

# Appendix I

## Roofing Technical Specifications

SECTION 00 7000  
Scope of Work Summary/ Milestone Dates

*Note: Contractor shall provide adequate manpower to start and finish the roofs in the allotted completion schedule dates.*

**Entire Campus: Modified Bitumen (Base Bid)**

Scope of Work: Fisher Middle School

1. Tear off existing roof down to the wood sheathing and properly dispose of.
2. Remove all metal trim, flashings, gutters, downspouts, vents, pipe jacks, hoods, etc, and dispose of.
3. Inspect roof sheathing for damage or dry rot. Replace "like in kind".
4. Tach nail HPR Glasbase to wood sheathing.
5. Mechanically attach 1/2" Dens Deck Prime board per wind up lift requirements.
6. Install new metal trim, gutters, downspouts, vents, pipe jacks, hoods, etc with 22ga flat sheet
7. Install Stressbase 120(field), and Versiply 40(flashings) in HPR All Temp Asphalt.
8. Install Stressply EUV FR Mineral in HPR All Temp Asphalt.
9. Coat buildings with StrataMax coating.
10. Coat walkways with Liquitiec
11. Install new dura block conduit supports throughout.

END OF SECTION

## Owner Furnished Products

SECTION 01640  
OWNER FURNISHED PRODUCTS

**Fisher Middle School**

**PART 1 - GENERAL**

System Description

**1.1 GARLAND ROOFING SYSTEM; SOLE-SOURCE DESIGNATION**

- A. The roofing system specified in this Section (the "Garland Roofing System") is manufactured by The Garland Company, Inc. The District's Board of Trustees has, pursuant to Public Contract Code section 3400 and Board of Trustees Resolution No. 65-25/26, designated the Garland Roofing System as the only acceptable roofing system for this Project in order to match other products in use on a particular public improvement either completed or in the course of completion.
- B. Where The Garland Company, Inc. and specific Garland product designations are listed in this Section, such references are intended as sole-source requirements and are not "basis-of-design," "or equal," or exemplary references.
- C. Any prior or conflicting "or equal" language relating to roofing materials is hereby superseded with respect to the Garland Roofing System.

**1.2 DEFINITIONS**

- A. **GENERAL:** The following are used to identify products as noted on the Drawings.
- B. **OWNER FURNISHED CONTRACTOR INSTALLED (O.F.C.I.):** Products or equipment furnished by the Owner for installation under this contract.
- C. **OWNER FURNISHED OWNER INSTALLED (O.F.O.I.):** Products or equipment to be provided and installed by the Owner, but requiring surfacing, backing, utility connections or other preparation under this contract, for proper installation.
- D. **NOT IN CONTRACT (N.I.C.):** Products or equipment to be provided and installed by Owner, not requiring surfacing, backing, utility connections or other preparation under this contract.

**PART 2 - PRODUCTS**

**2.1 PRODUCTS**

- A. **ROOFING MATERIAL FURNISHED BY OWNER (O.F.C.I.):** District supplied material through the CMAS (California Multiple Award Schedules) program. Related specification sections include:  
Section 076200 Sheet Metal Flashing and Trim  
Section 075200 Modified Bitumen

## **OWNER SUPPLIED MATERIAL LIST**

### **Fisher Middle School: (Base Bid)**

- 230 - HPR Glasbase 3 sq. roll
- 700 – Stressbase 120 1 sq. roll
- 940 – Stressply EUV FR Mineral 0.75 sq. roll
- 280 – StrataMax 5 gal pail
- 450 – HPR All Temp Asphalt
- 5 – Garla Prime VOC 5 gal pail
- 32 – Liquitec Base Coat 4.5 gal pail
- 32 – Liquitec Top Coat 4.5 gal pail
- 80 – 22ga Flat Sheet (standard color) 4'x10'
- 20 – Versiply 40 2 sq. roll
- 94 – ½” Dens Deck 9.6 sq. pallets

Any shop drawings, materials or accessories required for the installation of the roof system in excess of the district provided material must be supplied by the **Contractor**. It is up to the Contractor to determine the precise amount of material required for the completion of this project; and to provide excess material, as required. The cost to handle and break flashing metal from the District provided flat stock is contractor's responsibility.

## **PART 3 - EXECUTION**

### **2.2 OWNER'S RESPONSIBILITIES**

- A. **SUBMITTALS**: Arrange for and deliver necessary shop drawings, product data and samples to Contractor.
- B. **DELIVERY**:
  - 1. **General**: Arrange and pay for product delivery to site, in accordance with construction schedule.
  - 2. **Bill of Materials**: Deliver supplier's documentation to Contractor.
  - 3. **Inspection**: Inspect jointly with Contractor.
  - 4. **Claims**: Submit for transportation damage and replacement of otherwise damaged, defective, or missing items.
- C. **GUARANTEES**: Arrange for manufacturer's warranties, bonds, service, inspections, as required.

## 2.3 CONTRACTOR'S RESPONSIBILITIES

- A. **SUBMITTALS:** Shop drawings, product data and samples and submit to Architect/Owner with notification of any discrepancies or problems anticipated in use of product.
- B. **DELIVERY:**
1. **General:** Designate delivery date for each product in Progress Schedule.
  2. **Receiving:** Receive and unload products at site. Handle products at site, including uncrating and storage.
  3. **Inspection:** Promptly inspect products jointly with Owner; record shortages, damaged or defective items.
  4. **Storage:** Protect products from damage or exposure to elements.
- C. **INSTALLATION:**
1. **General:** Assemble, install, connect, adjust and finish products, as stipulated in the respective section of Specifications.
  2. **Repair and Replacement:** Items damaged during handling and installation are responsibility of contractor.

\* End Section 01640 \*

## Modified Bituminous Membrane Roofing

SECTION 07 52 00  
MODIFIED BITUMINOUS MEMBRANE ROOFING  
Alum Rock UESD, Fischer School

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Provide all labor, equipment, and miscellaneous materials to install District purchased and furnished roofing materials over the properly prepared substrate

\*ALL products listed in 2.2 will be furnished by the District. All products not listed in 2.2 to be furnished by the Contractor. All products listed in 2.2 will be manufactured by The Garland Company and purchased by ARUSD.

1.2 RELATED SECTIONS

- A. Section 07 22 16 - Roof Board Insulation.

1.3 REFERENCES

- A. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants.
- B. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
- C. ASTM D 312 - Standard Specification for Asphalt used in Roofing.
- D. ASTM D 412 - Tensile Test on Rubber and Elastomers.
- E. ASTM D 2178 Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
- F. ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.
- G. ASTM D 6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.
- H. ASTM D 6163 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.
- I. ASTM D 6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
- J. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings
- K. Factory Mutual Research (FM): Roof Assembly Classifications.
- L. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.
- M. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.
- N. Underwriters Laboratories, Inc. (UL): Fire Hazard Classifications.

- O. Intertek/Warnock Hersey (WH): Fire Hazard Classifications.
- P. ANSI-SPRI ES-1 Wind Design Standard for Edge Systems used with Low Slope Roofing Systems.
- Q. ASCE 7, Minimum Design Loads for Buildings and Other Structures
- R. UL - Fire Resistance Directory.
- S. FM Approvals - Roof Coverings and/or RoofNav assembly database.
- T. FBC - Florida Building Code.
- U. Miami-Dade Building Code Compliance - N.O.A. (Notice of Acceptance).
- V. California Title 24 Energy Efficient Standards.

#### 1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Perform work in accordance with all federal, state and local codes.
- B. Exterior Fire Test Exposure: Roof system shall achieve a UL, FM or WH Class rating for roof slopes indicated on the Drawings as follows:
  - 1. Factory Mutual Class A Rating.
  - 2. Underwriters Laboratory Class A Rating.
  - 3. Intertek/Warnock Hersey Class A Rating.
- C. Design Requirements:
  - 1. Uniform Wind Uplift Load Capacity
    - a. Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria.
      - 1) Design Code: ASCE 7, Method 2 for Components and Cladding.
      - 2) Importance Category:
        - a) IV
      - 3) Wind Speed: 103 mph
      - 4) Exposure Category:
        - a) C.
      - 5) Design Roof Height: 15 feet.
      - 6) Minimum Building Width: 75 feet.
      - 7) Roof Pitch: 1.5 :12.
      - 8) Roof Area Design Uplift Pressure:
        - a) Zone 1 - Field of roof 30.1 psf
        - b) Zone 2 - Eaves, ridges, hips and rakes 38.3 psf
        - c) Zone 3 - Corners 45 psf
  - 2. Live Load: Not to exceed original building design.
  - 3. Dead Load:
    - a. Installation of new roofing materials shall not exceed the dead load capacity of the existing roof structure.
- D. Roof system shall have been tested in compliance with the following codes and test requirements:
  - 1. NEMO:
    - a. Certification NER-GRL-001.R3
  - 2. Intertek/Warnock Hersey
    - a. ITS Directory of Listed Products
  - 3. FM Approvals:
    - a. RoofNav Website

## 1.5 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation instructions.
- C. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation and vapor retarder, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane, prior to job start.
- D. Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with ASCE 7 and local Building Code requirements. Include a roof system attachment analysis report, certifying the system's compliance with applicable wind load requirements before Work begins.
- E. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
  - 1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
  - 2. Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.
  - 3. Product reflectivity and emissivity criteria to qualify for one point under the LEED credit category, Credit 7.2, Landscape & Exterior Design to Reduce Heat Island - Roof.
- F. Verification Samples: For each modified bituminous membrane ply product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- G. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147. Testing must be performed at 73 deg. F. Tests at 0 deg. F will not be considered.
- H. Manufacturer's Fire Compliance Certificate: Certify that the roof system furnished is approved by Factory Mutual (FM), Underwriters Laboratories (UL), Warnock Hersey (WH) or approved third party testing facility in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.
- I. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

## 1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified with documented ISO 9001 certification and minimum of twelve years of documented experience and must not have been in Chapter 11 bankruptcy during the last five years.
- C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.

- D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.
- E. Manufacturer's Field Supervision: A representative of the roof system manufacturer must be present (insert days here) days per week during the roof system installation.
- F. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.
- G. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

#### 1.7 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to commencing Work of this section.
- B. Review installation procedures and coordination required with related Work.
- C. Inspect and make notes of job conditions prior to installation:
  - 1. Record minutes of the conference and provide copies to all parties present.
  - 2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
  - 3. Installation of roofing system shall not begin until all outstanding issues are resolved to the satisfaction of the Architect.

#### 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.
- B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.
- C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface except store KEE-Stone HP and FB 60 rolls flat on a clean flat surface. No wet or damaged materials will be used in the application.
- D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50-degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.
- E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.
- F. Adhesive storage shall be between the range of above 50-degree F (10 degree C) and below 80-degree F (27 degree C). Area of storage shall be constructed for flammable storage.

#### 1.9 COORDINATION

- A. Coordinate Work with installing associated metal flashings as work of this section proceeds.

#### 1.10 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

#### 1.11 WARRANTY

- A. Upon completion of the work, provide the Manufacturer's written and signed Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due to defective material or workmanship, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition, in accordance with the terms of the Manufacturer's warranty, warranty requirements and limitations.
  - 1. Warranty Period: 30 years from date of acceptance (in accordance with manufacturer's applicable warranty).
- B. Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.
  - 1. Warranty Period:
    - a. 5 years from date of acceptance.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

- A. BASIS OF DESIGN: Acceptable Manufacturer: Garland Company, Inc. (The); 3800 E. 91st St., Cleveland, OH 44105. Tom Chapman 831-682-6827. Phone: 216-641-7500. Fax: 216-641-0633.
- B. Substitutions: Not permitted.
- C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.
- D. The Products specified are intended and the Standard of Quality for the products required for this project. If other products are proposed the bidder must disclose in the bid the manufacturer and the products that they intend to use on the Project. If no manufacturer and products are listed, the bid may be accepted only with the use of products specified.
  - 1. Bidder will not be allowed to change materials after the bid opening date.
  - 2. If alternate products are included in the bid, the products must be equal to or exceed the products specified. Supporting technical data shall be submitted to the Architect/ Owner for approval prior to acceptance.
  - 3. In making a request for substitution, the Bidder/Roofing Contractor represents that it has:
    - a. Personally investigated the proposed product or method, and determined that it is equal or superior in all respects to that specified.
    - b. Will provide the same guarantee for substitution as for the product and method specified.
    - c. Will coordinate installation of accepted substitution in work, making such changes as may be required for work to be completed in all respects.
    - d. Will waive all claims for additional cost related to substitution, which consequently become apparent.
    - e. Cost data is complete and includes all related cost under his/her contract or other contracts, which may be affected by the substitution.

- f. Will reimburse the Owner for all redesign cost by the Architect for accommodation of the substitution.
- 4. Architect/ Owner reserves the right to act as the final authority on the acceptance or rejection of any or all bids, proposed alternate roofing systems or materials that have met ALL specified requirement criteria.
- 5. Failure to submit substitution package, or any portion thereof requested, will result in immediate disqualification and consideration for that particular contractor's request for manufacturer substitution.

## 2.2 HOT APPLIED 2-PLY ASPHALT ROOFING

- A. Nailable Base Sheet: One ply fastened to the deck per wind uplift calculations.
  - 1. HPR Glasbase. OWNER SUPPLIED
- B. Install ½" Dens Deck Prime, mechanically fastened as per code. OWNER SUPPLIED
- C. Base (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
  - 1. StressBase 120: OWNER SUPPLIED
- D. Modified Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive.
  - 1. StressPly EUV FR Mineral:: OWNER SUPPLIED
- E. Interply Adhesive: (1 and 2)
  - 1. HPR All-Temp Asphalt: OWNER SUPPLIED
- F. Flashing Base Ply: One ply bonded to the prepared substrate with Interply Adhesive: except torch sheet.
  - 1. VersiPly 40: OWNER SUPPLIED
- G. Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive: except torch sheet.
  - 1. StressPly EUV FR Mineral:
- H. Flashing Ply Adhesive:
  - 1. HPR All-Temp Asphalt:
- I. Surfacing:
  - 1. Surface Coatings:
    - a. StrataMax: OWNER SUPPLIED

## 2.3 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

- A. Pre-Manufactured Edge Metal: R-Mer Force Flash-less Snap-On Fascia Cover and Splice Plate.
  - 1. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 24-gauge, 22 gauge or 20 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality
- B. Pre-Manufactured Edge Metal: R-Mer Drip Edge Fascia.
  - 1. 22-gauge steel.
  - 2. .
- C. Pre-Manufactured Edge Metal Finishes:
  - 1. Exposed and unexposed surfaces for mill finish flashing, fascia, and coping cap, as shipped from the mill.
  - 2. Exposed surfaces for coated panels:
    - a. Steel Finishes: fluorocarbon finish. Epoxy primer baked both sides, .2-.25 mils

thickness as approved by finish coat manufacturer.

Weathering finish as referred by National Coil Coaters Association (NCCA).

Provided with the following properties.

- 1) Pencil Hardness: ASTM D3363, HB-H / NCCA II-2.
  - 2) Bend: ASTM D-4145, O-T / NCCA II-19.
  - 3) Cross-Hatch Adhesion: ASTM D3359, no loss of adhesion.
  - 4) Gloss (60 deg. angle): ASTM D523, 25+/-5%
  - 5) Reverse Bend: ASTM D2794, no cracking or loss of adhesion.
  - 6) Nominal Thickness: ASTM D1005.
    - a) Primer: 0.2 mils.
    - b) Topcoat: 0.7 mils min.
    - c) Clear Coat 0.3 mils.
  - 7) Color: Provide as specified. (Subject to minimum quantities)
- D. Flashing Boot - Rubbertite Flashing Boot: Neoprene pipe boot for sealing single or multiple pipe penetrations adhered in approved adhesives as recommended and furnished by the membrane manufacturer.
- E. Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended and furnished by the membrane manufacturer.
- F. Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.
- G. Drain Flashings should be 4lb (1.8kg) sheet lead formed and rolled.
- H. Plumbing stacks should be 4lb (1.8kg) sheet lead formed and rolled.
- I. Liquid Flashing - Tuff-Flash Plus LO: An asphaltic-polyurethane, low odor, liquid flashing material designed for specialized details unable to be waterproofed with typical modified membrane flashings.
  1. Tensile Strength, ASTM D 412: 650 psi.
  2. Elongation, ASTM D 412: 325%
  3. Density @77 deg. F 8.3 lb/gal typical.
- J. Fabricated Flashings: Fabricated flashings and trim are specified in Section 07 62 00 - Sheet Metal Flashing and Trim.
  1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the CDA Copper Development Association "Copper in Architecture - Handbook" as applicable.
- K. Manufactured Roof Specialties: Shop fabricated copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are specified in Section 07 71 23.
  1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and

elements.

- C. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.
- D. If substrate preparation and other conditions are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.2 PREPARATION

- A. General: Clean surfaces thoroughly prior to installation.
  - 1. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
  - 2. Fill substrate surface voids that are greater than 1/4 inch wide with an acceptable fill material.
  - 3. Roof surface to receive roofing system shall be smooth, clean, free from loose gravel, dirt and debris, dry and structurally sound.
  - 4. Wherever necessary, all surfaces to receive roofing materials shall be power broom and vacuumed to remove debris and loose matter prior to starting work.
  - 5. Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.
  - 6. Fasteners and plates for fastening components mechanically to the substrate shall provide a minimum pull-out capacity of 300 lbs. (136 k) per fastener. Base or ply sheets attached with cap nails require a minimum pullout capacity of 40 lb. per nail.
  - 7. Prime decks where required, in accordance with requirements and recommendations of the primer and deck manufacturer.
- B. Wood Deck:
  - 1. Dimensional wood deck shall be minimum 1 inch (25 mm) thick, knotholes and cracks larger than 1/4 inch shall be covered with sheet metal. All boards shall be appropriately nailed and have adequate end bearing to the centers of beams/rafters. Lumber shall be kiln dried.
  - 2. Plywood shall be a minimum 15/32 inch (11.9 mm) thick and conform to the standards and installation requirements of the American Plywood Association (APA).
  - 3. If no roof insulation is specified, provide a suitable dry sheathing paper, followed by an approved base sheet nailed appropriately for the specified roof system, with 1 inch (25 mm) diameter caps and annular nails unless otherwise required by the applicable Code or Approval agency.
  - 4. Insulation is to be mechanically attached in accordance with the insulation manufacturer's recommendations unless otherwise required by the applicable Code.
  - 5. In all retrofit roof applications, it is required that deck be inspected for defects. Any defects are to be corrected per the deck manufacturer's recommendations and standards of the APA/Engineered Wood Association prior to new roof application.
  - 6. Light metal wall ties or other structural metal exposed on top of the wood deck shall be covered with one ply of a heavy roofing sheet, such as HPR Glasbase Base Sheet, extending 2 inches to 6 inches (51 mm to 152 mm) beyond the metal in all directions. Nail in place before applying the base ply.

### 3.3 INSTALLATION - GENERAL

- A. Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors Association's Roofing & Waterproofing Manual, the Asphalt Roofing Manufacturers Association, and applicable codes.
- B. General: Avoid installation of modified bitumen membranes at temperatures lower than 40-

45 degrees F. When work at such temperatures unavoidable use the following precautions:

1. Take extra care during cold weather installation and when ambient temperatures are affected by wind or humidity, to ensure adequate bonding is achieved between the surfaces to be joined. Use extra care at material seam welds and where adhesion of the applied product to the appropriately prepared substrate as the substrate can be affected by such temperature constraints as well.
  2. Unrolling of cold materials, under low ambient conditions must be avoided to prevent the likelihood of unnecessary stress cracking. Rolls must be at least 40 degrees F at the time of application. If the membrane roll becomes stiff or difficult to install, it must be replaced with roll from a heated storage area.
- C. Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water
- D. All slopes greater than 2:12 require back-nailing to prevent slippage of the ply sheets. Use ring or spiral-shank 1 inch cap nails, or screws and plates at a rate of 1 fastener per ply (including the membrane) at each insulation stop. Place insulation stops at 16 ft o.c. for slopes less than 3:12 and 4 feet o.c. for slopes greater than 3:12. On non-insulated systems, nail each ply directly into the deck at the rate specified above. When slope exceeds 2:12, install all plies parallel to the slope (strapping) to facilitate backnailing. Install 4 additional fasteners at the upper edge of the membrane when strapping the plies.

### 3.4 INSTALLATION HOT APPLIED ROOF SYSTEM

- A. Base/Felt Ply(s): Install base sheet or felt plies in twenty-five (25) lbs (11.3kg) per square of bitumen shingled uniformly to achieve one or more plies over the entire prepared substrate. Shingle in direction of slope of roof to shed water on each area of roof. Do not step on base rolls until asphalt has cooled, fish mouths should be cut and patched.
1. Lap ply sheet ends 8 inches (203 mm). Stagger end laps 2 inches (304mm) minimum.
  2. Install base flashing ply to all perimeter and projection details after membrane application.
  3. Extend plies 2 inches beyond top edges of cants at wall and projection bases.
  4. Install base flashing ply to all perimeter and projection details.
  5. Allow the one ply of base sheet to cure at least 30 minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.
- B. Modified Cap Ply(s): Solidly bond the modified membrane to the base layers with specified material at the rate of 25 to (30). (11-13kg) per 100 square feet.
1. Roll must push a puddle of hot material in front of it with material slightly visible at all side laps. Use care to eliminate air entrapment under the membrane. Exercise care during application to eliminate air entrapment under the membrane.
  2. Apply pressure to all seams to ensure that the laps are solidly bonded to substrate.
  3. Install subsequent rolls of modified membrane as above with a minimum of 4-inch (101 mm) side laps and 8-inch (203 mm) end laps. Stagger end laps. Apply membrane in the same direction as the previous layers but stagger the laps so they do not coincide with the laps of the base layers.
  4. Apply hot material no more than 5 feet (1.5 m) ahead of each roll being embedded.
  5. Extend membrane 2 inches (50 mm) beyond top edge of all cants in full moppings of the specified hot material.
- C. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.

- D. Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips as specified in Section 06 11 00.
1. Provide nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.
  2. Wood nailers should match the height of any insulation, providing a smooth and even transition between flashing and insulation areas.
  3. Nailer lengths should be spaced with a minimum 1/8-inch gap for expansion and contraction between each length or change of direction.
  4. Nailers and flashings should be fastened in accordance with Factory Mutual "Loss Prevention Data Sheet 1 -49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs/lineal foot in any direction.
- E. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified in Section 07 62 00 or Section 07 71 23. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual.
- F. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.
- G. Flashing Base Ply: Install flashing sheets by the same application method used for the base ply.
1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
  2. Prepare all walls, penetrations, expansion joints and surfaces to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
  3. Adhere to the underlying base flashing ply with specified hot material unless otherwise noted in these specifications. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
  4. Solidly adhere the entire sheet of flashing membrane to the substrate.
  5. Coordinate counter flashing, cap flashings, expansion joints, and similar work with modified bitumen roofing work as specified.
  6. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.
- H. Flashing Cap Ply: Install flashing cap sheets by the same application method used for the cap ply.
1. Seal curb, wall, and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
  2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
  3. Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
  4. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
  5. Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system work.
  6. All stripping shall be installed prior to flashing cap sheet installation.
  7. Heat and scrape granules when welding or adhering at cut areas and seams to granular surfaces at all flashings.
  8. Secure the top edge of the flashing sheet using a termination bar only when the wall

- surface above is waterproofed or nailed 4 inches o.c. and covered with an acceptable counter flashing.
9. Seal all vertical laps of cap flashing ply with a three-course application of trowel-grade mastic and fiberglass mesh.
- I. Surface Coatings: Apply roof coatings in strict conformance with the manufacturer's recommended procedures.
- J. Roof Walkways: Provide walkways in areas indicated on the Drawings.

### 3.5 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

- A. Pre-Manufactured Snap-On Metal Edge System:
1. Position base plies of the built-up and/or modified roofing membrane over the roof edge covering nailers completely, fastening 8 inches (203 mm) o.c.. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.
  2. Cant Dam: Install Cant Dam overlapping Cant a minimum of 1 inch. Fasten Cant Dam through the top of nailer and outside face in accordance with ANSI/SPRI ES-1 test report.
  3. BUR or Modified Flashing: Prime Cant Dam at a rate of 100 square feet per gallon and allow to dry.
  4. Strip in Cant Dam with base flashing membrane extending 6 inches (152 mm) into roof field, followed with a cap sheet extending 9 inches into the roof field. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.
  5. Fascia Cover: Install fascia cover with splice plate under one end by pressing downward firmly until "snap" occurs, and cover is engaged along entire length of miter. Field cut where necessary with fine tooth saw.
  6. Sealant is to be placed between splice plates on metal edge pieces.
  7. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof.
- B. Curb Detail/Air Handling Station:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
  2. Set cant in bitumen. Run all field plies over cant a minimum of 2 inches (50 mm).
  3. Install base flashing ply covering curb set in bitumen with 6 inches (152 mm) on to field of the roof.
  4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
  5. Install pre-manufactured counterflashing with fasteners and neoprene washers or per manufacturer's recommendations.
  6. Set equipment on neoprene pad and fasten as required by equipment manufacturer.
- C. Exhaust Fan:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
  2. Set cant in bitumen. Run all plies over cant a minimum of 2 inches (50 mm).
  3. Install base flashing ply covering curb with 6 inches (152 mm) on to field of the roof.
  4. Install a second ply of modified flashing ply installed over the base flashing ply, 9 inches (228 mm) on to field of the roof. Attach top of membrane to top of wood curb and nail at 8 inches (203 mm) o.c. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
  5. Install metal exhaust fan over the wood nailers and flashing to act as counterflashing.

Fasten per manufacturer's recommendation.

D. Plumbing Stack:

1. Minimum stack height is 12 inches (609 mm).
2. Run roof system over the entire surface of the roof. Seal the base of the stack with elastomeric sealant.
3. Prime flange of new sleeve. Install properly sized sleeves set in 1/4-inch (6 mm) bed of roof cement.
4. Install base flashing ply in bitumen.
5. Install membrane in bitumen.
6. Caulk the intersection of the membrane with elastomeric sealant.
7. Turn sleeve a minimum of 1 inch (25 mm) down inside of stack.

3.6 CLEANING

- A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.
- B. Remove asphalt markings from finished surfaces.
- C. Repair or replace defaced or disfigured finishes caused by Work of this section.

3.7 PROTECTION

- A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes, and the like to protect personnel, roofs and structures, vehicles and utilities.
- B. Protect exposed surfaces of finished walls with tarps to prevent damage.
- C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.
- D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.
- E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.8 FIELD QUALITY CONTROL

- A. Inspection: Provide manufacturer's field observations at start-up and at intervals of approximately 30 percent, 60 percent, and 90 percent completion. Provide a final inspection upon completion of the Work.
  1. Warranty shall be issued upon manufacturer's acceptance of the installation.
  2. Field observations shall be performed by a Sales Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.
  3. Provide observation reports from the Sales Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.
  4. Provide a final report from the Sales Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

3.9 SCHEDULES

Roofing Contractor to be responsible for all Garland materials in excess of District purchased and furnished amount. District to provide material quantities matching the specified amount below. Any additional Garland material required to complete the project is the responsibility of the roofing

contractor. Roofing Contractor responsible for purchasing additional materials required, including all freight and tax charges.

Roofing contractor to be at delivery of District purchased roof materials. The District has no responsibility to provide any equipment for handling and / or loading the materials to the Contractor's trucks. District reserves the right to have all material delivered and stored by the contractor on non- District property at no additional charge to the District. Upon signature of delivery, the roofing contractor assumes full responsibility for all District purchased roof materials. Any materials lost or stolen are the responsibility of the roofing contractor to replace. Roofing Contractor responsible for freight and tax on the replaced materials.

Maximum quantity of the OFCI materials which will be provided to the Contractor are as follows:

| Material                 | Amount | Unit Size |
|--------------------------|--------|-----------|
| HPR Glasbase             | 230    | Roll      |
| Stressbase 120           | 700    | Roll      |
| Stressply EUV FR Mineral | 940    | Roll      |
| Versiply 40              | 20     | Roll      |
| Stratamax roof coating   | 280    | 5 Gal     |
| Dens Deck Prime          | 73     | Pallet    |
| HPR All Temp Asphalt     | 450    | 100# Keg  |

A. Base (Ply) Sheet:

1. StressBase 120: 120 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet with dual fiberglass reinforced scrim. ASTM D 6163, Type I.
  - a. Tensile Strength, ASTM D 5147
    - 1) 2 in/min. @ 0 +/- 3.6 deg. F MD 100 lbf/in XD 100 lbf/in
    - 2) 50mm/min. @ -17.78 +/- 2 deg. C MD 17.5 kN/m XD 17.5 kN/m
  - b. Tear Strength, ASTM D 5147
    - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 100 lbf XD 85 lbf
    - 2) 50mm/min. @ 23 +/- 2 deg. C MD 444 N XD 378 N
  - c. Elongation at Maximum Tensile, ASTM D 5147
    - 1) 2 in/min. @ 0 +/- 3.6 deg. F MD 4 % XD 4 %
    - 2) 50mm/min @ -17.78 +/- 2 deg. C MD 4 % XD 4 %
  - d. Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)

B. Thermoplastic/Modified Cap (Ply) Sheet:

1. StressPly EUVFR Mineral: 160 mil SBS (Styrene-Butadiene-Styrene) rubber modified membrane incorporating post-consumer recycled rubber and reinforced with a fiberglass and polyester composite scrim. ASTM D 6162 Type III Grade G
  - a. Tensile Strength, ASTM D 5147
    - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 550 lbf/in XD 500 lbf/in
    - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 96.25 kN/m XD 87.5 kNm
  - b. Tear Strength, ASTM D 5147
    - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 900 lbf XD 950 lbf
    - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 2557 N XD 2535 N
  - c. Elongation at Maximum Tensile, ASTM D 5147

- 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 10% XD 10%
    - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 10% XD 10%
  - d. Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34.44 deg. C)
  - e. Recycled Content (Pre-Consumer): 2%
  - f. Recycled Content (Post-Consumer): 12%
  - g. Bio-Based Content: 1%
- C. Interply Adhesive:
  - 1. HPR All-Temp Asphalt: Hot Bitumen, high penetration, high softening point mopping asphalt having the following characteristics:
    - a. Softening Point 225 deg. F - 235 deg. F
    - b. Flash Point 525 deg. F
    - c. Penetration @ 77 deg. F 16-20 units
    - d. Ductility @ 77 deg. F 1.5-2.0 cm
- D. Flashing Base Ply:
  - 1. VersiPly 40: 40 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet with dual fiberglass reinforced scrim.
    - a. Tensile Strength, ASTM D 5147
      - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 215 lbf/in XD 215 lbf/in
      - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 37.5 kN/m XD 37.5 kN/m
    - b. Tear Strength, ASTM D 5147
      - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 275 lbf XD 275 lbf
      - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 1223 N XD 1223 N
    - c. Elongation at Maximum Tensile, ASTM D 5147
      - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 4.5% XD 4.5%
      - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 4.5% XD 4.5%
    - d. Low Temperature Flexibility, ASTM D 5147
      - 1) Passes -30 deg. F (-34 deg. C). Meets or Exceeds ASTM D 4601 Type II Performance Criteria.
- E. Flashing Cap (Ply) Sheet:
  - 1. StressPly EUV FR Mineral: 160 mil SBS (Styrene-Butadiene-Styrene) rubber modified membrane incorporating post-consumer recycled rubber and reinforced with a fiberglass and polyester composite scrim. ASTM D 6162 Type III Grade G.
    - a. Tensile Strength, ASTM D 5147
      - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 550 lbf/in XD 500 lbf/in
      - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 96.25 kN/m XD 87.5 kNm
    - b. Tear Strength, ASTM D 5147
      - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 900 lbf XD 950 lbf
      - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 4002 N XD 4225 N
    - c. Elongation at Maximum Tensile, ASTM D 5147
      - 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 10% XD 10%
      - 2) 50 mm/min. @ 23 +/- 2 deg. C MD 10% XD 10%
    - d. Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F ( -34.44 deg. C)
- F. Flashing Ply Adhesive:
  - 1. HPR All-Temp Asphalt: Hot Bitumen, high penetration, high softening point mopping asphalt having the following characteristics:
    - a. Softening Point 225 deg. F - 235 deg. F
    - b. Flash Point 525 deg. F
    - c. Penetration @ 77 deg. F 16-20 units
    - d. Ductility @ 77 deg. F 1.5-2.0 cm
- G. Surfacing:
  - 1. Surface Coatings:
    - a. Surfacing:

- 1) StrataMax: Lightweight elastomeric roof coating, Energy Star approved acrylic roof coating
  - a) Weight/Gallon 8.4 lbs./gal. (1 mg/L)
  - b) Non-Volatile % (ASTM D 1644) 64% min.
  - c) VOC: > 50 g/l

END OF SECTION

## Preparation for Roof Replacement

SECTION 07 0150

PREPARATION FOR ROOF REPLACEMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Removal of existing Roofs in preparation for new modified bitumen system.
- B. Salvaging, and protect existing PV Stanchions, HVAC Equipment, Exhaust, and Intake Hoods.
- C. Clean metal portable roof in preparation for restoration coating

1.02 RELATED REQUIREMENTS

- A. Section 065100 - Rough Carpentry
- B. Section 075200 – Modified Bitumen Roofing
- C. Section 07610 Sheet Metal Flashing and Trim

1.03 PROJECT CONDITIONS

- A. Conform to applicable regulatory procedures when hazardous or contaminated materials are discovered.
- B. Schedule work to coincide with commencement of installation of new roofing system.
- C. Remove only existing roofing materials that can be replaced with new materials the same day.
- D. Coordinate the work with other affected mechanical and electrical work associated with roof penetrations.
- E. Do not disable or disrupt building fire or life safety systems without 10 (ten) days' prior written notice to Owner.
- F. Do not close or obstruct egress from any building exit or site exit.
- G. Conduct roof removal to minimize interference with adjacent and occupied building areas.
- H. Use all means necessary to protect existing objects, construction and plantings designated to remain. In the event of damage, make all repairs and replacements necessary for approval of Owner at no additional cost to the Owner.
- I. Protective measures: Provide all necessary safeguards, including warning signs and lights, barricades, and the like, for protection of the public, Contractor's employees and existing improvements during demolition. Prevent access of unauthorized persons to area of work
- J. Provide at least one person who shall be present at all times during execution of this portion of the work, be thoroughly familiar with the type of work being performed and

the best methods for its execution and who shall direct all work performed under this Section.

- K. Control the use of water to prevent damage to the existing facilities to remain. Provide wet vacuum equipment where water, such as waste cooling water from concrete sawing or water used as dust emollient, is used adjacent to and in existing buildings.
- L. Cease operations immediately if structure appears to be in danger and notify Owner's rep. Do not resume operations until directed.

#### 1.04 SCHEDULING

- A. Schedule work under the provisions of Section 01310.
- B. Schedule work to coincide with Solar and HVAC roof work.
- C. Coordinate preparation for roofing with other trades to assure the proper sequence, limits, methods and time of performance. Schedule work so as to impose a minimum of hardship on the present operation of facilities and the performance of the work of other trades or contracts.
- D. Describe removal procedures and schedule.

#### 1.05 FIELD CONDITIONS

- A. Do not remove existing roofing membrane when weather conditions threaten the integrity of the building contents or intended continued occupancy.
- B. Maintain continuous temporary protection prior to and during installation of new roofing system.

### PART 2 PRODUCTS

#### 2.01 MATERIALS

- A. Temporary Protection: Sheet polyethylene; provide weights and temporary fasteners to retain sheeting in position.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify that existing roof surface is clear and ready for work of this section.

#### 3.02 PREPARATION

- A. Provide, erect, and maintain temporary barriers at locations required to prevent unauthorized access to area of work.
- B. Inspect the area of work and verify locations of all items designated to be removed or preserved.
- C. Do not begin work until temporary barricades, warning signs and other forms of protection are installed.
- D. Erect and maintain weatherproof closures for exterior openings.

- E. Erect and maintain temporary partitions to prevent spread of dust, odors, and noise to permit continued occupancy of adjacent buildings.
- F. Protect existing equipment, materials and features that are not to be demolished or removed for re-installation.
- G. Prevent movement of structure; provide bracing and shoring.
  - 1. Be responsible for the adequacy and design of all temporary shoring and bracing systems.
- H. Notify affected utility companies before starting work and comply with their requirements.
  - 1. Mark location and termination of utilities.
  - 2. Provide appropriate temporary signage including signage for exit or building egress.
- I. Sweep roof surface clean of loose matter.
- J. Remove loose refuse and dispose of offsite.

### 3.03 MATERIAL REMOVAL

- A. Disconnect, cap, and identify designated utilities within removal areas.
- B. Remove metal flashings as required.
- C. Remove roofing membrane, shingles, perimeter base flashings, flashings around roof protrusions, pitch pans and pockets as required.
- E. Repair existing wood deck surface to provide smooth working surface for new roof system.
- F. Work not mentioned to be removed that interferes with new construction shall be cut to clean cut lines to provide for proper interface with new construction, or patching and repair, as required for scope of work indicated.

### 3.04 PROTECTION

- A. Provide temporary protective sheeting over uncovered deck surfaces.
- B. Turn sheeting up and over parapets and curbing. Retain sheeting in position with temporary fasteners.
- C. Provide for surface drainage from sheeting to existing drainage facilities.
- D. Do not permit traffic over unprotected or repaired deck surface.

### 3.05 SALVAGE

- A. Items indicated to be re-installed shall be removed carefully, cleaned and stored in a protected location on or off the site until re-installed.

### 3.06 PATCHING

- A. Patch materials to remain when damaged by this work. Finish materials and appearance of the patch or repair work shall match the existing contiguous materials and finishes in all respects and shall be approved by Owner.

- B. Where materials are removed oversize or in improper location, replace the excess removed material as instructed by Owner at no additional cost to the Owner.

### 3.07 RE-INSTALLATION

- A. Re-Install removed items as indicated on roof plans or details. Securely attach, provide watertight, weatherproof installation.

### 3.08 CLEAN-UP AND DISPOSAL

- A. Debris, waste, and removed materials, other than items to be salvaged, are Contractor's property for legal disposal off the site, as required by applicable Federal and State regulations. Continuously clean up and remove these items. Do not allow removed items to accumulate.
- B. Leave the site in a neat and orderly condition prepared for the work of other trades.

END OF SECTION

## Rough Carpentry

## 2026 Fisher Middle School Re-Roof Project

### Alum Rock Unified School District

#### **SECTION 06 5100 ROUGH CARPENTRY**

##### **PART 1 GENERAL**

###### **1.01 SUMMARY**

A. This section specifies rough carpentry, including all framing, and sheathing.

1. All damaged or dry rot wood to be replaced 'like in kind'.

###### **1.02 RELATED SECTIONS**

- A. Section 07000 - Scope of Work Milestones
- B. Section 07015 - Preparation for roof replacement
- C. Section 07221 – Roof Insulation
- F. Section 07610 – Sheet metal flashing and trim

###### **1.03 QUALITY ASSURANCE**

A. Furnish materials complying with the following:

1. Softwood Lumber.
  - a. Graded in accordance with the latest edition of "Standard Grading Rules No. 17," WCLIB, or "Western Grading Rules," WWP. Lumber grades specified below are taken from "Standard Grading Rules, No. 17." Equal grades from "Western Grading Rules" are acceptable. Furnish lumber bearing a recognized grading bureau mark or a "Certificate of Grade" may be substituted. Where a grade for Douglas Fir (DF) species is indicated, other species, if approved by the COR, may be supplied on an equal stress grade basis.
2. Pressure Treatment.
  - a. Waterborne, conforming to AWPA C2, AWPA P5.
3. Plywood.
  - a. Graded in accordance with APA PS 1-95. Furnish panels identifiable by a grade trademark of a recognized grading association. Index numbers listed (i.e. 24/0) may be larger but not smaller than shown.
4. All materials and construction techniques shall meet applicable Local codes or the requirements herein, whichever is stricter.

##### **PART 2 - PRODUCTS**

###### **2.01 MATERIALS**

A. Lumber.

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1. Furnish S4S lumber, unless otherwise shown on drawings. Furnish lumber with a moisture content of 19 percent or less for material 3 inches and less in nominal thickness, unless otherwise specified.
- B. 15 lb. felt.
  1. Install under pressure treated wood in contact with concrete.
- C. Framing Members.
  1. Beams.
    - a. 4 inches and less in width: No.2, DF, S-dry.
    - b. 5 inches and wider: No. 1 DF.
  2. Joists and Stair Stringers.
    - a. No. 2, DF, S-dry.
  3. Rafters.
    - a. No. 2, DF, S-dry.
  4. Studs & Plates (2 x 4 and smaller): Stud or standard grade, DF, Larch, Hemlock, S-dry.
  5. Headers.
    - a. No. 2, DF, Larch, Hemlock, S-dry.
    - b. Studs and Plates (2 x 6 and larger): No. 2, DF, Larch, Hemlock, S-dry.
    - c. Blocking.
      - 1) Standard grade, DF, Larch, Hemlock, S-dry.
  6. Columns.
    - a. No. 1, DF.
- D. Subfloor.
  1. 1/2 inch CDX plywood 32/16.
  2. 2 x 6 T&G decking, Commercial Dex., DF, S-dry.
- E. Exterior Sheathing.
  1. Roof Sheathing.
    - a. (Concealed Surfaces) 5/8 inch CDX ext. plywood, 24/0; (Exposed surface) 1/2 inch C-C ext., plywood 24/0.

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- b. (Concealed Surfaces) 3/4 inch C-C ext. plywood, 30/12; (exposed surfaces and soffits) 1 x 6, T&G, "B" finish, KD, WRC.
  - c. 2 x 6, T&G, decking, Commercial Dex., DF, S-dry.
2. Wall Sheathing.
- a. 1/2 inch CDX, plywood 24/0.

## PART 3 - EXECUTION

### 3.01 CONSTRUCTION

#### A. Framing.

1. Make joints in beam and girders over supports unless shown otherwise on the drawings.
2. Nail built-up girders from both sides with 16d nails at 30 inches on center staggered in 2 rows. Provide 2 nails at each end of each piece and each splice.
3. Set sills level and anchored on the foundation. Set in a full bed of Portland Cement mortar, if necessary to obtain full bearing. Provide flat washers on all anchor bolts.
4. Set joist with crown side up. Install solid blocking over supports. Provide a minimum of 1-1/2 inch bearing for each joist. Nail with two 16d nails at each bearing. Double joists under parallel partitions and at all openings.
5. Toenail rim joists to sill with 8d nails 16 on center.
6. Lap joists over girders 4 inches minimum. Nail with three 16d nails from each side.
7. Notching of joist will be allowed in the end 1/3 of the span only. Limit notching to 1/6 of the joist depth.
8. Set rafters with crown edge up. Cut birds-mouths to provide full bearing. Nail rafters to top plate with two 8d nails and to ceiling joists with three 16d or five 10d nails.
9. Fabricate trusses as shown on the drawings. Nail to top plate with four 10d nails. Install framing anchors where shown on the drawings.
10. Provide continuous length studs. Nail studs to top plate with four 8d toenails or two 16d end nails.
11. Install full length cripples at all openings. Nail cripples to studs with 16d nails at 24 inch on center. Toenail cripple to header with two 8d nails.
12. Provide headers, over opening, of a size indicated below:

Maximum 3'-6"

span 2-2x6's

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|               |               |
|---------------|---------------|
| Maximum 5'-0" | span 2-2x8's  |
| Maximum 6'-6" | span 2-2x10's |
| Maximum 8'-0" | span 2-2x12's |
| Maximum 8'-0" | span 2-2x12's |

13. Space header material with plywood or surfaced lumber to equal the stud depth.
14. End nail studs to header with three 16d nails.
15. Do not splice columns. Cut ends square to provide full bearing. Nail columns top and bottom with four 16d toenails, or as shown on drawings.

#### B. Subfloor.

1. Lay plywood subfloor with face grain at right angles to supports.
2. Space panel ends and edges 1/32 inch. Stagger end joints. Nail with 8d nails 6 inch on center at edges, and 10 inch on center intermediate supports.
3. Install 2 inch T&G subfloor at right angles to the supports. Make joints over supports, unless end matched. Stagger end joints a minimum of 1 span. Nail with two 16d nails at each support, 1 blind nail and 1 face nail.

#### C. Exterior Sheathing.

1. Install roof sheathing at right angles to supports. Stagger end joints a minimum of 1 span. Nail with two 8d nails at each support.
2. Apply plywood roof sheathing with the face grain at right angles to supports. Stagger end joints. Nail with 8d nails 6 inch on center at edges and 12 inch on center at intermediate supports.
3. Apply 1x6 inch T&G roof sheathing at right angles to supports. Make all joints over supports. Stagger end joints. Nail with two 8d nails at each support.
4. Install 2 inch T&G roof sheathing at right angles to supports. Make joints over supports, unless end matched. Stagger end joints a minimum of 1 span. Nail with two 16d nails at each support, 1 blind nail and 1 face nail.
5. Apply plywood wall sheathing with the face grain vertical. Nail with 6d nails at 6 inch on center at edge and 12 inch on center at intermediate supports.

#### E. Treated Wood.

1. Field treat cuts and holes in pressure treated members with copper naphthenate.

#### F. Exposed Hardware.

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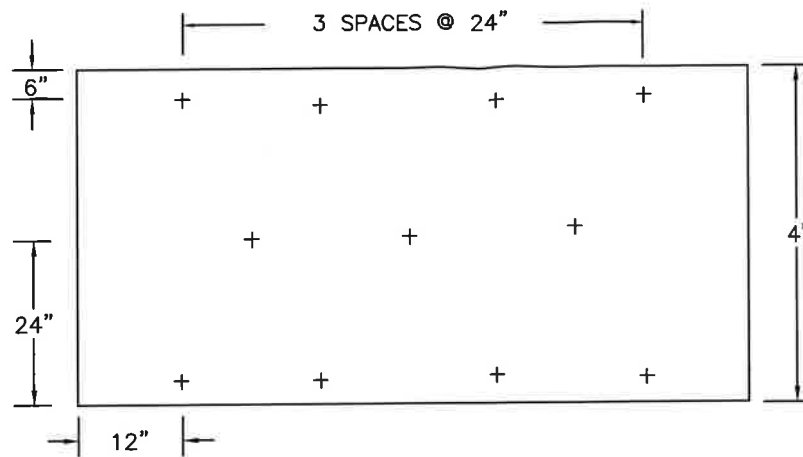
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1. Provide rough hardware for the proper installation of work. Install hot-dipped galvanized hardware, nails, bolts, etc. at locations exposed to the weather.

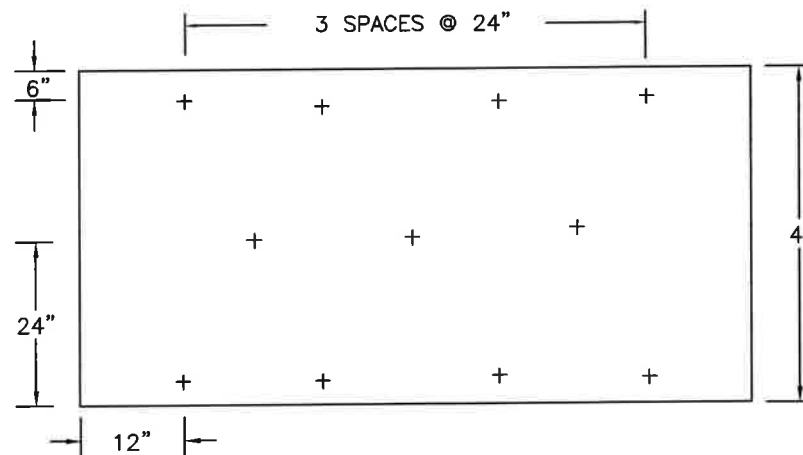
END OF SECTION

## Board Pattern

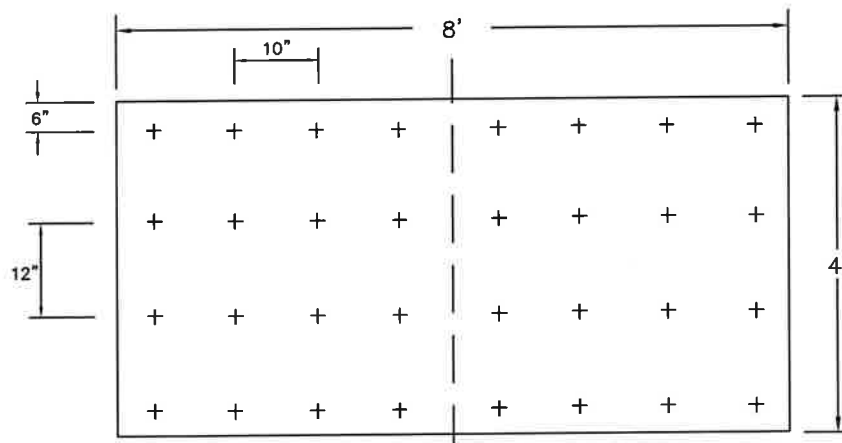
ZONE 1 INSULATION BOARD FASTENER PATTERN: 11 FASTENERS PER BOARD



ZONE 2 INSULATION BOARD FASTENER PATTERN: 11 FASTENERS PER BOARD



ZONE 3 INSULATION BOARD FASTENER PATTERN: 32 FASTENERS PER BOARD



DETAIL:

4 X 8 BOARD PATTERN

SECTION:

INSULATION BOARD FASTENER PATTERN



THE GARLAND COMPANY, INC.

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## Sheet Metal Flashing and Trim

**SECTION 07 6100**  
**SHEET METAL FLASHING AND TRIM**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Fabricated sheet metal items, including flashings, counter flashings, and other items indicated on drawings and as follows:
  - 1. Metal edge system with continuous cleats.
  - 2. Reglet mounted counterflashing.
  - 3. Skirt flashing at curbs.
  - 4. Gutters, Metal Trim, Down Spouts, Vents, etc.

**1.02 RELATED REQUIREMENTS**

- A. Section 075200 Modified Bitumen Roofing

**1.03 REFERENCE STANDARDS**

- A. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- C. ASTM A792 Steel Sheet, Aluminum-Zinc Alloy-Coated, by the Hot-Dip Process
- D. ASTM B 32 - Standard Specification for Solder Metal.
- E. ASTM B486 Paste Solder
- F. ASTM B 749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products.
- G. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
- H. ASTM D 2178 - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
- I. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
- J. FS QQ-L-201 Specification for Lead Sheet
- K. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association.

**1.04 SUBMITTALS**

2026 Fisher Middle School Re-Roof Project  
Alum Rock Unified School District

- A. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
  - 1. For manufactured and shop fabricated gravel stops, fascia, scuppers, and all other sheet metal fabrications.
  - 2. Indicate type, gauge and finish of metal.
- B. Product data: Provide manufacturer's specification data sheets for each product :
  - 1. Metal material characteristics and installation recommendations.
  - 2. Submit color chart prior to material ordering and/or fabrication so that equivalent colors to those specific can be approved.
- C. Manufacturer's installation instructions for reglets.
- E. Certification:
  - 1. Submit roof manufacturer's certifications that metal fasteners furnished are acceptable to roof manufacturer.
  - 2. Submit roof manufacturer's certification that metal furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.
  - 3. Submit certification that metal and fastening system furnished is Tested and Approved by Factory Mutual for 1-90 Wind Up-Lift Requirements.
- G. Proof of fabricator and installer qualifications.
- H. ANSI-SPRI ES-1 test results for all coping and edge metal.

#### **1.05 QUALITY ASSURANCE**

- A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements, except as otherwise indicated.
  - 1. Factory Mutual Loss Prevention Data Sheet 1-49 windstorm resistance: 1-90.
- B. Manufacturer's Warranty: Pre-finished metal material shall require a written 20-year non-prorated warranty covering fade, chalking and film integrity. The material shall not show a color change greater than 5 NBS color units per ASTM D-2244 or chalking excess of 8 units per ASTM D-659. If either occurs material shall be replaced per warranty, at no cost to the Owner.
- C. Contractor's Warranty: The Contractor shall provide the Owner with a notarized written warranty assuring that all sheet metal work including caulking and fasteners to be water-tight and secure for a period of five years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop, and make good any damage to other work or equipment caused by such leaks or the repairs thereof.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

2026 Fisher Middle School Re-Roof Project  
Alum Rock Unified School District

- A. Deliver materials in manufacturer's original, unopened containers or packages with labels intact and legible.
- B. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials that could cause discoloration or staining.

## **PART 2 PRODUCTS**

### **2.01 SHEET MATERIALS**

- A. Galvanized Steel: 22 gauge and greater as required by referenced standards for specific applications.
  - 1. Kynar coated.
  - 2. Color: Standard

### **2.02 ACCESSORIES**

- A. Fasteners:
  - 1. Corrosion resistant screw fastener as recommended by metal manufacturer. Finish exposed fasteners same as flashing metal.
  - 2. Fastening shall conform to Factory Mutual 1-90 requirements or as stated on section details, whichever is more stringent.
- B. Plastic Cement: ASTM D 4586, Type I.

### **2.03 FABRICATION - GENERAL**

- A. Fabricate in accordance with referenced standards. Form sections true to shape, accurate in size, square, and free from distortion or defects. Form pieces as recommended by SMACNA standard for conditions required.
  - 1. Provide reinforcements and supports as required for secure anchorage.
  - 2. Make joints rigid. Seams mechanically strong and soldered or sealed to make watertight
  - 3. Fabricate corners in one piece with legs extending 30-inches each way to field joint. Lap, rivet, and solder or seal corner seams watertight.
  - 4. Turn up "end dam" flanges at ends of opening sill flashing pieces, lap with wall flashing and membranes to shed water.
  - 5. Fabricate cleats of same material as sheet, minimum 3/4 inches wide, interlockable with sheet.
  - 6. Hem exposed edges on underside 1/2 inch; miter and seam corners.
  - 7. Solvent clean all sheet metal. Coat surfaces to be in contact with roofing or otherwise concealed with specified asphaltic paint; 0.015-inch minimum uniform thickness.
- B. Form pieces in longest possible lengths.
- C. Hem exposed edges on underside 1/2 inch; miter and seam corners.

- D. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- F. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

## **2.04 EDGE METAL SYSTEM AND METAL COPING SYSTEM**

- A. R-Mer Span Flat Stock Sheets by The Garland Company.
  - 1. ANSI SPRI ES-1 tested and certified.

## **2.05 ROOF-RELATED SHEET METAL AND FLASHINGS**

- A. Roof-Related Sheet Metal and Flashings: As indicated, as specified in related sections, as required by roofing material manufacturers and referenced standards. Coordinate work of this section with related sections. Provide complete systems without conflict or omission.

## **2.06 LADDERS, DRAINS AND HATCHES**

- A. Roof Drains: Clean and Reseal all internal drains

# **PART 3 EXECUTION**

## **3.01 EXAMINATION**

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.
- C. Beginning of installation means acceptance of existing conditions.
- D. Field measure site conditions prior to fabricating work.

## **3.02 PREPARATION**

- A. Install starter and edge strips, and cleats before starting installation.
- B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

## **3.03 INSTALLATION**

- A. Install work watertight, without waves, warps, buckles, fastening stress, or distortion, allowing for expansion and contraction. Conform to referenced standards. Make metal joints watertight.
- B. Fastening of metal to walls and wood blocking shall comply with SMACNA Architectural Sheet Metal Manual, Factory Mutual 1-90 wind uplift

specifications and/or manufacturer's recommendations whichever is of the highest standard.

- C. All accessories or other items essential to the completeness of sheet metal installation and water tight envelope of the building, whether specifically indicated or not, shall be provided.
- D. Reglets: Install in accordance with manufacturer's installation instructions.
- E. Metal fascia and copings shall be secured to wood nailers at the bottom edge with a continuous cleat. Cleats shall be at least one gauge heavier than the metal it secures.
- F. Install Sheet Membrane Waterproofing at closure flanges, under metal copings, caps and platforms; fully adhered, free of voids, blisters and buckling; roll as soon as practical following layout. Minimize exposure time to that period recommended by the manufacturer.
- G. Flashing: Joints at 10-foot maximum spacing and at 2-1/2-feet from corners. Butt joints with 3/16-inch space centered over matching 8-inch long backing plate with sealer tape in laps.
- H. Flanged flashings and roof accessories: Set on continuous sealer tape. Nail flanges through sealer tape and at 3-inch maximum spacing.
- I. Isolate metal from dissimilar metal with 2 coats of specified asphaltic paint, sealer tape or other approved coating, specifically made to stop electrolytic action.. Use only stainless steel fasteners to connect isolated dissimilar metals.
- J. Joints, fastenings, reinforcements and supports: Sized and located as required to preclude distortion or displacement due to thermal expansion and contraction. Conceal fastenings wherever possible.
- K. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.
- L. Flexible Flashing Installation:
  - 1. Prime substrates as recommended by flexible flashing manufacturer, allow to dry.
  - 2. Install flexible flashings in maximum feasible lengths to minimize lap joints.
  - 3. Peel release paper from roll to expose rubberized asphalt and position flashing to center over joint location before applying. Move along opening or joint, being careful to put flashing as evenly as possible over the opening. Avoid fishmouths.
  - 4. Press flashing firmly into place with heavy hand pressure . Ensure continuous and intimate contact with substrate.
  - 5. If wrinkles develop, carefully cut out affected area and replace as outlined above.
- M. Apply plastic cement compound between metal flashings and felt

flashings.

- N. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- O. Seal prefinished metal joints watertight.
- P. Solder other metal joints for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.
- Q. Connect downspouts and rain water leaders to storm sewer system. Seal connection watertight.
- R. Install hatches and ladders per manufacturer's recommendations.
- X. Install roof drains per manufacturer's recommendations.

### **3.04 FIELD QUALITY CONTROL**

- A. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.
- B. Tolerances
  - 1. Exposed surfaces: Free of dents, scratches, abrasions, or other visible defects; clean, ready for painting.
  - 2. Set flashings and sheet metal to straight, true lines with exposed faces aligned in plane as indicated.

### **3.05 SHOP FABRICATED SHEET METAL**

- A. Installing Contractor shall be responsible for determining if the sheet metal systems are in general conformance with roof manufacturer's recommendations.
- B. Metal work shall be shop fabricated to configurations and forms in accordance with recognized sheet metal practices.
- C. Hem exposed edges.
- D. Angle bottom edges of exposed vertical surfaces to form drip.
- E. All corners for sheet metal shall be lapped with adjoining pieces fastened and set in sealant.
- F. Joints for gravel stop fascia system, cap flashing, and surface-mount counterflashing shall be formed with a 1/4" opening between sections. The opening shall be covered by a cover plate or backed by an internal drainage plate formed to the profile of fascia piece. The cover plate shall be embedded in mastic, fastened through the opening between the sections and loose locked to the drip edges.
- G. Install sheet metal to comply with Architectural Sheet Metal manual, Sheet Metal and Air Conditioning Contractor's National Associations, Inc.

END OF SECTION

