standards

f. Availability and delivery time

2. The Contractor shall submit samples for review of size, kind, color, pattern, and texture. Submit samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.

a. Where variation in color, pattern, texture, or other characteristic is inherent in the material or product represented, submit at least three (3) multiple units that show approximate limits of the variations.

b. Refer to other Specification Sections for requirements for samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.

c. Refer to other Sections for samples to be returned to the Contractor for incorporation in the Work. Such samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of sample submittals.

d. Samples not incorporated into the Work, or otherwise designated as the Owner's property, are the property of the Contractor and shall be removed from the site prior to Substantial Completion.

3. Field samples are full-size examples erected onsite to illustrate finishes, coatings, or finish materials and to establish the Project standard.

a. The Contractor shall comply with submittal requirements to the fullest extent possible. The Contractor shall process transmittal forms to provide a record of activity.

## 1.7 QUALITY ASSURANCE DOCUMENTS

A. The Contractor shall comply with the General Conditions, Article 3.2

B. The Contractor shall submit quality control submittals including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.

C. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the Manufacturer certifying compliance with specified requirements.

1. Signature: Certification shall be signed by an officer of the Manufacturer or other individual authorized to contractually bind the Company.

D. Inspection and Test Reports: The Contractor shall submit the required inspection and test reports from independent testing agencies as specified in this Section and in other Sections of the Contract Documents.

E. Construction Photographs: The Contractor shall submit record construction photographs as specified in this Section and in other Sections of the Contract Documents.

1. The Contractor shall submit pre-construction photographs and documentation of existing conditions prior to the start of the project.

2. The Contractor shall submit progress photographs weekly, unless specified otherwise, showing the progress of the work.

3. Photographs shall be sent to the Architect.

4. The Owner or the Designer may request photographs be taken at specific times to document existing conditions, for clarification, or for answering questions. These photographs shall be sent to the Architect within 24 hours.

5. Photographs may be uploaded to a file sharing platform accessible to the Owner and the Designer. Notice of file uploads must be sent to the Architect and the Owner immediately upon uploading.

## 1.8 OPERATING AND MAINTENANCE MANUALS AND WARRANTIES

A. The Contractor shall submit all required manufacturer's operating instructions, maintenance/service manuals, and warranties in accordance with the General Conditions,

Article 3.5, and Supplementary Conditions along with this and other Sections of the Contract Documents.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 REQUIRED SUBMITTALS

A. Contractor shall submit the proposed submittal schedule to the Architect for the required scope of work, within five (5) days of the Notice to Proceed. Submittals shall be in order by Specification section, and presented in a chart, as seen in the example chart below.

PART 4 - GENERAL

PART 5 - EXECUTION

5.1 REQUIRED SUBMITTALS

A. Contractor shall submit the proposed submittal schedule to the Architect for the required scope of work, within five (5) days of the Notice to Proceed. Submittals shall be in order by Specification section, and presented in a chart, as seen in the example chart below.

| | | TYPE OF SUBMITTAL | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SECTION | DESCRIPTION | Shop Drawings | Product Data | Sample or Mock-up | Certifications | Manufacturer' s Instructions | Test report | Inspection Report | Contractor Submittal | Record Photographs | Maintenance Data | Operating Instruction | Warranty | Contractor Scheduled Meeting |
| 01 3100, 1.4, A | Coordination Drawings | | | | | | | | X | | | | | |
| 01 3100, 1.4, B | Key Personnel Names | | | | | | | | X | | | | | |
| 01 3100, 1.5 | Pre-Construction Meeting | | | | | | | | | | | | | X |
| 1.5, B | Progress Meetings | | | | | | | | | | | | | X |
| 1.5, C. | Preinstallation Conferences (As Required) | | | | | | | | | | | | | X |
| 01 3200 | Construction Schedule | | | | | | | | X | | | | | |
| 3.2 | Tabulation of Submittals | | | | | | | | X | | | | | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.2 | Complete Schedule | | | | | | | | X | | | | | |
| 3.3 | Schedule of Inspections, Tests, and Services | | | | | | | | X | | | | | |
| 01 3200, 1.4 | Daily Reports | | | | | | | | X | | | | | |
| 01 3300, 3.1 | Required Submittals (Update this Form with Required Submittals) | | | | | | | | X | | | | | |
| 01 3513.28 | Site Security and Health Requirements | | X | | | | | | X | | | | | |
| 01 3591, 1.7 | Historic Treatment Procedures – Historic Treatment Subschedule | | | | | | | | X | | | | | |
| 01 3591, 1.7 | Historic Treatment Procedures – Preconstruction Documentation | | | | | | | | X | | | | | |
| 01 3591, 1.7 | Historic Treatment Procedures – Fire Prevention Plan | | | | | | | | X | | | | | |
| 01 5000, 1.3, A | Construction Facilities and Temp Controls – Temporary Utilities – All reports, tests, inspections, meter readings, and similar procedures performed on temporary utilities | | | | | | | | X | | | | | |
| 01 5000, 1.3, B. | Implementation and Termination Schedule | | | | | | | | X | | | | | |
| 024100 | Site Demolition | | | | X | | | | | | | | | |
| 02 4296 1.5, A. | Qualification Data for historic removal specialist | | | | | | | | X | | | | | |
| 1.5, C. | Removal and Dismantling Historic Treatment Program | | | | | | | | X | | | | | |
| 1.5, D. | Inventory of salvaged items (may require multiple updates throughout project) | | | | | | | | X | | | | | |
| 02 8213, 2.2 | Asbestos Abatement | X | X | | X | | X | | X | | | | | X |
| 032000 | Concrete Reinforcement | X | X | | X | | | | | | | | | |
| 033000 | Cast in Place Concrete | | X | | X | X | | | | | | | | |
| 03 3000 | Concrete Mix Designs | | X | | | | | | | | | | | |
| 03 5413 | Gypsum Concrete Floor Topping | | X | | | | | | | | | | | |
| 05 119 | Metal Grating Stairs | X | X | | | | | | X | | | | | |
| 05 1200 | Structural Steel Framing | X | X | | | | | | | | | | | |
| 055200 | Exterior Handrails | X | X | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 06 1053 | Wood Framing Materials | | X | | | | | | | | | | | |
| 06 1053 | Wood Roof Trusses | X | | | | | | | | | | | | |
| 06 1053 | Wood Fasteners | | X | | | | | | | | | | | |
| 06 1053 | Misc Carpentry | | X | | | | X | | | | | | | |
| 06 2023, 2.2 | Interior Finish Carpentry - Trim | X | X | X | | | | | | | | | | |
| 06 2023, 2.2 | Interior Finish Carpentry - Moldings | X | X | X | | | | | | | | | | |
| 06 4116, 2.3 | Plastic-Laminate-Clad Architectural Cabinets | X | X | X | | | | | | | | | | X |
| 06 8400, 1.5 | Preparation for Re-Roofing | | X | X | | | | | | | | | | |
| 07 1326, 1.3, 1.4 | Self-Adhering Sheet Water-proofing | X | X | X | | | | | | | | | X | X |
| 07 2100, 1.4, 1.5 | Thermal Insulation | | X | X | | | X | | X | | | | | |
| 07 2500 | Weather Barriers | | X | | | | X | | | | | | | |
| 07 2600 | Vapor Retarders | | X | | | | X | | | | | | | |
| 07 3113, 1.5 1.6, 1.7, 1.8 | Asphalt Shingles | | X | X | | | X | | X | | X | | X | |
| 07 4646, 1.3 1.4 | Fiber-Cement Siding | | X | X | | | X | | X | | X | | X | |
| 07 5213, 1.4 1.5, 1.6, | Atactic-Polypropylene (APP) Roofing | X | X | X | | X | X | | X | | X | | X | X |
| 07 6200, 1.5 | Sheet Metal Flashing and Trim | X | X | X | | | | | | | | | | |
| 07 7100, 1.5 1.6, 1.7 | Roof Specialties | X | X | X | | | | | X | | X | | X | X |
| 07 8413, 1.3 1.4, 1.5 | Penetration Firestopping | X | X | | | | X | | X | | | | | X |
| 07 9200, 1.3 1.4, 1.5 | Joint Firestopping | X | X | | | | X | | X | | | | | X |
| 07 9200, 1.4 1.5 | Joint Sealants | X | X | X | | | X | | | | | | X | X |
| 08 1113, 1.6 1.7, 1.8 | Hollow Metal Doors and Frames | X | X | | | | X | X | | | | | | X |
| 08 1433 | Stile and Rail Wood Doors | X | X | X | X | | | | X | | | | X | X |
| 08 3080 | Traffic Doors | X | X | X | | | | | | | | | | X |
| 08 5200, 1.4 1.5 | Wood Aluminum Clad Win-dows | X | X | X | | | | | X | | | | X | X |
| 08 3133, 1.4 1.5 | Access Doors and Frames | X | X | X | X | | | | X | | | | | |
| 08 7100, 1.5 | Door Hardware -Product Data | | X | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08 7100, 1.5 | Door Hardware – Shop Drawings | X | | | | | | | | | | | | |
| 08 7100, 1.5 | Door Hardware - Samples | | | X | | | | | | | | | | |
| 08 7100, 1.5 | Door Hardware – Schedule (Hardware and Keying) | | X | | | | | | | | | | | |
| 09 2116.23 | Gypsum Board Shaft Wall Assemblies | X | X | | | | | | | | | | | X |
| 09 2900 | Gypsum Board | | X | X | | | | | | | | | | |
| 09 3013, 1.2 1.3, 1.4 | Ceramic Tiling | | X | X | | | | | X | | | | | |
| 09 5113 | Acoustical Panel Ceilings | X | X | X | | | X | | X | | X | | | X |
| 09 6400 | Wood Flooring | X | X | X | | | | | | | | | | |
| 09 6720, 1.4 | Seamless Epoxy Quartz and Marble-Chip Flooring | | X | X | | | | | | | | | | |
| 09 7720, 1.4 | Fiberglass Reinforced Wall Panels | X | X | X | | X | | | | | | | | |
| 09 9113, 1.3 | Exterior Painting | | X | X | | | | | | | | | | |
| 09 9123, 1.3 | Interior Painting | | X | X | | | | | | | | | | |
| 10 2600 | Wall and Door Protection | X | X | X | | | | | | | | | X | |
| 10 2800, 1.4 1.5 | Toilet, Bath, and Laundry Accessories | X | X | X | | | | | | | X | | X | |
| 10 4413 | Fire Extinguisher Cabinets | X | X | X | | | | | | | X | | | |
| 10 4416 | Fire Extinguishers | | X | | | | | | | | | | | |
| 11 4000 | Foodservice Equipment, Product Data sheets | | X | | | | | | | | X | X | X | X |
| 11 4000 | Foodservice Equipment, Dimensional rough in and special conditions submittal dwg's | X | | | | | | | | | X | | X | |
| 11 4000 | Foodservice Equipment, Walk in submittal dwg's | X | | | | | | | | | | | X | |
| 11 4000 | Foodservice Equipment, Hood submittal dwg's | X | | | | | X | X | | | | | X | |
| 11 4000 | Foodservice Equipment Fabrication submittal dwg's | X | | | | | | | | | | | X | |
| 220500 | Transition Fittings | | X | | | | | | | | | | | |
| 220500 | Dialectic Fittings | | X | | | | | | | | | | | |
| 220500 | Mechanical Sleeve Seals | | X | | | | | | | | | | | |
| 220500 | Escutcheons | | X | | | | | | | | | | | |
| 220500 | Trenching, Excavating & Backfilling | | | | | | X | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 220519 | Thermometers | | X | | X | X | | | | | X | X | | |
| 220519 | Gages | | X | | X | X | | | | | X | X | | |
| 220523 | Valves | | X | | | X | | | | | X | X | | |
| 220529 | Hangers & Supports | | X | | | | | | | | | | | |
| 220529 | Thermal-Hanger Shield Inserts | | X | | | | | | | | | | | |
| 220529 | Welding Certificates | | | | X | | | | | | | | | |
| 220553 | Labels & Tags | | X | | | | | | | | | | | |
| 220553 | Equipment Label Schedule | X | | | | | | | | | | | | |
| 220553 | Valve Schedules | X | | | | | | | | | | | | |
| 220700 | Insulation and Accessories | | X | | | | | | | | | | | |
| 220700 | Insulation Schedule | | X | | | | | | | | | | | |
| 221116 | Pipe & Fittings | | X | | | | | | | | | | | |
| 221116 | Test Reports | | | | | | X | | | | | | | |
| 221119 | Vacuum Breakers | | X | | | | | | | | | | | |
| 221119 | Backflow Preventers | | X | | | | | | | | | | | |
| 221119 | Strainers | | X | | | | | | | | | | | |
| 221119 | Hose Bibbs | | X | | | | | | | | | | | |
| 221119 | Water Hammer Arrestors | | X | | | | | | | | | | | |
| 221123 | Domestic Water Pumps | | | | | | | | | | | | | |
| 221123 | Pumps | | X | | | X | X | | | | X | X | | |
| 221123 | Wiring Diagrams | X | | | | | | | | | | | | |
| 221123.13 | Booster Pumps | | X | | X | X | X | | | | X | X | | |
| 221123.13 | Wiring Diagrams | X | | | X | | | | | | | | | |
| 221316 | Pipe & Fittings | | X | | | | X | | | | | | | |
| 221319 | Metal Cleanouts | | X | | | | | | | | | | | |
| 221319 | Floor Drains | | X | | | | | | | | | | | |
| 221319 | Through Stop Firestop Assem-blies | | X | X | | | | | | | | | | |
| 221323 | Grease Interceptor | X | X | | X | X | | | | | X | X | | |
| 224400 | Plumbing Fixtures | | X | | | | | | | | X | X | | |
| 221429 | Sump Pumps | | X | | X | X | X | | | | X | X | | |
| 221429 | Wiring Diagrams | X | | | | | | | | | | | | |
| 223400 | Water Heaters | | X | | X | X | X | | | | X | X | X | |
| 223400 | Wiring Diagrams | X | | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 227100 | Variable-Frequency Motor Controllers | X | X | | | X | X | | | | X | X | | |
| 230500 | Transition Fittings | | X | | | | | | | | | | | |
| 230500 | Dialectic Fittings | | X | | | | | | | | | | | |
| 230500 | Mechanical Sleeve Seals | | X | | | | | | | | | | | |
| 230500 | Escutcheons | | X | | | | | | | | | | | |
| 230500 | Trenching, Excavating & Back-filling | | | | | | X | | | | | | | |
| 230513 | Motors | | X | | | | | | | | X | | | |
| 230519 | Meters & Gauges | | X | | X | | | | | | X | X | | |
| 230523 | Valves | | X | | | | | | | | X | X | | |
| 230529 | Hangers & Supports | | X | | | | | | | | | | | |
| 230529 | Thermal-hanger Shield Inserts | | X | | | | | | | | | | | |
| 230529 | Welding Certificates | | | | X | | | | | | | | | |
| 230548 | Vibration Isolation Devices | X | X | | | | | | | | | X | | |
| 230548 | Welding Certificates | | | | X | | | | | | | | | |
| 230553 | Labels & Tags | X | X | | | | | | | | | | | |
| 230593 | Qualification Data | | | | X | | | | | | | | | |
| 230593 | TAB Reports | | | | | | X | | | | | | | |
| 230593 | Strategies & Procedures | X | | X | | | | | | | | | | |
| 230593 | Calibration Reports | | | | X | | X | | | | | | | |
| 230700 | Insulation & Accessories | | X | | | | | | | | | | | |
| 230700 | Insulation Schedule | X | | | | | | | | | | | | |
| 231126 | Pipe & Fittings | X | X | | | | X | X | | | | | | |
| 231126 | Piping Specialties | | X | | | | X | X | | | | | | |
| 231126 | Valves | | X | | | | | | | | | | | |
| 231126 | Pressure Regulators | | X | | | X | X | X | | | X | X | | |
| 231126 | Vaporizers | X | X | | | X | X | X | | | X | X | | |
| 231126 | Welding Certificates | | | | X | | | | | | | | | |
| 232300 | Pipe, Fittings & Specialties | X | X | | X | X | X | | | X | X | | | |
| 233113 | Duct Construction & Rein-forcement Schedules | X | | | | | | | | | | | | |
| 233113 | Duct Liner | | X | | | | | | | | | | | |
| 233113 | Duct Sealants & Gaskets | | X | | | | | | | | | | | |
| 233113 | Coordination Drawings | X | | | | | | | | | | | | |
| 233119 | Metal Casings | X | X | | | | | | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 233300 | Backdraft Dampers | | X | | | | | | | | X | X | | |
| 233300 | Manual Volume Damper | | X | | | | | | | | | | | |
| 233300 | Fire Dampers | | X | | | | | | | | X | X | | |
| 233300 | Motorized Control Dampers | X | X | | | X | X | | | | X | X | | |
| 233300 | Turning Vanes | | X | | | | | | | | | | | |
| 233300 | Access Doors | | X | | | | | | | | | | | |
| 233300 | Flexible Connectors | | X | | | | | | | | | | | |
| 233300 | Flexible Ducts | | X | | | | | | | | | | | |
| 233423 | Ceiling Mounted Exhaust Fans | | X | | | | X | | | | X | X | | |
| 233423 | Centrifugal Roof Ventilators | | X | | | | X | | | | X | X | | |
| 233713 | Grilles & Diffusers | | X | | | | | | | | | | | |
| 233723 | Louvers | | X | | | | | | | | | | | |
| 234100 | Filters, Racks and Gauges | X | X | | | | | | | | | | | |
| 235100 | Gas Valves | X | X | | X | | | | | | | | | |
| 235400 | Fan Coil Units | | X | | | X | | | | | X | X | X | |
| 235400 | Thermostats | X | X | | | X | | | | | X | X | | |
| 235400 | Filters | | X | | | | | | | | X | | | |
| 235400 | Refrigeration Components | | X | | | X | | | | | X | X | | |
| 236200 | Condensing Units | X | X | | | X | X | X | | | X | X | | |
| 237413 | Rooftop Unit | X | X | | X | X | X | | | | X | X | X | |
| 238239 | Unit Heaters | X | X | | | | X | X | | | X | X | | |
| 239100 | Variable Frequency Drives | X | X | | X | | | | | | X | X | | |
| 260519 | Low-Voltage Electrical Power Conductors and Cables | | X | | | | | | | | | | X | |
| 260529 | Hangers and Supports for Electrical Systems | | X | | | | | | | | | | X | |
| 260533 | Raceway and Boxes for Electrical Systems | | X | | | | | | | | | | X | |
| 260553 | Identification for Electrical Systems | | X | | | | | | | | | | X | |
| 260576 | Overcurrent Protective Device Short Circuit, Coordination, Arc-Flash Study | X | X | | | | | | | | | | X | |
| 260923 | Lighting Control Devices | | X | | | | | | | | | | X | |
| 262415 | Circuit Breaker Distribution Panelboards | X | X | | | | X | | | | X | X | X | |
| 262416 | Panelboards | X | X | | | | X | | | | X | X | X | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 262726 | Wiring devices | | X | | | | | | | | | | X | |
| 264113 | Lightning Protection for Structures | X | X | | X | | | | | | | | X | |
| 264313 | Transient-Voltage Suppression for Low Voltage Electrical Power Circuits | X | X | | | | X | | | | X | X | X | |
| 265100 | Interior Lighting | | X | | | | X | | | | X | X | X | |
| 265600 | Exterior Lighting | | X | | | | X | | | | X | X | X | |
| 28 31 11 | Digital, Addressable Fire-Alarm Systems | X | X | | | X | X | | X | | X | X | | |
| 312300 | Excavation and Fill | | | X | | | | | | | | | | |
| 312316 | Structure Excavation and Backfill | | | X | X | | X | | | | | | | |
| 321300 | Portland Cement Paving | | | | X | | | | | | | | | |
| 329200 | Turn Restoration | | X | | | X | | | | | | | | |
| 331000 | Water Distribution | X | X | | X | X | | | | X | | | | |
| 333000 | Sanitary Sewerage | X | X | | X | X | | | | | | | | |
| 334000 | Storm Drainage | X | X | | X | X | | | | | | | | X |

END OF SECTION 013300

# SECTION 013513.31 – SITE SECURITY AND HEALTH REQUIREMENTS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUBMITTALS

A. List of required submittals:
   1. Materials Safety Data Sheets for all hazardous materials to be brought onsite.
   2. Schedule of proposed shutdowns, if applicable.

## PART 2 - PRODUCTS (Not Applicable)

## PART 3 - EXECUTION

### 3.1 ACCESS TO THE SITE

A. The Contractor shall arrange with Facility Representatives to establish procedures for the controlled entry of workers and materials into the work areas at the Facility.

B. The Contractor shall establish regular working hours with Facility Representatives. The Contractor must report changes in working hours or overtime to Facility Representatives and obtain approval twenty-four (24) hours ahead of time. The Contractor shall report emergency overtime to Facility Representatives as soon as it is evident that overtime is needed. The Contractor must obtain approval from Facility Representatives for all work performed after dark.

C. The Contractor shall provide the name and phone number of the Contractor's employee or agent who is in charge onsite; this individual must be able to be contacted in case of emergency. The Contractor must be able to furnish names and address of all employees upon request.

### 3.2 FIRE PROTECTION, SAFETY, AND HEALTH CONTROLS

A. The Contractor shall take all necessary precautions to guard against and eliminate possible fire hazards.
   1. Onsite burning is prohibited.
   2. The Contractor shall store all flammable or hazardous materials in proper containers located outside the buildings or offsite, if possible.
   3. The Contractor shall provide and maintain, in good order, during construction fire extinguishers as required by the National Fire Protection Association. In areas of flammable liquids, asphalt, or electrical hazards, 15-pound carbon dioxide or 20-pound dry chemical extinguishers shall be provided.

B. The Contractor shall not obstruct streets or walks without permission from the Owner's Construction Representative and Facility Representatives.

C. The Contractor's personnel shall not exceed the speed limit of 15 mph while at the Facility unless otherwise posted.

D. The Contractor shall take all necessary, reasonable measures to reduce air and water pollution by any material or equipment used during construction. The Contractor shall keep volatile wastes in covered containers, and shall not dispose of volatile wastes or oils in storm or sanitary drains.

E. The Contractor shall keep the project site neat, orderly, and in a safe condition at all times. The Contractor shall immediately remove all hazardous waste, and shall not allow rubbish to accumulate. The Contractor shall provide onsite containers for collection of rubbish and shall dispose of it at frequent intervals during the progress of the Work.

F. Fire exits, alarm systems, and sprinkler systems shall remain fully operational at all times, unless written approval is received from the Owner's Construction Representative and the appropriate Facility Representative at least twenty-four (24) hours in advance. The Contractor shall submit a written time schedule for any proposed shutdowns.

G. For all hazardous materials brought onsite, Material Safety Data Sheets shall be on site and readily available upon request at least a day before delivery.

H. Alcoholic beverages or illegal substances shall not be brought upon the Facility premises. The Contractor's workers shall not be under the influence of any intoxicating substances while on the Facility premises.

**3.3 DISRUPTION OF UTILITIES**

A. The Contractor shall give a minimum of seventy-two (72) hours written notice to the Construction Representative and the Facility Representative before disconnecting electric, gas, water, fire protection, or sewer service to any building.

B. The Contractor shall give a minimum of seventy-two (72) hours written notice to the Construction Representative and Facility Representative before closing any access drives, and shall make temporary access available, if possible. The Contractor shall not obstruct streets, walks, or parking.

**END OF SECTION 013513.31**

# SECTION 013591 - HISTORIC TREATMENT 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 general protection and treatment procedures for historic spaces, areas, rooms, and surfaces in Project.

B. The Arrow Rock Tavern (J. Huston Tavern) is listed in the National Register of Historic Places. All work must meet the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. The standards may be found here https://www.nps.gov/tps/standards.htm

C. Great care shall be taken to preserve all existing historic materials and finishes. It should be assumed that all finishes, millwork, flooring, wallcoverings, decorative painting, fixtures, and other finishes are historic or important to presenting the historic story of the building and are to be protected throughout construction.

D. The removal of historic materials or alteration of historic finishes or features and spaces will not be permitted. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of deteriorated features must be approved by the Construction Representative and Designer.

E. Related Requirements:

1. Section 024296 "Historic Removal and Dismantling" for selective demolition for historic spaces.

### 1.3 DEFINITIONS

A. Consolidate: To strengthen loose or deteriorated materials in place.

B. Design Reference Sample: A sample that represents Architect's prebid selection of work to be matched; it may be existing work or work specially produced for Project.

C. Dismantle: To disassemble or detach a historic item from a surface, or a nonhistoric item from a historic surface, using gentle methods and equipment to prevent damage to historic items and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

D. Historic: Spaces, areas, rooms, surfaces, materials, finishes, and overall appearance that are important to the successful preservation, rehabilitation, restoration, and reconstruction as determined by Architect. Designated historic areas and surfaces are indicated on Drawings.

E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.

F. Preserve: Act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property.

G. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.

H. Reinstall: To protect removed or dismantled item, repair and clean it as indicated for reuse, and reinstall it in original position, or where indicated.

I. Remove: To take down or detach a nonhistoric item located within a historic space, area, or room, using methods and equipment to prevent damage to historic items and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

J. Repair: To correct damage and defects, retaining existing materials, features, and finishes while employing as little new material as possible. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.

K. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.

L. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.

M. Reproduce: To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.

N. Restore: To consolidate, replicate, reproduce, repair, and refinish as required to achieve the indicated results.

O. Retain: To keep existing items that are not to be removed or dismantled.

P. Reversible: New construction work, treatments, or processes that can be removed or undone in the future without damaging historic materials unless otherwise indicated.

Q. Salvage: To protect removed or dismantled items and deliver them to Owner ready for reuse.

R. Stabilize: To provide structural reinforcement of unsafe or deteriorated items while maintaining the essential form as it exists at present; also, to reestablish a weather-resistant enclosure.

S. Strip: To remove existing finish down to base material unless otherwise indicated.

## 1.4 COORDINATION

A. Historic Treatment Subschedule: In conjunction with the overall project schedule, Contractor shall provide a construction schedule coordinating the sequencing and scheduling of historic treatment work for entire Project, including each activity to be performed in historic spaces, areas, and rooms, and on historic surfaces; and based on Contractor's Construction Schedule. Secure time commitments for performing critical construction activities from separate entities responsible for historic treatment work.

1. Schedule construction operations in sequence required to obtain best historic treatment results.

2. Coordinate sequence of historic treatment work activities to accommodate the following:

    a. Owner's continuing occupancy of portions of existing building.
    b. Owner's partial occupancy of completed Work.
    c. Other known work in progress.
    d. Tests and inspections.

3. Detail sequence of historic treatment work, with start and end dates.
4. Utility Services: Indicate how long utility services will be interrupted. Coordinate shutoff, capping, and continuation of utility services.
5. Use of elevator and stairs.
6. Equipment Data: List gross loaded weight, axle-load distribution, and wheel-base dimension data for mobile and heavy equipment proposed for use. Do not use such equipment without certification from Contractor's professional engineer that the structure can support the imposed loadings without damage.

B. Pedestrian and Vehicular Circulation: Coordinate historic treatment work with circulation patterns within the Tavern and site. Some work is near circulation patterns. Circulation patterns cannot be closed off entirely, and in places can be only temporarily redirected around small areas of work. Plan and execute the Work accordingly. The property is gated and will continue to be gated throughout the entire project.

## 1.5 PROJECT MEETINGS FOR HISTORIC TREATMENT

A. Preliminary Historic Treatment Conference: Before starting historic treatment work, conduct conference at Project site.

1. Attendees: In addition to representatives of Owner, Architect, and Contractor, testing service representative, historic treatment specialists (plaster, decorative and plain painting, millwork, etc.), specialty manufacturer(s) (storefront, alarm, and security), and installers whose work interfaces with or affects historic treatment shall be represented at the meeting (mechanical, plumbing, and electrical subcontractors).
2. Agenda: Discuss items of significance that could affect progress of historic treatment work, including review of the following:

    a. Historic Treatment Subschedule: Discuss and finalize; verify availability of materials, historic treatment specialists' personnel, equipment, and facilities needed to make progress and avoid delays.
    b. Fire-prevention plan.
    c. Governing regulations.
    d. Areas where existing construction is to remain and the required protection.
    e. Hauling routes.
    f. Sequence of historic treatment work operations.
    g. Storage, protection, and accounting for salvaged and specially fabricated items.
    h. Existing conditions, staging, and structural loading limitations of areas where materials are stored.
    i. Qualifications of personnel assigned to historic treatment work and assigned duties.
    j. Requirements for extent and quality of work, tolerances, and required clearances.
    k. Methods and procedures related to historic treatments, including product manufacturers' written instructions and precautions regarding historic treatment procedures and their effects on materials, components, and vegetation.
    l. Embedded work such as flashings and lintels, special details, collection of wastes, protection of occupants and the public, and condition of other construction that affect the Work or will affect the work.

B. Coordination Meetings: Conduct specifically for historic treatment work in conjunction with regularly scheduled progress meetings. Designate a specific part of the meeting agenda to address historic concerns, include updating Historic Treatment Subschedule and any required upcoming Historic Treatment Conferences.

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

a. Historic Treatment Subschedule: Review progress since last coordination meeting. Determine whether each schedule item is on time, ahead of schedule, or behind schedule. Determine how construction behind schedule will be expedited with retention of quality; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities are completed within the Contract Time.

b. Schedule Updating: Revise Contractor's Historic Treatment Subschedule after each coordination meeting where revisions to schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.

c. Review present and future needs of each entity present, including review items listed in the "Preliminary Historic Treatment Conference" Paragraph in this article and the following:

1) Interface requirements of historic treatment work with other Project Work.
2) Status of submittals for historic treatment work.
3) Access to historic treatment work.
4) Effectiveness of fire-prevention plan.
5) Quality and work standards of historic treatment work.

## 1.6 MATERIALS OWNERSHIP

A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered or uncovered during the Work, regardless of whether they were previously documented, remain Owner's property.

1. Dismantle and salvage each item or object and protect it from damage, then promptly deliver it to Owner where directed at Project site.
2. Coordinate with Owner's Construction Representative who will establish special procedures for dismantling and salvaging.

## 1.7 INFORMATIONAL SUBMITTALS

A. Historic Treatment Subschedule:

1. Submit historic treatment subschedule within seven days of date established for commencement of historic treatment work.

B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by Contractor's historic treatment operations.

C. Historic Treatment Program: Submit 30 days before work begins.

D. Fire-Prevention Plan: Submit 30 days before work begins.

## 1.8 QUALITY ASSURANCE

A. Historic Treatment Specialist Qualifications (Plaster, Decorative Painting, Masonry): An experienced firm regularly engaged in historic treatments similar in nature, materials, design, and extent to the work as specified in each Section and that has completed a minimum of five (5) recent projects with a record of successful in-service performance that demonstrates the firm's qualifications to perform this work.

   1. Field Supervisor Qualifications: Full-time supervisors experienced in historic treatment work similar in nature, material, design, and extent to that indicated for this Project. Supervisors shall be on site when historic treatment work begins and during its progress. Supervisors shall not be changed during Project except for causes beyond control of the specialist firm.

      a. Construct new mockups of required work whenever a supervisor is replaced.

B. Each firm conducting activities that disturb painted surfaces shall be a "Lead-Safe Certified Firm" and use only workers that are trained in lead-safe work practices, as required by the State of Missouri.

C. Historic Treatment Program: Prepare a written plan for historic treatment for whole Project, including each phase or process and protection of surrounding materials during operations. Describe in detail the materials, methods, and equipment to be used for each phase of work. Show compliance with indicated methods and procedures specified in this and other Sections. Coordinate this whole-Project historic treatment program with specific requirements of programs required in other historic treatment Sections.

   1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control partitions and means of egress from occupied areas coordinated with continuing on-site operations and other known work in progress.
   2. Debris Hauling: Include plans clearly marked to show debris hauling routes, turning radii, and locations and details of temporary protective barriers.
   3. Indicate methods for
      a. Installation of roofing protection
      b. Installation of flooring protection throughout the building
      c. Installation of historic surface protections
      d. Plan to completely and carefully protect and work around furnishings remaining in the house. (Owner will provide coverings for all items remaining).

D. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-control devices during each phase or process. Coordinate plan with Owner's fire-protection equipment and requirements. Include fire-watch personnel's training, duties, and authority to enforce fire safety.

E. Safety and Health Standard: ANSI/ASSE A10.6.

## 1.9 STORAGE AND HANDLING OF HISTORIC MATERIALS

A. Salvaged Historic Materials:

   1. Clean loose dirt and debris from salvaged historic items unless more extensive cleaning is indicated.
   2. Pack or crate items after cleaning; cushion against damage during handling. Label contents of containers.
   3. Store items in a secure area until delivery to Owner.

4. Transport items to Owner's storage area designated by Owner.
5. Protect items from damage during transport and storage.

B. Historic Materials for Reinstallation:

1. Repair and clean historic items for reuse as indicated.
2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.

C. Existing Historic Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after historic treatment and construction work in the vicinity is complete.

D. Storage: Catalog and store historic items within a weathertight enclosure where they are protected from moisture, weather, condensation, and freezing temperatures.

1. Identify each item with a nonpermanent mark to document its original location. Indicate original locations on plans, elevations, sections, or photographs by annotating the identifying marks.
2. Secure stored materials to protect from theft.
3. Control humidity so that it does not exceed 85 percent. Maintain temperatures 5 deg F (3 deg C) or more above the dew point.

E. Storage Space:

1. Owner will arrange for limited on-site location(s) for free storage of historic material.

## 1.10 FIELD CONDITIONS

A. Size Limitations in Historic Spaces: Materials, products, and equipment used for performing the Work and for transporting debris, materials, and products shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, including temporary protection, by 12 inches (300 mm) or more.

# PART 2 - PRODUCTS - (Not Used)

# PART 3 - EXECUTION

## 3.1 PROTECTION

A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from historic treatment procedures.

1. Use only proven protection methods, appropriate to each area and surface being protected.

2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where historic treatment work is being performed.
3. Erect temporary barriers to form and maintain fire-egress routes.
4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during historic treatment work.
5. Contain dust and debris generated by historic treatment work and prevent it from reaching the public or adjacent surfaces.
6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
7. Protect floors and other surfaces along hauling routes from damage, wear, and staining.
8. Provide supplemental sound-control treatment to isolate removal and dismantling work from other areas of the building.

B. Temporary Protection of Historic Materials:

1. Protect existing historic materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
2. Do not attach temporary protection to historic surfaces except as indicated as part of the historic treatment program and approved by Architect.

C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.

D. Utility and Communications Services:

1. Notify Owner, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by historic treatment work before commencing operations.
2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for historic treatment work.
3. Maintain existing services unless otherwise indicated; keep in service and protect against damage during operations. Provide temporary services during interruptions to existing utilities.

E. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.

1. Prevent solids such as stone or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from historic treatment work.
2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

F. Existing Roofing: Prior to the start of work in an area, install roofing protection.

## 3.2 PROTECTION FROM FIRE

A. Follow fire-prevention plan and the following:

1. Comply with NFPA 241 requirements unless otherwise indicated. Perform duties titled "Owner's Responsibility for Fire Protection."
2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.

a. If combustible material cannot be removed, provide fire blankets to cover such materials.

3. Prohibit smoking by all persons within Project work and staging areas.

B. Heat-Generating Equipment and Combustible Materials: Comply with the following procedures while performing work with heat-generating equipment or combustible materials, including welding, torch-cutting, soldering, brazing, removing paint with heat, or other operations where open flames or implements using high heat or combustible solvents and chemicals are anticipated:

1. Obtain Owner's approval for operations involving use of open-flame or welding or other high-heat equipment. Notify Owner at least 24 hours before each occurrence, indicating location of such work.
2. As far as practicable, restrict heat-generating equipment to shop areas or outside the building.
3. Do not perform work with heat-generating equipment in or near rooms or in areas where flammable liquids or explosive vapors are present or thought to be present. Use a combustible gas indicator test to ensure that area is safe.
4. Use fireproof baffles to prevent flames, sparks, hot gases, or other high-temperature material from reaching surrounding combustible material.
5. Prevent the spread of sparks and particles of hot metal through open windows, doors, holes, and cracks in floors, walls, ceilings, roofs, and other openings.
6. Fire Watch: Before working with heat-generating equipment or combustible materials, station personnel to serve as a fire watch at each location where such work is performed. Fire-watch personnel shall have the authority to enforce fire safety. Station fire watch according to NFPA 51B, NFPA 241, and as follows:

   a. Train each fire watch in proper operation of fire-control equipment and alarms.
   b. Prohibit fire-watch personnel from other work that would distract from fire-watch duties.
   c. Cease work with heat-generating equipment whenever fire-watch personnel are not present.
   d. Have fire-watch personnel perform final fire-safety inspection each day beginning no sooner than 30 minutes after conclusion of work in each area to detect hidden or smoldering fires and to ensure that proper fire prevention is maintained.
   e. Maintain fire-watch personnel at each area of Project site until two hours after conclusion of daily work.

C. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for type of fire risk in each work area. Ensure that nearby personnel and fire-watch personnel are trained in fire-extinguisher and blanket use.

## 3.3 PROTECTION DURING APPLICATION OF CHEMICALS

A. Protect motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.

B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in historic treatment program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid

masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.

C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.

D. Neutralize alkaline and acid wastes and legally dispose of off Owner's property.

E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

## 3.4 GENERAL HISTORIC TREATMENT

A. Have historic treatment work performed only by qualified historic treatment specialists.

B. Ensure that supervisory personnel are present when historic treatment work begins and during its progress.

C. Record existing work before each procedure (preconstruction), and record progress during the work. Use digital preconstruction documentation photographs or video recordings.

D. Perform regular, but no less than daily, inspections of Project site as the Work progresses to detect hazards resulting from historic treatment procedures.

E. Follow the procedures in subparagraphs below and procedures approved in historic treatment program unless otherwise indicated:

1. Retain as much existing material as possible; repair and consolidate rather than replace.
2. Use additional material or structure to reinforce, strengthen, prop, tie, and support existing material or structure.
3. Use reversible processes wherever possible.
4. Use historically accurate repair and replacement materials and techniques unless otherwise indicated.
5. Record existing work before each procedure (preconstruction) and progress during the work with digital preconstruction documentation photographs or video recordings.

F. Notify Architect of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.

1. Do not proceed with the work in question until directed by Architect.

G. Where missing features are indicated to be repaired or replaced, provide work with appearance based on accurate duplications rather than on conjecture, subject to approval of Architect.

H. Where work requires existing features to be removed or dismantled and reinstalled, perform these operations without damage to the material itself, to adjacent materials, or to the substrate.

I. Identify new and replacement materials and features with permanent marks hidden in the completed Work to distinguish them from original materials. Record a legend of identification marks and the locations of the items on record Drawings.

**END OF SECTION 013591**

**SECTION 015000 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes requirements for construction facilities and temporary controls including temporary utilities, support facilities, security, and protection.

B. Temporary utilities include, but are not limited to, the following:

1. Water service and distribution
2. Temporary electric power and light
3. Temporary heating and cooling
4. Ventilation
5. Telephone service
6. Sanitary facilities, including drinking water
7. Storm and sanitary sewer

C. Support facilities include, but are not limited to, the following:

1. Field offices and storage sheds
2. Temporary roads and paving
3. Dewatering facilities and drains
4. Temporary enclosures
5. Hoists
6. Temporary project identification signs and bulletin boards
7. Waste disposal services
8. Rodent and pest control
9. Construction aids and miscellaneous services and facilities

D. Security and protection facilities include, but are not limited to, to following:

1. Temporary fire protection
2. Barricades, warning signs, and lights
3. Sidewalk bridge or enclosure fence for the site
4. Environmental protection

1.3 SUBMITTALS

A. Temporary Utilities: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.

B. Implementation and Termination Schedule: Within (15) days of the date established for commencement of the Work, submit a schedule indicating implementation and termination of each temporary utility.

1.4 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations including, but not limited to, the following:

1. Building code requirements
2. Health and safety regulations
3. Utility company regulations
4. Police, fire department, and rescue squad rules
5. Environmental protection regulations

B. Standards: Comply with NFPA 241 “Standard for Safeguarding Construction, Alterations, and Demolition Operations”. ANSI A10 Series standards for “Safety Requirements for Construction and Demolition”, and NECA Electrical Design Library “Temporary Electrical Facilities”.

1. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 “National Electric Code”.

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

1.5 PROJECT CONDITIONS

A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist onsite.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials. If acceptable to the Designer, the Contractor may use undamaged, previously used materials in serviceable condition. Provide materials suitable for use intended.

B. Lumber and Plywood: Comply with requirements in Division 6 Section “Rough Carpentry”.

1. For job-built temporary office, shops, and sheds within the construction area, provide UL-labeled, fire-treated lumber and plywood for framing, sheathing, and siding.
2. For signs and directory boards, provide exterior-type, Grade B-B high-density concrete form overlay plywood of sized and thicknesses indicated.

3. For fences and vision barriers, provide minimum 3/9" (9.5mm) thick exterior plywood.

4. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8" (16mm) thick exterior plywood.

C. Roofing Materials: Provide UL Class A standard-weight asphalt shingles or UL Class C mineral-surfaced roll roofing on roofs of job-built temporary office, shops, and shed.

D. Paint: Comply with requirements of Division 9 Section "Painting".

1. For job-built temporary offices, shops, sheds, fences, and other exposed lumber and plywood, provide exterior-grade acrylic-latex emulsion over exterior primer.

2. For sign panels and applying graphics, provide exterior-grade alkyd gloss enamel over exterior primer.

3. For interior walls of temporary offices, provide two (2) quarts interior latex-flat wall paint.

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

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

G. Open-Mesh Fencing: Provide orange snow fencing and painted steel posts for temporary safety fencing.

2.2 EQUIPMENT

A. General: Provide new equipment. If acceptable to the Designer, the Contractor may use undamaged, previously used equipment in serviceable condition. Provide equipment suitable for use intended.

B. Water Hoses: Provide ¾" (19mm), heavy-duty, abrasion-resistant, flexible rubber hoses 100' (30m) long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

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

D. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage rating.

E. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered-glass enclosures where exposed to breakage. Provide exterior fixture where exposed to moisture.

F. Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM, or another recognized trade association related to the type of fuel being consumed.

G. Temporary Offices: Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows, and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.

H. Temporary Toilet Units: Provide self-contained, single-occupant toilet units of the chemical, aerated re-circulation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.

I. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers, or a combination of extinguishers of NFPA-recommended classes for the exposures.

1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Provide each Facility ready for use when needed to avoid delay. Maintain and modify as required. 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: Engage the appropriate local utility company to install temporary service or connect to existing service. Where company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with company recommendations.

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

2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.

3. Obtain easements to bring temporary utilities to the site where the Owner's easements cannot be used for that purpose.

4. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Designer. Neither the Owner nor Designer will accept cost or use charges as a basis of claims for Contract Change.

B. Temporary Water Service: The Owner will provide water for construction purposes from the existing building system. All required temporary extensions shall be provided and removed by the Contractor. Connection points and methods of connection shall be designated and approved by the Construction Representative.

C. Temporary Electric Power Service: The Owner will provide electric power for construction lighting and power tools. Contractors using such services shall pay all costs of temporary services, circuits, outlet, extensions, etc.

D. Temporary Lighting: When overhead floor or roof deck has been installed, provide temporary lighting with local switching.

1. Install and operate temporary lighting that will fulfill security and protection requirements without operating the entire system. Provide temporary lighting that will provide adequate illumination for construction operations and traffic conditions.

E. Temporary Heating: Provide temporary heat required by construction activities for curing or drying of completed installations or for protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.

1. Heating Facilities: Except where the Owner authorizes use of the permanent system, provide vented, self-contained, LP gas or fuel-oil heaters with individual space thermostatic control.

2. Use of gasoline-burning space heaters, open flame, or salamander heating units is prohibited.

F. Temporary Cooling, Humidification, and De-Humidification Control for Construction Area: The existing cooling systems in the building shall not be maintained in operation during the construction and shall not be utilized for any temporary cooling or space environmental control.

G. Temporary Telephones: Provide temporary telephone service throughout the construction period for all personnel engaged in construction activities.

1. Telephone Service:

1. Provide a telephone or cell phone for the Contractor's Superintendent responsible to be on site during all work and the Contractor's Project Manager.

2. Post a list of important telephone numbers, including cell phone numbers for all project contacts, including sub-contractors at the entrance to the job office and at the entrance into the building.

3. Provide cell numbers for all Project Managers and Superintendents.

H. Temporary Toilets: Use of the Owner's existing toilet facilities will not be permitted. Install self-contained toilet units. Use of pit-type privies will not be permitted. Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.

1. Shield toilets to ensure privacy.

2. Provide separate facilities for male and female personnel.

3. Provide toilet tissue materials for each facility.

I. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a health and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.

1. Provide hand washing soap and paper towels or similar disposable materials for each facility.

2. Provide covered waste containers for used material.

3. Provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel.

J. Drinking-Water Facilities: Provide containerized, tap-dispenser, bottled-water drinking-water units, including paper supply.

K. Provide sandbags or similar barriers in and around excavations sufficient to prevent flooding by runoff of storm water from heavy rains.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Locate field offices, storage sheds, and other temporary construction and support facilities for easy access.

1. Maintain support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will not be permitted to use permanent facilities.

B. Field Offices: Provide insulated, weathertight temporary offices of sufficient size to accommodate required office personnel at the Project site. Keep the office clean and orderly for use for small progress meetings.

C. Storage Facilities: Limited areas for storage of building materials are available onsite. Available storage areas are shown on the drawings. The Contractor shall provide his own security. Specific locations for storage and craning operations will be discussed at the Pre-Bid Meeting and the Pre-Construction Meeting.

D. Construction Parking: Contractors must be prepared to discuss their storage and parking needs at the Pre-Bid Meeting. Parking for construction personnel is limited onsite. The Contractor(s) will have to park on Van Buren Street. Under no circumstances will any vehicle be parked on Main Street or in a fire lane. Parking on lawns shall be prohibited.

E. Dewatering Facilities and Drains: For temporary drainage and dewatering facilities and operations not directly associated with construction activities included under individual Sections, comply with dewatering requirements of applicable Division 2 Sections. Where feasible, utilize the same facilities. Maintain the site, excavations, and construction free of water.

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

1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and materials drying or curing requirements to avoid dangerous conditions and effects.

2. Install tarpaulins securely with incombustible wood framing and other materials. Close openings of 25SqFt (2.3SqM) or less with plywood or similar materials.

3. Close openings through floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.

4. Where temporary wood or plywood enclosure exceeds 100SqFt (9.2SqM) in area, use UL-labeled, fire-retardant-treated material for framing and main sheathing.

G. Temporary Lifts and Hoists: Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting materials are considered “tools and

equipment" and not temporary facilities. Coordinate location of temporary lifts and hoists at the pre-construction meeting.

H. Temporary Exterior Lighting: Install exterior yard and sign lights so signs are visible when Work is being performed.

I. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than seven (7) days during normal weather or three (3) days when the temperature is expected to rise above 80°F (27°C). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material lawfully.

J. Temporary Protections: Cover finished, permanent stairs and all areas of traffic with a protective covering of plywood or similar material so finishes will be undamaged at the time of acceptance. Construct temporary barriers to protect areas not included in the construction scope of work to contain dust and to protect historic and existing building fabric and materials.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

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

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

1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one (1) extinguisher on each floor at or near each usable stairwell.

2. Store combustible materials in containers in fire-safe locations.

3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for fighting fires. Prohibit smoking in hazardous fire-exposure areas.

4. Provide supervision of welding operations, combustion-type temporary heating units, and similar sources of fire ignition.

C. Permanent Fire Protection: At the earliest feasible date in each area of the Project complete installation of the permanent fire-protection facility including connected services and place into operation and use. Instruct key personnel on use of facilities.

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

E. Enclosure Fence: Before excavation begins, install an enclosure fence. Locate where indicated or enclose the entire site or the portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering the site, except by the entrance gates.

1. Provide temporary orange safety barrier fence with posts or stakes.

F. Storage: Where materials and equipment must be stored and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

G. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near the site.

3.5 OPERATION, TERMINATION AND REMOVAL

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

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

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.

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

C. Termination and Removal: Unless the Designer requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the Contractor's property. The Owner reserves the right to take possession of project identification signs.

2. At Substantial Completion, clean and renovate permanent facilities used during the construction period including, but not limited to, the following:

1. Replace air filters and clean inside of ductwork and housing.

2. Replace significantly worn parts and parts subject to unusual operating conditions.

3. Replace lamps burned out or noticeably dimmed by hours of use.

**END OF SECTION 015000**

**SECTION 017400 – CLEANING**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for cleaning during the Project.

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

1. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

2. Burning or burying of debris, rubbish, or other waste material on the premises is not permitted.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by the manufacturer or fabricator for the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces. Pay specific attention to historic and decorative finishes.

PART 3 - EXECUTION

3.1 PROGRESS CLEANING

A. General

1. Retain all stored items in an orderly arrangement allowing maximum access, not impending drainage or traffic, and providing the required protection of materials.

2. Do not allow the accumulation of scrap, debris, waste material, and other items not required for construction of this Work.

3. Daily, completely remove all scrap, debris, and waste material from the jobsite.

4. Provide adequate storage for all items awaiting removal from the jobsite, observing all requirements for fire protection and protection of the ecology.

B. Site

1. Daily, inspect the site and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.

2. Weekly, inspect all arrangements of materials stored onsite. Re-stack, tidy, or otherwise service all material arrangements.

3. Maintain the site in a neat and orderly condition at all times.

C. Structures

1. Daily, inspect the structures and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.

2. Weekly, sweep all interior spaces clean. “Clean” for the purposes of this paragraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and handheld broom.

3. In preparation for installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using all equipment and materials required to achieve the required cleanliness.

4. Following the installation of finish floor materials, clean the finish floor daily while work is being performed in the space in which finish materials have been installed. “Clean” for the purposes of this subparagraph, shall be interpreted as meaning free from all foreign material which, in the opinion of the Construction Representative, may be injurious to the finish of the finish floor material.

## 3.2 FINAL CLEANING

A. General: Provide final cleaning operations when indicated. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from a commercial building cleaning and maintenance program. Comply with manufacturer’s instructions.

B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for the entire Project or a portion of the Project.

1. Clean the Project Site, yard and grounds, in areas disturbed by construction activities including landscape development areas, of rubbish, waste material, litter, and foreign substances.

2. Sweep paved areas broom clean. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

3. Remove petrochemical spills, stains, and other foreign deposits.

4. Remove tools, construction equipment, machinery, and surplus material from the site.

5. Remove snow and ice to provide safe access to the building.

6. 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.

7. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.

8. Broom clean concrete floors in unoccupied spaces.

9. Vacuum clean carpet and similar soft surfaces removing debris and excess nap. Shampoo, if required.

10. Clean transparent material, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged

transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.

11. Remove labels that are not permanent labels.

12. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

    a. Do not paint over “UL” and similar labels, including mechanical and electrical nameplates.

13. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

14. Clean plumbing fixtures to a sanitary condition free of stains, including stains resulting from water exposure.

15. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

16. Clean ducts, blowers, and coils if units were operated without filters during construction

17. Clean food-service equipment to a sanitary condition, ready and acceptable for its intended use.

18. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs and defective and noisy starters in fluorescent and mercury vapor fixtures.

19. Leave the Project clean and ready for occupancy.

C. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period.

D. Compliances: Comply with governing regulations and safety standards for cleaning operations. Remove waste materials from the site and dispose of lawfully.

    1. Where extra materials of value remain after Final Acceptance by the Owner, they become the Owner’s property.

**END OF SECTION 017400**

**SECTION 024100 – SITE DEMOLITION**

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Removal of drainage structures, pavements, surfacing, base courses, curb, curb and gutter, sidewalks, steps, retaining walls, foundation walls, utility pipes, and other existing improvements which conflict with the work and are not designated to remain in place.

B. Drawings and General Provisions of Contract, including General and Special Conditions, apply to this section.

1.2 GENERAL

A. The Contractor shall remove old pavements, abandoned sewers or pipelines, and other obstructions to the work within the construction limits, and not designated or permitted to remain. The Contractor shall dispose of the materials away from the site of work.

B. It is the intent that the demolition be complete and adequate for the intended purpose. This work shall include the removal of all items, whether in view or hidden underneath the surface of the ground, regardless of whether shown on the Drawings or encountered during construction.

1.3 RELATED SECTIONS

A. Section 31 10 00 – Site Clearing

B. Section 31 23 00 – Excavation and Fill

C. Section 31 23 33 – Trenching and Backfilling

1.4 PERMITS

A. Contractor shall comply with all applicable local, state, and federal requirements regarding materials, methods of work, and disposal of excess and waste materials.

B. Contractor shall obtain and pay for all required inspections, permits, and fees. Provide notices required by governmental authorities.

1.5 SUBMITTALS

A. The Contractor shall submit utility service termination certificates, copies of demolition notices, and permits to the Owner’s Representative prior to removal.

B. If the Drawings or Specifications do not specify phasing, the Contractor shall submit demolition procedures and operational sequence for review and acceptance by the Owner’s Representative.

1.6 JOB CONDITIONS

A. Protection

1. Erect barriers, fences, guardrails, enclosures, chutes, and shoring to protect personnel, structures, and utilities remaining intact.

2. Protect trees and plants not noted for removal from damage.

3. Protect existing objects designated to remain. In case of damage, immediately make repairs or replacements necessary to the approval of the Owner's Representative at no additional cost to the Owner.

B. Maintaining Traffic

1. Minimize interference with roads, streets, driveways, sidewalks, and adjacent facilities.

2. Do not close or obstruct streets, sidewalks, alleys, or passageways without permission from authorities having jurisdiction.
3. If closure is permitted, provide signage indicating closure and signage to direct traffic to alternate route.

C. Dust Control

1. Moisten surfaces as required to prevent dust from being a nuisance to the public, neighbors, and concurrent performance of other work on the site.

PART 2 - MATERIALS NOT USED

PART 3 - EXECUTION

3.1 PREPARATION

A. Notification: Provide the Owner's Representative a minimum of seventy two (72) hours notice prior to commencing the work of this section. Notice may not include weekends or holidays.

B. Site Inspection: Prior to work under this section, the Contractor shall carefully inspect the entire site and verify all objects designated to be removed or to be preserved.

C. Protection of Utilities: The Contractor shall locate existing utility lines and services traversing the site and determine the requirements for their protection. The Contractor shall preserve in operating condition active utilities traversing the site that are designated to remain.

D. Disconnection of Utilities: Before starting site operations, the Contractor shall disconnect or arrange for the disconnection of all utility services designated to be removed. The Contractor shall perform all such work in accordance with the requirements of the utility company or agency involved.

3.2 PAVEMENTS

A. In removing pavement, curb and gutter, sidewalks, and similar improvements, where a portion is to be left in place, removal shall be to an existing joint or to a joint sawed to a minimum depth of 2" with a true line and a vertical face. Remove sufficient pavement to provide for proper grade and connections in the new work regardless of any limits indicated on the Drawings.

3.3 SEWERS

A. Existing castings and culverts, if salvageable and removed intact, shall remain the property of the owner. The Contractor shall use reasonable care in the removal. If privately owned, leave on the owner’s property. Arrange pickup by the appropriate agency if owned publicly.

B. All sewers, drainage pipe, and floor drains, which have been or are to be abandoned, shall be permanently sealed at the ends with bulkheads constructed of concrete, having a minimum thickness of 8”. No direct payment will be made for blocking abandoned sewers, drainage pipes, or floor drains.

C. Abandon storm or sanitary sewer structures by breaking the concrete bottom of the structure into pieces no larger than 12” in any direction and removing the top of the structure to 3' below finished grade. Plug all pipes with concrete and fill structure with 3/4" or 1” clean gravel.

3.4 BLASTING

A. Blasting is not permitted.

3.5 DISPOSAL

A. All debris shall be disposed of off site.

B. If off-site disposal of debris is required in the Drawings or Specifications, the Contractor shall remove demolition debris and grindings as soon as practicable.

C. Do not store or burn materials on site.

D. All asphaltic materials shall be disposed of off site.

3.6 CONSTRUCTION LIMITS

A. The Contractor's operations shall be restricted to those areas inside the construction limits indicated on the Drawings. If limits are not indicated, restrict work to the Owner's property, easement, or public rights-of-way.

B. Complete work within public rights-of-way under the permission of the governing agency.

C. Restoration and site repair within the construction limits shall be included in the base bid.

D. The Contractor shall repair damage outside the construction limits at no additional expense to the Owner.

3.7 UTILITY ADJUSTMENT

A. The Contractor is responsible for the adjustment of all gas vents, manholes, castings, and water valves within the grading limits to match the finished surface.

B. Adjustments shall be coordinated with the utility companies and the cost for all adjustments shall be incidental to construction unless noted as a bid item.

C. The Contractor shall repair any damage to utility structures and appurtenances that occurs during construction at no additional cost to the Owner.

3.8 EXISTING SIGNAGE

A. Carefully remove traffic signs designated on the Drawings or in conflict with the work and within the project limits. Protect from damage. Temporarily store and reinstall in the same fashion as their original installation.

B. The Contractor shall replace any signs he damages during construction at no cost to the Owner.

END OF SECTION 02 41 00

# SECTION 024296 - HISTORIC REMOVAL AND DISMANTLING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. Section includes historic treatment procedures in the form of special types of selective demolition work for historic spaces, areas, rooms, and surfaces and the following specific work:

1. Removal and dismantling of indicated portions of building or structure and debris hauling.
2. Removal and dismantling of indicated site elements and debris hauling.
3. Salvage of existing items to be reused or recycled.

B. Related Requirements:

1. Section 013591 "Historic Treatment Procedures" for general historic treatment requirements.

### 1.3 DEFINITIONS

A. Dismantle: To disassemble or detach a historic item from a surface, or a nonhistoric item from a historic surface, using gentle methods and equipment to prevent damage to historic items and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

B. Existing to Remain: Existing items that are not to be removed or dismantled, except to the degree indicated for performing required Work.

C. Remove: To take down or detach a nonhistoric item located within a historic space, area, or room, using methods and equipment to prevent damage to historic items and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

D. Preserve or Retain: To keep existing items that are not to be removed or dismantled.

E. Salvage: To protect removed or dismantled items and deliver them to Owner ready for reuse.

### 1.4 PRECONSTRUCTION MEETINGS

A. Preconstruction Conference(s): Conduct conference(s) at Project site.

1. Review minutes of Preliminary Historic Treatment Conference that pertain to removal and dismantling procedures and protection of historic areas and surfaces.
2. Review list of items indicated to be salvaged.
3. Verify qualifications of personnel assigned to perform removal and dismantling.
4. Inspect and discuss condition of each construction type to be removed or dismantled.

5. Review requirements of other work that depends on condition of substrates exposed by removal and dismantling work.
6. Review methods and procedures related to removal and dismantling work, including, but not limited to, the following:

    a. Historic removal and dismantling specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
    b. Materials, material application, sequencing, tolerances, and required clearances.
    c. Fire prevention.
    d. Coordination with building occupants.

## 1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For historic removal and dismantling specialist and historic removal and dismantling specialist's field supervisors.

B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by Contractor's removal and dismantling operations.

C. Removal and Dismantling Historic Treatment Program: Submit 15 days before work begins.

D. List of Items Indicated to Be Salvaged: Prepare a list of items indicated on Drawings to be salvaged for Owner's use or for reinstallation. Submit 15 days before preconstruction conference.

E. Inventory of Salvaged Items: After removal or dismantling work is complete, submit a list of items that have been salvaged.

    1. Include item description, item condition, number of items if more than one of a type, and tag number. Include photo of item in original location.
    2. As work proceeds, include on the inventory items that were indicated to be salvaged and items of historic importance discovered during the work. Document reasons, if any, why an item indicated to be salvaged was not salvaged.

## 1.6 QUALITY ASSURANCE

A. Historic Removal and Dismantling Specialist Qualifications: A qualified historic treatment specialist. General selective demolition experience is insufficient experience for historic removal and dismantling work.

B. Removal and Dismantling Historic Treatment Program: Prepare a written, detailed description of materials, methods, equipment, and sequence of operations to be used for each phase of removal and dismantling work, including protection of surrounding and substrate materials and Project site.

    1. Dust and Noise Control: Include locations of proposed temporary dust- and noise-control partitions and means of egress from occupied areas coordinated with continuing on-site operations and other known work in progress.
    2. Debris Hauling: Include plans clearly marked to show debris hauling routes, turning radii, and locations and details of temporary protective barriers.

C. Mockups: Prepare mockups of specific historic removal and dismantling procedures specified in this Section to demonstrate aesthetic effects and to set quality standards for materials and execution.

1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

D. Regulatory Requirements: Comply with notification regulations of authorities having jurisdiction before beginning removal and dismantling work. Comply with hauling and disposal regulations of authorities having jurisdiction.

## 1.7 FIELD CONDITIONS

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

B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.

C. Hazardous Materials: Hazardous materials are present in construction affected by removal and dismantling work. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.

1. Hazardous material remediation is specified elsewhere in the Contract Documents.
2. Do not disturb hazardous materials or items suspected of containing hazardous materials, except under procedures specified elsewhere in the Contract Documents.
3. If unanticipated asbestos is suspected, stop work in the area of potential hazard, shut off fans and other air handlers ventilating the area, and rope off area until the questionable material is identified. Resume work in the area of concern after safe working conditions are verified.

D. Storage or sale of removed or dismantled items on-site is not permitted unless otherwise indicated.

# PART 2 - PRODUCTS - (Not Used)

# PART 3 - EXECUTION

## 3.1 HISTORIC REMOVAL AND DISMANTLING EQUIPMENT

A. Dismantling Equipment: Use manual, hand-held tools, except as follows or otherwise approved by Architect on a case-by-case basis:

1. Hand-held power tools and cutting torches are permitted only as submitted in the historic treatment program. They must be adjustable so as to penetrate or cut only the thickness of material being removed.
2. Pry bars more than 18 inches (450 mm) long and hammers weighing more than 2 lb (0.9 kg) are not permitted for dismantling work.

## 3.2 EXAMINATION

A. Preparation for Removal and Dismantling: Examine construction to be removed or dismantled to determine best methods to safely and effectively perform removal and dismantling work. Examine adjacent work to determine what protective measures are necessary. Make explorations, probes, and inquiries as necessary to determine condition of construction to be removed or dismantled and location of utilities and services to remain that may be hidden by construction that is to be removed or dismantled.

1. Verify that affected utilities are disconnected and capped.
2. Inventory and record the condition of items to be removed and dismantled for reinstallation or salvage. Enter this information on the submittal of inventory of salvaged items.
3. Before removal or dismantling of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

B. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs and preconstruction video recordings.

C. Perform surveys as the Work progresses to detect hazards resulting from historic removal and dismantling procedures.

## 3.3 HISTORIC REMOVAL AND DISMANTLING

A. General: Have removal and dismantling work performed by a qualified historic removal and dismantling specialist. Ensure that historic removal and dismantling specialist's field supervisors are present when removal and dismantling work begins and during its progress.

B. Perform work according to the historic treatment program and approved mockup(s).

1. Perform removal and dismantling to the limits indicated.
2. Provide supports or reinforcement for existing construction that becomes temporarily weakened by removal and dismantling work, until the Project Work is completed unless otherwise indicated.
3. Perform cutting by hand or with small power tools wherever possible. Cut holes and slots neatly to size required, with minimum disturbance of adjacent work.
4. Do not operate air compressors inside building unless approved by Architect in each case.
5. Do not drill or cut columns, beams, joints, girders, structural slabs, or other structural supporting elements, without having Contractor's professional engineer's written approval for each location before such work is begun.
6. Dispose of removed and dismantled items off-site unless indicated to be salvaged or reinstalled.

C. Water-Mist Sprinkling: Use water-mist sprinkling and other wet methods to control dust only with adequate, approved procedures and equipment according to the historic treatment program to ensure that such water does not create a hazard or adversely affect other building areas or materials.

D. Unacceptable Equipment: Keep equipment that is not permitted for historic removal or dismantling work away from the vicinity where such work is being performed.

E. Removing and Dismantling Items on or Near Historic Surfaces:

1. Use only dismantling equipment and procedures within 12 inches (300 mm) of historic surface. Do not use pry bars. Protect historic surface from contact with or damage by tools.
2. Unfasten items in the opposite order from which they were installed.
3. Support each item as it becomes loosened to prevent stress and damage to the historic surface.
4. Dismantle anchorages.

F. Masonry Walls:

1. Remove masonry carefully, and erect temporary bracing and supports as needed to prevent collapse of materials being removed.
2. Stop removal work and immediately inform Architect and Structural Engineer if any structural elements above or adjacent to the work show signs of distress or dislocation during any phase of removal work.
3. Remove individual, full masonry units.
4. During removal, maintain the stability of the remaining wall. Notify Architect of the condition of temporary bracing for wall if work is temporarily stopped during the wall's removal.

G. Loose Plaster: Identify loose, nonhistoric plaster, and separate it from its substrate by tapping with a hammer and prying with a chisel or screwdriver. Do not use pry bars. Leave sound, firmly adhered plaster in place. Do not damage, remove, or dismantle historic plasterwork, except where indicated or where it is an immediate hazard to personnel and as approved by Architect.

H. Floor Surface Removal: Remove floor surfaces, fill, and topping to the indicated lower elevations for access to the required work, as indicated on Drawings. Use dismantling methods when removing floor surfaces 12 inches (300 mm) or less away from historic walls. Take away material to a uniform surface at the indicated level.

I. Anchorages:

1. Remove anchorages associated with removed items.
2. Dismantle anchorages associated with dismantled items.
3. In nonhistoric surfaces, patch holes created by anchorage removal or dismantling according to the requirements for new work.
4. In historic surfaces, patch or repair holes created by anchorage removal or dismantling according to Section that is specific to the historic surface being patched.

**END OF SECTION 024296**

**SECTION 028213 - ASBESTOS ABATEMENT**

PART 1 - GENERAL

1.1 PROJECT/WORK IDENTIFICATION

A. General: The abatement of asbestos containing materials (ACMs) specified herein shall be performed by certified and registered persons who are knowledgeable, qualified and trained in the abatement, handling, and disposal of asbestos containing material, and subsequent cleaning of the affected environment.

B. The contractor shall supply all labor, materials, equipment, testing, services, permits, notifications, insurance, and incidentals which are necessary and/or required to perform the work in accordance with applicable local, state, and federal regulations; as may be necessary for the abatement of asbestos containing materials and for other work as specified in this section or as indicated in associated drawings, sketches, or details of the work.

C. Scope of Work:

- Abate/remove asbestos containing rolled roofing from the roof above the kitchen.
- Abate/remove asbestos containing gray roof tar located at the peak of the kitchen roof.

D. Due to the exterior nature of the work, final clearance air sampling will not be performed. However, all work must pass a visual final clearance.

1.2 SUMMARY OF REQUIREMENTS:

A. All work performed on this project shall be done in the strictest accordance with applicable federal, state and local regulations, standards and codes governing asbestos abatement and any other trade work done in conjunction with the abatement. All applicable codes, regulations and standards are adopted into this specification and will have the same force and effect as this specification.

B. The most recent edition of any relevant regulation, standard, document or code shall be in effect. Where conflict among requirements or these specifications exists, the most stringent requirements shall be utilized.

C. Because asbestos exposure is a serious health hazard, construction work involving any asbestos-containing materials is regulated by the Occupational Safety and Health Administration Regulations. Compliance with OSHA regulations in the completion of this project is the sole responsibility of the contractor. OSHA regulations include, but are not limited to, conducting appropriate negative exposure assessments and/or daily personnel air monitoring. However, the following requirements will apply regardless of the removal methods to be employed:

a. Regardless of the removal methods employed, the contractor shall immediately stop work in the event of any of the following:

a. Visible Emissions (as defined in this document), or
b. Sanding, grinding, cutting abrading, removal by open flame, or
c. Breathing Zone air samples exceed the PEL or Excursion Limit; furthermore, the contractor shall implement corrective work practices, make re-notification to all regulatory agencies of the changes in work practices and material conditions, and comply with all referenced regulations in this document and the applicable sections of this specification as noted.

b. If any of the conditions above are observed by the Owner's Construction Representative, then this party has the right to issue a directive to stop work. The

Contractor shall be obligated to implement corrective action. The contractor shall not be entitled to additional compensation.

D. NON-FRIABLE ACM. The roofing tar and rolled roofing within the scope of work are considered non-friable Category I materials. The Contractor is strongly encouraged to remove the roofing using methods that will not render the material friable. All applicable federal, state, and local requirements, including notifications, should be followed.

1. Make notifications in compliance with Section 2.1 of this specification.

2. Remove and dispose of all asbestos containing materials in compliance with the federal and state regulations as listed, but not necessarily limited to, those under section 1.1 of this specification.

1.3 PROJECT COORDINATION

A. Contractor shall coordinate and schedule all phases of the work of the contract documents under his control with the Construction Administrator, Facility Representative, any subcontractors, materials suppliers, and other parties involved as necessary to ensure the smooth and orderly transition of separate phases, timely placement of items and materials, cooperation between parties, and proper execution of the work.

B. All coordination necessary with the facility will be made through the Facility Representative (name and phone number shown in Special Conditions) or their designated representative. The Construction Administrator and Facility Representative prior to the start of any work will approve scheduling and access to the work areas.

C. Normal working hours of the facility will be observed in performing the work unless the Facility Representative and Construction Administrator approve the modification as addressed in the Special Conditions.

D. Contractor shall coordinate any news media inquiries or releases with the Facilities Management Design & Construction Division at (573) 751-3339.

E. The contractor, project superintendent, subcontractors, and other appropriate parties shall attend meetings as scheduled and as otherwise necessary to accomplish the work in a timely and efficient manner. Meetings shall include but are not limited to the following:

1. Pre-Construction Meeting: the Construction Administrator will schedule the pre-construction meeting after the Notice of Award has been issued. The Construction Administrator will determine the date, time, and exact place of this meeting and all necessary parties will be notified. During the meeting, discussions will be held in regard to construction procedures, scheduling requirements, general conditions, special conditions, channels of communication, responsible persons, requirements for submittals, documentation requirements, payment applications, and other pertinent information necessary for completing the work. Specific requirements of the facility in regard to security, safety, utilities, access to buildings, and related matters will also be discussed.

2. Progress Meetings: Within one month after work has commenced and once a month thereafter, when applicable, a monthly progress meeting will be held. At this meeting, previous meeting minutes will be reviewed; progress of the work in comparison to the approved schedule, planned progress, payment applications, proposed changes, and problems and corrective measures will be discussed. The contractor shall be required to submit a revised schedule to reflect actual conditions as per Article 15 of the General Conditions at this meeting.

3. If, in the opinion of the Construction Administrator, additional meetings are required to maintain progress or scheduling requirements on the work, additional meetings will be scheduled.

F. All fees required for notifications, re-notifications, and/or inspections by the Department of Natural Resources shall be paid by the contractor. If necessary, bulk samples analysis information required in conjunction with the notification to the Missouri Department of Natural Resources, U. S. Environmental Protection Agency or city having jurisdiction shall be provided by the contractor unless provided within this specification.

1.4 TERMINOLOGY/DEFINITIONS/ABBREVIATIONS

A. Definitions:

1. Abatement: The Encapsulation, Enclosure and/or Removal of Asbestos Containing Materials (ACM). For Category I Non-friable ACM which will remain non-friable throughout disposal, abatement procedures will be modified and simplified as found within these and other applicable regulations.

2. Adequately Wet: To sufficiently mix or penetrate with liquid to prevent the release of particulates.

3. AHERA: Asbestos Hazard Emergency Response Act of 1966 (P.L. 99-519).

4. Aggressive Air Sampling: Sweeping of floors, ceilings and walls and other surfaces with the exhaust of a minimum of one (1) horsepower leaf blower or equivalent immediately prior to air monitoring.

5. Air Sampling Professional: An individual, certified by the State of Missouri, who supervises air sampling activities during asbestos abatement projects.

6. Air Sampling Technician: An individual, under the supervision of an Air Sampling Professional, who performs air sampling during asbestos abatement projects.

7. Asbestos: The asbestiform varieties of serpentinite (chrysotile, antigorite), riebeckite (crocidolite), cummintonite-grumerite (amosite), anthophyllite, and actinolite-tremolite. For purposes of determining respiratory and worker protection both the asbestiform and non-asbestiform varieties of the above materials and any of these materials that have been chemically treated and/or altered shall be considered as asbestos.

8. Asbestos Abatement Project Designer: An individual, certified by the State of Missouri, who prepares plans and specifications for asbestos abatement projects.

9. Asbestos Abatement Supervisor: An individual, certified by the State of Missouri, who directs, controls, and/or supervises workers during an asbestos abatement project.

10. Asbestos Abatement Worker: An individual, certified by the State of Missouri, who performs asbestos abatement.

11. Asbestos-Containing Material (ACM): Any material or product which contains more than 1 percent asbestos by weight as determined by using the Polarized Light Microscopy method.

12. Asbestos-Containing Building Material (ACBM): Surfacing ACM, thermal system insulation ACM, or miscellaneous ACM that is found in or on building components.

13. Asbestos Containing Building Material (ACBM) Repair: The restoration of ACBM to an undamaged condition or to an intact state so as to prevent fiber release.

14. Asbestos-Containing Waste Material (ACWM): Any material to be removed from a work area for disposal that is an asbestos containing material (ACM) or is suspected of being contaminated with ACM.

15. Barrier: Any surface that seals off the work area to inhibit the movement of asbestos fibers.

16. Breathing Zone: A hemisphere forward of the shoulders with a radius of approximately 6 to 9 inches.

17. Category I Non-friable ACM: Asbestos-containing packings, gaskets, resilient floor covering and asphalt roofing products containing more than one percent (1%) asbestos as determined using the method specified in 40 CFR part 763, subpart F, Appendix A, section 1, Polarized Light Microscopy.

18. Category II Non-friable ACM: Any material, excluding category I non-friable ACM, containing more than one percent (1%) asbestos as determined using the methods specified in 40 CFR part 768, subpart F, Appendix A, section 1, Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.

19. Certified Industrial Hygienist (C.I.H.): An industrial hygienist, certified in Comprehensive Practice by the American Board of Industrial Hygiene.

20. Competent Person: An individual, capable of identifying existing asbestos hazards in the workplace and who has authority to take prompt corrective measures to eliminate them. His duties include: establishing the negative-pressure enclosure, ensuring its integrity, and controlling entry to and exit from the enclosure; supervising any employee exposure monitoring; ensuring that all employees working within such an enclosure wear the appropriate personal protective equipment, are trained in the use of appropriate methods of exposure control, and in the use of hygiene facilities and decontamination procedures; and ensuring that engineering controls in use are in proper operating condition and are functioning properly. An individual who has been certified by the State of Missouri as an Asbestos Abatement Supervisor is considered a “Competent Person”.

21. Owner’s Construction Representative: An employee of the Division of Design & Construction representing the Director during the construction phase of the contract commencing at Notice of Award.

22. Containment: Area where asbestos abatement project is conducted. Area must be enclosed either by a glove bag or plastic sheeting barriers.

23. Critical Barrier: Plastic sheeting or other material to be placed over Work Area openings (i.e., windows, HVAC supply and return vents, doors, electrical fixtures, etc.).

24. Decontamination Facility: The serial arrangement of rooms or spaces for the purpose of separating the work site from the building environment upon entering the Work Area and for the cleaning of persons, equipment and contained waste prior to returning to the clean environment.

25. Disposal Bag: A properly labeled 6 mil. thick leak-tight clear plastic bag used for transporting asbestos waste from work site and to the disposal site.

26. Encapsulant (Sealant): A liquid material which can be applied to asbestos-containing material and which prevents the release of asbestos fibers from the ACM either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the ACM and binding its components together (penetrating encapsulant) or is specifically designed to minimize fiber release during removal of ACM (removal encapsulant).

27. Encapsulation: Treatment of asbestos-containing materials with an encapsulant.

28. Enclosure: The construction of an airtight, impact resistant barrier to isolate a surface coated with ACM.

29. Friable: Any material which when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

30. Glove Bag: A manufactured or fabricated device, typically constructed of six (6) mil transparent polyethylene or polyvinyl chloride plastic. This device consists of two (2) inward projecting long sleeves, an internal tool pouch and an attached, labeled receptacle for asbestos waste.

31. Initial Exposure Assessment: Is a required assessment to be performed by the Contractor's Competent Person (Asbestos Abatement Supervisor) concerning the exposure potential of a specific asbestos projects, or series of similar asbestos projects. If it is concluded that the employee exposures during the project are likely to be consistently below the Permissible Exposure Limit, the Contractor establishes a Negative Initial Exposure Assessment.

32. Outside Air: Air outside containment.

33. Permissible Exposure Limit (PEL): Eight-hour time weighted average of 0.1 fibers/cubic centimeter.

34. Personal Monitoring: Sampling of the asbestos fiber concentrations within the Breathing Zone.

35. Regulated Asbestos-Containing Material (RACM): Friable asbestos material; Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading; or Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

36. Removal: To take out or eliminate ACM from building components, materials, substrates.

37. Third Party Air Monitor (TPAM): The Air Sampling Professional who conducts air monitoring in who is not under the direct control of the abatement contractor and who has been selected by the owner.

38. Visible Emission: Any discharge of an air contaminant into the atmosphere that is visually detectable without the aid of instruments.

39. Work Area: A specific room or physically isolated portion of a room, other than the space enclosed within a glove bag, in which friable asbestos-containing material is required to be handled in accordance with current federal and state regulations. The area is designated as a work area from the time that the room, or portion of it, is secured and access restrictions are in place. The area remains designated as a work area until the time that it has been cleaned in accordance with any requirements applicable to the operations conducted.

B. Abbreviations:

1. AIA: American Institute of Architects
2. AIHA: American Industrial Hygiene Association
3. MoDNR: Missouri Department of Natural Resources
4. DEQ: Division of Environmental Quality, MoDNR
5. DOT: U. S. Department of Transportation
6. EPA: U. S. Environmental Protection Agency
7. MDH: Missouri Department of Health
8. NIOSH: National Institute for Occupational Safety and Health
9. NVLAP: National Voluntary Laboratory Accreditation Program
10. OSHA: Occupational Safety and Health Administration, U. S. Department of Labor.

1.5 CODES AND REGULATIONS

A. This section sets forth governmental regulations and industry standards which are included and incorporated herein by reference and made a part of this specification.

B. Requirements include adherence to work practices and procedures set forth in applicable codes, regulations and standards.

C. General Applicability of Codes, Regulations and Standards: Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, all applicable codes, regulations standards, statutes, laws and rules have the same force and effect (and are made a part of the contract documents by reference) as if copied directly into the contract documents, or as if published copies are bound herewith. In the event of conflicting applicable codes, regulations, standards, statutes, laws, or rules, the more stringent shall apply to these specifications.

D. Contractor Responsibility: The contractor shall assume full responsibility and liability for compliance with all applicable federal, state, and local regulations pertaining to work practices, hauling, disposal and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable federal, state, and local regulations. The contractor shall hold the owner harmless for failure to comply with any applicable work, hauling, disposal, safety, health, record keeping or other regulation on the part of himself, his employees, or his subcontractors.

E. Requirements which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

1. U. S. Department of Labor, Occupational Safety and Health Administration (OSHA) including but not limited to:

   a. Title 20, Part 1910, Section 1001 and Part 1926, Section 58 of the Code of Federal Regulations.
   b. Respiratory Protection, Title 29, Part 1910, Section 134 of the Code of Federal Regulations.
   c. Construction Industry, Title 29, Part 1926, of the Code of Federal Regulations.
   d. Access to Employee Exposure and Medical Records, Title, 29, Part 1910, Section 2 of the Code of Federal Regulations.
   e. Hazard Communication, Title 29, Part 1910, Section 1200 of the Code of Federal Regulations.
   f. Specifications for Accident prevention Signs and Tags, Title 29, Part 1910, Section 145 of the Code of Federal Regulations.

2. U. S. Environmental Protection Agency (EPA) including but not limited to:

   a. National Emission Standards for Hazardous Air Pollutants (NESHAPS) Title 40, Part 61, Subpart M of the Code of Federal Regulations.
   b. Asbestos Hazard Emergency Response Act (AHERA), Public Law (99-519) applicable only on schools.
   c. Asbestos-Containing Materials in Schools: Title 40, Part 763 of the Code of Federal Regulations, applicable only on schools.

3. U. S. Department of Transportation (DOT)

   a. Title 49, Part 172, Section 101 of the Code of Federal Regulations.

4. State of Missouri

   a. H.B. 77, 85th General Assembly.
   b. Missouri Air Conservation Law, Chapter 643.
   c. Due to a recent court decision, the following Code of State Regulations do not apply to this specification:

      1. 10 CSR 10-6.020, Definitions

2. 10 CSR 10-6.080, Emission Standards for Hazardous Air Pollutants.
3. 10 CSR 10-6.230, Administrative Penalties
4. 10 CSR 10-6.240, Asbestos Abatement Projects-Registration, Notification and Performance Requirements.
5. 10 CSR 10-6.250, Asbestos Abatement Projects - Certification, Accreditation, and Business Exemption Requirements.

PART 2 - EXECUTION

2.1 NOTIFICATIONS

A. If material being removed amounts to more than 260 LF, 160 SF or 35 cubic feet or if abatement is being done prior to a demolition, Notification shall be completed and sent by the contractor not less than ten (10) days before the intended starting date of the project. For amounts less than the above, contractor shall send a courtesy Notification. Use EPA form "Notification of Demolition and Renovation", (Appendix C of this specification) and the MoDNR form "Asbestos Project Notification", (Appendix D of this specification) to the following:

1. Department of Natural Resources
   Air Pollution Control Program (ASBESTOS)
   P. O. Box 176
   Jefferson City, MO 65102

2. Provide copies of these notifications to the state's independent oversight consultant, the Construction Administrator, and OA FMDC Hazardous Materials Manager.

B. A Post-Notification report shall be completed and sent by the Contractor to the agencies listed in 2.1A above within forty-five (45) days of the completion of the project. The MoDNR form "Asbestos Post Notification" (Appendix E of this Specification) is to be used for that purpose.

2.2 SUBMITTALS

The following submittals will be required of the contractor prior to commencement of work and are subject to approval by the Owner's Construction Representative. The contractor shall send one copy of the submittals for approval and then send approved copies of the submittals to the distribution list as discussed at the Pre-Construction Conference.

A. Copy of Material Safety Data Sheets (MSDS) for each product to be used by the contractor in the performance of his work. Contractor will also maintain copies of the MSDS on site, per OSHA.
B. A copy of the notifications to regulatory agencies as required in Section 2.1 of this specification.
C. Current training certificates and MoDNR licenses for project superintendent, asbestos abatement supervisor(s), and asbestos workers. Superintendent shall meet the qualifications established in Section 2.8 of these specifications.
D. Name, address, and contact person's name of testing laboratory or laboratories to be utilized by the contractor (this is <u>not</u> the TPAM) in analyzing samples for bulk analysis or air monitoring from taking personal air samples. Required by OSHA.
F. Provide a detailed work schedule with milestones for the completion of the project within the established timeframe.
G. Provide a disposal plan to detail the types of disposal containers to be used, the methods of transportation to the disposal site, the waste hauler, and disposal site. Copies of notifications required as part of the emergency notification plan in Section 2.6 of this specification.

Upon completion of the work and prior to final payment, the following information must be submitted to the Construction Administrator.

A. Waste disposal receipts and waste shipment record on all asbestos waste removed from the project. The enclosed Waste Shipment Record and Receipt form (or something similar) must be used for every load brought to the waste disposal site. The disposal and/or shipment record must include the following information:

1. Work site name and address
2. Project Number
3. Owner's name and telephone
4. Operator's (Contractor's) name, address and telephone
5. Waste Disposal Site name, address and telephone
6. Name and address of responsible agency
7. Type of materials and quantity in cubic yards
8. Name, address and phone number of transporter, and date of transport
9. Name, address and phone number of Waste Disposal Site representative and date material was received.

B. MoDNR "Asbestos Post Notification" form (see Appendix E of this Specification), within forty-five (45) days of the completion of the project.

C. Any other specific requirements spelled out in the General Conditions.

2.3 TESTING LABORATORY

A. Testing laboratories utilized by the contractor for OSHA required sample analysis during the project shall meet the following minimum requirements.
B. For bulk sample analysis the laboratory must be accredited by the National Voluntary Laboratory Accreditation Program for asbestos fiber analysis.
C. For air samples analyzed by Phase Contrast Microscopy, the laboratory must be accredited by the American Industrial Hygiene Association.
D. For air samples analyzed by Transmission Electron Microscopy, the laboratory must be accredited by the National Voluntary Laboratory Accreditation Program.
E. On-site analysis by Phase Contrast Microscopy, when applicable, shall be by an Air Sampling Technician or Air Sampling Professional.
F. Neither the contractor, nor any of his principals, officers, or directors may have any financial or business interests in any laboratory utilized on this contract.

2.4 LOCAL AREA PROTECTION/SITE SECURITY

A. The contractor shall be responsible for all areas of the building used by him and/or subcontractors in the performance of the work. He shall exert full control over the actions of all employees and other persons with respect to the use and preservation of the existing building, except such controls as may be specifically reserved to the owner by these specifications.
B. The contractor has the right to exclude from the work area all persons who have no purpose related to the work or its inspection, and shall require all persons in the work area to observe the same regulations as he requires his employees.
C. The contractor shall have control of site security during abatement operations in order to protect his work and equipment. He will have the owner's assistance in notifying building occupants of impending activity and enforcement of restricted access by owner's employees.
D. The contractor shall keep, as a minimum, two 10 lbs. type ABC fire extinguishers on site at all times. One extinguisher will be maintained outside the work area and one inside the work area. The contractor's employees shall be trained in the use and operation of the extinguishers. (Applies only to interior work.)
E. As a minimum requirement, barriers must be constructed of regulatory specified layers of poly and 1/2" plywood and 2" x 4" framing 16" on center, with lockable door, to isolate any areas from employees, clients, and the public. (For outside work, where such barriers are impractical, other regulatory compliant poly containment methods can be considered/accepted on a case-by-case basis. Use of barrier tape on non- RACM roof projects

can be considered/accepted on a case-by-case basis.)

F. The contractor shall use as small an area as necessary for storage of supplies and equipment and shall keep such in a neat and orderly fashion. Trash must be removed daily and will not be allowed to accumulate.

G. The contractor shall maintain the work area free from rubbish, debris, and dirt and keep a clean safe work area. The contractor shall take measures to keep surfaces free from contamination or shall clean and lock down surfaces after work is done, protect with plastic sheeting and/or plywood during work, or remove from the work area.

2.5 WORKER PROTECTION/TRAINING (AS NOTED)

A. The contractor shall be responsible for providing his employees with proper respiratory protection, respiratory training, a written respirator program, medical examinations, protective clothing and equipment and for maintaining medical records to comply with OSHA requirements.

B. The contractor shall be responsible for all testing and costs incurred for complying with requirements OSHA regulations for Personal Monitoring.

C. All workers are to be trained in the dangers inherent in handling asbestos and breathing asbestos dust and in proper work procedures and personal and protective measures.

2.6 EMERGENCY PROTECTION PLAN

A. The contractor shall be responsible for developing a written site specific Emergency Protection Plan and shall maintain this plan on site. The plan shall include considerations for asbestos leakage from site, fire, explosion, toxic atmospheres, electrical hazards, slips, falls, and heat related injury. All employees shall be instructed and trained in the procedures.

B. Emergency protection planning shall also include written notification of police, fire, and medical personnel of the planned abatement activities, work schedule, and the layout of the work area, particularly barriers that may affect response capabilities.

2.7 SUPERINTENDENCE OF ABATEMENT

A. The contractor shall designate an abatement superintendent, subject to approval of the contractor's representative, who will serve as the contractor's representative on the project and will ensure that all work is performed in compliance with all applicable regulations and following minimum requirements:

1. The Abatement Superintendent must be certified as an Asbestos Abatement Supervisor, and must have at least one year full time experience in asbestos abatement work.
2. Shall be on site whenever work is going on.
3. Maintain a daily log documenting project events, visitations/inspections, problems, and accidents.
4. Implement first aid, safety training, respiratory protection, and ensure workers are trained in emergency procedures.
5. Conduct visual inspection of the work area prior to the Construction Manger's final clearance inspection. This inspection shall be documented on the form "Contractor's Superintendent Visual Inspection Report", Appendix B of specification 13240A Asbestos Abatement Forms.
6. Supervise activities of any subcontractors of the contractor to ensure compliance with contract documents.
7. Duties shall include those for the "Competent Person" as defined in this specification.

2.8 FINAL CLEARANCE REQUIREMENTS

A. Following the completion of the abatement work, the abatement superintendent shall notify the Construction Administrator. The superintendent shall then perform a visual inspection of the work area. (Document inspection on Appendix B "Construction Manager's Visual Final Inspection Report form.) Due to the exterior nature of the work, final clearance air samples will

not be performed.

A. Any work areas failing to meet the clearance requirements of this section shall be re-cleaned and re-inspected at the contractor's expense until satisfactory levels are obtained. The owner will not reimburse the contractor for re-cleaning the work area.

2.9 RE-ESTABLISHMENT OF THE WORK AREA AND SYSTEMS

A. Re-establishment of the work area shall only occur after the contractor has complied with the clearance requirements of Section 2.9. Upon clearance, and prior to the removal of barriers, an encapsulant shall be applied by the contractor. All barriers, signs, trash, and equipment shall then be removed from the site. All electrical and HVAC systems shall be re-established.

B. All damage to finishes, equipment, and/or the area affected by the abatement shall be repaired by the contractor to equal or better condition as was prior to the work, at no cost to the owner.

2.10 WASTE DISPOSAL

A. All ACWM shall be disposed of in compliance with current federal and state regulations.

B. RACM and category II nonfriable ACM that is disposed of in Missouri shall be disposed of in a sanitary landfill having a state permit to operate. ACM shall be disposed of in a demolition landfill or a sanitary landfill having a state permit to operate. The landfill shall handle all ACWM so that it does not become friable. Demolition landfills shall cover category I nonfriable ACM with at least six (6) inches of so il or non-asbestos waste at the end of each operating day.

C. A chain of custody letter/waste shipment record and disposal receipts shall be provided to the owner for all materials disposed of. The attached Waste Shipment Record and Receipt form (or something similar) may be used.

D. The waste shipment record shall be originated and signed by the waste generator and shall be used to track and substantiate the disposition of ACWM.

2.11 DRAWINGS

E. For the purpose of this specification, all provided listings of ACMs requiring abatement and accompanying drawings, are intended to be used as a “reference” to the intended abatement scope-of-work and areas involved. Information provided is to the best of our knowledge, is approximate only, and should not be relied upon as being specific as to the exact quantities or exact locations of all ACMs. The contractor is required to field verify the locations, condition, and quantities of all ACMs requiring abatement prior to demolition.

2.12 QUALITY ASSURANCE

A. Abatement Contractor:

1. Certified by the Missouri Department of Natural Resources as Asbestos Abatement contractor.
2. The Asbestos Abatement Contractor must list similar asbestos abatement projects they have completed in the past on the enclosed Contractor’s Qualifications Form.

2.13 LISTING OF ASBESTOS CONTAINING MATERIALS (ACMs)

See the Report of Asbestos Inspection Form dated May 23, 2019. This report identifies the ACM’s type/color/friability and % asbestos content, location, and approximate quantity. These tables are meant to assist the abatement contractor, by providing a listing of all available info used to develop the asbestos abatement specification, drawing(s), and SOW. It is the responsibility of the Contractor to field verify all ACM locations, conditions, and quantities.

**END OF SECTION**

APPENDIX A

CONTRACTOR/SUPERVISOR'S ASBESTOS ABATEMENT COMPLETION CERTIFICATION FORM

PROJ NUMBER/TITLE: _____

_____

SITE/BLDG NAME: _____

_____

WORK AREA(S): _____

_____

ABATEMENT CONTRACTOR: _____

I_____, hereby certify that all asbestos abatement work has been
(Print abatement Contractor/Supervisor representative name)
completed in accordance with the project's contract documents; applicable Federal, State, and Local asbestos regulations; and I affirm that I have inspected and found the abatement work area to be free of visible dust and debris, and ready for subsequent TPAM final clearance.

_____ _____

Signature of Contractor/Supervisor Date and Time

APPENDIX B

CONSTRUCTION MANAGER'S FINAL CLEARANCE CERTIFICATION FORM

PROJ NUMBER/TITLE: _____

_____

SITE/BLDG NAME: _____

_____

WORK AREA(S): _____

_____

ABATEMENT CONTRACTOR: _____

CONSTRUCTION MANAGER: _____

I_____certify that I have monitored the abatement contractor's work; and have
(Print Construction Manager's name)
inspected and found the abatement contractor's work to be 100% complete, free of visible dust/debris, ready for final clearance air monitoring; and affirm that the completed project has achieved passing Final Clearance Air Monitoring, and that the affected area is safe for reoccupancy and operational use.

_____ _____
Signature of CONSTRUCTION MANAGER Date and Time

**EPA NOTIFICATION OF DEMOLITION AND RENOVATION**

| Operator Project # | Postmark | Date Received | Notification Number |
|---|---|---|---|
| I. TYPE OF NOTIFICATION (O=Original R=Revised C=Cancelled): | | | |
| II. FACILITY INFORMATION (Identify owner, removal contractor, and other operator) | | | |
| OWNER NAME: | | | |
| ADDRESS: | | | |
| CITY: | | STATE: | ZIP CODE: |
| CONTACT: | | TELEPHONE: | |
| REMOVAL CONTRACTOR: | | | |
| ADDRESS: | | | |
| CITY: | | STATE: | ZIP: |
| CONTACT: | | TELEPHONE: | |
| OTHER OPERATOR: | | | |
| ADDRESS: | | | |
| CITY: | | STATE: | ZIP: |
| CONTACT: | | TELEPHONE: | |
| III. TYPE OF OPERATION: (D=DEMO O=ORDERED DEMO R=RENOVATIONS E=EMERGENCY RENOVATION): | | | |
| IV: IS ASBESTOS PRESENT (YES/NO) | | | |
| V. FACILITY DESCRIPTION (INCLUDE BUILDING NAME, NUMBER AND FLOOR OR ROOM NUMBER) | | | |
| BUILDING NAME: | | | |
| ADDRESS: | | | |
| CITY: | | STATE: | ZIP: |
| SITE LOCATION: | | | |
| BUILDING SIZE: | | NUMBER OF FLOORS: | AGE IN YEARS: |
| PRESENT USE: | | PRIOR USES: | |
| VI. PROCEDURE, INCLUDING ANALYTICAL METHOD, IF APPROPRIATE, USED TO DETECT THE PRESENCE OF ASBESTOS MATERIAL: | | | |

| VII. APPROXIMATE AMOUNT OF ASBESTOS, INCLUDING: 1. Regulated ACM to be | | NONFRIABLE ASBESTOS MATERIAL NOT TO BE REMOVED | | INDICATE UNIT OF MEASUREMENT BELOW | |
|---|---|---|---|---|---|
| | | Cat. I | Cat. II | UNIT | |
| PIPES: | | | | LnFt: | Ln m: |
| SURFACE AREA: | | | | SqFt: | Sq m: |
| VOL RACM OFF FACILITY | | | | CuFt: | Cu m: |

| | | |
|---|---|---|
| VIII. SCHEDULED DATES ASBESTOS REMOVAL (mm/dd/yy) Start: | Complete: | |
| IX. SCHEDULED DATES DEMO/RENOVATION (mm/dd/yy) | Start: | Complete: |

Continued on page two

| | | |
|---|---|---|
| X. DESCRIPTION OF PLANNED DEMOLITION OR RENOVATION WORK, AND METHOD(S) TO BE USED : | | |
| XI. DESCRIPTION OF WORK PRACTICES AND ENGINEERING CONTROLS TO BE USED TO PREVENT EMISSIONS OF ASBESTOS AT THE DEMOLITION AND RENOVATION SITE: | | |
| XII. WASTE TRANSPORTER #1 | | |
| NAME: | | |
| ADDRESS: | | |
| CITY: | STATE: | ZIP: |
| CONTACT PERSON: | | TELEPHONE: |
| WASTE TRANSPORTER #2 | | |
| NAME: | | |
| ADDRESS: | | |
| CITY: | STATE: | ZIP: |
| CONTACT PERSON: | | TELEPHONE: |
| XIII. WASTE DISPOSAL SITE | | |
| NAME: | | |
| LOCATION: | | |
| CITY: | STATE: | ZIP |
| TELEPHONE: | | |
| XIV: IF DEMOLITION ORDERED BY A GOVERNMENT AGENCY, PLEASE IDENTIFY THE AGENCY BELOW: | | |
| NAME: | TITLE: | |
| AUTHORITY: | | |
| DATE OF ORDER (mm/dd/yy): | DATE ORDER TO BEGIN (mm/dd/yy): | |
| XV: FOR EMERGENCY RENOVATIONS | | |
| DATE AND HOUR OF EMERGENCY (mm/dd/yy): | | |
| DESCRIPTION OF THE SUDDEN, UNEXPECTED EVENT: | | |
| EXPLANATION OF HOW THE EVENT CAUSED UNSAFE CONDITIONS OR WOULD CAUSE EQUIPMENT DAMAGE OR AN UNREASONABLE FINANCIAL BURDEN: | | |
| XVI. DESCRIPTION OF PROCEDURES TO BE FOLLOWED IN THE EVENT THAT UNEXPECTED ASBESTOS IS FOUND OR PREVIOUSLY NONFRIABLE ASBESTOS MATERIAL BECOMES CRUMBLED, PULVERIZED, OR REDUCED TO POWDER: | | |
| I CERTIFY THAT AN INDIVIDUAL TRAINED IN THE PROVISIONS OF THIS REGULATION (40 CFR PART 61, SUBPART M) WILL BE ON-SITE DURING THE DEMOLITION OR RENOVATION AND EVIDENCE THAT THE REQUIRED TRAINING HAS BEEN ACCOMPLISHED BY THIS PERSON WILL BE AVAILABLE FOR INSPECTION DURING NORMAL BUSINESS HOURS. (REQUIRED 1 YEAR AFTER PROMULGATION) | | |
| I CERTIFY THAT THE ABOVE INFORMATION IS CORRECT:<br><br>(Signature of Owner/Operator) | (Date) | |

MISSOURI DEPARTMENT OF NATURAL RESOURCES
AIR POLLUTION CONTROL PROGRAM
**ASBESTOS PROJECT NOTIFICATION**

☐ ORIGINAL ☐ REVISION
☐ EMERGENCY ☐ CANCELLATION

☐ Greater than or equal to 160 square feet of 260 linear feet of friable asbestos-containing material.

☐ Less than 160 square feet or 260 linear feet of friable asbestos containing material.

**NOTE:** A non-refundable review fee of $100 must be submitted for any asbestos abatement project involving 160 or more square feet or 260 or more linear feet of friable asbestos-containing material, and for planned renovation projects as defined

**PART A AUTHENTICATION**

| | | | | |
|---|---|---|---|---|
| ASBESTOS CONTRACTOR ADDRESS | CITY | STATE | ZIP | TELEPHONE NUMBER |
| MISSOURI REGISTRATION NUMBER | | REGISTRATION EXPIRATION DATE | | |

I CERTIFY THAT AN INDIVIDUAL TRAINED IN THE PROVISIONS OF FEDERAL REGULATION (40 CFR PART 61 SUBPART M) WILL BE ON SITE DURING THE PROJECT AND PROOF THAT THIS PERSON HAS COMPLETED THE

THE ASBESTOS CONTROL MEASURES PRACTICED ON THIS PROJECT WILL COMPLY WITH 10 CSR 10-6.240 AND THE STANDARDS FOR WORK PROTECTION ESTABLISHED BY OSHA IN 29 CFR 1926.58 AND 1910.1001.

I HEREBY CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE AND UNDERSTANDING, THE INFORMATION PROVIDED

| | |
|---|---|
| SIGNED | DATE |
| PRINTED NAME AND TITLE | |

**PART B ADDITIONAL INFORMATION**

IF AN UNSAFE STRUCTURE IS BEING DEMOLISHED UNDER ORDER OF A STATE OR LOCAL GOVERNMENTAL AGENCY, GIVE NAME, TITLE, AND AUTHORITY OF INDIVIDUAL WHO ORDERED THE DEMOLITION. INCLUDE

| | | | |
|---|---|---|---|
| NAME | TITLE | AUTHORITY OF INDIVIDUAL | TELEPHONE NUMBER |

IF A WAIVER OF ANY PORTION OF 10 CSR 10-240 IS REQUESTED, INDICATE THE WAIVER DESIRED AND THE JUSTIFICATION FOR SUCH A WAIVER. IDENTIFY ITEM NUMBER. USE SUPPLEMENTAL SHEET TO DESCRIBE

| | |
|---|---|
| WAIVER | JUSTIFICATION |

NAME OF AIR SAMPLING PROFESSIONAL PERFORMING CLEARANCE AIR MONITORING FOR THIS PROJECT

| | | | | |
|---|---|---|---|---|
| ADDRESS | CITY | STATE | ZIP | TELEPHONE NUMBER |

**PART C PROJECT DESCRIPTION**

| | | |
|---|---|---|
| COUNTY WHERE PROJECT IS TO BE PERFORMED | PROJECT NAME OR NOTIFICATION NUMBER | |
| CONTRACTORS ON-SITE SUPERVISOR | PROJECT SITE TELEPHONE NUMBER | |
| PROJECT SITE ADDRESS | CITY | STATE ZIP |
| OWNER NAME | OWNER CONTACT PERSON | TELEPHONE NUMBER |
| OWNER ADDRESS | | |

**PART C PROJECT DESCRIPTION (CONTINUED)**

PROJECT TYPE ☐OPERATIONS AND MAINTENANCE ☐REMOVAL ☐ENCLOSURE
☐ REPAIR ☐RENOVATION ☐DEMOLITION ☐DISMANTLING ☐ENCAPSULATION

DESCRIBE PROCEDURE USED FOR THE DETECTION OF RACM INCLUDING ANALYTICAL METHOD EMPLOYED IF APPROPRIATE

DESCRIPTION AND QUANTITY OF FRIABLE ASBESTOS MATERIALS TO BE DISTURBED.(REPORT ONLY DEBRIS IN

| | | | |
|---|---|---|---|
| MATERIAL | SQUARE FEET | LINEAR FEET | CUBIC FEET |
| MATERIAL | SQUARE FEET | LINEAR FEET | CUBIC FEET |
| MATERIAL | SQUARE FEET | LINEAR FEET | CUBIC FEET |
| MATERIAL | SQUARE FEET | LINEAR FEET | CUBIC FEET |
| **TOTAL FRIABLE ACM** | SQUARE FEET | LINEAR FEET | CUBIC FEET |

**NOTE:** If project is NESHAPS size, attach laboratory sample analysis for all friable asbestos materials to be disturbed. Per 10 CSR 10-6.240 (4) (A), OSHA Material Safety Data Sheet, OMB #1218-0073, may be substituted if it lists percent asbestos

QUANTITY OF MATERIAL WHICH WILL BE ABOVE 150° WHEN DISTURBED. A WAIVER MUST BE REQUESTED AND

| | | | |
|---|---|---|---|
| MATERIAL | SQUARE FEET | LINEAR FEET | CUBIC FEET |

DESCRIPTION AND QUANTITY OF NON-FRIABLE ASBESTOS MATERIALS TO BE DISTURBED.

| | | | |
|---|---|---|---|
| MATERIAL | SQUARE FEET | LINEAR FEET | CUBIC FEET |
| MATERIAL | SQUARE FEET | LINEAR FEET | CUBIC FEET |
| MATERIAL | SQUARE FEET | LINEAR FEET | CUBIC FEET |

**NOTE:** If chemical mastic removers are to be used to remove floor covering mastic, attach Material Safety Data Sheet for the

DESCRIBE ABATEMENT WORK INCLUDING LOCATION IN BUILDING, PLANNED DEMOLITION/RENOVATION, AND

DESCRIBE WORK PRACTICES AND ENGINEERING CONTROLS TO BE USED TO PREVENT EMISSION OF ASBESTOS

DESCRIBE THE CONTINGENCY PLAN IF UNEXPECTED RACM IS DISCOVERED

| | | |
|---|---|---|
| APPROXIMATE AGE OF STRUCTURE | PRESENT USE OF STRUCTURE | FORMER USE OF STRUCTURE IF KNOWN |

**PROJECT SCHEDULE**

No phase of the project may begin during twenty day notification review period without explicit waiver from the department

| | START DATE | COMPLETE DATE | TIME |
|---|---|---|---|
| Preparation Phase | | | |
| Abatement Phase | | | |
| Daily Work Schedule | START TIME | QUIT TIME | LUNCH BREAK |
| DAYS OF WEEK WORK WILL TAKE PLACE | | | |

**PART E DISPOSAL**

| | |
|---|---|
| NAME OF WASTE HAULER IF OTHER THAN ASBESTOS CONTRACTOR | |
| ADDRESS | |
| NAME OF DISPOSAL SITE | |
| ADDRESS | TELEPHONE |

**PART F SUPPLEMENTAL INFORMATION**

| | |
|---|---|
| PROJECT SITE | NOTIFICATION DATE |
| PART NUMBER | ITEM NUMBER |
| | |
| | |
| | |
| | |
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APPENDIX E

MISSOURI DEPARTMENT OF NATURAL RESOURCES AIR POLLUTION CONTROL PROGRAM

**ASBESTOS POST-NOTIFICATION FORM**

**GENERAL INSTRUCTIONS**

Asbestos abatement projects of a magnitude of ten (10) square feet, sixteen (16) linear feet or greater are required to submit post-notification to the department within sixty (60) days of the completion date submitted on your initial notification or application form to the department.
This post-notification shall include a signed and dated receipt of the asbestos disposal slip(s) as well as the final clean air results. These documents, inspection fees (if applicable), as well as the completed post-notification form shall be mailed to the following address:

MISSOURI DEPARTMENT OF NATURAL RESOURCES AIR
POLLUTION CONTROL PROGRAM (ASBESTOS)
P. O. BOX 176
Jefferson City, Missouri 65102

**PART A ASBESTOS PROJECT INFORMATION**

| | | |
|---|---|---|
| NAME OF CONTRACTOR | | |
| CONTRACTOR CONTACT PERSON | | |
| BUILDING/STRUCTURE OWNER NAME | | |
| STREET ADDRESS | | |
| CITY | STATE | ZIP |
| START DATE OF PROJECT | COMPLETION DATE OF PROJECT | |

**PART B AIR SAMPLING AND LABORATORY INFORMATION**

| | | |
|---|---|---|
| ANALYTIC LABORATORY UTILIZED FOR FINAL AIR RESULTS NAME | | |
| STREET ADDRESS | | |
| CITY | STATE | ZIP |
| TELEPHONE | CONTACT PERSON | |

**NOTE:** INCLUDE A COPY OF THE FINAL CLEARANCE AIR RESULTS

## WASTE SHIPMENT RECORD AND RECEIPT

**GENERATOR**

| 1. Work site name and address | Project Number | Owner's telephone no. | Owner's name and mailing address |
|---|---|---|---|
| | | | |

| 2. Operator's name and address | Operator's telephone number |
|---|---|
| | |

| 3. Waste disposal (WDS) name, mailing address, and physical site location | WDS telephone number |
|---|---|
| | |

4. Name and address of responsible agency:

| 5. Description of materials | No. | 6. Containers | Type | 7. Total quantity (cubic yards) |
|---|---|---|---|---|
| Friable | | | | |
| Category I, Non-Friable, Non RACM | | | | |
| Category II, Non-Friable, Non RACM | | | | |
| Other: | | | | |

8. Special handling instructions and additional information RQ (ASBESTOS) Class 9 NA 2212 P.G. III

***9. OPERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations.***

| Printed/typed name and title | Signature | Month Day Year |
|---|---|---|
| | | |

**TRANSPORTER**

10. Transporter 1 (Acknowledgment of receipt of materials)

| Printed/typed name, title, address and phone no. | Signature (Truck Driver) | Month Day Year |
|---|---|---|
| | | |

11. Transporter 2 (Acknowledgment of receipt of materials)

**DISPOSAL SITE**

12. Discrepancy Indication space

13. Waste disposal site owner or operator:

| Printed/typed name and title | Signature | Month Day Year |
|---|---|---|
| | | |

**SECTION 031000 - CONCRETE FORMS AND ACCESSORIES**

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Form work for cast-in-place concrete shown on the drawings or required by other sections of these Specifications.

B. Drawings and General Provisions of Contract, including General and Special Conditions, apply to this section.

1.2 RELATED SECTIONS

A. Section 03 20 00 – Concrete Reinforcement.

B. Section 03 30 00 – Cast-in-Place Concrete.

1.3 QUALITY ASSURANCE

A. Comply with all pertinent provisions of the following standards

B. ACI 847 - Recommended Practice for Concrete Formwork

C. ACI 301 - Standard Specification for Structural Concrete for Building

PART 2 - PRODUCTS

2.1 MATERIALS

A. Forms

1. Construct forms for exposed (painted or unpainted) concrete surfaces with smooth faced undamaged plywood to provide continuous, straight, and smooth as-cast surfaces.

2. Construct forms for concrete concealed from view with rough-sawed boards of sound grade, plywood, or steel.

3. Provide form material with sufficient thickness to withstand pressure of newly placed concrete without excessive and objectionable bow or deflection.

B. Form Ties

1. Provide factory-fabricated, adjustable-length, removable or snap off metal form ties, designed to prevent form deflection and spalling concrete surfaces upon removal.

2. Provide ties so that the portion remaining within the concrete after removal is at least 1-1/2" from the outer concrete surface.

3. Provide ties that do not leave a hole larger than one inch in diameter in the concrete's surface.

C. Form Coatings

1. Provide commercial formulation, form-coating compounds that do not bond with, stain, or adversely affect concrete surfaces requiring bond or adhesion, nor impede the wetting of surfaces to be cured with water or curing compounds.

2.2 FABRICATION

A. Design, erect, support, brace, and maintain forms that will safely support vertical and lateral loads until the concrete structure can support such loads.

B. Design forms to include assumed values of live and dead loads, weight of moving equipment operated on forms, concrete mix, height of concrete drop, vibrator frequency, ambient temperature, foundation pressures, stresses, lateral stability, and other factors pertinent to safety of structure during construction.

C. Provide shoring and struts with positive means of adjustment capable of taking up form settlement during concrete placement.

D. Provide trussed supports when adequate foundations for shores and struts cannot be secured.

E. Support form facing materials by structural members spaced sufficiently to prevent deflection.

F. Fit forms placed in successive units for continuous surfaces to provide accurate alignment, free from irregularities, and within allowable tolerances.

G. Provide camber in forms required for anticipated deflections due to weight and pressures of fresh concrete and construction loads.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrata and conditions which work under section is to be performed.

B. Correct conditions detrimental to the proper and timely completion of the work.

C. Do not proceed until satisfactory conditions have been corrected.

3.2 ERECTION

A. General

1. Construct forms complying with ACI 347 to the size, shape, line, and dimensions shown, and required to obtain accurate alignment, location, grade, level, and plumb in finish structure.

2. Provide for features including openings, offsets, sinkages, keyways, recesses, moldings, reglets, chamfers, blocking, screeds, bullheads, anchorages, and inserts. Use selected materials to obtain required finish.

3. Provide openings in concrete forms to accommodate work of other trades after verifying size and location of openings with the trade requiring such items.

B. Fabrication

1. Place forms to protect previously installed structures.

2. Fabricate forms for easy removal without hammering or prying against exposed concrete surfaces.

3. Where stripping may damage cast concrete surfaces, provide crush or wrecking plates.

4. Forms shall be sufficiently tight to prevent loss of mortar from the concrete.

5. Solidly butt joints and provide material at joints as needed.

3.3 PREPARATION

A. Cleaning

1. Thoroughly clean forms and adjacent surfaces of accumulated mortar, grout, wood chips, sawdust, dirt, or other foreign material before placing concrete.

B. Form Coating

1. Coat form contact surfaces with an approved form coating material that will effectively prevent absorption of moisture and prevent bond with the concrete.
2. Do not allow excess form-coating material to accumulate or contact surfaces that will be bonded to fresh concrete.
3. Apply in accordance with manufacturers instructions.

3.4 INSTALLATION

A. Set and build into the work anchorage and other embedded items required for other work to be attached or supported by cast-in-place concrete.

B. Use supplier provided setting drawings, diagrams, instructions, and directions for embedded items.

C. Forms not supporting concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50°F for 24 hours after placing, provided that:

1. Concrete is sufficiently hard to not be damaged by form removal operations.
2. Maintain curing and protection operations

D. Backfilling on only one side of concrete walls shall not be permitted unless:

1. The walls have attained the 28-day design compressive strength and have appropriate lateral bracing. The final concrete structure or sufficient temporary bracing may be used for the lateral support.
2. Sufficient temporary bracing is installed to provide adequate lateral support of the entire wall surface until condition 1 above occurs.

E. Forms supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements may not be removed in less than 14 days, and not until concrete has attained design minimum 28-day compressive strength. Determine the compressive strength of in-place concrete by testing field-cured specimens representative of the concrete locations or members.

F. Forms supporting weight of concrete may be removed four days after concrete placement only if shores and other vertical supports have been arranged to adequately support the concrete until the concrete has attained the design minimum 28 -day compressive strength.

END OF SECTION 03 10 00

**SECTION 032000 - CONCRETE REINFORCEMENT**

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Reinforcing steel bars and welded steel wire fabric for cast-in-place concrete, complete with tie wire.

B. Support chairs, bolster, bar supports, and spacers for reinforcing.

C. Drawings and General Provisions of Contract, including General and Special Conditions, apply to this section.

1.2 RELATED SECTIONS

A. Section 03 10 00 – Concrete Forms and Accessories.

B. Section 03 30 00 – Cast-In-Place Concrete.

1.3 REFERENCE

A. ACI 315 - American Concrete Institute - Manual of Standard Practice.

B. ACI 318 - Building Code Requirements for Reinforced Concrete.'

1.4 SUBMITTALS

A. Submit shop drawings under provisions of Section 01 33 00.

B. Include diagram of bent bars and arrangement, bar schedules, and stirrup spacing.

C. Make shop drawings in accordance with ACI 315.

D. Submit steel producers certificates of mill analysis, tensile, and bend tests for reinforcing steel.

1.5 QUALITY ASSURANCE

A. Perform concrete reinforcing work in accordance with CRSI and ACI Publications listed in reference standards unless specified otherwise in this section or on the drawings.

B. CRSI - Manual of Standard Practice

C. CRSI - Recommended Practice for Placing Reinforcing Bars

D. CRSI - Recommended Practice for Placing Bar Supports, Specifications, and Nomenclature

E. CRSI - Recommended Practice for Reinforcing Bar Splices

F. ASTM A82 - Standard Specifications for Cold-Drawn Steel Wire For Concrete Reinforcement

G. ASTM Al 85 - Welded Steel Wire Fabric for Concrete Reinforcement

H. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement

I. AWS D12.1 - Welding Reinforcing Steel, Metal Inserts, and Connections in Reinforced Concrete Construction

1.6 DELIVERY, STORAGE AND HANDLING

A. Delivery

1. Deliver reinforcement to the job site bundled, tagged, and marked.

2. Use metal tags indicating bar size, lengths, and other information corresponding to markings shown on placement diagrams.

B. Storage

1. Store reinforcement at the job site in a manner to prevent damage and accumulation of dirt and excessive rust.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Reinforcing steel: 60 ksi yield grade, ASTM A615, plain finish.

B. Tie rods, turn buckles, plates, and nuts: ASTM A36.

C. Welded Steel Wire Fabric: ASTM A185; in flat sheets, plain finish; 12” maximum wire spacing. Use WWF 6x6-W4.0xW4.0 unless otherwise noted.

D. Steel Wire: ASTM A82.

2.2 ACCESSORIES

A. Chairs, Bolster, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcing during construction conditions.

B. Tie Wire: Minimum 16.5 gauge, black annealed type, or patented system accepted by the Owner’s Representative.

C. Special Chairs, Bolsters, Bar Supports, Spacers where adjacent to exposed concrete surfaces: Plastic-coated or hot-dipped galvanized steel type, sized and shaped as required.

PART 3 - EXECUTION

3.1 FABRICATION

A. General

1. Fabricate reinforcing bars to conform to required shapes and dimensions, with fabrication tolerances complying with CRSI Manual of Standard Practices and ACI 315.

2. In case of fabricating errors, do not rebend or straighten reinforcement in a manner that will injure or weaken the material.

3. Locate reinforcing splices, not indicated on drawings, at points of minimum stress. Location of splices subject to review of Owner’s Representative.

4. Where indicated, weld reinforcing bars in accordance with AWS D12.1.

B. Reinforcement with any of the following defects shall be deemed unacceptable and will not be permitted in the work.

1. Bar lengths, depths, and bends exceeding specified fabrication tolerances.

2. Bends or kinks not indicated on drawings or final shop drawings.

3. Bar with reduced cross-section due to excessive rusting or other cause.

3.2 PREPARATION

A. Examine the substrate, forms, and the conditions under which concrete reinforcement is to be placed.

B. Correct conditions detrimental to the proper and timely completion of the work.

C. Do not proceed until unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Reinforcing shall be accurately placed and rigidly secured in position in accordance with the requirements of Recommended Practice for Placing Reinforcing Bars (CRSI), Recommended Practice for Placing Bar Supports (CRSI), and with further requirements specified herein and on the drawings.

B. Tie reinforcing with black annealed (16.5 gauge min.) wire and bend all wire back beyond general plane of reinforcing.

C. Welded wire fabric reinforcement in slabs shall be continuous, shall have joints lapped at least one full mesh, but not less than 8", and shall be supported at proper elevations by accessories. Stagger laps of sheets to avoid continuous lap in either direction. Provide support bars to maintain the fabric in its proper position during the placing of the concrete.

D. Bending, tack welding, curing or substituting reinforcement in the field, other than shown on the contract drawings, in any manner is prohibited, unless the Engineer gives specific approval for each case.

E. At the time of placing the concrete, all reinforcement shall be free from excessive rust, scale, or other coatings that might destroy or reduce the bond.

F. Prior to placing concrete, avoid reinforcement's exposure to the weather for any considerable length of time. Where this is unavoidable, paint reinforcement with a heavy coat of cement grout. The Contractor shall be responsible for protecting exposed concrete and any other materials against staining from exposed reinforcement.

G. Before concrete is cast, check all reinforcement after placement to insure reinforcement conforms to contract drawings, approved shop detail drawings, and Specification requirements.

   1. Checking shall be done by qualified, experienced personnel

   2. Notify the Owner’s Representative at least 36 hours (excluding weekends and holidays) prior to concrete placement and given the opportunity to inspect the completed reinforcement and forms before concrete placement.

H. Splice the reinforcement in accordance with recommended practice for reinforcing bar splices (CRSI) unless shown otherwise on the drawings or approved by the Owner’s Representative.

I. The minimum cover of concrete for all reinforcement shall conform to the drawing dimensions, which indicate the clear distance from the edge of the reinforcement to the concrete surface. Where not otherwise specified or shown by written dimension, the minimum coverage of the concrete over the steel shall be as follows:

   1. Concrete cast against and permanently exposed to earth — 3 inches

   2. Formed concrete exposed to earth or weather — 2 inches

   3. Formed concrete not exposed to weather or in contact with ground.

      a. Slabs and walls — ¾ inch

      b. Beams and columns — 1-½ inches

J. Lap splices as shown or called for on the drawings. Those not shown or called out shall have a minimum lap of 30 bar diameters.

END OF SECTION 03 20 00

**SECTION 033000 – CAST IN PLACE CONCRETE**

PART 1- GENERAL

1.1 SECTION INCLUDES

A. Poured-in-place concrete floors, foundation walls, and supported slabs

B. Floors and slabs on grade

C. Poured-in-place equipment pads

D. Surface finish of walls, beams, and other formed surfaces

E. Grouting for base plates and bearing plates

F. Drawings and General Provisions of Contract, including General and Special Conditions, apply to this section.

1.2 RELATED SECTIONS

A. Section 01 33 00 – Submittals

B. Section 03 10 00 – Concrete Forms and Accessories

C. Section 03 20 00 – Concrete Reinforcement

1.3 REFERENCE STANDARDS

A. Applicable standards listed in this section include, but are not necessarily limited to, the following:

1. ACI 21 1.1 - Recommended Practice for Selecting Proportions for Normal Weight Concrete
2. ACI 301 - Specification for Structural Concrete for Buildings
3. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete
4. AC I 305 - Recommended Practice for Hot Weather Concreting
5. ACI 306 - Recommended Practice for Cold Weather Concreting
6. ACI 318 - Building Code Requirements for Reinforced Concrete
7. ASTM C31 - Making and Curing Concrete Test Specimens
8. ASTM C33 - Concrete Aggregates
9. ASTM C94 - Ready-mixed Concrete
10. ASTM C143 - Test for Slump of P.C. Concrete
11. ASTM C150 - Portland Cement
12. ASTM C171 - Sheet Materials for Curing Concrete
13. ASTM C260 - Air Entraining Admixtures for Concrete
14. ASTM C309 - Liquid Membrane - Forming Compound for Curing Concrete
15. ASTM C494 - Chemical Admixtures for Concrete
16. AASHTO M 182 - Specification for Burlap Cloth made from Jute or Kenaf

1.4 SUBMITTALS

A. Manufacturer’s Data in accordance with Section 01 33 00.

1. Submit manufacturers data and instructions for proprietary materials and items, including reinforcement accessories, admixtures, patching compounds, joint systems, and others as requested.

B. Ready-mixed concrete delivery tickets: Furnish duplicate delivery tickets with each load of concrete. Delivery tickets shall provide the following information:

1. Date
2. Name of supplier
3. Job location
4. Contractor
5. Type and brand name of cement
6. Class and specified cement content - bags per cu./yd.
7. Truck number
8. Time dispatched and time placed
9. Amount of concrete in load
10. Admixture, if any
11. Maximum size aggregate
12. Time water is added to dry cement and aggregate

C. Certificates of Compliance: Submit certificates of material properties and compliance with specified requirements if requested by the Owner's Representative. The material's producer and the Contractor must sign certificates of compliance.

1.5 QUALITY ASSURANCE

A. Standards

1. Comply with standards specified in this section.
2. In case of conflict between the referenced standards, the more stringent requirements shall govern.

B. Quality Control

1. The Owner or his Representative will provide materials testing.
2. Provide free access to work and cooperation.
3. Take three concrete test cylinders for every 75 or less cubic yards of concrete placed.
4. Take one slump test for each set of test cylinders taken.

C. Use necessary means to protect the materials before, during, and after installation. Protect the work and materials of all other trades.

D. In cause of damage, immediately make repairs and replacements necessary to the approval of the Owner's Representative and at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

A. Cement

1. Portland cement shall conform to the requirements of ASTM C 150, Type 1.

2. Use only one brand of cement for the entire work. Use in same sequence as received at the site.

B. Aggregates

1. Aggregates shall conform to requirements of ASTM C33.
2. Maximum aggregate size shall be not larger than 1/5th of the narrowest dimension between sides of form, 1/3rd of the depth of the slabs, or ¾ of the minimum clear spacing between individual reinforcing bars.
3. The combined maximum weight of flint and chert shall be 1% of the weight of coarse aggregate.
4. The maximum weight of lignite shall be 0.07% of the weight of the fine aggregate.

C. Water

1. Water used as an ingredient in concrete shall be clean, potable, and free from injurious amounts of foreign matter.

2.2 ADMIXTURES

A. Air Entrainment: ASTM C260

B. Chemical: ASTMC494, Type A, Water-reducing agents shall be applied at the dosage rates recommended by the manufacturer. Chlorides are not permitted.

2.3 CURING MATERIALS

A. Liquid curing and sealing compounds shall conform to ASTM C309, Type 1. Curing materials used with metallic toppings and hardeners shall be Masterseal, by Master Builders.

B. Sheet material shall conform to ASTM C171.

C. Burlap cloth made from jute or kenaf. Material shall weigh approximately 9 oz/sy, conform to AASHTO M 182 for moist curing, and shall be used in two layers.

2.4 JOINT MATERIALS

A. Performed joint filler shall be a flexible, closed-cell, polyurethane foam compatible with the Contractor's intended use.

B. Backup rod shall be a closed cell polyethafoam sealant rod sized as required.

C. Joint filler for slabs shall be a one or two component polysulfide polymer sealant or a one or two component polyurethane prepolymer sealant

2.5 SURFACE HARDENERS

A. Surface hardener shall be MasterTop 100 by Master Builders Solutions, Quartz Floor Hardener by SpecChem, or Surflex by Euclid Chemical , or approved equal.

2.6 RELATED MATERIALS

A. Concrete repair compound shall be Sonopatch, by Sonneborn Building Products Division, Embeco 411 Mortar, by Master Builders, or Duo Patch by SpecChem, or approved equal.

2.7 PROPORTIONING AND DESIGN OF MIXES

A. Proportion mixes by the Laboratory Trial Batch Method. Use the same materials to be employed on the project for each class of concrete required. Comply with ACI 211.

1. Required 28-day compressive strength of concrete: 4,000 psi.
2. Slump: 4-in. maximum, 2-in. minimum.

B. Laboratory Trial Batches:

1. The Contractor shall retain an independent testing facility or concrete plant, acceptable to the Owner's Representative, to select concrete mix proportions.
2. Test specimens shall be prepared in accordance with ASTM C192.
3. Conduct strength tests in accordance with ASTM C39, specified in ACI 301.

C. Submit written test reports, to the Owner's Representative, for each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until the Owner's Representative has accepted mixes.

D. Adjustment to Concrete Mixes: The Contractor may propose mix design adjustments when characteristics of materials, job conditions, weather, test results or other circumstances, warrant. The Owner's Representative must accept test data for revised mix designs and strength results before using in the work.

E. Use air-entraining admixture in exterior exposed concrete or structures and slabs exposed to freezing and thawing. Add air-entraining admixture at the manufacturers prescribed rate to result in concrete at the point of placement having air content within the following limits:

1. 1" Aggregate Concrete Mix: 4% to 5%
2. ¾" Aggregate Concrete Mix: 6% to 7%
3. ½" Aggregate Concrete Mix: 7% to 8%

F. The mix may use water-reducing agents as determined by the mix design organization subject to the approval of the Owner's Representative. Water-reducing agents are encouraged in conjunction with slabs to receive metallic hardeners or Anvil-Top.

2.8 CONCRETE MIXING

A. Ready-Mix Concrete: Comply with the requirements of ASTM C94, and as herein specified. Do NOT add water to the batch.

B. During hot weather or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C94 may be required.

C. When the air temperature is between 85°F and 90°F, reduce the mixing and delivery time from 90 minutes to 75 minutes. When the air temperature is above 90°F, reduce the mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the area and condition that work under this section.

B. Correct conditions detrimental to the proper and timely completion of the work.

C. Do not proceed until achieving satisfactory conditions.

3.2 CONCRETE PLACEMENT

A. Place concrete in accordance with ACI 304.

B. Notify Owner's Representative 36 hours prior to commencement of concrete placing operations.

C. Ensure anchors, seats, plates, and other items cast into concrete, are placed, held securely, and will not cause hardship in placing concrete.

D. Maintain records of poured concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

E. Ensure concrete placement does not disturb reinforcement, inserts, embedded parts, formed expansion and contraction joints, and special form materials.

F. Concrete shall be deposited continuously, in layers of such thickness that no concrete will be deposited on concrete that has hardened sufficiently to cause the formation of seams and planes of weakness within the section.

1. If, due to emergency conditions, the Contractor cannot place a section continuously between planned construction joints, introduce a field joint and additional reinforcement to preserve the structural continuity.

2. Notify the Owner's Representative immediately and obtain his consent.

G. Construction Joints

1. Place construction joints in slabs and beams at the center of spans.

2. Secure full bond at construction joints. Prior to placement of new concrete, clean the surfaces of the concrete already placed, including vertical and inclined surfaces.

a. Thoroughly clean surface of foreign materials and laitance.

b. Roughen with suitable tools; chipping hammers, wire brushes, etc.

c. Re-clean with a stream of water or compressed air.

3. Dampen the joints with water.

4. Apply bonding compound: Euro Weld, by Euclid Chemical Company, or approved equal. Place new concrete after the bonding compound has dried.

H. Place concrete in a manner to prevent segregation and accumulations of hardened concrete on the forms or reinforcement above the placed mass of concrete. Use hoppers, spouts with restricted outlets, tremies, etc. as needed.

I. Do NOT add water to concrete between the mixing and placing operation without approval of Owner's Representative. Under no circumstances shall added water cause concrete to slump greater than that established in the design of the mix.

J. Avoid cold joints. If a cold joint occurs, the Owner's Representative may require removal of all or parts of the concrete at the cold joint. Minimum requirement is treating a cold joint as a bonded construction joint as specified above.

K. Floor Slabs

1. Pour floor slabs in checkerboard or saw cut pattern as indicated on Drawings. Saw cut control joints within 18 hours after finishing. Use 3/16-in. thick blade. Joint depth shall be 1/4 of slab thickness.

2. Separate slabs-on-grade from vertical surfaces with ½” thick joint filler. Extend joint filler from bottom of slab to within ½” of finished slab surface.

L. Footings: Pour footings and grade beams on well dampened, firm, undisturbed soil or engineered compacted backfill, unless otherwise shown on the Drawings.

M. In locations where doweling new concrete to existing work, drill holes in existing concrete, inset steel dowels, and pack solidly with no shrink grout.

N. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Owner’s Representative upon discovery.

O. Maintain minimum concrete cover around reinforcing as follows, unless noted otherwise:

1. Beams 1-½ in

| | | |
|---|---|---|
| 2. Supported slabs and joists | ¾ in | |
| 3. Column ties | 1-½ in | |
| 4. Walls (exposed to weather or backfill) | | 2 in |
| 5. Walls (interior) | | ¾ in |
| 6. Footings and concrete formed against earth | 3 in | |
| 7. Slabs on fill | 2 in | |

3.3 HOT WEATHER PLACEMENT

A. Hot weather concrete placement procedures shall be followed when the rate of evaporation is expected to approach 0.2-lb./sq. ft./hr., calculated from Figure 2.1.5, ACI 301, or when the maximum daytime temperature exceeds 85°F.

B. Place and protect concrete in conformance with ACI 305 during hot weather. The critical air temperature decreases as relative humidity decreases, as concrete temperature as placed increases, and as wind increases.

C. The temperature of the concrete as placed shall be kept below 80°F by one or more of the following:

1. Sprinkle aggregate stockpiles to lower temperatures through evaporation
2. Chilling the mixing water
3. Replacing some of the mixing water with shaved ice

D. Cool forms by sprinkling. Remove all excess water before placing concrete.

E. Concrete shall be in the forms within 45 minutes after water is added to the dry ingredients.

F. Curing procedures shall start as soon as the condition of the concrete surface permits.

G. Use windbreaks and sunshades to protect flat work from drying winds and direct sun.

H. Do NOT use admixtures to retard setting without the authorization of the Owner's Representative.

3.4 COLD WEATHER PLACEMENT

A. Follow cold weather concrete placement procedures when the surrounding air temperature is below 40°F or if freezing temperatures are likely during the specified curing period.

B. Place and protect concrete in accordance with ACI 306 during cold weather. Minimum temperature maintained during curing shall be as specified in Table 1.4.1, ACI 306.

C. From November 1st to April 15th, concrete shall not be placed without materials for its protection readily available on the job site, in quantities sufficient to protect all concrete that has not cured for the specified curing time.

D. The tables and graphs in Chapter 4, ACI 306 indicate the required minimum amount of insulation.

E. Do NOT use frozen materials or materials containing ice in the concrete.

F. Forms, reinforcement, filler, etc. are to be free from frost and concrete. Do NOT place forms over or in contact with frozen earth.

G. Concrete placement with air temperature at or anticipated to fall below 40°F within the 24-hours of placement shall use heated mixing water and aggregate. Protect the concrete by adequate heating and/or covering.

H. Heating: Within the enclosure, provide artificial heat to maintain the temperatures specified, continuously, and with a reasonable degree of uniformity in all parts of the enclosure.

1. All exposed concrete surfaces within the heated area shall be wet down with a hose stream at least once every 24 hours during the heating period.
2. The Contractor shall provide' adequate fire protection at all times on each floor where heating is in progress.
3. The Contractor shall maintain watchmen or other attendants to keep the heating units in continuous operation.
4. Do NOT place heating appliances in a manner to endanger formwork, expose any area of concrete to drying out, or other injury due to excessive temperatures.
5. Vent heating units. Do NOT permit the heat to dry the concrete. Venting shall adequately exhaust carbon dioxide and carbon monoxide to prevent damage to the concrete and protect the workers.

I. Covering: Protect exposed surfaces of slabs on earth, frames, slabs, beams, girders, walls, etc., formed with 1 in. or less thick wood forms or all metal forms. Protect with 2-in. blanket insulation covered with polyethylene sheets, Sisalkraft, or tarpaulins. Protection is in addition to curing membrane.

J. Placing concrete when outside temperature is below 40°F:

1. Standard concrete mixes shall have a temperature of not less than 70°F or more than 80°F when placed in the forms.
2. Maintain standard concrete mixes at a temperature of not less than 70°F for three days or 50°F for five days.
3. Maintain high strength concrete at a temperature of not less than 70°F for two days or 50°F for three days.
4. The method of protection and curing shall prevent evaporation of moisture from the concrete and injury to the surface.

K. After discontinuing heating, lower temperatures gradually. Drop shall not exceed 1 degree per hour for the first 24 hours and 2 degrees per hour thereafter until reaching the outside temperature.

L. Do NOT use salts or chemicals for protection from freezing.

M. Remove and replace concrete damaged by freezing at the Contractor's expense.

3.5 CONVEYING

A. Conveying method shall insure a uniform concrete mixture at the forms faces with a minimum slump loss.

B. Use chutes, steep enough to permit concrete of design consistency to flow to point of deposit, or other means of conveying.

C. Placement in Deep, Narrow Forms

1. If free fall exceeds 3-feet, discharge into a hopper feeding into a drop chute (tremie).
2. Drop to vertical: Do NOT push or pull the chute bottom from the vertical position to distribute the concrete. Move the chute.
3. Place concrete of a drier consistency near top of lift to offset the tendency of the concrete to become wetter at top.
4. Place full height of each section in one day.

D. Allow six hours (minimum) after depositing concrete in columns or walls before depositing beams, girders, or slabs supported thereon.

E. Unless otherwise permitted, execute the work so a section begun on any one day is complete in daylight on the same day.

3.6 PLACING CONCRETE BY PUMPING

A. Contractor may place cast-in-place concrete by pumping in accordance with ACI 304.

B. Design Mix

1. Submit separate design mix for pumped concrete.
2. Note, the fine aggregate gradation, and water and cement content are more critical and different from the regular concrete mix.
3. The supplier may increase the slump 1-in. for individual batches at point of discharge. Flowable Concrete may have a 7-in. slump.

C. Pumping Equipment and Placement

1. Do not convey concrete through aluminum or aluminum alloy pipes.
2. The loss of slump in pumping equipment shall not exceed 2 inches.
3. Discard the mortar used for lubricating the pumping equipment. Do not incorporate in the work.
4. Take slump and air tests at both points of delivery to pump equipment and at point of discharge from the line.
5. Take concrete cylinders at the point of discharge from the line.

3.7 VIBRATION OF CONCRETE

A. Insert and withdraw slowly internal type vibrators.

B. Insert vibrator vertically to full depth of placed layer at regular intervals (18 to 30).

C. All vibrators used for normal weight concrete shall operate at a speed of not less than 10,000 rpm and be of suitable capacity.

D. For all surfaces exposed to view in the finished work, supplement vibration by proper wooden spade puddling to remove bubbles and honeycomb.

E. For placements other than concealed massive foundations, etc., at least one vibrator shall be on hand for every 10 cubic yards of concrete placed per hour plus one spare. All vibrators shall be operable and on the site prior to starting equipment.

F. Do not use vibrator to cause concrete to flow from one location to another.

3.8 SCREEDING

A. Screed floors, slabs-on-fill, and concrete base for toppings level: Maintain surface flatness of maximum 1/8$^{th}$ in. in 10 ft. except where drains occur. Around drains, pitch floors in planes true to the same tolerance.

3.9 CONCRETE FINISHING

A. Finish concrete surfaces to be left exposed without special finish as follows:

1. Fill honeycomb, tie holes, and other depressions.
2. Remove projecting fins.
3. Leave surfaces as they come from forms, except as noted above.

3.10 FINISHING, HARDENING, AND CURING OF INTERIOR FLOOR SLABS

A. Perform initial finishing operations including screeding, tapering, and floating until surface water glaze is disappearing. Use only wood floats.

B. Apply floor hardener as recommended by the manufacturer.

C. Steel trowel finish floor surfaces.

D. Cure slab with hardener manufacturers recommended curing compound applied in accordance with manufacturer's recommendations.

3.11 FINISHING AND CURING OF EXTERIOR SLABS

A. Float slabs and stoops, trowel, and fiber broom finish. Tool the edges.

B. Seal concrete slabs with a curing membrane as soon as finishing operation is completed. Apply in accordance with the manufacturer's recommendations.

3.12 CONCRETE CURING AND PROTECTION

A. General

1. Protect exposed, freshly placed concrete from drying and wash by rain, water leaks, falling objects, floor traffic, and other hazards that might mar the surface.

2. Concrete shall be kept continually wet for seven days after placing, including weekends and holidays. Do NOT alternate cycle of wetting and drying. Take particular care when heating surrounding air during cold weather operations. Provide uniform distribution of heat during cold weather, between 50°F and 60°F.

B. The following are approved methods of curing:

1. Horizontal Surfaces

a. Cover with burlap, cotton, or other approved fabric mats. Keep mat wet during curing period.

b. Cover with 0.004 thick Polyethylene sheets. Lap edges 4" (min.). Seal with adhesive tape.

c. Apply one coat of concrete curing compound. Apply with lamb's wool applicator paintbrush or spray. Make application immediately after troweling or as soon as the concrete can be walked upon (usually 1 to 8 hours). Apply in accordance with manufacturers specifications.

d. Curing compound shall not be used when other hardeners and applications are specified which are not compatible with curing compounds, or on horizontal exposed surfaces on top of walls.

2. Vertical Surfaces

a. Wood forms (kept wet), and metal forms provide satisfactory protection against loss of moisture; top surfaces are to be cured as specified above.

b. After removal of forms, continue curing for specified period with one of the methods listed for horizontal surfaces. Do not use curing compound on exposed vertical surfaces.

3.13 GROUTING OF BASE PLATES AND BEARING PLATES

A. Grout Mixture

1. Grout shall consist of the approved package grout mixture and water. Use the minimum amount of water required to produce a flowable grout. Take care to avoid the use of excessive water, which may cause segregation or bleeding.

2. Minimum ultimate compressive strength of grout shall be 5,000 psi at seven days and 7,500 psi at 28 days.

B. Mixing

1. Mix materials and water in a paddle type, mortar mixer for not less than three minutes.
2. Mix the material as close to the grouted area as possible. Provide adequate means to transport the mixed grout as quickly as possible, and in a manner to prevent segregation.
3. Place grout within a period of 15 minutes after mixing. After mixing the grout, do not re-temper by adding water.

C. Preparation

1. Remove all defective concrete, laitance, dirt, oil, grease, and loose material from the concrete foundation by bush hammering, chipping, or other approved means until obtaining sound, clean concrete.
2. Leave the surface of the concrete reasonably rough, but not so rough as to interfere with proper placing of the grout.
3. Cover the area as completely as possible with a waterproof paper to prevent contamination prior to grouting.

3.14 SLAB SURFACE TOLERANCES

A. Interior floor slabs shall be level with the maximum deviation being 1/8$^{th}$ in. in 10 ft. The testing method shall be as follows:

1. Set a 10 ft. long straightedge on 3/8-in. high shims at any location on the floor
2. A ¼-in. roller bar should pass anywhere under the straightedge
3. A ½-in. roller bar should not be able to fit anywhere under the straightedge

B. Exterior slabs shall be to the slopes shown on the Drawings and not deviate from uniform slopes more than ¼-in. in any 10 ft. checked. Checking shall be similar to above utilities ½-in. high shims, a ¼-in. small roller, and a ¾-in. large roller.

3.15 PATCHING

A. Repair surface defects, including tie holes and honeycomb, unless otherwise specified by the contract documents immediately after form removal.

B. Remove all honeycombed and other defective concrete down to sound concrete with edges perpendicular to the surface or slightly undercut.

1. Do NOT feather the edges.
2. Dampen the area for patching and an area at least six inches wide surrounding it, to prevent absorption of water from the patching mortar.
3. A bonding grout shall be prepared using a mix of approximately 1 part cement to 1 part fine sand passing a No. 30 mesh sieve, mixed to the consistency of thick cream, and then well brushed into the surface.

C. The patching mixture shall be consist of the same materials and approximate the same proportions used for the concrete with the following changes:

1. Omit the coarse aggregate
2. The mortar shall consist of not more than 1 part cement to 2-1/2 parts sand by damp loose volume
3. Substitute white portland cement for a part of the gray portland cement on exposed concrete. Match color by a trial patch.
4. Quantity of mixing water shall be no more than necessary for handling and placing.

5. Mix the patching mortar in advance. Allow mortar to stand with frequent manipulation with a trowel, without addition of water, until it has reached the stiffest consistency that will permit placing.

D. After evaporation of the surface water from the patched area, brush the bond coat into the surface.

1. When the bond coat begins to lose the water sheen, apply the premixed patching mortar.
2. Thoroughly consolidate into place and strike off the mortar.
3. Leave the patch slightly higher than the surrounding surface.
4. To permit initial shrinkage, leave the patch undisturbed for at least one hour before final finishing.
5. Keep the patched area damp for seven days. In a formed, exposed wall, do NOT use metal tools to finish a patch.

E. After cleaning and thoroughly dampening, fill the tie holes solid with patching mortar.

F. Repair concrete slab surfaces containing defects that adversely affect durability, strength, or appearance, by a method approved by the Owners Representative or replace.

3.16 DEFECTIVE CONCRETE

A. Do not patch defective concrete until the Owner's Representative examines and approves the areas. Where so approved, make repairs using the following procedures:

1. Clean surfaces to patch of all loose particles, oils, grease, etc., and roughen surfaces as required.
2. Pre-dampen surfaces before application of patching compound.
3. Mix, apply, finish, and cure patching compound in strict compliance with the manufacturer's instructions.

B. Where concrete is to be exposed to view in the finished work, exercise care to avoid damaging the virgin skin of surrounding parent concrete.

END OF SECTION 03 30 00

**SECTION 035413 - GYPSUM CEMENT UNDERLAYMENT**

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Self-leveling, gypsum cement underlayment for application below interior floor coverings.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at [Project site] <Insert location>.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Installer who is approved by manufacturer for application of underlayment products required for this Project.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ventilation, ambient temperature and humidity, and other conditions affecting underlayment performance.

1. Place gypsum cement underlayments only when ambient temperature and temperature of substrates are between 50 and 80 deg F (10 and 27 deg C).

PART 2 - PRODUCTS

2.1 GYPSUM CEMENT UNDERLAYMENTS

A. Gypsum Cement Underlayment: Self-leveling, gypsum cement product that can be applied in minimum uniform thickness of 1/8 inch (3 mm) to match adjacent floor elevations.
1. Cement Binder: Gypsum or blended gypsum cement as defined by ASTM C219.
2. Compressive Strength: Not less than 4000 psi (27.6 MPa) at 28 days when tested according to ASTM C472.

B. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3 to 6 mm); or coarse sand as recommended by underlayment manufacturer.

1. Provide aggregate when recommended in writing by underlayment manufacturer for underlayment thickness required.

C. Water: Potable and at a temperature of not more than 70 deg F (21 deg C).

D. Reinforcement: For underlayment applied to wood substrates, provide galvanized metal lath or other corrosion-resistant reinforcement recommended in writing by underlayment manufacturer.

E. Primer: Product of underlayment manufacturer recommended in writing for substrate, conditions, and application indicated.

F. Surface Sealer: Designed to reduce porosity as recommended by manufacturer for type of floor covering to be applied to underlayment.

## PART 3 - EXECUTION

### 3.1 PREPARATION

A. General: Prepare and clean substrate according to manufacturer's written instructions.

1. Treat nonmoving substrate cracks according to manufacturer's written instructions to prevent cracks from telegraphing (reflecting) through underlayment.
2. Fill substrate voids to prevent underlayment from leaking.

B. Concrete Substrates: Mechanically remove, according to manufacturer's written instructions, laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond.

1. Moisture Testing: Perform Perform tests so that each test area does not exceed 1000 sq. ft. (304.8 sq. m) and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
   a. Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum [85] <Insert number> percent relative humidity level measurement, or as recommended by gypsum cement underlayment manufacturer.

C. Wood Substrates: Mechanically fasten loose boards and panels to eliminate substrate movement and squeaks. Sand to remove coatings that might impair underlayment bond and remove sanding dust.

1. Install underlayment reinforcement recommended in writing by manufacturer.

D. Nonporous Substrates: For ceramic tile, quarry tile, and terrazzo substrates, remove waxes, sealants, and other contaminants that might impair underlayment bond; prepare surfaces according to manufacturer's written instructions.

E. Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions.

3.2 APPLICATION

A. General: Mix and apply underlayment components according to manufacturer's written instructions.

1. Close areas to traffic during underlayment application and for time period after application recommended in writing by manufacturer.
2. Coordinate application of components to provide optimum adhesion to substrate and between coats.

B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.

C. Apply underlayment to produce uniform, level surface.
1. Feather edges to match adjacent floor elevations.

D. Cure underlayment according to manufacturer's written instructions. Prevent contamination during application and curing processes.

E. Do not install floor coverings over underlayment until after time period recommended in writing by underlayment manufacturer.

F. Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.

**END OF SECTION 035413**

**SECTION 051200 - STRUCTURAL STEEL FRAMING**

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Structural steel.
2. Grout.

B. Related Requirements:

1. Section 051213 "Architecturally Exposed Structural Steel Framing" for additional requirements for architecturally exposed structural steel.

1.2 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show fabrication of structural-steel components.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD, or is accredited by the IAS Fabricator Inspection Program for Structural Steel (AC 172).

B. Comply with applicable provisions of the following specifications and documents:

1. AISC 303.
2. AISC 360.
3. RCSC's "Specification for Structural Joints Using ASTM A325 or A 490 Bolts."

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A992/A992M

B. Channels, Angles: ASTM A36/A36M.

C. Plate and Bar: ASTM A36/A36M.

D. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade B, structural tubing.

E. Welding Electrodes: Comply with AWS requirements.

## 2.2 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325 (Grade A325M), Type 1, heavy-hex steel structural bolts; heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.

B. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F3125/F3125M, Grade F1852, Type 1, consisting of steel structural bolts with splined ends; ASTM A563, Grade DH (ASTM A563M, Class 10S), heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1 hardened carbon-steel washers.

1. Finish: Plain.

C. Unheaded Anchor Rods: ASTM F1554, Grade 36.

1. Configuration: Straight.
2. Finish: Plain.

## 2.3 PRIMER

A. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

## 2.4 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

## 2.5 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303, "Code of Standard Practice for Steel Buildings and Bridges," and to AISC 360.

## 2.6 SHOP PRIMING

A. Shop prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
2. Surfaces to be field welded.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. SSPC-SP 2, "Hand Tool Cleaning."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

B. Baseplates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of baseplate.
3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure.

C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

### 3.3 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A325 or A 490 Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened.

### 3.4 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Bolted Connections: Inspect bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A325 or A 490 Bolts."

C. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.

**END OF SECTION 051200**

**SECTION 055119 - METAL GRATING STAIRS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Industrial Class stairs with steel-grating treads.
2. Steel railings attached to metal stairs.
3. Steel handrails attached to walls adjacent to metal stairs.

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.

1.4 ACTION SUBMITTALS

A. Product Data: For metal grating stairs and the following:

1. Gratings.
2. Woven-wire mesh.
3. Welded-wire mesh.
4. Shop primer products.
5. Grout.

B. Shop Drawings:

1. Include plans, elevations, sections, details, and attachment to other work.
2. Indicate sizes of metal sections, thickness of metals, profiles, holes, and field joints.
3. Include plan at each level.
4. Indicate locations of anchors, weld plates, and blocking for attachment of wall-mounted handrails.

C. Delegated-Design Submittal: For stairs and railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer's experience with providing delegated-design engineering services of the kind indicated, including documentation that engineer is licensed in the state in which Project is located.

B. Welding certificates.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design stairs and railings, including attachment to building construction.

B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Uniform Load: 100 lbf/sq. ft. (4.79 kN/sq. m).
2. Concentrated Load: 300 lbf (1.33 kN) applied on an area of 4 sq. in. (2580 sq. mm).
3. Uniform and concentrated loads need not be assumed to act concurrently.
4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
5. Limit deflection of treads, platforms, and framing members to L/360

C. Structural Performance of Railings: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ft. (0.73 kN/m) applied in any direction.
b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
b. Infill load and other loads need not be assumed to act concurrently.

3. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

a. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces

## 2.2 METALS

A. Metal Surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

C. Rolled-Steel Floor Plate: ASTM A786/A786M, rolled from plate complying with ASTM A36/A36M or ASTM A283/A283M, Grade C or D.

D. Steel Bars for Grating Treads: ASTM A36/A36M or steel strip, ASTM A1011/A1011M or ASTM A1018/A1018M.

E. Steel Wire Rod for Grating Crossbars: ASTM A510/A510M.

F. Aluminum Bars for Grating Treads: ASTM B221 (ASTM B221M) extruded aluminum, alloys as follows:

G. Steel Tubing for Railings: ASTM A500/A500M
   1. Provide galvanized finish for exterior installations and where indicated.

H. Steel Pipe for Railings: ASTM A53/A53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

I. Provide galvanized finish for exterior installations and where indicated.

J. Woven-Wire Mesh: Intermediate-crimp, diamond or square pattern, 2-inch (50-mm) woven-wire mesh, made from 0.135-inch (3.5-mm) nominal-diameter steel wire complying with ASTM A510/A510M.

K. Woven-Wire Mesh: Intermediate-crimp, diamond or square pattern, 2-inch (50-mm) woven-wire mesh, made from 0.162-inch- (4.1-mm-) diameter, aluminum wire complying with ASTM B211 (ASTM B211M), Alloy 6061-T94.

L. Welded-Wire Mesh: diamond or square pattern, 2-inch (50-mm) welded-wire mesh, made from 0.236-inch (6.0-mm) nominal-diameter steel wire complying with ASTM A510/A510M.

## 2.3 FASTENERS

A. General: Provide zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5, Type 304 stainless-steel fasteners for exterior use.

   1. Select fasteners for type, grade, and class required.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated.

C. Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563 (ASTM A563M); and, where indicated, flat washers.

D. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563 (ASTM A563M); and, where indicated, flat washers.

1. Provide mechanically deposited or hot-dip, zinc-coated anchor bolts for exterior stairs.

E. Post-Installed Anchors: [\Torque-controlled expansion anchors or chemical anchorscapable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless-steel bolts, ASTM F593, and nuts, ASTM F594.

## 2.4 MISCELLANEOUS MATERIALS

A. Welding Electrodes: Comply with AWS requirements.

B. Shop Primers: Provide primers that comply with Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

C. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

D. Zinc-Rich Primer: Comply with SSPC-Paint 20 and compatible with topcoat.

E. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

F. Galvanizing Repair Paint: High-zinc-dust-content paint complying with ASTM A780/A780M and compatible with paints specified to be used over it.

G. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout; recommended by manufacturer for exterior use; noncorrosive and nonstaining; mixed with water to consistency suitable for application and a 30-minute working time.

## 2.5 FABRICATION, GENERAL

A. Provide complete stair assemblies, including metal framing, hangers, railings, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.

1. Join components by welding unless otherwise indicated.
2. Use connections that maintain structural value of joined pieces.

B. Assemble stairs and railings in shop to greatest extent possible.

1. Disassemble units only as necessary for shipping and handling limitations.
2. Clearly mark units for reassembly and coordinated installation.

C. Cut, drill, and punch metals cleanly and accurately.

1. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated.
2. Remove sharp or rough areas on exposed surfaces.

D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

E. Form exposed work with accurate angles and surfaces and straight edges.

F. Weld connections to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Weld exposed corners and seams continuously unless otherwise indicated.
5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish # 3 - Partially dressed weld with spatter removed.

G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.

1. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated.
2. Locate joints where least conspicuous.
3. Fabricate joints that are exposed to weather in a manner to exclude water.
4. Provide weep holes where water may accumulate internally.

## 2.6 FABRICATION OF STEEL-FRAMED STAIRS

A. NAAMM Stair Standard: Comply with NAAMM AMP 510, "Metal Stairs Manual," for Industrial Class, unless more stringent requirements are indicated.

B. Stair Framing:

1. Fabricate stringers of steel plates or channels.

a. Stringer Size: As required.
b. Provide closures for exposed ends of channel stringers.
c. Finish: Galvanized.

2. Construct platforms and tread supports of steel plate or channel headers and miscellaneous framing members as required.

a. Provide closures for exposed ends of channel framing.
b. Finish: Galvanized.

3. Weld stringers to headers; weld framing members to stringers and headers.

C. Metal Bar-Grating Stairs: Form treads and platforms to configurations shown from metal bar grating; fabricate to comply with NAAMM MBG 531, "Metal Bar Grating Manual."

1. Fabricate treads and platforms from welded steel grating with 1-1/4-by-3/16-inch (32-by-5-mm) bearing bars at 15/16 inch (24 mm) o.c. and crossbars at 4 inches (100 mm) o.c.
2. Fabricate treads and platforms from welded steel grating with openings in gratings no more than 1/2 inch (12 mm) in least dimension.

    a. Surface: Plain.
    b. Finish: Galvanized.

3. Fabricate grating treads with rolled-steel floor plate nosing and with steel angle or steel plate carrier at each end for stringer connections.

    a. Secure treads to stringers with bolts.

4. Fabricate grating platforms with nosing matching that on grating treads.

    a. Secure grating to platform framing by welding.

D. Risers: Open.

E. Toe Plates: Provide toe plates around openings and at edge of open-sided floors and platforms, and at open ends and open back edges of treads.

1. Material and Finish: Steel plate to match finish of other steel items.
2. Fabricate to dimensions and details indicated.

## 2.7 FABRICATION OF STAIR RAILINGS

A. Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of member, post spacings, wall bracket spacing, and anchorage, but not less than that needed to withstand indicated loads.

1. Rails and Posts: 1-1/2-inch- (38-mm-) square top and bottom rails and 1-1/2-inch- (38-mm-) square posts.
2. Picket Infill: 3/4-inch (19-mm) square pickets spaced less than 4 inches (100 mm) clear.
3. Mesh Infill: Woven or Welded-wire mesh crimped or welded into 1-by-1/2-by-1/8-inch (25-by-13-by-3-mm) steel channel frames.

B. Welded Connections: Fabricate railings with welded connections.

1. Fabricate connections that are exposed to weather in a manner that excludes water.

    a. Provide weep holes where water may accumulate internally.

2. Cope components at connections to provide close fit, or use fittings designed for this purpose.
3. Weld all around at connections, including at fittings.
4. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
5. Obtain fusion without undercut or overlap.
6. Remove flux immediately.
7. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #3 - Partially dressed weld with spatter removed.

C. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required.

1. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

D. Close exposed ends of railing members with prefabricated end fittings.

E. Connect posts to stair framing by direct welding unless otherwise indicated.

F. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports.

1. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

## 2.8 FINISHES

A. Finish metal stairs after assembly.

B. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.

1. Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.
2. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

# PART 3 - EXECUTION

## 3.1 INSTALLING METAL STAIRS

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction.

1. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.

C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.

1. Grouted Baseplates: Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces.

a. Clean bottom surface of baseplates.
b. Set steel-stair baseplates on wedges, shims, or leveling nuts.
c. After stairs have been positioned and aligned, tighten anchor bolts.

d. Do not remove wedges or shims, but if protruding, cut off flush with edge of bearing plate before packing with grout.
e. Promptly pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

1) Neatly finish exposed surfaces; protect grout and allow to cure.
2) Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

E. Fit exposed connections accurately together to form hairline joints.

1. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
2. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
3. Comply with requirements for welding in "Fabrication, General" Article.

## 3.2 INSTALLING RAILINGS

A. Adjust railing systems before anchoring to ensure matching alignment at abutting joints with tight, hairline joints.

1. Space posts at spacing indicated or, if not indicated, as required by design loads.
2. Plumb posts in each direction, within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
3. Align rails so variations from level for horizontal members and variations from parallel with rake of stairs for sloping members do not exceed 1/4 inch in 12 feet (6 mm in 3.5 m).
4. Secure posts and rail ends to building construction as follows:

a. Anchor posts to steel by welding to steel supporting members.
b. Anchor handrail ends to concrete and masonry with steel round flanges welded to rail ends and anchored with post-installed anchors and bolts.

## 3.3 REPAIR

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

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

**END OF SECTION 055119**

**SECTION 055200 – EXTERIOR HANDRAILS**

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Steel Two Pipe Handrail or Guardrail.

B. Drawings and general provisions of Contract, including General and Special Conditions, apply to this Section.

1.2 WORK INCLUDES

A. Design of railings and attachments to resist a lateral force of 75 lbs (333 N) at any point without damage or permanent set.

1.3 SUBMITTALS

A. Shop Drawings: Indicate profiles, sizes, connections, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

B. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Posts: 1½" (1.900" O.D.) schedule 40, galvanized pipe, ASTM A53, Grade B.

B. Rails: 1" (1.315" O.D.) schedule 40, galvanized pipe, ASTM A53, Grade B.

C. Vertical Balusters: ½" (0.840" O.D.) Schedule 40, galvanized pipe, ASTM-A53, Grade B.

D. Welding Materials: AWS D1.1.

E. Paint:

1. Intermediate Coat: Two component, polyamide epoxy coating with recommended DFT of 2.0 to 6.0 mils per coat. Must be compatible with galvanized pipe.

2. Top Finish: Aliphatic Acrylic Polyurethane coating resistant to abrasion, wet conditions, corrosive fumes, and exterior weathering.

3. Color: Black

2.2 FABRICATION - GENERAL

A. Fit and shop assemble items complete rail sections, for delivery to site.

B. Continuously seal joined members by continuous welds.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush and hairline. Ease exposed edges to small uniform radius.

D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts, consistent with design of component.

E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication.

F. Accurately form components required for anchorage of railings to each other and to ramp structure.

2.3 FINISHES

A. Hand rails may be shop or field painted. Paint in accordance with manufacturer's instructions.

B. Clean surface per SSPC-SP7/NACE 4, Brush-off blast cleaning.

C. Prime surface with intermediate coat specified above. Provide 4.0 to 6.0 mil dry thickness

D. Paint with top coat specified above with 6.0 to 9.0 total mil dry film thickness. Place in two to three coats have 2.0 to 3.0 mil dry film thickness

PART 3 - EXECUTION

3.1 GENERAL

A. Obtain review by Owner's Representative prior to site cutting or making adjustments that are not part of scheduled work.

B. Make provision for erections stresses by temporary bracing. Keep work in alignment.

C. Replace items damaged in course of installation.

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

E. Supply to appropriate trades items required to be cast into concrete or embedded in masonry, complete with necessary setting templates.

3.2 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Allow for erection loads and provide temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

3.3 QUALITY CONTROL

A. Set rails parallel to slope of the stairs, ramp, or other pavement surface within 1/8 inch in 12 feet.

END OF SECTION 05 5200

**SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY**

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. Rooftop equipment bases and support curbs.
3. Wood blocking, cants, and nailers.
4. Wood furring and grounds.
5. Wood sleepers.
6. Plywood backing panels.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.

1.3 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Preservative-treated wood.
2. Fire-retardant-treated wood.
3. Power-driven fasteners.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
3. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 15 percent unless otherwise indicated.

## 2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.
5. Wood floor plates that are installed over concrete slabs-on-grade.

## 2.3 FIRE-RETARDANT-TREATED MATERIALS

A. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.

1. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated.
2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201 at 92 percent relative humidity. Use where exterior type is not indicated.
3. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D5664, and design value adjustment factors shall be calculated according to ASTM D6841.[ For enclosed roof framing, framing in attic spaces, and where high-temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for Project's climatological zone.]

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.

C. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

D. Application: Treat items indicated on Drawings, and the following:

1. Framing for raised platforms.
2. Concealed blocking.
3. Roof framing and blocking.
4. Wood cants, nailers, curbs, equipment support bases, blocking, and similar members in connection with roofing.
5. Plywood backing panels.

## 2.4 DIMENSION LUMBER FRAMING

A. Non-Load-Bearing Interior Partitions: Construction or No. 2 or Construction, Stud, or No. 3, as noted on the structural drawings, grade of any species.

B. Other Framing: No. 2 grade of species:

1. Hem-fir (north); NLGA.
2. Southern pine; SPIB.
3. Douglas fir-larch; WCLIB or WWPA.
4. Southern pine or mixed southern pine; SPIB.
5. Spruce-pine-fir; NLGA.
6. Douglas fir-south; WWPA.
7. Hem-fir; WCLIB or WWPA.
8. Douglas fir-larch (north); NLGA.
9. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

## 2.5 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Rooftop equipment bases and support curbs.
4. Cants.
5. Furring.
6. Grounds.
7. Utility shelving.

B. Dimension Lumber Items: Construction or No. 2 grade lumber of any species.

C. Concealed Boards: 19 percent maximum moisture content of any of the following species and grades:

1. Mixed southern pine or southern pine, No. 2 grade; SPIB.
2. Eastern softwoods, No. 2 Common grade; NELMA.
3. Northern species, No. 2 Common grade; NLGA.
4. Western woods, Construction or No. 2 Common grade; WCLIB or WWPA.

2.6 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, A-C, Exterior, C-C Plugged Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch (19-mm) nominal thickness.

2.7 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners[ with hot-dip zinc coating complying with ASTM A153/A153M] [of Type 304 stainless steel].

B. Screws for Fastening to Metal Framing: ASTM C1002 and ASTM C954, length as recommended by screw manufacturer for material being fastened.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

2.8 MISCELLANEOUS MATERIALS

A. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D3498 that is approved for use indicated by adhesive manufacturer.

B. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate[ furring,] nailers, blocking, [grounds, ]and similar supports to comply with requirements for attaching other construction.

C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels.[ Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.]

D. Do not splice structural members between supports unless otherwise indicated.

E. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

F. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
3. ICC-ES evaluation report for fastener.

3.2 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

**END OF SECTION 061053**

**SECTION 062023 - INTERIOR FINISH CARPENTRY**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Interior trim, including non-fire-rated interior door frames.

B. Related Requirements:

1. Section 061053 "Miscellaneous Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view.
2. Section 099123 "Interior Painting" for priming and back-priming of interior finish carpentry.

1.3 DEFINITIONS

A. MDF: Medium-density fiberboard.

B. MDO: Plywood with a medium-density overlay on the face.

C. PVC: Polyvinyl chloride.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Retain "Samples" Paragraph below for single-stage Samples, with a subordinate list if applicable. Retain "Samples for Initial Selection" and "Samples for Verification" paragraphs for two-stage Samples.

B. Samples: For each exposed product and for each color and texture specified.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with applicable rules of any rules-writing agency certified by the American

Lumber Standard Committee's (ALSC) Board of Review. Grade lumber by an agency certified by the ALSC's Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.

B. Softwood Plywood: DOC PS 1.

C. Hardboard: ANSI A135.4.

D. MDF: ANSI A208.2, Grade 130.

E. Particleboard: ANSI A208.1, Grade M-2.

F. Melamine-Faced Particleboard: Particleboard complying with ANSI A208.1, Grade M-2, finished on both faces with thermally fused, melamine-impregnated decorative paper and complying with NEMA LD 3, Grade VGL, for Test Methods 3.3, 3.4, 3.6, 3.8, and 3.10.

1. Color: As selected by Architect from manufacturer's full range.

## 2.2 INTERIOR TRIM

A. Lumber Trim for Opaque Finish (Painted Finish):

1. Species and Grade: Eastern white pine; NeLMA or NLGA Finish or 1 Common.
2. Species and Grade: Idaho white, lodgepole, ponderosa, radiata, or sugar pine; NLGA or WWPA 1 Common (Colonial).
3. Species and Grade: Douglas fir-larch or Douglas fir south; NLGA, WCLIB, or WWPA Prime or D finish.
4. Maximum Moisture Content: 15 percent.
5. Maximum Moisture Content: 10 percent.
6. Finger Jointing: Not allowed.
7. Face Surface: Surfaced (smooth).
8. Optional Material: Primed MDF of same actual dimensions as lumber indicated may be used in lieu of lumber.

## 2.3 MISCELLANEOUS MATERIALS

A. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.

B. Low-Emitting Materials: Adhesives shall comply with testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

C. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.

D. Multipurpose Construction Adhesive: Formulation, complying with ASTM D3498, that is recommended for indicated use by adhesive manufacturer.

## 2.4 FABRICATION

A. Back out or kerf backs of the following members, except those with ends exposed in finished work:

1. Interior standing and running trim, except shoe and crown molds.

B. Ease edges of lumber less than 1 inch (25 mm) in nominal thickness to 1/16-inch (1.5-mm) radius and edges of lumber 1 inch (25 mm) or more in nominal thickness to 1/8-inch (3-mm) radius.

# PART 3 - EXECUTION

## 3.1 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.

## 3.2 INSTALLATION, GENERAL

A. Do not use materials that are unsound; warped; improperly treated or finished; inadequately seasoned; too small to fabricate with proper jointing arrangements; or with defective surfaces, sizes, or patterns.

B. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials.

1. Use concealed shims where necessary for alignment.
2. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
3. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.
4. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining interior finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.
5. Coordinate interior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate interior finish carpentry.

## 3.3 STANDING AND RUNNING TRIM INSTALLATION

A. Install trim with minimum number of joints as is practical, using full-length pieces from maximum lengths of lumber available.

1. Do not use pieces less than 24 inches (610 mm) long, except where necessary.
2. Stagger joints in adjacent and related standing and running trim.
3. Miter at returns, miter at outside corners, and cope at inside corners to produce tight-fitting joints with full-surface contact throughout length of joint.

4. Use scarf joints for end-to-end joints.
5. Plane backs of casings to provide uniform thickness across joints where necessary for alignment.
6. Match color and grain pattern of trim for transparent finish (stain or clear finish) across joints.
7. Install trim after gypsum-board joint finishing operations are completed.
8. Install without splitting; drill pilot holes before fastening where necessary to prevent splitting.
9. Fasten to prevent movement or warping.
10. Countersink fastener heads on exposed carpentry work and fill holes.

## 3.4 ADJUSTING

A. Replace interior finish carpentry that is damaged or does not comply with requirements.

1. Interior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

B. Adjust joinery for uniform appearance.

## 3.5 CLEANING

A. Clean interior finish carpentry on exposed and semi-exposed surfaces.

B. Restore damaged or soiled areas and touch up factory-applied finishes if any.

## 3.6 PROTECTION

A. Protect installed products from damage from weather and other causes during construction.

B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

**END OF SECTION 062023**

# SECTION 064116 - PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

## PART 1 - GENERAL

### 1.1 SUMMARY

A. Section Includes:

1. Plastic-laminate-clad architectural cabinets.
2. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-clad architectural cabinets that are not concealed within other construction.

### 1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

### 1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Shop Drawings:

1. Include plans, elevations, sections, and attachment details.

C. Samples: For each exposed product and for each color and texture specified.

### 1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer

### 1.5 QUALITY ASSURANCE

A. Manufacturer's and Installer Qualifications: Employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

## PART 2 - PRODUCTS

### 2.1 PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

A. Quality Standard: Unless otherwise indicated, comply with the Architectural Woodwork Standards for grades of cabinets indicated for construction, finishes, installation, and other requirements.

B. Architectural Woodwork Standards Grade: Economy.

C. Type of Construction: Face frame.

D. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by quality standard.

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

a. Formica Corporation.
b. Pionite; a Panolam Industries International, Inc. brand.
c. Wilsonart LLC.

E. Laminate Cladding for Exposed Surfaces:

1. Horizontal Surfaces: Grade HGS.
2. Postformed Surfaces: Grade HGP.
3. Vertical Surfaces: Grade HGS.
4. Edges: Grade HGS
5. Pattern Direction: Vertically for drawer fronts, doors, and fixed panels.

F. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, NEMA LD 3, Grade BKL.

G. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:

1. As indicated by laminate manufacturer's designations.
2. Match Architect's sample.
3. As selected by Architect from laminate manufacturer's full range in the following categories:

a. Solid colors, matte finish.
b. Solid colors with core same color as surface, matte finish.
c. Wood grains, matte finish.
d. Patterns, matte finish.

## 2.2 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.

1. Wood Moisture Content: 5 to 10 percent.

B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.

## 2.3 FIRE-RETARDANT-TREATED MATERIALS

A. Fire-Retardant-Treated Materials, General: Where fire-retardant-treated materials are indicated, use materials that are acceptable to authorities having jurisdiction as determined by testing performed on identical products by a qualified testing agency.

1. Use treated materials that comply with requirements of referenced quality standard. Do not use materials that are warped, discolored, or otherwise defective.
2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.
3. Identify fire-retardant-treated materials with appropriate classification marking of qualified testing agency in the form of removable paper label or imprint on surfaces that will be concealed from view after installation.

## 2.4 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets

B. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081

C. Shelf Rests: BHMA A156.9, B04013; metal

D. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.

1. Dark, Oxidized, Satin Bronze, Oil Rubbed: BHMA 613 for bronze base; BHMA 640 for steel base; match Architect's sample.
2. Bright Brass, Clear Coated: BHMA 605 for brass base; BHMA 632 for steel base.
3. Bright Brass, Vacuum Coated: BHMA 723 for brass base; BHMA 729 for zinc-coated-steel base.
4. Satin Brass, Blackened, Bright Relieved, Clear Coated: BHMA 610 for brass base; BHMA 636 for steel base.
5. Satin Chromium Plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base.
6. Bright Chromium Plated: BHMA 625 for brass or bronze base; BHMA 651 for steel base.
7. Satin Stainless Steel: BHMA 630.

E. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

## 2.5 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.

B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.

C. Adhesive for Bonding Plastic Laminate: Unpigmented contact cement

1. Adhesive for Bonding Edges: Hot-melt adhesive.

## 2.6 FABRICATION

A. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

B. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

# PART 3 - EXECUTION

## 3.1 INSTALLATION

A. Before installation, condition cabinets to humidity conditions in installation areas for not less than 72 hours.

B. Architectural Woodwork Standards Grade: Install cabinets to comply with quality standard grade of item to be installed.

C. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with wafer-head cabinet installation screws.

D. Install cabinets level, plumb, and true in line to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm) using concealed shims.

1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
2. Install cabinets without distortion so doors and drawers fit openings and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
3. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches (400 mm) o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch (38-mm) penetration into wood framing, blocking, or hanging strips.

**END OF SECTION 064116**

**SECTION 070150.19 - PREPARATION FOR REROOFING**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Full tear-off of entire roof.
2. Temporary roofing.

1.3 UNIT PRICES

A. Work of this Section is affected by metal deck removal and replacement unit price.

1.4 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" apply to work of this Section.

B. Full Roof Tear-Off: Removal of existing roofing system from deck.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include plans, sections, and details.

C. Temporary Roofing Submittal: Product data and description of temporary roofing system. If temporary roof remains in place, include surface preparation requirements needed to receive permanent roof, and submit a letter from roofing manufacturer, stating acceptance of the temporary roof and that its inclusion does not adversely affect the roofing system's resistance to fire and wind or its FM Global rating.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1. Include certificate that Installer is approved by warrantor of existing roofing system.

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

C. Supplemental photographic documentation: Once roofing system is removed to deck, provide photographs of the existing metal deck conditions with any deteriorated sections noted which require replacement as part of the unit cost values.

D. Landfill Records: Indicate receipt and acceptance of demolished roofing materials by a landfill facility licensed to accept them.

## 1.7 QUALITY ASSURANCE

A. Installer Qualifications: Approved by warrantor of existing roofing system to work on existing roofing.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning roofing removal. Comply with hauling and disposal regulations of authorities having jurisdiction.

## 1.8 FIELD CONDITIONS

A. Existing Roofing System: Modified Bitumen Roof.

B. Owner will occupy portions of building immediately below reroofing area. Conduct reroofing so Owner's operations are not disrupted. Provide Owner with not less than 72 hours' notice of activities that may affect Owner's operations.

1. Coordinate work activities daily with Owner so Owner can place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.
2. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below affected area. Verify that occupants below work area have been evacuated before proceeding with work over impaired deck area.

C. Protect building to be reroofed, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.

D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

E. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.

1. Remove only as much roofing in one day as can be made watertight in the same day.

F. Hazardous Materials: Refer to Specification Section 28207.2.

1. If materials suspected of containing hazardous materials are encountered beyond those tested in the enclosed limited hazardous materials survey report, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

1.9 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during reroofing, by methods and with materials so as not to void existing or future roofing system warranty. Notify warrantor before proceeding.
   1. The roofing manufacturer shall provide written confirmation, submitted with shop drawings, that: “All roofing components exclusive of the deck, contained in the system proposed are approved, and compatible with the warranty requirements of the roof system as specified, and that the warranty specified will be issued at completion of project if system is installed as designed”.
   2. A 20-year weathertightness warranty shall be required for Modified Bitumen roofs. This warranty shall be for full replacement cost and shall be non-prorated. In addition, all insulation, flashings and penetrations shall be included within this warranty.
   3. Warranty shall be executed by both the system manufacturer and the roofing contractor. Specifications shall require roofing contractor to guarantee complete installation and any area of work not covered by roof system warranty for 5 years.

PART 2 - PRODUCTS

2.1 TEMPORARY PROTECTION MATERIALS

A. Expanded Polystyrene (EPS) Insulation: ASTM C 578.

B. Plywood: DOC PS1, Grade CD Exposure 1.

2.2 TEMPORARY ROOFING MATERIALS

A. Design and selection of materials for temporary roofing are Contractor's responsibilities. If temporary roofing materials are to remain in place as part of the final scope of work roofing system, all materials are to comply with Section 075213 Atactic – Polypropylene Modified Bituminous (APP).

B. Sheathing Paper: Red-rosin type, minimum 3 lb/100 sq. ft.

C. Base Sheet: ASTM D 4601, Type II, nonperforated, asphalt-impregnated and -coated, glass-fiber sheet.

D. Glass-Fiber Felts: ASTM D 2178, Type IV, asphalt-impregnated, glass-fiber felt.

E. Asphalt Primer: ASTM D 41/D 41M.

F. Roofing Asphalt: ASTM D 312, Type III or IV.

G. Base Sheet Fasteners: Capped head, factory-coated steel fasteners, listed in FM Global's "Approval Guide."

2.3 INFILL AND REPLACEMENT MATERIALS

A. Use infill materials matching existing roofing system materials unless otherwise indicated.

B. Wood blocking, curbs, and nailers are specified in Section 061000 "Rough Carpentry."

2.4 AUXILIARY REROOFING MATERIALS

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

PART 3 - EXECUTION

3.1 PREPARATION

A. Shut off rooftop utilities and service piping before beginning the Work.

B. Protect existing roofing system that is not to be reroofed.
   1. Limit traffic and material storage to areas of existing roofing that have been protected.
   2. Maintain temporary protection and leave in place until replacement roofing has been completed. Remove temporary protection on completion of reroofing.

C. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.

D. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

E. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday. Prevent debris from entering or blocking roof drains and conductors. Use roof-drain plugs specifically designed for this purpose. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.

3.2 ROOF TEAR-OFF

A. General: Notify Owner each day of extent of roof tear-off proposed for that day and obtain authorization to proceed.

B. Full Roof Tear-Off: Remove existing roofing and other roofing system components down to the deck.

   1. Remove wood blocking, curbs, and nailers.
   2. Remove fasteners from deck.

3.3 DECK PREPARATION

A. Inspect deck after tear-off of roofing system.

B. If broken or loose fasteners that secure deck panels to one another or to structure are observed, or if deck appears or feels inadequately attached, immediately notify Architect. Do not proceed with installation until directed by Architect.

C. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect. Do not proceed with installation until directed by Architect.

D. Replace decking that is deteriorated and determined to be structurally unsound as directed by Architect.

3.4 TEMPORARY ROOFING

A. Install approved temporary roofing over area to be reroofed.

B. Remove temporary roofing before installing new roofing.

C. If temporary roofing is to remain in place, prepare temporary roof to receive new roofing according to approved temporary roofing proposal. Restore temporary roofing to watertight condition. Obtain approval for temporary roof substrate from roofing manufacturer and Architect before installing new roof.

3.5 BASE FLASHING REMOVAL

A. Remove existing base flashings. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.

B. Do not damage metal counterflashings that are to remain. Replace metal counterflashings damaged during removal with counterflashings of same metal, weight or thickness, and finish and as specified in Section 076200 "Sheet Metal Flashing and Trim."

C. When directed by Architect, replace parapet framing, wood blocking, curbs, and nailers to comply with Section 061000 "Rough Carpentry."

3.6 DISPOSAL

A. Collect demolished materials and place in containers. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

1. Storage or sale of demolished items or materials on-site is not permitted.

B. Transport and legally dispose of demolished materials off Owner's property.

**END OF SECTION 070150.19**

**SECTION 071326 - SELF-ADHERING SHEET WATERPROOFING**

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Modified bituminous sheet waterproofing.
2. Modified bituminous sheet waterproofing, fabric reinforced.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at project site

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show locations and extent of waterproofing and details of substrate joints and cracks, expansion joints, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

1. Include setting drawings showing layout, sizes, sections, profiles, and joint details of pedestal-supported concrete pavers.

C. Samples: For each exposed product and for each color and texture specified.

1.4 INFORMATIONAL SUBMITTALS

A. Sample warranties.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.

1.6 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.

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

PART 2 - PRODUCTS

2.1 MODIFIED BITUMINOUS SHEET WATERPROOFING

A. Modified Bituminous Sheet: Minimum 60-mil (1.5-mm) nominal thickness, self-adhering sheet consisting of 56 mils (1.4 mm) of rubberized asphalt laminated on one side to a 4-mil- (0.10-mm-) thick, polyethylene-film reinforcement, and with release liner on adhesive side; formulated for application with primer or surface conditioner that complies with VOC limits of authorities having jurisdiction.

1. Approved Manufacturers include, but are not limited to:

a. American Hydrotech, Inc.
b. Carlisle Coatings & Waterproofing Inc.
c. CETCO, a Minerals Technologies company.
d. GCP Applied Technologies Inc.
e. Henry Company.
f. MAPEI Corporation.
g. Mar-flex Waterproofing & Building Products.
h. Protecto Wrap Company.
i. Soprema, Inc.
j. Tamko Building Products, Inc.
k. W.R. Meadows, Inc.
l. York Manufacturing, Inc.

2. Physical Properties:

a. Tensile Strength, Membrane: 250 psi (1.7 MPa) minimum; ASTM D412, Die C, modified.
b. Ultimate Elongation: 300 percent minimum; ASTM D412, Die C, modified.
c. Low-Temperature Flexibility: Pass at minus 20 deg F (minus 29 deg C); ASTM D1970/D1970M.
d. Crack Cycling: Unaffected after 100 cycles of 1/8-inch (3-mm) movement; ASTM C836/C836M.
e. Puncture Resistance: 40 lbf (180 N) minimum; ASTM E154/E154M.
f. Water Absorption: 0.2 percent weight-gain maximum after 48-hour immersion at 70 deg F (21 deg C); ASTM D570.
g. Water Vapor Permeance: 0.05 perm (2.9 ng/Pa x s x sq. m) maximum; ASTM E96/E96M, Water Method.
h. Hydrostatic-Head Resistance: 200 feet (60 m) minimum; ASTM D5385.

3. Sheet Strips: Self-adhering, rubberized-asphalt strips of same material and thickness as sheet waterproofing.

B. Modified Bituminous Sheet, Fabric Reinforced: Minimum 60-mil (1.5-mm) nominal thickness, self-adhering sheet consisting of rubberized-asphalt membrane with embedded fabric reinforcement, and with release liner on adhesive side.

1. Approved Manufacturers include, but are not limited to:
a. Carlisle Coatings & Waterproofing Inc.
b. Protecto Wrap Company.
c. Royston.

2. Physical Properties:

   a. Pliability: No cracks when bent 180 degrees over a 1-inch (25-mm) mandrel at minus 25 deg F (minus 32 deg C); ASTM D146/D146M.
   b. Puncture Resistance: 100 lbf (445 N) minimum; ASTM E154/E154M.
   c. Water Vapor Permeance: 0.05 perm (2.9 ng/Pa x s x sq. m) maximum; ASTM E96/E96M, Water Method.

3. Sheet Strips: Self-adhering, reinforced, rubberized-asphalt strips of same material and thickness as sheet waterproofing.

## 2.2 AUXILIARY MATERIALS

A. Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.

   1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.

B. Primer: Liquid waterborne primer recommended for substrate by sheet-waterproofing material manufacturer.

C. Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by sheet-waterproofing material manufacturer.

D. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.

E. Substrate Patching Membrane: Low-viscosity, two-component, modified asphalt coating.

F. Metal Termination Bars: Aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm), predrilled at 9-inch (229-mm) centers.

G. Protection Course: ASTM D6506, semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners and as follows:

   1. Thickness: Nominal 1/8 inch (3 mm) for vertical applications; 1/4 inch (6 mm) elsewhere.
   2. Adhesive: Rubber-based solvent type recommended by waterproofing manufacturer for protection course type.

H. Protection Course: Fan folded, with a core of extruded-polystyrene board insulation faced on both sides with plastic film, nominal thickness 1/4 inch (6 mm), with compressive strength of not less than 8 psi (55 kPa) per ASTM D1621, and maximum water absorption by volume of 0.6 percent per ASTM C272/C272M.

I. Protection Course: Extruded-polystyrene board insulation, unfaced, ASTM C578, Type X, 1/2 inch (13 mm) thick.

J. Protection Course: Molded-polystyrene board insulation, ASTM C578, Type I, 0.90-lb/cu. ft. (15-kg/cu. m) minimum density, 1-inch (25-mm) minimum thickness.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.

B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.

3.2 MODIFIED BITUMINOUS SHEET-WATERPROOFING APPLICATION

A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions and per recommendations in ASTM D6135.

B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.

C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- (64-mm-) minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure watertight installation.

1. When ambient and substrate temperatures range between 25 and 40 deg F (minus 4 and plus 5 deg C), install self-adhering, modified bituminous sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F (16 deg C).

D. Horizontal Application: Apply sheets from low to high points of decks to ensure that laps shed water.

E. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.

F. Seal edges of sheet-waterproofing terminations with mastic.

G. Install sheet-waterproofing and auxiliary materials to tie into adjacent waterproofing.

H. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches (150 mm) beyond repaired areas in all directions.

I. Immediately install protection course with butted joints over waterproofing membrane.

3.3 MOLDED-SHEET DRAINAGE-PANEL INSTALLATION

A. Place and secure molded-sheet drainage panels, with geotextile facing away from wall or deck substrate, according to manufacturer's written instructions. Use adhesive or another method that does not penetrate waterproofing. Lap edges and ends of geotextile to maintain continuity. Protect installed molded-sheet drainage panels during subsequent construction.

1. For vertical applications, install [**board insulation**] [**protection course**] before installing drainage panels.

3.4 INSULATION DRAINAGE-PANEL INSTALLATION

A. Install insulation drainage panels over waterproofed surfaces. Cut and fit to within 3/4 inch (19 mm) of projections and penetrations.

B. Ensure that drainage channels are aligned and free of obstructions.

C. On vertical surfaces, set insulation drainage panels in adhesive or tape applied according to manufacturer's written instructions.

D. On horizontal surfaces, loosely lay insulation drainage panels according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

3.5 PROTECTION, REPAIR, AND CLEANING

A. Do not permit foot or vehicular traffic on unprotected membrane.

B. Protect installed insulation drainage panels from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

C. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.

D. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

**END OF SECTION 071326**

**SECTION 072100 - THERMAL INSULATION**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Wall Insulation and Ceiling Insulation.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each product, for tests performed by a qualified testing agency.

B. Research reports.

1.5 WARRANTY

A. Provide the manufacturer's written 20 year warranty that insulations have no thermal drift and the installed R-value will not degrade below the published values at the time of installation. Products with warranty's based on decreasing percentage or time weighted average thermal performance provisions will not be acceptable.

PART 2 - PRODUCTS

2.1 EXTRUDED POLYSTYRENE FOAM-PLASTIC BOARD

A. Extruded polystyrene boards in this article are also called "EPS boards." Roman numeral designators in ASTM C 578 are assigned in a fixed random sequence, and their numeric order does not reflect increasing strength or other characteristics.

B. Extruded Polystyrene Board, Type VI: ASTM C 578, Type VI, 40-psi (276-kPa) minimum compressive strength; maximum flame-spread and smoke-developed indexes of 25 and 450, respectively, per ASTM E 84.

1. Acceptable Manufacturers include, but are not limited to the following
a. DiversiFoam Products.

b. Dow Chemical Company (The).
c. Kingspan Insulation.
d. Soprema, Inc.

## 2.2 GLASS-FIBER BLANKET

A. Glass-Fiber Blanket, Unfaced ASTM C665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E84; passing ASTM E136 for combustion characteristics.

1. Acceptable Manufacturers include, but are not limited to the following
   a. Certainteed Inc
   b. Johns Manville
   c. Knauf Insulation
   d. Owens Corning

## 2.3 ACCESSORIES

A. Insulation for Miscellaneous Voids:

1. Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.
2. Spray Polyurethane Foam Insulation: ASTM C 1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.

B. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.

# PART 3 - EXECUTION

## 3.1 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and applications.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.2 INSTALLATION OF SLAB INSULATION

A. On vertical slab edge and foundation surfaces, set insulation units using manufacturer's recommended adhesive according to manufacturer's written instructions.

B. On horizontal surfaces, loosely lay insulation units according to manufacturer's written instructions. Stagger end joints and tightly abut insulation units.

3.3 INSTALLATION OF FOUNDATION WALL INSULATION

A. Butt panels together for tight fit.

B. Anchor Installation: Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors.

C. Adhesive Installation: Install with adhesive or press into tacky waterproofing or dampproofing according to manufacturer's written instructions.

3.4 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
4. Attics: Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
5. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.
6. For wood-framed construction, install blankets according to ASTM C1320 and as follows:

   a. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.

B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:

1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).
2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

**END OF SECTION 072100**

**SECTION 072500 - WEATHER BARRIERS**

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Building paper.
2. Building wrap.
3. Flexible flashing.
4. Drainage material.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For water-resistive barrier and flexible flashing, from ICC-ES.

PART 2 - PRODUCTS

2.1 WATER-RESISTIVE BARRIER

A. Building Paper: ASTM D226, Type 1 (No. 15 asphalt-saturated organic felt), unperforated.

B. Building Paper: Water-vapor-permeable, asphalt-saturated kraft building paper that complies with ICC-ES AC38, Grade D except with water-resistance rating not less than 1 hour.

C. Building Wrap: ASTM E1677, Type I air barrier; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E84; UV stabilized; and acceptable to authorities having jurisdiction.

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

a. Dorken Systems Inc.
b. Dow Chemical Company (The).
c. DuPont de Nemours, Inc.
d. Kingspan Insulation Limited.
e. Ludlow Coated Products.
f. Raven Industries, Inc.
g. TYPAR.

2. Water-Vapor Permeance: Not less than 75 perms (4300 ng/Pa x s x sq. m) per ASTM E96/E96M, Desiccant Method (Procedure A).

3. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.

D. Building-Wrap Tape: Pressure-sensitive plastic tape recommended by building-wrap manufacturer for sealing joints and penetrations in building wrap.

## 2.2 FLEXIBLE FLASHING

A. Butyl Rubber Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm.

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

a. DuPont de Nemours, Inc.
b. GCP Applied Technologies Inc.
c. Protecto Wrap Company.
d. Raven Industries, Inc.
e. TYPAR.

2. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.

B. Rubberized-Asphalt Flashing: Composite, self-adhesive, flashing product consisting of a pliable, rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

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

a. Advanced Building Products Inc.
b. Carlisle Coatings & Waterproofing Inc.
c. Fiberweb, Clark Hammerbeam Corp.
d. Fortifiber Building Systems Group.
e. GCP Applied Technologies Inc.
f. MFM Building Products Corp.
g. Polyguard Products, Inc.
h. TYPAR.
i. Wire-Bond.

2. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.

## 2.3 DRAINAGE MATERIAL

A. Drainage Material: Product shall maintain a continuous open space between water-resistive barrier and exterior cladding to create a drainage plane and shall be used under siding.

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

a. CavClear/Archovations, Inc.

b. DuPont de Nemours, Inc.
c. Insulfoam; Carlisle Construction Materials Company.
d. Keene Building Products.
e. Mortar Net Solutions.
f. Stuc-O-Flex International, Inc.
g. TYPAR.

2. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.

PART 3 - EXECUTION

3.1 WATER-RESISTIVE BARRIER INSTALLATION

A. Cover sheathing with water-resistive barrier as follows:

1. Cut back barrier 1/2 inch (13 mm) on each side of the break in supporting members at expansion- or control-joint locations.
2. Apply barrier to cover vertical flashing with a minimum 4-inch (100-mm) overlap unless otherwise indicated.

B. Building Paper: Apply horizontally with a 2-inch (50-mm) overlap and a 6-inch (150-mm) end lap; fasten to sheathing with galvanized staples or roofing nails.

C. Building Wrap: Comply with manufacturer's written instructions and warranty requirements.

1. Seal seams, edges, fasteners, and penetrations with tape.
2. Extend into jambs of openings and seal corners with tape.

3.2 FLEXIBLE FLASHING INSTALLATION

A. Apply flexible flashing where indicated to comply with manufacturer's written instructions.

1. Lap seams and junctures with other materials at least 4 inches (100 mm) except that at flashing flanges of other construction, laps need not exceed flange width.
2. Lap flashing over water-resistive barrier at bottom and sides of openings.
3. Lap water-resistive barrier over flashing at heads of openings.

3.3 DRAINAGE MATERIAL INSTALLATION

A. Install drainage material over building wrap and flashing to comply with manufacturer's written instructions.

**END OF SECTION 072500**

**SECTION 072600 - VAPOR RETARDERS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Polyethylene vapor retarders.
2. Reinforced-polyethylene vapor retarders.

B. Related Requirements:

1. Section 072100 "Thermal Insulation" for vapor retarders integral with insulation products.
2. Section 033000 “Cast-in-Place Concrete”

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each product, for tests performed by a qualified testing agency.

PART 2 - PRODUCTS

2.1 POLYETHYLENE VAPOR RETARDERS

A. Polyethylene Vapor Retarders: Maintain permeance of less than 0.01 Perms as tested in accordance with mandatory conditioning tests per ASTM E1745 Section 7.1 (7.1.1-7.1.5).

B. Other performance criteria:
1. Strength: ASTM E1745 Class A.
2. Thickness: 15 mils minimum
   a. Provide third party documentation that all testing was performed on a single production roll per ASTM E1745 Section 8.1.

PART 3 - EXECUTION

3.1 INSTALLATION OF VAPOR RETARDERS UNDER CONCRETE SLABS

A. Install vapor barrier in accordance ASTM E1643.
   1. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement and face laps away from the expected direction of the placement whenever possible.
   2. Extend vapor barrier to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise (a) at a point acceptable to the structural engineer or (b) where obstructed by impediments, such as dowels, waterstops, or any other site condition requiring early termination of the vapor barrier. At the point of term nation, seal vapor barrier to the foundation wall, grade beam or slab itself.
      a) Seal vapor barrier to the entire slab perimeter using textured tape, per manufacturer's instructions.

      OR

      b) Seal vapor barrier to the entire perimeter wall or footing/grade beam with double-sided tape, or both termination bar and double-sided tape, per manufacturer’s instructions. Ensure the concrete is clean and dry prior to adhering tape.
   3. Overlap joints 6 inches and seal with manufacturer’s seam tape.
   4. Apply seam tape/textured tape/double-sided tape to a clean and dry vapor barrier.
   5. Seal all penetrations (including pipes) per manufacturer’s instructions.
   6. Avoid the use of stakes driven through vapor barrier by utilizing vapor barrier-safe, peel-and-stick screed and forming penetration prevention systems. Ensure peel-and-stick adhesive base is fully adhered to the vapor barrier.
   7. If non-permanent stakes must be driven through vapor barrier, repair as recommended by vapor barrier manufacturer.
   8. Use reinforcing bar supports with base sections that eliminate or minimize the potential for puncture of the vapor barrier.
   9. Repair damaged areas with vapor barrier material of similar (or better) permeance, puncture and tensile.
   10. For vapor barrier-safe concrete screeding applications, install vapor barrier-safe, fixed elevation, point-to-point guide screed system prior to placing concrete.

3.2 INSTALLATION OF VAPOR RETARDERS IN CRAWL SPACES

A. Install vapor retarders over prepared grade. Lap joints a minimum of 12 inches (305 mm) and seal with manufacturer's recommended tape. Install second layer over pathways to equipment.

B. Extend vapor retarder over footings and seal to foundation wall or grade beam with manufacturer's recommended tape.
   1. Extend vapor retarder vertically minimum 16 inches above top of footing.

C. Seal around penetrations such as utilities and columns in order to create a monolithic, airtight membrane at grade surface, perimeter, and all vertical penetrations.

**END OF SECTION 072600**

**SECTION 073113 - ASPHALT SHINGLES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Granule surfaced asphalt shingles.
2. Felt underlayment.
3. Self-adhering sheet underlayment.
4. Ridge vents.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for roof sheathing.
2. Section 076200 "Sheet Metal Flashing and Trim" for flashing.

1.3 DEFINITION

A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 REFERENCES

A. ASTM D 225 – Standard Specification for Asphalt Shingles (Organic Felt) Surfaced with Mineral Granules.

B. ASTM D 226 – Standard Specification for Asphalt-Saturated Organic Felt used in Roofing and Waterproofing.

C. ASTM D 3018 – Standard Specification for Class A Shingles Surfaced with Mineral Granules.

D. ASTM D 3462 – Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules.

E. ASTM G 21 – Determining Resistance of Synthetic Polymers to Fungi

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Certificate of Compliance: Provide Certificate of Compliance from an independent laboratory indicating that the asphalt fiberglass shingles made in normal production meet or exceed the requirements of the following:

1. ASTM E 108/UL 790 Class A Fire Resistance.
2. ASTM D 3161/UL 997 Wind Resistance.
3. ASTM D 3462

C. Manufacturer's Literature for Initial Selection: For each type of asphalt shingle, ridge cap shingle, ridge vent and any other required trim accessories. Include full range of colors.

D. Samples: For each exposed product and for each color and texture specified.

1. Granule Surface Asphalt Shingles: Full size.
2. Ridge and Hip Cap Shingles: Full size.
3. Ridge Vent: 12-inch long Sample.

E. Samples for Initial Selection: For each type of asphalt shingle indicated.

1. Include similar Samples of accessories involving color selection.

## 1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer. Installer Minimum Qualifications: Installer shall be licensed or otherwise authorized by all federal, state and local authorities to install all products specified in this section. Installer shall perform work in accordance with NRCA Roofing and Waterproofing Manual.

B. Sample Warranty: For manufacturer's warranty.

## 1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For asphalt shingles to include in maintenance manuals.

## 1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Asphalt Shingles: 50 sq. ft. of each type, in unbroken bundles.

## 1.9 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer with a minimum of two years' documented experience installing asphalt shingle roofing. Reference Informational Submittal requirements.
1. Installer must have a minimum of three (3) years experience installing the roofing system specified.
2. Job Site Superintendent must have a minimum of 5 years experience in roofing.

B. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Finish areas designated by architect.
2. Do not proceed with remaining work until workmanship, color and pattern are approved by Architect.
3. Rework mock-up area as required to produce acceptable work.

C. Source Limitations: Obtain ridge and hip cap shingles, ridge vents, felt underlayment, and self-adhering sheet underlayment through one source from a shingle asphalt shingle manufacturer.

D. Pre-Installation Conference: Conduct conference at Project site. Comply with requirements in Division 1 Section “Project Management and Coordination.” Review methods and procedures related to roofing system including, but not limited to, the following:
1. Meet with Construction Administrator, Architect, Roofing Installer, Deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer’s written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer’s personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof decking during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

## 1.10 DELIVERY, STORAGE, AND HANDLING

A. Store roofing materials in a dry, well-ventilated location protected from weather, sunlight, and moisture according to manufacturer's written instructions.

B. Store underlayment rolls on end on pallets or other raised surfaces. Do not double stack rolls.

C. Protect unused roofing materials from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

D. Handle, store, and place roofing materials in a manner to prevent damage to roof deck or structural supporting members.

## 1.11 FIELD CONDITIONS

A. Environmental Limitations: Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended in writing by manufacturer. Do not install products under environment conditions outside manufacturer’s absolute limits.

B. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit asphalt shingle roofing to be performed according to manufacturer's written instructions and warranty requirements.

1.12 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials within specified warranty period. Materials failures include manufacturing defects and failure of asphalt shingles to self-seal after a reasonable time.

1. Material Warranty Period: 30 years from date of Substantial Completion, nonprorated.
2. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds up to 70 mph (33 m/s) for 10 years from date of Substantial Completion.
3. Algae-Discoloration Warranty Period: Asphalt shingles will not discolor 10 years from date of Substantial Completion.
4. Workmanship Warranty Period: 5 years from date of Substantial Completion.

B. Installers Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of roofing system for the following warranty period:

1. The liability of the Surety Company under the installer warranty provisions of this contract is limited to correcting defective workmanship and materials for a period of two years from the substantial completion date of the project. Any warranty beyond the first two years is an agreement between the owner and the contractor and falls outside the performance bond obligation.
2. Warranty Period: Five (5) years from date of Substantial Completion.

1.13 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Asphalt shingles: 100 sq. ft. of each type, in unbroken bundles.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Exterior Fire-Test Exposure: Provide asphalt shingles and related roofing materials identical to those of assemblies tested for Class A fire resistance according to ASTM E 108 or UL 790 by Underwriters Laboratories or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

## 2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

A. Laminated-Strip Asphalt Shingles: ASTM D 3462/D 3462M, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
   1. Approved Manufacturers include, but are not limited to:
      a. CertainTeed Corporation; Landmark 30
      b. Owens Corning; Oakridge Pro30
      c. GAF Materials Corporation; Timberline 30
      d. Atlas Roofing Corporation; Pinnacle 35
      e. TAMKO Roofing Products, Inc.; Heritage 30

   2. Shingles: Conforming to ASTM D 3018 Type I – Self Sealing; UL Certification of ASTM D 3462, ASTM D 3161 Class “F” (110-mph) / UL997 Wind Resistance and UL Class A Fire Resistance; glass fiber mat base, ceramically colored/UV resistant mineral surface granules across entire face of shingle.
   3. Butt Edge: Straight cut.
   4. Algae Resistance: Granules resist algae discoloration.
   5. Impact Resistance: UL 2218, Class 4.
   6. Color: Weathered Wood.

B. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles.

## 2.3 UNDERLAYMENT MATERIALS

A. Felt: ASTM D 226/D 226M and ASTM D 4869, Type II, asphalt-saturated organic felts, nonperforated.

B. Waterproofing Underlayment:

   1. ASTM D 1970 sheet barrier of self-adhering rubberized asphalt membrane shingle underlayment having internal reinforcement, and “split” back plastic release film; Use in “low slope’ areas (below 4:12, but no less than 2:12 pitch); and at roof edges back 3’-0”. Provide material warranty with equal in duration to that of shingles being applied.

   2. ASTM D 1970, Minimum of 55 mil thick sheet; glass-fiber-mat-reinforced.

   3. Products:
      a. Atlas Roofing Corporation; StormMaster DG
      b. CertainTeed Corporation; WinterGuard
      c. GAF Materials Corporation; WeatherWatch
      d. Henry Company; Eaveguard
      e. Owens Corning; WeatherLock G.

## 2.4 RIDGE VENTS

A. Rigid Ridge Vent: Manufacturer's standard, rigid section high-density polypropylene or other UV-stabilized plastic ridge vent for use under ridge shingles.

   1. Features:

      a. Nonwoven geotextile filter strips.

b. External deflector baffles.

2. Products:
   a. Air Vent Inc., a CertainTeed Company; ShingleVent IL
   b. Cor-a-Vent, Inc.; V-Series
   c. GAF Materials Corporation; Cobra Rigid Vent II
   d. Lomanco, Inc.; OR-4
   e. Owens corning; VentSure Ridge Vent

## 2.5 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.

B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch diameter (minimum 11 or 12 gage), sharp-pointed, with a minimum 3/8-inch diameter flat head and of sufficient length to penetrate 3/4 inch into solid wood decking or extend at least 1/8 inch through OSB or plywood sheathing.

   1. Shank: Barbed.
   2. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

C. Felt-Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized-steel wire with low-profile capped heads or disc caps, 1-inch minimum diameter.

## 2.6 METAL FLASHING AND TRIM

A. General: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."

   1. Sheet Metal: Stainless steel, Zinc-tin alloy-coated stainless steel, Zinc-tin alloy-coated steel.

B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.

   1. Apron Flashings: Fabricate with lower flange a minimum of 5 inches over and 4 inches beyond each side of downslope asphalt shingles and 6 inches up the vertical surface.
   2. Step Flashings: Fabricate with a headlap of 2 inches and a minimum extension of 4 inches over the underlying asphalt shingle and up the vertical surface.
   3. Cricket or Backer Flashings: Fabricate with concealed flange extending a minimum of 24 inches beneath upslope asphalt shingles and 6 inches above the roof plane.
   4. Drip Edges: Fabricate in lengths not exceeding 10 feet with 2-inch roof-deck flange and 1-1/2-inch fascia flange with 3/8-inch drip at lower edge.

C. Vent Pipe Flashings: ASTM B 749, Type L51121, at least 1/16 inch thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof and extending at least 4 inches from pipe onto roof.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provisions have been made for flashings and penetrations through asphalt shingles.

B. 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 UNDERLAYMENT INSTALLATION

A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.

B. Double-Layer Felt Underlayment: Install on roof deck parallel with and starting at the eaves. Install a 19-inch wide starter course at eaves and completely cover with full-width second course. Install succeeding courses lapping previous courses 19 inches in shingle fashion. Lap ends a minimum of 6 inches. Stagger end laps between succeeding courses at least 72 inches. Fasten with felt-underlayment nails.

1. Apply a continuous layer of asphalt roofing cement over starter course and on felt-underlayment surface to be concealed by succeeding courses as each felt course is installed. Apply over entire roof.
2. Install felt underlayment on roof sheathing not covered by self-adhering sheet underlayment. Lap edges over self-adhering sheet underlayment not less than 3 inches in direction that sheds water.
3. Terminate felt underlayment extended up not less than 4 inches against sidewalls, curbs, chimneys, and other roof projections.
4. Install fasteners at no more than 36 inch o.c.

C. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install lapped in direction that sheds water. Lap sides not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24 inches between courses. Roll laps with roller. Cover underlayment within seven days.

1. Prime concrete and masonry surfaces to receive self-adhering sheet underlayment.
2. Eaves: Extend from edges of eaves 36 inches beyond interior face of exterior wall.
3. Rakes: Extend from edges of rake 36 inches beyond interior face of exterior wall.
4. Hips: Extend 18 inches on each side.
5. Ridges: Extend 36 inches on each side without obstructing continuous ridge vent slot.

6. Sidewalls: Extend beyond sidewall 18 inches and return vertically against sidewall not less than 4 inches.
7. Roof Slope Transitions: Extend 18 inches on each roof slope.

## 3.3 METAL FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."

1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."

B. Apron Flashings: Extend lower flange over and beyond each side of downslope asphalt shingles and up the vertical surface.

C. Step Flashings: Install with a headlap of 2 inches and extend over the underlying asphalt shingle and up the vertical surface. Fasten to roof deck only.

D. Cricket or Backer Flashings: Install against the roof-penetrating element extending concealed flange beneath upslope asphalt shingles and beyond each side.

E. Rake Drip Edges: Install rake drip-edge flashings over underlayment and fasten to roof deck.

F. Eave Drip Edges: Install eave drip-edge flashings below underlayment and fasten to roof sheathing.

G. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

## 3.4 ASPHALT-SHINGLE INSTALLATION

A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and recommendations in NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."

B. Install starter strip along lowest roof edge, consisting of an asphalt-shingle strip with tabs removed at least 7 inches wide with self-sealing strip face up at roof edge.

1. Extend asphalt shingles 1/2 inch over fasciae at eaves and rakes.
2. Install starter strip along rake edge.

C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

D. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with 4-inch half-tab and per manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

E. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full-length first course followed by cut second course, repeating alternating pattern in succeeding courses.

F. Fasten asphalt-shingle strips with a minimum of four roofing nails located according to manufacturer's written instructions.

1. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.
2. When ambient temperature during installation is below 50 deg F, seal asphalt shingles with asphalt roofing cement spots.

G. Ridge Vents: Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.

H. Hip and Ridge Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.

1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.

## 3.5 ROOFING INSTALLER'S WARRANTY

A. WHEREAS <Insert name> of <Insert address> herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
1. Owner: <Insert name of Owner.>
2. Address: <Insert address.>
3. Building Name/Type: <Insert information.>
4. Address: <Insert address.>
5. Area of Work: <Insert information>
6. Acceptance Date: <Insert date.>
7. Warranty Period: <Insert time.>
8. Expiration Date: <Insert date.>

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:
1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
   a. lightning;
   b. peak gust wind speed exceeding 70 mph (m/sec);
   c. fire;
   d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;

e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
f. vapor condensation on bottom of roofing; and
g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building contents resulting from leaks or faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this <Insert day> day of <Insert month>, 20<Insert year.>

1. Authorized Signature: <Insert signature.>
2. Name: <Insert name.>
3. Title: <Insert title.>

**END OF SECTION 073113**

**SECTION 074646 - FIBER-CEMENT SIDING**

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes fiber-cement siding and soffit.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For fiber-cement siding and soffit including related accessories.

1.3 INFORMATIONAL SUBMITTALS

A. Product certificates.
B. Product test reports.
C. Research/evaluation reports.
D. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 QUALITY ASSURANCE

A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and to set quality standards for fabrication and installation.

1. Build mockup of typical wall area as shown on Drawings.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 WARRANTY

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

1. Warranty Period: 25 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 FIBER-CEMENT SIDING

A. General: ASTM C1186, Type A, Grade II, fiber-cement board, noncombustible when tested according to ASTM E136; with a flame-spread index of 25 or less when tested according to ASTM E84.

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

a. CertainTeed Corporation.
b. James Hardie Building Products, Inc.
c. Nichiha Architectural Panels.

B. Labeling: Provide fiber-cement siding that is tested and labeled according to ASTM C1186 by a qualified testing agency acceptable to authorities having jurisdiction.

C. Nominal Thickness: Not less than 5/16 inch (8 mm).

D. Horizontal Pattern: Boards to match the spacing of existing wood siding.

1. Texture: Smooth.

E. Factory Priming: Manufacturer's standard acrylic primer.

2.2 FIBER-CEMENT VENTED SOFFIT

A. General: ASTM C1186, Type A, Grade II, fiber-cement board, noncombustible when tested according to ASTM E136; with a flame-spread index of 25 or less when tested according to ASTM E84.

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

a. CertainTeed Corporation.
b. James Hardie Building Products, Inc.
c. Nichiha Architectural Panels.

B. Nominal Thickness: Not less than 5/16 inch (8 mm).

C. Pattern: 12-inch- (300-mm-) wide sheets with smooth texture.

D. Factory Priming: Manufacturer's standard acrylic primer.

E. Net-Free Ventilation Area: minimum of 5 square inches per lineal foot of soffit.

2.3 FIBER-CEMENT BEADED BOARD

A. General: ASTM C1186, Type A, Grade II, fiber-cement board, noncombustible when tested according to ASTM E136; with a flame-spread index of 25 or less when tested according to ASTM E84.

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

   a. CertainTeed Corporation.
   b. James Hardie Building Products, Inc.
   c. Nichiha Architectural Panels.

B. Nominal Thickness: Not less than 5/16 inch (8 mm).

C. Pattern: 12-inch- (300-mm-) wide sheets with smooth texture.

D. Factory Priming: Manufacturer's standard acrylic primer.

## 2.4 ACCESSORIES

A. Siding Accessories, General: Provide starter strips, edge trim, outside and inside corner caps, and other items as recommended by siding manufacturer for building configuration.

B. Flashing: Provide aluminum or stainless-steel flashing complying with Section 076200 "Sheet Metal Flashing and Trim" at window and door heads and where indicated.

   1. Finish for Aluminum Flashing: Factory-prime coating.

C. Fasteners:

   1. For fastening to wood, use siding nails of sufficient length to penetrate a minimum of 1 inch (25 mm) into substrate.
   2. For fastening to metal, use ribbed bugle-head screws of sufficient length to penetrate a minimum of 1/4 inch (6 mm), or three screw-threads, into substrate.
   3. For fastening fiber cement, use hot-dip galvanized fasteners.

# PART 3 - EXECUTION

## 3.1 INSTALLATION

A. General: Comply with manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.

   1. Install fasteners no more than 24 inches (600 mm)

B. Install joint sealants as specified in Section 079200 "Joint Sealants" and to produce a weathertight installation.

## 3.2 ADJUSTING AND CLEANING

A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.

B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

**END OF SECTION 074646**

# SECTION 075213 - ATACTIC-POLYPROPYLENE (APP) MODIFIED BITUMINOUS MEMBRANE ROOFING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

B. Refer to the *Architects/Engineer's Roof Design Manual,*, Missouri Division of Facilities Management, Design & Construction for installation requirements. https://archive.oa.mo.gov/fmdc/dc/fmdc_dip/6%20Roof%20Design%20Manual/Roof%20Design%20Manual.pdf

C. All installation shall be consistent with the *2013 NRCA Roofing and Waterproofing Manual*.

### 1.2 SUMMARY

A. Section Includes:

1. Atactic-polypropylene (APP)-modified bituminous membrane roofing.
2. Hybrid roofing system that combines built-up ply sheets with atactic-polypropylene (APP)-modified bituminous membrane.
3. Vapor retarder.
4. Roof insulation.
5. Cover board.

B. Related Requirements:

1. Section 076200 "Sheet Metal Flashing and Trim" for metal roof flashings and counterflashings.
2. Section 079200 "Joint Sealants" for joint sealants, joint fillers, and joint preparation.

### 1.3 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" apply to Work of this Section.

B. Hot Roofing Asphalt: Roofing asphalt heated to its equiviscous temperature, the temperature at which its viscosity is 125 centipoise for mop-applied roofing asphalt and 75 centipoise for mechanical spreader-applied roofing asphalt, within a range of plus or minus 25 deg F (14 deg C), measured at the mop cart or mechanical spreader immediately before application.

### 1.4 ACTION SUBMITTALS

A. Product Data: For each type of product, including, but not limited to:
1. Sheathing Paper
2. Coated Heavy-Weight Base

3. Primer
4. Fasteners
5. Asphalt
6. Cold-Applied low-rise foam Adhesive (insulation attachment)
7. Asphalt Roofing Cement
8. Insulation
9. Coverboard
10. APP Cap Sheet
11. APP Cap Sheet Adhesive
12. Modified Flashing Plies
13. Sealants and Mastic

B. System Spec Plate: Submit a manufacturer's assembly spec plate depicting the ordering and attachment of the materials in the system.
   1. Included with the spec plate, provide a narrative of the assembly including the application and attachment methods.
   2. Narrative must include all system components from the deck up through the cap sheet.
   3. Include manufacturer's system spec number for roof system.

C. Schedule: Contractor shall provide a complete schedule for all roofing work indicating the sequence of removal and replacement of the roof. Show phasing on a roof plan defining each day's proposed work.

D. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work, including:

   1. Manufacturer's approved, but project specific, installation details of roofing and flashings, including roof slopes and insulation lay-outs, penetration details, curbs, and accessories.
   2. Base flashings and membrane terminations.

E. Samples for Verification: For the following products:

   1. Cap sheet, of color required.
   2. Flashing sheet, of color required.
   3. 12" X 12" sample of roof membrane from actual material used in project.
   4. Manufacturer's roof warranty.

## 1.5 INFORMATIONAL SUBMITTALS

A. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

B. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

   1. Submit evidence of compliance with performance requirements.

C. Product Test Reports: For components of roofing system, for tests performed by manufacturer and witnessed by a qualified testing agency.

D. Research/Evaluation Reports: For components of roofing system, from ICC-ES.

E. Field quality-control reports.

F. Maintenance Data: For roofing system to include in maintenance manuals.

G. A “systems” letter from the manufacturer agreeing “That all roofing components exclusive of the deck, contained in the system proposed are approved and compatible with the warranty requirements of the roof system as specified, and that the warranty specified will be issued at completion of project if system is installed as designed.

H. Sample Warranties: For manufacturer's special warranties.

## 1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing system to include in maintenance manuals.

B. Manufacturer’s roof warranty.

## 1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is UL listed and FM Global approved for membrane roofing system identical to that used for this Project.

B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.
   1. Installer must have a minimum of three (3) years experience installing the roof system specified.
   2. Job Site Superintendent must have a minimum of five (5) years experience in roofing.

## 1.8 PRE-INSTALLATION CONFERENCE

A. A Pre-installation Conference shall be held no earlier than two weeks before the start of the roof work. This Conference shall not be scheduled until all submittals have been received and approved by the project A/E.
   1. Meet with Owner, Architect, Roofing Installer, roofing system manufacturer’s representative, deck installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
   2. Review methods and procedures related to roofing installation, including manufacturer’s written instructions.
   3. Review and finalize construction schedule and verify availability of materials, installer’s personnel, equipment, and facilities needed to make progress and avoid delays.
   4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
   5. Review structural loading limitations on roof deck during and after roofing.
   6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
   7. Review temporary protection requirements for roofing system during and after installation.
   8. Review roof observation and repair procedures after roofing installation.
   9. Review governing regulations and State of Missouri FMDC regulations and requirements for roofing system during and after installation.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.10 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

B. No delay in the installation of the cap sheeting is allowable.

1.11 WARRANTY

A. Manufacturer’s Warranty: Manufacturer's form, without monetary limitation, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.

1. Special warranty includes roofing membrane, base flashings, roofing membrane accessories roof insulation fasteners cover boards walkway products and other components of roofing system.

2. Warranties that allow for arbitration are not acceptable.

3. Warranty must allow for litigation in the State of Missouri and be subject to Missouri law per Chapter 506, Section 506.500 of the Missouri Statutes.

4. Indicate by letter that “All roofing components exclusive of the deck are approved and compatible with the warranty requirements of the roof system as specified, and that the warranty specified will be issued at completion of the project if system is installed as designed.”

5. Warranty Period Requested: Fifteen (15) years from date of Substantial Completion.

6. Owner reserves the right to purchase a Twenty (20) year warranty for all of the roofs covered under the scope of work, up through the substantial completion of the project.

B. Installers Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of roofing system such as roofing membrane, ply sheets, base sheets, base flashing, roof insulation, fasteners, cover boards, and walkway products, for the following warranty period:

1. The liability of the Surety Company under the installer warranty provisions of this contract is limited to correcting defective workmanship and materials for a period of two years from the substantial completion date of the project. Any warranty beyond the first two years is an agreement between the owner and the contractor and falls outside the performance bond obligation.

2. Warranty Period: Five (5) years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

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

1. Approved Manufacturers include, but are not limited to:
   a. CertainTeed
   b. Firestone Building Projects
   c. Johns Manville
   d. GAF Materials Corporation
   e. Performance Roofing Systems, Inc.
   f. TAMKO Roofing Products, Inc.
   g. Tremco

B. Source Limitations: Obtain components including fasteners for roofing system from same manufacturer as membrane roofing.

C. Substitutions: Any proposed substitution to the list of Manufacturer’s above must be approved a minimum of 10 days in advance of the bid date by submitting the “SUBSTITUTION REQUEST” from enclosed with the bidding documents.
   1. No substitutions will be accepted for roof systems after the bid date.

### 2.2 PERFORMANCE REQUIREME NTS

A. General Performance: Provide installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and base flashings shall remain watertight.

1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D4272.

B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

C. FM Global Listing: Roofing, base flashings, and component materials shall comply with requirements in FM Global 4450 or FM Global 4470 as part of a roofing system, and shall be listed in FM Global' "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.

1. Fire/Windstorm Classification: Class 1A-90, 72 MPH peak wind speed.
2. Hail-Resistance Rating: SH.

D. Energy Star Listing: Roofing system shall be listed on the DOE's ENERGY STAR "Roof Products Qualified Product List" for low-slope roof products.

E. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

F. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.

## 2.3 ROOFING SHEET MATERIALS

A. Base Sheet: ASTM D 4601, Type II, nonperforated, asphalt-impregnated and -coated, glass-fiber sheet, dusted with fine mineral surfacing on both sides.

B. Roofing Membrane Sheet: ASTM D 6222/D 6222M, Grade S, Type I or II, APP-modified asphalt sheet (reinforced with polyester fabric); smooth surfaced; suitable for application method specified.

C. Granule-Surfaced Roofing Cap Sheet: ASTM D 6222/D 6222M, Grade G, Type I or II, APP-modified asphalt sheet (reinforced with polyester fabric); granule surfaced; suitable for application method specified, and as follows:

1. Granule Material: Mineral ceramic coated
2. Granule Color: To be selected by Architect.

## 2.4 BASE FLASHING SHEET MATERIALS

A. Backer Sheet: ASTM D 4601, Type II, asphalt-impregnated and -coated, glass-fiber sheet, dusted with fine mineral surfacing on both sides.

B. Granule-Surfaced Flashing Sheet: ASTM D 6222/D 6222M, Grade G, Type I or II, APP-modified asphalt sheet (reinforced with polyester fabric); granule surfaced; suitable for application method specified, and as follows:

1. Granule Color: To be selected by Architect.

C. Glass-Fiber Fabric: Woven glass-fiber cloth, treated with asphalt, complying with ASTM D 1668, Type I.

## 2.5 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.

B. Asphalt Primer: ASTM D 41/D 41M.

C. Roofing Asphalt: ASTM D 312, Type III or IV as recommended by roofing system manufacturer for application.

D. Roofing Asphalt: ASTM D 6152, SEBS modified.

E. Cold-Applied Adhesive: Roofing system manufacturer's standard asphalt-based, one- or two-part, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with roofing membrane and base flashings.

F. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.

G. Mastic Sealant: Polyisobutylene, plain or modified bitumen; nonhardening, nonmigrating, nonskinning, and nondrying.

H. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roofing components to substrate; tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.

I. Roofing Granules: Ceramic-coated roofing granules, No. 11 screen size with 100 percent passing No. 8 sieve and 98 percent of mass retained on No. 40 sieve, color to match roofing.

J. Miscellaneous Accessories: Provide those recommended by roofing system manufacturer.

## 2.6 SUBSTRATE BOARDS

A. Substrate Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, Type X, 5/8 inch thick, factory primed.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening substrate board to roof deck.

## 2.7 VAPOR RETARDER

A. Polyethylene Film: ASTM D 4397, 6 mils thick, minimum, with maximum permeance rating of 0.13 perm.

1. Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.
2. Adhesive: Manufacturer's standard lap adhesive, FM Global approved for vapor-retarder application.

B. Glass-Fiber Felt: ASTM D 2178, Type IV, asphalt impregnated.

## 2.8 ROOF INSULATION

A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer’s standard sizes and of thicknesses indicated.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class I, glass-fiber mat facer on both major surfaces.
   1. Preformed units to fit applications indicated, selected from the manufacturer's standard thicknesses, widths, and lengths.
   2. Manufacturers:
      a. Atlas Roofing Corp.
      b. Firestone Building Products Company
      c. GAF Materials Corporation
      d. Johns Manville International, Inc.
      e. Certainteed Corp

C. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated or needed for sloping to drain. Fabricate to slopes indicated.

## 2.9 INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturers for intended use and compatible with membrane roofing.

B. Mechanical Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roofing membrane and insulation components to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.

C. Cold Fluid-Applied Low-Rise Foam Adhesive: Manufacturer's standard cold fluid-applied low-rise foam formulated to adhere roof insulation to substrate.

D. Insulation Cant Strips: ASTM C278, perlite insulation board or cellulosic-fiber insulation board ASTM C208, Type II, Grade I. Approved for use in a Class A roof system and by roofing manufacturer.

E. Provide tapered edge strips in the same material as the cant strips.

F. Provide exterior grade wood nailer strips, as recommended by roofing manufacturer.

G. Cover Board: ASTM C208, Type II, Grade 1, cellulosic-fiber insulation board, ½-inch thick. Approved for use in Class A roof system and by the roof system manufacturer.

## 2.10 COATING MATERIALS

A. Roof Coating: ASTM D 1227, Type II, Class 1, mineral-colloid-emulsified, fibered asphalt emulsion, asbestos free.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work:

1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Section 053100 "Steel Decking."
4. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch out of plane relative to adjoining deck.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. The Contractor shall not remove any more roofs during the day than they can completely replace with new roofing materials including night seal-off and flashing of perimeter and accessories.

**D. Re-roofing shall not begin from November 1 through March 1, without specific approval from Deputy Director, Operations.**

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Prime surface of concrete deck with asphalt primer at a rate of 3/4 gal./100 sq. ft., and allow primer to dry.

3.3 INSTALLATION, GENERAL

A. Comply with roofing system manufacturer's written instructions and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing."

B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel when required by the manufacturer or when requested by the designer or owner's representative.

C. Cooperate with the construction administrator and allow for inspection of the roof system as it is being installed.

D. Coordinate installing roofing system so insulation and other components of the roofing membrane system are not permanently exposed and are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecasted.
1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.
2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of the roofing system.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

E. Asphalt Heating: Heat asphalt to its equiviscous temperature, measured at the mop cart or mechanical spreader immediately before application. Circulate asphalt during heating. Do not raise asphalt temperature above equiviscous temperature range more than one hour before time of application. Do not exceed asphalt manufacturer's recommended temperature limits during asphalt heating. Do not heat asphalt within 25 deg F of flash point. Discard asphalt maintained at a temperature exceeding finished blowing temperature for more than four hours.

1. Apply hot roofing asphalt within plus or minus 25 deg F of equiviscous temperature.

F. Absolutely No Torching of the membrane, flashing plies or any other components will be allowed.
1. Do not torch to dry any substrate unless pre-approved and as directed by the owner’s representative with approval from the designer.

G. Heat Welding of seams will be permitted on cold-applied membrane cap sheets and flashing plies as required by the manufacturer.

H. Coordinate installing roofing accessories, blocking, and nailers that are integral with the roof system.
1. Temporarily flash until permanent flashing or similar measures can be put into place to prevent water from entering the roof system or building below.

I. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

## 3.4 SUBSTRATE BOARD INSTALLATION

A. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.

1. Fasten substrate board to top flanges of steel deck according to recommendations in FM Global's "RoofNav" and FM Global Loss Prevention Data Sheet 1-29 for specified Windstorm Resistance Classification.
2. Fasten substrate board to top flanges of steel deck to resist uplift pressure at corners, perimeter, and field of roof according to roofing system manufacturers' written instructions.

## 3.5 VAPOR-RETARDER INSTALLATION

A. Polyethylene Film: Loosely lay polyethylene-film vapor retarder in a single layer over area to receive vapor retarder, side and end lapping each sheet a minimum of 2 inches and 6 inches, respectively. Continuously seal side and end laps with adhesive.

B. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into roofing system.

## 3.6 INSULATION INSTALLATION

A. Comply with roofing system manufacturer’s written instructions for installing roof insulation.

B. Nailer Strips: Mechanically fasten 4-inch nominal-width wood nailer strips as required by the manufacturer and for all penetrations.

C. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding ¼ inch with insulation.

D. Adhered insulation: Install each layer of insulation and adhere to substrate as follows:
   1. Set each layer of insulation in solid mopping of hot roofing asphalt.
   2. Set each layer of insulation in a cold fluid-applied low-rise foam adhesive.

E. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Stagger joints from joints in insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together and secure to roof deck.
   1. Install a mopping of hot roofing asphalt and immediately bond to previous layer of insulation.
   2. Install a cold fluid-applied low-rise foam adhesive to the top of the previous layer of insulation as recommended by the roof system manufacturer.

F. Preformed Saddles and Crickets: Install and secure preformed saddles and crickets where indicated and secure with hot asphalt or cold fluid-applied low-rise foam adhesive, as recommended by the roofing system manufacturer.

G. Insulation Cant Strips at vertical surfaces and Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces: Install an secure, 45-degree insulation cant strips at junctures of roofing membrane system with vertical surfaces or angle changes greater than 45 degrees. Install in mopping of hot roofing asphalt or cold fluid-applied low-rise foam adhesive, as recommended by the roofing system manufacturer.

## 3.7 ROOFING INSTALLATION, GENERAL

A. Install roofing system according to roofing system manufacturer's written instructions and applicable recommendations in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing" and as follows:

   1. Deck Type: N (nailable).
   2. Adhering Method: T (torched).
   3. Base Sheet: One, installed over sheathing paper.
   4. Number of Glass-Fiber Base-Ply Sheets: Two.
   5. Number of APP-Modified Asphalt Sheets: One.
   6. Surfacing Type: M (mineral-granule-surfaced cap sheet).

B. Start installation of roofing in presence of manufacturer's technical personnel.

C. Where roof slope exceeds 1/2 inch per 12 inches, install roofing sheets parallel with slope.

   1. Backnail roofing sheets to substrate according to roofing system manufacturer's written instructions.

D. Coordinate installation of roofing system so components of the roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

   1. Provide tie-offs at end of day's work to cover exposed roofing sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt, with joints and edges sealed.
   2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.

3. Remove and discard temporary seals before beginning work on adjoining roofing.

## 3.8 BASE-SHEET INSTALLATION

A. Loosely lay one course of sheathing paper, lapping edges and ends a minimum of 2 inches and 6 inches, respectively.

B. Install lapped base-sheet course, extending sheet over and terminating beyond cants. Attach base sheet as follows:

1. Mechanically fasten to substrate.
2. Spot or strip mop to substrate with hot roofing asphalt.
3. Adhere to substrate in a solid mopping of hot roofing asphalt.

## 3.9 BASE-PLY SHEET INSTALLATION

A. Install glass-fiber base-ply sheets according to roofing system manufacturer's written instructions starting at low point of roofing system. Align glass-fiber base-ply sheets without stretching. Extend sheets over and terminate beyond cants.

1. Shingle side laps of glass-fiber base-ply sheets uniformly to ensure that required number of glass-fiber base-ply sheets covers substrate at any point. Shingle in direction to shed water.
2. Embed each glass-fiber base-ply sheet in a continuous void-free mopping of hot roofing asphalt to form a uniform membrane without glass-fiber base-ply sheets touching.

## 3.10 APP-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

A. Install modified bituminous roofing cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing sheets over and terminate beyond cants, installing as follows:

1. Adhere to substrate in cold-applied adhesive.
2. Torch apply to substrate.
3. Unroll roofing sheets and allow them to relax for minimum time period required by manufacturer.

B. Laps: Accurately align roofing sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.

1. Repair tears and voids in laps and lapped seams not completely sealed.
2. Apply roofing granules to cover exuded bead at laps while bead is hot.

C. Install roofing sheets so side and end laps shed water.

## 3.11 FLASHING AND STRIPPING INSTALLATION

A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof; secure to substrates according to roofing system manufacturer's written instructions and as follows:

1. Prime substrates with asphalt primer if required by roofing system manufacturer.
2. Backer-Sheet Application: Adhere backer sheet to substrate in a solid mopping of hot roofing asphalt.
3. Flashing-Sheet Application: Adhere flashing sheet to substrate in asphalt roofing cement at rate required by roofing system manufacturer.
4. Flashing-Sheet Application: Torch apply flashing sheet to substrate.

B. Extend base flashing up walls or parapets a minimum of 8 inches above roofing membrane and 4 inches onto field of roofing membrane.

C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.

1. Seal top termination of base flashing with a strip of glass-fiber fabric set in asphalt roofing cement.

D. Install roofing cap-sheet stripping where metal flanges and edgings are set on roofing according to roofing system manufacturer's written instructions.

## 3.12 COATING INSTALLATION

A. Apply coating to roofing membrane and base flashings according to manufacturer's written instructions, by spray, roller, or other suitable application method to provide a dry film thickness of not less than 20 mils.

## 3.13 FIELD QUALITY CONTROL

A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

1. Notify Architect and Owner 48 hours in advance of date and time of inspection.

B. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements

C. Repair or replace items damaged caused by the contractor or subcontractors.

D. Roofing system will be considered defective if it does not pass tests and inspections.

1. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

## 3.14 FINAL INSPECTION

A. Roofing Contractor shall notify Construction Administrator when Manufacturer’s final Warranty inspection is to occur. Furnish a copy of the warranty inspection report to Construction Administrator.

B. The Contractor must provide copies of all disposal receipts for any hazardous materials removed from roof.

3.15 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

D. Protect other roof and building areas adjacent to the work from damage due to construction operations.

E. Do not store materials on or traffic roofs that are not part of the scope of work without approval.

**END OF SECTION 075213**

**SECTION 076200 - SHEET METAL FLASHING AND TRIM**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Manufactured through-wall flashing.
2. Manufactured reglets and counterflashing.
3. Formed low-slope roof sheet metal fabrications.

B. Related Requirements:

1. Section 061053 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.
2. Section 079200 “Joint Sealants” field-applied sheet metal flashing and trim sealants.

1.3 COORDINATION

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 PERFORMANCE REQUIREMENTS

A. General:
1. Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
   a. Sheet metal flashings, roof composite construction, parapets, terminations, expansion joints, and penetrations shall be designed according to the NRCA Roofing and Waterproofing manual details and specifications.

B. Fabricate and install roof edge flashing capable of resisting the following forces according to recommendations in FMG Loss Prevention Data Sheet 1-49:

1. Wind Zone 3: For velocity pressures of 46 to 104 lbf/sq. ft: 208-lbf/sq. ft. perimeter uplift force, 312-lbf/sq. ft. corner uplift force, and 104-lbf/sq. ft. outward force.

C. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by

preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

D. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

## 1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

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

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of roof-penetration flashing.
8. Include details of connections to adjoining work.
9. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Verification: For each type of exposed finish.

1. Sheet Metal Flashing: 12 inches long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
2. Trim, Metal Closures, Joint Intersections, and Miscellaneous Fabrications: 12 inches long and in required profile. Include fasteners and other exposed accessories.

## 1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.8 WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, 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 paint to adhere to bare metal.

2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Zinc-Tin Alloy-Coated Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, dead-soft, fully annealed, stainless-steel sheet of minimum uncoated thickness indicated; coated on both sides with zinc-tin alloy (50 percent zinc, 50 percent tin), with factory-applied gray preweathering.

C. Zinc-Tin Alloy-Coated Copper Sheet: ASTM B 370, cold-rolled copper sheet, H00 temper, of minimum uncoated weight (thickness) indicated; coated on both sides with zinc-tin alloy (50 percent zinc, 50 percent tin).

2.2 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

2. Fasteners for Zinc-Tin Alloy-Coated Copper Sheet: Copper, hardware bronze or passivated Series 300 stainless steel.
3. Fasteners for Zinc-Tin Alloy-Coated Stainless-Steel Sheet: Series 300 stainless steel.

C. Solder:
1. For Zinc-Tin Alloy-Coated Stainless Steel and Copper: ASTM B 32, 100 percent tin, with maximum lead content of 0.2 percent, as recommended by sheet metal manufacturer.

D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

## 2.3 MANUFACTURED SHEET METAL FLASHING AND TRIM

A. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions.

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

a. Cheney Flashing Company.
b. Fry Reglet Corporation.
c. Hickman, W. P. Company.

2. Material: Galvanized steel, 0.022 inch thick.
3. Stucco Type: Provide with upturned fastening flange and extension leg of length to match thickness of applied finish materials.
4. Accessories:

a. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing's lower edge.

## 2.4 UNDERLAYMENT MATERIALS

A. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970, minimum of 40 mils thick; slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release-paper backing; cold applied. Furnish type as recommended by sheet metal manufacturer for use at anticipated temperature at time of application. Provide primer over substrate as recommended by underlayment manufacturer.

1. Products: Subject to compliance with requirements, provide products by one of the following:

   a. Grace, W. R. & Co.; Grace Ice and Water Shield.
   b. Polyken Technologies; “Polyken 640 Underlayment Membrane.”

## 2.5 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.

   1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
   2. Obtain field measurements for accurate fit before shop fabrication.
   3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
   4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

   1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.

D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

G. Do not use graphite pencils to mark metal surfaces.

## 2.6 ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch long sections. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.

   1. Gutter Profile: 6 inch k-style profile.

2. Expansion Joints: Butt type with cover plate.
3. Gutters with Girth up to 15 Inches: Fabricate from the following materials:

   a. Pre-finished Aluminum: 0.032 inch thick.

B. Downspouts: Fabricate round or rectangular downspouts (depending upon location) to dimensions indicated, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors. Shop fabricate elbows.
1. Fabricate from the following materials:

   a. Prefinished Aluminum: 0.024 inch thick.

## 2.7 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Roof Edge Flashing (Gravel Stop): Fabricate in minimum 96-inch long, but not exceeding 12-foot long sections. Furnish with 6-inch wide, joint cover plates. Shop fabricate interior and exterior corners.

1. Joint Style: Butted with expansion space and 6-inch wide, concealed backup plate.
2. Fabricate from the Following Materials:

   a. Prefinished Aluminum: 0.050 inch thick.

B. Copings: Fabricate in minimum 96-inch long, but not exceeding 12-foot long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, solder or weld watertight. Shop fabricate interior and exterior corners.

1. Coping Profile: Fig 3-4A according to SMACNA's "Architectural Sheet Metal Manual."
2. Joint Style: Butted with expansion space and 6-inch wide, concealed backup plate.
3. Fabricate from the Following Materials:

   a. Prefinished Aluminum: 0.050 inch thick.

C. Roof and Roof-to-Wall Transition Roof-to-Roof Edge-Flashing (Gravel-Stop) and Fascia-Cap Transition Expansion-Joint Cover: Fabricate from the following materials: Shop fabricate interior and exterior corners.
1. Prefinished Aluminum: 0.050 inch thick.

D. Base Flashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
1. Prefinished Aluminum: 0.040 inch thick.

E. Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:

1. Prefinished Aluminum: 0.032 inch thick.

F. Flashing Receivers: Fabricate from the following materials:

1. Prefinished Aluminum: 0.032 inch thick.

G. Roof-Penetration Flashing: Fabricate from the following materials:

1. Copper: 16 oz./sq. ft. (0.55 mm thick)].

2. Stainless Steel: 0.019 inch (0.48 mm) thick.
3. Aluminum-Zinc Alloy-Coated Steel: 0.028 inch (0.71 mm) thick.
4. Lead: 4 lb (1.8 kg).

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps and edges with roller. Cover underlayment within 14 days.

### 3.3 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Torch cutting of sheet metal flashing and trim is not permitted.
2. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

1. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.

D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction.

1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

## 3.4 ROOF-DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

B. Hanging Gutters: Join sections with riveted and soldered joints or joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.

1. Fasten gutter spacers to front and back of gutter.
2. Anchor and loosely lock back edge of gutter to continuous cleat.
3. Anchor gutter with gutter brackets or straps spaced not more than 24 inches apart to roof deck, unless otherwise indicated, and loosely lock to front gutter bead.

C. Downspouts: Join sections with 1-1/2-inch telescoping joints.

1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches o.c.
2. Provide elbows at base of downspout to direct water away from building.

## 3.5 ROOF FLASHING INSTALLATION

A. General: Install sheet metal roof flashing and trim to comply with performance requirements, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated.

1. Interlock bottom edge of roof edge flashing with continuous cleats anchored to substrate at 16-inch centers.

C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing receivers and fit tightly to base flashing. Extend counterflashing 4 inches

over base flashing. Lap counterflashing joints a minimum of 4 inches and bed with elastomeric sealant.

## 3.6 WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

## 3.7 ERECTION TOLERANCES

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

B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

## 3.8 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean off excess sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

**END OF SECTION 076200**

**SECTION 077100 - ROOF SPECIALTIES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Gutters and Downspouts.
   2. Flashings.

B. Preinstallation Conference: Conduct conference at Project site.

1.3 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

B. CSSB: Refers to Cedar Shake and Shingle Bureau.

1.4 REFERENCES

A. Roofing and Flashing Installation: Refer to the NRCA's "The NRCA Roofing and Waterproofing Manual" for standard of work.

B. Roofing and Flashing Installation: Refer to the "Architect/Engineer's Roof Design Guidelines," Missouri Division of Facilities Management, Design & Construction, 2017.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

   1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For roof specialties.

   1. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.
   2. Include details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.

3. Indicate profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.
4. Detail termination points and assemblies, including fixed points.
5. Include details of special conditions.

C. Samples: For each type of roof specialty and for each color and texture specified.

D. Samples for Initial Selection: For each type of roof specialty indicated with factory-applied color finishes.

E. Samples for Verification:

1. Include Samples of each type of roof specialty to verify finish and color selection, in manufacturer's standard sizes.

## 1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer.

B. Product Certificates: For each type of roof specialty.

C. Sample Warranty: For manufacturer's special warranty.

## 1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing specialties to include in maintenance manuals.

## 1.8 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer and installer.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and set quality standards for fabrication and installation.
1. Build mockup of typical roof edge, including gutter and downspout, approximately [10 feet (3.0 m)] long, including supporting construction, seams, attachments, underlayment, and accessories.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

## 1.9 DELIVERY, STORAGE, AND HANDLING

A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.

B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

1.10 FIELD CONDITIONS

A. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.

B. Coordination: Coordinate roof specialties with flashing, trim, and construction of parapets, roof deck, roof and wall panels, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

A. Roofing-System Warranty: Roof specialties are included in warranty provisions in Section 073113 and 075213.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): [120 deg F (67 deg C), ambient; 180 deg F (100 deg C)] material surfaces.

2.2 ROOF-EDGE DRAINAGE SYSTEMS

A. Prefinished Metal Gutters: Manufactured in uniform section lengths, with matching corner units, ends, outlet tubes, and other accessories. Elevate back edge at least 1 inch (25 mm) above front edge. Furnish flat-stock gutter straps, gutter brackets, expansion joints, and expansion-joint covers fabricated from same metal as gutters.
1. Aluminum Sheet: 0.040 inch (1.02mm) thick.
2. Color: White
3. Gutter Profile: Style K
4. Gutter Supports: Gutter brackets and Straps with finish matching the gutters.

B. Prefinished Metal Downspouts: Plain round complete with smooth-curve elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, and anchors.
1. Formed Aluminum: 0.040 inch (1.02mm) thick.

C. Copper Gutters: Manufactured in uniform section lengths, with matching corner units, ends, outlet tubes, and other accessories. Elevate back edge at least 1 inch (25 mm) above front

edge. Furnish flat-stock gutter straps, gutter brackets, expansion joints, and expansion-joint covers fabricated from same metal as gutters.
1. Copper Sheet: 16 oz./sq. ft. (0.55 mm thick).
2. Gutter Profile for Existing Tavern Roof: Half-round single bead according to SMACNA's "Architectural Sheet Metal Manual."
3. Gutter Supports: Gutter brackets and Straps with finish matching the gutters.

D. Copper Downspouts: Plain round complete with smooth-curve elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, and anchors.
1. Copper: 16 oz./sq. ft.

E. Copper Finish: Non-patinated, mill.

F. Aluminum Finish: Two-coat fluoropolymer.

## 2.3 FLASHINGS, REGLETS AND COUNTERFLASHINGS

A. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches (100 mm) and in lengths not exceeding 12 feet (3.6 m)] designed to snap into reglets and compress against base flashings with joints lapped, from the following exposed metal:
1. Formed Aluminum (0.61 mm thick).

B. Accessories:

1. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where reglet is provided separate from metal counterflashing.
2. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.
3. Aluminum Finish: Two-coat fluoropolymer.

## 2.4 MATERIALS

A. Copper Sheet: ASTM B 370, cold-rolled copper sheet, H00 or H01 temper.

B. Aluminum Sheet: ASTM B209 (ASTM B209M), alloy as standard with manufacturer for finish required, with temper to suit forming operations and performance required.

## 2.5 MISCELLANEOUS MATERIALS

A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:

1. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.
2. Fasteners for Copper Sheet: Copper, hardware bronze, or passivated Series 300 stainless steel.
3. Fasteners for Aluminum: Aluminum or Series 300 stainless steel.
4. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.

5. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153/A 153M or ASTM F 2329.

B. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane and silicone polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.

C. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type joints with limited movement.

D. Solder for Copper: ASTM B 32.

## 2.6 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Copper Sheet Finishes:

1. Non-Patinated Finish: Mill finish.
2. Pre-Patinated Finish: Chemically treated according to ASTM B 882.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.

B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.

C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 INSTALLATION, GENERAL

A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.

1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
2. Provide uniform, neat seams with minimum exposure of solder and sealant.
3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
4. Torch cutting of roof specialties is not permitted.
5. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.

1. Coat concealed side of [uncoated aluminum] [and] [stainless-steel] roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
2. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.

C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.

1. Space movement joints at a maximum of 12 feet (3.6 m) with no joints within 18 inches (450 mm) of corners or intersections unless otherwise indicated on Drawings.
2. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.

D. Fastener Sizes: Use fasteners of sizes that penetrate wood substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.

F. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F (4 deg C).

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work. Tin edges of uncoated copper sheets using solder for copper. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

## 3.3 ROOF-EDGE SPECIALITIES INSTALLATION

A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.

B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

## 3.4 ROOF-EDGE DRAINAGE-SYSTEM INSTALLATION

A. General: Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.

B. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 24 inches apart, or as recommended by SMACNA. Attach ends with rivets and solder to make watertight. Slope to downspouts.

   1. Install gutter with expansion joints at locations, as recommended by SMACNA.

C. Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately [60 inches (1500 mm)].

   1. Provide elbows at base of downspouts at grade to direct water away from building.

D. Splash Pans: To be provided by Owner.

## 3.5 REGLET AND COUNTERFLASHING INSTALLATION

A. General: Coordinate installation of reglets and counterflashings with installation of base flashings.

B. Surface-Mounted Reglets: Install reglets to receive flashings where flashing without embedded reglets is indicated on Drawings. Install at height so that inserted counterflashings overlap 4 inches (100 mm) over top edge of base flashings.

C. Counterflashings: Insert counterflashings into reglets or other indicated receivers; ensure that counterflashings overlap 4 inches (100 mm) over top edge of base flashings. Lap counterflashing joints a minimum of 4 inches (100 mm) and bed with butyl sealant. Fit counterflashings tightly to base flashings.

## 3.6 CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder and sealants.

C. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.

D. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

**END OF SECTION 077100**

**SECTION 078413 - PENETRATION FIRESTOPPING**

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Penetrations in fire-resistance-rated walls.
2. Penetrations in horizontal assemblies.
3. Penetrations in smoke barriers.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.

1. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly. Obtain approval of authorities having jurisdiction prior to submittal.

1.4 INFORMATIONAL SUBMITTALS

A. Product test reports.

1.5 CLOSEOUT SUBMITTALS

A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics:

1. Perform penetration firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
2. Test per testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:

a. Penetration firestopping systems shall bear classification marking of a qualified testing agency.

1) UL in its "Fire Resistance Directory."
2) Intertek Group in its "Directory of Listed Building Products."
3) FM Global in its "Building Materials Approval Guide."

2.2 PENETRATION FIRESTOPPING SYSTEMS

A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.

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

a. 3M Fire Protection Products.
b. A/D Fire Protection Systems Inc.
c. Construction Solutions.
d. Grabber Construction Products.
e. HOLDRITE.
f. Passive Fire Protection Partners.
g. RectorSeal.
h. Specified Technologies, Inc.
i. STC Sound Control.
j. Tremco, Inc.

B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).

1. F-Rating: Not less than the fire-resistance rating of constructions penetrated.

C. Penetrations in Horizontal Assemblies: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).

1. F-Rating: At least one hour, but not less than the fire-resistance rating of constructions penetrated.
2. T-Rating: At least one hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.

3. W-Rating: Provide penetration firestopping systems showing no evidence of water leakage when tested according to UL 1479.

D. Penetrations in Smoke Barriers: Penetration firestopping systems with ratings determined per UL 1479, based on testing at a positive pressure differential of 0.30-inch wg (74.7 Pa).

1. L-Rating: Not exceeding 5.0 cfm/sq. ft. (0.025 cu. m/s per sq. m) of penetration opening at and no more than 50-cfm (0.024-cu. m/s) cumulative total for any 100 sq. ft. (9.3 sq. m) at both ambient and elevated temperatures.

E. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, per ASTM E84.

F. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.

B. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.

C. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.

D. Install fill materials by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

### 3.2 IDENTIFICATION

A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches (76 mm) high and with minimum 0.375-inch (9.5-mm) strokes.

1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feet (4.57 m) from end of wall and at intervals not exceeding 30 feet (9.14 m).

B. Penetration Identification: Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:

1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's name, address, and phone number.
3. Designation of applicable testing and inspecting agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

3.3 FIELD QUALITY CONTROL

A. Owner may engage a qualified testing agency to perform tests and inspections according to ASTM E2174.

B. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.

C. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

**END OF SECTION 078413**

**SECTION 078443 - JOINT FIRESTOPPING**

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Joints in or between fire-resistance-rated constructions.
2. Joints in smoke barriers.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Product Schedule: For each joint firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing agency.
1. Engineering Judgments: Where Project conditions require modification to a qualified testing agency's illustration for a particular joint firestopping system condition, submit illustration, with modifications marked, approved by joint firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.4 INFORMATIONAL SUBMITTALS

A. Product test reports.

1.5 CLOSEOUT SUBMITTALS

A. Installer Certificates: From Installer indicating that joint firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics:

1. Perform joint firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
2. Test per testing standards referenced in "Joint Firestopping Systems" Article. Provide rated systems complying with the following requirements:
   a. Joint firestopping systems shall bear classification marking of a qualified testing agency.
      1) UL in its "Fire Resistance Directory."
      2) Intertek Group in its "Directory of Listed Building Products."

2.2 JOINT FIRESTOPPING SYSTEMS

A. Joint Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which joint firestopping systems are installed. Joint firestopping systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.

B. Joints in or between Fire-Resistance-Rated Construction: Provide joint firestopping systems with ratings determined per ASTM E1966 or UL 2079.

1. Manufacturers: Acceptable Manufacturer’s include, but are not limited to the following:

   a. 3M Fire Protection Products.
   b. A/D Fire Protection Systems Inc.
   c. CEMCO; California Expanded Metal Products Co.
   d. Hilti, Inc.
   e. NUCO Inc.
   f. Rockwool International.
   g. Thermafiber, Inc.; an Owens Corning company.
   h. Tremco, Inc.

2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the wall, floor, or roof in or between which it is installed.

C. Exposed Joint Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E84.
D. Accessories: Provide components of fire-resistive joint systems, including primers and forming materials, that are needed to install elastomeric fill materials and to maintain ratings required. Use only components specified by joint firestopping system manufacturer and approved by the qualified testing agency for conditions indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.

B. General: Install fire-resistive joint systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

C. Install forming materials and other accessories of types required to support elastomeric fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
   1. After installing elastomeric fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.

D. Install elastomeric fill materials for fire-resistive joint systems by proven techniques to produce the following results:
   1. Elastomeric fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
   2. Apply elastomeric fill materials so they contact and adhere to substrates formed by joints.
   3. For elastomeric fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.2 IDENTIFICATION

A. Joint Identification: Identify joint firestopping systems with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of joint edge so labels are visible to anyone seeking to remove or joint firestopping system. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
   1. The words "Warning - Joint Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
   2. Contractor's name, address, and phone number.
   3. Designation of applicable testing agency.
   4. Date of installation.
   5. Manufacturer's name.
   6. Installer's name.

3.3 FIELD QUALITY CONTROL

A. Inspecting Agency: Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E2393.

B. Where deficiencies are found or joint firestopping systems are damaged or removed due to testing, repair or replace joint firestopping systems so they comply with requirements.

C. Proceed with enclosing joint firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

**END OF SECTION 078443**

**SECTION 079200 - JOINT SEALANTS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Nonstaining Silicone joint sealants.
2. Urethane joint sealants.
3. Mildew-resistant joint sealants.
4. Butyl joint sealants.
5. Latex joint sealants.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

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

B. Samples for Verification: For each kind and color of joint sealant required.

C. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS

A. Field-Adhesion-Test Reports: For each sealant application tested.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.7 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

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

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

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

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

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 NONSTAIING SILICONE JOINT SEALANTS

A. Silicone, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.
1. Adfast
2. GE Construction Sealants
3. Pecora Corporation
4. Sika Corporation
5. The Dow Chemical Company.

## 2.3 URETHANE JOINT SEALANTS

A. Urethane, S, NS, 25, NT: Single-component, nonsag, nontraffic-use, plus 25 percent and minus 25 percent movement capability, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.
   1. BASF Corp
   2. Bostik, Inc.
   3. Pecora Corporation
   4. Sherwin Williams Company
   5. Sika
   6. Tremco Incorporated

B. Urethane, S, P, 25, T, NT: Single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type S, Grade P, Class 25, Uses T and NT.
   1. BASF Corp
   2. Pecora Corporation
   3. Sherwin Williams Company

C. Urethane, M, P, 50, T, NT: Multicomponent, pourable, plus 50 percent and minus 50 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type M, Grade P, Class 50, Uses T and NT.
   1. BASF Corp
   2. Bostik, Inc.
   3. Pecora Corporation
   4. Sherwin Williams Company
   5. Sika
   6. Tremco Incorporated

## 2.4 MILDEW-RESISTANT JOINT SEALANTS

A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.

B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.
   1. GE Construction
   2. May Natinal
   3. Pecora Corporation
   4. Soudal
   5. The Dow Chemical Company
   6. Tremco Incorporated

## 2.5 BUTYL JOINT SEALANTS

A. Butyl-Rubber-Based Joint Sealants: ASTM C1311.
   1. Bostik, Inc.
   2. Pecora Corporation
   3. Or Equal

## 2.6 LATEX JOINT SEALANTS

A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.
   1. Pecora Corporation
   2. Sherwin Williams Company
   3. Tremco Incorporated

## 2.7 JOINT-SEALANT BACKING

A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

## 2.8 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

    a. Concrete.
    b. Masonry.
    c. Unglazed surfaces of ceramic tile.
    d. Exterior insulation and finish systems.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

    a. Metal.
    b. Glass.
    c. Porcelain enamel.
    d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

## 3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

    1. Do not leave gaps between ends of sealant backings.
    2. Do not stretch, twist, puncture, or tear sealant backings.
    3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint profile per Figure 8A in ASTM C1193 unless otherwise indicated.
4. Provide flush joint profile at locations indicated on Drawings according to Figure 8B in ASTM C1193.
5. Provide recessed joint configuration of recess depth and at locations indicated on Drawings according to Figure 8C in ASTM C1193.

a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

## 3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed and cured sealant joints as follows:

a. Perform one (1) test for the first 1000 feet (300 m) of joint length for each kind of sealant and joint substrate.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.

a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

B. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

## 3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

## 3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

## 3.7 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.

1. Joint Locations:

   a. Control and expansion joints in brick pavers.
   b. Isolation and contraction joints in cast-in-place concrete slabs.
   c. Joints between different materials listed above.
   d. Other joints as indicated on Drawings.

2. Joint Sealant: Urethane, M, P, 50, T, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:

   a. Construction joints in cast-in-place concrete..
   b. Control and expansion joints in unit masonry.
   c. Joints between different materials listed above.
   d. Perimeter joints between materials listed above and frames of doors, windows and louvers.
   e. Control and expansion joints in ceilings and other overhead surfaces.
   f. Other joints as indicated on Drawings.

2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.

1. Joint Locations:

   a. Isolation joints in cast-in-place concrete slabs.
   b. Control and expansion joints in tile flooring.
   c. Other joints as indicated on Drawings.

2. Joint Sealant: Urethane, S, P, 25, T, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

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

1. Joint Locations:

   a. Control and expansion joints on exposed interior surfaces of exterior walls.
   b. Vertical joints on exposed surfaces of unit masonry concrete walls and partitions.

c. Other joints as indicated on Drawings.

2. Joint Sealant: Urethane, S, NS, 25, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.

1. Joint Locations:

a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
b. Tile control and expansion joints.
c. FRP trim molding, and as recommended by FRP manufacturer.
d. Other joints as indicated on Drawings.

2. Joint Sealant: Silicone, mildew resistant, S, NS, 25, NT.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

F. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.

1. Joint Locations:

a. Control joints on exposed interior surfaces of exterior walls.
b. Perimeter joints between interior wall surfaces and frames of interior doors windows and similar installation.
c. Other joints as indicated on Drawings.

2. Joint Sealant: Acrylic latex.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

G. Joint-Sealant Application: Concealed mastics.

1. Joint Locations:

a. Aluminum thresholds.
b. Sill plates.
c. Other joints as indicated on Drawings.

2. Joint Sealant: Butyl-rubber based.
3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

**END OF SECTION 079200**

**SECTION 079219 - ACOUSTICAL JOINT SEALANTS**

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes acoustical joint sealants.

1.2 ACTION SUBMITTALS

A. Product Data: For each acoustical joint sealant.

B. Samples: For each kind and color of acoustical joint sealant required.

C. Acoustical-Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.3 INFORMATIONAL SUBMITTALS

A. Product test reports.

1.4 WARRANTY

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

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

B. Special Manufacturer's Warranty: Manufacturer agrees to furnish acoustical joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 ACOUSTICAL JOINT SEALANTS

A. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex acoustical sealant complying with ASTM C834.
1. Manufacturer’s include the following, but are not limited to:
a. CertainTeed Corporation
b. Owens Corning

c. United States Gypsum Corporation (USG)

2. Colors of Exposed Acoustical Joint Sealants: As selected by Architect from manufacturer's full range of colors

B. Primer: Material recommended by acoustical-joint-sealant manufacturer where required for adhesion of sealant to joint substrates.

C. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.

D. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## PART 3 - EXECUTION

### 3.1 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing acoustical joint sealants to comply with joint-sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where recommended by acoustical-joint-sealant manufacturer.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces.

### 3.2 INSTALLATION OF ACOUSTICAL JOINT SEALANTS

A. Comply with acoustical joint-sealant manufacturer's written installation instructions unless more stringent requirements apply.

B. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical joint sealant. Install acoustical joint sealants at both faces of partitions, at perimeters, and through penetrations. Comply with ASTM C919, ASTM C1193, and manufacturer's written recommendations for closing off sound-flanking paths around or through assemblies, including sealing partitions to underside of floor slabs above acoustical ceilings.

C. Acoustical Ceiling Areas: Apply acoustical joint sealant at perimeter edge moldings of acoustical ceiling areas in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

**END OF SECTION 079219**

**SECTION 081113 - HOLLOW METAL DOORS AND FRAMES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes:
1. Interior standard steel doors and frames.
2. Exterior standard steel doors and frames

B. Related Requirements:
1. Section 087100 "Door Hardware" for door hardware for hollow-metal doors.
2. Section 08380 – “Traffic Doors”

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, core descriptions, fire-resistance ratings, temperature-rise ratings, and finishes.

B. Shop Drawings: Include the following:

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

C. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports.

B. Field quality control reports.

1.5 CLOSEOUT SUBMITTALS

A. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

1.6 QUALITY ASSURANCE

A. Fire-Rated Door Inspector Qualifications: Inspector for field quality control inspections of fire-rated door assemblies shall meet the qualifications set forth in NFPA 80, section 5.2.3.1 and the following:

1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following, or equal:
1. Apex Industries, Inc.
2. Ceco Door; ASSA ABLOY.
3. Custom Metal Products.
4. Daybar Industries, Ltd.
5. DCI Hollow Metal.
6. Fleming Door Products Ltd.; Assa Abloy Group Company.
7. JR Metal Frames Manufacturing, Inc.
8. LaForce, Inc.
9. Mesker Door Inc.
10. Metropolitan Door Industries Corp.
11. Michbi Doors Inc.
12. National Custom Hollow Metal Doors & Frames.
13. Pioneer Industries.
14. Premier Products, Inc.
15. Steelcraft; an Allegion brand.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings and temperature-rise limits indicated on Drawings, based on testing at positive pressure according to NFPA 252 or UL 10C.

1. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.
2. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
3. Temperature-Rise Limit: Provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.

B. Thermally Rated Door Assemblies: Provide door assemblies with U-factor of not more than 0.50 deg Btu/F x h x sq. ft. when tested according to ASTM C518.

## 2.3 EXTERIOR STANDARD STEEL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B. At locations indicated in the Door and Frame Schedule.

1. Flush Metal Doors:

   a. Type: As indicated in the Door and Frame Schedule
   b. Thickness: 1-3/4 inches (44.5 mm).
   c. Face: Metallic-coated steel sheet, minimum thickness of 0.042 inch (1.0 mm) with minimum A60 coating.
   d. Edge Construction: Model 2, Seamless.
   e. Edge Bevel: Bevel lock and hinge edges 1/8 inch in 2 inches (3.2 mm in 51 mm).
   f. Top Edge Closures: Close top edges or doors with flush closures of same material as face sheets. Seal joints against water penetration.
   g. Bottom Edges: Closet bottom edges of doors where required for attachment of weather stripping with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.
   h. Core: Manufacturer's standard Vertical steel stiffener.

2. Frames:

   a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A60 coating.
   b. Construction: Full profile welded.

3. Exposed Finish: Prime.

## 2.4 INTERIOR STANDARD STEEL DOORS AND FRAMES

A. Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B. At locations indicated in the Door and Frame Schedule.

1. Paneled Fire Rated Doors:

   a. Type: As indicated in the Door and Frame Schedule
   b. Thickness: 1-3/4 inches (44.5 mm).
   c. Face: Uncoated steel sheet, minimum thickness of 0.042 inch (1.0 mm).
   d. Edge Construction: Model 2, Seamless.
   e. Edge Bevel: Provide manufacturer's standard beveled or square edges.
   f. Core: Manufacturer's standard.
   g. Fire-Rated Core: Manufacturer's standard vertical steel stiffener laminated mineral board core for fire-rated and temperature-rise-rated doors.

2. Frames:

   a. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch (1.3 mm).
   b. Construction: Full profile welded.

3. Exposed Finish: Prime.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches (610 mm) of frame height above 7 feet (2.1 m).
3. Postinstalled Expansion Anchor: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

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

C. Floor Anchors for Concrete Slabs with Underlayment: Adjustable-type anchors with extension clips, allowing not less than 2-inch (51-mm) height adjustment. Terminate bottom of frames at top of underlayment.

D. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.

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

2.6 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

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

D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A153/A153M.

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

F. Mineral-Fiber Insulation: ASTM C665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics.

G. Insulating-Glass Units: ASTM E 2190.

1. Glass: ASTM C 1036, Type 1, Class 1, q3.

a. Tint: Clear.
b. Kind: Fully tempered.

2. Lites: One.
3. Filling: Fill space between glass lites with argon.
4. Low-E Coating: Sputtered on third surface.

## 2.7 FABRICATION

A. Door Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch (19 mm) beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.

B. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.
   1. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
   2. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

      a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
      b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

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

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

D. Glazed Lites: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted hairline joints.

   1. Provide stops and moldings flush with face of door, and with beveled stops unless otherwise indicated.
   2. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames. Provide loose stops and moldings on inside of hollow-metal doors and frames.
   3. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.
   4. Provide stops for installation with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

## 2.8 STEEL FINISHES

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

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

PART 3 - EXECUTION

3.1 PREPARATION

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

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

3.2 INSTALLATION

A. Hollow-Metal Frames: Comply with ANSI/SDI A250.11 and NAAMM-HMMA 840.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.

    a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
    b. Install frames with removable stops located on secure side of opening.

2. Fire-Rated Openings: Install frames according to NFPA 80.
3. Floor Anchors: Secure with postinstalled expansion anchors.

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

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

    a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
    c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

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

1. Non-Fire-Rated Steel Doors: Comply with ANSI/SDI A250.8 and NAAMM-HMMA guide specification indicated.
2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
3. Smoke-Control Doors: Install doors according to NFPA 105.

C. Glazing: Comply with installation requirements in hollow-metal manufacturer's written instructions.

3.3 FIELD QUALITY CONTROL

A. Inspections:

1. Fire-Rated Door Inspections: Inspect each fire-rated door according to NFPA 80, Section 5.2.

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

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

D. Prepare and submit separate inspection report for each fire-rated door assembly indicating compliance with each item listed in NFPA 80 and NFPA 101.

3.4 CLEANING AND TOUCH-UP

A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

B. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

C. Factory-Finish Touchup: Clean abraded areas and repair with same material used for factory finish according to manufacturer's written instructions.

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

**END OF SECTION 081113**

**SECTION 081416 - PANELED WOOD DOORS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Section Includes:

1. Solid-core door with wood-veneer faces.

C. Related Requirements:

1. Section 062023 "Interior Finish Carpentry
2. Section 099123 "Interior Painting" for field finishing doors.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of door. Include details of core and edge construction and trim for openings.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:
1. Undercuts.
2. Fire-protection ratings for fire-rated doors.

C. Samples for Verification:

1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches (200 by 250 mm), for each material and finish**.**

1.3 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For special warranty.

B. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in plastic bags or cardboard cartons.

C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.5 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during remainder of construction period.

1.6 WARRANTY

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

1. Failures include, but are not limited to, the following:

a. Warping (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section.
b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 76.2-mm) span.

2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
3. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers:
1. ABS – American Building Supply
2. Eggers Industries
3. Mohawk Paneled Doors, Inc.
4. Oregon Door
5. Or Equal.

2.2 PANELED WOOD DOORS, GENERAL

A. Quality Standard: In addition to requirements specified, comply with AWI's, AWMAC's, and WI's "Architectural Woodwork Standards.

1. Provide AWI Quality Certification Labels indicating that doors comply with requirements of grades specified.
2. Contract Documents contain selections chosen from options in quality standard and additional requirements beyond those of quality standard. Comply with those selections and requirements in addition to quality standard.

B. WDMA I.S.1-A Performance Grade: Heavy Duty (Restroom) or Standard Duty (Furnace and Electrical).

C. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or [UL 10C.

1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
2. Temperature-Rise Limit: provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
3. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
4. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
5. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.

D. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.

E. Particleboard-Core Doors:

1. Particleboard: ANSI A208.1, Grade LD-1 or Grade LD-2.
2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.

   a. 5-inch (125-mm) top-rail blocking, in doors indicated to have closers.
   b. 5-inch (125-mm) bottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
   c. 5-inch (125-mm) midrail blocking, in doors indicated to have exit devices.

3. Provide doors with glued-wood-stave or structural-composite-lumber cores instead of particleboard cores for doors indicated to receive exit devices.

F. Structural-Composite-Lumber-Core Doors:

1. Structural Composite Lumber: WDMA I.S.10.

   a. Screw Withdrawal, Face: 700 lbf (3100 N).
   b. Screw Withdrawal, Edge: 400 lbf (1780 N).

G. Mineral-Core Doors:

1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
2. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as[needed to eliminate through-bolting hardware.][follows:]

   a. 5-inch (125-mm) top-rail blocking.
   b. 5-inch (125-mm) bottom-rail blocking, in doors indicated to have protection plates.
   c. 5-inch (125-mm) midrail blocking, in doors indicated to have armor plates.

3. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

    a. Screw-Holding Capability: 400 lbf per WDMA T.M.-10.

## 2.3 DOORS FOR OPAQUE FINISH

A. Interior Solid-Core Doors:

1. Grade: Premium.
2. Faces: Any closed-grain hardwood of mill option.
    a. Hardboard Faces: ANSI A135.4, Class 1 (tempered) or Class 2 (standard).
    b. MDF Faces: ANSI A208.2, Grade 150 or Grade 160.
3. Exposed Vertical and Top Edges: Any closed-grain hardwood.
4. Core: Either glued wood stave or structural composite lumber.
5. Construction: Five or seven plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering.

## 2.4 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

1. Comply with NFPA 80 requirements for fire-rated doors.

B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.

1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
2. Metal Astragals: Factory machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.

## 2.5 SHOP PRIMING

A. Doors for Opaque Finish: Shop prime faces, all four edges, edges of cutouts, and mortises with one coat of wood primer.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Examine doors and installed door frames, with Installer present, before hanging doors.

1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.

2. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Hardware: For installation, see Section 087100 "Door Hardware.

B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.

1. Install fire-rated doors according to NFPA 80.
2. Install smoke- and draft-control doors according to NFPA 105.

C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.

1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide1/4 inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.

a. Comply with NFPA 80 for fire-rated doors.
b. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.

2. Bevel fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock edge; trim stiles and rails only to extent permitted by labeling agency.

D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

E. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

**END OF SECTION 081416**

**SECTION 083080 – TRAFFIC DOORS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Include
1. Food Service Doors.
2. Hardware and Accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product, including the following:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations
3. Installation methods.
4. Operation and maintenance data.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data, including head, jamb, and meeting stile details including full or partial gaskets.

C. Samples: Decorative Plastic Laminate Finish: Selected from manufacturer's standard selection.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer’s unopened packaging until ready for installation.

1.5 WARRANTY

A. Manufacturer’s standard two-year warranty that products are free of defects in material and workmanship, guaranteeing to replace parts proven defective within two years after date of shipment to purchaser.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers include, but are not limited to:
1. Eliason Corporation

2. Chase Industries
3. Curtron Products by TMI International, LL

2.2 FOOD SERVICE DOORS

A. Food Service Doors: 1-5/16 inch (33.3 mm) High strength polymer cell core; 1-13/16 inch (46 mm) total thickness; light to medium duty.
   1. Facing: Decorative plastic laminate.
      a. Base Plates: 8 inches (203.2 mm) high 0.09 (2.2 mm) black ABS both sides; black ABS hinge cover back side only.
   2. Window Size: 9 inches (229 mm) wide by 14 inches (356 mm) high.
   3. Window Flush 4. Glazing: Clear acrylic.
   4. Laminate Finish: As selected from manufacturer's standard selection.

2.3 FRAME, HARDWARE, AND ACCESSORIES

A. Frames:
   1. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch.
   2. Construction: Full profile welded.
   3. Anchors: Four total compression anchors, two on each side of frame.
   4. Pre-drilled Holes: For top hardware, bottom hardware, and for fastening frame to the door opening.

B. Hinges: Double action hinges.
   1. Finish: Zinc coated.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.2 INSTALLATION
   1. Install in accordance with manufacturer’s instructions
   2. Minimum jamb construction of double studded 2 by 4 wood construction or equivalent.
   3. Reinforce hollow metal jambs at hardware locations
   4. Steel channel jambs are required for heavy duty traffic doors.

3.3 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair, or replace damaged products before Substantial Completion

**END OF SECTION 08380**

**SECTION 083113 - ACCESS DOORS AND FRAMES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes access doors and frames for walls and ceilings.
   1. Ceilings: flush with concealed flanges (insulated).
   2. Exterior Walls (insulated with keyed lock).
   3. Interior Fire- Rated Walls (fire-rated with keyed lock).

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

   1. Include construction details material descriptions, dimensions of individual components and profiles, and finishes.

B. Samples: For each type of access door and frame and for each finish specified, complete assembly minimum 6 by 6 inches (150 by 150 mm) in size.

C. Product Schedule: For access doors and frames. Use same designations indicated on Drawings.

1.4 CLOSEOUT SUBMITTALS

A. Record Documents: For fire-rated doors, list of applicable room name and number in which access door is located.

PART 2 - PRODUCTS

2.1 ACCESS DOORS AND FRAMES

A. Exterior Insulated Flush Access Doors with Exposed Flanges:

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

      a. Acudor Products, Inc.
      b. Babcock-Davis.
      c. Elmdor/Stoneman Manufacturing Company; a division of Acorn Engineering Company.

d. JL Industries, Inc.; a division of the Activar Construction Products Group.
e. Karp Associates, Inc.
f. Nystrom, Inc.
g. Williams Bros. Corporation of America (The).

2. Description: Weatherproof assembly, with face of door flush with frame, with exposed flange and concealed hinge.Include extruded door gaskets and minimum 2” thick insulation.
3. Locations: Exterior Wall.
4. Opening Size: 4’-8” x 2’-10”. Confirm with Mechanical Engineer for Fan Coil Unit access to crawl space.
5. Uncoated Steel Sheet for Door: Nominal 0.060 inch (1.52 mm), 16 gage, factory primed.
6. Frame Material: Same material, thickness, and finish as door.
7. Latch and Lock: Cam latch, key operated with interior release.

B. Interior Fire-Rated Flush Access Doors with Exposed Flanges:

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

a. Acudor Products, Inc.
b. Babcock-Davis.
c. Elmdor/Stoneman Manufacturing Company; a division of Acorn Engineering Company.
d. JL Industries, Inc.; a division of the Activar Construction Products Group.
e. Karp Associates, Inc.
f. Nystrom, Inc.
g. Williams Bros. Corporation of America (The).

2. Description: Face of door flush with frame, with exposed flange, self-closing door, and concealed hinge.
3. Locations: Wall.
4. Door Size: 24”x 34”
5. Fire-Resistance Rating: Not less than 1 hour.
6. Temperature-Rise Rating: 450 deg at the end of 30 minutes.
7. Uncoated Steel Sheet for Door: Nominal 0.060 inch (1.52 mm), 16 gage, factory primed.
8. Frame Material: Same material, thickness, and finish as door.
9. Latch and Lock: Cam latch, key operated with interior release.

C. Recessed Access Doors with Concealed Flanges:

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

a. Acudor Products, Inc.
b. Babcock-Davis.
c. Elmdor/Stoneman Manufacturing Company; a division of Acorn Engineering Company.
d. JL Industries, Inc.; a division of the Activar Construction Products Group.
e. Karp Associates, Inc.
f. Nystrom, Inc.
g. Williams Bros. Corporation of America (The).

2. Description: Door face recessed 5/8 inch (16 mm) for plaster infill; with concealed flange for plaster installation and concealed hinge.
3. Locations: Ceiling.
4. Door Size: 24”x36” (Verify in Field)
5. Uncoated Steel Sheet for Door: Nominal 0.060 inch (1.52 mm), 16 gage, factory finished.
6. Latch and Lock: Cam latch, key operated.

## 2.2 MATERIALS

A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A879/A879M, with cold-rolled steel sheet substrate complying with ASTM A1008/A1008M, Commercial Steel (CS), exposed.

C. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

D. Aluminum Extrusions: ASTM B221 (ASTM B221M), Alloy 6063.

E. Aluminum Sheet: ASTM B209 (ASTM B209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

F. Frame Anchors: Same material as door face.

G. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A153/A153M or ASTM F2329.

## 2.3 FABRICATION

A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.

B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.

1. For concealed flanges with drywall bead, provide edge trim for gypsum panels securely attached to perimeter of frames.
2. For concealed flanges with plaster bead for full-bed plaster applications, provide zinc-coated expanded-metal lath and exposed casing bead welded to perimeter of frames.

D. Recessed Access Doors: Form face of panel to provide recess for application of applied finish. Reinforce panel as required to prevent buckling. Provide access sleeves for each latch operator and install in holes cut through finish.

1. For recessed doors with plaster infill, provide self-furring expanded-metal lath attached to door panel.

E. Latch and Lock Hardware:

1. Quantity: Furnish number of latches and locks required to hold doors tightly closed.
2. Keys: Furnish two keys per lock and key all locks alike.

F. Aluminum: After fabrication, apply manufacturer's standard protective coating on aluminum that will come in contact with concrete.

2.4 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

1. Factory Primed: Apply manufacturer's standard, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.
2. Factory Finished: Apply manufacturer's standard baked-enamel or powder-coat finish immediately after cleaning and pretreating, with minimum dry-film thickness of 1 mil (0.025 mm) for topcoat.

a. Color: As selected by Architect from full range of industry colors. (Match ceiling color)

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer's written instructions for installing access doors and frames.

3.2 FIELD QUALITY CONTROL

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

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

3.3 ADJUSTING

A. Adjust doors and hardware, after installation, for proper operation.

**END OF SECTION 083113**

**SECTION 085200 – ALUMINUM-CLAD WOOD WINDOWS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes aluminum-clad wood windows.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For aluminum clad wood windows.

C. Samples: For each exposed product and for each color specified, 2 by 4 inches in size.

D. Product Schedule: For aluminum clad wood windows. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each type of wood window, for tests performed by a qualified testing agency.

C. Field quality-control reports.

D. Sample Warranties: For manufacturer's warranties.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An installer acceptable to wood window manufacturer for installation of units required for this Project.

B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

1. Build mockup of typical wall area as directed by Architect.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.

3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace wood windows that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure to meet performance requirements.
b. Structural failures including excessive deflection, water leakage, and air infiltration.
c. Faulty operation of movable sash and hardware.
d. Deterioration of materials and finishes beyond normal weathering.
e. Failure of insulating glass.

2. Warranty Period:

a. Window: 10 years from date of Substantial Completion.
b. Glazing Units: 10 years from date of Substantial Completion.
c. Aluminum-Cladding Finish: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain wood windows from single source from single manufacturer.

2.2 WINDOW PERFORMANCE REQUIREMENTS

A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

1. Window Certification: WDMA certified with label attached to each window.

B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:

1. Minimum Performance Class: LC.
2. Minimum Performance Grade: 50.

C. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.30 Btu/sq. ft. x h x deg F.

D. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.40.

E. Sound Transmission Class (STC): Rated for not less than 26 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413.

F. Outside-Inside Transmission Class (OITC): Rated for not less than 26 OITC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 1332.

G. Windborne-Debris-Impact Resistance: Capable of resisting impact from windborne debris based on testing glazed windows identical to those specified, according to ASTM E 1886 and testing information in ASTM E 1996 and requirements of authorities having jurisdiction.

## 2.3 WOOD ALUMINUM CLAD WINDOWS

A. Aluminum-Clad Wood Windows:

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

   a. Marvin Windows and Doors. – Ultimate Double Hung Clad
   b. Kolbe & Kolbe Millwork Co., Inc.
   c. Pella Corporation. – Reserve Architectural Line

B. Operating Types: Provide the following operating types in locations indicated on Drawings:

1. Double-hung.
2. Operable.

C. Frames and Sashes: Fine-grained wood lumber complying with AAMA/WDMA/CSA 101/I.S.2/A440; kiln dried to a moisture content of not more than 12 percent at time of fabrication; free of visible finger joints, blue stain, knots, pitch pockets, and surface checks larger than 1/32 inch deep by 2 inches wide; water-repellent preservative treated.

1. Exterior Finish: Aluminum-clad wood.

   a. Aluminum Finish: Manufacturer's standard baked-on enamel finish.
   b. Color: As selected by Architect from manufacturer's full range.

2. Interior Finish: Manufacturer's standard factory-prime coat.

   a. Exposed Unfinished Wood Surfaces: Pine.
   b. Color: As selected by Architect from manufacturer's full range.

D. Glass: Clear annealed glass, ASTM C 1036, Type 1, Class 1, q3.

1. Kind: Fully tempered.

E. Insulating-Glass Units: ASTM E 2190.

1. Glass: ASTM C 1036, Type 1, Class 1, q3.

   a. Tint: Clear.
   b. Kind: Fully tempered.

2. Lites: Two.
3. Filling: Fill space between glass lites with argon.
4. Low-E Coating: Sputtered on third surface.

F. Hardware, General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, carbon steel complying with AAMA 907, or other corrosion-resistant material compatible with adjacent materials; designed to smoothly operate, tightly close, and securely lock windows, and sized to accommodate sash weight and dimensions.

1. Exposed Hardware Color and Finish: As selected by Architect from manufacturer's full range.

G. Hung Window Hardware:

1. Counterbalancing Mechanism: Complying with AAMA 902, concealed, of size and capacity to hold sash stationary at any open position.
2. Locks and Latches: Allow unobstructed movement of the sash across adjacent sash in direction indicated and operated from the inside only.
3. Tilt Hardware: Releasing tilt latch allows sash to pivot about horizontal axis to facilitate cleaning exterior surfaces from the interior.

H. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.

I. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.

1. Exposed Fasteners: Do not use exposed fasteners to greatest extent possible. For application of hardware, use fasteners that match finish hardware being fastened.

## 2.4 INSECT SCREENS

A. General: Fabricate insect screens to integrate with window frame. Provide screen for each operable exterior sash. Screen wickets are not permitted.

1. Type and Location: Full, outside for single-hung sashes.

B. Aluminum Frames: Manufacturer's standard aluminum alloy complying with SMA 1004 or SMA 1201. Fabricate frames with mitered or coped joints or corner extrusions, concealed fasteners, and removable PVC spline/anchor concealing edge of frame.

1. Tubular Framing Sections and Cross Braces: Roll formed from aluminum sheet.
2. Finish for Exterior Screens: Matching color and finish of cladding.

C. Aluminum Wire Fabric: 18-by-16 mesh of 0.011-inch diameter, coated aluminum wire.

1. Wire-Fabric Finish: Charcoal gray.

## 2.5 FABRICATION

A. Fabricate wood windows in sizes indicated. Include a complete system for installing and anchoring windows.

B. Glaze wood windows in the factory.

C. Weather strip each operable sash to provide weathertight installation.

D. Mullions: Provide mullions and cover plates, matching window units, complete with anchors for support to structure and installation of window units. Allow for erection tolerances and provide for movement of window units due to thermal expansion and building deflections. Provide mullions and cover plates capable of withstanding design wind loads of window units.

E. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Verify rough opening dimensions, levelness of sill plate, and operational clearances.

C. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure weathertight window installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.

B. Install windows level, plumb, square, true to line, without distortion, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.

### 3.3 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

1. Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.

B. Testing Services: Testing and inspecting of installed windows shall take place as follows:

1. Testing Methodology: Testing of windows for air infiltration and water resistance shall be performed according to AAMA 502.
2. Air-Infiltration Testing:

   a. Test Pressure: That required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance class indicated.
   b. Allowable Air-Leakage Rate: 1.5 times the applicable AAMA/WDMA/CSA 101/I.S.2/A440 rate for product type and performance class rounded down to one decimal place.

3. Water-Resistance Testing:

a. Test Pressure: Two-thirds times test pressure required to determine compliance with AAMA/WDMA/CSA 101/I.S.2/A440 performance grade indicated.
b. Allowable Water Infiltration: No water penetration.

4. Testing Extent: Three windows of each type as selected by Architect and a qualified independent testing and inspecting agency. Windows shall be tested after perimeter sealants have cured.
5. Test Reports: Prepared according to AAMA 502.

C. Windows will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

## 3.4 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.

B. Clean exposed surfaces immediately after installing windows. Remove excess sealants, glazing materials, dirt, and other substances.

1. Keep protective films and coverings in place until final cleaning.

C. Remove and replace sashes if glass has been broken, chipped, cracked, abraded, or damaged during construction period.

D. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written instructions.

**END OF SECTION 085200**

**SECTION 087100 – DOOR HARDWARE**

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 includes commercial door hardware for the following:

1. Swinging doors.
2. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Hollow Metal Doors and Frames”.
2. Division 08 Section “Paneled Wood Doors”.
3. Division 08 Section “Stile and Rail Wood Doors”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards:

1. ANSI/BHMA Certified Product Standards - A156 Series
2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

a. Type, style, function, size, label, hand, and finish of each door hardware item.
b. Manufacturer of each item.
c. Fastenings and other pertinent information.
d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
e. Explanation of abbreviations, symbols, and codes contained in schedule.
f. Mounting locations for door hardware.
g. Door and frame sizes and materials.
h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
b. Complete (risers, point-to-point) access control system block wiring diagrams.
c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

## 1.4 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

D. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

E. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

F. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

G. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

## 1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

## 1.6 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

## 1.7 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:

1. Ten years for mortise locks and latches.
2. Seven years for heavy duty cylindrical (bored) locks and latches.
3. Five years for exit hardware.
4. Twenty five years for manual surface door closer bodies.
5. Two years for electromechanical door hardware.

## 1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

# PART 2 - PRODUCTS

## 2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

## 2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

   a. Two Hinges: For doors with heights up to 60 inches.
   b. Three Hinges: For doors with heights 61 to 90 inches.
   c. Four Hinges: For doors with heights 91 to 120 inches.
   d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

   a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
   b. Sizes from 3’6” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

   a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
   b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:

   a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

5. Manufacturers:

   a. Bommer Industries (BO) - LB Series.
   b. Ives (IV).
   c. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - TA Series.

## 2.3 DOOR OPERATING TRIM

A. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.

4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

5. Manufacturers:

   a. Burns Manufacturing (BU).
   b. Hiawatha, Inc. (HI).
   c. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

## 2.4 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years of experience designing secured master key systems and have on record a published security keying system policy.

B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.

   1. Manufacturers:

      a. Corbin Russwin Hardware (RU).
      b. Sargent Manufacturing (SA).
      c. Schlage (SC).

C. Cylinders: Original manufacturer cylinders complying with the following:

   1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
   2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
   3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
   4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
   5. Keyway: Manufacturer’s Standard.

D. Keying System: Each type of lock and cylinders to be factory keyed.

   1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
   2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
   3. New System: Key locks to a new key system as directed by the Owner.

E. Key Quantity: Provide the following minimum number of keys:

   1. Change Keys per Cylinder: Two (2)
   2. Master Keys (per Master Key Level/Group): Five (5).
   3. Construction Keys (where required): Ten (10).

F. Construction Keying: Provide construction master keyed cylinders.

G. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

H. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.

1. Manufacturers:

a. Lund Equipment (LU).
b. MMF Industries (MM).
c. Telkee (TK).

## 2.5 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

1. Provide status indicators with highly reflective color and wording for “locked/unlocked” or “vacant/occupied” with custom wording options if required. Indicator to be located above the cylinder with the inside thumb-turn not blocking the visibility of the indicator status. Indicator window size to be a minimum of 2.1” x 0.6” with a curved design allowing a 180 degree viewing angle with protective covering to prevent tampering.

2. Manufacturers:

a. Corbin Russwin Hardware (RU) – ML2000 Series.
b. Sargent Manufacturing (SA) – 8200 Series.
c. Schlage (SC) – L9000 Series.

B. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified.

1. Furnish with solid cast levers, standard 2 3/4” backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt.

2. Locks are to be non-handed and fully field reversible.

3. Extended cycle test: Locks to have been cycle tested in ordinance with ANSI/BHMA 156.2 requirements to 2 million cycles.

4. Manufacturers:

a. Corbin Russwin Hardware (RU) – CL3300 Series.
b. Sargent Manufacturing (SA) – 10 Line.
c. Schlage (SC) – ND Series.

## 2.6 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

## 2.7 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.

3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

5. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

   a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
   b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

6. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.

7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.

8. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

9. Rail Sizing: Provide exit device rails factory sized for proper door width application.

10. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

1. Manufacturers:

a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
b. Sargent Manufacturing (SA) - 80 Series.
c. Von Duprin (VD) - 35A/98 XP Series.

## 2.8 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.

2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.

4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.

5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

1. Manufacturers:

a. Corbin Russwin Hardware (RU) - DC6000 Series.
b. LCN Closers (LC) - 4040 Series.
c. Sargent Manufacturing (SA) - 351 Series.
d. Norton Door Controls (NO) - 7500 Series.

## 2.9 SURFACE MOUNTED CLOSER HOLDERS

A. Electromagnetic Door Holders: Certified ANSI A156.15 electromagnetic door holder/releases with a minimum 20 to 40 pounds holding power and single coil construction able to accommodate.12VDC, 24VAC, 24VDC and 120VAC. Coils to be independently wound, employing an integral fuse and armatures to include a positive release button.

1. Manufacturers:

a. Rixson (RF) - 980/990 Series.
b. Sargent Manufacturing (SA) - 1560 Series.

## 2.10 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW). Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.

4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:

a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

6. Manufacturers:

a. Burns Manufacturing (BU).
b. Hiawatha, Inc. (HI).
c. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

2.11 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

a. Burns Manufacturing (BU).
b. Hiawatha, Inc. (HI).
c. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

2.12 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. National Guard Products (NG).

2. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
3. Reese Enterprises, Inc. (RE).

2.13 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.14 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

## 3.4 FIELD QUALITY CONTROL

A. Field Inspection (Punch-Out Report): Reference Division 01 Section "Closeout Procedures". Final inspect installed door hardware and state in report whether work complies with or deviates from specification requirements, including whether door hardware is properly installed, operating and adjusted.

## 3.5 ADJUSTING

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

## 3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

B. The supplier is responsible for handing and sizing all products and providing the correct option for the appropriate door type and material where more than one is presented in the hardware sets. Quantities listed are for each pair of doors, or for each single door.

C. Manufacturer’s Abbreviations:

1. MK - McKinney
2. SA - SARGENT
3. RO - Rockwood
4. OT - Other
5. NO - Norton
6. RF - Rixson
7. PE - Pemko
8. LU - Lund Equipment Co

**Hardware Sets**

**Set: 1.0**
Doors: 010A, 107B, 115A

| | | | | |
|---|---|---|---|---|
| 3 | Hinge (heavy weight) | T4A3386/T4A4386 NRP 4-1/2" x 4-1/2" | US32D | MK |
| 1 | Dormitory/Exit Lock | 8225 LNP | US32D | SA |
| 1 | Surface Closer | CPS7500 | 689 | NO |
| 1 | Threshold | 171A | | PE |
| 1 | Gasketing | 2891AS | | PE |
| 1 | Rain Guard | 346C | | PE |
| 1 | Sweep | 3452AV | | PE |

Notes: LOCK FUNCTION: KEY OUTSIDE OR THUMBTURN INSIDE RETRACTS AND PROJECTS DEADBOLT. TRIM FROM EITHER SIDE RETRACTS LATCHBOLT IN PASSAGE TYPE FUNCTION WHEN DEADBOLT IS NOT PROJECTED. OUTSIDE TRIM IS LOCKED WHEN DEADBOLT IS

PROJECTED. INSIDE LEVER RETRACTS LATCH AND DEADBOLT SIMULTANEOUSLY, COMPLYING WITH ALL ADA REQUIREMENTS.

**Set: 2.0**
Doors: 116A, 117A, 118A
Description: ALTERNATE #1

| | | | | |
|---|---|---|---|---|
| 3 | Hinge (heavy weight) | T4A3386 4-1/2" x 4-1/2" | US32D | MK |
| 1 | Dormitory/Exit Lock w/Indicator | V20 8225 LNP | US32D | SA |
| 1 | Foot Pull | StepNpull | | OT |
| 1 | Surface Closer | 7500 | 689 | NO |
| 1 | Wall Stop | 409 | US32D | RO |
| 1 | Threshold | 171A | | PE |
| 1 | Gasketing | S773D | | PE |
| 1 | Sweep | 315CN | | PE |

**Set: 3.0**
Doors: 119A
Description: ALTERNATE #1

| | | | | |
|---|---|---|---|---|
| 3 | Hinge (heavy weight) | T4A3386 4-1/2" x 4-1/2" | US32D | MK |
| 1 | Storeroom Lock | 8204 LNP | US32D | SA |
| 1 | Surface Closer | 7500 | 689 | NO |
| 1 | Wall Stop | 409 | US32D | RO |
| 1 | Threshold | 171A | | PE |
| 1 | Gasketing | S773D | | PE |
| 1 | Sweep | 315CN | | PE |

**Set: 4.0**
Doors: 103A

| | | | | |
|---|---|---|---|---|
| 3 | Hinge, Full Mortise, Hvy Wt | T4A3786 NRP BT 4-1/2" x 4-1/2" | US3 | MK |
| 1 | Rim Exit Device, Classroom | 8813 ETP | US3 | SA |
| 1 | Surface Closer | CPS7500 | 605 | NO |
| 2 | Kick Plate | K1050 10" x 2' LDW CSK BEV | US3 | RO |
| 1 | Threshold | 171B | | PE |
| 1 | Gasketing | 2891DS | | PE |
| 1 | Rain Guard | 346D | | PE |
| 1 | Sweep | 3452DV | | PE |

Notes: DOOR TO BE RESTORED AND PREPPED TO RECEIVE NEW ADA COMPLIANT HARDWARE.

**Set: 5.0**
Doors: 103E

| | | |
|---|---|---|
| 1 | Hardware By Others | Hardware By Door Supplier |

**Set: 6.0**
Doors: 105B

| | | | | |
|---|---|---|---|---|
| 3 | Hinge, Full Mortise, Hvy Wt | T4A3786 4-1/2" x 4-1/2" | US3 | MK |
| 1 | Dormitory/Exit Lock | 8225 LNP | US3 | SA |
| 1 | Surface Closer | CLP7500R | 605 | NO |
| 1 | Kick Plate | K1050 10" x 2' LDW CSK BEV | US3 | RO |
| 1 | Gasketing | S773BL | | PE |

Notes: LOCK FUNCTION: KEY OUTSIDE OR THUMBTURN INSIDE RETRACTS AND PROJECTS DEADBOLT. TRIM FROM EITHER SIDE RETRACTS LATCHBOLT IN PASSAGE TYPE FUNCTION WHEN DEADBOLT IS NOT PROJECTED. OUTSIDE TRIM IS LOCKED WHEN DEADBOLT IS PROJECTED. INSIDE LEVER RETRACTS LATCH AND DEADBOLT SIMULTANEOUSLY, COMPLYING WITH ALL ADA REQUIREMENTS.

**Set: 7.0**
Doors: 106A

| | | | | |
|---|---|---|---|---|
| 3 | Hinge, Double Acting, Spring | 1001 5" | US3 | MK |
| 2 | Push Plate | 70C-RKW | US3 | RO |
| 2 | Kick Plate | K1050 10" x 2' LDW CSK BEV | US3 | RO |
| 1 | Door Stop & Keeper | 485 | US3 | RO |
| 1 | Door Stop | 483 | US3 | RO |
| 1 | Threshold | 171B | | PE |

**Set: 8.0**
Doors: 107A

| | | | | |
|---|---|---|---|---|
| 3 | Hinge (heavy weight) | T4A3786/T4A4786 4-1/2" x 4-1/2" | US26D | MK |
| 1 | Passage Latch | 10U15 LP | US26D | SA |
| 1 | Surface Closer | PR7500 | 689 | NO |
| 1 | Kick Plate | K1050 10" x 2" LDW 4BE CSK | US32D | RO |
| 1 | Electromagnetic Holder | 998 (tie into fire alarm) | 689 | RF |
| 1 | Gasketing | S773D | | PE |

**Set: 9.0**
Doors: 109A

| | | | | |
|---|---|---|---|---|
| 3 | Hinge (heavy weight) | T4A3786/T4A4786 4-1/2" x 4-1/2" | US26D | MK |
| 1 | Privacy Lock | V20 8265 LNP | US26D | SA |
| 1 | Foot Pull | StepNpull | | OT |
| 1 | Surface Closer | 7500 | 689 | NO |
| 1 | Kick Plate | K1050 10" x 2" LDW 4BE CSK | US32D | RO |
| 1 | Wall Stop | 409 | US32D | RO |
| 1 | Gasketing | S773D | | PE |

**Set: 10.0**
Doors: 113A

| | | | |
|---|---|---|---|
| 3 Hinge (heavy weight) | T4A3786/T4A4786 4-1/2" x 4-1/2" | US26D | MK |
| 1 Passage Latch | 10U15 LP | US26D | SA |
| 1 Surface Closer | 7500 | 689 | NO |
| 2 Kick Plate | K1050 10" x 2" LDW 4BE CSK | US32D | RO |
| 1 Wall Stop | 409 | US32D | RO |
| 3 Silencer | 608 | | RO |

**Set: 11.0**
Doors: 114A

| | | | |
|---|---|---|---|
| 3 Hinge, Full Mortise, Hvy Wt | T4A3786 4-1/2" x 4-1/2" | US3 | MK |
| 1 Privacy Lock | V20 8265 LNP | US3 | SA |
| 1 Foot Pull | StepNpull | | OT |
| 1 Surface Closer | 7500 | 605 | NO |
| 1 Kick Plate | K1050 10" x 2' LDW CSK BEV | US3 | RO |
| 1 Wall Stop | 409 | US3 | RO |
| 1 Gasketing | S773D | | PE |

**Set: 12.0**
Doors: MISC
Description: MISC

| | | |
|---|---|---|
| 1 BITTING LIST | KEY RECORDS | SA |
| 1 KEY BLANKS | BOX OF 50 | SA |
| 1 Key Cabinet | Sized per specification documents | LU |
| 1 Knox Box | Knox Box (coordinate with local fire station for requirements and location) | |

**END OF SECTION 087100**

# SECTION 092116.23 - GYPSUM BOARD SHAFT WALL ASSEMBLIES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. Section includes gypsum board shaft wall assemblies.

### 1.3 ACTION SUBMITTALS

A. Product Data: For each component of gypsum board shaft wall assembly.

B. Perform Pre-Construction Walk-through to discuss fire rating expectations and identify locations. Mark on Shop Drawing submittal for review.

### 1.4 DELIVERY, STORAGE, AND HANDLING

A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and support them on risers on a flat platform to prevent sagging.

### 1.5 FIELD CONDITIONS

A. Environmental Limitations: Comply with gypsum-shaftliner-board manufacturer's written instructions.

B. Do not install finish panels until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, moisture damaged, or mold damaged.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.

B. STC-Rated Assemblies: Provide materials and construction identical to those of assemblies tested according to ASTM E90 and classified according to ASTM E413 by a testing and inspecting agency.

## 2.2 GYPSUM BOARD SHAFT WALL ASSEMBLIES

A. Fire-Resistance Rating: As indicated.

B. STC Rating: As indicated.

C. Gypsum Shaftliner Board:

1. Type X: ASTM C1396/C1396M; manufacturer's proprietary fire-resistive liner panels with paper faces, 1 inch (25.4 mm) thick, with double beveled long edges.

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

1) American Gypsum.
2) Continental Building Products, LLC.
3) National Gypsum Company.
4) USG Corporation.

D. Non-Load-Bearing Steel Framing, General: Complying with ASTM C645 requirements for metal unless otherwise indicated and complying with requirements for fire-resistance-rated assembly indicated.

1. Protective Coating: Coating with equivalent corrosion resistance of ASTM A653/A653M, G40 (Z120) unless otherwise indicated.

E. Studs: Manufacturer's standard profile for repetitive, corner, and end members as follows:

1. Depth: As indicated.
2. Minimum Base-Metal Thickness: As indicated.

F. Runner Tracks: Manufacturer's standard J-profile track with manufacturer's standard long-leg length, but at least 2 inches (51 mm) long and matching studs in depth.

G. Firestop Tracks: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs.

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

a. Fire Trak Corp.
b. Metal-Lite.
c. SCAFCO Steel Stud Company.
d. Steel Construction Systems.

H. Finish Panels: Gypsum board as specified in Section 092900 "Gypsum Board.".

## 2.3 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with shaft wall manufacturer's written instructions.

B. Trim Accessories: Cornerbead, edge trim, and control joints of material and shapes as specified in Section 092900 "Gypsum Board" that comply with gypsum board shaft wall assembly manufacturer's written instructions for application indicated.

C. Steel Drill Screws: ASTM C1002 unless otherwise indicated.

D. Track Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on shaft wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.

1. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E488/E488M conducted by a qualified testing agency.
2. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E1190 conducted by a qualified testing agency.

E. Reinforcing: Galvanized-steel reinforcing strips with 0.033-inch (0.84-mm) minimum thickness of base metal (uncoated).

F. Acoustical Sealant: Section 079219 "Acoustical Joint Sealants."

G. Gypsum Board Cants:

1. Gypsum Board Panels: As specified in Section 092900 "Gypsum Board," Type X, 1/2- or 5/8-inch (13- or 16-mm) panels.
2. Adhesive: Laminating adhesive as specified in Section 092900 "Gypsum Board."
3. Non-Load-Bearing Steel Framing: As specified in Section 092216 "Non-Structural Metal Framing."

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. General: Install gypsum board shaft wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated and manufacturer's written installation instructions.

B. Install supplementary framing in gypsum board shaft wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, wall-mounted door stops, and similar items that cannot be supported directly by shaft wall assembly framing.

C. Penetrations: At penetrations in shaft wall, maintain fire-resistance rating of shaft wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons and floor indicators, and similar items.

D. Isolate perimeter of gypsum panels from building structure to prevent cracking of panels while maintaining continuity of fire-rated construction.

E. Firestop Tracks: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.

F. Control Joints: Install control joints according to ASTM C840 and in specific locations approved by Architect while maintaining fire-resistance rating of gypsum board shaft wall assemblies.

G. Sound-Rated Shaft Wall Assemblies: Seal gypsum board shaft walls with acoustical sealant at perimeter of each assembly where it abuts other work and at joints and penetrations within each assembly.

H. Gypsum Board Cants: At projections into shaft exceeding 4 inches (102 mm), install gypsum board cants covering tops of projections.

1. Slope cant panels at least 75 degrees from horizontal. Set base edge of panels in adhesive and secure top edges to shaft walls at 24 inches (610 mm) o.c. with screws fastened to shaft wall framing.
2. Where non-load-bearing steel framing is required to support gypsum board cants, install framing at 24 inches (610 mm) o.c. and extend studs from the projection to shaft wall framing.

I. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

## 3.2 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, or mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, and irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

**END OF SECTION 092116.23**

**SECTION 092900 - GYPSUM BOARD**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Interior gypsum board.

B. Related Requirements:
1. Section 092116.23 "Gypsum Board Shaft Wall Assemblies" for metal shaft-wall framing, gypsum shaft liners, and other components of shaft-wall assemblies.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each texture finish indicated on same backing indicated for Work.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.3 INTERIOR GYPSUM BOARD

A. Gypsum Wallboard: ASTM C1396/C1396M.

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

    a. American Gypsum.
    b. CertainTeed Corporation.
    c. CertainTeed Gypsum.
    d. Continental Building Products, LLC.
    e. Georgia-Pacific Gypsum LLC.
    f. National Gypsum Company.
    g. PABCO Gypsum.
    h. USG Corporation.
2. Thickness: 1/2 inch (12.7 mm).
3. Long Edges: Tapered.

B. Gypsum Board, Type X: ASTM C1396/C1396M.

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

    a. American Gypsum.
    b. CertainTeed Corporation.
    c. CertainTeed Gypsum.
    d. Continental Building Products, LLC.
    e. Georgia-Pacific Gypsum LLC.
    f. National Gypsum Company.
    g. PABCO Gypsum.
    h. USG Corporation.

2. Thickness: 5/8 inch (15.9 mm).
3. Long Edges: Tapered.

C. Gypsum Ceiling Board: ASTM C1396/C1396M.

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

    a. American Gypsum.
    b. CertainTeed Corporation.
    c. CertainTeed Gypsum.
    d. Continental Building Products, LLC.
    e. Georgia-Pacific Gypsum LLC.
    f. National Gypsum Company.
    g. PABCO Gypsum.
    h. USG Corporation.

2. Thickness: 1/2 inch (12.7 mm).
3. Long Edges: Tapered.

## 2.4 SPECIALTY GYPSUM BOARD

A. Gypsum Board, Type C: ASTM C1396/C1396M. Manufactured to have increased fire-resistive capability.

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

    a. American Gypsum.
    b. CertainTeed Corporation.
    c. CertainTeed Gypsum.
    d. Continental Building Products, LLC.
    e. Georgia-Pacific Gypsum LLC.
    f. National Gypsum Company.
    g. PABCO Gypsum.
    h. USG Corporation.
2. Thickness: As required by fire-resistance-rated assembly indicated on Drawings.
3. Long Edges: Tapered.

B. Mold-And-Moisture-Resistant Gypsum Board: ASTM C1396/C1396M. With moisture- and mold-resistant core and paper surfaces.

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

    a. American Gypsum.
    b. CertainTeed Corporation.
    c. CertainTeed Gypsum.
    d. Continental Building Products, LLC.
    e. Georgia-Pacific Gypsum LLC.
    f. National Gypsum Company.
    g. PABCO Gypsum.
    h. USG Corporation.
2. Core: 5/8 inch, Type X
3. Long Edges: Tapered.
4. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

## 2.5 TRIM ACCESSORIES

A. Interior Trim: ASTM C1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet.
2. Shapes:

    a. Cornerbead.
    b. Bullnose bead.
    c. LC-Bead: J-shaped; exposed long flange receives joint compound.
    d. L-Bead: L-shaped; exposed long flange receives joint compound.
    e. U-Bead: J-shaped; exposed short flange does not receive joint compound.
    f. Expansion (control) joint.
    g. Curved-Edge Cornerbead: With notched or flexible flanges.

B. Exterior Trim: ASTM C1047.

1. Material: Hot-dip galvanized-steel sheet, plastic, or rolled zinc.
2. Shapes:

    a. Cornerbead.

b. LC-Bead: J-shaped; exposed long flange receives joint compound.
c. Expansion (Control) Joint: One-piece, rolled zinc with V-shaped slot and removable strip covering slot opening.

## 2.6 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C475/C475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.
2. Exterior Gypsum Soffit Board: Paper.
3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
4. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping or drying-type, all-purpose compound.

   a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use setting-type, sandable topping or drying-type, all-purpose compound.
4. Finish Coat: For third coat, use setting-type, sandable topping or drying-type, all-purpose compound.

## 2.7 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.

B. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."

# PART 3 - EXECUTION

## 3.1 APPLYING AND FINISHING PANELS

A. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

B. Comply with ASTM C840.

C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

3.2 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Wallboard Type: Vertical surfaces unless otherwise indicated.
2. Type X: As indicated on Drawings and where required for fire-resistance-rated assembly.
3. Mold-And-Moisture Resistant: As indicated on Drawings
4. Ceiling Type: Ceiling surfaces.

3.3 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim per manufacturer's written instructions.

B. Control Joints: Install control joints according to ASTM C840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:
1. Cornerbead: Use at outside corners.
2. Bullnose Bead: Use at outside corners.
3. LC-Bead: Use at exposed panel edges.
4. U-Bead: Use at exposed panel edges.

3.4 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
   a. Primer and its application are specified in Section 099123 "Interior Painting."

3.5 PROTECTION

A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.

B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, and mold damaged.

**END OF SECTION 092900**

**SECTION 093013 – PORCELAIN TILE**

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Porcelain tile.
2. Waterproof membrane for thinset applications.
3. Crack isolation membrane.

B. Scope of Tile work includes:
1. Installation of new tile in Restroom 114.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples:

1. Each type and composition of tile and for each color and finish required.
2. Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each color and finish required.
3. Stone thresholds.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Tile and Trim Units: Furnish quantity of full-size units equal to 10 percent of amount installed for each type, composition, color, pattern, and size indicated.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:
1. Installer employs Ceramic Tile Education Foundation Certified Installers or installers recognized by the U.S. Department of Labor as Journeyman Tile Layers.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockup of each type of floor tile installation.

2. Build mockup of each type of wall tile installation.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide Standard-grade tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

2.2 TILE PRODUCTS

A. Ceramic Tile Type: Glazed wall tile for Restroom 014

1. Available Manufacturers, or approved equal:
   a. American Olean
   b. Daltile
   c. Seneca Tiles
2. Module Size: 12”x24”
3. Thickness: 3/8”
4. Finish: Unpolished
5. Tile Color and Pattern: Match Architect's sample.
6. Grout Color: As selected by Architect from manufacturer's full range.
7. Mounting: Factory, back mounted.
8. Mounting: Pregrouted sheets of tiles are factory assembled and grouted with manufacturer's standard white silicone rubber.
9. Trim Units: Coordinated with sizes and coursing of adjoining flat tile where applicable. Provide shapes as follows, selected from manufacturer's standard shapes:

2.3 THRESHOLDS

A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.

1. Bevel edges at 1:2 slope, with lower edge of bevel aligned with or up to 1/16 inch (1.5 mm) above adjacent floor surface. Finish bevel to match top surface of threshold. Limit height of threshold to 1/2 inch (12.7 mm) or less above adjacent floor surface.

2.4 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9 or ASTM C1325, Type A.

B. Fiber-Cement Backer Board: ASTM C1288.

## 2.5 CRACK ISOLATION MEMBRANE

A. General: Manufacturer's standard product, selected from the following, that complies with ANSI A118.12 for standard performance and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.

B. Chlorinated Polyethylene Sheet: Nonplasticized, chlorinated polyethylene faced on both sides with nonwoven polyester fabric; 0.030-inch (0.76-mm) nominal thickness.

C. PVC Sheet: PVC heat-fused on both sides to facings of nonwoven polyester; 0.040-inch (1-mm) nominal thickness.

D. Polyethylene Sheet: Polyethylene faced on both sides with fleece webbing; 0.008-inch (0.2-mm) nominal thickness.

E. Corrugated Polyethylene: Corrugated polyethylene with dovetail-shaped corrugations and with anchoring webbing on the underside; 3/16-inch (4-mm) nominal thickness.

F. Fabric-Reinforced, Modified-Bituminous Sheet: Self-adhering, modified-bituminous sheet with fabric reinforcement facing; 0.040-inch (1mm) nominal thickness.

G. Fabric-Reinforced, Fluid-Applied Membrane: System consisting of liquid-latex rubber or elastomeric polymer and fabric reinforcement.

H. Fluid-Applied Membrane: Liquid-latex rubber or elastomeric polymer.

I. Latex-Portland Cement Crack-Resistant Mortar: Flexible mortar consisting of cement-based mix and latex additive.

J. Crack Isolation Membrane and Tile-Setting Adhesive: One-part, fluid-applied product intended for use as both a crack isolation membrane and tile-setting adhesive in a two-step process.

## 2.6 SETTING MATERIALS

A. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.02.

B. Standard Dry-Set Mortar (Thinset): ANSI A118.1.
   1. For wall applications, provide nonsagging mortar.

C. Modified Dry-Set Mortar (Thinset): ANSI A118.4.
   1. Provide prepackaged, dry-mortar mix to which only water must be added at Project site.
   2. Provide prepackaged, dry-mortar mix combined with liquid-latex additive at Project site.
   3. For wall applications, provide nonsagging mortar.

D. Improved Modified Dry-Set Mortar (Thinset): ANSI A118.15.
   1. Provide prepackaged, dry-mortar mix to which only water must be added at Project site.
   2. Provide prepackaged, dry-mortar mix combined with liquid-latex additive at Project site.
   3. For wall applications, provide nonsagging mortar.

E. EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar (Thinset): ANSI A118.11.
   1. Provide prepackaged, dry-mortar mix to which only water must be added at Project site.
   2. Provide prepackaged, dry-mortar mix combined with liquid-latex additive at Project site.

F. Water-Cleanable, Tile-Setting Epoxy: ANSI A118.3.

G. Organic Adhesive: ANSI A136.1, Type I.

## 2.7 GROUT MATERIALS

A. Sand-Portland Cement Grout: ANSI A108.10, consisting of white or gray cement and white or colored aggregate as required to produce color indicated.

B. Standard Cement Grout: ANSI A118.6.
   1. Ardex Americas
   2. Bonsai American
   3. C-Cure
   4. Laticrete Supercap
   5. Mapei Corporation

C. High-Performance Tile Grout: ANSI A118.7.
   1. Ardex Americas
   2. Bonsai American
   3. C-Cure
   4. Laticrete Supercap
   5. Mapei Corporation
   6. Polymer Type: Dry, redispersible form, prepackaged with other dry ingredients.
   7. Polymer Type: Liquid-latex form for addition to prepackaged dry-grout mix.

D. Grout for Pregrouted Tile Sheets: Same product used in factory to pregrout tile sheets.

## 2.8 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

B. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications; stainless-steel, ASTM A666, 300 Series exposed-edge material.

C. Floor Sealer: Manufacturer's standard product for sealing grout joints and that does not change color or appearance of grout.
   1. Bonsai American
   2. JamoLaticrete Supercap
   3. Mapei Corporation

# PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

   1. Verify that substrates for setting tile are firm; dry; clean; free of coatings that are incompatible with tile-setting materials, including curing compounds and other

substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.

2. Verify that concrete substrates for tile floors installed with adhesives bonded mortar bed or thinset mortar comply with surface finish requirements in ANSI A108.01 for installations indicated.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 PREPARATION

A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

B. Where indicated, prepare substrates to receive waterproofing by applying a reinforced mortar bed that complies with ANSI A108.1A and is sloped 1/4 inch per foot (1:50) toward drains.

C. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

## 3.3 CERAMIC TILE INSTALLATION

A. Comply with TCNA's "Handbook for Ceramic, Glass, and Stone Tile Installation" for TCNA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.

1. For the following installations, follow procedures in the ANSI A108 series of tile installation standards for providing 95 percent mortar coverage:

a. Tile floors in wet areas.

B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

D. Provide manufacturer's standard trim shapes where necessary to eliminate exposed tile edges.

E. Where accent tile differs in thickness from field tile, vary setting bed thickness so that tiles are flush.

F. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the

use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.

G. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
   1. Pressed Floor Tile: 1/4 inch (6.4 mm).
   2. Glazed Wall Tile: 1/16 inch (1.6 mm).
   3. Porcelain Tile: 1/4 inch (6.4 mm).

H. Expansion Joints: Provide expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated. Form joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

   1. Where joints occur in concrete substrates, locate joints in tile surfaces directly above them.

I. Metal Edge Strips: Install where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with or below top of tile and no threshold is indicated.

J. Floor Sealer: Apply floor sealer to cementitious grout joints in tile floors according to floor-sealer manufacturer's written instructions. As soon as floor sealer has penetrated grout joints, remove excess sealer and sealer from tile faces by wiping with soft cloth.

K. Install tile backing panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.

L. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness that is bonded securely to substrate.

M. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness that is bonded securely to substrate.

## 3.4 INTERIOR CERAMIC TILE INSTALLATION SCHEDULE

A. Interior Floor Installations, Concrete Subfloor:

   1. Ceramic Tile Installation: TCNA F111 and ANSI A108.1A; .

      a. Ceramic Tile Type: CT-1
      b. Bond Coat for Cured-Bed Method: Improved modified dry-set mortar.
      c. Grout: High-performance unsanded grout.

B. Interior Floor Installations, Wood Subfloor:

C. ANSI A108.1A is wet-set method, ANSI A108.1B is cured-bed method, and ANSI A108.1C allows Contractor choice of using either method.

**END OF SECTION 093013**

# SECTION 095113 - ACOUSTICAL PANEL CEILINGS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

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

### 1.2 SUMMARY

A. Section includes acoustical panels and exposed suspension systems for interior ceilings.

### 1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

### 1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified, 6 inches (150 mm) in size.

### 1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, and coordinated with each other, using input from installers of the items involved.

B. Product test reports.

C. Research reports.

D. Field quality-control reports.

### 1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For finishes to include in maintenance manuals.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

A. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: Class A according to ASTM E1264.
2. Smoke-Developed Index: 50 or less.

B. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL or from the listings of another qualified testing agency.

## 2.2 ACOUSTICAL PANELS

A. Acceptable Manufacturers include, but are not limited to:
1. Armstrong World Industries, Inc.
2. Certainteed
3. USG Corporation

B. Acoustical Panel Standard: Provide manufacturer's standard panels according to ASTM E1264 and designated by type, form, pattern, acoustical rating, and light reflectance unless otherwise indicated.

C. Surface Texture: Smooth

D. Composition: Mineral Fiber

E. Color: As selected from manufacturer's full range

F. Ceiling Attenuation Class (CAC): ASTM C1414; Classified with UL label on product carton 35.

G. Noise Reduction Coefficient (NRC): Not less than 0.50.

H. Edge/Joint Detail: Square Lay-In 15/16.

I. Thickness: 5/8 inch

J. Modular Size: 24 by 48 inches

K. Antimicrobial Treatment: Manufacturer's standard broad spectrum, antimicrobial formulation that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria and showing no mold, mildew, or bacterial growth when tested according to ASTM D3273, ASTM D3274, or ASTM G21 and evaluated according to ASTM D3274 or ASTM G21.

## 2.3 METAL SUSPENSION SYSTEM

A. Acceptable Manufacturers include, but are not limited to:
1. Armstrong World Industries, Inc.
2. Certainteed
3. USG Corporation

B. Metal Suspension-System Standard: Provide manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C635/C635M and designated by type, structural classification, and finish indicated.

1. High-Humidity Finish: Provide coating tested and classified for "severe environment performance" according to ASTM C635/C635M.

C. Wide-Face, Capped, Double-Web,Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized, G30 (Z90) coating designation; with prefinished 15/16-inch- (24-mm-) wide metal caps on flanges.

1. Structural Classification: Intermediate duty system..
2. Face Design: Flat, flush.

2.4 ACCESSORIES

A. Wire Hangers, Braces, and Ties: Provide wires as follows:

1. Zinc-Coated, Carbon-Steel Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper.
2. Stainless-Steel Wire: ASTM A580/A580M, Type 304, nonmagnetic.
3. Nickel-Copper-Alloy Wire: ASTM B164, nickel-copper-alloy UNS No. N04400.
4. Size: Wire diameter sufficient for its stress at three times hanger design load (ASTM C635/C635M, Table 1, "Direct Hung") will be less than yield stress of wire, but not less than 0.106-inch diameter wire.

B. Hanger Rods: Mild steel, zinc coated or protected with rust-inhibitive paint.

C. Flat Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.

D. Angle Hangers: Angles with legs not less than 7/8 inch (22 mm) wide; formed with 0.04-inch- (1-mm-) thick, galvanized-steel sheet complying with ASTM A653/A653M, G90 (Z275) coating designation; with bolted connections and 5/16-inch- (8-mm-) diameter bolts.

E. Hold-Down Clips: Manufacturer's standard hold-down.

F. Impact Clips: Manufacturer's standard impact-clip system designed to absorb impact forces against acoustical panels.

G. Seismic Clips: Manufacturer's standard seismic clips designed to secure acoustical panels in place during a seismic event.

H. Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.

I. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.

J. Clean-Room Gasket System: Where indicated, provide manufacturer's standard system, including antimicrobial gasket and related adhesives, tapes, seals, and retention clips, designed to seal out foreign material from and maintain positive pressure in clean room.

PART 3 - EXECUTION

3.1 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated, and comply with layout shown on reflected ceiling plans.

B. Layout openings for penetrations centered on the penetrating items.

3.2 INSTALLATION

A. Install acoustical panel ceilings according to ASTM C636/C636M and manufacturer's written instructions.

1. Fire-Rated Assembly: Install fire-rated ceiling systems according to tested fire-rated design.

B. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
2. Do not use exposed fasteners, including pop rivets, on moldings and trim.

C. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

D. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide precise fit.

1. Arrange directionally patterned acoustical panels as follows:

a. As indicated on reflected ceiling plans.
b. Install panels with pattern running in one direction parallel to [long] [short] axis of space.
c. Install panels in a basket-weave pattern.

2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension-system runners and moldings.
3. For reveal-edged panels on suspension-system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
4. For reveal-edged panels on suspension-system members with box-shaped flanges, install panels with reveal surfaces in firm contact with suspension-system surfaces and panel faces flush with bottom face of runners.
5. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
6. Install hold-down clips in areas indicated; space according to panel manufacturer's written instructions unless otherwise indicated.

a. Hold-Down Clips: Space 24 inches o.c. on all cross runners.

7. Install clean-room gasket system in areas indicated, sealing each panel and fixture as recommended by panel manufacturer's written instructions.
8. Protect lighting fixtures and air ducts according to requirements indicated for fire-resistance-rated assembly.

## 3.3 FIELD QUALITY CONTROL

A. Perform the following tests and inspections of completed installations of acoustical panel ceiling hangers and anchors and fasteners in successive stages and when installation of ceiling suspension systems on each floor has reached 20 percent completion, but no panels have been installed. Do not proceed with installations of acoustical panel ceiling hangers for the next area until test results for previously completed installations of acoustical panel ceiling hangers show compliance with requirements.

1. Within each test area, testing agency will select one of every 10 power-actuated fasteners and postinstalled anchors used to attach hangers to concrete and will test them for 200 lbf (890 N) of tension; it will also select one of every two postinstalled anchors used to attach bracing wires to concrete and will test them for 440 lbf (1957 N) of tension.
2. When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those anchors not previously tested until 20 pass consecutively and then will resume initial testing frequency.

B. Acoustical panel ceiling hangers, anchors, and fasteners will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.

## 3.4 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage.

B. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

**END OF SECTION 095113**

**SECTION 096400 - WOOD FLOORING**

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Field-finished wood flooring.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each type of floor assembly and accessory.

C. Samples: For each exposed product and for each color and texture specified.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

1. Certification: Provide flooring that carries NWFA grade stamp on each bundle or piece.

B. Maple Flooring: Comply with applicable MFMA grading rules for species, grade, and cut.

1. Certification: Provide flooring that carries MFMA mark on each bundle or piece.

2.2 FIELD-FINISHED WOOD FLOORING

A. Solid-Wood Flooring: Kiln dried to 6 to 9 percent maximum moisture content; tongue and groove and end matched; with backs channeled.

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

a. Aacer Flooring, LLC.
b. Carlisle Wide Plank Floors.
c. EcoTimber.
d. Kentucky Wood Floors.
e. Miller and Company, Inc.
f. Oregon Lumber Company.
g. WD Flooring, LLC.
h. Yesteryear Floorworks Company.

2. Grade and Species: MFMA-RL First Grade hard maple.
3. Thickness: 3/4 inch (19 mm).
4. Face Width: 3-1/4

5. Lengths: No lengths shorter than 36-inches. Random lengths required up to 8 feet in length.

B. Urethane Finish System: Complete water-based system of compatible components that is recommended by finish manufacturer for application indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by the following, or equal:
   a. Basic Coatings, Inc.
   b. BonaKemi USA Inc.Dura Seal
   c. Hillyard, Inc.
   d. MAPEI Corporation
   e. PoloPlaz Coatings

2. Stain: Penetrating and nonfading type.

   a. Color: to be selected from manufacturer full range.

3. Floor Sealer: Pliable, penetrating type. Satin finish.
4. Finish Coats: Formulated for multicoat application on wood flooring.

C. Wood Filler: Compatible with finish system components and recommended by filler and finish manufacturers for use indicated. I

2.3 ACCESSORY MATERIALS

A. Wood Underlayment: Per Drawings.

B. Asphalt-Saturated Felt: ASTM D4869/D4869M, Type II.

C. Trowelable Leveling and Patching Compound: Latex-modified, hydraulic-cement-based formulation approved by wood flooring manufacturer.

D. Fasteners: As recommended by manufacturer, but not less than that recommended in NWFA's "Installation Guidelines."

E. Thresholds and Saddles: To match wood flooring. Tapered on each side.

F. Reducer Strips: To match wood flooring. 2 inches (51 mm) wide, tapered, and in thickness required to match height of flooring.
G. Cork Expansion Strip: Composition cork strip.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with flooring manufacturer's written installation instructions, but not less than applicable recommendations in NWFA's "Installation Guidelines.

B. Wood Underlayment: Per Drawings. Ensure underlayment is sound and free of movement.

C. Provide expansion space at walls and other obstructions and terminations of flooring of not less than 3/4 inch (19 mm).

D. Solid-Wood Flooring: Blind nail or staple flooring to substrate.

1. Plank Flooring: For flooring of face width more than 3 inches (76 mm):

a. Hardwood: Install countersunk screws at each end of each piece in addition to blind nailing. Cover screw heads with wood plugs glued flush with flooring.
b. Softwood: Install no fewer than two countersunk nails at each end of each piece, spaced not more than 16 inches (406 mm) along length of each piece, in addition to blind nailing. Fill holes with matching wood filler.

## 3.2 FIELD FINISHING

A. Machine-sand flooring to remove offsets, ridges, cups, and sanding-machine marks that are noticeable after finishing. Vacuum and tack with a clean cloth immediately before applying finish.
1. Comply with applicable recommendations in NWFA's "Installation Guidelines."
2. Utilize ‘dustless’ sanding system.
3. Provide temporary enclosures to prohibit sanding dust from entering adjacent spaces.

B. Fill open-grained hardwood.

C. Fill and repair wood flooring defects.

D. Apply floor-finish materials in number of coats recommended by finish manufacturer for application indicated, but not less than one coat of floor sealer and three finish coats.

1. Apply stains to achieve an even color distribution matching approved Samples.
2. For water-based finishes, use finishing methods recommended by finish manufacturer to minimize grain raise.

E. Cover wood flooring before finishing.

F. Do not cover wood flooring after finishing until finish reaches full cure, and not before seven days after applying last finish coat.

## 3.3 PROTECTION

A. Protect installed wood flooring during remainder of construction period with covering of heavy kraft paper or other suitable material. Do not use plastic sheet or film that might cause condensation.

1. Do not move heavy and sharp objects directly over kraft-paper-covered wood flooring. Protect flooring with plywood or hardboard panels to prevent damage from storing or moving objects over flooring.

**END OF SECTION 096400**

**SECTION 09672 SEAMLESS EPOXY QUARTZ AND MARBLE-CHIP FLOORING**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Seamless resinous flooring. This is a troweled flooring system, broadcast or combination system not permitted.
2. Coved seamless wall base.

1.3 QUALITY ASSURANCE

A. All materials must be recommended and manufactured by a single supplier to insure compatibility and proper chemical and mechanical bond.

B. Surfacing shall be applied by a surfacing applicator approved by the Architect, with a minimum of seven (7) years experience installing the brand of surfacing in similar size and function projects. A list of ten (10) completed projects using the specified materials must be submitted proving seven (7) years experience by the lead mechanic.

C. Surfacing applicator shall provide to the architect a completed list of jobs including the names of the Architect, General Contractor, Owner, telephone numbers of all concerned, materials used, quantity installed and date completed on similar projects.

D. Surfacing applicator must provide a written guarantee for materials and workmanship between applicator and surfacing manufacturer for one (1) year.

E. Surfacing applicator or manufacturer seeking approval of products other than what is specified must supply samples, full product information, technical data with specifications, certification from an independent testing laboratory that the product being submitted for approval meets all requirements of the performance properties specified within this specification, installation instructions and comply with the above quality assurances in writing fourteen (14) days before bid letting. Omission of any item will result in an automatic rejection.

F. Bidders will be notified by addendum of substitute surfacing materials, if approved.

1.4 SUBMITTALS

A. Selection Samples: Surfacing applicator shall submit samples of color and textures for Architect's approval. For each finish product specified, submit two samples 4 by 4 inches (102 mm by 102 mm) in size illustrating color, chip size and variation, and matrix color.

B. Prior to commencing work, at architect’s discretion, applicator shall install a 100 square foot sample on the job of desired color and texture and when approved, this will serve as the standard for the entire project.

1.5 PRODUCT STORAGE AND ENVIRONMENTAL CONDITIONS

A. Material temperatures shall be a minimum of 55°F before use.

B. Work on seamless flooring shall not commence until the building can be maintained at a minimum temperature of 55°F for 48 hours before, during and 48 hours after application. Areas shall also be broom clean and reasonably dust free and shall have adequately controlled ventilation with bright, uniform lighting.

1.6 PROJECT CONDITIONS

A. Before commencing work, ensure environmental and site conditions are suitable for application and curing.

B. Surfaces shall be acceptable in accordance with flooring manufacturer's recommendations.

C. Notify Architect and Contractor in writing of unsuitable surfaces and conditions. Commencement of work shall imply acceptance of surfaces and working conditions.

D. Recommended Moisture Vapor Transmission Considerations:
1. Placement of on-grade slabs over a Class A vapor retarder as defined by ASTM E-145.
2. A water cement ratio of 0.45 and 0.5.
3. Curing by ASTM C-171 sheet materials for curing concrete.
4. A slump in the range of 3 to 4 inches which can be increased by the use of super plasticizers.

E. Substrate requirements (See Appendix A).

1.7 PROTECTION

A. Protect adjacent surfaces from damage resulting from work of this trade. If necessary, mask and/or cover adjacent surfaces, fixtures, cabinet work, equipment, etc. by suitable means.

1.8 WARRANTY

A. Applicator shall notify manufacturer of project requirements before bidding. An officer of the manufacturing company shall provide written statement before bidding; to the Architect, that they accept single source warranty for entire installation including labor for one year. By agreeing to sign warranty and supply product, manufacturer waives all rights of sellers' liability of warranty and limitation. Warranty shall include removal and replacement if proven defective. Defective items are, but not limited to debonding, regionalized discoloration, excessive wear and staining by bodily fluids. Non-acceptance of above by manufacturer is grounds for rejection of product.

**PART 2 - PRODUCTS**

2.1 MANUFACTURERS

A. Acceptable Manufacturers:

a) Desco Coatings, Inc. 1-800-426-4164.
b) Dur-A-Flex, Inc. 1-877-251-5418
c) Everlast Epoxy Systems, Inc. 1-800-708-9870

2.2 MATERIALS

A. Seamless Floor Covering where called for on the drawings.

C Provide 4" high turned up coved base with 1" radius cove as indicated on drawings. (OPTIONAL)

D Provide elastomeric waterproof membrane. (OPTIONAL)

E. Binder and all successive grout and top coats shall be 100% solids clear/epoxy resin. Ceramic coated quartz aggregates as supplied by approved manufacturer are to be used to achieve all color. No pigmented epoxy base or top coats allowed.

F Minimum Performance Characteristics:

| | | |
|---|---|---|
| 1. | Compressive Strength (ASTM C-579) | 10,000 psi |
| 2. | Tensile Strength (ASTM C-307) | 2,250 psi |
| 3. | Flexural Strength | 4,000 psi |
| 4. | Shore D Hardness (ASTM D-2240) | 85-90 |
| 5. | Bond Strength (ASTM D-4541) | 425 psi |
| 6. | Abrasion Resistance (ASTM D-4060) | 0.08 gm |
| 7. | Pot Life | 35 min |
| 8. | Cure Time @ 77˚ F | 10-12 hours |

Epoxy top coats shall produce no color shift after exposure to fluorescent lighting on the “b” axis yellow index after 3 weeks exposure.

| | | |
|---|---|---|
| 20% Hydrochloric Acid | | 10% Lactic Acid |
| Urine | | Tea |
| Coffee | | Mustard |
| Ethyl Alcohol | Mercurochrome | |
| | | Betadyne |

**PART 3 – EXECUTION**

3.1 TESTING OF CONCRETE SUBSTRATE

One of the following three methods shall be used to determine moisture content of slab at time of application. These test only measure the specific area tested at the time of the test and are not predictors of future substrate conditions.

A. Using a concrete moisture detection device, firmly apply the test apparatus to concrete that has had sealers or other subsequent coatings removed. The readings shall be 4.2% or less. If readings are higher, use ASTM F-2170 for non conditional spaces and/or ASTM F1869 for conditioned spaces.

B. ASTM F-2170 in site Relative Humidity Test. Follow test procedures of manufacturer of testing equipment. Reading should be below 80%. If above 80%, use the next test method below. (Only if space is conditioned.)

C. ASTM F-1869 Calcium Chloride Moisture Vapor Transmission Test. Follow test procedures of manufacturers of MVT kits. Results should be below 3 to 4 lbs/1,000 square feet/24 hours.

3.2 FLOORING PREPARATION

A. Surface must be clean, sound and dry.

B. Effectively remove concrete laitance on accessible floor surfaces by mechanical shot blast. Acid etching is not acceptable.

C. Areas where flooring is existing must be cleaned to remove all floor material, grease or any residue that might retard interfacial adhesion between substrate and surfacing.

3.3 FLOORING APPLICATION

A. Apply flooring in accordance with manufacturer's printed instructions, employing lead mechanic qualified under the quality assurance portion of this specification, using equipment specifically designed for this purpose.

B. Thickness
Hand troweled grade 11 aggregate with 20% of grade 28 as a filler. The system should be hand troweled to 3/16” thickness over epoxy primer.

C. Install integral cove base to height of 4" with 1" radius cove as designated in the finish schedule.

1. Trowel apply vertical cove base.
2. Hand sand cove base.
3. Apply three coats of resin to assure a smooth surface and cove.
4. Do not allow resin to puddle in cove.

D. Install OPTIONAL waterproof membrane to a dry mil thickness of 20 mils. (OPTIONAL as designated in the finish schedule.)

E. Finished work shall match approved samples; be uniform in thickness, sheen, color, pattern, and texture; and be free from defects detrimental to performance.

3.8 PROTECTION

A. After completion of flooring the General Contractor/Owner shall protect flooring from damage by other trades.

## APPENDIX A

## GENERAL SUBFLOOR REQUIREMENTS

### CONTROL JOINTS -- Section 03250

1. Install control and expansion joints in accordance with standard practice per ACI-501.

2. The floor contractor may fill non-moving control joint(s) with approved elastomeric sealant or full depth semi-rigid two-component epoxy joint filler, designed specifically for this purpose (use full depth joint filler when reinforcement of the joint edges is desirable), or two-component epoxy and filler (epoxy to be same material as flooring). Movement may crack surfacing unless proper detailing has been done.

3. Filling of moving isolation joints or expansion joints is not recommended.

4. Filling of non-moving isolation joints with elastomeric caulking and sealants or with a semi-rigid epoxy joint filler or two-component epoxy and filler is acceptable. Movement may crack surfacing unless proper detailing has been done.

5. Joint identified by owner/designer or general contractor as moving joints shall be treated by terminating flooring on each side of joint. After flooring is completed, joint shall then be filled by sealant contractor.

### BACKING FOR COVE BASE

Surface to receive cove and/or base shall be strong, durable and dry. Suitable backings include; concrete, cement plaster, standard light-weight block, clay, sand-lime, cement bricks and drywall with a toe plate. Masonry surface(s) to be free of voids, irregularities and recessed joints (if present, fill with recommended epoxy plaster).

**END OF SECTION 09672-4**

**SECTION 09 7720 – FIBERGLASS REINFORCED WALL PANELS**

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Prefinished polyester glass reinforced plastic sheets and adhered to unfinished mold-and moisture resistant gypsum wallboard.
   1. PVC trim.

B. Products Not Furnished or Installed under This Section:
   1. Mold-and-Moisture Resistant Gypsum Board
   2. Seamless Epoxy Quartz and Marble-Chip Flooring and integral base.

1.2 RELATED SECTIONS

A. Section 092900 – Gypsum Board.

B. Section 099123- Interior Painting

C. Section 096720 – Seamless Epoxy Quartz and Marble-Chip Flooring

1.3 REFERENCES

A. American Society for Testing and Materials: Standard Specifications (ASTM)
   1. ASTM D 256 - Izod Impact Strengths (ft #/in)
   2. ASTM D 570 - Water Absorption (%)
   3. ASTM D 638 - Tensile Strengths (psi) & Tensile Modulus (psi)
   4. ASTM D 790 - Flexural Strengths (psi) & Flexural Modulus (psi)
   5. ASTM D 2583- Barcol Hardness
   6. ASTM D 5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels.
   7. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.4 SUBMITTALS

A. Product Data: Submit sufficient manufacturer's data to indicate compliance with these specifications, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

B. Shop Drawings: Submit elevations of each wall showing location of paneling and trim members with respect to all discontinuities in the wall elevation.

C. Selection Samples: Submit manufacturer’s standard color pattern selection samples representing manufacturer's full range of available colors and patterns.

D. Samples for Verification: Submit appropriate section of panel for each finish selected indicating the color, texture, and pattern required.
   1. Submit complete with specified applied finish.
   2. For selected patterns show complete pattern repeat.
   3. Exposed Molding and Trim: Provide samples of each type, finish, and color.

E. Manufacturers Material Safety Data Sheets (MSDS) for adhesives, sealants and other pertinent materials prior to their delivery to the site

## 1.5 QUALITY ASSURANCE

A. Conform to building code requirements for interior finish for smoke and flame spread requirements as tested in accordance with:
   1. ASTM E 84 (Method of test for surface burning characteristics of building Materials)
      a. Wall Required Rating – Class [A] [C].

B. Sanitary Standards: System components and finishes to comply with:
   1. United States Department of Agriculture (USDA) requirements for food preparation facilities, incidental contact.
   2. Food and Drug Administration (FDA) 1999 Food Code 6-101.11.
   3. Canadian Food Inspection Agency (CFIA) requirements.

## 1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials factory packaged on strong pallets.

B. Store panels and trim lying flat, under cover and protected from the elements. Allow panels to acclimate to room temperature (70°) for 48 hours prior to installation.

## 1.7 PROJECT CONDITIONS

A. Environmental Limitations: Building are to be fully enclosed prior to installation with sufficient heat (70°) and ventilation consistent with good working conditions for finish work

B. During installation and for not less than 48 hours before, maintain an ambient temperature and relative humidity within limits required by type of adhesive used and recommendation of adhesive manufacturer.
   1. Provide ventilation to disperse fumes during application of adhesive as recommended by the adhesive manufacturer.

## 1.8 WARRANTY

A. Furnish one year guarantee against defects in material and workmanship.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Marlite; 202 Harger Street, Dover, OH 44622. 800-377-1221 FAX (330) 343-4668 Email: info@marlite.com www.marlite.com.
B. Crane Composites
C. Nudo: 1500 Taylor Avenue, Springfield, Illinois 62703

2.2 PANELS

A. Fiberglass reinforced thermosetting polyester resin panel sheets complying with ASTM D 5319.
   1. Coating: Multi-layer print, primer and finish coats or applied over-layer.
   2. Dimensions:
      a. Thickness – 0.090 “ (2.29mm) nominal
      b. Width - 4'-0” (1.22m) nominal
      c. Length – As indicated on the drawings
   3. Tolerance:
      a. Length and Width: +/-1/8 “ (3.175mm)
      b. Square - Not to exceed 1/8 “ for 8 foot (2.4m) panels or 5/32 “ (3.96mm) for 10 foot (2.4m) panels

B. Properties: Resistant to rot, corrosion, staining, denting, peeling, and splintering.
   1. Flexural Strength - 1.0 x $10^4$ psi per ASTM D 790. (7.0 kilogram-force/square millimeter)
   2. Flexural Modulus - 3.1 x $10^5$ psi per ASTM D 790. (217.9 kilogram-force/square millimeter)
   3. Tensile Strength - 7.0 x $10^3$ psi per ASTM D 638. (4.9 kilogram-force/square millimeter)
   4. Tensile Modulus - 1.6 x $10^5$ psi per ASTM D 638. (112.5 kilogram-force/square millimeter)
   5. Water Absorption - 0.72% per ASTM D 570.
   6. Barcol Hardness (scratch resistance) of 35 55 as per ASTM D 2583.
   7. Izod Impact Strength of 72 ft. lbs./in ASTM D 256

C. Back Surface: Smooth. Imperfections which do not affect functional properties are not cause for rejection.

D. Front Finish: In accordance with preapproved sample.
   a. Color: Architect to select from standard FRP colors
   b. Surface Architect to select from standard FRP texture.

PART 3 - EXECUTION

3.1 PREPARATION

A. Examine backup surfaces to determine that corners are plumb and straight, surfaces are smooth, uniform, clean and free from foreign matter, nails countersunk, joints and cracks filled flush and smooth with the adjoining surface.
   1. Verify that stud spacing does not exceed 24” (61cm) on-center.

B. Repair defects prior to installation.

1. Level wall surfaces to panel manufacturer's requirements. Remove protrusions and fill indentations.

## 3.2 INSTALLATION

A. Comply with manufacturer's recommended procedures and installation sequence.

B. Cut sheets to meet supports allowing 1/8" (3 mm) clearance for every 8 foot (2.4m) of panel.
   1. Cut and drill with carbide tipped saw blades or drill bits,or cut with shears.
   2. Pre-drill fastener holes 1/8" (3mm) oversize with high speed drill bit.
      a. Space at 8" (200mm) maximum on center at perimeter, approximately 1" from panel edge.
      b. Space at in field in rows 16' (40.64cm) on center, with fasteners spaced at 12" (30.48 cm) maximum on center.

C. Apply panels to board substrate, above base, vertically oriented with seams plumb and pattern aligned with adjoining panels.
   1. Install panels with manufacturer's recommended gap for panel field and corner joints.
      a. Adhesive trowel and application method to conform to adhesive manufacturer's recommendations.
      b. Drive fasteners for snug fit. Do not over-tighten.

D. Apply panel moldings to all panel edges using silicone sealant providing for required clearances.
   1. All moldings must provide for a minimum 1/8 " (3mm) of panel expansion at joints and edges, to insure proper installation.
   2. Apply sealant to all moldings, channels and joints between the system and different materials to assure watertight installation.

## 3.3 CLEANING

A. Remove excess sealant from panels and moldings. Wipe panel down using a damp cloth and mild soap solution or cleaner.

B. Refer to manufacturer's specific cleaning recommendations Do not use abrasive cleaners.

**END OF SECTION 09 7720**

**SECTION 099113 - EXTERIOR PAINTING**

PART 1 - GENERAL

1.1 SUMMARY

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

1.2 DEFINITIONS

A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D523.
B. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.
C. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D523.
D. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D523.
E. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D523.
F. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D523.

1.3 ACTION SUBMITTALS

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

1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.

B. Samples: For each type of paint system and each color and gloss of topcoat.

1.4 QUALITY ASSURANCE

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

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

a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
b. Other Items: Architect will designate items or areas required.

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

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

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS – EXTERIOR PAINT

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

1. Benjamin Moore & Co.
2. PPG Paints.
3. Sherwin-Williams Company (The).

B. Products: Subject to compliance with requirements, provide products listed in the Exterior Painting Schedule for the paint category indicated.

### 2.2 PAINT, GENERAL

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

B. Material Compatibility:

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

C. Colors: As selected by Architect from manufacturer’s full range.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

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

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

1. Concrete: 12 percent.
2. Fiber-Cement Board: 12 percent.
3. Masonry (Clay and CMUs): 12 percent.
4. Wood: 15 percent.
5. Portland Cement Plaster: 12 percent.
6. Gypsum Board: 12 percent.

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

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

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

## 3.2 PREPARATION

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

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

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

## 3.3 APPLICATION

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

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

## 3.4 CLEANING AND PROTECTION

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

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

## 3.5 EXTERIOR PAINTING SCHEDULE

A. Wood Substrates: Wood trim, Architectural woodwork, Door frames and Windows.

1. Alkyd/Latex System:
   a. Prime Coat: Primer, alkyd for exterior wood.
   b. Intermediate Coat: Latex, exterior, matching topcoat.
   c. Topcoat: Latex, exterior, low sheen (MPI Gloss Level 3-4), MPI #15.

B. Fiber-Cement Board Substrates: Siding, Soffit Panels, Trim.

1. Acrylic Latex System:
   a. Prime Coat: Primer, one coat masonry Primer, or two coats Exterior Acrylic Latex.
   b. Intermediate Coat: Latex, exterior, matching topcoat.
   c. Topcoat: Latex, exterior, low sheen (MPI Gloss Level 3-4), MPI #15.

C. Steel and Iron Substrates:
   1. Water-Based Light Industrial Coating System **MPI EXT 5.1C**:
      a. Prime Coat: Shop primer specified in 081113 Hollow Metal Doors and Frames.
      b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
      c. Topcoat: Light industrial coating, exterior, water based, semi-gloss (MPI Gloss Level 5)**, MPI #163**.

D. Galvanized-Metal Railings and Guardrails:

   1. Latex System MPI EXT 5.3H:
      a. Prime Coat: Primer, galvanized, water based, MPI #134.
      b. Intermediate Coat: Latex, exterior, matching topcoat.
      c. Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5), MPI #11.

**END OF SECTION 099113**

**SECTION 099123 - INTERIOR PAINTING**

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of interior paint and high-performance coating systems on interior substrates.

B. Related Requirements:

1. Section 013591 "Historic Treatment Procedures" for general historic treatment requirements.
2. Section 099113 "Exterior Painting" for exterior painting.

1.2 DEFINITIONS

A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D523.
B. MPI Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.
C. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.
D. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D523.
E. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D523.
F. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D523.
G. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D523.

1.3 ACTION SUBMITTALS

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

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

B. Samples: For each type of paint system and in each color and gloss of topcoat.

1.4 QUALITY ASSURANCE

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

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

a. Vertical and Horizontal Surfaces: Provide samples of at least 50 sq. ft. (9 sq. m).
b. Other Items: Architect will designate items or areas required.

2. Final approval of color selections will be based on mockups.
   a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Benjamin Moore & Co.
2. PPG Paints.
3. Sherwin-Williams Company (The).

B. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include but are not limited to products listed in the Interior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL

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

B. Material Compatibility:

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

C. Colors: As selected by Architect from manufacturer’s full range.

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. Maximum Moisture Content of Substrate when measured with an electronic moisture meter:
1. Concrete: 12 percent.
2. Fiber-Cement Board: 12 percent.
3. Masonry (Clay and CMUs): 12 percent.
4. Wood: 15 percent.
5. Gypsum Board: 12 percent.
6. Plaster: 12 percent.

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

D. Proceed with coating application only after unsatisfactory conditions have been corrected.
   1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

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

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
   1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

3.3 APPLICATION

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

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

3.4 INTERIOR PAINTING SCHEDULE

A. Gypsum Board and Plaster Substrates:

   1. Latex over Latex Sealer System MPI INT 9.2A:
      a. Prime Coat: Primer sealer, latex, interior, MPI #50.
      b. Prime Coat: Latex, interior, matching topcoat.
      c. Intermediate Coat: Latex, interior, matching topcoat.
      d. Topcoat: Latex, interior (MPI Gloss Level 2), MPI #44.

B. Interior Metal Handrails:
   1. Latex System, Alkyd Primer MPI INT 5.1Q:
      a. Prime Coat: Shop primer specified in Section where substrate is specified.
      b. Intermediate Coat: Latex, interior, matching topcoat.
      c. Topcoat: Latex, interior, semi-gloss (MPI Gloss Level 5), MPI #54.

3.5 INTERIOR HIGH-PERFORMANCE COATING SCHEDULE

A. Gypsum Board Substrates:
   1. Epoxy System MPI INT 9.2E:
      a. Prime Coat: Primer sealer, latex, interior, MPI #50.
      b. Intermediate Coat: Epoxy, matching topcoat.
      c. Topcoat: Epoxy, gloss, MPI #77.

**END OF SECTION 099123**

**SECTION 102600 - WALL AND DOOR PROTECTION**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Vinyl corner guards.
2. Stainless steel corner guards.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each type of wall and door protection showing locations and extent.

C. Samples for Initial Selection: For each type of corner guard indicated.

1.4 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of wall- and door-protection units that fail in materials or workmanship within specified warranty period.

1. Warranty Period: One year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Surface Burning Characteristics: Comply with ASTM E84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 450 or less.

2.2 CORNER GUARDS

A. Surface-Mounted, Vinyl Corner Guards, fabricated as one piece from acrylic-modified vinyl sheet; with formed edges; fabricated with 90- or 135-degree turn to match wall condition.

1. Acceptable Manufacturers, or approved equal
a. Roppe Corporation

b. Johnsonite by Tarkett USA
c. Acrovyn by Construction specialties, Inc.
2. Wing Size: Nominal 2 by 2 inches
3. Mounting: Adhesive.
4. Color and Texture: As selected by Architect from manufacturer's full range

B. Surface-Mounted, Stainless Corner Guards: Fabricated as one piece from formed or extruded metal with formed edges; with 90- or 135-degree turn to match wall condition.

1. Acceptable Manufacturers, or approved equal
a. American Specialties
b. Koroseal
c. Acrovyn by Construction specialties, Inc.
2. Material: Stainless-steel sheet, Type 304 16 gauge
a. Finish: Directional satin, No. 4
3. Wing Size: Nominal 2 by 12 inches
4. Corner Radius: 1/8 inch
5. Mounting: Flat-head, countersunk screws through factory-drilled mounting holes

2.3 FINISHES

A. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation Quality: Install wall and door protection according to manufacturer's written instructions, level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.

B. Mounting Heights: Install wall and door protection in locations and at mounting heights indicated on Drawings.

3.2 CLEANING

A. Immediately after completion of installation, clean plastic covers and accessories using a manufacturer-recommended cleaning agent.

B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

**END OF SECTION 102600**

**SECTION 102800 – TOILET AND BATH ACCESSORIES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Washroom accessories.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
3. Include electrical characteristics.

B. Samples: Full size, for each exposed product and for each finish specified.

1. Approved full-size Samples will be returned and may be used in the Work.

C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated.
2. Identify accessories using designations indicated.

1.4 INFORMATIONAL SUBMITTALS

A. Sample Warranty: For manufacturer's special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For accessories to include in maintenance manuals.

1.6 WARRANTY

A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, visible silver spoilage defects.
2. Warranty Period: Fifteen years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 PUBLIC-USE WASHROOM ACCESSORIES

A. Toilet Tissue (Roll) Dispenser:

1. Approved Manufacturers include, but are not limited to:
   a. Bobrick Washroom Equipment
   b. Bradley Corporation
   c. American Specialties, Inc.
2. Description: Double-roll dispenser with Utility Shelf.
3. Mounting: Surface mounted.
4. Operation: Noncontrol delivery with standard spindle.
5. Capacity: Designed for 4-1/2- or 5-inch- (114- or 127-mm-) diameter tissue rolls.
6. Material and Finish: Stainless steel, No. 4 finish (satin).

B. Semi-Recessed Waste Receptacle

1. Approved Manufacturers include, but are not limited to:
   a. Bobrick Washroom Equipment
   b. Bradley Corporation
   c. American Specialties, Inc.
2. Description: removable waste receptacle.
3. Mounting: Semi-recessed.

   a. Designed for nominal 4-inch (100-mm) wall depth.
4. Minimum Waste-Receptacle Capacity: 12 gal. (45.4 L).
5. Material and Finish: Stainless steel, No. 4 finish (satin).

C. Combination Towel (Folded) Dispenser/Waste Receptacle

1. Approved Manufacturers include, but are not limited to:
   a. Bobrick Washroom Equipment
   b. Bradley Corporation
   c. American Specialties, Inc.
2. Description: Combination unit for dispensing C-fold or multifold towels, with removable waste receptacle.

3. Mounting: Semirecessed.

    a. Designed for nominal 4-inch (100-mm) wall depth.

4. Minimum Towel-Dispenser Capacity: 600 C-fold or 800 multifold paper towels.
5. Minimum Waste-Receptacle Capacity: 12 gal. (45.4 L).
6. Material and Finish: Stainless steel, No. 4 finish (satin).
7. Liner: Reusable, vinyl waste-receptacle liner.
8. Lockset: Tumbler type for towel-dispenser compartment.

D. Grab Bars:

1. Approved Manufacturers include, but are not limited to:
    a. Bobrick Washroom Equipment
    b. Bradley Corporation
    c. American Specialties, Inc.
2. Mounting: Flanges with concealed fasteners.
3. Material: Stainless steel, 0.05 inch (1.3 mm) thick.

    a. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.

4. Outside Diameter: 1-1/4 inches (32 mm) or 1-1/2 inches (38 mm).
5. Configuration and Length: Straight, 36 inches (914 mm) long.

E. Mirror Unit:

1. Approved Manufacturers include, but are not limited to:
    a. Bobrick Washroom Equipment
    b. Bradley Corporation
    c. American Specialties, Inc.

2. Frame: Stainless-steel channel.

    a. Corners: Manufacturer's standard.
3. Hangers: Produce rigid, tamper- and theft-resistant installation, using method indicated below.

    a. One-piece, galvanized-steel, wall-hanger device with spring-action locking mechanism to hold mirror unit in position with no exposed screws or bolts.
    b. Wall bracket of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.

4. Size: 24” x 36”.

F. Soap Dispenser

1. Approved Manufacturers include, but are not limited to:
    a. Bobrick Washroom Equipment
    b. Bradley Corporation
    c. American Specialties, Inc.
2. Description: Surface Mounted 40 fl oz. capacity with easy to view refill window.
3. Mounting: Wall mounted
4. Material and Finish: Stainless steel, No. 4 finish (satin).

G. Coat Hook:

1. Approved Manufacturers include, but are not limited to:
   a. Bobrick Washroom Equipment
   b. Bradley Corporation
   c. American Specialties, Inc.
2. Description: Single-prong unit.
3. Material and Finish: Stainless steel, No. 4 finish (satin).

H. Sanitary Napkin Disposal:

1. Approved Manufacturers include, but are not limited to:
   a. Bobrick Washroom Equipment
   b. Bradley Corporation
   c. American Specialties, Inc.
2. Description: Surface-mounted sanitary napkin disposal with removable, leak-proof molded polyethylene receptacle
3. Mounting: Surface mounted.
4. Operation: Self-closing panel or cover for disposal opening. Napkin disposal is emptied by opening door with furnished key and removing waste receptacle.
5. Capacity: Receptable shall have a capacity of 1.2-gal.
6. Material and Finish: Stainless steel, No. 4 finish (satin).

I. Baby Changing Station:

1. Approved Manufacturers include, but are not limited to:
   a. Bobrick Washroom Equipment
   b. Bradley Corporation
   c. American Specialties, Inc.
2. Description: Baby Changing station with polyethylene interior. Surface mounted stainless steel clad unit.
3. Material and Finish: Stainless steel, No. 4 finish (satin).

J. Mop and Broom Holder:

1. Approved Manufacturers include, but are not limited to:
   a. Bobrick Washroom Equipment
   b. Bradley Corporation
   c. American Specialties, Inc.
2. Description: Mop and Broom holder with shelf, 36” long unit with three spring loaded rubber com-type mop/broom holders.
3. Material and Finish: Stainless steel, No. 4 finish (satin).

## 2.3 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch (0.8-mm) minimum nominal thickness unless otherwise indicated.

B. Brass: ASTM B 19, flat products; ASTM B 16/B 16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.

C. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch (0.9-mm) minimum nominal thickness.

D. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 (Z180) hot-dip zinc coating.

E. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.

F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

G. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

H. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

2.4 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of three (3) keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf (1112 N), when tested according to ASTM F 446.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written instructions.

**END OF SECTION 102800**

**SECTION 104413 - FIRE PROTECTION CABINETS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Fire-protection cabinets for portable fire extinguishers.

B. Related Requirements:

1. Section 104416 "Fire Extinguishers" for portable, hand-carried fire extinguishers accommodated by fire-protection cabinets

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For fire-protection cabinets.

C. Samples: For each type of exposed finish required.

D. Samples for Initial Selection: For each type of exposed finish required.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For fire-protection cabinets to include in maintenance manuals.

1.5 COORDINATION

A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

B. Coordinate sizes and locations of fire-protection cabinets with wall depths.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Rated Fire-Protection Cabinets: Listed and labeled to comply with requirements in ASTM E814 for fire-resistance rating of walls where they are installed.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 FIRE-PROTECTION CABINET

A. Cabinet Type: Suitable for fire extinguisher.

B. Cabinet Construction: Nonrated

1. Fire-Rated Cabinets: Construct fire-rated cabinets with double walls fabricated from 0.043-inch-thick cold-rolled steel sheet lined with minimum 5/8-inch-thick fire-barrier material. Provide factory-drilled mounting holes.

C. Cabinet Material: Stainless-steel sheet.

1. Shelf: Same metal and finish as cabinet.

D. Surface-Mounted Cabinet: Cabinet box fully exposed and mounted directly on wall with no trim.

E. Cabinet Trim Material: Same material and finish as door.

F. Door Material: Stainless-steel sheet.

G. Door Style: Fully glazed, frameless, backless, acrylic panel.

H. Door Glazing: Acrylic sheet.

1. Acrylic Sheet Color: Clear transparent acrylic sheet.

I. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

1. Provide manufacturer's standard.
2. Provide manufacturer's standard hinge, permitting door to open 180 degrees.

J. Accessories:

1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire-protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
2. Break-Glass Strike: Manufacturer's standard metal strike, complete with chain and mounting clip, secured to cabinet.
3. Break-Glass Door Handle: Manufacturer's standard, integral to glass with the words "PULL TO BREAK GLASS" applied to handle.
4. Lettered Door Handle: One-piece, cast-iron door handle with the word "FIRE" embossed into face.

5. Door Lock: Cam lock that allows door to be opened during emergency by pulling sharply on door handle.
6. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location.

    a. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER”

        1) Location: Applied to cabinet door.
        2) Lettering Color: Red

K. Materials:

1. Stainless Steel: ASTM A666, Type 304.

    a. Finish: No. 4 directional satin finish
2. Transparent Acrylic Sheet: ASTM D4802, Category A-1 (cell-cast sheet), at least 1.5 mm thick, with Finish 1 smooth or polished.

## 2.3 FABRICATION

A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub) with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.

1. Weld joints and grind smooth.
2. Miter corners and grind smooth.
3. Provide factory-drilled mounting holes.
4. Prepare doors and frames to receive locks.
5. Install door locks at factory.

B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles.

1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch (13 mm) thick.
2. Fabricate door frames of one-piece construction with edges flanged.
3. Miter and weld perimeter door frames and grind smooth.

C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

## 2.4 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces of fire-protection cabinets from damage by applying a strippable, temporary protective covering before shipping.

C. Finish fire-protection cabinets after assembly.

D. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

A. General: Install fire-protection cabinets in locations and at mounting heights indicated below:

1. Fire-Protection Cabinets: 42 inches (1067 mm) above finished floor to top of fire extinguisher.

B. Fire-Protection Cabinets: Fasten cabinets to structure, square and plumb.
1. Provide inside latch and lock for break-glass panels.
2. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.

C. Identification:

1. Apply decals at locations indicated.

### 3.3 ADJUSTING AND CLEANING

A. Remove temporary protective coverings and strippable films, if any, as fire-protection cabinets are installed unless otherwise indicated in manufacturer's written installation instructions.

B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.

D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet and mounting bracket manufacturers.

E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

**END OF SECTION 104413**

**SECTION 104416 - FIRE EXTINGUISHERS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes portable fire extinguishers.

B. Owner-Furnished Material: fire extinguishers.

C. Related Requirements:

1. Section 104413 "Fire Protection Cabinets."
2. Section 233813 "Commercial-Kitchen Hoods" for fire-extinguishing systems provided as part of commercial-kitchen exhaust hoods.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include rating and classification, material descriptions, dimensions of individual components and profiles, and finishes for fire extinguisher.

1.4 INFORMATIONAL SUBMITTALS

A. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire extinguishers to include in maintenance manuals.

1.6 COORDINATION

A. Coordinate type and capacity of fire extinguishers with fire-protection cabinets to ensure fit and function.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure of hydrostatic test according to NFPA 10 when testing interval required by NFPA 10 is within the warranty period.
b. Faulty operation of valves or release levers.

2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

1. Provide fire extinguishers approved, listed, and labeled by FM Global.

2.2 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: Type, size, and capacity for each fire-protection cabinet indicated.
1. Source Limitations: Obtain fire extinguishers, fire-protection cabinets, and accessories, from single source from single manufacturer.
2. Valves: Manufacturer's standard
3. Handles and Levers: Manufacturer's standard
4. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B

B. Type ABC

C. Type K

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine fire extinguishers for proper charging and tagging.

1. Remove and replace damaged, defective, or undercharged fire extinguishers.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install fire extinguishers in locations indicated and in compliance with requirements of authorities having jurisdiction.

**END OF SECTION 104416**

**SECTION 114000 - FOOD SERVICE EQUIPMENT**

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:
   1. Foodservice Equipment as scheduled on the drawings.

B. Whenever the term “Foodservice Equipment Sub-Contractor” is used, it shall be the company that is the successful bidder and is awarded the contract for the erection and completion of the work that is outlined herein to the complete satisfaction of the Owner.

1.02 SUBMITTALS

A. Within ten calendar days after award of contract, the Foodservice Equipment Sub-Contractor is to supply an electronic set of fully dimensioned rough-in drawings and also, as required, plans indicating bases in the building upon which equipment is to set.

B. State the name of the fabricator of all custom fabricated equipment. Any change of source afterward shall be subject approval by the Owner.

C. Within thirty (30) days after award of contract, the Foodservice Equipment Sub-Contractor is to supply an electronic set of detailed set of shop drawings of custom fabricated equipment, at a scale of no less than 3/4” equals 1’0”. Submit in quadruplicate, specifications sheets with full data on all items of brand name manufacturer, catalog cuts to be bound in booklet form and clearly identified with item number to correspond with itemized specifications, hereinafter indicated.

D. Approval of detailed shop drawings and specification sheets shall not waive obligation of Foodservice Equipment Sub-Contractor to furnish materials and methods of construction called for in specifications, even though they may be shown incorrectly, or, not at all, in the drawings.

E. Any substitute for materials specified, or changes in methods of construction from the way specified and shown on the approved detail drawings is to be requested, in writing, from the Owner, before any such substitution is applicable.

F. All equipment of brand name manufacture shall be of the latest model or succeeding model at the time of the delivery. Any price adjustment in this connection shall be requested of the Owner in writing.

1.03 WARRANTY

A. Submit Foodservice Equipment Sub-Contractor’s guarantee for all workmanship, material and equipment, for a period of one (1) year from the time the equipment is put into operation and accepted by the Owner.

B. Guarantee and conditions of service on items of brand name manufacture, as established by the manufacturers, shall apply where extending beyond the guarantee and service set forth in these specifications.

1.04 QUALITY ASSURANCE

A. The following are basic specifications of items of custom fabricated equipment covering the type and quality of materials, the method of fabrication, assembly and design and will be referred to in the itemized specifications by the term “as specified”.

B. All items of custom fabrication shall be the product of the single manufacturer of such equipment so as to insure uniformity throughout.

C. All metal gauges shall be United States Standard.

D. All workmanship shall be of the finest and all materials shall be new, of best quality and without flaws.

E. All equipment shall comply with National Sanitation Foundation standards and all Federal, State and Local Health Codes.

F. All gas equipment to be U.L. and A.G.A. approved.

G. All electrical equipment shall ear Underwriter's seal of approval.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

A. All stainless steel, where specified, shall be type #302 18-8 analysis, nickel bearing steel. All exposed surfaces shall be standard #4 finish.

B. All piecing of stainless steel, whether on cabinet surfaces or cabinet bases, shall be continuous welded joints. All welded joints shall e smooth and polished to original finish.

C. Where galvanized iron is specified, it shall be copper bearing sheets, used in largest sizes with as few joints as possible. All welded joints shall be sandblasted and finished with rustproof galvanized zinc compound. All galvanized iron is to be finished with a prime coat and two (2) finish coats of hammerloid enamel.

D. When plywood is used for backing, supports, construction of casework, it shall be no less than exterior grade plywood, manufactured per U.S. Product Standard PS-1-83, 5 or 7 ply, with waterproof glue.

E. Where marine grade plywood is specified it will be manufactured per U.S. Product Standard PS-1-83, complete with Douglas Fir 1 and Western Larch. Plywood shall be 5 or 7 ply with waterproof glue.

2.02 PRODUCTS

A. PIPE STANDS AND OPEN BASE TABLES
   1. All pipe stands shall be constructed of 1-5/8" O.D. 16 gauge steel tubing with all pipe joints welded, ground smooth and polished. Assembly of pipe stands by use of threaded or slip joint fittings will not be accepted. Tables over 6'0" in length shall have legs spaced not over 5'0" apart. Legs to be fitted at top with stainless steel full closed gussets, welded to the channel underbracing, or the table tops, and shall be fitted with approved, down 1-3/4", polished, stainless steel adjustable feet, with adaptation being internal.
   2. All wood tops shall be 1-1/2" selected kiln dried maple strips, set on edge, glued together and bolted with steel rods running through from side to side. End of rods shall be counter sunk and concealed with maple plugs set flush with edges of tops. Top surface and edges shall be scraped and sanded smooth and the underside finished with one (1) coat of waterproof paint. All stainless steel tops shall have all corners welded also all seams. Welded seams shall be ground smooth and polished to match the adjacent surfaces. The edges, unless otherwise specified in itemized specifications, shall be rolled down 1-3/4", except where adjacent to walls or high adjoining equipment, where top is turned up 6" and back 1" on a 30 degree angle. Where turn-up meets top it shall be coved on a minimum of 3/4" radius. End apertures to be closed. All exposed leading corners shall be bull-nosed. Underside of worktop shall be galvanized iron. End apertures of channel bracing shall be closed. Where angle iron is lusted, it shall be 1-1/2" x 2" H.R., welded, extending around outer perimeter and 2'0" on centers. Underside of top shall be given a smooth coating of sound deadening mastic painted aluminum.

B. BASE CABINETS
   1. All cabinet type bodies shall be constructed of 18-gauge stainless steel. Where entirely concealed from view, 18-gauge galvanized steel shall be used. Interior walls shall be galvanized where enclosed by doors, but of stainless steel where open to shelves. Vertical mullions shall be closed flush on the inner side.

C. FIELD JOINTS
   1. All field joints in both tops and cabinet bases shall be completely welded on the job and ground smooth and polished to match original finish. Tack welding will not be accepted.

D. SERVICE PIPE CHASES

1. Cabinet bases are to be so constructed with adequate pipe chases provided in the equipment prior to delivery to the jobsite. If necessary to provide overlooked pipe chases in equipment delivered to the jobsite, they are to be provided by the Foodservice Equipment Sub-Contractor and are to be adequately finished to the complete satisfaction of the Owner.

E. SHELVES

1. All interior shelves and cabinet bases or counters shall be constructed of 18-gauge stainless steel, or, of gauges specified in itemized specifications. Under shelves for pipe base tables shall be constructed of 18-gauge stainless steel and are to have outside edges turned down 1-1/2” with 1/2” coved down edge, turned back 3/4” forming a channel. Shelves for both cabinet bases and pipe base tables are to be rigidly braced.

F. SINKS

1. All sinks shall be constructed throughout of 14-gauge stainless steel with all seams and joints welded, ground smooth, and polished to the original finish. To have all vertical and horizontal corners coved on a minimum of 3/4” radius to facilitate cleaning. All exposed edges to have a continuous 1-1/2” diameter semi-rolled rim. Where adjacent to walls provide a 6” high x 4” wide deck for faucets. Where away from the wall, the decks are to 6” high and 6” wide. Sinks shall be fitted with 2” twist lever drains and faucets as specified in installation requirements. Cross partitions between sink compartments shall be of double wall construction.

G. DRAINBOARDS

1. To be constructed of 14-gauge stainless steel and are to be welded integral with sink compartments. To have all vertical and horizontal corners coved and to have underside treated with sound deadened material and painted aluminum. Exposed edges are to be as constructed for sinks and where adjacent to walls, or adjoining equipment, to be turned up 3” and back 2” on a 45 degree angle. Drainboards under 3’0” long to be supported by stainless steel angles welded from end of drainboard to sink facing, just above cove of compartment bottom. Drainboards over 3’0” long to be supported on pipe stands, as previously specified. Unless otherwise noted, these drainboards will 1-1/2” deep, pitching to 2” at sink.

H. DRAWERS

1. All drawers shall be of 18-gauge stainless steel and shall measure approximately 20” x 20” x 5” deep, or size as specified in itemized specifications. Drawers shall be die formed, one-piece construction, with all corners coved and drawer body to be of lift out type. All drawer faces to be 16-gauge stainless steel double pan with full length, recessed integral, horizontal pull. Drawers shall operate on roller bearing slides, with nylon roller and are to be self-closing type. Drawer bodies to be removable for cleaning.

I. SLIDING DOORS

1. Sliding doors are to be of double wall construction. Exterior faces and edges of doors shall be of 18- gauge stainless steel. Spaces between doors shall be filled with approved sound proofing material. Doors shall operate on nylon rollers running in a sill at the bottom. Door shall lift out for cleaning and shall have overhead tracks constructed with a drop at the closing run to hold doors closed.

J. ELEVATED CABINETS

1. All elevated cabinets shall be of size specified and shall match base cabinet construction. To be of 16- gauge stainless steel throughout with top constructed as an integral part of body. Bottom of cabinet shall be closed flush.

K. CLOSURE PLATES

1. All equipment bodies, where resting on bases or against walls or columns, shall have 16-gauge stainless steel closure plates where any gaps may occur due to interference’s or wall irregularities.

L. ELEVATED SHELVING
   1. All elevated shelving shall be of length and width specified and constructed of 14-gauge stainless steel. All exposed edges shall be rolled down 1-3/4". Where butting walls or other equipment, the edges shall be coved up 2". Shelving shall be spaced and mounted as specified in itemized specifications.

M. PRESENT, OWNER, VENDOR SUPPLIED EQUIPMENT
   1. Where specified in itemized specifications, present equipment is to be removed from present locations and installed in new locations, where shown on plans. Related trades are to see that all service lines are disconnected prior to Foodservice Equipment Sub-Contractor moving the equipment.

   2. Where specified in itemized specifications, Owner and/or Vendor supplied equipment is to be installed in locations, where shown on plans by the Owner and/or the Vendor. The Foodservice Equipment Sub-Contractor shall be responsible for verifying Owner and/or Vendor provided equipment and provide rough in information for the same on the submittal drawings
   3. Owner will be removing any existing equipment that is to be re-used and they will store. Owner will also remove any equipment that is to be salvaged unless otherwise noted on the drawings

N. SEALANTS
   1. General: Dow Corning, Silastic, or G.E. RTV-108 silver color for stainless steel tops, cabinets, shelves, equipment, etc. Color match (approved by Owner or Architect) for solid surface, stone, millwork, etc. : Type S Grade NS, Class 25: comply with Food and Drug Administration Regulation 21 CFR 177.2600 for food contacts areas

   2. Walk-in Penetrations: Dow Corning 999a Silicone glazing sealant

PART 3 - EXECUTION

3.01 PREPARATION

A. All valves, traps, tail pieces, fittings, cut-off switches, or other materials necessary for connections are to be furnished by related contractors, except where otherwise specified.

B. All electrical equipment shall be correct for type of electric current available.

C. All items of equipment specified with cord and plug shall match receptacle at the jobsite.

3.02 INSTALLATION

A. The Foodservice equipment Sub-Contractor is to deliver and set in place, ready for related contractors to make required plumbing, electrical and ventilation connections, all equipment at locations where shown on plan.

B. All equipment to be sealed to the walls.

C. All refrigeration units are to be completely installed by the Foodservice Equipment Sub-Contractor except for final electric, water, if water-cooled units are used, and drain connections. The Foodservice Equipment Sub-Contractor is to furnish necessary charge of refrigerant, start and adjust equipment and service the same for a period of one (1) year after final acceptance by the Owner.

3.03 CLEANING AND PROTECTION

A. Foodservice Equipment Sub-Contractor shall remove all debris accumulated during the delivery and installation of his equipment daily and immediately upon completion of said installation. He will provide a representative, when necessary, to correlate final hook-up by related contractors, so as not to impede job progress. Alter final hook-up, he shall lubricate, start up and check out all

equipment requiring this service, and shall clean equipment and turn over to the Owner, for his final acceptance, in first class condition, all items in his contract.

3.04 COMMISSIONING

A. The Foodservice Equipment Sub-Contractor shall provide a capable representative or representatives, to demonstrate the proper use of the equipment, at the time selected by the Owner. The Owner is to give the Foodservice Equipment Sub-Contractor a minimum of seven (7) calendar days prior to this demonstration date.

B. At the completion of the project, and prior to final payment, the Foodservice Equipment Sub-Contractor shall provide THREE (3) hard copies and an electronic copy of Operation and Maintenance Manuals complete with list of authorized service agencies. FSEC shall also provide and electronic copy of “As Built” drawings, picking up all changes, modifications, adjustments, etc. as it pertains to their scope.

FOODSERVICE EQUIPMENT SPECIFICATIONS

ITEM 1, WALK-IN COOLER/FREEZER: ONE (1) REQUIRED CFCI

Manufacturer: Thermalrite, Bally, American Panel

Size: Approximately 8'-10" x 22'-6" x 9'-0" high with floor

Description: Walk-In Cooler/Freezer with floor
Freezer compartment approximately 8'-10" x 9'-9"
Cooler compartment approximately 8'-10" x12"-9"
4" urethane insulation – U.L. class 1 form
Heavy duty, reinforced, 1000 #/ft floor panels with internal ramp
K.E.C. shall provide heavy gauge rubberized B&H (or equal) safety flooring system over walk in floor. Fully welded seams, turned up approx... 6" onto walk in walls, complete with finish trim strip.
White stucco aluminum interior walls and ceiling
Stucco aluminum exterior finish
Two (2) 36" x 78" high door hinged as shown on plans w/non-positive latch/cylinder locks, door closure, three hinges and heated observation window
Diamond tread protector plate on interior and exterior of each door
48" high diamond tread protector plate on exposed exterior
Two (2) Modularm 75LC battery back-up alarms w/extended probes
Vapor proof light over each door w/ two (2) additional LED lights in cooler compartment and one (1) additional LED lights in freezer compartment
Trim panels to walls and ceiling as required
White aluminum cove base to match walls
Bi-parting vinyl doors behind cooler door
One (1) HWN015X6C, 1-1/2 H.P. water cooled, hermetic condensing unit, with LCA6135AEB medium temp. 115-60-1 unit cooler. +35 degree 208/230-60-3, R404A – indoor water cooled condensing unit for large cooler compartment
One (1) HWN032X6C, 3 H.P., water cooled, hermetic condensing unit, with LCE665BEB low temp. 208-60-1 unit cooler. -10 degree 208/230-60-3, R404A – indoor water cooled condensing unit for freezer compartment.
The condensing units shall be located indoors on top of the walk in box

The Kitchen Equipment Contractor shall install the drain lines and heater tape: also, shall install the refrigeration lines, charge and insulate the same. The final electrical connections from the compressors and the coils to the supply in the building shall be by the Electrical Contractor. Provide refrigeration systems with one (1) year free service policy, including parts and labor and standard five (5) year warranty.
No exposed electrical conduit or sprinkler piping will be allowed – Kitchen Equipment Contractor shall coordinate with trades.

ITEM 2, COOLER SHELVING: ONE (1) LOT REQUIRED OFCI

Manufacturer: Metro, Amco, Eagle

Style: Metro Max Q
Four (4) MX2442G shelves
Twelve (12) MX2448G shelves
Four (4) MX2460G shelves
Twenty (20) MX74P post

To be assembled as individual sections, four (4) shelves high.

ITEM 3, RACK: ONE (1) REQUIRED OFCI

Manufacturer: Piper, Metro, Lakeside

Model: A72-1826-20
Pan stops
Wrap around bumper

ITEM 4, FREEZER SHELVING: ONE (1) LOT REQUIRED OFCI

Manufacturer: Metro, Amco, Eagle

Style: Metro Max Q
Four (4) MX2442G shelves
Sixteen (16) MX2454G shelves
Twenty (20) MX74P post

To be assembled as individual sections, four (4) shelves high

ITEM 5, DRY STORAGE: ONE (1) LOT REQUIRED OFCI

Manufacturer: Metro, Amco, Eagle

Style: Metro Seal 3
Twenty-four (24) 2448NK3 shelves
Twenty-four (24) 74PK3 post
Casters

To be assembled as individual sections, four (4) shelves high.

ITEM 6, CAN RACK: ONE (1) REQUIRED OFCI

Manufacturer: Amco, New Age, Piper

Model: SM3-B
First in First out operation

ITEM 7, SODA SYSTEM: ONE (1) REQUIRED OFOI

The Soda System shall be furnished and Installed by the Vendor.

ITEM 8, ICE MACHINE W/BIN: ONE (1) REQUIRED OFCI

The Ice Machine w/Bin is an existing leased unit that shall be relocated.

ITEM 9, MOP SINK: ONE (1) REQUIRED CFCI

The Mop Sink shall be furnished and installed by the Plumber.

ITEM 10, MOP RACK: ONE (1) REQUIRED CFCI

The Mop Rack shall be furnished and installed by the General Contractor.

ITEM 11, WALL SHELF: ONE (1) REQUIRED CFCI

Size: Approximately 2'-6" x 1'-0" front to back mount approximately 6'-0" A.F.F.

Description: 18 gauge stainless steel construction
1-1/2" straight turn down on front
2" turn up at rear and ends
Stainless steel wall brackets

ITEM 12, REFRIGERATOR: ONE (1) REQUIRED OFCI

Manufacturer: True, Traulsen, Continental

Model: T-23-2-HC
Half height doors hinged as shown on plans
Three (3) additional shelves
Lock and key – all units keyed alike
Four (4) year extended compressor warranty
Cord and plug

ITEM 13, PREP TABLE W/SINK: ONE (1) REQUIRED OFCI

Size: Approximately 8'-0" x 6'-0" 2'-6" x 3'-0" high

Description: 14 gauge stainless steel top
1-1/2" straight turn down on front and ends
6" high x 1" deep splash at rear
6" h. x 6" d. deck on rear at sink
Two (2) 18" x 20" x 10" d. sink compartment
One (1) Fisher #23981 deck mounted faucet
Two (2) Fisher #22209 twist lever drain
Tier of Three (3) 20" x 20" x 5" drawers, drawers complete with stainless steel removable drawer pan, stainless steel double pan drawer face w/recessed horizontal, integral pull in an 18 gauge stainless steel cabinet base
6" high stainless steel legs below tier of drawers
18 gauge stainless steel under shelf welded to legs 10" above finished floor
1-5/8" O.D. stainless steel tubing legs with stainless steel gussets and stainless steel adjustable feet

ITEM 14, WALL SHELF: ONE (1) REQUIRED OFCI

Size: Size and shape as shown on plans x 1'-0" front to back mount approximately 21" above table top.

Description: 18 gauge stainless steel construction
1-1/2" straight turn down on front and ends
2" turn up at rear
Stainless steel wall brackets

ITEM 15, REFRIGERATED SANDWICH PREP TABLE: ONE (1) REQUIRED OFCI

The Refrigerated Sandwich Prep Table is existing equipment that shall be relocated.

ITEM 16, WALL SHELF: TWO (2) REQUIRED OFCI

Size: Approximately 4'-6" x 1'-0" front to back mount approximately 21" above table top. Shelf to cap low wall. Upper shelf shall be approximately 1'-0" above lower shelf

Description: 18 gauge stainless steel construction
1-1/2" straight turn down on front and ends
2" turn up where shelf pass's thru the wall
Stainless steel wall brackets

ITEM 17, HOT HOLDING CABINET: ONE (1) REQUIRED OFCI

Manufacturer: FWE, Alto-Shaam, Metro

Model: MT-5-5
Split cavity
Cord and plug
Magnetic edge mount door handle
Perimeter bumper
Casters

ITEM 18, HAND SINKS: TWO (2) REQUIRED OFCI

Manufacturer: Advance Tabco, John Boos, Eagle

Model: 7-PS-70
Punch holes for 8"O.C. Faucet
Splash shields
Fisher splash mounted faucet #61301
Crumb cup drain

Mounted at ADA height to 34" above finished floor

ITEM 19, FIRE CABINET: ONE (1) REQUIRED CFCI

Manufacturer: Ansul

Model: R-102 Wet Chemical

1. The Kitchen Equipment Contractor shall furnish and install this item per the general and specific conditions complete with the following:

    a. Furnish fire suppression system to meet NFPA standards 17A and 96, and be U.L. Listed to provide protection for plenum, exhaust duct collars and all grease producing cooking surfaces located under the ventilator. All piping, conduit, cable, etc., shall be concealed as applicable.
    b. All nozzles and exposed piping to be chrome-plated or stainless steel. Size, number and location of nozzles and number of fusible links to be in accordance with U.L. limits for this particular system.
    c. Manual control of the system shall be possible by actuation of remote release controls. Provide double-pole, double-throw, and electric snap action switch assembly.
    d. Mechanical gas shut-off valves will be furnished loose and installed by the plumbing contractor. Electrical contractors (or Shut-trip breakers) required will be furnished and installed by the electrical contractor.
    e. Obtain permits and conduct test of system in the presence of the owner's

representative and the agency having jurisdiction.

f. Pre-piping of fire suppression system to be provided by ventilator manufacturer at factory.

ITEM 20, GLASS RACK DOLLIES: TWO (2) REQUIRED OFCI

Manufacturer: Piper, Metro, Lakeside

Model: 722
Rotating bumpers

ITEM 21, DISH RACK DOLLY: ONE (1) REQUIRED OFCI

Manufacturer: Metro, Piper, Lakeside

Model: PCD11A

ITEM 22, CONVECTION OVEN: ONE (1) REQUIRED OFCI

Manufacturer: Vulcan, Southbend, Blodgett

Model: VC44GD
Propane gas
Double deck
Casters
Dormont Super-swivel quick disconnect complete with restraining device

ITEM 23, SALAMANDER BROILER: ONE (1) REQUIRED OFCI

The Salamander Broiler is an existing equipment that shall be relocated. Unit Is a Vulcan Model #36RB-P Kitchen Equipment Contractor shall provide wall mounting bracket for this unit to be mounted on wall above Range Item #25

ITEM 24, CHAR BROILER: ONE (1) REQUIRED OFCI

Manufacturer: Vulcan, Southbend, Wolf

Model: VCCB25
Propane gas
Dormont Supr Swivel Quick Disconnect w/ restraining device
Complete with stainless steel stand with under shelf and casters

ITEM 25, RANGE W/GRILL: ONE (1) REQUIRED OFCI

Manufacturer: Vulcan, Southbend, Wolf

Model: 48S-4B-24G-P
Propane gas
Casters
Standard oven base
10” high stub back
Natural Gas
Dormont Super-swivel quick disconnect complete with restraining device

ITEM 26, BRAISING PAN: ONE (1) REQUIRED OFCI

Manufacturer: Vulcan, Southbend, Groen

Model: VG30
Propane gas
2" tangent draw-off
Single pantry faucet
Faucet bracket
Pan Carrier
Lip strainer

ITEM 27, FRYERS W/DUMP STATION: ONE (1) REQUIRED OFCI

Manufacturer: Pitco, Frymaster, Vulcan

Model: 2SG14R-FD-BNB
SG/SE DUMP STATION
Natural gas
Basket lifts
I-12 Computer controls
FD Filter drawer
Casters
Dump station on right side with flush work surface
Stainless steel ends
Heat lamp above dump station
Dormant Supr – Swivel quick disconnect with restraints

ITEM 28, ST.ST. WALL PANELING: ONE (1) REQUIRED OFCI

Size: Approximately 18’-0” x 5’-0” x 5’-0”x 9’-0” high (behind full length of hood)

Description: 18 gauge stainless steel
Overlap installation
From top of floor base to 9’-0” above finished floor - up behind hood

ITEM 29, HOOD: ONE (1) REQUIRED CFCI

Manufacturer: Captive-Air, Halton, Accu-Rex

Model: 6024ND-2-PSP-F

Description: The ND-2 series exhaust only canopy hood system rated for all types of cooking equipment. The hood shall have the size, shape and performance specified on drawings. Construction shall be type 304 stainless steel with a #3 or #4 polish where exposed. Individual component construction shall be determined by the manufacturer, ETL, and NSF. Construction shall be dependent on the structural application to minimize distortion and other defects. All seams, joints and penetrations of the hood enclosure to the lower outermost perimeter that directs the captures grease-laden vapor and exhaust gasses shall have a liquid-tight continuous external weld in accordance with NFPA 96. Hood shall be wall type with fully welded 10 gauge corner hanging angles. Corner hanging angles have a .625 x 1.500 slot pre-punched at the factory, allowing hanging rods to be used for quick and safe installations. Hanging rod and connect is provided by and installed by others.
Ventilator shall be furnished with U.L. classified stainless steel “Captrate” filters, supplied in size and quantity as required by ventilator. The filters shall extend the full length of the hood and the filler panels shall not be more than 6’ in width.

The hood manufacturer shall supply complete computer generated submittal drawings including hood section view(s) and hood plan view(s). These drawings must be available to the engineer, architect and owner for their use in construction, operation and maintenance.
Exhaust duct collar to be 4" height with 1" flange. Duct sizes, CFM and static pressure requirements shall be as shown on drawings. Static pressure requirements shall be precise and accurate; air velocity and volume information shall be accurate within 1-ft increments along the length of the ventilator.
U.L. light fixtures shall be 4'-0" LED fixtures and shall be installed and pre-wired to a junction box.
The hood shall have:

- A double wall insulated front to eliminate condensation and increase rigidity. The insulation shall have a flexural modulus of 475 EI, meet UL 181 requirements and be in accordance with NFPA 90A and 90B.
- An integral front baffle to direct grease laden vapors toward the exhaust filter bank.
- A built-in wiring chase provided for outlets and electrical controls on the hood face and shall not penetrate the capture area or require an external chaseway.
- A removable grease cup for easy cleaning.

The hood shall be ETL Listed as "Exhaust Hood Without Exhaust Damper", NSF Listed and built in accordance with NFPA 96. The hood shall be listed for 450 F cooking surfaces at 150 CFM/ft, 600 F cooking surfaces at 200 CFM/ft, and 700 F cooking surfaces at 250 CFM/ft.

Enclosure Panels to finished ceiling as required

ITEM 30, DUCT AND FAN: ONE (1) REQUIRED CFCI

The Duct and Fan shall be furnished and installed by the H.V.A.C.

ITEM 31, TRENCH DRAIN: ONE (1) REQUIRED CFCI

Size: Approximately 3'-6" x 2'-0"

Description: 14 gauge stainless steel construction
Fully welded, Anti-Splash design. FOR INSTALLATION IN WOOD FLOOR
Flashing flange
Dome strainer
One (1) 4" drain connections
Stainless steel removable grates with st. st. filler plates as required where equipment legs may land on grate

ITEM 32, WORK TABLE: ONE (1) REQUIRED OFCI

Size: Approximately 5'-9" x 2'-8" x 3'-0" high

Description: 14 gauge stainless steel top
1-1/2" straight turn down on front, rear, and right end
2" high splash at left end
Front open to accept Item #33 Under Counter Freezer
1-5/8" O.D. stainless steel cross rails
1-5/8" O.D. stainless steel tubing legs with stainless steel gussets and stainless steel adjustable feet.

ITEM 33, UNDER COUNTER FREEZER: ONE (1) REQUIRED OFCI

Manufacturer: True, Continental, Turbo-Air

Model: TUC-48F-LP-HC
Cord and plug

ITEM 34, HEAT LAMPS: TWO (2) REQUIRED OFCI

Manufacturer: Hatco, APY-Wyott, Merco

Model: GRAH-48
Glo-Ray infrared food warmers, mounted under upper shelf as shown
High wattage
Aluminum construction
Infinite control w/ remote control enclosure
Adjustable angle brackets for mounting to stainless steel shelf

Voltage: 115-60-1

ITEM 35, HOT FOOD TABLE: ONE (1) REQUIRED OFCI

The Hot Food Table is existing equipment that shall be relocated.

ITEM 36, REFRIGERATED SANDWICH PREP TABLE: ONE (1) REQUIRED OFCI

The Refrigerated Sandwich Prep Table is existing equipment that shall be relocated.

ITEM 37, DOUBLE OVER SHELF: ONE (1) REQUIRED OFCI

Size: Lower shelf approximately 15’-0” x 1’-6” front to back. Upper shelf approximately 12’-6” x 1’-6”. Mount first shelf approximately 18” above pick up counter and second shelf approximately 1’-0” above first shelf

Description: 18 gauge stainless steel construction with tombstone receptacle on for Item #41
1-1/2” straight turn down on front, rear, and right end
2” splash on left end at wall
1-5/8” o.d. stainless steel tubing supports thru raised openings in top of item #38 Pick-up Counter with stainless steel cantilever brackets. Extend and anchor tubing supports down into pick up counter for support

ITEM 38, PICK-UP COUNTER: ONE (1) REQUIRED OFCI

Size: Approximately 15'-0" x 2’-5" x 2'-10" high

Description: 14 gauge stainless steel top construction
1-1/2" straight turn down on front and left end
2” splash on right end at wall
Top shall cap low wall. Low wall by G.C.
Where shown the base shall accept Item #16 Drawer Warmer
18 gauge stainless steel cabinet base construction
Apron below soup wells for soup well controls
18 gauge stainless steel bottom and intermediate shelves as shown.
6" high stainless steel legs with stainless steel adjustable feet
KEC shall provide Two (2) 115v tombstone receptacles on top ready for connection by E.C.

ITEM 39, DROP-IN SOUP WELLS: TWO (2) REQUIRED OFCI

Manufacturer: Hatco, Atlas, Vollrath

Model: HWBH-11QTD
Stainless steel food pans
Round wells with notched lids
1" Drains

ITEM 40, UNDER COUNTER DRAWER WARMER: ONE (1) REQUIRED OFCI

Manufacturer: Hatco, APW-Wyott, Alto-Shaam

Model: HDW-2
Cord and plug

ITEM 41, MICROWAVE: ONE (1) REQUIRED OFCI

Manufacturer: Panasonic, ACP Amana, sharp

Model: NE-1064F

ITEM 42, BEVERAGE TABLE W/ SINK: ONE (1) REQUIRED OFCI

Size: Approximately 11’-0” x 2’-8” x 3’-0” high

Description: 14 gauge stainless steel top
1-1/2” straight turn down on front and ends
6” high x 1” deep splash on rear
6” h. x 6” d. deck at sink
One (1) 16” x 20” x 10” d. sink compartment
One (1) Fisher #23981 deck mounted faucet
One (1) Fisher #22209 twist lever drain
Top cut to accept Item #43 Ice and Soda Unit
Base open to accept Item #46 Under Counter Refrigerator
18 gauge stainless steel cabinet base construction
18 gauge stainless steel bottom shelf
18 gauge stainless steel double pan hinged door with recessed pulls at soda unit and below sink compartment
Two sections of cabinet base shall be open to accept glass racks on 1-1/2” x 1-1/2” stainless steel angle slides approximately 6-1/2” O.C. with ends closed
6” high stainless steel legs with stainless steel adjustable feet

ITEM 43, SODA SYSTEM: ONE (1) REQUIRED OFOI

The Soda System shall be furnished and installed by the Vendor.

ITEM 44, WALL SHELF: ONE (1) REQUIRED OFCI

Manufacturer: Advance Tabco, John Boos, Eagle

Model: WS-12-60-16

ITEM 45, SLIDE-IN GLASS RACKS: ONE (1) REQUIRED OFOI

The Slide-in Glass Racks shall be furnished and installed by the Owner

ITEM 46, UNDER COUNTER REFRIGERATOR: ONE (1) REQUIRED OFCI

Manufacturer: True, Continental, Turbo-Air

Model: TUC-27-LP-HC
Cord and plug

ITEM 47, TEA BREWER: ONE (1) REQUIRED OFOI

The Tea Brewer shall be furnished and installed by the Vendor.

ITEM 48, COFFEE MAKER: ONE (1) REQUIRED OFOI

The Coffee Maker shall be furnished and installed by the Vendor.

ITEM 49, THREE COMPARTMENT SINK: ONE (1) REQUIRED OFCI

Size: Approximately 9’-6” x 2’-6” x 3’-1” high over roll rim

Description: 14 gauge stainless steel construction
1-1/2” roll rim 3” high on front and right end
15-1/2” high splash on rear
Three (3) approximately 20" x 27" x 14" d. sink compartments
Three (3) removable stainless steel sink covers with finger hole
Drain board on left pitched to and turn down into dish machine
Drain board on right pitched to sink
Two (2) Fisher #60658 splash mounted faucets
Three (3) Fisher #22209 twist lever drains
1-5/8” o.d. stainless steel tubing legs with stainless steel gussets and stainless steel adjustable feet
1-5/8” o.d. stainless steel cross rails

ITEM 50, DOUBLE OVER SHELF: ONE (1) REQUIRED OFCI

Size: Approximately 8’-0”x 1’-3” front to back – upper shelf
1’-0” front to back - lower shelf

Description: 18 gauge stainless steel construction
1-1/2” straight turn down on front and ends
2” turn up on rear
1-5/8” o.d. stainless steel tubing supports thru splash of pot sink with stainless steel cantilever brackets

ITEM 51, DISH MACHINE: ONE (1) REQUIRED OFCI

Manufacturer: Hobart, Champion, Jackson

Model: AM15VLT
Tall unit
Straight thru Installation
Tank heat
Built in booster heater
Drain water tempering kit
With single point elec connection
With vent fan control

Common water connection

Voltage: 208-60-3

ITEM 52, SOILED DISH TABLE: ONE (1) REQUIRED OFCI

Size: Approximately 5’-6” x 2’-6” x 3’-1” high over roll rim

Description: 14 gauge stainless steel construction
1-1/2” x 3” high roll rim on front
15-1/2” high splash on rear and left end
21" x 21" x 6"d. scrap sink.
Removable rack slide
Removable perforated stainless steel basket
One (1) Fisher #22209 twist lever drain
One (1) Fisher #36463 deck mounted pre-rinse spray
6" high deck at scrap sink
1⅝” O.D. stainless steel tubing legs with stainless steel gussets and stainless steel adjustable feet.
1⅝” O.D. stainless steel rear cross rails

ITEM 53, RACK SHELF: ONE (1) REQUIRED OFCI

Size: Approximately 2'-0" long

Description: 14 gauge stainless steel construction
Single sided slanted
Inverted raised rolled rim along front
2" straight turn up on rear and ends
Weep drains with plastic bleeder tubes
1-5/8" o.d. stainless steel tubing supports with through splash and raised opening in bed of soiled table with stainless steel cantilever brackets

ITEM 54, SPARE NUMBER

ITEM 55, POT RACKS: TWO (2) LOT REQUIRED OFCI

Manufacturer: Metro, Amco, Eagle

Style: Metro Max
Four (4) MQ2154G shelves
Four (4) MQ2160G shelves
Eight (8) MX74P post
Eight (8) Casters

To be assembled as individual sections, four (4) shelves high.

ITEM 56, TRASH CANS: ONE (1) LOT REQUIRED OFOI

The Trash Cans shall be furnished and installed by the Owner.

ITEM 57, CAN OPENER: ONE (1) LOT REQUIRED OFCI

Manufacturer: Edlund

Model: #1S
Mount to top of Item #13 Prep Table w/ Sink as shown on plan

ITEM 58, UNDER COUNTER DRAWER WARMER: ONE (1) REQUIRED OFCI

Manufacturer: Hatco, APW-Wyott, Alto-Shaam

Model: HDW-1
Cord and plug

ITEM 59, FILL FAUCET: ONE (1) REQUIRED OFCI

Manufacturer: Fisher, T&S, Chicago

Model: 5212
Pot Filler Faucet w/ 12” Swing spout
Mount above burners on wall at approximately 4’-6” A.F.F.

| ITEM NUMBER | ITEM DESCRIPTION | ITEM PRICE |
|---|---|---|
| 1. | WALK-IN COOLER/FREEZER | CFCI $_____ |
| 2. | COOLDER SHELVING (1) LOT | OFCI |
| 3. | RACK | OFCI |
| 4. | FREEZER SHELVING (1) LOT | OFCI |
| 5. | DRY STORAGE (1) LOT | OFCI |
| 6. | CAN RACK | OFCI |
| 7. | SODA SYSTEM | OFCI |
| 8. | ICE MACHINE W/BIN | OFCI |
| 9. | MOP SINK | CFCI |
| 10. | MOP RACK | CFCI |
| 11. | WALL SHELF | CFCI |
| 12. | REFRIGERATOR | OFCI |
| 13. | PREP TABLE W/SINK | OFCI |
| 14. | WALL SHELF | OFCI |
| 15. | REFRIGERATED SANDWICH PREP TABLE | OFCI |
| 16. | WALL SHELVES | OFCI |
| 17. | HOT HOLDING CABINET | OFCI |
| 18. | HAND SINKS (2) | OFCI |
| 19. | FIRE CABINET | CFCI $_____ |
| 20. | GLASS RACK DOLLIES | OFCI |
| 21. | DISH DOLLY | OFCI |
| 22. | CONVECTION OVEN | OFCI |
| 23. | SALAMANDER BROILER | OFCI |
| 24. | CHAR BROILER | OFCI |
| 25. | RANGE w/ GRILL | OFCI |
| 26. | BRAISNG PAN | OFCI |
| 27. | FRYERS W/DUMP STATION | OFCI |

| ITEM NUMBER | ITEM DESCRIPTION | ITEM PRICE |
|---|---|---|
| 28. | ST. ST. WALL PANELING | OFCI |
| 29. | HOOD | CFCI $_____ |
| 30. | DUCT AND FAN | CFCI |
| 31. | TRENCH DRAIN | CFCI $_____ |
| 32. | WORK TABLE | OFCI |
| 33. | UNDER COUNTER FREEZER | OFCI |
| 34. | HEAT LAMP (2) | OFCI |
| 35. | HOT FOOD TABLE | OFCI. |
| 36. | REFRIGERATED PREP TABLE | OFCI. |
| 37. | DOUBLE OVER SHELF | OFCI |
| 38. | PICK-UP COUNTER | OFCI |
| 39. | DROP-IN SOUP WELLS (2) | OFCI |
| 40. | UNDER COUNTER DRAWER WARMER | OFCI |
| 41. | MICROWAVE | OFCI |
| 42. | BEVERAGE COUNTER W/SINK | OFCI |
| 43. | SODA UNIT | OFOI |
| 44. | WALL SHELF | OFCI |
| 45. | SLIDE-IN GLASS RACKS | OFOI |
| 46. | UNDER COUNTER REFRIGERATOR | OFCI |
| 47. | TEA BREWER | OFOI |
| 48. | COFFEE BREWER | OFOI |
| 49. | THREE COMPARTMENT SINK | OFCI |
| 50. | DOUBLE OVER SHELF | OFCI |
| 51. | DISH MACHINE | OFCI |
| 52. | SOILED DISH TABLE | OFCI |
| 53. | RACK SHELF | OFCI |
| 54. | SPARE NUMBER | |

| ITEM NUMBER | ITEM DESCRIPTION | ITEM PRICE |
|---|---|---|
| 55. | POT RACKS (2) | OFCI |
| 56. | TRASH CANS | OFOI |
| 57. | CAN OPENER | OFCI |
| 58. | DRAWER WARMER | OFCI |
| 59. | FILL FAUCET | OFCI |

**END OF SECTION 114000**