CLACKAMAS COUNTY

MARC GONZALES
DIRECTOR

DEPARTMENT OF FINANCE
PUBLIC SERVICES BUILDING
2051 KAEN ROAD | OREGON CITY, OR 97045

Board of County Commissioners
Clackamas County

Members of the Board:

Approval of Contract Amendment #3 with ABC Roofing for the Re-roof Multiple Buildings Project – Roofing Services

Purpose/Outcome	Approval of amendment
Dollar Amount and fiscal Impact	$208,480.00
Funding Source	Facilities Management Budget Line: 744-7532-00-437100-99999: $200,000.00 Budget Line: 420-7532-00-437100-99999: $8,480.00 Fiscal year 2018-2019
Duration	Contracting through December 31, 2018
Previous Board Action/Review	Approval of Original Contract, May 10, 2018.
Strategic Plan Alignment	Build public trust through good government, build a strong infrastructure and ensure safe, healthy and secure communities.
Contact Person	Steven Bloemer, (503) 805-9870
Contract No.	

BACKGROUND:

The present Clackamas County Fairgrounds Main Pavilion has been in place since 1924, with multiple revisions, additions and reroofs over its lifespan. The current roof consists of multiple and vastly different treatments, all of which have exceeded their expected lifespans, has leaks in multiple locations, and is beyond repair or rejuvenation. With the flat and low-pitched roof designs, the most economical and feasible solution is to install a membrane roof over the affected areas.

The Pavilion's roof replacement was included as an additive alternate in the original Invitation to Bid in February 2018, however funding for this roof was not available at the time of the contract production. As it would be cost prohibitive to rebid the Pavilion's roof as a standalone project, it is in the County's best interest to amend the existing contract with ABC Roofing to add the Pavilion roof into the project. This contract amendment will allow the installation of a roof with a 20-year warranty.

This contract amendment has been reviewed and approved by County Counsel.

PROCUREMENT PROCESS:
This original Invitation to Bid advertised in accordance with ORS 279C and LCRB Rules on January 18, 2018. Bids were publicly opened on February 1, 2018. The County received three (3) bids: ABC Roofing; Forest Roofing; and Snyder Roofing. The Contract was awarded to the lowest responsive bidder, ABC Roofing Co.
Amendment #1 was a bid alternate that added fall protection to the buildings being reroofed. Amendment #2 corrected contract language. Amendment #3 will include the bid alternate for the Clackamas County Fairgrounds Main Pavilion building to be included in the roofing project.

This contract has been reviewed and approved by County Counsel.

RECOMMENDATION:
Staff respectfully recommends the Board approve the contract with ABC Roofing for the Re-Roof Multiple Buildings Project.

Sincerely,

Christa Bosserman-Wolfe
Finance Deputy Director

Placed on the board agenda of August 9th, 2018 by the Procurement Division

AMENDMENT #3

TO THE CONTRACT DOCUMENTS WITH A.B.C. ROOFING COMPANY FOR PROJECT #2017-115 REROOF OF MULTIPLE BUILDINGS

This Amendment #3 is entered into between **A.B.C. Roofing Company** ("Contractor") and Clackamas County ("County") and shall become part of the Contract entered into between the parties on May 10, 2018 and amended with Amendment #1 on June 18, 2018 and with Amendment #2 on July 2, 2018.

The Purpose of the Amendment #3 is to make the following changes to the Contract:

1. Contract Price, Contract Documents and Work is hereby changed as follows:
   County is moving forward with Additive Alternate #2 to reroof the Fairgrounds Pavilion Building as provided for in the Detailed Requirements #4 and as per the attached specifications.

   Compensation to complete the additional Work for this project is increased by $208,480.00. The maximum compensation authorized under this Contract shall not exceed $1,186,260.00.

ORIGINAL CONTRACT	**$ 891,480.00**
AMENDMENT #1	**$ 86,300.00**
AMENDMENT #2	**Language Change**
AMENDMENT #3	**$ 208,480.00**
TOTAL CONTRACT AMOUNT	**$1,186,260.00**

Contract Final Completion date remains unchanged at October 31, 2018.

Except as expressly amended above, all other terms and conditions of the Contract shall remain in full force and effect.

By signature below, the parties agree to this Amendment #3, effective upon the date of the last signature below.

A.B.C. Roofing Company
P.O. Box 23294
Tigard, Oregon 97281

Authorized Signature

Tom Bolt VP
Name, Title

7/30/18
Date

61031-13 / DBC Oregon
Oregon Business Registry Number

427 Exp: May 31, 2020
CCB#

Clackamas County Board of County Commissioners

Chair Date

Recording Secretary

Approved as to Form

County Counsel 7/30/18
Date

Jeff Jorgensen
Manager

CLACKAMAS COUNTY

FACILITIES MANAGEMENT
CENTRAL UTILITY PLANT
1710 Red Soils Court,#200 \ Oregon City, OR 97045

SINGLE PLY MEMBRANE REROOF PROJECTS

FOR CLACKAMAS COUNTY BUILDINGS

PROJECT SPECIFICATIONS

PROJECT OVERVIEW

The scope of this bid is for the reroofing of up to four (4) County owned buildings: The Silver Oak building located at 1810 Red Soils Ct. Oregon City, OR 97045, The Bowman and PSTC Buildings located at 12800 and 12700 SE 82nd Ave., Clackamas, OR 97015 and as an additive alternate, the Clackamas County Fairgrounds Pavilion Center at 694 NE 4th Ave., Canby OR 97013. Each building will have a separate bid schedule with one Contractor selected to perform all work by the lowest aggregate quote.

TECHNICAL INQUIRIES

Questions relating to materials in the Bid Proposal, the Standard Specifications and Special Provisions and the Plans and Drawings shall be addressed to:

Ryan Rice
Contract Analyst
503-742-5446 or via email at rrice@clackamas.us

LICENSING

Subcontractors must be currently licensed in good standing with the Oregon Construction Contractor's Board and have or obtain a Metro or City of Oregon City license to bid on this project.

BOLI WAGES

This contract falls under BOLI requirements. The Subcontractor shall be required to follow the Prevailing Wage Rate Law and pay the appropriate hourly rates as found in the 'Prevailing Wage Rates for Public Works Contracts in Oregon Effective July 1, 2017 book. The Subcontractor and their subcontractors if any, are required to have a public works bond on file with the Oregon Construction Contractors Board before starting any work unless exempt. **Copies of the certified wage reports must be submitted before final labor invoices can be paid as per the Public Contracting Code - ORS 279C.845 and ORS 279.555.**

SCOPE

The contractor shall supply all materials and labor to complete their portion of the project in compliance with all local codes and regulations according to specifications and detailed requirements specified below.

This contract will cover permits and the supply and installation of single ply membrane roofing, recover boards, flashing and coping, fall restraint system and all incidentals needed or required to deliver a complete, cohesive roof system at each location. All work under this bid shall be completed by 31st of October, 2018.

GENERAL REQUIREMENTS

1. Quotations must be submitted as specified above, or they will not be considered.

2. Each location shall be open for a non-mandatory pre-bid inspection. Dates and times will be provided in a separate attachment.

3. The Contractor shall apply and pay for all necessary permits to perform the work associated with or described in this Bid. Contractor must obtain and pay for performance and payment bonds which shall be a required part of the Contract.

4. It is understood that work to be performed by the Contractor is based upon the specified structures in the existing locations and conditions, and that Clackamas County assumes no responsibility and makes no guarantee or representation as to the condition thereof prior to, or subsequent to, the execution of the contract.

5. Work hours for the Bowman, Silver Oak and Pavilion Buildings are Monday through Friday 6:30am to 5:30pm. Work hours for the PSTC Building are varied: This is an active training and public shooting range with Monday and Tuesday closures, and Thursday and Friday early afternoon openings. Additionally, police training may be scheduled on closed days. No work will be permitted while the range is open over the range roof area. The County proposes full standard hour work days during complete range closures, and an early start and end time on other days. Specific times will be discussed and approved at the pre-con meeting.

6. Clackamas County will provide potable water access and 120v power supply for Contractor's operations. Any additional requirements or needs of the Contractor shall be included in the bid proposal.

7. Selected Contractor shall convene a pre-construction meeting after contract award and before ordering materials or commencing any work. The Contractor shall provide a duration schedule for each roof including anticipated delivery dates of materials. The pre-con shall be held at a mutually agreed upon location and may include all projects in one meeting.

DETAILED REQUIREMENTS

1. The Contractor shall be responsible for supplying, fabricating, delivering and installing all required materials and labor to include incidentals to complete the scope of work detailed in these specifications and as directed by the County.

2. The **Silver Oak Building** had a partial reroof project completed in 2016 which covers approximately 25% of the roof area. This building's reroof project will require the use of a compatible TPO to be tied into and welded to the existing membrane roof, as well as recover board and insulation panels that are of the same make and manufacturer, or similar in grade and performance to the previously installed components.

   The remainder of the existing roof consists of a built up roof (BUR) installed over a wood framed and sheathed deck. The insulation and recover boards shall be installed over the BUR roof, with the TPO mechanically fastened in place. All parapet flashings to be replaced shall be similar in grade, performance and appearance to the flashings replaced during the 2016 partial reroof. The 2016 project submittals shall be included with the bid documents as a reference.

3. The **PSTC and Bowman Buildings** roofs consist of a BUR roof over a wood framed and sheathed deck. These roofs may be bid with any single ply material (PVC, TPO, Etc) and recover board that meets the required specifications. A portion of the PSTC's current roof is built over a firearm range, which has a positive pressure system that can and has affected the existing roof. The Contractor shall provide and install a minimum of 10 roof vents, each no less than 6" in diameter over the range roof to help eliminate the pressures the new membrane roof will be subject to.

   Additive alternate #1: For the **PSTC and Bowman Building** roofs, provide an estimate to remove, haul away and dispose of the existing gravel topping cover.

4. The Clackamas County **Fairgrounds Pavilion Building** consists of a traditional wood framed structure with a mix of rafters and manufactured trusses originally built in 1924. The existing roofs are a mix of TPO, high-ribbed rolled metal, architectural composition shingles and hot mop asphalt. This project will be a reroof of the existing membrane and hot mop asphalt roofs comprised of an overlay only, leaving existing roofs in place. The existing metal roof shall remain in place with no work performed.

   Additive alternate #2: Provide estimate to reroof the **Fairgrounds Pavilion Building** as provided for in Detailed Requirements #4 and as per the attached specifications.

   Additive alternate #3: Provide a separate estimate for each building to incorporate a Guardian CB-12 integrated fall protection system manufactured by Guardian Fall Protection, Inc.

BUILDING SPECIFICATIONS

SILVER OAK BUILDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Complete adhered thermoplastic polyolefin (TPO) membrane roofing system with insulation and recovery board mechanically fastened to existing roof sheathing, and PMMA interfacing flashing between two roof systems, using manufacturer's standard details throughout unless otherwise indicated.

B. Disposal of demolition debris and construction waste in manner complying with applicable federal, state, and local regulations.

1.02 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D1079 for definition of terms related to roofing work not otherwise defined in the section.

B. LTTR: Long Term Thermal Resistance, as defined by CAN-ULC S770.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference: See General Requirements #7. Before start of roofing work, Contractor shall hold a meeting to discuss the proper installation of materials and requirements to achieve the warranty.
   1. Require attendance with all parties directly influencing the quality of roofing work or affected by the performance of roofing work.

1.04 SUBMITTALS

A. Provide the following information in PDF form to the County for review and approval after contract ratification and before ordering materials or commencing work.

B. Product Data:
   1. Provide membrane manufacturer's printed data sufficient to show that all components of roofing system, including insulation and fasteners, comply with the specified requirements and with the membrane manufacturer's requirements and recommendations for the system type specified; include data for each product used in conjunction with roofing membrane.

C. Shop Drawings: Provide the roof membrane manufacturer's standard details customized for this project for all relevant conditions, including flashing types and conditions, base tie-ins, roof edges, terminations, expansion joints, penetrations, and drains.
   1. For tapered insulation, provide project-specific layout and dimensions for each board.

D. Specimen Warranty: Submit prior to starting work.

E. Installer Qualifications: Letter from manufacturer attesting that the roofing installer meets the specified qualifications.

F. Pre-Installation Notice: Copy to show that manufacturer's required Pre Installation Notice (PIN) has been accepted and approved by the manufacturer.

G. Executed Warranty.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual for roofing system.

B. Manufacturer Qualifications: Company specializing in manufacture of thermoplastic polyolefin (TPO) membrane roofing systems with ten years of experience without a membrane failure.

C. Installer Qualifications: Company specializing in installation of thermoplastic polyolefin (TPO) membrane roofing systems with five years of experience with this manufacturer's product and with written approval as successfully passing installation training program from this manufacturer.

D. Pre-installation Conference: See General Requirement #7

E. Manufacturer's Technical Representative:
   1. Visit site not less than three times, or more if required, to review technical aspects critical to roofing application, and installation procedures.
      a. Pre-installation meeting.
      b. Substrate suitability approval for application of roofing Installation.
      c. Observation of completed installation.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver products in manufacturer's original containers, dry and undamaged, with seals and labels intact and legible.

B. Store materials clear of ground and moisture with weather protective covering.

C. Keep combustible materials away from ignition sources.

1.07 WARRANTY

A. Comply with all warranty procedures required by manufacturer, including notifications, scheduling, and inspections.

B. Warranty: Warranty covering membrane, roof insulation, and other indicated components of the system, for the term of 20 years.
   1. Limit of Liability: No dollar limitation.
   2. Scope of Coverage: Repair leaks in the roofing system caused by:
      a. Ordinary wear and tear of the elements.
      b. Manufacturing defect in materials.
      c. Defective workmanship used to install these materials.
      d. Damage due to winds up to 55 mph.
   3. Not Covered:
      a. Damage due to winds in excess of 55 mph.
      b. Damage due hurricanes or tornadoes.
      c. Hail.
      d. Intentional damage.
      e. Unintentional damage due to normal rooftop inspections, maintenance, or service.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Design Basis Manufacturer: Carlisle Roofing Systems, Inc; www.carlisle-syntec.com.

B. Acceptable Manufacturers pending conformance to Design Basis manufacturer:

C. Manufacturer of Insulation and Cover Boards: Same manufacturer as roof membrane.

D. Substitutions: Submit products that are directly compatible with Carlisle product for review.

2.02 ROOFING SYSTEM DESCRIPTION

A. Roofing System: Thermoplasticolefin (TPO) single-ply membrane.

2.03 MEMBRANE MATERIALS

A. Membrane: Flexible, heat weldable sheet composed of thermoplastic polyolefin polymer and ethylene propylene rubber; complying with ASTM D6878, with polyester weft inserted reinforcement and the following additional characteristics:
   1. Thickness: 0.080 inch plus/minus 10 percent, with coating thickness over reinforcement of 0.030

inch plus/minus 10 percent.

2. Sheet Width: Provide sheets of width necessary to accommodate batten spacing required by manufacturer for project conditions.
3. Puncture Resistance: 415 lbf, minimum, when tested in accordance FTM 101C Method 2031.
4. Solar Reflectance: 0.84, minimum, when tested in accordance with ASTM C1549.

B. Insulation Fasteners: Type and size as required by roof membrane manufacturer for roofing system attachment to existing plywood roof sheathing through existing built-up roof system and warranty to be provided; use only fasteners furnished by roof membrane manufacturer.

C. Curb and Parapet Flashing: Same material as membrane, with encapsulated edge which eliminates need for seam sealing the flashing-to-roof splice; precut to 18 inches wide.

D. Formable Flashing: Non-reinforced, flexible, heat weldable sheet, composed of thermoplastic polyolefin polymer and ethylene propylene rubber.
1. Thickness: 0.060 inch plus/minus 10 percent.
2. Tensile Strength: 1550 psi, minimum, when tested in accordance with ASTM D638 after heat aging.
3. Elongation at Break: 650 percent, minimum, when tested in accordance with ASTM D638 after heat aging.
4. Tearing Strength: 12 lbf, minimum, when tested in accordance with ASTM D1004 after heat aging.
5. Color: White.
6. Acceptable Product: TPO Flashing by Carlisle.

E. Tape Flashing: 5-1/2 inch nominal wide TPO membrane laminated to cured rubber polymer seaming tape, overall thickness 0.065 inch nominal; TPO Flashing by Carlisle.

F. Pourable Sealer: Two-part polyurethane, two-color for reliable mixing; Pourable Sealer by Carlisle.

G. Termination Bars: Aluminum bars with integral caulk ledge; 1.3 inches wide by 0.10 inch thick; Termination Bar by Carlisle.

H. Cut Edge Sealant: Synthetic rubber-based, for use where membrane reinforcement is exposed; Cut Edge Sealant by Carlisle.

I. General Purpose Sealant: EPDM-based, one part, white general purpose sealant; TPO General Purpose Sealant by Carlisle.

J. Molded Flashing Accessories: Unreinforced TPO membrane pre-molded to suit a variety of flashing details, including pipe boots, inside corners, outside corners, etc.; TPO Small and Large Pipe Flashing by Carlisle.

K. Water Block Seal: Butyl rubber sealant for use between two surfaces, not exposed; Water Block Seal by Carlisle.

L. Roof Walkway Pads: Non-reinforced TPO walkway pads, 0.130 inch by 30 inches by 40 feet long with patterned traffic bearing surface; TPO Walkway Pads by Carlisle.

M. PMMA flashing at termination of TPO to built-up roofing where TPO will not cover built-up roofing. Verify compatibility of PMMA flashing to both roofing materials prior to proceeding with PMMA flashing application.

204 ROOF INSULATION AND COVER BOARDS

A. Polyisocyanurate Board Insulation: Closed cell polyisocyanurate foam with black glass reinforced mat laminated to faces, complying with ASTM C1289 Type II Class 1, with the following additional characteristics:
1. Thickness: Not less than 80mil on deck and 60mil on parapet
2. Size: 48 inches by 96 inches, nominal.
3. Exception: Insulation to be attached using adhesive or asphalt may be no larger than 48 inches by 48 inches, nominal.
4. R-Value (LTTR): R = 6.0/inch, minimum.
5. Compressive Strength: 20 psi when tested in accordance with ASTM C1289.
6. Ozone Depletion Potential: Zero; made without CFC or HCFC blowing agents.

7. Recycled Content: 19 percent post-consumer and 15 percent post-industrial, average.

B. High Density Polyisocyanurate Recover Board: Non-combustible, water resistant, high density closed cell polyisocyanurate core with coated glass mat facers, with the following characteristics:
   1. Size: 48 inches by 96 inches, nominal.
   2. Thickness: 1/4 inch.
   3. Thermal Value: R-value of 2.5, when tested in accordance with ASTM C518 and ASTM C177.
   4. Surface Water Absorption: 3 percent, maximum, when tested in accordance with ASTM C209.
   5. Compressive Strength: 120 psi, when tested in accordance with ASTM D1621.
   6. Density: 5 pcf, when tested in accordance with ASTM D1622.
   7. Factory Mutual approved for use with FM 1-60 and 1-90 rated roofing assemblies.
   8. Mold Growth Resistance: Passing ASTM D3273.

C. Insulation Fasteners: Type and size as required by roof membrane manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane manufacturer.

PART 3 INSTALLATION

3.01 DEMOLITION

A. Neatly, provide precision removal of portions of the existing roof system and flashings at perimeters as necessary to allow for installation of roofing membrane manufacturer's standard details customized for this project in accordance with roofing manufacturer's published instructions and recommendations for the specified roofing system. Comply with federal, state, and local regulations.

B. Remove all demolished items and clean all contaminants generated by demolition work from building and surrounding areas, including bitumen, adhesives, sealants, and coatings.

C. Do not start new roof system work until manufacturer's technical representative reviews substrate and determine substrate condition satisfactory for roofing installation

3.02 EXAMINATION

A. Examine roof deck to determine that it is sufficiently rigid to support installers and their mechanical equipment and that deflection will not strain or rupture roof components or deform deck.

B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work.

C. Examine roof substrate to verify that it is properly sloped to drains and will not create ponding, especially at areas where new roof cover-over meets existing roof not being covered over.

D. Verify that the specifications and drawing details are workable and not in conflict with the roofing manufacturer's recommendations and instructions; start of work constitutes acceptable of project conditions and requirements.

3.03 GENERAL

A. Install roofing, insulation, flashings, and accessories in accordance with roofing manufacturer's published instructions and recommendations for the specified roofing system. Where manufacturer provides no instructions or recommendations, follow good roofing practices and industry standards. Comply with federal, state, and local regulations.

B. Obtain all relevant instructions and maintain copies at project site for duration of installation period.

C. Do not start work until Pre-Installation Notice has been submitted to manufacturer as notification that this project will require a manufacturer's warranty.

D. Perform work using competent and properly equipped personnel.

E. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the applicator. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.

F. Install roofing membrane only when surfaces are clean, dry, smooth and free of snow or ice; do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application; consult manufacturer for recommended procedures during cold weather. Do not work with sealants and adhesives when material temperature is outside the range of 60 to 80 degrees F.

G. Protect adjacent construction, property, vehicles, and persons from damage related to roofing work; repair or restore damage caused by roofing work.

1. Protect from spills and overspray from bitumen, adhesives, sealants and coatings.
2. Particularly protect metal, glass, plastic, and painted surfaces from bitumen, adhesives, and sealants within the range of wind-borne overspray.
3. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.

H. Until ready for use, keep materials in their original containers as labeled by the manufacturer.

I. Consult membrane manufacturer's instructions, container labels, and Material Safety Data Sheets (MSDS) for specific safety instructions. Keep all adhesives, sealants, primers and cleaning materials away from all sources of ignition.

3.04 PREPARATION

A. Take appropriate measures to ensure that fumes from adhesive solvents are not drawn into the building through air intakes.

B. Prior to proceeding, prepare roof surface so that it is clean, dry, and smooth, and free of sharp edges, fins, roughened surfaces, loose or foreign materials, oil, grease and other materials that may damage the membrane.

C. Fill all surface voids in the immediate substrate that are greater than 1/4 inch wide with fill material acceptable insulation to membrane manufacturer.

D. Seal, grout, or tape deck joints, where needed, to prevent bitumen seepage into building.

3.05 INSULATION AND RECOVER BOARD INSTALLATION

A. Install recover board over existing roof surface in configuration and with attachment method required by roofing manufacturer to separate existing and new systems and provide a suitable substrate for system insulation installation specified in PART 2, under Roofing System.

B. Install insulation in configuration and with attachment method(s) specified in PART 2, under Roofing System.

C. Install only as much insulation as can be covered with the completed roofing system before the end of the day's work or before the onset of inclement weather.

D. Lay roof insulation in courses parallel to roof edges.

E. Neatly and tightly fit insulation to all penetrations, projections, and nailers, with gaps not greater than 1/4 inch. Fill gaps greater than 1/4 inch with acceptable insulation. Do not leave the roofing membrane unsupported over a space greater than 1/4 inch.

3.06 SINGLE-PLY MEMBRANE INSTALLATION

A. Beginning at low point of roof, place membrane without stretching over substrate and allow to relax at least 30 minutes before attachment or splicing; in colder weather allow for longer relax time.

B. Lay out the membrane pieces so that field and flashing splices are installed to shed water.

C. Install membrane without wrinkles and without gaps or fishmouths in seams; bond and test seams and laps in accordance with membrane manufacturer's instructions and details.

D. Adhered Membrane: Bond membrane sheet to substrate using membrane manufacturer's recommended bonding material, application rate, and procedures.
   1. Do not apply bonding material to fleece backing or to seaming area of membrane.

E. Edge Securement: Secure membrane at all locations where membrane terminates or goes through an angle change greater than 2 in 12 inches using mechanically fastened reinforced perimeter fastening strips, plates, or metal edging as indicated or as recommended by roofing manufacturer.
   1. Exceptions: Round pipe penetrations less than 18 inches in diameter and square penetrations less than 4 inches square.
   2. Metal edging is not merely decorative; ensure anchorage of membrane as intended by roofing manufacturer.

3.07 FLASHING AND ACCESSORIES INSTALLATION

A. Install flashings, including laps, splices, joints, bonding, adhesion, and attachment, as required by membrane manufacturer's recommendations and details.

B. Metal Accessories: Install metal edgings, gravel stops, and copings in locations indicated on the drawings, with horizontal leg of edge member over membrane and flashing over metal onto membrane.
   1. Follow roofing manufacturer's instructions.
   2. Remove protective plastic surface film immediately before installation.
   3. Install water block sealant under the membrane anchorage leg.
   4. Flash with manufacturers recommended flashing sheet unless otherwise indicated.
   5. Where single application of flashing will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.
   6. If the roof edge includes a gravel stop and sealant is not applied between the laps in the metal edging, install an additional piece of self-adhesive flashing membrane over the metal lap to the top of the gravel stop; apply seam edge treatment at the intersections of the two flashing sections.
   7. When the roof slope is greater than 1:12, apply seam edge treatment along the back edge of the flashing.

3.08 FINISHING AND WALKWAY INSTALLATION

A. Install walkways at access points to the roof, around rooftop equipment that may require maintenance, and existing walkway locations, or as directed by the County.

B. Walkway Pads: Adhere to the roofing membrane, spacing each pad at minimum of 1.0 inch and maximum of 3.0 inches from each other to allow for drainage.
   1. If installation of walkway pads over field fabricated splices or within 6 inches of a splice edge cannot be avoided, adhere another layer of flashing over the splice and extending beyond the walkway pad a minimum of 6 inches on either side.
   2. Prime the membrane, remove the release paper on the pad, press in place, and walk on pad to ensure proper adhesion.

3.09 FIELD QUALITY CONTROL

A. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer specifically to inspect installation for warranty purposes (i.e. not a sales person).

B. Perform all corrections necessary for issuance of warranty.

3.10 CLEANING

A. Clean all contaminants generated by roofing work from building and surrounding areas, including bitumen, adhesives, sealants, and coatings.

B. Repair or replace building components and finished surfaces damaged or defaced due to the work of this section; comply with recommendations of manufacturers of components and surfaces.

C. Remove leftover materials, trash, debris, equipment from project site and surrounding areas.

3.11 PROTECTION

A. Where construction traffic must continue over finished roof membrane, provide durable protection and replace or repair damaged roofing to original condition.

END OF SECTION

PSTC, BOWMAN AND FAIRGROUNDS PAVILION BUILDINGS

PART 4 GENERAL

401 SECTION INCLUDES

A. Mechanically fastened single ply membrane roofing system with recovery board mechanically fastened to existing roof sheathing or framing, and PMMA interfacing flashing between two roof systems, using manufacturer's standard details throughout unless otherwise indicated.

B. Disposal of demolition debris and construction waste in manner complying with applicable federal, state, and local regulations.

402 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D1079 for definition of terms related to roofing work not otherwise defined in the section.

B. LTTR: Long Term Thermal Resistance, as defined by CAN-ULC S770.

403 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference: See General Requirements #7. Before start of roofing work, Contractor shall hold a meeting to discuss the proper installation of materials and requirements to achieve the warranty.
   1. Require attendance with all parties directly influencing the quality of roofing work or affected by the performance of roofing work.

404 SUBMITTALS

A. Provide the following information in PDF form to the County for review and approval after contract ratification and before ordering materials or commencing work.

B. Product Data:
   1. Provide membrane manufacturer's printed data sufficient to show that all components of roofing system, including insulation and fasteners, comply with the specified requirements and with the membrane manufacturer's requirements and recommendations for the system type specified; include data for each product used in conjunction with roofing membrane.

C. Shop Drawings: Provide the roof membrane manufacturer's standard details customized for this project for all relevant conditions, including flashing types and conditions, base tie-ins, roof edges, terminations, expansion joints, penetrations, and drains.

D. Specimen Warranty: Submit prior to starting work.

E. Installer Qualifications: Letter from manufacturer attesting that the roofing installer meets the specified qualifications.

F. Pre-Installation Notice: Copy to show that manufacturer's required Pre Installation Notice (PIN) has been accepted and approved by the manufacturer.

G. Executed Warranty.

405 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual for roofing system.

B. Manufacturer Qualifications: Company specializing in manufacture of single ply membrane roofing systems with ten years of experience without a membrane failure.

C. Installer Qualifications: Company specializing in installation of single ply membrane roofing systems with five years of experience with this manufacturer's product and with written approval as successfully passing installation training program from this manufacturer.

D. Pre-installation Conference: See General Requirement #7. Review requirements for roofing system preparation and installation, including surface preparation that may be specified under other Sections, substrate condition and pretreatment, procedures for forecasted weather conditions, special details and flashings, installation procedures, testing and inspection procedures, and protection and repairs.

E. Manufacturer's Technical Representative:
   1. Visit site not less than three times, or more if required, to review technical aspects critical to

roofing application, and installation procedures.
a. Pre-installation meeting.
b. Substrate suitability approval for application of roofing Installation.
c. Observation of completed installation.
2. Document site visits in writing with copy to Architect.

406 DELIVERY, STORAGE AND HANDLING

A. Deliver products in manufacturer's original containers, dry and undamaged, with seals and labels intact and legible.

B. Store materials clear of ground and moisture with weather protective covering.

C. Keep combustible materials away from ignition sources.

407 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Comply with all warranty procedures required by manufacturer, including notifications, scheduling, and inspections.

C. Warranty: Warranty covering membrane, roof insulation, and other indicated components of the system, for the term of 20 years.
1. Limit of Liability: No dollar limitation.
2. Scope of Coverage: Repair leaks in the roofing system caused by:
a. Ordinary wear and tear of the elements.
b. Manufacturing defect in materials.
c. Defective workmanship used to install these materials.
d. Damage due to winds up to 55 mph.
3. Not Covered:
a. Damage due to winds in excess of 55 mph.
b. Damage due hurricanes or tornadoes.
c. Hail.
d. Intentional damage.
e. Unintentional damage due to normal rooftop inspections, maintenance, or service.

PART 5 PRODUCTS

501 MANUFACTURERS

A. Design Basis Manufacturer: Carlisle Roofing Systems, Inc; www.carlisle-syntec.com.

B. Acceptable Manufacturers pending conformance to Design Basis manufacturer:

C. Manufacturer of Insulation and Cover Boards: Same manufacturer as roof membrane.

D. Substitutions: Submit a single ply membrane that matches the design basis in performance, thickness, warranty coverage and application.

502 ROOFING SYSTEM DESCRIPTION

A. Roofing System: Single-ply membrane.

503 MEMBRANE MATERIALS

A. Membrane: Flexible, heat weldable sheet composed of thermoplastic polyolefin polymer and ethylene propylene rubber; complying with ASTM D6878, with polyester weft inserted reinforcement and the following additional characteristics:
1. Thickness: 0.080 inch plus/minus 10 percent, with coating thickness over reinforcement of 0.030 inch plus/minus 10 percent.
2. Sheet Width: Provide sheets of width necessary to accommodate batten spacing required by manufacturer for project conditions.
3. Puncture Resistance: 415 lbf, minimum, when tested in accordance FTM 101C Method 2031.
4. Solar Reflectance: 0.84, minimum, when tested in accordance with ASTM C1549.

B. Insulation Fasteners: Type and size as required by roof membrane manufacturer for roofing system attachment to existing plywood roof sheathing through existing built-up roof system and warranty to be provided; use only fasteners furnished by roof membrane manufacturer.

C. Curb and Parapet Flashing: Same material as membrane, with encapsulated edge which eliminates need for seam sealing the flashing-to-roof splice; precut to 18 inches wide.

D. Formable Flashing: Non-reinforced, flexible, heat weldable sheet, composed of thermoplastic polyolefin polymer and ethylene propylene rubber.
   1. Thickness: 0.060 inch plus/minus 10 percent.
   2. Tensile Strength: 1550 psi, minimum, when tested in accordance with ASTM D638 after heat aging.
   3. Elongation at Break: 650 percent, minimum, when tested in accordance with ASTM D638 after heat aging.
   4. Tearing Strength: 12 lbf, minimum, when tested in accordance with ASTM D1004 after heat aging.
   5. Color: White.
   6. Acceptable Product: TPO Flashing by Carlisle.

E. Tape Flashing: 5-1/2 inch nominal wide TPO membrane laminated to cured rubber polymer seaming tape, overall thickness 0.065 inch nominal; TPO Flashing by Carlisle.

F. Pourable Sealer: Two-part polyurethane, two-color for reliable mixing; Pourable Sealer by Carlisle.

G. Termination Bars: Aluminum bars with integral caulk ledge; 1.3 inches wide by 0.10 inch thick; Termination Bar by Carlisle.

H. Cut Edge Sealant: Synthetic rubber-based, for use where membrane reinforcement is exposed; Cut Edge Sealant by Carlisle.

I. General Purpose Sealant: EPDM-based, one part, white general purpose sealant; TPO General Purpose Sealant by Carlisle.

J. Molded Flashing Accessories: Unreinforced TPO membrane pre-molded to suit a variety of flashing details, including pipe boots, inside corners, outside corners, etc.; TPO Small and Large Pipe Flashing by Carlisle.

K. Water Block Seal: Butyl rubber sealant for use between two surfaces, not exposed; Water Block Seal by Carlisle.

L. Roof Walkway Pads: Non-reinforced TPO walkway pads, 0.130 inch by 30 inches by 40 feet long with patterned traffic bearing surface; TPO Walkway Pads by Carlisle.

M. PMMA flashing at termination of TPO to built-up roofing where TPO will not cover built-up roofing. Verify compatibility of PMMA flashing to both roofing materials prior to proceeding with PMMA flashing application.

5.04 ROOF RECOVER BOARDS

A. High Density Polyisocyanurate Recover Board: Non-combustible, water resistant, high density closed cell polyisocyanurate core with coated glass mat facers, with the following characteristics:
   1. Size: 48 inches by 96 inches, nominal.
   2. Thickness: 1/4 inch.
   3. Thermal Value: R-value of 2.5, when tested in accordance with ASTM C518 and ASTM C177.
   4. Surface Water Absorption: 3 percent, maximum, when tested in accordance with ASTM C209.
   5. Compressive Strength: 120 psi, when tested in accordance with ASTM D1621.
   6. Density: 5 pcf, when tested in accordance with ASTM D1622.
   7. Factory Mutual approved for use with FM 1-60 and 1-90 rated roofing assemblies.
   8. Mold Growth Resistance: Passing ASTM D3273.

B. Insulation Fasteners: Type and size as required by roof membrane manufacturer for roofing system and warranty to be provided; use only fasteners furnished by roof membrane manufacturer.

PART 6 INSTALLATION

6.01 DEMOLITION

A. Neatly, provide precision removal of portions of the existing roof system and flashings at perimeters as necessary to allow for installation of roofing membrane manufacturer's standard details customized for this project in accordance with roofing manufacturer's published instructions and recommendations for the specified roofing system. Comply with federal, state, and local regulations.

B. Remove all demolished items and clean all contaminants generated by demolition work from building and surrounding areas, including bitumen, adhesives, sealants, and coatings.

C. Do not start new roof system work until manufacturer's technical representative reviews substrate and determine substrate condition satisfactory for roofing installation

602 EXAMINATION

A. Examine roof deck to determine that it is sufficiently rigid to support installers and their mechanical equipment and that deflection will not strain or rupture roof components or deform deck.

B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work.

C. Examine roof substrate to verify that it is properly sloped to drains and will not create ponding, especially at areas where new roof cover-over meets existing roof not being covered over.

D. Verify that the specifications and drawing details are workable and not in conflict with the roofing manufacturer's recommendations and instructions; start of work constitutes acceptable of project conditions and requirements.

603 GENERAL

A. Install roofing, insulation, flashings, and accessories in accordance with roofing manufacturer's published instructions and recommendations for the specified roofing system. Where manufacturer provides no instructions or recommendations, follow good roofing practices and industry standards. Comply with federal, state, and local regulations.

B. Obtain all relevant instructions and maintain copies at project site for duration of installation period.

C. Do not start work until Pre-Installation Notice has been submitted to manufacturer as notification that this project will require a manufacturer's warranty.

D. Perform work using competent and properly equipped personnel.

E. Temporary closures, which ensure that moisture does not damage any completed section of the new roofing system, are the responsibility of the applicator. Completion of flashings, terminations, and temporary closures shall be completed as required to provide a watertight condition.

F. Install roofing membrane only when surfaces are clean, dry, smooth and free of snow or ice; do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application; consult manufacturer for recommended procedures during cold weather. Do not work with sealants and adhesives when material temperature is outside the range of 60 to 80 degrees F.

G. Protect adjacent construction, property, vehicles, and persons from damage related to roofing work; repair or restore damage caused by roofing work.
   1. Protect from spills and overspray from bitumen, adhesives, sealants and coatings.
   2. Particularly protect metal, glass, plastic, and painted surfaces from bitumen, adhesives, and sealants within the range of wind-borne overspray.
   3. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.

H. Until ready for use, keep materials in their original containers as labeled by the manufacturer.

I. Consult membrane manufacturer's instructions, container labels, and Material Safety Data Sheets (MSDS) for specific safety instructions. Keep all adhesives, sealants, primers and cleaning materials away from all sources of ignition.

604 PREPARATION

A. Take appropriate measures to ensure that fumes from adhesive solvents are not drawn into the building through air intakes.

B. Prior to proceeding, prepare roof surface so that it is clean, dry, and smooth, and free of sharp edges, fins, roughened surfaces, loose or foreign materials, oil, grease and other materials that may damage the membrane.

C. Fill all surface voids in the immediate substrate that are greater than 1/4 inch wide with fill material acceptable insulation to membrane manufacturer.

D. Seal, grout, or tape deck joints, where needed, to prevent bitumen seepage into building.

6.05 INSULATION AND RECOVER BOARD INSTALLATION

A. Install recover board over existing roof surface in configuration and with attachment method required by roofing manufacturer to separate existing and new systems and provide a suitable substrate for system insulation installation specified in PART 2, under Roofing System.

6.06 SINGLE-PLY MEMBRANE INSTALLATION

A. Beginning at low point of roof, place membrane without stretching over substrate and allow to relax at least 30 minutes before attachment or splicing; in colder weather allow for longer relax time.

B. Lay out the membrane pieces so that field and flashing splices are installed to shed water.

C. Install membrane without wrinkles and without gaps or fishmouths in seams; bond and test seams and laps in accordance with membrane manufacturer's instructions and details.

D. Mechanically attached membrane: Use attachment means and methods as required by the membrane manufacturer's installation instructions and details.
   1. Use recommended spacing of seams and terminations.
   2. Use manufacturer's required type, diameter, length and spacing of anchors as determined by the roof framing, substrate or other attachment point.

E. Edge Securement: Secure membrane at all locations where membrane terminates or goes through an angle change greater than 2 in 12 inches using mechanically fastened reinforced perimeter fastening strips, plates, or metal edging as indicated or as recommended by roofing manufacturer.
   1. Exceptions: Round pipe penetrations less than 18 inches in diameter and square penetrations less than 4 inches square.
   2. Metal edging is not merely decorative; ensure anchorage of membrane as intended by roofing manufacturer.

6.07 FLASHING AND ACCESSORIES INSTALLATION

A. Re-install existing flashings replacing pieces damaged beyond reuse during removal at no cost to the County. Replacement sheet metal to closely match existing color and style. Use the membrane manufacturer's recommendations and details.

B. Metal Accessories: Install metal edgings, gravel stops, and copings in locations indicated on the drawings when applicable, with horizontal leg of edge member over membrane and flashing over metal onto membrane.
   1. Follow roofing manufacturer's instructions.
   2. Remove protective plastic surface film immediately before installation.
   3. Install water block sealant under the membrane anchorage leg.
   4. Flash with manufacturers recommended flashing sheet unless otherwise indicated.
   5. Where single application of flashing will not completely cover the metal flange, install additional piece of flashing to cover the metal edge.
   6. If the roof edge includes a gravel stop and sealant is not applied between the laps in the metal edging, install an additional piece of self-adhesive flashing membrane over the metal lap to the top of the gravel stop; apply seam edge treatment at the intersections of the two flashing sections.
   7. When the roof slope is greater than 1:12, apply seam edge treatment along the back edge of the flashing.

6.08 FINISHING AND WALKWAY INSTALLATION

A. Install walkways at access points to the roof, around rooftop equipment that may require maintenance, and existing walkway locations, or as directed by the County.

B. Walkway Pads: Adhere to the roofing membrane, spacing each pad at minimum of 1.0 inch and maximum of 3.0 inches from each other to allow for drainage.
   1. If installation of walkway pads over field fabricated splices or within 6 inches of a splice edge cannot be avoided, adhere another layer of flashing over the splice and extending beyond the walkway pad a minimum of 6 inches on either side.
   2. Prime the membrane, remove the release paper on the pad, press in place, and walk on pad to ensure proper adhesion.

6.09 FIELD QUALITY CONTROL

A. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer specifically to inspect installation for warranty purposes (i.e. not a sales person).
B. Perform all corrections necessary for issuance of warranty.

6.10 CLEANING

A. Clean all contaminants generated by roofing work from building and surrounding areas, including bitumen, adhesives, sealants, and coatings.
B. Repair or replace building components and finished surfaces damaged or defaced due to the work of this section; comply with recommendations of manufacturers of components and surfaces.
C. Remove leftover materials, trash, debris, equipment from project site and surrounding areas.

6.11 PROTECTION

A. Where construction traffic must continue over finished roof membrane, provide durable protection and replace or repair damaged roofing to original condition.

END OF SECTION

SECTION 07227 - FALL PROTECTION DEVICES

PART 7 – GENERAL

7.01 SUMMARY

A. Section Includes: Roof tie-down system of fall restraint and fall arrest for worker safety.

B. Design and engineering of system shall be based upon roofing substrate on each building.

7.01 REFERENCES

A. American Society for Testing and Materials (ASTM)

B. American National Standard Institute (ANSI)

1. ANSI Z359.1-2007 – Safety Requirements for Personal Fall Arrest Systems, Subsystems and Components
2. ANSI Z359.6-2009 – Specifications and Design Requirements for Active Fall Protection Systems

C. Occupational Health And Safety Administration (OSHA)

1. OSHA 1926.502 – Fall Prevention Systems Criteria and Practices

7.02 SYSTEM DESCRIPTION

A. General: Provide structural fall restraint and fall arrest system capable of withstanding loads and stresses within limits and under conditions specified in OSHA and other applicable safety codes. Provide fall protection anchors permanently attached to roof structure.

B. Design Requirements: Anchors and accessories comprising system of following types:

1. Guardian CB Anchors, spaced as indicated by manufacturer, for safety snap connection by individual workers capable of withstanding a 5,000 pound load or safety factor of 2 meeting the requirements of OSHA 1926.502(d)(8).

C. Performance Requirements: System and components tested for the resistance of the following loads:

1. Fall Restraint: 1 User
2. Fall Arrest: 1 User
3. Design fall protection anchors to resist a 5,000 pound load applied in any direction at maximum anchor height or provide engineered system designed meeting the requirements of OSHA 1926.502(d)(8).

7.03 SUBMITTALS

A. Product Data: For each type of device specified, including manufacturer's standard fabrication details and installation instructions.

B. Shop Drawings: Show layout, profiles, and anchorage details. Shop drawings & calculations to be stamped by a Professional Engineer registered in the State in which the project is located.

C. Maintenance Data: Written instructions for maintenance of fall prevention safety devices to be included in the operation and maintenance manual.

D. In-house Test Reports: Indicate anchor fabrication compliance with performance requirements.

E. Signage: Provide laminated sign showing system layout and usage notes, to be installed at roof access locations.

7.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Firm having at least 10 years continuous experience in manufacturing fall safety equipment similar to systems specified and exhibiting records of successful in-service acceptability and performance. Firm must employ personnel dedicated to provide regularly scheduled Authorized and Competent Person Training courses as mandated by OSHA 1926 and 1910 for owner's authorized safety personnel.

B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the jurisdiction where the Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of roof anchors that are similar to those indicated for this Project in material, design and extent.

C. OSHA Standards: Comply with Occupational Safety and Health Administration Standards for the Construction Industry 29 CFR § 1926.500 Subpart M (Fall Protection), and with applicable State Administrative Code safety standards for Fall Restraint and Fall Arrest.

D. Source Limitations: Obtain all roof anchors through one source from a single manufacturer.

E. Testing: Perform quality control tests for each system per manufacturer's requirements.

7.05 COORDINATION

A. Contractor to coordinate installation of structural deck to meet requirements of roof anchor manufacturer.

1. Concrete Deck: Minimum concrete strength, Fc = 2,000 psi. Minimum 6" thickness for adhesive anchor connection; minimum 4" thickness for mechanical anchor connection.
2. Metal Deck: Minimum 18 gauge thickness, or provided with additional deck reinforcing per manufacturer's instructions.
3. Wood Deck: Minimum 3/4" CDX plywood, or provided with additional deck reinforcing per manufacturer's instructions.
4. Structural beam for weld-on or backer plate connection: structure must be capable of supporting a 5,000 pound ultimate load.
5. Concrete or composite metal deck for backer plate or toggle anchor connection: Deck must be capable of supporting a 5,000 pound ultimate load.
6. Other structural decks not listed above shall be approved by a Qualified Person.

B. Contractor to coordinate installation of structural deck reinforcements and anchorages to receive fall protection anchors.

C. Contractor to coordinate placement of roofing system, insulation and flashing to ensure water-tight integrity to roof.

7.06 WARRANTY

A. Provide manufacturer's standard warranty to guarantee products will be free from defects for a period of 12 months. Warranty period shall become effective on date of substantial completion.

PART 8 – PRODUCTS

8.01 MANUFACTURER

A. Provide fall protection system manufactured by Guardian Fall Protection Inc., 6305 South 231st Street Kent, WA, phone 800-466-6385, fax 800-670-7892, or equal.

8.02 MATERIALS

A. CB Anchor post: 2-1/2" schedule 80 pipe, galvanized steel (size as necessary for height).

B. CB Anchor U-bar: 5/8" diameter U-bar, galvanized steel.

C. CB Anchor base plate: galvanized steel.

8.03 MANUFACTURED ASSEMBLIES

A. Guardian CB-12 or CB-18 Galvanized Roof Anchors.

8.04 FABRICATION

A. Fabricate work true to dimension, square, plumb, level, and free from distortions or defects detrimental to appearance and performance.

B. Prepare, treat and coat galvanized metal to comply with manufacturer's written instructions. Prepare galvanized metal by removing grease, dirt, oil, flux, and other foreign matter.

PART 9 – EXECUTION

9.01 EXAMINATION

A. Examine framing and substrate and verify conditions comply with structural requirements for proper system performance.

B. Proceed with installation of roof anchors only after verifying conditions are satisfactory.

9.02 INSTALLATION

A. General: Installation of Anchor Posts to be performed by contractor according to manufacturer's instructions and recommendations.

9.03 FIELD QUALITY CONTROL

A. Testing: Test on site 100% of anchors relying upon chemical adhesive fasteners using load cell test apparatus in accordance with manufacturer's written recommendations.

9.04 ADJUSTMENT AND INSPECTION

A. Ensure all manufactured anchors have been installed in accordance with fall protection manufacturer's engineering documentation and specifications.

B. Provide plan drawings with any deviations in anchor locations as installed.

END OF SECTION

SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 10 GENERAL

10.01 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings, counter flashings, and other items indicated in Schedule.

10.02 REFERENCE STANDARDS

A. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels; 2013.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.

D. ASTM D2178/D2178M - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing; 2013a.

E. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012)e1.

10.03 ADMINISTRATIVE REQUIREMENTS

A. Pre-installation Meeting: Convene one week before starting work of this section.

10.04 SUBMITTALS

A. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
   1. Three dimensional axonometric views of flashings, pans and sheet metal details.

B. Samples: Submit two samples 6 by 6 inch in size illustrating metal finish color.

10.05 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual and CDA Copper in Architecture Handbook requirements and standard details, except as otherwise indicated.

B. Maintain one copy of each document on site.

C. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 10 years of documented experience.

10.06 PRE-INSTALLATION CONFERENCE

A. Convene one week before starting work of this section.

10.07 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

PART 11 PRODUCTS

11.01 SHEET MATERIALS

A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 0.02 inch thick base metal, shop pre-coated with modified silicone coating.
   1. Modified Silicone Polyester Coating: Pigmented Organic Coating System, AAMA 2603; baked enamel finish system.
   2. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as scheduled.

B. Stainless Steel: ASTM A666 Type 304, soft temper, 0.015 inch thick; smooth No. 4 finish.

11.02 ACCESSORIES

A. Fasteners: Stainless steel, with soft neoprene washers.
B. Underlayment: ASTM D2178, glass fiber roofing felt.
C. Flexible Flashing Underlayment: Product specified in Sectin 07 25 00 or 07 27 00.
D. Slip Sheet: Rosin sized building paper.
E. Primer: Zinc chromate type.
F. Protective Backing Paint: Zinc molybdate alkyd.
G. Plastic Cement: ASTM D4586, Type I.

11.03 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
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.
G. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake edges.

11.04 ROOF PENETRATIONS

A. Comply with NRCA and SMACNA requirements.
B. Roof Drains and Vents: Lead.
C. Posts, pipes, and Conduit: Prefinished galvanized steel cone shape and counter flashing with draw-band and top sealant channel.
D. Equipment Pads: Galvanized steel.

PART 12 EXECUTION

12.01 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.

12.02 PREPARATION

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

12.03 INSTALLATION

E. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.
F. Apply plastic cement compound between metal flashings and felt flashings.
G. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
H. Seal metal joints watertight.

1204 FIELD QUALITY CONTROL

I. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

1205 SCHEDULE

J. Miscellaneous Trim:
   1. Thickness: 0.0239 inch
   2. Finish: Preprimed for field finish

K. Coping, Cap, Parapet, Sill and Fascia Flashings:
   1. Thickness: 0.0396 inch
   2. Finish: Prefinished in two separate custom colors

L. Flashings Associated with Shingle Roofing, including Cricket, Eave, and Gutter Drip
   1. Thickness: 0.0239 inch
   2. Finish: Prefinished in custom color.

M. Flashings Associated with all other types of Roofing
   1. Thickness: 0.0239 inch
   2. Finish: Prefinished in custom color.

END OF SECTION