	Page Unified School District, #8 Amendment #2		500 S. Navajo Drive Page, AZ 86040
	IFB: 20-08-20 PROJECT: Roof Replacement at Page Middle School	Page 1 of 22	

January 7, 2020

This amendment is released to all interested parties.

1. The specifications have been revised. Please find attached the cover page that is sealed and the 17 page specifications document in pdf format.



075500 Modified
Roofing 7-30-19.pdf



Addendum No. 2
Page MS Roofing.pdf

2. This adds a significant burden to all the responding firms. This is one of the reasons for the time extension.
3. All other terms and conditions remain the same.
4. The **due time has changed** and is now **February 6, 2020 by 2:30 PM (Mountain Standard Time)**. A new Bid Package Label is attached that reflects the new due date and time.
5. All other terms and conditions remain the same.
6. Please remember to acknowledge this Amendment #3 with your offer.
7. End of Amendment #3.

SEALED BID PACKAGE – DELIVERY LABEL

Submitted by:	
Address:	
City, State, Zip:	

IFB #20-08-20 for Roof Replacement at Page Middle School

Due: No later than February 6, 2020 by 2:30 PM (Mountain Standard Time)

Page Unified School District, #8
District Office
500 S Navajo
Page, AZ 86040

SEALED BID PACKAGE – US MAIL LABEL

Submitted by:	
Address:	
City, State, Zip:	

IFB #20-08-20 for Roof Replacement at Page Middle School

Due: No later than February 6, 2020 by 2:30 PM (Mountain Standard Time)

Page Unified School District, #8
District Office
PO Box 1927
Page, AZ 86040

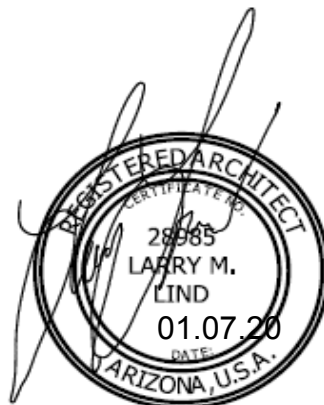
ADDENDUM: Number 02
DATE: January 07, 2019
TO: Interested Bidders
CLIENT: Page Unified School District
Page, Arizona
PROJECT: Page Middle School Roof Improvements
SITE: Page Middle School
Page, Arizona
ARCHITECT: Architechnology, Inc.
5229 North 7th Avenue, Suite 101
Phoenix, Arizona 85013



AT PROJECT NO: 19-117.01

1. INSTRUCTIONS

1. This supplement to Bid Documents is issued prior to the receipt of bids. All Work covered in the supplement shall be included in the original quotation and the Supplement will be considered an integral part of the Contract Documents.
2. All work performed under this Supplement shall be subject to the General Conditions of the Contract and the Specifications for similar work in connection with this Project.



EXPIRES: 3-21-22

A. General Items – Clarification

None.

B. Addendum Drawings – Change

1. None

C. Specifications – Change

1. Remove and replace specification section 07 55 00.



EXPIRES: 3-21-22

SECTION 07550
MODIFIED BITUMEN ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. 2-Ply Low Sloped Roofing
- B. Edge Treatment and Roof Penetration Flashings.

1.2 SUMMARY OF WORK – All Modified Bituminous Membranes Must Be Manufactured/Supplied and Warranted by One Manufacturer.

- A. Scope of Work:
 - 1. Remove existing roofing assembly down to light weight concrete or structural deck.
 - 2. Install polyisocyanurate insulation (1.5-inch min.) per wind uplift calculations. See roof plans for depth of insulation.
 - 3. Fully adhere ½" asphalt coated wood fiberboard insulation (recovery board) in Type IV asphalt.
 - 4. Install factory tapered crickets as required to create positive slope to drains.
 - 5. Install perlite cant strips at all 90 degree angles.
 - 6. In field, fully adhere one ply of SBS modified smooth surfaced membrane with specified tensile and tear strengths in Type IV asphalt.
 - 7. In field, fully adhere one ply of modified surfacing membrane with specified tensile and tear strengths in Type IV asphalt.
 - 8. At all base flashings, fully adhere one ply of modified smooth surfaced membrane with specified tensile and tear strengths in Type IV asphalt.
 - 9. Over smooth surfaced base flashing ply, fully adhere one ply of thermoplastic membrane in low rise adhesive/Type IV asphalt/bonding adhesive.
 - 10. Strip in base flashing membrane to field surfacing membrane with asphalt mastic, reinforced with fiberglass mesh; broadcast granules into top layer of asphalt mastic.
 - 11. Install new metal flashings, including but not limited to drip edge, copings, counter flashings, slip flashings, scuppers, lead jacks, lead at drains, and pitch pans/covers.
 - 12. Properly support all conduit, gas lines and any other roof top lines to complete the roof with UV resistant and galvanized supports blocking.
 - 13. Spray apply acrylic white coating to surfaced membrane, base flashings, pipe penetrations, and miscellaneous areas; application must be applied in two coats in cross-hatch manner.

1.3 REFERENCES

- A. Roofing Terminology:
 - 1. RCI "Glossary of Building Envelope Terms."
 - 2. Glossary of Terms: SMACNA "Architectural Sheet Metal Manual."
 - 3. ASTM D 1079 "Standard Terminology Relating to Roofing & Waterproofing."
 - 4. Glossary of Terms: "National Roofing Contractors Association Roofing and Waterproofing Manual."

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Perform work in accordance with all federal, state and local codes.
- B. Exterior Fire Test Exposure: Roof system submitted shall achieve a UL, Intertek-WH or FM Class rating. Rating must meet state and local codes.
- C. Design Requirements – **Architect to provide applicable pressures and Manufacture to provide fastening pattern.**

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- 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: Contractor must submit shop drawings including installation details of roofing, flashing, fastening, insulation, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane, prior to job start.
- D. Design Pressure Calculations: Manufacturer must submit fastening patterns from provided design pressure calculations for the site-specific roof areas in accordance with ASCE 7 and local Building Code requirements.
- E. Verification Samples: For each product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- F. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous surfacing sheets, indicating compliance with ASTM D5147.
- G. Manufacturer's Fire Compliance Certificate: Certify that the roof system furnished is tested by a third party in accordance with ASTM E108 or UL 790 and meets local or nationally recognized building codes.
- H. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.
- B. Installer Qualifications: Company specializing in performing work of this section with a minimum of five (5) years documented experience and is certified and pre-approved by the manufacturer unless stated differently in the RFP.
- C. Installer's Field Supervision: Maintain a full-time foreman on job site during all phases of roofing work while roofing work is in progress.

1.7 PRODUCT INFORMATION REQUIRED WITH BID SUBMITTAL AND DUE AT BID OPENING

- A. Required Product Information to be submitted with bid:

1. Product identification: including Manufacturer's current literature and Manufacturer's name and address.
 2. Letter from manufacturer stating they will provide field inspections no less than a minimum of one (1) day each week, on during, and until all construction work is completed and accepted by the Owner and Architect.
- B. Products will not be considered if:
1. Product or method of major waterproofing field components to be considered does not have a minimum of five (5) years of successful performance in roofing and reroofing applications in Arizona.
 2. The independent test data does not meet or exceed the minimum performance standards specified.
 3. Acceptance will require substantial revision of Contract Documents.
 4. Architect/ Owner reserves the right to be the final authority on the acceptance or rejection of any and all products.
- 1.8 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.
- 1.9 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. No wet or damaged materials will be used in the application.
 - D. Refer to manufacturer's published requirements for additional storing recommendations.
- 1.10 COORDINATION
- A. Coordinate Work with installing associated metal flashings as work of this section proceeds.
- 1.11 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.

1.12 WARRANTY

- A. Upon completion of the work, provide the Manufacturer's written and signed NDL (no dollar limit) Warranty. Warranty shall cover defective material or defective workmanship by the installing contractor. 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.
 - 1. Warranty Period:
 - a) 20 years NDL from date of acceptance. (NDL) material and labor warranty to be provided by the manufacturer for all the types of roofing failures which will include roof leaks, blisters, ponding, sliding materials, and loss of granules.
- B. Installer is to guarantee all work against defects in materials and workmanship for the period indicated following final acceptance of the Work.
 - 1. Warranty Period:
 - a) 2 years from date of acceptance.

PART 2 PRODUCTS

2.1 MANUFACTURERS –The Products specified are intended and the Standard of Quality for the products required for this project.

2.2 2-PLY LOW SLOPED ROOFING

- A. Inter-Ply Adhesive: ASTM D 312, Type IV special steep asphalt approved by membrane manufacturer.
- B. Waterproofing Assembly: Multi Ply SBS Modified Bitumen Roofing System with a minimum of two and a maximum of three plies, where the combination of the plies meets or exceeds 500 lbf. / in. of tensile strength and 850 lbf. / in. of tear strength when tested per ASTM D 5147 @ 73.4 +/- 3.6 deg F.
 - 1. All plies may contain any combination of the following scrim reinforcements:
 - a) Polyester Scrim Reinforcement - ASTM D 6164.
 - b) Fiberglass Scrim Reinforcement - ASTM D 6163.
 - c) Dual Fiberglass Scrim Reinforcements - ASTM D 6162.
- C. Flashing Cap Ply Sheet: 60-mil high-performance reinforced thermoplastic membrane approved by membrane manufacturer.
- D. Surfacing: White elastomeric Energy Star coating approved by membrane manufacturer.

2.3 ACCESSORIES:

- A. Fasteners: Non-ferrous metal or galvanized steel, except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; and stainless steel nails shall be used with stainless steel, Fasteners shall be self-clinching type of penetrating type as recommended by the deck manufacturer. Fasten nails and fasteners flush-driven through flat metal discs not less than 1 inch (25 mm) diameter. Omit metal discs when one-piece composite nails or fasteners with heads not less than 1 inch (25 mm)

diameter are used.

- B. Asphalt Primer: Approved by Membrane Manufacturer for 20-year NDL warranty.
- C. Flashing Cap Adhesive: Approved by Membrane Manufacturer for 20-year NDL warranty. .
- D. Base Sheet for tie ins: Approved by Membrane Manufacturer for 20-year NDL warranty. .
- E. Asphalt Mastic: Approved by Membrane Manufacturer for 20-year NDL warranty.
- F. Three Course Reinforcing Mesh: Approved by Membrane Manufacturer for 20-year NDL warranty.
- G. Wood Nailers
- H. Pipe, Conduit, Power-runs & Condensate Line Supports: Approved by Membrane Manufacturer for 20-year NDL warranty.
- I. Urethane Sealant: One part, non-sag sealant Approved by Membrane Manufacturer for 20-year NDL warranty.
- J. Structural Adhesive: Single component, 100% solids structural adhesive Approved by Membrane Manufacturer for 20-year NDL warranty.
- K. Butyl Tape: 100% solids, asbestos free and compressive tape designed to seal as recommended and furnished by the membrane manufacturer for 20-year NDL warranty.
- L. Liquid Flashing Reinforced w/ Polyester: Polyurethane-based, low-odor, liquid flashing membrane Approved by Membrane Manufacturer for 20-year NDL warranty.
- M. Liquid Flashing Reinforcement: Strong, elastic, polyester reinforcing fabric Approved by Membrane Manufacturer for 20-year NDL warranty for 20-year NDL warranty.
- N. Roof Insulation:
 - 1. Rigid Polyisocyanurate Roof Insulation; ASTM C1289 Approved by Membrane Manufacturer for 20-year NDL warranty.
 - a. Thickness: Identified in drawings.
 - 2. Tapered Polyisocyanurate Roof Insulation; ASTM C1289.
 - 3. High Density Fiberboard Roof insulation; ASTM C208.
 - 4. Cant and Tapered Edge Strips; ASTM C728.
 - 5. Tapered Perlite Roof Insulation; ASTM C728.

2.4 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

- A. Drain Flashings should be 4lb (1.8kg) sheet lead formed and rolled.
- B. Plumbing Stacks should be 4lb (1.8kg) sheet lead formed and rolled.
- C. Cylinder Support Pipes Flashings should be 4lb (1.8kg) sheet lead formed and rolled.
- D. Fabricated Flashings: Fabricated flashings 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. Match existing.
2. Approved by Membrane Manufacturer.

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" 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 components to damp or wet surfaces.

3.3 INSULATION INSTALLATION (General)

- A. Metal Deck Mechanical Attachment:
 1. Mechanically attach approved insulation board per manufacturer's wind uplift calculations with plates and fasteners.
 2. Embed second layer of insulation board in solid moppings of hot asphalt after first layer has been attached as recommended by insulation manufacturer. Stagger end joints of boards so all open joints will be eliminated. Walk in each piece of insulation and leave boards completely adhered to base felt or deck. Each insulation board shall be butt firmly against adjoining panels. All open joints shall be eliminated.
 3. Approved insulation shall be tapered around roof drains and scuppers. Tapered insulation sump shall start with a thickness of one-half at drain bowl to the specified dimension of three feet from the center line of the drain. Install tapered insulation sump in such a way to provide proper slope for runoff. Shape insulation with tool as required so completed surface is smooth and flush with ring of drain. Under no circumstances will the membrane be left unsupported in an area greater than one quarter (1/4) inch. Install recovery board over tapered insulation sump as required.

4. Approved recovery board one half (1/2) inch thickness shall be installed over base tapered insulation using hot asphalt at the rate of approximately thirty-three (33) pounds per square.
5. All boards shall be cut and fitted where the roof deck intersects a vertical surface. The boards shall be cut to fit a minimum of one quarter (1/4) inch away from the vertical surface.
6. Install no more insulation at one time than can be roofed on the same day.
7. Install temporary water cut-offs at completion of each day's work and remove upon resumption of work.
8. Cant Strips/Tapered Edge Strips: Install preformed forty five (45) degree cant strip at junctures of vertical surfaces. Provide preformed, tapered edge strips at perimeter of edges of roof that do not terminate at vertical surfaces and/or indicated on the drawings.
9. Minimum penetration into deck shall be as recommended by the fastener manufacturer. There is a one (1) inch minimum for metal.

B. Wood Deck Mechanical Attachment:

1. Mechanically attach approved insulation board per manufacturer's wind uplift calculations with plates and fasteners.
2. Embed second layer of insulation board in solid moppings of hot asphalt after first layer has been attached as recommended by insulation manufacturer. Stagger end joints of boards so all open joints will be eliminated. Walk in each piece of insulation and leave boards completely adhered to base felt or deck. Each insulation board shall be butt firmly against adjoining panels. All open joints shall be eliminated.
3. Approved insulation shall be tapered around roof drains and scuppers. Tapered insulation sump shall start with a thickness of one-half at drain bowl to the specified dimension of three feet from the center line of the drain. Install tapered insulation sump in such a way to provide proper slope for runoff. Shape insulation with tool as required so completed surface is smooth and flush with ring of drain. Under no circumstances will the membrane be left unsupported in an area greater than one quarter (1/4) inch. Install recovery board over tapered insulation sump as required.
4. Approved recovery board one half (1/2) inch thickness shall be installed over base tapered insulation using hot asphalt at the rate of approximately thirty-three (33) pounds per square.
5. All boards shall be cut and fitted where the roof deck intersects a vertical surface. The boards shall be cut to fit a minimum of one quarter (1/4) inch away from the vertical surface.
6. Install no more insulation at one time than can be roofed on the same day.
7. Install temporary water cut-offs at completion of each day's work and remove upon resumption of work.
8. Cant Strips/Tapered Edge Strips: Install preformed forty five (45) degree cant strip at junctures of vertical surfaces. Provide preformed, tapered edge strips at perimeter of edges of roof that do not terminate at vertical surfaces and/or indicated on the drawings.
9. Minimum penetration into deck shall be as recommended by the fastener manufacturer. There is a one (1) inch minimum for wood.

C. Light Weight Concrete Deck, Tectum Deck, and Gypsum Deck Mechanical Attachment:

1. Mechanically attach base sheet to deck per manufacturer's wind uplift calculations with plates and fasteners.
2. Over base sheet, embed one layer of rigid insulation board in solid moppings of hot asphalt at the rate and temperature recommended by insulation manufacturer. Stagger end joints of boards so all open joints will be eliminated. Walk in each piece of insulation and leave boards completely adhered to deck. Each insulation board shall be butt firmly against adjoining panels. All open joints shall be eliminated.
3. Embed second layer of insulation board in solid moppings of hot asphalt after first layer has been attached as recommended by insulation manufacturer. Stagger end joints of boards so all open joints will be eliminated. Walk in each piece of insulation and leave boards completely adhered to base felt or deck. Each insulation board shall be butt firmly against adjoining panels. All open joints shall be eliminated.
4. Approved insulation shall be tapered around roof drains and scuppers. Tapered insulation sump shall start with a thickness of one-half at drain bowl to the specified dimension of three feet from the center line of the drain. Install tapered insulation sump in such a way to provide proper slope for runoff. Shape insulation with tool as required so completed surface is smooth and flush with ring of drain. Under no circumstances will the membrane be left unsupported in an area greater than one quarter (1/4) inch. Install recovery board over tapered insulation sump as required.
5. Approved recovery board one half (1/2) inch thickness shall be installed over base tapered insulation using hot asphalt at the rate of approximately thirty-three (33) pounds per square.
6. All boards shall be cut and fitted where the roof deck intersects a vertical surface. The boards shall be cut to fit a minimum of one quarter (1/4) inch away from the vertical surface.
7. Install no more insulation at one time than can be roofed on the same day.
8. Install temporary water cut-offs at completion of each day's work and remove upon resumption of work.
9. Cant Strips/Tapered Edge Strips: Install preformed forty five (45) degree cant strip at junctures of vertical surfaces. Provide preformed, tapered edge strips at perimeter of edges of roof that do not terminate at vertical surfaces and/or indicated on the drawings.

D. Concrete Deck Attachment:

1. Over the entire deck surface, prime concrete surfaces with asphalt primer at the rate of 1 (one) gallon per one hundred (100) square feet.
2. Embed one layer of rigid insulation board in solid moppings of hot asphalt at the rate and temperature recommended by insulation manufacturer. Stagger end joints of boards so all open joints will be eliminated. Walk in each piece of insulation and leave boards completely adhered to deck. Each insulation board shall be butt firmly against adjoining panels. All open joints shall be eliminated.
3. Embed second layer of insulation board in solid moppings of hot asphalt after first layer has been attached as recommended by insulation manufacturer. Stagger end joints of boards so all open joints will be eliminated. Walk in each piece of insulation and leave boards completely adhered to base felt or deck. Each insulation board shall be butt firmly against adjoining panels. All open joints shall be eliminated.
4. Approved insulation shall be tapered around roof drains and scuppers. Tapered insulation sump shall start with a thickness of one-half at drain bowl to the specified dimension of three feet from the center line of the drain. Install tapered insulation sump in such a way to provide proper slope for runoff. Shape insulation with tool as

required so completed surface is smooth and flush with ring of drain. Under no circumstances will the membrane be left unsupported in an area greater than one quarter (1/4) inch. Install recovery board over tapered insulation sump as required.

5. Approved recovery board one half (1/2) inch thickness shall be installed over base tapered insulation using hot asphalt at the rate of approximately thirty-three (33) pounds per square.
6. All boards shall be cut and fitted where the roof deck intersects a vertical surface. The boards shall be cut to fit a minimum of one quarter (1/4) inch away from the vertical surface.
7. Install no more insulation at one time than can be roofed on the same day.
8. Install temporary water cut-offs at completion of each day's work and remove upon resumption of work.
9. Cant Strips/Tapered Edge Strips: Install preformed forty five (45) degree cant strip at junctures of vertical surfaces. Provide preformed, tapered edge strips at perimeter of edges of roof that do not terminate at vertical surfaces and/or indicated on the drawings.
10. Tape joints of insulation as per manufacturer's requirements.

3.4 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 back-nailing. Install 4 additional fasteners at the upper edge of the membrane when strapping the plies.

3.5 INSTALLATION HOT APPLIED ROOF SYSTEM

- A. Base Ply: Install base ply 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: Solidly bond the modified membrane to the base layers with specified material at the rate of 25 to thirty 30 lbs. (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 asphalt.
- C. Fibrous Cant Strips: Provide non-combustible 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.
1. Provide nailers at all roof perimeters and penetrations (as required by primary roofing manufacturer) 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."
- E. Metal Work: Provide new metal flashings, counter flashings, and parapet coping caps. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual, finish to match existing.
- 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 through butyl tape to achieve constant compression. Provide suitable, sealant at the top edge if required.

- G. Flashing Base Ply General:
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. Extend flashing base ply four inches above cant and four inches below cant.
 4. Solidly adhere the entire sheet of flashing base ply 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 General:
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 the flashing cap ply with specified adhesive. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces. Three-course with an application of mastic, mesh and granules at transition on field of roof. Allow to cure before coating.
 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. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.
- I. Surface Coatings: Apply roof coating in strict conformance with the manufacturer's recommended procedures.
1. Remove dust, dirt, debris and excess roofing granules from field and base flashings receiving coating.
 2. Install 2.5 gallons per square (1.25 gal per coat, two coat application) in a cross hatch manner of specified acrylic white energy star coating to all field, wall and penetrations.

3.6 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

- A. Metal Edge:
1. Inspect the nailers to assure proper attachment and configuration.
 2. Run one ply over the edge. Assure coverage of all wood nailers. Fasten plies with ring shank nails at 8 inches (203 mm) o.c.
 3. Install continuous cleat and fasten at 6 inches (152 mm) o.c.
 4. Install new metal edge hooked to continuous cleat and set in bed of roof cement. Fasten flange to wood nailers every 3 inches (76 mm) o.c. staggered.
 5. Prime metal edge at a rate of 100 square feet per gallon and allow to dry.
 6. Strip in flange with base flashing ply covering entire flange in bitumen with 6 inches (152 mm) on to the field of roof. Assure ply laps do not coincide with metal laps.

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. Seal outside edge with rubberized cement.
- B. Roof Edge with Gutter:
1. Inspect the nailer to assure proper attachment and configuration. Increase slope at metal edge by additional degree of slope in first board.
 2. Run one ply over the edge. Assure coverage of all wood nailers. Fasten plies with ring shank nails at 8 inches (203 mm) o.c.
 3. Install gutter and strapping.
 4. Install continuous cleat and fasten at 6 inches (152 mm) o.c.
 5. Install new metal edge hooked to continuous cleat and set in bed of roof cement. Fasten flange to wood nailer every 3 inches (76 mm) o.c. staggered.
 6. Prime metal edge at a rate of 100 square feet per gallon and allow to dry.
 7. Strip in flange with base flashing ply covering entire flange in bitumen with 6 inches (152 mm) onto the field of the roof. Assure ply laps do not coincide with metal laps.
 8. 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.
- C. Scupper Through Wall:
1. Inspect the nailer to assure proper attachment and configuration.
 2. Run one ply over nailer, into scupper hole and up flashing as in typical wall flashing detail. Assure coverage of all wood nailers.
 3. Install a scupper box in a 1/4 inch (6 mm) bed of mastic. Assure all box seams are soldered and have a minimum 4 inch (101 mm) flange. Make sure all corners are closed and soldered. Prime scupper at a rate of 100 square feet per gallon and allow to dry.
 4. Fasten flange of scupper box every 3 inches (76 mm) o.c. staggered.
 5. Strip in flange of scupper box with base flashing ply covering entire area with 6 inch (152 mm) overlap on to the field of the roof and wall flashing.
 6. Install base flashing surfacing ply, 60 mil POLIMER REINFORCED PVC membrane, in bitumen or low rise adhesive over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Heat-weld all side laps. Three-course with an application of mastic, mesh and granules at transition on field of roof. Allow too cure before coating.
- D. Scupper Through Wall (Overflow):
1. Inspect the nailer to assure proper attachment and configuration.
 2. Run one ply over nailer up the overflow, into the scupper hole and up flashing as in typical wall flashing detail. Assure coverage of all wood nailers.
 3. Install scupper box in a 1/4 inch (6 mm) bed of mastic. Assure all box seams are soldered and have a minimum 4 inch (101 mm) flange. Make sure all corners are closed and soldered. Prime scupper at a rate of 100 square feet per gallon and allow to dry.
 4. Fasten flange of scupper box every 3 inches (76 mm) o.c. staggered.
 5. Strip in flange scupper box with base flashing ply covering entire area with 6 inch (152 mm) overlap on to the field of the roof and wall flashing.
 6. Install base flashing surfacing ply, 60 mil POLIMER REINFORCED PVC membrane, in bitumen or low rise adhesive over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Heat-weld all side laps. Three-course with an application of mastic, mesh and granules at transition on field of roof. Allow too cure before coating.
- E. Coping Cap:

1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Prime vertical wall 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, extend sheet 4 inches above top of cant and down face with 4 inches on to field of roof.
 4. Install base flashing surfacing ply, 60 mil POLIMER REINFORCED PVC membrane, in bitumen or low rise adhesive over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Heat-weld all side laps. Three-course with an application of mastic, mesh and granules at transition on field of roof. Allow too cure before coating.
 5. Install continuous cleat and fasten at 6 inches (152 mm) o.c. to outside wall.
 6. Install new metal coping cap hooked to continuous cleat.
 7. Fasten inside cap 24 inches (609 mm) o.c. with approved fasteners and neoprene washers through slotted holes, which allow for expansion and contraction.
- F. Surface Mounted Counterflashing/Coping Cap:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Prime vertical wall 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, extend sheet 4 inches above top of cant and down face with 4 inches on to field of roof.
 4. Install base flashing surfacing ply, 60 mil POLIMER REINFORCED PVC membrane, in bitumen or low rise adhesive over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Heat-weld all side laps. Three-course with an application of mastic, mesh and granules at transition on field of roof. Allow too cure before coating.
 5. Apply butyl tape to wall behind flashing. Secure termination bar through flashing, butyl tape and into wall. Alternatively use caulk to replace the butyl tape.
 6. Secure counterflashing set on butyl tape above flashing. Fasten 8 inches (203 mm) o.c. and caulk top of counterflashing.
 7. Cover tapered board and all exposed wood with base flashing ply. Fasten inside and out at 8 inches (203 mm) o.c.
 8. Install continuous cleat and fasten at 6 inches (152 mm) o.c. to outside wall.
 9. Install new metal coping cap hooked to continuous cleat.
 10. Fasten inside of cap 24 inch (609 mm) o.c. with approved fasteners and neoprene washers.
- G. Surface Mounted Counterflashing:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Prime vertical wall 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, extend sheet 4 inches above top of cant and down face with 4 inches on to field of roof.
 4. Install base flashing surfacing ply, 60 mil POLIMER REINFORCED PVC membrane, in bitumen or low rise adhesive over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Heat-weld all side laps. Three-course with an application of mastic, mesh and granules at transition on field of roof. Allow too cure before coating.
 5. Apply butyl tape to wall behind flashing. Secure termination bar through flashing, butyl tape and into wall. Alternatively use caulk to replace the butyl tape.
 6. Secure counterflashing set on butyl tape above flashing at 8 inches (203 mm) o.c. and caulk top of counterflashing.

- H. Reglet Mounted Counterflashing:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Prime vertical wall 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, extend sheet 4 inches above top of cant and down face with 4 inches on to field of roof.
 4. Install base flashing surfacing ply, 60 mil POLIMER REINFORCED PVC membrane, in bitumen or low rise adhesive over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Heat-weld all side laps. Three-course with an application of mastic, mesh and granules at transition on field of roof. Allow too cure before coating.
 5. Apply butyl tape to wall behind flashing. Secure termination bar through flashing, butyl tape and into wall. Alternatively use caulk to replace the butyl tape.
 6. Cut reglet in masonry one joint above flashing.
 7. Secure reglet counterflashing with expansion fasteners and caulk reglet opening.
- I. Expansion Joint:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Prime vertical wall 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, extend sheet 4 inches above top of cant and down face with 4 inches on to field of roof.
 4. Install base flashing surfacing ply, 60 mil POLIMER REINFORCED PVC membrane, in bitumen or low rise adhesive over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Heat-weld all side laps. Three-course with an application of mastic, mesh and granules at transition on field of roof. Allow too cure before coating.
 5. Install pre-manufactured expansion joint cover. Fasten sides at 12 inches (609 mm) o.c. with fasteners and neoprene washers. Furnish all joint cover laps with butyl tape between metal covers.
- J. Area Divider:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Prime vertical wall 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, extend sheet 4 inches above top of cant and down face with 4 inches on to field of roof.
 4. Install base flashing surfacing ply, 60 mil POLIMER REINFORCED PVC membrane, in bitumen or low rise adhesive over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Heat-weld all side laps. Three-course with an application of mastic, mesh and granules at transition on field of roof. Allow too cure before coating.
 5. Install pre-manufactured cover. Fasten sides at 24 inches (609 mm) o.c. with fasteners and neoprene washers through slotted holes. Furnish all joint cover laps with butyl tape between metal covers.
- K. Equipment Support:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Prime vertical wall 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, extend sheet 4 inches above top of cant and down face with 4 inches on to field of roof.
 4. Install base flashing surfacing ply, 60 mil POLIMER REINFORCED PVC membrane,

- in bitumen or low rise adhesive over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Heat-weld all side laps. Three-course with an application of mastic, mesh and granules at transition on field of roof. Allow too cure before coating.
5. Install pre-manufactured cover. Fasten sides at 24 inches (609 mm) o.c. with fasteners and neoprene washers. Furnish all joint cover laps with butyl tape between metal covers.
 6. Set equipment on neoprene pad and fasten as required by equipment manufacturer.
- L. Curb Detail/Air Handling Station:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Prime vertical wall 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, extend sheet 4 inches above top of cant and down face with 4 inches on to field of roof.
 4. Install base flashing surfacing ply, 60 mil POLIMER REINFORCED PVC membrane, in bitumen or low rise adhesive over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Heat-weld all side laps. Three-course with an application of mastic, mesh and granules at transition on field of roof. Allow too cure before coating.
 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.
- M. Skylight:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Prime vertical wall 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, extend sheet 4 inches above top of cant and down face with 4 inches on to field of roof.
 4. Install base flashing surfacing ply, 60 mil POLIMER REINFORCED PVC membrane, in bitumen or low rise adhesive over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Heat-weld all side laps. Three-course with an application of mastic, mesh and granules at transition on field of roof. Allow too cure before coating.
 5. Install pre-manufactured lens and fasten flashing sides at 8 inches (203 mm) o.c. with fasteners and neoprene washers.
- N. Pre-manufactured Curb for Equipment Support:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Prime vertical wall 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, extend sheet 4 inches above top of cant and down face with 4 inches on to field of roof.
 4. Install base flashing surfacing ply, 60 mil POLIMER REINFORCED PVC membrane, in bitumen or low rise adhesive over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Heat-weld all side laps. Three-course with an application of mastic, mesh and granules at transition on field of roof. Allow too cure before coating.
 5. Install pre-manufactured cover. Fasten sides at 24 inches (609 mm) o.c. with fasteners and neoprene washers. Furnish all joint cover laps with butyl tape between metal covers.
 6. Set equipment on neoprene pad and fasten as required by equipment manufacturer.

- O. Exhaust Fan:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Prime vertical wall 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, extend sheet 4 inches above top of cant and down face with 4 inches on to field of roof.
 4. Install base flashing surfacing ply, 60 mil POLIMER REINFORCED PVC membrane, in bitumen or low rise adhesive over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Heat-weld all side laps. Three-course with an application of mastic, mesh and granules at transition on field of roof. Allow too cure before coating.
 5. Install metal exhaust fan over the wood nailers and flashing to act as counterflashing. Fasten per manufacturer's recommendation.
- P. Passive Vent/Air Intake:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Prime vertical wall 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, extend sheet 4 inches above top of cant and down face with 4 inches on to field of roof.
 4. Install base flashing surfacing ply, 60 mil POLIMER REINFORCED PVC membrane, in bitumen or low rise adhesive over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Heat-weld all side laps. Three-course with an application of mastic, mesh and granules at transition on field of roof. Allow too cure before coating.
 5. Install passive vent/air intake over the wood nailers and flashing to act as counterflashing. Fasten per manufacturer's recommendations.
- Q. Roof Drain:
1. Plug drain to prevent debris from entering plumbing.
 2. Taper insulation to drain minimum of 24 inches (609 mm) from center of drain.
 3. Run roof system plies over drain. Cut out plies inside drain bowl.
 4. Set lead flashing (30 inch square minimum) in 1/4 inch bed of mastic. Run lead into drain a minimum of 2 inches (50 mm). Prime lead at a rate of 100 square feet per gallon and allow to dry.
 5. Install base flashing ply (40 inch square minimum) in bitumen.
 6. Install modified membrane (48 inch square minimum) in bitumen.
 7. Install clamping ring and assure that all plies are under the clamping ring.
 8. Remove drain plug and install strainer.
- R. Plumbing Stack & Cylinder Supports:
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.
- S. Heat 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 modified membrane in bitumen.
 6. Caulk the intersection of the membrane with elastomeric sealant.
 7. Install new collar over cape. Weld collar or install stainless steel draw brand.
- T. Liquid Flashing:
1. Mask target area on roof membrane with tape.
 2. Clean all non-porous areas with isopropyl alcohol.
 3. Apply 32 wet mil base coat of liquid flashing over masked area.
 4. Embed polyester reinforcement fabric into the base coat of the liquid flashing.
 5. Apply 48-64 wet mil top coat of the liquid flashing material over the fabric extending 2 inches (51 mm) past the scrim in all directions.
 6. Apply minerals immediately or allow the liquid flashing material to cure 15-30 days and then install reflective coating.

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. 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 a minimum of one (1) time a week.
- B. Warranty shall be issued upon manufacturer's acceptance of the installation and the from the completion date listed on the certificate of completion.
- C. Field observations shall be performed by the Technical Representative contracted by or employed by the manufacturer, and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.
- D. Provide observation reports from the Technical Representative upon each site visit including electronic, written and photo documentation. These reports must me sent to the Architect after each inspection.
- E. Provide a final report from the Technical Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

END OF SECTION