

**San Francisco Housing Authority**  
Solicitation No. 18-050-RFQ-0014-1

**ROOF LEAKS AND STRUCTURAL REPAIRS  
AT CAL 1-3, SUNNYDALE DEVELOPMENT**

**San Francisco, CA**

**Permit Set  
SPECIFICATIONS**

June 22, 2018





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1.1 DESIGN PROFESSIONALS OF RECORD

A. Architect:

1. Andrew C. Chen, RA
2. Architect License # C10872
3. Responsible for Divisions 01-07 Sections except where indicated as prepared by other design professionals of record.

B. Structural Engineer:

1. Michael J. Ross, PE, SE
2. Civil Engineer License # C51803 / Structural Engineer License # S4485
3. Responsible for Divisions 02 and 06.

END OF DOCUMENT 000107



DOCUMENT 000115 - LIST OF DRAWING SHEETS

1.1 LIST OF DRAWINGS

- A. Drawings: Drawings consist of the Contract Drawings and other drawings listed on the Table of Contents page of the separately bound drawing set titled San Francisco Housing Authority, Selected Repairs and Improvements Sunnydale Development, dated October 3, 2017, as modified by subsequent Addenda and Contract modifications.
- B. List of Drawings: Drawings consist of the following Contract Drawings and other drawings of type indicated:

- G1.0 TITLE SHEET, LEGEND, AND VICINITY MAP
- G2.1 SUNNYDALE SITE PLAN
- A1.1 TYPICAL ARCHITECTURAL DETAILS
- A2.1 ARCHITECTURAL ROOF PLANS
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- S2.1 STRUCTURAL ROOF PLANS

END OF DOCUMENT 000115





## SECTION 011000 - SUMMARY

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and Drawing conventions.
7. Miscellaneous provisions.

#### 1.2 PROJECT INFORMATION

A. Project Identification:

1. Project Name: San Francisco Housing Authority, Roof Leaks and Structural Repairs Sunnydale Development, San Francisco, CA.
2. Project Location: Sunnydale and Potrero Terrace/Annex Developments in San Francisco, CA.

B. Owner:

San Francisco Housing Authority  
1815 Egbert Ave., 3<sup>rd</sup> Floor  
San Francisco, CA 94124  
Mr. Simon Chu, Project Manager

C. Phone: 1-415-715-3266 Architect:

TECTONICS  
Architects / Planners / Engineers  
833 Market Street, Suite 502  
San Francisco, CA 94103  
Contact: Andrew C. Chen, Principal Architect  
Phone: 415-543-2133

### 1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and consists of the following:
1. The Scope of work shall be Selected Repairs of Roof Leaks and Structural Repairs, to the Sunnydale and Potrero Terrace/Annex Housing Developments , includes but not limited to the following:
    - a. Repair roofing as indicated.
    - b. Remove and replace damaged existing roof trusses as indicated in drawings.
    - c. Patch removed roofing and roof sheathing as indicated in drawings.
- B. Type of Contract:
1. Project will be constructed under a single prime contract.

### 1.4 GENERAL

- A. This section is intended for the Contractor's general information only and is not intended to be a list of the work intended for this project. The following pages are intended to provide the Contractor with general information regarding the scope of work required for the selected repairs and improvement project.
- B. The scope of work shall be indicated in the Construction Documents and by the requirements of each section. Where specific sections, are not referenced but material is required that would correspond to a specific section, it shall be implied that all material provided shall meet the requirements of the corresponding specification section.
- C. Review entire sections of the specification referenced. All pertinent section requirements must be fully adhered to for the completion of the work.
- D. The Contractor shall furnish all labor, materials, equipment and services necessary for and incidental to the completion of all work specified and intended in the Construction Documents. It shall be expressly understood that all detail work of the Construction Documents are not all inclusive since it is not possible to enumerate in every detail all utilities, deterioration, damage, or no longer serviceable parts or materials at the sites. Therefore, it shall be the Contractor's responsibility to make adequate pre-bid site inspections to ascertain the full extent of the existing conditions and to make all such repairs, replacements, installation etc. as may be necessary. Where it is discovered that materials or work differ substantially from the Construction documents, it is the responsibility of the Contractor to notify the Owner or the Owner's Representative immediately. All exposed surfaces shall present a neat finished appearance to match existing at the completion of the project. Accordingly omission involving minor repair work shall be performed by the Contractor without cost to the San Francisco Authority (SFHA),

- E. The Work includes all labor, materials, tools, fees, transportation, and service necessary for and properly incidental to the fabrication, delivery, and installation of the Project as described herein.
- F. The Work includes all items and features reasonable to be inferred therefrom as well as all work and materials required for complete installations and completely, properly detailed alterations. All work described herein must, when complete, be ready to receive the work of other contractors, and all must be acceptable to Owner or Owner's Representative and all regulatory agencies having jurisdiction, excepting only as may be specially excluded elsewhere herein. All work will be subject to independent engineering review for certification to the Owner to be approved directly by the Owner or Owner's Representative.
- G. The intent of the documents is to include all items necessary for the proper execution and completion of the Work. The documents are complimentary, and what is required by any one is binding as if required by all.
- H. The Contractor will be held to have carefully examined all of the various Construction Documents as well as all parts of the existing building, grounds, and approaches thereto, including existing structure, existing finish construction, and existing systems which may affect or be effected by the Work included in the Construction Documents and specified and to have made suitable allowance in his bid quotation for the conditions and limitations under which the Work is to be performed. No allowance will be made for additional cost to the Contractor resulting from his failure to acquaint himself with existing conditions, to compare same with the Construction Documents, and to notify the Owner or Owner's Representative in writing, before submission of final bid quotation, of any errors, discrepancies, omissions, or conflicts in the Construction Documents.

#### 1.5 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Access to the site must be coordinated with the Property Manager or Owner's Representative.
- C. Provide the Owner or Owner's Representative with access to the work at all times. Provide facilities for such access so the Owner's Representative may perform his function under the contract documents.
- D. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
  - 1. Driveways, Walkways and Entrances: Keep driveways, parking spaces, and entrances serving premises clear and available to tenants, Owner's Representative, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.

- a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
    - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
  - E. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.
  - F. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.
- 1.6 COORDINATION WITH OCCUPANTS (TENANTS)
- A. Partial Tenants Occupancy: Tenants will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Tenants during construction operations to minimize conflicts and facilitate Tenants usage. Perform the Work so as not to interfere with Tenant's operations. Maintain existing exits unless otherwise indicated.
    - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner's Representative and authorities having jurisdiction.
    - 2. Provide not less than 72 hours' notice to Owner's Representative of activities that will affect Owner's operations.
- 1.7 WORK RESTRICTIONS
- A. Work Restrictions, General: Comply with restrictions on construction operations.
    - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
  - B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 8:00 a.m. to 5:00 p.m., Monday through Friday, unless otherwise indicated.
    - 1. Weekend Hours: <Insert restrictions on times permitted for weekend work>.
    - 2. Early Morning Hours: <Insert restrictions or references to regulations by authorities having jurisdiction for restrictions on noisy work>.
    - 3. Hours for Utility Shutdowns: <Insert Owner's restrictions>.
    - 4. Hours for Noisy Activity: <Insert Owner's restrictions>.
  - C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Tenants or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Owner's Representative not less than two days in advance of proposed utility interruptions.
  2. Obtain Owner's Representative written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Tenants occupancy with Owner's Representative.
1. Notify Owner's Representative not less than two days in advance of proposed disruptive operations.
  2. Obtain Owner's Representative written permission before proceeding with disruptive operations.
- E. Restricted Substances: Use of tobacco products and other controlled substances is not permitted.
- F. Employee Identification: Owner's Representative will provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.
- G. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.
1. Maintain list of approved screened personnel with Owner's representative.

## 1.8 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
  2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. General provisions of the Contract, including, without limitation, the General and Supplementary Conditions and Division 1, "General Requirements", of these specifications apply to all work specified herein as fully as if repeated here. .
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
  2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.

3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.
- D. In case of conflict between or within the various Construction Documents, the more stringent requirement (as determined by the Owner or Owner's Representative) shall be furnished. This rule does not apply where one requirement is specifically modified or superseded by another and where additions to, deletions from, and other changes are specifically made, as in Addenda, Modifications, Change Orders, and the like. The general provisions of the Contract, including with limitation, the General and Supplementary Conditions, apply to work specified in this Section.

## 1.9 CONTRACTOR'S DUTIES

- A. Except as otherwise noted, provide an pay for:
  1. Labor, materials, transportation, and equipment.
  2. Tools, construction equipment, and machinery.
  3. Other facilities fee and services necessary for proper completion of Work.
- B. Pay legally required sales, consumer, and use taxes.
- C. Secure execute, complete application and pay for, as necessary, at the applicable time:
  1. Permit fees.
  2. Government fees.
  3. Licenses.
- D. Give all required notices, but not limited to 72 hours notification to a development Property Manager of schedule of construction at each development. The Contractor shall be responsible for notifying all residents of affected buildings in person if available and by posting door hangers on each resident's door. Also, the Contractor shall post no less than two signs in high traffic areas near the site alerting residents and neighbors of the work including duration and any utility service outages.
- E. Comply with codes, ordinances, rules, regulations, orders, and other legal requirements of public authorities which are applicable to Work.
- F. Do not perform Work knowing it to be contrary to laws, ordinances, rules, codes, or regulations.
- G. Notify Owner or Owner's Representative in writing, within 2 hours of delivery to insurance company agent of every claim made under any insurance required by the General Conditions.
- H. Coordinate Work by others.
- I. Observe and enforce Owner's or Owner's Representative security and other regulations.

- J. Make all necessary provisions for safety and protection of Owner's or Owner's Representative personnel, furnishings and equipment.
- K. Attend general coordination pre-construction meeting with Owner's Representative, Property Managers and SFHA personnel to review project schedule.

#### 1.10 ACCESS

- A. Access to the site must be coordinated with the Property Manager or Owner's designated site representative.
- B. Provide the Owner or Owner's Representative with access to the work at all times. Provide facilities for such access so the Owner's Representative may perform his function under the contract documents.
- C. Maintain public access to all buildings entrances, exits, stairs and garages during the course of the work. Protect such access where required by city ordinance or as necessary for the safety of public and property.

#### 1.11 CONTRACTOR USE OF SITE AND PREMISES

- A. Office Space: The Contractor will not be required to maintain an office on site.
- B. Facilities: The Contractor shall provide a portable toilet and security storage shed for use by his workers.

#### 1.12 RECORD SET OF DRAWINGS

- A. The Contractor shall be responsible to record all actual work performed on the record set of drawings which is updated and reviewed weekly. The Contractor shall furnish to the Owner's Representative with the complete record set of As-Built drawings upon completion of the project.

#### 1.13 CHANGE ORDERS

- A. At the option of the Owner or Owner's Representative, change orders will be issued to reflect the discrepancies between the listed unit price quantities and the quantities of the actual work.

#### 1.14 PERMITS AND GOVERNING CODES

- A. All work shall conform to all governing agency codes and ordinances including but not limited to the current San Francisco Building Code, and Standard Specifications, July 1986, Bureau of Engineering, Department of Public Works, City and County of San Francisco.

- B. The Contractor shall be responsible for obtaining all permits and for arranging all inspections. Refer to Supplementary General Conditions, Section 12 – Permits and Codes. (HUD-5370).

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000



## SECTION 024119 - SELECTIVE DEMOLITION

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

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

B. Contractor shall complete and submit all necessary information to obtain required permits.

C. Related Requirements:

1. Section 011000 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Section 017300 "Execution" for cutting and patching procedures.
3. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade improvements not part of selective demolition.

#### 1.2 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and store.

C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

#### 1.3 QUALITY ASSURANCE

A. Contractor shall utilize work persons skilled in the trades appropriate for each task.

B. Contractor shall take precautions to guard against movement, settlement, or collapse of any nearby structures not designated for demolition and is liable for the consequences of any such movement, settlement or collapse.

- C. Contractor shall prepare a fully coordinated plan for demolition, site shoring, and excavation work as indicated in the Contract Documents.
- D. Contractor shall not damage roots and trees not designated for demolition.

#### 1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and for noise control. Indicate proposed locations and construction of barriers.
- B. Schedule of Selective Demolition Activities: Indicate the following:
  - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's building manager and other tenants on-site operations are uninterrupted.
  - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
  - 3. Coordination for shutoff, capping, and continuation of utility services.
  - 4. Use of stairs.
  - 5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- C. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces that might be misconstrued as damage caused by demolition operations.
- D. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

#### 1.7 FIELD CONDITIONS

- A. Tenants will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Tenant's operations will not be disrupted.
- B. Explosive use or possession on site is not permitted.
- C. Contractor is required to conduct demolition operation and debris removal to minimize interference with roads, streets, walks, and other adjacent buildings and facilities. The Contractor shall not close or obstruct streets, walks, or other occupied and used

facilities without approval, and provide alternate routes around closed or obstructed traffic ways in accordance with applicable regulations. Do not allow equipment to pass over existing streets or other public and private property without ample protection. Protect and maintain existing fences, paths, and driveway concrete paving. Any such property, which is damaged as the result of operations, shall be restored to original condition.

- D. Comply with requirements of CCR Title 8, Construction Safety Orders, and California State Building Code. Protect adjacent structures, sidewalk, curbs and streets from settlement or other damage.
- E. Every precaution shall be taken by the Contractor to prevent spillage when hauling on or adjacent to any public street or highway. If spillage occurs, all such spillage shall be removed and the streets and highway shall be swept, washed or otherwise cleaned as required by the Owner or Owner's Representative.
- F. All precautions shall be taken by the Contractor to prevent dust nuisance to on-site and off-site facilities, and prevent erosion and transportation of soils to off-site properties. Any damage to facilities to remain caused by Contractor shall be repaired at the Contractor's expense.
- G. All portion of the Work shall be kept free of standing water at all times. Maintain uniform grades, construct ditches and provide and operate pumps as necessary to prevent erosion, softening of compacted surfaces and formation of mud in trenches and excavations. If ditches are required, they shall be constructed, tamped and maintain in a neat, uniform shape. Do not under any circumstances, conduct or pump water or allow water to be diverted or flow towards other areas of the site, which may, in the opinion of the Owner or Owner's Representative, be damaged thereby. Protect inlets from siltation as necessary.
- H. Conditions existing at time of inspection for bidding purpose will be maintained by Owner or Owner's Representative as far as practical.
- I. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- J. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
  - 1. Hazardous materials will be removed by Owner before start of the Work.
  - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- K. Hazardous Materials: Present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
  - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.

2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
  3. Owner will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures to be selectively demolished because of building operations or processes performed there.
- L. Storage or sale of removed items or materials on-site is not permitted.
- M. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
1. Maintain fire-protection facilities in service during selective demolition operations.

#### 1.8 PROTECTION

- A. Contractor shall provide, erect and maintain all catch platform, lights, barriers, weather protection, warning signs, and all other items as required for the proper protection of workers engaged in demolition operations, visitors, public and adjacent construction.
- B. Contractor shall provide adequate fire protection in accordance with all governing agency requirements.
- C. Provide and maintain temporary protection of all existing elements designated to remain including but not limited to utility lines, courtyard furniture, streets, light standards, planters, benches, tables, trees, and fire alarm boxes. Make all repairs necessitated by operations under this Section to the complete satisfaction of the owner of the damaged property.
- D. Make all necessary explorations to determine required protective measures before proceeding with demolition and removal work. Contractor shall provide shoring and bracing to prevent damage to elements to remain and/or adjacent properties.

#### 1.9 EXISTING UTILITIES

- A. Prior to starting any work related to existing utilities, notify the Owner's Representative seven days in advance and obtain the Owner's approval before proceeding with this phase of the Work.
- B. Contractor shall be responsible for protection of existing utility lines. If existing active utility lines are encountered, protect same from damage and notify the Owner's Representative. Do not interrupt service except as directed or accepted by the Owner's Representative and allow sufficient time to make arrangements for continuation of required services. Damage to said lines as a result of demolition operations shall be repaired or replaced as directed by the Owner or Owner's Representative.

- C. Protect existing active utilities as required to prevent unauthorized disruption of services. Prior to commencing any operations in the general location where utilities are indicated, determine exact alignment and depth of utilities.
- D. Abandon-in-Place existing utility piping, conduits, and other related items shown to be abandoned and plug remaining open ends with concrete to cap. Utility piping to be abandoned in place, cut, or capped shall be tagged with permanent markings identifying the type of service.
- E. Remove existing utilities shown to be removed, cap or plug remaining open ends, and backfill trenches per the Owner's Representative.

1.10 NOISE CONTROL

- A. Contractor shall comply with the noise ordinance and the Contracting Requirements within the Division 1 specifications.

1.11 DUST CONTROL

- A. Contractor shall comply with the dust control requirements and Contracting Requirements within the Division 1 specifications.

1.12 LANDSCAPE PROTECTION

- A. Protect existing trees and landscaping to remain.

1.13 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.14 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

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

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. Verify conditions in the field prior to the start of work. If unanticipated utility elements conflicts with the proper operation of systems that are to remain, investigate and measure both nature and extent of the conflict and notify the Owner's Representative prior to proceeding with demolition work.
- B. Provide shoring, bracing, and other supports as required to comply with all laws and regulations. If safety of adjacent structure and other elements appears to be endangered, cease operations and notify the Owner's Representative immediately. Take precautions to support endangered work until determination is made for continuing operations.

### 3.2 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner or Owner's Representative. Owner or Owner's Representative does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
  - 1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- E. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video and templates.

1. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

### 3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
  1. Owner or Owner's Representative will arrange to shut off indicated services/systems when requested by Contractor.
  2. Arrange to shut off utilities with utility companies.
  3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

### 3.4 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
  2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  4. Cover and protect furniture, furnishings, and equipment that have not been removed.
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
  1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

### 3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
  2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
  3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
  5. Maintain fire watch during and for at least 24 hours after flame-cutting operations.
  6. Maintain adequate ventilation when using cutting torches.
  7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  10. Dispose of demolished items and materials promptly
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Work in Historic Areas: Selective demolition may be performed only in areas of Project that are not designated as historic. In historic spaces, areas, and rooms, or on historic surfaces, the terms "demolish" or "remove" shall mean historic "removal" or "dismantling" as specified in Section 024296 "Historic Removal and Dismantling."
- D. Removed and Salvaged Items:
1. Clean salvaged items.
  2. Pack or crate items after cleaning. Identify contents of containers.
  3. Store items in a secure area until delivery to Owner.
  4. Transport items to Owner's storage area [on-site] [off-site] [designated by Owner] [indicated on Drawings].
  5. Protect items from damage during transport and storage.
- E. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
  2. Pack or crate items after cleaning and repairing. Identify contents of containers.



3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

- F. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

### 3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight. See Section <Insert Section number and title> for new roofing requirements.
1. Remove existing roof membrane, flashings, copings, and roof accessories.
  2. Remove existing roofing system down to substrate.

### 3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.
1. Do not allow demolished materials to accumulate on-site.
  2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn demolished materials.
- C. Removal: Transport from site and legally dispose of all removed materials.

### 3.8 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.
- B. Upon completion of all work under this Section, remove all tools, materials, apparatus and rubbish of any sort. The premises shall be left clean.

### 3.9 SELECTIVE DEMOLITION SCHEDULE

- A. Refer to drawings for demolition schedule.

END OF SECTION 024119

## SECTION 061053 - MISCELLANEOUS ROUGH 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. Framing with dimension lumber.
  - 2. Wood blocking and nailers.
- B. Related Requirements:
  - 1. Section 061600 "Sheathing" for sheathing, subflooring, and underlayment.

#### 1.3 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal (38 mm actual) size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater size but less than 5 inches nominal (114 mm actual) size in least dimension.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
  - 2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:

1. Preservative-treated wood.
2. Post-installed anchors.
3. Metal framing anchors.

#### 1.6 QUALITY ASSURANCE

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

### 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**
  3. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: **15 percent for 2-inch nominal (38-mm actual) thickness or less, 19 percent for more than 2-inch nominal (38-mm actual) thickness** unless otherwise indicated.

#### 2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWWPA U1; Use Category UC2 **for interior construction not in contact with ground**
- B. .
  1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. **Do not use inorganic boron (SBX) for sill plates.**
- C. 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.

- D. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- E. Application: Treat **items indicated on Drawings, and the following:**
  - 1. Wood sills, sleepers, blocking, and similar concealed members in contact with concrete.

### 2.3 DIMENSION LUMBER FRAMING

- A. Other Framing: [**No. 2**] grade of **the following** species:
  - 1. Douglas fir-larch; WCLIB or WWPA.
  - 2. Douglas fir-larch (north); NLGA.

### 2.4 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. Cants.
- B. Dimension Lumber Items: **No. 2** grade lumber of **the following species:**
- C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- E. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

### 2.5 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 A 153/A 153M.**
- B. Nails, Brads, and Staples: ASTM F 1667.

- C. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on **ICC-ES AC193** as appropriate for the substrate.
  - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

## 2.6 METAL FRAMING ANCHORS

- A. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.
  - 1. Use for wood-preservative-treated lumber and where indicated.
- B. Stainless-Steel Sheet: ASTM A 666, **Type 304**.
  - 1. Use for exterior locations and where indicated.

PART 3 - Retain "Flexible Flashing" Paragraph below if required as a separator between preservative-treated wood and metal decking

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 metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- D. Do not splice structural members between supports unless otherwise indicated.
- E. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
  - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.
- F. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

- G. Comply with AWWA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
  - 1. Use inorganic boron for items that are continuously protected from liquid water.
  - 2. Use copper naphthenate for items not continuously protected from liquid water.
- H. 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.
- I. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

### 3.2 WOOD BLOCKING AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

### 3.3 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.
- B. Protect miscellaneous rough carpentry from weather. If, despite protection, miscellaneous rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061053





## SECTION 061600 - SHEATHING

### 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. Roof sheathing.
- B. Related Requirements:
  - 1. **Section 061053 "Miscellaneous Rough Carpentry"** for plywood backing panels.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
  - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
  - 2. For products receiving waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:
  - 1. Wood-preservative-treated plywood.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

## PART 2 - PRODUCTS

### 2.1 WOOD PANEL PRODUCTS

- A. Emissions: Products shall meet the 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."
- B. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.
- C. Factory mark panels to indicate compliance with applicable standard.
- D. Kiln-dry material after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or does not comply with requirements for untreated material.

### 2.2 ROOF SHEATHING

- A. Plywood Sheathing: **Either DOC PS 1 or DOC PS 2 Exterior, Structural I]** sheathing.
  - 1. Span Rating: Not less than **24/0**.
  - 2. Nominal Thickness: Not less than **1/2 inch (13 mm)**.
- B. Oriented-Strand-Board Sheathing: DOC PS 2, **Exposure 1, Structural I** sheathing.
  - 1. Span Rating: Not less than **24/0**.
  - 2. Nominal Thickness: Not less than **1/2 inch (13 mm)**.

### 2.3 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
  - 1. For **roof** sheathing, provide fasteners **with hot-dip zinc coating complying with ASTM A 153/A 153M**.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

### 2.4 MISCELLANEOUS MATERIALS

- A. Adhesives for Field Gluing Panels to Wood Framing: Formulation complying with **APA AFG-01** that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
  - 2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in the ICC's International Residential Code for One- and Two-Family Dwellings.
  - 3. ICC-ES evaluation report for fastener.
- D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- E. Coordinate **roof** sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- F. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

### 3.2 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
  - 1. Retain fastening methods as required. Coordinate with building code requirements Wall and Roof Sheathing:
    - a. A continuous bead of glue applied to framing at edges of wall sheathing panels helps seal panel joints so sheathing functions as an air barrier. **Nail** to wood framing. **Apply a continuous bead of glue to framing members at edges of sheathing panels.**
    - b. Screw to cold-formed metal framing.
    - c. Space panels **1/8 inch (3 mm)** apart at edges and ends.

END OF SECTION 061600

## 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. Asphalt shingles.
  - 2. Underlayment.
  - 3. Metal flashing and trim.

#### 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 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at 264 Blythdale Avenue, San Francisco CA

#### 1.5 ACTION SUBMITTALS

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

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each type of asphalt shingle and underlayment product indicated, for tests performed by a qualified testing agency.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For asphalt shingles to include in maintenance manuals.

1.8 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.9 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.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended in writing by manufacturer.

1.11 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace asphalt shingles that fail within specified warranty period.

1. Failures include, but are not limited to, the following:

- a. Manufacturing defects.

- B. Roofing Installer's Warranty: On warranty form at end of this Section, signed by Installer, in which Installer agrees to repair or replace components of asphalt-shingle roofing that fail in materials or workmanship within specified warranty period.

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

## 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. Manufacturers and products

a. CertainTeed: Landmark.

b. GAF: Timberline.

c. Owens/Corning: Oakridge

2. Strip Size: Manufacturer's standard

3. Algae Resistance: Granules resist algae discoloration.

4. Impact Resistance: UL 2218, Class 4.

5. Color and Blends: As selected by Architect from manufacturer's full range.

- B. Hip and Ridge Shingles: [Manufacturer's standard units to match asphalt shingles.

### 2.3 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D 226/D 226M asphalt-saturated organic felts, nonperforated.

1. Type: Type I.

## 2.4 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- (3-mm-) diameter, sharp-pointed, with a minimum 3/8-inch- (9.5-mm-) diameter flat head and of sufficient length to penetrate 3/4 inch (19 mm) into solid wood decking or extend at least 1/8 inch (3 mm) 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 (25-mm) minimum diameter.

## 2.5 METAL FLASHING AND TRIM

- A. General: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
  - 1. Sheet Metal: Aluminum, mill finished.
- 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 4 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. 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. Single-Layer Felt Underlayment: Install on roof deck parallel with and starting at the eaves. Lap sides a minimum of 2 inches over underlying course. Lap ends a minimum of 4 inches. Stagger end laps between succeeding courses at least 72 inches. Fasten with felt-underlayment nails.
  - 1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3 inches in direction that sheds water. Lap ends of felt not less than 6 inches over self-adhering sheet underlayment.
  - 2. Install fasteners at no more than 36 inches o.c.
- C. 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 roofing nails.

1. Terminate felt underlayment extended up not less than 4 inches against sidewalls, and other roof projections.
- D. 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. Eaves: Extend from edges of eaves 24 inches beyond interior face of exterior wall.
  2. Rakes: Extend from edges of rake 24 inches beyond interior face of exterior wall.
  3. Ridges: Extend 36 inches on each side
  4. Chimneys, vents, and Other Roof-Penetrating Elements: Extend beyond penetrating element 18 inches and return vertically against penetrating element not less than 4 inches
  5. 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 at least 7 inches wide with self-sealing strip face up at roof edge.
  - 1. Extend asphalt shingles 3/4 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 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. 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 ("the 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 the 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 the 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 the work as are necessary to correct faulty and defective work and as are necessary to maintain the 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 the work and other parts of the building, and to building contents, caused by:
    - a. Lightning;
    - b. Peak gust wind speed exceeding 125 mph:

- 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 the 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 the work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of the work.
  4. During Warranty Period, if Owner allows alteration of the 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 the alterations, but only to the extent the alterations affect the work covered by this Warranty. If Owner engages Roofing Installer to perform the alterations, Warranty shall not become null and void unless Roofing Installer, before starting the alterations, notified Owner in writing, showing reasonable cause for claim, that the alterations would likely damage or deteriorate the work, thereby reasonably justifying a limitation or termination of this Warranty.
  5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a use or service more severe than originally specified, this Warranty shall become null and void on date of the change, but only to the extent the change affects the 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 the 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 the 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 the 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>, <Insert year>.

1. Authorized Signature: <Insert signature>.
2. Name: <Insert name>.
3. Title: <Insert title>.

END OF SECTION 073113

## SECTION 073216 - CONCRETE ROOF TILES

### 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. Concrete roof tiles.
  - 2. Underlayment.

- B. Related Requirements:

#### 1.3 DEFINITIONS

- A. Roofing Terminology: See ASTM D 1079, glossaries in TRI/WSRCA's "Concrete and Clay Roof Tile Design Criteria Installation Manual for Moderate Climate Regions," and NRCA's "NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

#### 1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at 264 Blythdale Avenue, San Francisco CA.

#### 1.5 ACTION SUBMITTALS

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

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Material Test Reports: For each type of concrete roof tile, based on evaluation of comprehensive tests performed by a qualified testing agency.

- B. Evaluation Reports: From ICC-ES or other testing and inspecting agency acceptable to authorities having jurisdiction, indicating that product is suitable for intended use under applicable building codes for the following:

- 1. Fasteners, and attachment systems.

- C. Sample Warranty: Manufacturer's materials warranty.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing to include in maintenance manuals.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store underlayment rolls in a dry, well-ventilated location protected from weather, sunlight, and moisture according to manufacturer's written instructions.

- 1. Store on end, on pallets or other raised surfaces. Do not double stack rolls.

- B. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

- C. Handle, store, and place roofing materials in a manner to prevent damage to roof deck or structural supporting members.

#### 1.9 FIELD CONDITIONS

- A. Environmental Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing to be installed according to manufacturer's written instructions and warranty requirements.

- 1. Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.

#### 1.10 WARRANTY

- A. Roofing Installer's Warranty: On warranty form at end of this Section, signed by Installer, in which Installer agrees to repair or replace components of concrete-tile roofing that fail in materials or workmanship within specified warranty period.

- 1. Warranty Period: TWO years from date of Substantial Completion.



## PART 2 - PRODUCTS

### 2.1 UNDERLAYMENT MATERIALS

- A. Felt Underlayment: ASTM D 226/D 226M, Type II, asphalt-saturated organic felt, unperforated.
- B. Roll-Roofing Underlayment: ASTM D 6380, Class M, Type II, asphalt-saturated and -coated organic felt, mineral-granule surfaced.
- C. Synthetic Underlayment: UV-resistant polypropylene, polyolefin, or polyethylene polymer fabric with surface coatings or treatments to improve traction underfoot and abrasion resistance; evaluated and documented to be suitable for use as a roof underlayment under applicable codes by a testing and inspecting agency acceptable to authorities having jurisdiction.
- D. Self-Adhering Sheet Underlayment, Granular Surfaced: ASTM D 1970/D 1970M, minimum of 40-mil-thick sheet; glass-fiber-mat-reinforced, SBS-modified asphalt; mineral-granule surfaced; with release paper backing; cold applied.
- E. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970/D 1970M, minimum of 40-mil-thick, slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified-asphalt adhesive, with release paper backing; cold applied.
- F. Self-Adhering Sheet Underlayment, High Temperature: Minimum of 40-mil-thick; with slip-resisting, polymer-film-reinforced or glass-reinforced top surface laminated to layer of butyl or SBS-modified-asphalt adhesive; with release backing; cold applied; and evaluated and documented to be suitable for use for intended purpose under applicable codes by a testing and inspecting agency acceptable to authorities having jurisdiction.
  - 1. Thermal Stability: Stable after testing at 240 deg F according to ASTM D 1970/D 1970M.
  - 2. Low-Temperature Flexibility: Passes after testing at minus 20 deg F according to ASTM D 1970/D 1970M.

### 2.2 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D 4586/D 4586M, Type II, asbestos free.
- B. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied.
- C. Roofing Asphalt: ASTM D 312, Type IV.

- D. Cold-Applied Adhesive: Manufacturer's standard asphalt-based, one- or two-part, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with underlayments.
- E. Wood Nailers: Comply with requirements for pressure-preservative-treated wood in Section 061053 "Miscellaneous Rough Carpentry."

### 2.3 FASTENERS

- A. Roofing Nails: ASTM F 1667, hot-dip galvanized-steel, **0.120-inch- (3.05-mm-)**diameter shank, sharp-pointed, conventional roofing nails with barbed shanks; minimum 3/8-inch diameter head; of sufficient length to penetrate 3/4 inch (**19 mm**) into substrate or through thickness of the sheathing, whichever is less.
  - 1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.
- B. Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized-steel wire with low-profile metal or plastic caps, 1-inch minimum diameter.
- C. Wood Batten Nails: ASTM F 1667; common or box, steel wire, flat head, and smooth shank.
- D. Wire Ties: Stainless steel 0.083-inch (2.11-mm) minimum diameter.

### 2.4 METAL FLASHING AND TRIM

- A. General: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
  - 1. Sheet Metal: match existing
- B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for design, dimensions, metal, and other characteristics of the item.
  - 1. Apron Flashings: Fabricate with lower flange extending a minimum of 4 inches over and 4 inches beyond each side of downslope tile roofing and 6 inches up the vertical surface.
  - 2. Channel Flashings: Fabricate with vertical surface extending a minimum of 4 inches above the concrete roof tile and 4 inches beneath the tile roofing, with a 1-inch high vertical return to form a runoff channel.

3. 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 provision has been made for flashings and penetrations through roofing.
- 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 concrete roof tile manufacturer's written instructions and with recommendations in NRCA's "NRCA Roofing Manual: Steep-Slope Roof Systems" unless more stringent requirements are indicated.
1. Cover ridge wood nailers with underlayment strips.
- B. Single-Layer Felt Underlayment: Install on roof deck parallel with and starting at the eaves. Lap sides a minimum of 2 inches over underlying course. Lap ends a minimum of 4 inches. Stagger end laps between succeeding courses at least 72 inches. Fasten with underlayment nails.
1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3 inches in direction that sheds water. Lap ends of felt not less than 6 inches over self-adhering sheet underlayment.

2. Install fasteners at no more than 36 inches o.c. Retain "Double-Layer Felt Underlayment" Paragraph below if required.
- C. Self-Adhering Sheet Underlayment: Install wrinkle free; 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 succeeding courses. Roll laps with roller. Cover underlayment within seven days.
1. Prime concrete and masonry surfaces to receive self-adhering sheet underlayment.
  2. Extend self-adhering sheet underlayment over entire roof deck.
  3. Eaves: Extend from edges of eaves 24 inches beyond interior face of exterior wall.
  4. Rakes: Extend from edges of rakes 24 inches beyond interior face of exterior wall.
  5. Ridges: Extend 36 inches on each side.
  6. Sidewalls: Extend 18 inches beyond sidewalls and return vertically against sidewalls not less than 4 inches.

### 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 concrete roof tile manufacturer's written instructions and recommendations in NRCA's "NRCA Roofing Manual: Steep-Slope Roof Systems."
- B. Apron Flashings: Extend lower flange over and beyond each side of downslope tile roofing and up the vertical surface.
- C. Step Flashings: Install with a head lap of 3 inches and extend both horizontally and vertically. Install with lower edge of flashing just upslope of, and concealed by, butt of overlying tile. Fasten to roof deck only.
- D. Cricket and Backer Flashings: Install against roof-penetrating elements, extending concealed flange beneath upslope tile roofing and beyond each side.

- E. Channel Flashings: Install over underlayment and fasten to roof deck.
- F. Rake Drip Edges: Install over underlayment and fasten to roof deck.
- G. Eave Drip Edges: Install beneath underlayment and fasten to roof deck.
- H. Pipe Flashings: Form flashing around pipe penetrations and tile roofing. Fasten and seal to tile roofing.

1.

### 3.4 WOOD NAILERS

- 1. Hips.
- 2. Ridges.
- 3. Rakes.
- B. Install beveled wood cant at eaves and securely fasten to roof deck.
- C. Install wood battens to match existing over existing substrate, at spacing required by concrete roof tile manufacturer, and securely fasten to roof deck.

### 3.5 CONCRETE ROOF TILE INSTALLATION

- A. General: Install concrete roof tiles according to manufacturer's written instructions and with recommendations in TRI/WSRCA's "Concrete and Clay Roof Tile Design Criteria Installation Manual for Moderate Climate Regions" and NRCA's "NRCA Roofing Manual: Steep-Slope Roof Systems" unless more stringent requirements are indicated.
  - 1. Maintain uniform exposure and coursing of concrete roof tiles throughout roof.
  - 2. Extend tiles 2 inches over eave fasciae.
  - 3. Nail Fastening: match existing.
    - a. Install wire through nail holes of cut tiles that cannot be nailed directly to roof deck, and fasten to nails driven into deck.
- B. Low-Profile, Flat-Shingle Concrete Roof Tile Installation:

1. Maintain 2-inch head lap between succeeding courses of concrete roof tiles.
2. Offset joints by half the concrete roof tile width in succeeding courses.
3. Extend concrete roof tiles 1 inch over fasciae at rakes.
4. Install ridge tiles in V-ridge configuration with laps facing away from prevailing wind. Seal laps with asphalt roofing cement.
  - a. Close voids where ridge tiles meet concrete roof tiles with [ridge closure tiles] [mortar struck with face of ridge cover tiles].
5. Install hip tiles in [V-ridge] [saddle] [mitered] configuration. Seal laps with [asphalt roofing cement] [butyl sealant] [elastomeric sealant].
  - a. Fill voids with mortar where hip tiles meet concrete roof tiles, and strike mortar flush with face of hip cover tiles.

C. Low-Profile, Flat Interlocking Concrete Roof Tile Installation:

1. Provide minimum 3-inch lap between succeeding courses of concrete roof tiles.
2. Offset joints by half the concrete roof tile width in succeeding courses.
3. Install existing L-shaped rake tiles.
4. Install ridge tiles in V-ridge configuration with laps facing away from prevailing wind. Seal laps with asphalt roofing cement.
  - a. Close voids where ridge tiles meet concrete roof tiles with ridge closure tiles if salvaged from existing or mortar struck with face of ridge cover tiles.
  - b. Fill voids with mortar where hip tiles meet concrete roof tiles, and strike mortar flush with face of hip cover tiles.

3.6 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS <Insert name> of <Insert address>, herein called the "Roofing Installer," has performed roofing and associated work ("the 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 the 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 the 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 the work as are necessary to correct faulty and defective work and as are necessary to maintain the 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 the work and other parts of the building, and to building contents, caused by:
    - a. Lightning;
    - b. Peak gust wind speed exceeding 120 mph;
    - 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 the 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 the work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of the work.
  4. During Warranty Period, if Owner allows alteration of the 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 the alterations, but only to the extent the alterations affect the work covered by this Warranty. If Owner engages Roofing Installer to perform the alterations, Warranty shall not become null and void unless Roofing Installer, before starting the alterations, notified Owner in writing, showing reasonable cause for claim, that the alterations would likely damage or deteriorate the work, thereby reasonably justifying a limitation or termination of this Warranty.
  5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a use or service more severe than originally specified, this Warranty shall become null and void on date of the change, but only to the extent the change affects the 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 the 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 the 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 the 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>, <Insert year>.

1. Authorized Signature: <Insert signature>.

2. Name: <Insert name>.

3. Title: <Insert title>.

END OF SECTION 073216



## 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. Formed roof-drainage sheet metal fabrications.
  - 2. Formed steep-slope roof sheet metal fabrications.
- B. Related Requirements:
  - 1. Section 061053 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking.
  - 2. Section 073113 - Asphalt Shingles for materials and installation of sheet metal flashing and trim integral with roofing.

#### 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 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at 264 Blythdale Avenue, San Francisco CA.
  - 1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
  - 3. Review requirements for insurance and certificates if applicable.
  - 4. Review sheet metal flashing observation and repair procedures after flashing installation.

## 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 edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
9. Include details of special conditions.
10. Include details of connections to adjoining work.
11. Trim, Metal Closures, Joint Intersections, and Miscellaneous Fabrications: 12 inches long and in required profile. Include fasteners and other exposed accessories.

## 1.6 INFORMATIONAL SUBMITTALS

### A. Qualification Data: For fabricator.

## 1.7 CLOSEOUT SUBMITTALS

### A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

## 1.8 QUALITY ASSURANCE

### A. Fabricator Qualifications: 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.

## 1.9 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.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

### 2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat surface.
  - 1. As-Milled Finish: One-side bright mill.
  - 2. Factory Prime Coating: Where painting after installation is required, pretreat metal with white or light-colored, factory-applied, baked-on epoxy primer coat; minimum dry film thickness of 0.2 mil

### 2.3 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt; nonperforated.
- B. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. minimum.

### 2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, 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 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 Aluminum Sheet: Aluminum or Series 300 stainless steel.
- C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, non-sag, nontoxic, non-staining tape 1/2 inch wide and 1/8 inch thick.
- D. Elastomeric Sealant: ASTM C 920, elastomeric polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- F. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- G. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.
- H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.5 MANUFACTURED SHEET METAL FLASHING AND TRIM

2.6 FABRICATION, GENERAL

- A. General: Custom fabricated 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 tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."
- 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. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- G. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- H. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.
- I. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.
- J. Do not use graphite pencils to mark metal surfaces.

## 2.7 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 and gutter accessories from same metal as gutters.
1. Expansion Joints: Lap type.
  2. Accessories: Wire-ball downspout strainer.
  3. Gutters with Girth up to 15 Inches: Fabricate from the following materials:
    - a. Aluminum: 0.032 inch thick.
  4. Gutters with Girth 16 to 20 Inches: Fabricate from the following materials:
    - a. Aluminum: 0.040 inch thick.
  5. Gutters with Girth 21 to 25 Inches: Fabricate from the following materials:
    - a. Aluminum: 0.050 inch thick.
  6. Gutters with Girth 26 to 30 Inches: Fabricate from the following materials:
    - a. Aluminum: 0.063 inch thick.
- B. Downspouts: Fabricate round to match existing conditions providing hangar style that matches existing..

## 2.8 STEEP-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Apron, Step, Cricket, and Backer Flashing: Fabricate from the following materials:
  1. Aluminum: 0.032 inch thick.
- B. Drip Edges: Fabricate from the following materials:
  1. Aluminum: 0.032 inch thick.
- C. Eave, Rake Flashing: Fabricate from the following materials:
  1. Aluminum: 0.032 inch thick.
- D. Counterflashing: Fabricate from the following materials:
  1. Aluminum: 0.032 inch thick.
- E. Flashing Receivers: Fabricate from the following materials:
  1. Aluminum: 0.032 inch thick.



## 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 that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
  - 2. 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. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.
- B. Synthetic Underlayment: Install synthetic underlayment, wrinkle free, according to manufacturers' written instructions, and using adhesive where possible to minimize use of mechanical fasteners under sheet metal.
- C. 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. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
  - 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
  - 3. Space cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
  - 4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.

5. Torch cutting of sheet metal flashing and trim is not permitted.
  6. 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. Coat concealed side of uncoated-aluminum sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
  2. 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.
  2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
1. Use sealant-filled joints unless otherwise indicated. 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. Do not solder aluminum sheet.
- G. Rivets: Rivet joints in uncoated aluminum where necessary for strength.
- 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 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 back of gutter that extends onto roof deck with cleats spaced not more than 24 inches apart.
  3. Anchor gutter with gutter brackets spaced not more than 36 inches apart to roof deck, unless otherwise indicated, and loosely lock to front gutter bead.
  4. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet apart. Install expansion-joint caps.
- 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. Connect downspouts to underground drainage system.

### 3.5 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.
- C. Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.
1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 24-inch centers.
  2. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch centers.
- D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.
- E. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.6 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