S P E C I F I C A T I O N

FOR PROJECT

QJVF 07-0213
MAINTAIN BASE AND MAF ROOFS - IDIQ

AT

MINOT AIR FORCE BASE, NORTH DAKOTA

PREPARED BY:

5 CES, ENGINEERING FLIGHT

MINOT AIR FORCE BASE, NORTH DAKOTA

APRIL 2008

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DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01005

STATEMENT OF WORK

1. GENERAL:

1.1 DESCRIPTION OF WORK: Work of this Contract, Maintain Base and MAF Roofs - IDIQ, MIN 07-0213, comprises maintenance and repair of various roofs at two distinct areas. The first area is roof maintenance and repair to “Base” roofs located on Minot Air Force Base, North Dakota. The second area is roof maintenance and repair to 15 remote Missile Alert Facilities (MAFs), located in the Minot Air Force Base missile field.

1.2 APPLICABLE PUBLICATIONS: All federal specifications, standards, and other publications shall be of the latest and most current issue at date of Invitation for Bids (IFB) issuance.

1.3 PROTECTION:

1.3.1 Roof Surfaces: Contractor shall protect all roof decking and installed roofing and hold them free from any damage due to his operations.

1.3.1.1 Roof loading of materials, planking, debris, equipment, etc., shall not exert a total concentrated loading in excess of 20 pounds per square foot on any part of the structure, at any one time.

1.3.1.2 Confine equipment, materials, storage and workmen's movements and operation within limits required to perform specified work.

1.3.1.3 All materials, tools and appliances brought on roof surfaces or stacked thereon shall be adequately supported on pallets, planks, or other approved systems.

1.3.1.4 Wheeled Conveyances: Temporary runways shall be provided for all vehicular conveyances such as wheelbarrows, pallets, felt, etc.

1.3.1.5 Debris removed as a result of this work shall be immediately loaded into an awaiting container, removed by means of an enclosed chute, hoist or bucket, and disposed of without again coming in contact with the roof surface.

1.3.2 Existing Facilities: Using agencies will occupy premises during entire period of repair for the conduct of normal operations. Contractor shall monitor weather conditions and progress of work and be prepared to provide protection to occupied spaces below at the end of each day and during sudden changes in weather to prevent damage due to precipitation and/or wind.

1.3.3 Contractor shall provide protection and storage of all materials to be incorporated into project work. No material shall be stored on roof structure except sufficient material required for each day's work accomplishment, when in compliance with roof loading restrictions.

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01010

ADMINISTRATIVE PROVISIONS - BASE ROOFS

1. GENERAL:

1.1 DESCRIPTION OF WORK: Work of this Contract, Maintain Base and MAF Roofs - IDIQ, MIN 07-0213, comprises maintenance and repair of various types of roofs located at Minot Air Force Base, North Dakota, including all associated appurtenances, by methods inherent to type of defect, imperfection, or deterioration, thereby restoring waterproof/ weatherproof reliability.

1.2 UTILITY SERVICES AVAILABILITY: All reasonable quantities of water and electricity will be made available to the Contractor without cost.

1.3 CONDUCT: The Contractor shall conduct all work in an orderly manner with a minimum disturbance and inconvenience to normal operations of the Base.

1.4 SAFETY REQUIREMENTS: The Contractor shall comply with all applicable provisions of the Corps of Engineers Manual EM 385-1-1 entitled, "General Safety Requirements," and all OSHA, NEC, and Worker's Compensation requirements.

1.5 CONTRACTOR'S WORK HOURS: Working hours for the Contractor shall normally be between the hours of 7:30 a.m. and 4:00 p.m. excluding Saturdays, Sundays and paid federal holidays. If the Contractor desires to work during periods other than the above, additional Government inspection forces may be required. The Contractor must make his/her request to the Contracting Officer 3 days in advance of his/her intention to work during other periods to allow assignment of additional inspection forces. If such force is reasonably available, the Contracting Officer may authorize the Contractor to perform work during periods other than normal duty hours/days. However, if inspectors are required to perform in excess of their normal duty hours/days solely for the benefit of the Contractor, the actual cost of inspection at overtime rates will be charged to the Contractor. These adjustments to the Contract price may be made periodically as directed by the Contracting Officer.

1.6 METHOD OF MEASUREMENT AND BASIS OF PAYMENT: The Contractor shall be paid based on the bid schedule for items in units shown. Measurement will be based on quantities used on bid schedule; square feet (SF), board feet (BF), square (Sq), lineal feet (LF), each (Ea) or roof. The unit bid prices shall include full compensation for furnishing labor, material, tools and equipment, and for performing work involved in this Contract.

1.7 PROTECTION:

1.7.1 Existing Facilities: Using agencies will occupy premises during entire period of repair for the conduct of normal operations. Contractor shall monitor weather conditions and progress of work and be prepared to provide protection to occupied spaces below at the end of each day and during sudden changes in weather to prevent damage due to precipitation and/or wind.

1.7.2 Contractor shall provide protection and storage of all materials to be incorporated into project work. No material shall be stored on roof structure except sufficient material required for each day's work accomplishment, when in compliance with roof loading restrictions.

1.8 HAZARDOUS WASTE: Hazardous waste or other materials, as defined by the Resource Conservation and Recovery Act or Applicable Federal, State or local Regulations resulting from the Contractor's operations shall be removed, by the Contractor, off base on a daily basis and be disposed of IAW all applicable Federal and State Regulations.

1.9 DISMANTLING, DEMOLITION AND MATERIAL DISPOSITION:

1.9.1 Removal of Salvage: Contractor shall remove items to the extent required, with all removed materials and unsalvageable items hauled and disposed of off base. All materials salvaged for reuse shall receive prior approval of the Contracting Officer before reuse. Materials not acceptable for reuse shall be disposed of and replaced with new materials as hereinafter specified.

1.9.2 Sequence and method of operation shall be such that maximum practicable protection is provided for personnel, materials, equipment, aircraft and structures to minimize the spread of dust, flying particles, and intrusion of unfavorable weather at all times.

1.10 CLEANUP: Contractor shall maintain site and roof area clean of all debris resulting from his work at all times. This shall include policing work area each day and removing any wind blown debris or materials from this area of operation. No materials or debris shall be permitted to be burned on the Base. All debris and unsalvageable waste materials shall become property of Contractor, and shall be removed and disposed of off Minot Air Force Base at the close of each day and prior to departure upon completion of a specific building, in an approved landfill for operation under North Dakota Solid Waste Management Regulation 23-29-01. Debris shall not be permitted to accumulate, unless deposited in an approved manner, and in a covered container. Gutters and downspouts shall be cleaned of all debris, and any other foreign material.

1.11 STORM-WATER REMOVAL: Contractor shall be responsible for removal of water in areas scheduled for daily work performance. Water removal shall be by pumping, siphoning, absorbent mopping, high-pressure air, brooming and/or combinations thereof or other approved methods that shall not cause any damage to applied roof systems, surrounding structures, landscape, etc. All storm water removal shall be in compliance with the Clean Water Act.

1.12 INSPECTING FOR ASBESTOS AND LEAD BASED PAINT (LBP): The "right to know" rules for LBP and asbestos are defined in the Occupational Health and Safety Administration (OSHA) 29 CFR 1910 and 1926. The Contractor will inspect the affected worksite for asbestos-containing materials and lead based paint where applicable. Typically, sampling roofing material is destructive and can lead to water damage of the roof and interior. The Contractor shall inspect the roofing material for asbestos (and LBP where applicable) no more than two weeks prior to start of work to minimize the potential for water damage.

1.12.1 Certification of Inspectors: The Contractor shall furnish a copy of the state issued asbestos (and LBP where applicable) inspector certifications prior to the inspection process. The inspectors will carry their state issued cards on their person during the inspection process.

1.12.2 Materials testing: Typically roofing materials are classified as Category I non-friable, Presumed Asbestos Containing Materials (PACM) due to the difficulty of bulk sampling the material without interfering with the integrity of the roof itself. PACM roofing products include; built-up roofing, asphalt-containing single ply membrane systems, asphalt shingles, asphalt containing underlayment felts, asphalt-containing roof coatings and mastics, and asphalt-containing base flashings. PACM roofing products that use other bituminous or resinous binders (such as coal tars or pitches) are also considered to be Category I non-friable PACM.

1.12.3 Sample Analysis Summary Report: Each inspection shall be documented in an inspection report with lab results. The Contractor shall submit two paper copies and one electronic copy to the government.

1.13 HANDLING ASBESTOS CONTAINING ROOFING MATERIAL:

1.13.1 An ACM that is regulated under EPA NESHAPS is referred to as a Regulated Asbestos-Containing Material (RACM). RACM includes: friable ACM; Category I non-friable ACM that has become friable; Category I non-friable ACM that has been or will be sanded, grounded, cut, or abraded; and Category II non-friable ACM that has already been or is likely to become crumbled, pulverized, or reduced to powder.

1.13.2 EPA NESHAPS does not cover roofing projects on single-family homes or on residential dwellings containing four or fewer units. Also, if the roofing project involves less than 160 square feet of RACM, NESHAPS does not apply regardless of the removal methods or material type. Notification of Demolition is always required under NESHAPS. However, EPA has determined that most roofing operations do not constitute a demolition but in fact a renovation activity and therefore, does not require a Notification unless 160 square feet of RACM roofing material is disturbed.

1.13.3 EPA has determined that when using a rotating blade (RB) roof cutter or other similar device that damages the roofing material, the removal of 5580 square feet of that material will create 160 square feet of RACM. For this interpretation, when using a knife, as, pry bar, etc., the action of “slicing” the roofing instead of cutting it (i.e. making it friable) is not governed under NESHAPS and therefore any amount or type of roofing material may be removed without falling under NESHAPS regulations.

1.13.4 OSHA considers certain roofing projects as Class II operations. These include the removal of built-up roofing in which the roofing felts contain asbestos and the removal of asbestos-containing shingles. Other Class II operations may include the removal of asbestos-containing cement coatings, mastics, and flashings that are not intact or will not remain intact during the removal operation. If the coatings, mastics, and flashings can be removed intact “sliced” (I.e. not cut, sanded abraded, or pulverized) then they do not fall under OSHA Class II regulations.

1.13.5 Under OSHA, if the roofing operation is determined to be a Class II activity by a competent person (40 hour trained), certain work practices, personal protective equipment (PPE), and training are all required. Training for Class II work on roofing systems requires, at a minimum, 8-hour specific training with at least one person trained as a competent person. The competent person does not necessarily have to be an employee of the roofing contractor. Removal procedures would include manual methods (no sanding, abrading or pulverizing). It must be lowered to the ground, not thrown off the roof, at the end of each work shift. Any material that is not deemed intact by the competent person shall be wrapped in plastic or placed in covered containers. RB roof cutters may be used for roofing but the blade(s) must be continually misted, unless the competent person determines that the wetting action may cause a slip or fall hazard. The debris from the cutting action must be collected either by HEPA vacuuming or placing in a covered container.

1.13.6 Personal exposure monitoring is also required if the roofing operation is determined to fall under Class II regulations. An alternative is to perform a negative exposure assessment in which personal air sampling is completed on the workers during the roofing removal activities in an effort to establish work practices that will not create airborne asbestos fiber

concentrations at or above the OSHA permissible exposure limit (PEL) of 0.1 f/cc for 30 minutes. OSHA has determined that most Class II activities will not exceed the PEL when performed properly.

1.13.7 If the competent person determines that the roof operation can be performed intact, all the above stated requirements for Class II operations do not apply.

1.13.8 EPA maintains that if a roofing system is removed non-friable (left intact by slicing, prying, etc.) then the NESHAPS regulations do not apply. However, should a RB roof cutter be used or the roofing materials are determined to be non-intact, NESHAPS regulations would apply.

1.13.9 NESHAPS roofing regulations state that if a RB roof cutter is used, the blade(s) must be misted with water and all discharges from the cutter must be collected either by HEPA vacuuming or by placing in leak-tight impermeable containers. There are some exceptions to the wetting requirements such as if the water may damage the existing structure or equipment inside the structure or if wetting will present a safety hazard. All dust, debris, and material considered non-intact needs to be packaged in leak-tight impermeable containers and disposed of in an EPA approved landfill site. Roofing material that has been removed intact can be disposed of in any general refuse landfill- with their permission.

1.13.10 EPA states that for roof removals that are subject to NESHAP, at least one on-site supervisor trained in the provisions of NESHAP be present during the removal of the asbestos-containing roofing material. This onsite supervisor does not necessarily have to be an employee of the roofing contractor. If the roofing material is removed intact training under NESHAP is not required.

1.14 NEW ROOFING MATERIALS: The Contractor shall not use new roofing material containing more than 1 percent asbestos. The Contractor shall provide material safety data sheets (MSDS) for all new roofing materials proving the materials contain less than 1 percent asbestos. New roofing materials with unknown asbestos content (especially coatings, cements, and mastics) are subject to EPA and OSHA asbestos regulations. Currently no ban on manufacturing with asbestos exists in the United States and asbestos can be found in new roofing materials.

1.15 HANDLING MATERIALS WITH LEAD BASED PAINT: Lead-Based Paint (LBP) activities must be performed in accordance with 40 CFR 745 and 29 CFR 1926.

1.16 ASBESTOS-CONTAINING "TRANSITE" SIDING: Some roofing material may be near or along the edge of asbestos-containing "transite" siding. The asbestos in this siding is fixed into the matrix of the siding material and is not friable unless disturbed. This transite siding is a Class II asbestos material and must be handled using Class II work practices.

1.16.1 The Contractor shall not disturb this material and make it friable. This includes using care with ladders and scaffolding. Heightened awareness while removing or placing roofing material near the transite siding will ensure the material is not scratched or otherwise damaged.

1.16.2 The Contractor will make all workers aware of the asbestos dangers inherent in this Class II material through their OSHA "right to know" training.

1.16.3 No other asbestos-containing materials have been identified with this work. However, if asbestos materials are encountered or even suspected, immediately stop work and notify the Contracting Officer.

1.17 RECYCLING/REUSE OF EXCESS MATERIALS AND CONSTRUCTION AND DEMOLITION (C&D) DEBRIS: The Contractor shall reuse/recycle excess materials and Construction and Demolition (C&D) debris to the maximum extent possible. C&D debris are those excess/residue materials resulting from construction or demolition activity that would normally be discarded to a landfill. C&D debris includes, but is not limited to soil, rock, vegetation, concrete, asphalt, and building materials such as windows, wood, metal, and roofing materials. The Contractor shall recycle C&D debris resulting from demolition, which shall become the property of the Contractor unless specified otherwise or as determined by the Contracting Officer.

1.17.1 Materials not to be returned to the Government and all Contractor-generated rubbish, if not recycled, shall be disposed of by the Contractor off site at his own expense, and in compliance with applicable environmental codes and regulations of governing authorities.

1.17.2 Reporting Tonnage of C&D Debris: Contractor shall track and report the tonnage of C&D Debris in two categories.

1.17.3 The C&D recycled/disposed tonnage report shall consist of a written memo with the tonnage of each category (recycled and disposed tonnage) submitted to 5 CES/CEVP through the Contracting Offices. Submit C&D recycled and disposed tonnage report when the project is completed.

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01300

SUBMITTALS

1. GENERAL:

1.1 PROCEDURES:

1.1.1 The Contractor shall be required to submit items listed in the Submittal Schedule at the end of this section.

1.1.2 Transmit each item under AF 3000, Material Approval Submittal form. Identify contract number, project number, and Contractor. Identify section and paragraph reference for each item submitted with the AF 3000. Submit five (5) copies unless otherwise required elsewhere in the specification.

1.1.3 Unless specifically stated otherwise elsewhere in this specification, each submittal shall be approved by the Contracting Officer prior to incorporation of materials into the work.

1.2 MANUFACTURER'S DATA AND SAMPLES: For the following types of submittals when a specific product of a specific manufacturer is identified (by catalog or product number, pattern, or style) and the Contractor does not desire to propose an alternate product as an equal, where an equal is allowed, a detailed submittal will not be required. The Contractor shall submit on an AF Form 3000 a list of submittals for which the specified products will be used. Submit in accordance with procedures identified in 1.1 above.

1.2.1 Product Data: Submit complete manufacturer's literature, which describes all salient characteristics identified as requirements in the specification. Literature, which is not specific to the proposed product, shall be marked to indicate clearly which item is being proposed for use in this contract.

1.2.2 Manufacturer's Certification: Submit a statement from the product manufacturer that proposed products meet the specified standards and other salient characteristics identified as requirements in the specification.

1.3 TEST DATA: Test results shall be dated and signed by the agency performing the test.

1.4 WARRANTY: Submit detailed warranty information, which identifies specifically items covered as well as exclusions from the warranty and the warranty period. All copies shall be dated and signed by an authorized officer of the company. The officer's name and title shall be typed on the warranty adjacent to the signature.

1.5 MISCELLANEOUS SUBMITTALS: Submittals, which are none of the above types, shall meet the specific requirements identified in the referenced paragraph of the Specification Section identified in the schedule.

SCHEDULE OF MATERIALS SUBMITTALS												Project Number QJVF 07-0213			Project Title: Maintain Base and MAF Roofs - IDIQ						Solicitation/Contract Number
TO BE COMPLETED BY PROJECT ENGINEER												TO BE COMPLETED BY CONTRACT ADMINISTRATOR									
		Number of Copies Required																			
LINE NUMBER	ITEM OR DESCRIPTION OF ITEM, CONTRACT REFERENCE, TYPE OF SUBMITTAL	CERTIFICATION OF COMPLIANCE	SHOP DRAWINGS	SAMPLES	COLOR SELECTION	MANUFACTURER'S RECOMMENDATIONS	MANUFACTURER'S WARRANTY	CATALOG DATA	OPERATING INSTRUCTIONS		OTHER	REQUIRED SUBMISSION DATE	DATE RECEIVED IN CONTRACTING	DATE TO CIVIL ENGINEERING	RETURN SUSPENSE DATE	SUBMITTAL NUMBERS	DATE CONTRACTOR NOTIFIED		CONTRACTOR RESUBMITTAL	FINAL APPROVAL	REMARKS
																	APPROVED	DISAPPROVED			
1	SECTION 01010/1.2.1 CERTIFICATION										6										
2	SECTION 01010/1.12.3 ASBESTOS REPORT										6										
3	SECTION 01010/1.17.3 C&D TONNAGE REPORT										5										
4	SECTION 02072/1.4 NOTIFICATION FORM										5										
5	SECTION 05310/1.4 PRODUCT DATA							5													
6	SECTION 05500/1.4 PRODUCT DATA			5	5	5	5	5													
7	SECTION 05500/1.4.5 PRODUCT DATA				5	5	5	5													
8	SECTION 06100/1.6.1 PRODUCT DATA							5			5										
9	SECTION 06100/1.6.2 MANUAL & PLAN	5	5			5		5													
10	SECTION 07240/1.4 SUBMITTALS	5		5	5	5	5	5													
11	SECTION 07300/1.3.1 SAMPLES			5																	

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																	APPROVED	DISAPPROVED			
12	SECTION 07300/1.3.2 PRODUCT DATA							5													
13	SECTION 07300/1.3.3 WARRANTY						5														
14	SECTION 07300/1.3.4 PLAN VIEW (PER D.O.)										5										
15	SECTION 07300/1.3.5 AS-BUILT DRAWING (PER D.O.)										5										
16	SECTION 07300/1.3.6 MSDS DATA SHEETS	5																			
17	SECTION 07401/1.3 SUBMITTALS		5	5	5	5	5	5													
18	SECTION 07468/1.2.1 SAMPLES--COLOR							5													
19	SECTION 07468/1.2.2 PRODUCT AND INSTALLATION DATA							5													
20	SECTION 07468/1.2.3 WARRANTY						5														
21	SECTION 07468/1.2.4 MSDS DATA SHEETS	5																			
22	SECTION 07510/1.5.1 MANUFACTURER'S CERTIFICATION	5																			

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																	APPROVED	DISAPPROVED			
23	SECTION 07510/1.5.2 QUALITY CONTROL DESIGNATE										5										
24	SECTION 07510/1.5.3 PRODUCT DATA							5													
25	SECTION 07510/1.5.4 MANUAL & PLAN	5	5					5													
26	SECTION 07510/1.5.5 WARRANTY						5														
27	SECTION 07510/1.5.6 MSDS DATA SHEETS	5																			
28	SECTION 07510/1.5.7.1 QUALITY CONTROL RECORD										5										
29	SECTION 07510/1.5.7.2 ROOF PLAN										5										
30	SECTION 07510/1.5.7.3 AS-BUILT ROOF SUMMARY										5										
31	SECTION 07510/4.1 QUALITY CONTROL										5										
32	SECTION 07560/1.7.1 FORM A-3	5																			
33	SECTION 07560/1.7.2 FORM C										5										

AF Form 66

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																	APPROVED	DISAPPROVED			
34	SECTION 07560/1.7.3.1 ROOFING SYSTEM					5		5		5											
35	SECTION 07560/1.7.3.2 SEALANT					5		5		5											
36	SECTION 07560/1.7.4 SHOP DRAWINGS		5																		
37	SECTION 07560/1.7.5 WARRANTY						5														
38	SECTION 07560/1.7.6 MANUAL & PLAN	5	5					5													
39	SECTION 07560/1.7.7 MSDS DATA SHEETS	5																			
40	SECTION 07560/1.7.8 RECORD DOCUMENT										5										
41	SECTION 07560/3.8.1 QUALITY CONTROL										5										
42	SECTION 07565/1.3.1 PRODUCT DATA							5													
43	SECTION 07565/1.3.2 MSDS DATA SHEETS	5																			
44	SECTION 07565/1.3.3 INSTALLATION INSTRUCTIONS					5															

AF Form 66

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																	APPROVED	DISAPPROVED			
45	SECTION 07565/1.3.4 WARRANTY						5														
46	SECTION 10420/1.2 SUBMITTALS		5	5	5	5		5													
47	SECTION 15400/1.4 PRODUCT DATA							5													

END OF SECTION 01300-7

AF Form 66

DIVISION 2 - SITEWORK

SECTION 02072

MINOR DEMOLITION FOR REMODELING

1. GENERAL:

1.1 WORK INCLUDED:

1.1.1 Notify the North Dakota Department of Health using form SFN 17987, Notification of Demolition and Renovation. (See Attachment at end of this section.)

1.1.2 Remove designated roofing systems.

1.1.3 Remove designated metal fascia, flashings, gutters, downspouts, etc. and all accessories.

1.1.4 Remove designated curbs, steel framing and cut all required welds.

1.1.5 Remove designated siding system material.

1.1.6 Cap and identify exposed utilities.

1.1.7 Provide temporary partitions to allow continued building occupancy.

1.1.8 All material resulting from demolition work, except as indicated or specified otherwise, shall become the property of the Contractor and shall be removed from the limits of Minot AFB.

1.1.9 Work shall include furnishing all necessary labor, materials, tools, and equipment necessary to demolish work specified and/or indicated on the drawings and spelled out in delivery order.

1.2 RELATED WORK:

1.2.1 Section 01010: Administrative provisions - Base Roofs.

1.2.2 Section 01020: Administrative provisions - MAF Roofs.

1.2.3 Section 05310: Metal roof deck.

1.2.4 Section 05500: Metal fabrication.

1.2.5 Section 06100: Rough carpentry.

1.2.6 Section 07240: Exterior Insulation and finish system.

1.2.7 Section 07300: Shingle roofing system.

1.2.8 Section 07401: Long-span panel steel siding.

1.2.9 Section 07468: Aluminum soffits, fascia and gutter systems.

1.2.10 Section 07510: Built-up roofing..

1.2.11 Section 07560: EPDM roofing systsm.

1.2.12 Section 07565: Rubber roof coating.

1.2.13 Section 15400: Plumbing

1.3 PROTECTION:

1.3.1 Do not interfere with use of adjacent rooms and spaces. Maintain free and safe passage to and from.

1.3.2 Prevent movement or settlement of structure(s). Provide and place bracing or shoring and be responsible for safety and support of structure. Assume liability for such movement, settlement, damage or injury.

1.3.3 Cease operations and notify the Contracting Officer immediately if safety of structure appears to be endangered. Take precautions to properly support structure. Do not resume operations until safety is restored.

1.3.4 Provide, erect, and maintain barricades, lighting, and guard rails as required to protect occupants of building and workers.

1.4 SUBMITTALS:

1.4.1 Submit a copy of the North Dakota Department of Health form SFN 17987 that was submitted to state in accordance with Section 01300.

2. PRODUCTS:

2.1 MATERIALS:

2.1.1 Except where noted otherwise, maintain possession of materials being demolished. Immediately remove from site.

3. EXECUTION:

3.1 PREPARATION:

3.1.1 Erect and maintain dustproof partitions as required to prevent spread of dust, fumes and smoke to other parts of the building. On completion, remove partitions and repair damaged surfaces to match adjacent surfaces.

3.1.2 Carry out demolition work to cause as little inconvenience to adjacent occupied building areas as possible.

3.1.3 Install fencing around openings to protect workers. Post clearly visible warning signs.

3.2 DEMOLITION:

3.2.1 Demolish in an orderly and careful manner as required to accommodate new work.

3.2.2 Perform demolition in accordance with applicable authorities having jurisdiction.

3.2.3 Repair all demolition performed in excess of that required, at no cost to the Air Force.

3.2.4 Burning of materials on site is not permitted.

3.2.5 Remove from site contaminated, vermin infested or dangerous materials encountered and dispose of by safe means so as not to endanger health of workers and public.

3.2.6 Remove demolished materials, tools and equipment from site upon completion of work.

3.3 DEBRIS CONTROL:

3.3.1 Extreme care will be taken when transporting debris. The Contractor will be responsible for sweeping and maintaining any and all base roads used as haul routes during construction. Debris shall be removed and transported by the Contractor in a manner as to prevent spillage on streets or adjacent areas.

3.3.2 Regulations: Minot AFB and North Dakota state regulations regarding hauling and disposal shall apply.

3.4 USE OF EXPLOSIVES: Use of explosives will not be permitted.

END OF SECTION

NORTH DAKOTA
DEPARTMENT of HEALTH

ASBESTOS NOTIFICATION OF DEMOLITION AND RENOVATION

Division of Air Quality
SFN 17987 (7/05)

I. Type of Notification

THIS NOTICE MUST BE SUBMITTED 10 DAYS BEFORE BEGINNING THE ACTIVITY

☐ Original ☐ Revised ☐ Cancelled	Date:

II. Type of Operation

III. Is Asbestos Present?

☐ Demolition ☐ Renovation ☐ Ordered Demolition ☐ Emergency Renovation	☐ Yes ☐ No

IV. Dates of Asbestos Removal (MM-DD-YY) Start: Stop:	**V. Dates of Demolition or Renovation** (MM-DD-YY) Start: Stop:

VI. Facility Information (identify owner and operator, if applicable)

Owner Name			
Owner Address	City	State	Zip Code
Contact Person		Telephone Number	
Operator (if different than owner)			
Operator Address	City	State	Zip Code
Contact Person		Telephone Number	

VII. Facility Description (include building name, number and floor or room number)

Building Name				
Building Address	City	State	Zip Code	County
Site Location (floor or room number(s))				
Building Size (Sq. Ft.)	Number of Floors			Age of Building or Year Built
Present Use	Prior Use			

VIII. Asbestos Contractor or Demolition Contractor

Contractor Name			ND License Number
Contractor Address	City	State	Zip Code
Contact Person		Telephone Number	

IX. Asbestos Inspector or Project Monitoring Firm (if applicable)

Firm Name			ND License Number
Firm Address	City	State	Zip Code
Name of Inspector or Onsite Hygienist		Telephone Number	

X. Approximate Amount of Asbestos, Including:

	Regulated Asbestos-Containing Material (RACM) to be Removed	Nonfriable Asbestos-Containing Material to be Removed		Nonfriable Asbestos-Containing Material not to be Removed	
		Category I	Category II	Category I	Category II
Surface Area (Sq. Ft.)					
Volume from Facility Component(s) (Cu.Ft.)					
Pipe (Linear Ft.)					

XI. Testing Procedure for Determining Asbestos and Type of Asbestos Material(s)

☐ PLM ☐ Other: ☐ TEM	Type of Asbestos-Containing Material(s)

XII. Description of Work Practices and Engineering Controls to Prevent Asbestos Emissions (check all that apply)

☐ Adequately Wet Materials	☐ Glove Bag	☐ Seal in Leaktight Containers	☐ Encapsulate
☐ Negative Air Containment	☐ Seal in Leaktight Wrapping	☐ Mini-enclosure	☐ Other:

XIII. Description of Planned Demolition or Renovation Work (backhoe, bulldozer, hand removal, etc.)

	Will the Facility or Facility Debris be Burned? ☐ Yes ☐ No If yes, you must contact your local Health Unit or the Air Quality Division at 701.328.5188, to complete an open burn variance: **SFN 8509**

XIV. Waste Transporter

Name			
Address	City	State	Zip Code
Contact Person		Telephone Number	

XV. Waste Disposal Site

Name	Permit Number	Telephone Number	
Address	City	State	Zip Code

XVI. If Demolition was Ordered by Government Agency, Identify the Agency and Attach a Copy of the Order

Name	Title	Telephone Number
Authority/Agency	Date of Order (MM/DD/YY)	

XVII. If Emergency Renovation, Please Complete this Section

Date of Emergency (MM/DD/YY)	Hour of Emergency
Description of the emergency or sudden event:	
Explanation of how the event caused unsafe conditions or would cause equipment damage or an unreasonable financial burden:	

XVIII. Description of Procedures to be Followed in the Event of an Unexpected Asbestos Fiber Release

XIX. General Comments

XX. I certify to the best of my knowledge that the above information is true and correct. I further certify that all asbestos abatement work on this project will be performed by individuals certified in accordance with the North Dakota Air Pollution Control Rules 33-15-13.

Signature of Owner/Operator **Date**

Return form to:

North Dakota Department of Health
Division of Air Quality
1200 Missouri Ave.
P.O. Box 5520
Bismarck, ND 58506-5520

Telephone: 701.328.5188
Fax: 701.328.5200 (If faxing, original copy must be mailed)

INSTRUCTIONS FOR COMPLETING THE ASBESTOS DEMOLITION AND RENOVATION NOTIFICATION FORM

GENERAL INFORMATION

The Asbestos NESHAP, Section 33-15-13-02 of the North Dakota Air Pollution Control Rules, requires written notification of demolition or renovation activities in facilities under Subsection 02.6. In most cases, a facility includes all types of structures except single family homes and apartment buildings having no more than four units. The enclosed form must be used to fulfill this requirement. Only complete notification forms will be accepted.

The notification should be typewritten or neatly printed and postmarked or delivered no later than ten days prior to the beginning of either the asbestos removal activity (Section IV) or demolition activity (in Section V) whichever is applicable.

INSTRUCTIONS

I. Type of Notification: Check "Original" if the notification is a first time or original notification," Revised" if the notification is a revision of a prior notification, or "Canceled" if the activity has been canceled. On the right side enter the date that the notification is being submitted.

II. Type of Operation: Check as appropriate for facility demolition, for facility renovation, for ordered demolitions, or for emergency renovations.

III. Is Asbestos Present? Answer "Yes" or "No."

IV. Scheduled Dates of Asbestos Removal (MM-DD-YY): Enter scheduled dates (month/day/year) for asbestos removal work. Asbestos removal work includes any activity, including site preparation, which may break up, dislodge or disturb asbestos material.

V. Scheduled Dates of Demolition/Renovation (MM-DD-YY): Enter scheduled dates (month/day/year) for beginning and ending the planned demolition or renovation project.

VI. Facility Information: Enter the names, addresses, contact persons and telephone numbers of the following:

Owner: Legal owner of the site at which asbestos is being removed or demolition planned.

Operator: Demolition contractor, general contractor, or any other person who leases, operates, controls or supervises the site.

If known, the name of the site supervisor should be entered as the contact person for the notification. If additional parties share responsibility for the site, demolition activity, renovation or ACM removal, include complete information (including name, address, contact person and telephone number) on additional sheets submitted with the form.

VII. Facility Description: Provide the following information on the areas being renovated or demolished:

Building Address:	Physical location of site.
Building Size:	The building size in square feet.
No. of Floors:	Enter the number of floors including basement, if applicable.
Year Facility was Built or Age:	Enter approximate age of the facility.

Present Use/Prior Use: Describe the primary use of the facility or enter the following codes: H -- Hospital; S -- School; P -- Public Building; O -- Office; I -- Industrial; U -- University or College; C -- Commercial; or R -- Residence.

VIII. Asbestos Contractor or Demolition Contractor: Name of contractor hired to remove asbestos or to demolish the facility.

IX. Asbestos Inspector or Project Monitor: The firm who conducted the asbestos inspection prior to demolition/renovation, or the monitoring firm hired to oversee project, collect air samples, etc. (not to include the project designer).

X. Approximate Amount of Asbestos Including: (1) Regulated ACM to be removed (including nonfriable ACM to be sanded, ground or abraded); (2) Category I and Category II nonfriable asbestos containing material (ACM) to be removed; and (3) Category I and Category II nonfriable asbestos containing material not to be removed. For both renovations and demolitions, enter the amount of RACM to be removed by entering a number in the appropriate box. If applicable, enter the amount of nonfriable ACM to be removed during a demolition or renovation, and/or enter the amount of nonfriable ACM not to be removed during a demolition or renovation.

Category I nonfriable material includes packing, gaskets, resilient floor covering and asphalt roofing materials. Category II nonfriable material includes any material, excluding Category I materials, that when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure, or mechanical forces expected to operate on the material during the demolition or renovation activity. All Category II materials must be removed prior to demolition.

Complete the volume from facility component(s) if asbestos-containing materials have been removed from facility components and the volume is known.

XI. Asbestos Testing Procedure and Type of Asbestos Materials Present: Check the appropriate box for the procedure that was used to determine asbestos content. Also, describe the kinds of asbestos-containing materials that are present.

XII. Description of Work Practices and Engineering Controls to Prevent Asbestos Emissions: Check the appropriate box(s) for work practices that will be employed to prevent asbestos emissions.

XIII. Description of Planned Demolition or Renovation Work: Include a brief description of the renovation/demolition technique(s) to be used. Also, indicate if the facility or facility debris will be burned.

XIV. Waste Transporter(s): Enter the name(s), addresses(s), contact person(s) and telephone number(s) of the person(s) or company(ies) responsible for transporting ACM from the removal site to the waste disposal site. If the removal contractor or owner is the waste transporter, state "same as owner" or "same as removal contractor." If multiple parties are responsible include complete information on an additional sheet and submit with this form.

XV. Waste Disposal Site: Identify the waste disposal site, including the complete name, location, and telephone number of the facility. If ACM is to be disposed of at more than one site, provide complete information on an additional sheet submitted with the form. Permit number(s) must be included.

XVI. If Demolition Ordered by a Government Agency, Please Identify the Agency below: Provide the name of the responsible official, title and agency, authority under which the order was issued and the date of the order. A copy of the order from the government agency must be attached to this form.

XVII. Emergency Renovation Information: Provide the date and time of the emergency, a description of the event and a description of unsafe conditions, equipment damage or financial burden resulting from the event. The information should be detailed enough to evaluate whether a renovation falls within the emergency exemption.

XVIII. Description of Procedures to be Followed in the Event that Unexpected Asbestos Fiber Release: Provide adequate information to demonstrate that appropriate actions have been considered and can be implemented to control asbestos emissions adequately, including at a minimum, conformance with applicable work practice standards. Attach an additional sheet of paper if needed and submit with this form.

XIX. General Comments: as necessary. Attach an additional sheet of paper if needed and submit with this form.

XX. Verification and Certification: Certify the accuracy and completeness of the information provided and the intent to comply with the North Dakota Air Pollution Control Rules by signing and dating the notification form.

DIVISION 5 - METALS

SECTION 05310

METAL ROOF DECK

1. GENERAL:

1.1 WORK INCLUDED:

1.1.1 Steel roof deck and accessories.

1.1.2 Steel framed openings.

1.1.3 Bearing plates and angles.

1.2 REFERENCES:

1.2.1 AISI - Specification for the Design of Cold-Formed Steel Structural Members.

1.2.2 ASTM A36 - Structural Steel.

1.2.3 ASTM A325 - High strength bolts for structural steel joints.

1.2.4 ASTM A446 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.

1.2.5 ASTM A490 - Quenched and tempered alloy steel bolts for structural steel joints.

1.2.6 ASTM A525 - Steel Sheet, Zinc-Coated, Galvanized by the Hot-Dip Process.

1.2.7 ASTM A611 - Steel, Cold-Rolled Sheet, Carbon, Structural.

1.2.8 AISC - Specification for the design, fabrication and erection of structural steel for buildings.

1.2.9 AWS D1.1 - Structural Welding Code.

1.2.10 SDI - Design Manual for Composite Decks, Form Decks, Roof Decks.

1.3 DELIVERY, STORAGE AND HANDLING:

1.3.1 Store decking and steel on wood sleepers with slope for positive drainage.

1.4 SUBMITTALS:

1.4.1 Submit shop drawings and product data in accordance with Section 01300.

1.5 RELATED WORK:

1.5.1 Section 07510 - Built-up Roofing

1.5.2 Section 07560 - EPDM Roofing System

2. PRODUCTS:

2.1 MATERIALS:

2.1.1 Sheet Steel: ASTM A446, Grade A structural quality; with G90 coating primed.

2.1.2 Bearing Plates or Angles: ASTM A36 steel.

2.1.3 Bolts, nuts and washers: ASTM A325.

2.1.4 Welding Materials: AWS D1.1.

2.1.5 Cell Closures: Closed cell foam rubber, one inch thick, profiled to decking.

2.1.6 Metal Closure Strips, Wet Concrete Stops, Cover Plates, and Related Accessories: 20 gage sheet steel; of required profiles and size.

2.1.7 Primer: Red oxide type.

2.1.8 Touch-up Primer: To match deck finish.

2.2 FABRICATION:

2.2.1 Metal Decking: Minimum 22 gage sheet steel, 1 1/2 inch high, Type "A" fluted profile to SDI 36 inches wide sheets; multiple span; lapped joints.

2.2.2 Fabricate metal decking in accordance with SDI Design Manual for Composite Decks, Form Decks, Roof Decks to accommodate maximum working stress of 20,000 psi and maximum span deflection of 1/240.

3. EXECUTION:

3.1 INSTALLATION:

3.1.1 Erect metal decking in accordance with SDI Design Manual for Composite Decks, Form Decks, Roof Decks. Provide welding in accordance with AWS D1.1.

3.1.2 On steel support members provide 3 inch minimum bearing. Align and level on supports.

3.1.3 On masonry support surfaces provide 4 inch minimum bearing. Align and level on supports.

3.1.4 Mechanically fasten male/female side laps at 24 inches o/c maximum or weld male/female side lap at 18 inches o/c maximum.

3.1.5 Fasten deck to steel support members at ends and intermediate supports with 3/4 inch fusing welds at 12 inches o/c maximum.

3.1.6 Install steel closures and angle flashings to close openings between deck and walls, columns and openings.

3.1.7 Install foam cell closures in locations above walls and partitions.

3.1.8 Immediately after welding deck in place, touch-up welds, burned areas and surface coating damage with prime paint.

END OF SECTION

DIVISION 5 - METALS

SECTION 05500

METAL FABRICATIONS

1. GENERAL:

1.1 WORK INCLUDED:

1.1.1 Shop fabricated ferrous metal items.

1.1.1.1 Fascia

1.1.1.2 Soffits

1.1.1.3 Fabricated Gutter

1.1.1.4 Fabricated Downspouts

1.1.1.5 Flashing and Caps

1.1.1.6 Scuppers

1.1.1.7 Miscellaneous Metal

1.1.1.8 Accessory Components

1.2 RELATED WORK:

1.2.1 Section 05310 - Metal Roof Deck

1.2.2 Section 06100 - Rough Carpentry

1.2.3 Section 07300 - Shingle Roofing System

1.2.4 Section 07510 – Built-up Roofing

1.2.5 Section 07560 – EPDM Roofing System

1.3 REFERENCES:

1.3.1 ANSI/ASTM A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

1.3.2 ANSI/ASTM A167 - Stainless and Heat Resisting Chromium-Nickel Steel Plate, Sheet and Strip.

1.3.3 ANSI/ASTM A446 - Steel Sheet, Zinc Coated (Galvanized) by the Hot Dip Process, Structural (Physical) Quality.

1.3.4 ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate.

1.3.5 ASTM E84 - Surface Burning Characteristics of Building Materials.

1.4 SUBMITTALS:

1.4.1 Submit shop drawings and product data in accordance with Section 01300.

1.4.2 Indicate dimensions, panel layout, construction details, method of anchorage, method and sequence of installation.

1.4.3 Submit manufacturer's color samples in accordance with Section 01300.

1.4.4 Submit manufacturer's installation instructions in accordance with Section 01300.

1.4.5 Submit Product Data, Installation Instructions and Color/Finishes for Snow Guards, in accordance with Section 01300.

1.5 WARRANTY:

1.5.1 Finish:

1.5.1.1 Written 20-year non-prorated warranty covering fade, chalking and film integrity.

1.5.1.2 The warranty shall include labor and materials through the 20th year.

1.5.1.3 The material shall be warranted not to show a color change greater than five NBS color units per ASTM D 2244-79.

1.5.1.4 The finish shall not show chalking in excess of eight per ASTM D 659-80.

1.5.2 Installation:

1.5.2.1 Written by the installer, a 5-year non-prorated warranty for water tightness of the installed system.

2. PRODUCTS:

2.1 SHEET METAL:

2.1.1 General:

2.1.1.1 All materials shall be 24-gauge, hot-dipped galvanized steel (G-90) commercial quality, extra smooth primed and finished one side with Kynar based fluoropolymer coating 1.0 ± 0.1 mil total dry film thickness.

2.1.1.2 A wash coat of .3 to .4 mil dry film thickness shall be applied to the reverse side.

2.1.1.3 Lead: Manufactured from a base metal conforming to FSQQ-L-171E Lead Pig, Grades A or C or ASTM B29 Pig Lead, chemical lead type modified as follows: Hard lead containing 4 to 6 percent antimony, and the remainder lead or hard lead containing 3.75 to 4.75 percent antimony, 0.07 to 0.10 percent arsenic.

2.1.1.4 Solder, Flux and Accessories: As necessary and compatible with the material being installed.

2.1.2 Performance Criteria:

2.1.2.1 The finish coating shall conform to the following tests and standards.

2.1.2.1.1 Hardness - F Minimum NCCA Technical Bulletin 11-12.

2.1.2.1.2 Adhesion, Cross Hatch - 1/16 inch (no removal): NCCA Technical Bulletin 11-5.

2.1.2.1.3 Formability, 2T Bend (no cracking or removal): ASTM D 522-60 (1973).

2.1.2.1.4 Reverse Impact; no removal when tapped: NCCA Technical Bulletin 11-6 (impact force - 70 in. - lbs.).

2.1.2.2 The base metal shall conform to the following test and standards:

2.1.2.2.1 Minimum Yield: 33,000 psi ASTM 370-77.

2.1.2.2.2 Thermal Expansion - 6.7 x 10^6 in/in/F degrees; ASTM E 228-71 (1979).

2.1.2.2.3 Modulus of Elasticity - 29 x 10^6; ASTM E 111-61 (1978).

2.1.3 Panel Color: Panel shall be dark bronze, Federal Standard #X0040, or match existing.

2.2 SEALANTS AND GASKETS: Type suitable for use with installation of metal.

2.3 OTHER MATERIALS: Provide all other materials, not specifically described, but required to construct a complete watertight installation.

2.4 SCUPPERS: Minimum 12″ wide x 6″ Out.

3. EXECUTION:

3.1 FABRICATION:

3.1.1 Form angles for a watertight installation.

3.1.2 Soffits to be fabricated to match roof panels and existing soffits.

3.1.3 Gutters, corners, downspouts, and trim to be of the same material as panels. Fabricate to required shapes.

3.1.4 Miter internal corners, back brace with solid sheeting.

3.1.5 Expansion Joints: Same material and finish as panels.

3.1.6 Form joints to allow for expansion.

3.2 ERECTION:

3.2.1 Install underlayment.

3.2.2 Permanently install panels to structure; align, level and plumb.

3.2.3 Coordinate caps and flashing with elastomeric sheet roofing. Seal to prevent weather penetration.

3.2.4 Fabricate and install metal as shown on drawings. Meet the requirements of the components of materials manufacturers, NRCA, SMACNA, and Copper Development Association, as they apply to this project.

3.2.5 Prime all sheet metal that will come in contact with bituminous materials with asphalt primer and allow to dry before applying bitumen.

3.2.6 Isolate dissimilar metals in contact by painting with a compatible bituminous coating, or by using an uncured neoprene gasket.

3.2.7 Sheet Metal with Flanges: Follow applicable published requirements of membrane manufacturer.

3.2.8 Do not overlap edge metal. Allow 1/4" minimum spacing between edge metal pieces. Cover gap between adjacent edge metal with a joint cover 4 to 6" wide set in mastic.

3.2.9 Maintain neat appearance.

3.2.10 Touch up damaged paint surface.

3.2.11 Fasten every 12 inches minimum or closer as recommended by manufacturer.

3.3 TOLERANCES: Maximum offset from true alignment between adjacent new and existing members butting or in line: 1/8-inch.

3.4 SNOW GUARDS: Install snow guards as per manufacturer’s requirements.

END OF SECTION

DIVISION 6 - WOOD AND PLASTIC

SECTION 06100

ROUGH CARPENTRY

1. GENERAL:

1.1 WORK INCLUDED:

1.1.1 Miscellaneous wood framing and sheathing.

1.1.2 Concealed wood blocking.

1.1.3 Provide nails, bolts, screws, framing anchors, wall bracing, rough hardware and other items needed.

1.2 QUALITY ASSURANCE:

1.2.1 Lumber: Identify with grade stamp.

1.2.2 Fire retardant treatment to conform to requirements of Underwriters' Laboratories (UL).

1.2.3 American Wood-Preservers’ Association (AWPA) Book of Standards, Latest Addition.

1.3 REGULATORY REQUIREMENTS:

1.3.1 Conform to applicable codes for fire retardant treatment of wood surfaces for flame/fuel/smoke ratings.

1.4 REFERENCES:

1.4.1 NFPA - National Design Specification for Stress Grade Lumber and its Fastening.

1.4.2 PS 1 - Construction and Industrial Plywood.

1.4.3 PS 20 - American Softwood Lumber Standard.

1.4.4 Factory Mutual Global Manual 1-49, perimeter flashing.

1.5 RELATED WORK:

1.5.1 Section 05500 - Metal Fabrications

1.5.2 Section 07300- Shingle Roofing System

1.5.3 Section 07468- Aluminum Soffit, Fascia and Gutter Systems

1.5.4 Section 07510 - Built-up Roofing

1.5.5 Section 07560 - EPDM Roofing System

1.6 SUBMITTALS:

1.6.1 Product Data: Submit data showing conformance with the specifications.

1.6.2 Factory Mutual Global Manual 1-49 with plan and details to meet FM 1-90 wind load requirements.

2. PRODUCTS:

2.1 MATERIALS:

2.1.1 Lumber: PS 20, graded in accordance with NFPA Grading Rules; maximum moisture content of 19 percent; FIR or SPF species; standard grade.

2.1.2 Softwood Plywood: PS 1; exterior quality match existing grade and thickness. Lumber to have visible grade stamp of an agency certified by NFPA.

2.2 ACCESSORIES:

2.2.1 Bolts, Nuts, Washers, Lags and Screws: Medium carbon steel; size and type to suit application; galvanized for exterior locations, high humidity locations and treated wood; plain finish for other interior locations.

2.2.1.1 All new wood blocking shall be fastened with galvanized screws minimum 16″ centers.

2.2.2 Fasteners: Toggle bolt type for anchorage to hollow masonry. Expansion shield and lag bolt type for anchorage to solid masonry or concrete. Bolts or power activated type for anchorage to steel.

2.2.2.1 All new wood blocking attached to a concrete deck shall be minimum 1/4″ x 3″ zinc expansion anchors at 2′-0″ centers.

3. EXECUTION:

3.1 SITE TREATMENT OF WOOD MATERIALS:

3.1.1 Prime paint surfaces in contact with cementitious materials.

3.1.2 Treat site-sawn ends. Allow preservative to cure prior to placing members.

3.2 INSTALLATION:

3.2.1 Install miscellaneous blocking, furring, cants, nailing strips, framing and sheathing.

3.2.2 Install members true, plumb and level. Secure in place.

3.2.3 Space miscellaneous framing and furring at 16 inches o/c.

3.2.4 Construct members of continuous pieces of longest possible lengths.

3.2.5 On steel or wood decks lap all new wood plates a minimum 4″ on a sound structural deck and fasten with galvanized threaded screws at a maximum 16″ centers or as per FM 1-49 manual, whichever is more restrictive, all other wood blocking attached to new wood blocking shall be with galvanized threaded screws at maximum 16″ ctrs. No nailing attachment shall be allowed. Make sure that all wood blocking attachment is secured to sound structural decking and framing, stagger all new fasteners.

3.2.6 On concrete decks lap all new wood plated a minimum 4″ on a sound structural deck and fasten with minimum 1/4″ x 3″ zinc. Expansion anchors at a maximum 24″ centers or as per FM 1-49 manual, whichever is more restrictive.

3.2.7 All new plywood sheathing shall be attached with galvanized or plated screws at 6: centers at panel perimeter and at 8″ centers within panel, no nailing attachment shall be allowed.

END OF SECTION

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07240

EXTERIOR INSULATION AND FINISH SYSTEM

1. GENERAL:

1.1 SCOPE: The work to be performed consists of furnishing all labor, materials, equipment, and miscellaneous to provide patching and repair of an exterior insulation and finish system. Bid shall include insulation system from minimum up to 2″ thick. All insulation shall match existing.

1.2 DESCRIPTION: The exterior insulation and finish system shall be a job-fabricated exterior wall covering system consisting of insulation board, glass fabric reinforcing mesh, mechanical anchors, chopped fiberglass strands, polymer modified base coat and a choice of polymer modified textured finish with acrylic sealer, or synthetic finish with integral color finish. Color and texture to match existing adjacent finish.

1.3 QUALIFICATIONS: Manufacturer shall have regularly marketed an exterior insulated system in this country for at least five years and shall have satisfactorily completed a minimum of at least 50 installations.

1.4 SUBMITTALS:

1.4.1 Certificates of Compliance: Certificates of compliance shall be submitted in accordance with Section 01300 attesting that the finish coating system meets the specified requirements.

1.4.2 Instructions: The manufacturer's standard printed instructions for installation of the system shall be submitted.

1.4.3 Samples: Samples indicating size, thickness, texture and color.

1.4.4 Guarantee: Written manufacturer's guarantee for a period of five years.

1.5 DELIVERY AND STORAGE: Materials shall be delivered to the job site in their original unopened packages, clearly marked with the manufacturer's name, brand name, and description of contents. Storage shall be in accordance with the manufacturer's recommendations in a clean, dry, well-ventilated area. Materials shall be protected from sunlight, and kept away from excessive heat, and wet materials, at a temperature not less than 40 degrees F. Insulation board shall not be exposed to flame or other ignition sources.

1.6 JOB CONDITIONS: Ambient air temperature shall be 40 degrees F. or greater and rising at the time of insulation of the coating system and shall remain at 40 degrees F. or greater for at least 24 hours after application. Temporary heat may be used.

2. PRODUCTS:

2.1 MATERIALS:

2.1.1 Insulation shall conform to Fed. Spec. HH-I-524, Type IV, thickness to match existing adjacent with 3/4-inch minimum.

2.1.2 Mechanical fasteners shall be non-rusting nail with nylon sheath, expandable shanks, or non-rusting nail or screw with 1-1/2 inch nylon washer.

2.1.3 Reinforcing fabric shall be balanced, open weave, glass fiber fabric made from twisted multi-end strands and supplied by systems manufacturer.

2.1.4 Base coat shall be polymer-modified Portland cement type 1 and silica sand to function as base coat for coating application and mixed with base coat liquid admixture as supplied by systems manufacturer.

2.1.5 Standard finish coat shall be polymer-modified Portland cement type 1 and silica sand and shall be compatible with the base coat and mixed with finish coat liquid admixture as supplied by systems manufacturer.

2.1.6 Colored sealer for textured finish shall be acrylic-based, factory mixed sealer and shall be compatible with finish coat.

2.1.7 Synthetic finish shall be acrylic based, factory mixed sealer with integral color and texture.

2.1.8 Trim accessories: "J" and drip channels, expansion joints, and corner beads made of zinc and galvanized metal as needed and recommended by systems manufacturer.

2.2 TESTING OF FINISH SYSTEMS:

2.2.1 Accelerated Weathering, ASTM G-154

2.2.2 Freeze Thaw Resistance, ASTM C-67

2.2.3 Impact Resistance, ASTM D-1037

2.2.4 Air Leakage, ASTM E-283

2.2.5 Water Penetration, ASTM E-331

2.2.6 Water Resistance, ASTM D-2247

2.2.7 Salt Spray Resistance, ASTM B-117

2.2.8 Sand Abrasion Resistance, ASTM D-968

2.2.9 Transverse Wind Load, ASTM E-330, E-72

2.2.10 Mildew Resistance, MIL STD 810B

2.2.11 Rain Test (wind driven rain), RED STD TT-C-55B

2.3 FIRE HAZARD TESTS:

2.3.1 Procedure: The system shall have been tested using the test apparatus of ASTM E108M to test a 6-foot wide by 10-foot tall panel placed in a vertical position and exposed to a 5-foot tall flame for 15 minutes. The flame shall impose a heat flux of not less than 2 watts per centimeter on the finish surface. Panel shall consist of steel stud framing, 1/2-inch gypsum sheathing, insulation of thickness not less that 3/4-inch, base coat, reinforcing fabric, and finish coating. The joint between the simulated eave and test panel shall be filled with a non-combustible grout. Air flow of approximately 3 m.p.h. shall be provided up the face of the panel and made as laminar as possible.

2.3.2 Requirements: No flame shall reach the sides or top of the test panel, and base and exterior finish layers shall not ignite or contribute to the vertical or horizontal flame spread. The base and exterior finish layers must prevent flame involvement of the core insulation material.

3. EXECUTION:

3.1 INSTALLATION:

3.1.1 Installation shall conform to the manufacturer's printed recommendations except as otherwise specified.

3.1.2 Inspection of all surfaces to be covered shall be conducted and approved by systems Contractor prior to installation.

3.1.3 Insulation Board and Reinforcing Fabric: Boards shall be placed from a level base line. Vertical joints shall be staggered and insulation boards interlocked at corners. Joints of insulation shall be butted tightly. Surfaces of adjacent boards shall be flush at joints. Reinforcing glass fabric shall be overlapped 3 inches. Insulation and reinforcing fabric shall be mechanically anchored with manufacturer's standard

anchors spaced not more than 12 inches vertically or not more than 24 inches horizontally on studs. Approximately 50 percent of the mechanical anchors are fastened through the insulation board only and the balance through reinforcing mesh and board together. Provide expansion joints so that no area exceeds 150 square feet. Placement shall be coordinated with the Contracting Officer.

3.1.4 Base Coat: Base coat shall be mixed in accordance with the manufacturer's instructions and applied to insulated wall surfaces, trowelling the materials into the reinforcing fabric in a tight coat and doubling back to 1/18-inch to 3/16-inch thickness. Base coat shall be applied to level out surface and to fill joints smooth with adjacent areas.

3.1.5 Textured Finish Coating: Textured finish coating shall be applied and leveled in one operation. Final texture shall be obtained by trowels or floats, as necessary to achieve the required matching finish. Finish coating shall be 1/16-inch to 1/8-inch thick. Texture shall match existing. Color shall be added to the finish coat mix to approximate the color of the colored sealer being used.

3.1.6 Colored Sealer: For textured finish, one coat of colored sealer shall be rolled or sprayed over entire surface.

3.1.7 Synthetic Finish: Shall be trowelled onto base surface and floated to achieve desired texture.

3.2 TEMPERATURE AND CURING: Application of all coating materials shall be at 40 degrees F. or above. Each coat must cure at least 24 hours prior to application of next coat.

3.3 GUARANTEE: Manufacturer shall provide written warranty for a 5-year period.

END OF SECTION

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07300

SHINGLE ROOFING SYSTEM

1. GENERAL:

1.1 WORK INCLUDED:

1.1.1 Furnish all labor, materials, and equipment required to complete the removal (some roofs have up to two layers of shingles to remove) down to the deck; and installation of all roofing, venting and roof accessories, gutters and downspouts as shown on the plans and specified herein.

1.1.2 Furnish and install a sign for the roof indicating that a warranty is in effect and who to contact.

1.2 PRODUCT HANDLING:

1.2.1 Protection: Use all means necessary to protect shingles before, during and after installation.

1.2.2 Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Contracting Officer or Technical Representative.

1.3 SUBMITTALS:

1.3.1 Samples: For manufacturers other than specified, submit samples of the manufacturer’s full line of standard colors.

1.3.2 Product Data: Submit data showing conformance with the specifications.

1.3.3 Warranty: Submit in accordance with Section 1300.

1.3.4 Plan view drawing of roof including all penetrations and accessories.

1.3.5 As-Built Roof Summary: Submit in accordance with Section 01300.

1.3.6 MSDS: Submit “Material Safety Data Sheet” (MSDS) for all new roofing materials that will be utilized in project.

1.4 RELATED WORK:

1.4.1 Section 02072 - Minor Demolition

1.4.2 Section 05500 - Metal Fabrication

1.4.3 Section 06100- Rough Carpentry

1.4.4 Section 07468- Aluminum Soffit, Fascia and Gutter Systems

1.4.5 Section 10420 - Signage

2. PRODUCTS:

2.1 SHINGLES: Timberline Ultra, super heavyweight architectural slab, fiberglass asphalt shingles as manufactured by GAF, or approved equal.

2.1.1 Lifetime limited transferable product warranty.

2.1.2 Meets ASTM-D3018, Type 1 and D3161, Type 1 and D3462.

2.1.3 Meets ASTM D3018, Class A Asphalt Shingles Surfaced with Mineral Granules.

2.1.4 Meets CSA A123.5-M90 and CSA A123.5-98.

2.1.5 U.L. Class "A" label, fire resistance; meets UL 790, Tests for Fire Resistance of Roof Covering Materials.

2.1.6 Comply with UL 580, Tests for Wind Uplift Resistance of Roof Assemblies.

2.1.7 Lifetime Limited Transferable Warranty: including 5 year warranty against wind uplift up to 110 miles per hour. Passes UL 997 110 MPH wind test.

2.1.8 NRCA (National Roofing Contractors Association), Steep Roofing Manual.

2.1.9 Color: Burnt Sienna blend.

2.2 RIDGE CAP: Timbertex ridge cap shingles as manufactured by GAF, or approved equal.

2.2.1 Required to meet 110 miles per hour wind warranty.

2.2.2 Color: Burnt Sienna blend or match shingle color.

2.3 STARTER STRIP: Precut "Leading Edge" starter strip with sealant strip at bottom edge by IKO or approved equal.

2.4 UNDERLAYMENT:

2.4.1 Modified Asphalt: Polymer modified asphalt with fiberglass base, self-adhesive backing and polyethylene plastic surface. "Weather Watch" by GAF, "Moisture Guard" by Tamko, or approved equal. Thirty-six-inch-wide rolls.

2.4.2 No. 15 Felt: Asphalt saturated felt meeting ASTM Spec: D-226, Type 1.

2.5 FASTENERS: Nails shall be used to apply shingles to plywood roof deck. Nails shall be 11 or 12 gauge, hot dipped, galvanized roofing nails with heads at least 3/8″ diameter and shanks long enough to penetrate completely through sheathing. Staples shall not be allowed to maintain 110 MPH wind warranty.

2.6 ROOFING ADHESIVE: "Through the Roof" roofing adhesive as manufactured by Sashco or approved equal. Color: Clear.

2.7 DRIP EDGE: Style "D" or gutter apron minimum 28 gauge pre-finished metal or aluminum as manufactured by Edco Products, Inc., or approved equal. Color: Dark Brown.

2.7.1 Meets ASTM A653/A653M, Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated by the Hot-Dip Process.

2.7.2 Meets ASTM B209/B209M, Aluminum and Aluminum-Alloy Sheet and Plate.

2.7.3 SMACNA (Sheet Metal and Air Conditioning Contractors National Association), Architectural Sheet Metal Manual.

2.8 FLASHING: Aluminum flashing in rolls or flat sheets of widths required, Catalog 999, Economy Aluminum as manufactured by Appleton Supply Co., or approved equal. color: Dark Brown at any exposed locations.

2.8.1 Reference Standards: Same as 2.7.

2.9 VALLEY FLASHING: Galvanized sheet steel in rolls or flat sheets of widths required, minimum nominal 29 GA, as manufactured by Appleton Supply Co., or approved equal.

2.9.1 Reference Standards: Same as 2.7.

2.10 CONTINUOUS RIDGE VENT: Cobra, continuous roof ridge vent, polyester composite, as manufactured by GAF or approved equal.

2.10.1 10 1/2" wide x 3/4" thick x 20' or 50' lengths.

2.10.2 UL class A rated.

2.10.3 Meets ASTM D1929.

2.10.4 Net free ventilating area is 16.9 square inches (hand nail version) and 14.1 square inches (nail gun version) per linear foot.

2.11 SLP-61 GRAVITY VENT: Pre-finished plastic gravity vent with a 12 1/2″ x 10″ opening and NFA 61 square inches of venting as manufactured by Air Vent, Inc., or approved equal. Select from manufacturer's standard color selection.

2.12 PLUMBING VENT FLASHING: Preformed, metal flashing to fit tight to plumbing vent pipe and to roof plane.

2.13 PROPER VENTS:

2.13.1 Proper vents shall be plastic foam, 48″ x 22″ model #DV2248 as manufactured by Durovent, or model #MAX124 as manufactured by Styrovent, or approved equal. Install one proper vent in each truss space. Install as per manufacturer's requirements.

2.14 POWER ROOF VENTILATORS:

2.14.1 Model #355, 1200 cfm roof-mounted power ventilator by Broan-Nutone LLC or approved equal.

2.14.1.1 14″ diameter blades with 120V, 1 phase electric motor.

2.14.1.2 Built-in adjustable automatic thermostat.

2.14.1.3 Thermally protected, permanently lubricated motor.

2.15 FUEL VENT PIPE: High pressure, schedule 80 PVC pipe and fittings. Match existing size and color.

2.15.1 Metal Brace: Riser clamp type-8, galvanized with 12-gauge galvanized metal extension. All fasteners shall be galvanized.

3. EXECUTION:

3.1 SURFACE CONDITIONS: Prior to start of installation, carefully inspect roof sheathing to verify that it is smooth, dry, and free of surface imperfections.

3.1.1 If any existing sheathing joint height differential is greater than 1/8″ and the slope change with the shingles can be seen from 5′ away or more, the Contractor shall shim sheathing as required and refasten sheathing or fill and taper with an approved filler material.

3.2 SHEATHING: Place roof sheathing with end joints staggered. Secure sheets over firm bearing. Maintain minimum 1/16 inch (1.6 mm) and maximum 1/8 inch (3.2 mm) spacing between joints on roof. Place perpendicular to framing members.

3.3 UNDERLAYMENT INSTALLATION:

3.3.1 Modified asphalt membrane: Install from gable and eave to 24″ inside exterior wall line of building and at valleys in accordance with manufacturer’s instructions.

3.3.2 No. 15 Felt: Install on all areas not covered by modified asphalt membrane with a 2″ top lap and 4″ side laps.

3.4 DRIP EDGE: Shall be installed under underlayment along eaves and over underlayment at rakes. The edge shall extend not more than 3″ back from edge of the deck and shall be secured with roofing nails 12″ on center along its inner edge.

3.5 SHINGLES: Install in accordance with manufacturer’s instructions and to maintain 110 mph wind warranty.

3.5.1 At eaves and rake drip edges, shingles shall extend past outside edge a minimum of 1/4″ and maximum 3/8″.

3.5.2 All trimmed shingles shall be cut with a straight edge. Trimmed shingles shall have a straight line with no visual variations.

3.5.3 At valleys, install 24″-wide galvanized steel flashing over top of weather guard modified asphalt membrane. Center in valley.

3.5.4 All single valleys shall be blind valleys where bottom layer runs past valley and top layer is trimmed 2″ above the valley line or as required by manufacturer. Blind valley trim line shall be parallel with the valley. Exposure side of blind valley trim line shall be approved by contracting officer.

3.6 FLASHING: Install at all roof penetrations as necessary to provide watertight construction.

3.7 CONTINUOUS RIDGE VENT: Install as per manufacturer’s printed installation instructions. Cut roof sheathing at ridge line as required by ridge vent manufacturer to install continuous ridge vent. Ridge vent shall extend to fascia lines.

3.8 SLP-61 GRAVITY VENT: Install as per manufacturer’s printed installation instructions. Cut roof sheathing below ridge line as required. Verify locations with Government Representative.

3.9 ROOF ADHESIVE: Install as per manufacturer's printed instructions. Roof adhesive shall be applied with a continuous bead for every felt layer, except outside edge of weather guard membrane, starter strip, and every shingle layer at all eaves, gable ends, blind valleys, roof flashing, skylights, and other roof penetrations. At the beginning and end of all ridge caps, install a continuous bead of roof adhesive and a minimum 2" in at each corner. After **ALL** layers are glued and cured it shall not be possible to lift or move any shingle edge.

3.10 POWER ROOF VENTILATORS:

3.10.1 Cut hole as required as per manufacturer’s requirements.

3.10.2 Install as per manufacturer’s requirements.

3.10.3 All electrical work as per NEC.

3.11 VENT PIPE:

3.11.1 Install vent pipe and fittings as per NFPA.

3.11.2 Install metal clamp and extension as per Manufacturers’ Standardization Society (MSS) of the Valve and Fittings Industry, Inc.

END OF SECTION

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07401

PREFORMED METAL WALL PANELS

1. GENERAL:

1.1 WORK INCLUDED:

1.1.1 The work of this section includes, but is not necessarily limited to, furnishing and installation of all preformed and prefinished metal wall panels with all related flashings, and accessory components as indicated and specified here in.

1.2 REFERENCE STANDARDS:

1.2.1 ASTM:

1.2.1.1 A370-03a

1.2.1.2 A792-97a

1.2.1.3 D522-93a

1.2.1.4 E228-95

1.2.1.5 E283-98

1.2.1.6 E331-93

1.3 SUBMITTALS:

1.3.1 Submit color samples. Panel color to match Fed. Std. 595 B 33578. Trim color to match Fed. Std. 595 B 20040 or 33578 as directed.

1.3.2 Submit manufacturer's installation instructions and product data.

1.3.3 Shop drawings showing dimensions, layout of panels, anchoring details, joint details, trim, flashing, accessories, and sequence of installation.

1.3.4 Manufacturer's Warranty: Twenty-year written warranty against cracking, peeling, and fade (not to exceed 5 N.B.S. units).

1.3.5 Installer's Warranty: Five-year written non-prorated warranty for watertightness of the installed system.

2. MATERIALS:

2.1 SIDING:

2.1.1 Metal wall panels shall be manufactured in accordance with ASTM A 792-97a commercial quality smooth face 12-inch-wide panels with 1 1/2-inch depth with concealed fastening system. Panels shall have two equally spaced pencil gooves per panel. Panels shall be FW-12 panel in Parchment by Berridge Manufacturing Company or approved equal.

2.2 PANELS:

2.2.1 General:

2.2.1.1 All materials shall be 24-gauge, hot-dipped galvanized steel (G-90) commercial quality, extra smooth primed and finished one side with Kynar 500 fluoropolymer coating 1.0 ± 0.1 mil total dry film thickness.

2.2.1.2 A wash coat of .3 to .4 mil dry film thickness shall be applied to the reverse side.

2.2.2 Performance Criteria:

2.2.2.1 The finish coating shall conform to the following tests and standards.

2.2.2.1.1 Hardness - F Minimum NCCA Technical Bulletin 11-12.

2.2.2.1.2 Adhesion, Cross Hatch - 1/16 inch (no removal): NCCA Technical Bulletin 11-5.

2.2.2.1.3 Formability, 2T Bend (no cracking or removal): ASTM D 522-01.

2.2.2.1.4 Reverse Impact; no removal when tapped: NCCA Technical Bulletin 11-6 (impact force - 70 in. - lbs.).

2.2.2.2 The base metal shall conform to the following test and standards:

2.2.2.2.1 Minimum Yield: 33,000 psi ASTM A370-03a.

2.2.2.2.2 Thermal Expansion - 6.7 x 10^6 in/in/F degrees; ASTM E 228-95.

2.2.2.2.3 Modulus of Elasticity - 29 x 10^6; ASTM E 111-97.

2.3 ACCESSORY COMPONENTS:

2.3.1 Accessory Components: Flashing & trim shall be of same finish and material as wall panels.

2.3.2 Furring Channels: Shall be 1-1/2" inch hat channels, corrosion resistant.

2.3.3 Fasteners: Concealed fasteners with clips, galvanized steel, as per manufacturer's recommendations.

2.3.4 Closures: Neoprene or polyethylene foam, die-cut or formed to panel configuration.

2.4 SEALANTS:

2.4.1 Sealants: Conforming to Fed. Specs. TT-S-001543 and TT-S-00230.

2.4.2 Sealants and Gaskets: Type suitable for use with installation of metal siding.

2.5 PREFINISHED STEEL: Fascia and Trim.

2.5.1 ASTM A370-03a hot-dipped galvanized steel (G-90) commercial quality, extra smooth primed and finished one side with Kynar Based Fluoropolymer Coating 1.0quality, extra smooth primed and finished one side with Kynar Based Fluoropolymer Coating 1.0 ± 0.1 mil. Total dry film thickness. Minimum gauge shall be 24. Opposite side shall have a wash coat of .3-.4 mil. Dry film thickness. Color to match existing fascia or as directed by Contracting Officer.

2.6 OTHER MATERIALS: Provide all other materials, not specifically described, but required to construct a complete watertight installation.

2.7 12″ WIDE SIDING:

2.1.1 Metal wall panels shall be manufactured in accordance with ASTM A 792-97a commercial quality smooth face 12-inch-wide panels with 1 1/2-inch depth with concealed fastening system. Panels shall have double

recessed shadow line equally spaced. Panels shall be FW-12 panel in Parchment by Berridge Manufacturing Company or approved equal.

2.8 PANELS:

2.8.1 General:

2.8.1.1 All materials shall be 24-gauge, hot-dipped galvanized steel (G-90) commercial quality, extra smooth primed and finished one side with Kynar 500 fluoropolymer coating 1.0 ± 0.1 mil total dry film thickness.

2.8.1.2 A wash coat of .3 to .4 mil dry film thickness shall be applied to the reverse side.

2.8.2 Performance Criteria:

2.8.2.1 The finish coating shall conform to the following tests and standards.

2.8.2.1.1 Hardness - F Minimum NCCA Technical Bulletin 11-12.

2.8.2.1.2 Adhesion, Cross Hatch - 1/16 inch (no removal): NCCA Technical Bulletin 11-5.

2.8.2.1.3 Formability, 2T Bend (no cracking or removal): ASTM D 522-01.

2.8.2.1.4 Reverse Impact; no removal when tapped: NCCA Technical Bulletin 11-6 (impact force - 70 in. - lbs.).

2.8.2.2 The base metal shall conform to the following test and standards:

2.8.2.2.1 Minimum Yield: 33,000 psi ASTM A370-03a.

2.8.2.2.2 Thermal Expansion - 6.7×10^6 in/in/F degrees; ASTM E 228-95.

2.8.2.2.3 Modulus of Elasticity - 29×10^6; ASTM E 111-97.

2.9 ACCESSORY COMPONENTS:

2.9.1 Accessory Components: Flashing & trim shall be of same finish and material as wall panels.

2.9.2 Furring Channels: Shall be 7/8 inch hat channels, corrosion resistant.

2.9.3 Fasteners: Concealed fasteners with clips, galvanized steel, as per manufacturer's recommendations.

2.9.4 Closures: Neoprene or polyethylene foam, die-cut or formed to panel configuration.

3. EXECUTION:

3.1 PREPARATION OF SURFACES:

3.1.1 Patch existing insulation.

3.1.2 Remove existing siding and dispose of off base at the end of each work day.

3.2 FABRICATION:

3.2.1 Form angles for a watertight installation.

3.2.2 Soffits to be fabricated to match roof panels.

3.2.3 Corners, ridge vent and trim to be of the same material as panels. Fabricate to required shapes.

3.2.4 Miter internal corners, back brace with sheetrock.

3.2.5 Expansion Joints: Same material and finish as panels.

3.2.6 Ridge Vent: Fabricate to allow continuous air flow.

3.2.7 Form joints to allow for expansion.

3.3 ERECTION:

3.3.1 Permanently install panels to structure; align, level and plumb.

3.3.2 Install clips at 18" O.C. within 2 feet of all edges, and 24" O.C. in the center.

3.3.3 Provide expansion joints at 20 feet on center maximum.

3.3.4 Seal to prevent weather penetration.

3.3.5 Maintain neat appearance.

3.3.6 Touch up damaged paint surface.

3.3.7 Remove and/or extend existing light and receptacle boxes, as required or shown on drawings. All electrical work shall comply with National Electrical Code.

3.4 TOLERANCES: Maximum offset from true alignment between adjacent members butting or in line: 1/8-inch.

END OF SECTION

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07468

ALUMINUM SOFFITS, FASCIA, AND GUTTER SYSTEMS

1. GENERAL:

1.1 WORK INCLUDED:

1.1.1 Preformed and prefinished soffits, fascia and gutter systems with related flashings, and accessory components.

1.2 SUBMITTALS:

1.2.1 Submit manufacturer's color samples and a complete schedule of patterns to be installed. Colors and patterns to match existing.

1.2.2 Submit manufacturer's installation instructions and product data.

1.2.3 Manufacturer's Warranty: Thirty-year written warranty against chipping, flaking, peeling, eroding to bare metal, and hail damage.

1.2.4 MSDS: Submit "Material Safety Data Sheet" (MSDS) for all new materials utilized in project.

1.3 RELATED WORK:

1.3.1 Section 02072 - Minor Demolition

1.3.2 Section 06100- Rough Carpentry

1.3.3 Section 07300- Shingle Roofing System

1.4 REFERENCES:

1.4.1 American Architectural Manufacturers Association - Standard Specifications for Aluminum Siding, Soffit and Fascia.

1.4.2 The Aluminum Remodeling Action Center - Aluminum Siding Application Manual RA-15.

2. MATERIALS:

2.1 SOFFIT:

2.1.1 Soffit shall be nominal .019 inch thick aluminum, vented type, ribbed and factory finished with polyvinyl chloride enamel. Manufactured by Sell-Evan building products, Alcoa, Rollex, Edco products, Inc. or approved equal. Color shall be dark brown.

2.1.2 Soffit shall provide a minimum of 1 square foot and a maximum of 2 square feet of open ventilation for every 150 square feet of attic space.

2.2 FASCIA:

2.2.1 Fascia shall be 29-gage galvanized steel, non embossed smooth finish with factory finished polyvinyl chloride based enamel, color dark brown. Manufactured by Sell-Evan building products, Alcoa, Rollex, Edco Products, Inc., or approved equal.

2.3 ACCESSORY COMPONENTS:

2.3.1 Accessory Components: Trim shall be of same finish and material as soffit.

2.4 SPLASHBLOCKS:

2.4.1 Splashblock shall be 1'-0" X 3'-0" X4" concrete unit to match existing as manufacturec by Monarch Products Co., or approved equal.

2.4.2 New splashblock shall be installed directly below and centered on downspout. Fill with compacted clay or gravel below splashblock with a positive slope so water will flow away from the building.

2.4.3 When repositioning an existing splashblock, it shall be installed directly and centered on downspout. Fill with compacted clay or gravel below splashblock with a positive slope so water will flow away from the building.

END OF SECTION

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07510

BUILT-UP ROOFING

1. GENERAL:

1.1 DESCRIPTION OF WORK:

1.1.1 Furnish the administration, facilities, materials, labor, equipment and quality control necessary to integrate the work into the total building system so that leakage into the roofing system or the building does not occur.

1.1.2 The roofing system is an assembly of components including the insulation, base sheet, roofing membrane and surfacing, flashings, wood blocking, and all related parts necessary to complete the assembly.

1.1.2.1 The roofing assembly includes a 5/8″ Dens Deck on all metal decking. (No Base Decking on concrete deck is required), 6″ rigid insulation on sloped decks, or minimum 1/4″ sloped tapered insulation at flat areas, 3/4″ Perlite Top Sheathing and Built-Up Roofing on top. At areas that require tapered insulation, the average thickness of that area shall equal 6″.

1.1.2.2 At all doors and ladders going onto the roof, there shall be a 4′-0″ wide x 3′-0″ deep SBS walk surface. At all roof hatches and mechanical equipment there shall be a 3′-0″ deep SBS walk surface at all sides and corners.

1.1.3 The roofing system manufacturer is the roofing membrane manufacturer, who may or may not manufacture and market the other components of the roofing system.

1.1.4 Furnish and install a sign for the roof indicating that a warranty is in effect and who to contact.

1.1.5 Summary:

1.1.5.1 This Section includes the following new construction of:

1.1.5.1.1 Four-ply, built-up roof system: Four plies of type VI fiberglass reinforced felts.

1.1.5.1.2 Adhered over coverboard: Perlite.

1.1.5.1.3 Adhered over two layered insulation: Bottom layer of polyisocyanurate top layer of tapered or flat polyisocyanurate.

1.1.5.1.4 Adhered over vapor barrier: Two plies of type VI fiberglass reinforced felts.

1.1.5.1.5 Adhered over coverboard: Dens deck.

1.1.5.1.6 Attached over: steel deck.

1.2 STORAGE OF MATERIALS:

1.2.1 Roofing materials such as insulation, membrane and so forth, shall be stored under cover (building, van trailers or waterproof canvas tarpaulin) to protect them from rain or snow. Materials must be stored on raised platforms or pallets. Vinyl or polyethylene sheets or insulation shipping wrappers are not suitable covering and material so stored will be marked, rejected and removed from the site.

1.2.2 Materials shall remain in the original shipping pallets or placed on raised platforms to keep them off the ground or storage surface. All rolled goods shall be stored on pallets or raised platforms ON END and not laid flat on the storage surface. Damaged or "flattened" rolls will be rejected and removed from the job site.

1.2.3 All cants and tapered edge strips shall be protected from the weather at all times.

1.2.4 Packaged asphalt shall be stored in a protected area to prevent contamination during storage. Wet materials shall not be used.

1.2.5 Surfacing aggregate shall be maintained as defined by ASTM D 1863.

1.2.6 Materials shall be covered by the night of delivery at the latest.

1.3 COORDINATION REQUIREMENTS:

1.3.1 Roofing operations shall be coordinated with sheet metal work so flashings are installed to permit continuous roof surfacing operations.

1.3.2 Roofing operations shall be coordinated with roof insulation work so that all insulation applied each day is waterproofed the same day with the complete roofing system.

1.4 MATERIALS: Materials shall conform to applicable ASTM standards as specified. Certificates of compliance may be required from each respective material manufacturer. All materials to be installed shall be delivered to the job site bearing product labels of their manufacturer.

1.5 SUBMITTALS:

1.5.1 Submittal Forms A-1 thru A-2: Roofing System Manufacturer's Certifications are a qualification requirement for this contract. Forms A-1, A-2, must be submitted and be accepted by the Contracting Officer prior to Contract Award.

1.5.2 Quality Control Designate: Submit completed Form C in accordance with Section 01300.

1.5.3 Product Data: Submit the following in accordance with Section 01300.

1.5.3.1 Latest edition of roofing system manufacturer's published general requirements and applicable literature for roofing systems to be used in this contract.

1.5.3.2 Latest editions of all other applicable materials, manufacturer's products and installation literature.

1.5.4 Latest edition of Factory Mutual Global Manual 1-90.

1.5.4.1 Insulation panel plan of individual roof showing insulation panels and fastener layout that complies with Factory Mutual Global 1-90 requirements.

1.5.5 Warranty: Submit in accordance with Section 01300 completed Submittal Forms B-1 and B-2, included at the end of this section.

1.5.6 MSDS: Submit “Material Safety Data Sheet” (MSDS) for all new roofing materials that will be utilized in project.

1.5.7 Record Documents: Submit the following in accordance with Section 01300.

1.5.7.1 Quality Control Record (AF Form 1063).

1.5.7.2 Plan view drawing of roof including all penetrations and accessories.

1.5.7.3 As-Built Roof Summary: Submit completed Submittal Forms C and D, included at the end of this section in accordance with Section 01300.

1.6 REFERENCE STANDARDS:

1.6.1 References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards are deemed mandatory and applicable to the Work.

1.6.2 ASTM American Society for Testing Materials., Philadelphia, PA.

1.6.3 NRCA National Roofing Contractors Association, Rosemont, IL.

1.6.4 FM Factory Mutual Engineering and Research, Norwood, MA.

1.6.5 UL Underwriters Laboratories, Inc., Northbrook, IL.

1.6.6 PIMA Polyisocyanurate Insulation Manufacturers Association, Bethesda, MD.

1.6.7 SMACNA Sheet Metal and Air Conditioning National Contractor's Association, Chantilly, Virginia.

1.6.8 OSHA Occupational Safety and Health Administration, Washington, DC.

1.7 DEFINITIONS:

1.7.1 Roofing Terminology: Refer to ASTM D 1079 "Terminology Relating to Roofing and Waterproofing"; glossary of NRCA's "The NRCA Roofing and Waterproofing Manual"; and the Roof Consultants Institute Glossary of Roofing Terms for definition of terms related to roofing work in this Section.

1.7.2 Sheet Metal: SMACNA Architectural Sheetmetal Manual.

1.8 PERFORMANCE REQUIREMENTS:

1.8.1 General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

1.8.2 Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.

1.8.3 Jobsite Safety: Contractor shall execute all operations and provide a safe work environment in accordance to OSHA standards and regulations. This shall apply to all contractor personnel, associated subcontractors, workers in other trades, and jobsite visitors.

1.8.3.1 Follow all industry fire prevention guidelines for storage of materials, staging areas, roof access, and application means and methods.

1.8.3.2 Any applicable local fire codes supersede industry guidelines.

1.8.4 Roofing System Design: Provide a membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist uplift pressure calculated according to ASCE 7-02.

1.8.5 FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a membrane roofing system and that are listed in FMG's "RoofNav" for Class 1 for noncombustible construction and Class A for exterior fire rating, as applicable. Identify materials with FMG markings.

1.8.6 UL Listing: Provide membrane roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test methods mandated by UL. Identify materials with appropriate markings of applicable testing and inspecting agency.

1.9 RELATED WORK:

1.9.1 Section 02072 - Minor Demolition

1.9.2 Section 05310 - Metal Roof Deck

1.9.3 Section 05500 - Metal Fabrication

1.9.4 Section 06100 - Rough Carpentry

1.9.5 Section 10420 - Signage

1.10 APPLICATION REQUIREMENTS:

1.10.1 Surfaces will be inspected and approved by the Contracting Officer or representative immediately prior to application of roofing and flashings; said inspection to be coordinated by the Contractor.

1.10.2 Roofing and flashings shall be applied to a smooth and firm surface free of ice, frost, moisture, dirt, projections and foreign materials.

1.10.3 Application of roofing shall not be performed under damp or wet conditions or excessive wind conditions as determined by the Contracting Officer or Technical Representative.

1.11 ROOF PROTECTION:

1.11.1 When wheeled or other traffic over the partially or fully completed roofing is unavoidable, use adequate plank or plywood protection for the roofing.

1.11.2 Mechanical application devices shall be mounted on pneumatic-tired wheels, and shall be designed and maintained to operate without damaging the insulation or the roofing membrane.

1.12 FIRE PROTECTION: Provide 15-pound minimum size fire extinguishers, using ammonium phosphate fire fighting agent. Locate two at each kettle, tanker, and site of hot bitumen application on the roof.

1.12.1 Cutting and Welding: A permit shall be obtained from the Base Fire Prevention Office, 435 Peacekeeper Place, prior to any cutting or welding operation. These permits can be issued for the duration of the contract, if conditions permit.

1.12.2 The Contractor shall comply with Minot AFB Instruction 32-2001, Responsibilities of Base Personnel to Eliminate or Control Fire Hazards.

1.12.3 The Contractor shall comply with NFPA Standard 241, Chapter 7, Safeguarding Roofing Operations Asphalt and Tar Kettles.

1.13 DAILY CLEAN-UP: Remove all debris daily from the roof. Use enclosed chute, crane and bucket or construction hoist to reduce amount of dust, dirt, and noise.

1.14 ACCEPTANCE OF COMPLETED WORK:

1.14.1 Acceptance of completed work will be based on its conformance to the contract. Nonconforming work will be rejected. The Air Force is not obligated to accept nonconforming work at a reduced price.

1.14.2 Start replacement or correction of rejected work within 10 calendar days after receipt of the rejection notice.

1.14.3 Contractor receipt of a final acceptance certificate, signed and dated by the Contracting Officer, will constitute Air Force acceptance of the roofing work.

1.15 OPERATIONAL PROCEDURES:

1.15.1 Confine operations, movement of workmen and equipment, storage, materials and debris within limits as directed by the Contracting Officer.

1.15.2 Do not load the deck or any part of the building structure or permit to be loaded with a weight, which will cause excessive deflection or endanger safety or cause damage. Do not put kettles on the roof deck or roofing systems.

1.15.3 Protect the building and surrounding area from damage or injury. The Contractor must determine the nature of these operations and provide proper protection.

1.15.4 Repair all damage caused by the lack of such protection to the Contracting Officer's satisfaction. If the repairs are not made or the Contracting Officer determines that repairs are beyond the Contractor's ability, the Air Force will have the work done by others, and will charge the cost to the Contractor.

1.16 WIND WARRANTY: Provide FM 1-90 (72MPH) wind uplift warranty. Warranty shall include membrane, roof insulation, and membrane accessories.

2. PRODUCTS:

2.1 ASPHALT SYSTEMS:

2.1.1 Membrane:

2.1.1.1 Standard: Four plies of asphalt coated fibrous glass felt, ASTM D 2178, Type IV.

2.1.1.2 20- Year Type: Four plies of asphalt coated fibrous glass felt or manufacturer's equal premium membrane capable of obtaining a 20-year warranty.

2.1.2 Bitumen:

2.1.2.1 Slopes less than 1/2 inch per foot: asphalt ASTM D 312, Type II or III.

2.1.2.2 Slopes 1/2 inch per foot or more: asphalt ASTM D 312, Type III or IV.

2.1.3 Base Flashings: SBS rubber modified asphalt coated, 250 gram/square meter of polyester or fiberglass and polyester. The membrane shall have a minimum thickness of 160 mils and shall be surfaced with ceramic granules. The base flashing shall be capable of obtaining a 20-year warranty.

2.1.4 Surfacing:

2.1.4.1 Flood Coat: Asphalt Bitumen

2.1.4.2 Aggregate: ASTM D 1863-86, Mineral Aggregate Used on Built-up Roofs, gradation size 6, 7 or 67.

2.2 SBS MODIFIED BITUMEN SYSTEMS:

2.2.1 Top Layer Membrane: SBS (Styrene butadiene styrene) modified bitumen reinforced sheet.

2.2.1.1 Type: Fully adhered.

2.2.1.2 Surface: Factory applied granules.

2.2.1.3 Acceptable products:

2.2.1.3.1 System 4GIG by Johns-Manville..

2.2.1.3.2 BRAI Flex M by U.S. Intec.

2.2.1.3.3 Sopralene 250 by Soprema.

2.2.1.3.4 Approved equal.

2.2.1.4 Installed Weight (pounds per square foot): 1.00.

2.2.1.5 Reinforcing Mat: Polyester mat with a minimum weight of 200 grams per square meter.

2.2.1.6 Granule Color: White.

2.2.1.7 Thickness: 158 mils nominal, 156 mils minimum actual.

2.2.1.8 Method of Application: Hot mopping.

2.2.2 Base Sheet Systems: Three-ply asphalt-coated fiberglass sheet meeting ASTM D 2178 88a, type IV.

2.2.3 Bitumen:

2.2.3.1 Slopes Less Than 1/4 Inch Per Foot: Asphalt, ASTM D312-84, Type III.

2.2.3.2 Slopes 1/4 Inch Per Foot to 3 Inches Per Foot: Asphalt, ASTM D312-84, Type IV.

2.2.4 Base Flashings: SBS modified asphalt coated polyester mat weighing 250 grams/square meter with thickness of 160 mils and ceramic granule surfacing.

2.3 PRIMER: ASTM D41 Asphalt Primer.

2.4 VAPOR BARRIER: Two plies Type 15 asphalt saturated organic felts (perforated).

2.5 UNDERLAYMENT:

2.5.1 Concrete or Gypsum Decks: One ply of asphalt coated fiberglass felt or heavy duty base sheet as recommended by membrane manufacturer.

2.5.2 Steel decks: DensDeck DuraGuardTM Roof Boards –

2.5.2.1 Acceptable product: G-P Gypsum Corporation, 5/8″ DensDeck DuraGuard Roof Board.

2.5.2.2 Composition: Glass mat faced gypsum panel with blue low-perm, durable, integrated coating on one side and coated glass mat on the back.

2.5.2.3 Size: Nominal 4′ x 8′, special order 4′x4′. Edges: Square.

2.5.2.4 Thickness: 5/8″ DensDeck DuraGuard.

2.5.2.5 Fire Resistance:

2.5.2.5.1 Flame spread 15, smoke developed 0, when tested in accordance with ASTM E 84. Noncombustible when tested in accordance with ASTM E 136.

2.5.2.5.2 Class A when tested to UL 790.

2.5.2.5.3 Code alternate to 15 minute thermal barrier as tested to UL 1256.

2.5.2.6 Miscellaneous Materials:

2.5.2.6.1 FM-approved flat bottom plates and fasteners: Provide size and type in accordance with FM requirements and roof membrane manufacturer’s written recommendations.

2.5.2.6.2 Adhesives: As recommended by roof system manufacturer.

2.5.3 Wood Decks: Five pound rosin sized sheathing paper overlaid with one ply of asphalt glass fiber felt or heavy duty fiberglass base sheet as recommended by membrane manufacturer.

2.6 CEMENTS:

2.6.1 Asphalt Base Roofing Cement: ASTM D2822 Asphalt Roof Cement, Type II.

2.6.2 Coal Tar Base Roofing Cement: Coal Tar Roof Cement.

2.6.3 Flashing Cement: Membrane manufacturer's standard.

2.7 INSULATION:

2.7.1 Polyisocyanurate Insulation: FSHH-I-1972 GEN Insulation Board, Thermal, Polyurethane or Polyisocyanurate style 2, 2 inches thick or tapered.

2.7.2 Basalt Wood Roof Insulation as manufactured by Partek Insulation, Inc. or approved equal. Minimum thickness shall be 1.5 inches per layer.

2.7.2.1 Thermal Conductivity (k): 0.23.

2.7.2.2 Moisture Absorption (ASTM C 553): Less than 0.03%.

2.7.2.3 Corrosion Resistance: Passes ASTM C 665.

2.7.2.4 Dimensional Stability (ASTM D 2126): 2.0% maximum change in dimension in any direction.

2.7.2.5 Compressive Strength (ASTM C 165): 12.5 psi.

2.7.2.6 Laminar Tensile Strength (ASTM C 209, 6" x 6" Sample Size): 155 psf.

2.7.3 Perlite Thermal Insulation Board, ASTM C728,.75 inch thick.

2.7.4 Tapered Insulation: Perlite Thermal Insulation Board meeting with slope of 1/4 inch per foot, minimum thickness of 1/2 inch, maximum thickness of 4 inches.

2.7.4.1 Perlite meeting ASSTM C 728.

2.7.4.2 Fiberglass meeting ASTM C 726.

2.8 AGGREGATE: ASTM D1863, Mineral Aggregate used on built-up roofs, graduation size 6, 7, or 67.

2.9 CANT AND TAPERED EDGE STRIPS:

2.9.1 ASTM C 208 Insulating Board (Cellulosic Fiber), Structural and Decorative, ASTM C 726 Mineral Fiber and Mineral Fiber, Rigid Cellular Polyurethane Composite Roof Insulation Board, or as recommended by the membrane manufacturer.

2.9.2 Size:

2.9.2.1 Cants: 4" x 4" or as required by conditions.

2.9.2.2 Tapered Edge: 1-1/2 inch x 18 inch or as required by conditions.

2.10 FASTENERS:

2.10.1 Nails: Nonferrous or galvanized steel.

2.10.2 Bolts and Nuts: ASTM A307 Carbon Steel Externally and Internally Threaded Standard Fasteners, hot-dip galvanized.

2.10.3 Roofing Fasteners: Fasteners used to fasten to steel, wood and gypsum decks must be approved by FM as evidenced by being listed in the FM Approval Guide or supplements. Fasteners shall be treated to prevent corrosion according to FM Std 4470.

2.10.4 Underlayment, Roof Membrane, and Base Flashing Fasteners: Types as recommended by the membrane system manufacturer.

2.10.5 Sheet Metal Fasteners: Galvanized or Cadmium Plated Steel.

2.11 WOOD PRODUCTS:

2.11.1 Lumber Species: Choose from the following: Douglas fir, northern white pine, ponderosa pine, southern pine, jack pine and red pine.

2.11.2 Grades: Choose either WWPA, NELMA, or SPIB grading rules for the specified grades for lumber provided. Plywood panels shall meet the requirements of the latest edition of U.S. Product Standard PS 1.

2.11.2.1 Lumber:

2.11.2.1.1 Thickness less than 2", and all widths: WWPA and NELMA; Board Class No. 2 common grade or SPIB No. 1 boards.

2.11.2.1.2 2 to 4" thick, and 2 to 4" wide: SPIB, WWPA and NELMA: Structural light framing class, No. 2 grade.

2.11.2.1.3 2 to 4" thick, and 4" and over in width: SPIB, WWPA and NELMA: Structural joists and planks Class, No. 2 grade.

2.11.2.2 Plywood for all uses except decking, choose from the following:

2.11.2.2.1 APA, veneer grade C-C plugged, plywood, exterior.

2.11.2.2.2 APA, veneer grade C-D plywood, Exposure 1

2.11.2.2.3 APA, Structural I or II Rated Sheathing, Exterior.

2.11.2.2.4 APA, Structural I or II Rated Sheathing, Exposure I.

2.11.3 Moisture: The allowable moisture content for lumber and plywood is to be 13%. For exterior trim, soffits, and wood exposed to view, the moisture content applies at the time it is painted. For wood enclosed and incorporated into the roof system, the moisture content specified in LP22 applies at the time of enclosure.

2.11.4 Marking:

2.11.4.1 Each piece of lumber must bear a grade stamp or grade mark showing the association under whose rules it was graded, the grade, the species, and either "S-DRY," "KD," or "MC 15."

2.11.4.2 Each panel of plywood must bear the appropriate trademark of the American Plywood Association (APA).

2.11.4.3 Each piece of lumber and plywood must bear the AWPB quality mark.

2.12 SEALANT:

2.12.1 Sealant Primer: As manufactured and recommended by the sealant manufacturer in writing. All sealants must be used with a primer. If a manufacturer does not routinely require a primer, obtain a recommendation to fill this requirement.

2.12.2 Sealant Backup Material: As manufactured or recommended by the sealant manufacturer for the substrate type and joint design on this project. Unless indicated or specified otherwise, all joints must have a backup material sized to be slightly compressed in the joint when installed.

2.12.3 Color: As specified herein, or if unspecified, to match the adjacent substrate as closely as possible with standard stock colors.

2.12.4 Sealant type for general use: FSTT-S-230C (COM-NBS)(Feb 2, 1970) including amendment 2 (Oct 19, 1970) single component sealing compound, Type II, Class A. Sealant material must be urethane or acrylic polymer.

2.12.5 Use sealants whose date of manufacture shows they have not exceeded their shelf life. Do not use sealants with a date of manufacture more than 12 months old.

2.13 EXPANSION JOINT:

2.13.1 Metal: Metal cap type roof expansion joints installed on a wood curb extending 8" minimum above the roof as shown on NRCA detail K-1(89).

2.14 FELT ENVELOPES: ASTM D226 Asphalt-Saturated Organic Felt, Type II.

2.15. ALUMINUM ROOF COATING: ASTM D 2824, Type III.

3. EXECUTION:

3.1 The entire roofing system shall be installed as per manufacturer’s requirements and factory mutual 1-90 wind rating.

3.2 APPLICATION OF ROOFING: The entire roofing system, shall be finished in one operation up to the line of termination at end of day's work. Daily graveling-in may be delayed as specified elsewhere. Application of roofing shall immediately follow application of insulation as a continuous operation. Phase construction will not be permitted. Membrane shall be installed according to membrane manufacturer's requirements and specifications. To ensure a waterproof membrane, care shall be taken to preclude bare spots (voids) between plies. To prevent slippage, care shall be taken to preclude use of excessive amounts of bitumen. Asphalt shall not be heated higher than 50 degrees F. below the flash point. Kettle attendants shall be present at the kettle at all times during the heating. Application temperatures shall be measured at the mop bucket or mechanical applicator. Asphalt shall be applied at or no less than 25 degrees F. below the manufacturer's stated EVT. Asphalt at a temperature below this range shall be returned to the kettle. Coal tar shall not be heated above 410 degrees F. for ASTM D450, Type I and 425 degrees F. for ASTM D450, Type III. Coal tars shall be applied at the roofing felt manufacturer's recommended temperature range. Coal tar at a temperature below this range shall be returned to the kettle. The surface of the felts shall be broomed-in full width to obtain complete adhesion between plies and to eliminate air pockets. The method of mopping a half sheet width and turning the sheet back to mop under the other half will not be used. Workers shall avoid walking on mopped surfaces when the bitumen is sticky. Each layer of roofing felt shall be carried up abutting vertical surfaces at least 4", or the top of the cant strip.

3.3 UNDERLAYMENT INSTALLATION:

3.3.1 Concrete Decks: Prime the deck with a uniform coating of asphalt primer at the rate of one gallon per square and allow to dry. Apply one ply of the specified felt underlayment in a strip or spot mopping of hot and fluid asphalt with 2" side laps and 6" end laps minimum per manufacturer's specifications. NOTE: On precast concrete decks, specify that joints be treated as recommended by membrane manufacturer, and primer and asphalt moppings be held back 4" minimum from panel joints.

3.3.2 Gypsum Decks: Apply one ply of the specified felt underlayment with 4" side laps and 6" end laps minimum. Attach with specified mechanical fasteners through side laps on 6 to 9" centers. Also, stagger nail center of sheets at approximately 18" on-center, in two parallel rows, 10 to 12" apart from the edges of the base ply. Do not drive fasteners into or between the metal edges of the gypsum planks.

3.3.3 Wood Decks:

3.3.3.1 Completely cover the deck with one ply of sheathing paper. Lap each sheet a minimum of 2" and nail sufficiently to hold in place.

3.3.3.2 Over the sheathing paper, apply one ply of the specified felt underlayment with 2" side laps and 6" end laps minimum. Nail through side laps on 6 to 9" centers and stagger nail center of sheets at approximately 18" on-center in two parallel rows, 10 to 12" apart from the edges of the base ply.

3.4 INSULATION INSTALLATION:

3.4.1 General Requirements:

3.4.1.1 On slopes of 1" per foot or more, provide pressure treated wood insulation stops according to the roof insulation manufacturer's requirements.

3.4.1.2 Secure cant and tapered edge strips in place with asphalt; cut and neatly fit all joints and miters.

3.4.1.3 Insulation board, cant strips and tapered edge strips that can be readily lifted or displaced by hand are not adequately secured. Reinstall all lifted and displaced items that are not damaged. Replace damaged items with new material.

3.4.1.4 Follow additional applicable requirements of the roof insulation manufacturer and membrane manufacturer.

3.4.2 Over Steel, Wood and Gypsum Decks:

3.4.2.1 First (bottom) layer:

3.4.2.1.1 Place insulation so that side joints between boards are fully supported at all times.

3.4.2.1.2 Stagger end joints by a minimum of 6"; bring boards into moderate, uniform contact.

3.4.2.1.3 Also, secure all insulation boards in the first layer with mechanical fasteners over the entire roof deck according to FM Loss Prevention Data Sheet 1-28. Filler pieces must have at least two fasteners. Locate all fasteners such that there is at least 1 fastener every 2 square feet, or comply with FM Windstorm Class FM I-90, whichever is more stringent.

3.4.2.1.4 Use those driving methods prescribed by the fastener manufacturer.

3.4.2.2 Second or additional layers: Secure in full and uniform moppings of hot, fluid bitumen; stagger end joints by minimum 6";

bring boards into moderate, uniform contact at sides and ends while the bitumen is hot and fluid. Offset all joints between layers by maximum dimensions in both directions.

3.4.3 Over Non-Nailable Decks with Underlayments:

3.4.3.1 Secure all insulation boards in full and continuous moppings of hot fluid bitumen.

3.4.3.2 Stagger end joints by minimum 6″. Bring boards into moderate, uniform contact at sides and ends while the bitumen is hot and fluid. Offset all joints between layers by maximum dimensions in both directions.

3.5 VAPOR BARRIER INSTALLATION:

3.5.1 Over Nailable Roof Decks (excluding steel decks):

3.5.1.1 Install two plies of specified vapor barrio membrane, starting at the low point of the roof. Plies shall be lapped 19 inches, leaving an exposure of 17 inches and nailed at 9 inches on center across top of sheet.

3.5.1.2 Embed plies in a fluid, continuous application of asphalt. In no place shall felt touch felt, and no asphalt shall be applied to the substrate.

3.5.1.3 Asphalt shall be applied at a rate of 20 pounds of asphalt (±25% on a total-job-average basis) per roof square between the plies and 20 pounds of asphalt (±25% on a total-job-average basis).

3.5.2 Over Steel Roof Decks:

3.5.2.1 Mechanically fasten one layer of ¾ inch perlite to steel deck.

3.5.2.2 Install two plies of specified vapor barrier membrane, starting at the low point of the roof. Plies shall be lapped 19 inches, leaving an exposure of 17 inches.

3.5.2.3 Embed plies in a fluid, continuous application of asphalt. In no place shall felt touch felt, and no asphalt shall be applied to the substrate.

3.5.2.4 Asphalt shall be applied at a rate of 20 pounds of asphalt (±25% on a total-job-average basis) per roof square between the plies and 20 pounds of asphalt (±25% on a total-job-average basis).

3.5.3 Over Non-Nailable Concrete Roof Decks:

3.5.3.1 Prime concrete deck with a coating of asphalt primer, applied at a rate of 3/4 gallon of primer per roof square.

3.5.3.2 Install two plies of specified vapor barrier membrane, starting at the low point of the roof. Plies shall be lapped 19 inches, leaving an exposure of 17 inches.

3.5.3.3 Embed plies in a fluid, continuous application of asphalt. In no place shall felt touch felt, and no asphalt shall be applied to the substrate.

3.5.3.4 Asphalt shall be applied at a rate of 20 pounds of asphalt (±25% on a total-job-average basis) per roof square between the plies and 20 pounds of asphalt (±25% on a total-job-average basis).

3.6 MEMBRANE INSTALLATION:

3.6.1 General Requirements: Except as modified and supplemented herein, apply membrane to meet requirements and recommendations of the membrane manufacturer. On slopes over 1" per foot, provide nailers and backnail felts, and if required by the membrane manufacturer on lower slopes.

3.6.2 Asphalt Systems:

3.6.2.1 Apply felts shingle fashion and maintain proper lap distance to result in a 2" minimum headlap. Maintain a straight run of felts so that kinks or fishmouths do not result, and the felts are completely flat.

3.6.2.2 Once established, do not change the direction of felt application. Provide organic felt envelopes at gravel stop roof edges and sheet metal pitch dams at deck penetrations to prevent bitumen drippage.

3.6.2.3 Broom or squeegee each ply of roll goods into place, full width, while the bitumen is hot and fluid, such that felt does not touch felt and interply voids or skips in the bitumen do not occur. Broom or squeegee and do not walk on the freshly laid felt until bitumen has reached set temperature. Bitumen shall be visible continuously along both edges of the felt. NRCA Publication, Application Techniques for Glass Fiber Roofing Felts, shall be used as a recommended procedure.

3.6.3 Modified Bitumen: Membrane System(4-ply, 20-year system):

3.6.3.1 Base Sheet System:

3.6.3.1.1 Install 3plies of specified fiberglass base sheet. Starting from the low point of the roof, apply a 12-inch width, then a ply 24-3/4 inches in such a manner so that at least 3 plies of ply sheet cover the insulation at any point.

3.6.3.1.2 Apply parallel to roof slope on slopes exceeding 3/4 inch per foot. Nail sheets along the top of the sheet at intervals of not more than 6 inches. Roof slopes exceeding 1 inch per foot shall include treated wood nailers spaced at intervals in accordance with insulation manufacturer's recommendation. Sheets shall be fastened to nailers at 6-inch intervals across the width of the sheet.

3.6.3.1.3 Apply perpendicular to roof slope on slopes 3/4 inch per foot or less.

3.6.3.1.4 Embed sheet with approximately 23 pounds (± 15%)of specified asphalt per 100 square feet.

3.6.3.1.5 Turn down base sheet system over face of roof edge to below nailer. Nail sheets along the top of the sheet at intervals of not more than 6 inches. Roof slopes exceeding 1 inch per foot shall include treated wood nailers spaced at intervals in accordance with insulation manufacturer's recommendation. Sheets shall be fastened to nailers at 6 inch intervals across the width of the sheet.

3.6.3.2 Membrane:

3.6.3.2.1 Install one layer of specified membrane sheet, side lapped 4 inches and end lapped 6 inches.

3.6.3.2.2 Apply parallel to roof slope on slopes exceeding 3/4 inch per foot.

3.6.3.2.3 Apply perpendicular to roof slope 3/4 inch per foot or less.

3.6.3.2.4 Membrane shall be solidly adhered to the base ply, pressed into the hot asphalt, with approximately 30 pounds (±15%) per 100 square feet of specified asphalt. The asphalt shall be mopped not more than 4 feet in front of the roll.

3.6.3.2.5 Membrane laps shall be sealed together as the sheet is being adhered to the deck. Laps shall be fabricated to shed water wherever possible. Apply pressure to both the membrane and lap areas to ensure contact.

3.7 FLASHING INSTALLATION:

3.7.1 General Requirements:

3.7.1.1 Prime all surfaces to be flashed with asphalt primer and allow to dry.

3.7.1.2 Completely bond all flashings to the substrate, and the flashing plies to each other without voids. Coat all flashing substrate and ply interfaces to achieve a full and uniformly bonded laminate.

3.7.1.3 Follow additional applicable published requirements of the membrane manufacturer.

3.7.1.4 Asphalt Coated Flashings: All side laps of membrane flashing surfacing sheets must be sealed with roofing cement reinforced with woven glass fiber 4 inches wide centered over the lap. Tops of all membrane base flashings must be sealed with roofing cement reinforced with 4 inch wide woven glass fiber fabric. Tops of all membrane base flashings must be sealed with roofing cement reinforced with 4 inch wide woven glass fiber fabric. Flashing cement shall be applied in a continuous layer. Brushing application is not acceptable.

3.7.1.5 SBS Modified Bitumen Flashings:

3.7.1.5.1 Flashing membrane shall not be stretched when applied.

3.7.1.5.2 Mechanically fasten at 8 inches on-center at top of base flashing.

3.7.1.5.3 Adhere solidly in hot asphalt. Mop surface to which flashing will be applied and back mop flashing sheet. Then apply flashing.

3.7.1.5.4 Extend flashing a minimum of 6 inches onto the field roof surface and a minimum of 8 inches up the wall where a wall is being flashed.

3.7.2 Roof Drain Flashing: Follow applicable published requirements of membrane manufacturer or NRCA published details and procedures.

3.7.3 Expansion Joint Covers: Install expansion joint covers with NRCA detail, BUR K-1 (1989) or Modified Bitumen K-1 (1989) as applicable.

3.8 WOOD INSTALLATION:

3.8.1 Provide fasteners at not more than 2' 8" on-center, and also within approximately 6" of each end to secure nailers to the building construction.

3.8.2 Where nailers are stacked, secure the top nailer to the lower with screws of proper length, spaced maximum 16" on-center, staggered and within approximately 6" of all nailer ends. Ends of stacked nailers shall be offset approximately 12" in long runs and staggered (alternated) at corners.

3.7.3 Wood cants may be used where they can be securely anchored to prevent warping.

3.9 SEALANT INSTALLATION:

3.9.1 Follow sealant manufacturer's installation requirements except as specified herein.

3.9.2 Clean the substrate so no contaminants such as bitumen, concrete curing compound, paint, dirt, or moisture will prevent bonding of the primer or sealant directly to the substrate.

3.9.3 Prime with sealant primer, all substrates to which sealant will be applied and allow the primer to cure. This must be done regardless of whether the sealant manufacturer requires priming.

3.9.4 Except for sheet metal joints, install sealant backup material.

3.10 ASPHALT SYSTEM SURFACING: After roofing felts have been laid and flashings installed, the roof surface shall be flood-coated uniformly and appropriate aggregate surfacing applied according to membrane manufacturer requirements and specification. Graveling-in may be delayed for designated roof areas if approved in writing by the Contracting Officer and job conditions dictate this procedure. Graveling-in for any area within the designated area must be completed per manufacturer's requirements. The entire designated area must be complete before starting the next designated area unless otherwise directed by the Contracting Officer or Technical Representative. Glazing-in procedures will be as recommended by the manufacturer.

3.11 ROOF MEMBRANE SAMPLING FOR COAL TAR AND ASPHALT SYSTEMS:

3.11.1 A minimum of one test cut 4" x 36" or 12" x 12" in dimension taken perpendicular to the long dimension of the felts is required each day of construction until a level of confidence is established between the quality

controller and the inspector. A test cut of same dimensions is also required when job conditions change significantly thereafter, such as, ambient temperature, crew members, or when visual observations indicate that membrane integrity may be compromised, such as, bitumen too cool, workers walking on freshly laid felts, or continuous bitumen film not present at edge of felts. Remove the test samples before application of the surface coating at locations selected by the quality controller and/or inspector. Immediately take the sample off the roof and cool it to about 0 degrees F. (minimum). Comply with stated tolerances on interply bitumen weight, head laps and void content. If results show out of tolerance conditions, the construction process will be adjusted and an additional sample taken to verify that construction is back within tolerance. Turn all samples over to Government representative.

3.11.2 Sample removal and repair of the completed roof shall be done by the Contractor. Do not cut a sample from a completed membrane until it has cured for at least 2 hours. Using a template and utility knife, cut the membrane a little at a time. Ensure that you cut through the entire membrane. Any bitumen that sticks to the insulation after the sample is removed shall be carefully removed and included with the sample for weighing and analysis. Remove the cut sample slowly taking care not to bend the sample.

3.12 CONTRACTOR QUALITY CONTROL:

3.12.1 It is the responsibility of the Contractor to ensure that the designated roofing quality control person complies with all requirements relating to the roofing work. To accomplish this, the quality controller must observe work in progress, including observation of testing and measuring conducted by the Air Force inspector, and report work conditions daily on AF Form 1063, Quality Control Record. Instructions on how to use it are included in Section 4. Work accomplished on a daily basis will be considered satisfactory only when the daily record form shows that all "variances" have been corrected and that the work is in conformance with the contract.

3.12.2 Quality Assurance (QA):

3.12.2.1 As specified herein, provide the QA evidence needed to establish confidence that quality control (QC) is being performed adequately.

3.12.2.2 Except as modified and supplemented herein, follow the published requirements and written recommendations of the membrane and other materials manufacturers. Concerning methods of installation, industry practices apply only when this contract does not address the matter.

3.12.2.3 The specified QC requirements are minimums; provide additional QC, if in the opinion of the Contracting Officer, the QC is

not effective enough to provide conforming work. This additional QC does not constitute a change to the contract.

3.12.2.4 The QC is subject to audit by an Air Force inspector. Provide the inspector all information necessary for this audit.

3.12.2.4.1 The Air Force is not obligated to inspect a Contractor's work or to protect a Contractor from the consequences of such work. Air Force inspection is a general examination of the Contractor's conduct and work, and is solely for the purposes of the Air Force. Air Force inspectors do not have the authority to accept any work, whether or not it is conforming. Air Force inspection is not to be construed as conclusive. Information that may be offered to the Contractor does not change the contract.

3.12.2.4.2 Air Force Agents, including inspectors, engineers and quality assurance evaluators, are not authorized to change the Contract without the written authorization of the Contracting Officer. This lack of authority extends to all situations in which the actions of these agents could be construed as constituting a change.

3.12.3 Provide quality control defined as follows:

3.12.3.1 Quality control is the regulatory process by which the Contractor measures actual quality performance, compares it with standards, and acts on the difference. The quality function is the entire collection of activities through which fitness for use is achieved.

3.12.3.2 Contractor inspection is a careful and critical investigation of all work to assure that it conforms to the contract, and to detect variances and act to correct them in time to prevent reworking and delay. This includes detailed, skillful examination and testing with immediate comparison to the requirements of the contract. On discovery of variance the Contractor shall immediately institute corrective action to eliminate the variance and to insure that all future work conforms to the requirements of the contract.

3.12.3.3 The quality controller shall have at least 5 years experience in the supervision and inspection of construction.

3.12.3.4 Coal Tar, Asphalt and SBS Modified Bitumen System: Before the start of roofing work, the Contractor shall attend a pre-construction conference at the air base to review the contract. The quality controller and foreman or superintendent must attend the conference. A Technical Representative from both the membrane and insulation manufacturers shall also be present at this conference, if requested. These representatives shall be knowledgeable in the installation peculiarities and compatibility of

their product. The Contractor shall, if requested give an oral presentation of proposed construction method. The manufacturer's representatives shall provide input where necessary to describe the proper installation of their materials. The conference may include a slide presentation relating to job site membrane sampling and analysis.

3.12.3.5 Basic quality control requirements are contained in Section 4 of this specification. As a minimum, the quality controller shall perform each of the actions listed in 4. on a daily basis.

3.12.4 Prior to Work.

3.12.4.1 Investigative Roof Inspection: When requested by the Contracting Officer or Technical Representative, roof inspection shall be conducted to determine work requirements by Roof Contractor and 5 CES/CECN representative. Contractor will be given seven days notification for inspection.

3.12.4.2 Work Plan Inspection: When an investigative roof inspection is not conducted, the Contractor will be provided with a drawing or statement describing the work to be done. Preparatory Inspection by the Contractor shall be considered incidental to the work to be done.

3.12.4.3 Before actual work begins, the quality controller must:

3.12.4.3.1 Read the specifications.

3.12.4.3.2 Understand the required tests and measurements.

3.12.4.3.3 Understand AF Form 1063, Quality Control Record, and reporting procedures. (See Section 4.)

3.12.4.3.4 Attend the pre-construction conference, if so required by Contracting Officer.

3.12.5 Test Equipment: The quality controller shall supply the following equipment for tests and measurements required to be performed under this contract:

3.12.5.1 Calibrated portable thermometer to measure the bitumen temperature at the kettle and at the point of application.

3.12.5.2 Triple beam scale or postal-type platform scale for weighing roof membrane samples.

3.12.5.3 Non-conductive measuring tape, 50 or 100 feet.

3.12.5.4 Hand held Delmhorst Model BD-7 Moisture Meter or approved equal for determining moisture content of materials at time of installation.

3.12.5.5 Sheet metal template (4" x 36'' or 12'' x 12") for BUR samples.

3.12.5.6 A capability for cooling BUR samples to a minimum temperature of 0 degrees F.

3.12.5.7 Tools required for cutting samples and splitting felt plies apart (cutting knife and blades).

3.12.5.8 Clear template with 1/2" grid for analyzing sample void area.

3.12.5.9 MIL gauge for measuring flood coat thickness.

3.12.6 Allowable Tolerances. The following tolerances establish the range of acceptable variances. The quality controller shall review these tolerances and ensure that work is in compliance. Follow manufacturer recommendations as they apply to their 20-year warranted system. If Air Force requirements are more stringent, follow them. The work item listed after each tolerance should be used to assure compliance with this specification.

3.12.6.1 Headlap:

3.12.6.1.1 Asphalt Membranes: Minimum 1" (Work Item #9).

3.12.6.1.2 SBS Modified Bitumen System: as specified.

3.12.6.2 Endlap:

3.12.6.2.1 Asphalt Membranes: Minimum 6", no maximum. (No Work Item).

3.12.6.2.2 SBS Modified Bitumen System: as specified.

3.12.6.3 Insulation Board Joint Gaps: 3/16" maximum between boards and 1/4" maximum between boards and abutting surfaces. (Work Item #8).

3.12.6.4 Bitumen Temperatures: (Work Item #2).

3.12.6.4.1 Maximum At Kettle: Do not heat above flashpoint (FP).

3.12.6.4.2 Temperature At Point Of Application: Equiviscous Temperature (EVT) ± 25 degrees F.

3.12.6.4.3 Holding Temperature: Do not heat and hold asphalt between 500-525 degrees F. for more than 4 hours. Do not heat coal tars above 410 degrees F. for ASTM D450 Type I and 425 degrees F. for ASTM D450 Type III.

3.12.6.4.4 Interply Moppings: As required ± 20%, unless specified otherwise. (Work item #10)

3.12.6.4.5 Flood Coat: Asphalt, 60 pounds per square average and at no location less than 50 pounds (Work Item #14).

3.12.6.4.6 Gravel Surfacing: Quantity, as required for complete coverage. Embedment by weight, 50 percent minimum of specified amount. (Work Item #14).

3.12.6.4.7 Foaming Hot Bitumen At Point Of Application: Not acceptable for ply mopping construction. (Work Items #1 and #10).

3.12.6.4.8 Foreign Materials Between Plies: None acceptable. (Work Item #9).

3.12.6.4.9 Material Variance From Specified: None acceptable. (Work Item #3).

3.12.6.4.10 Variance From Number Of Plies Specified: None acceptable. (Work Item #9).

3.12.6.4.11 Phased Construction Of Membrane Felts: Not acceptable. (Work Items #4 and #9).

3.12.6.4.12 Material Moisture Content: Maximum percent by dry weight as follows: Organic felts 2.5 percent; fiberglass felts 1 percent; lumber and plywood 13 percent; insulation as per manufacturer requirements. (Work Item #1).

3.12.6.4.13 Felt Laying: Wrinkles, buckles, kinks, and fishmouths: Not acceptable. (Work Item #9).

3.12.6.4.14 Interply Voids For Individual Sample: (Work Item #10).

3.12.6.4.14.1 Maximum Area Of All Voids: 5% of interply area for individual sample.

3.12.6.4.14.2 Dry Voids (Felt On Felt): Not acceptable.

3.12.6.4.14.3 Overlapping Voids Between 2 Or More Plies: Not acceptable.

3.12.7 Quality Control Record: The quality controller shall complete AF Form 1063 daily. (See Section 4 of this specification).

3.12.8 Initial Inspection: (To be conducted after a representative sample of the work is complete).

3.12.8.1 Review each significant feature and segment of the work each day.

3.12.8.2 Deliver all materials to the site, except those in quantity (bitumen in hot bulk and truckloads of aggregate) with packaging intact and with readable labels. Use those materials having labels that:

3.12.8.2.1 Identify the material.

3.12.8.2.2 Indicate conformance with the reference standard applicable to the material.

3.12.8.3 For bitumens in hot bulk and truckloads of aggregate delivered to the site in quantity, obtain a certification for each shipment.

3.12.8.4 Store and handle all materials, except bitumen, metal components, and material in sealed cans, as follows:

3.12.8.4.1 Aggregate shall comply with moisture and dust content requirements of ASTM D1863.

3.12.8.4.2 Other materials:

3.12.8.4.2.1 Do not expose materials to water (rain, snow and so forth) before, during, or after delivery to the site.

3.12.8.4.2.2 Completely cover materials with waterproof canvas tarpaulins to protect from weather and

moisture. Arrange covers to prevent condensation from occurring beneath them; do not allow covers to extend onto the ground.

3.12.8.4.2.3 Conspicuously mark unprotected materials and permanently remove these materials from the site.

3.12.8.5 Equip kettles and tankers with automatic thermostatic controls and keep them in working order.

3.12.8.6 Use separate kettles and materials application and transporting equipment for asphalts and coal tar products.

3.12.8.7 Do not use bitumens which have been overheated, heated and held beyond specified storage period, or contaminated bitumens. Permanently remove such bitumens from the site.

3.12.9 Daily Work Production:

3.12.9.1 Roofing operations shall be coordinated with sheet metal work so that flashings are installed to permit continuous roof surfacing operations the same day felts are installed where practical. If gravel stops or perimeter flashings are not installed on the same day as roof completion, the roof membrane at perimeters shall be nailed with large-headed nails 8" on-center to perimeter wood nailers and sealed against water entry with glass fabric set in roofing cement. Roofing operations shall be coordinated with roof insulation work so that all insulation applied each day is waterproofed the same day with the complete roofing system. Graveling-in may be delayed in accordance with specified requirements.

3.12.9.2 Install temporary water cutoffs and tie-ins each workday. Remove temporary cutoffs and tie-ins so that all vertical faces of insulation are exposed at the beginning of the next day's work.

3.12.9.3 Do not cut the staggered insulation pieces that are already installed. Straighten the staggered insulation side of the day's work with unattached cut pieces of insulation; do not permanently include such cut pieces into the roof system.

3.13 SIGNS: Install as per manufacturer’s requirements. Mount sign on fascia or wall as directed by Government Representative. Use fasteners that are appropriate for substrate material.

4. QUALITY CONTROL PROCEDURES:

4.1 GENERAL: Instructions for completing AF Form 1063, Quality Control Record. Contractor quality control personnel must follow Instructions 1 through 5 below when completing the daily record. Pages following discuss and identify work items 1 through 14. Contractor quality control personnel shall review the work items daily and designate on the Daily Record Form compliance or noncompliance with them. All variances must be explained to the satisfaction of the Contracting Officer. Submit a copy of the daily AF Form 1063, quality control record in the form of a submittal as per Section 01300, on a weekly basis or as instructed by the government representative.

INSTRUCTIONS

1. Top Section:

   a. Insert date and record number.

   b. Insert weather description and temperature.

   c. Indicate crew start and stop times.

   d. Indicate your start and stop times.

   e. Indicate total roof area.

   f. Indicate roof area previously completed.

2. Products Section. This section is divided into major categories. Each category may include several materials:

   a. Examine each material within the category and check the proper box.

   b. Check the "Not Applicable" box for materials not included in today's work.

   c. Assure that all materials in a category comply with the contract to result in a check in the "Complies" box. To determine compliance, compare the material with the project specifications and drawings, and also with the approved manufacturer's literature submitted. Since materials other than those covered by the components listed may be used, enter their compliance in the "All Other Materials" category.

3. Execution Section:

a. The work item numbers in this section of the record correspond to the work items in these basic QC requirements. The work items are specification items considered to be of major concern. These items are in the basic QC requirements for convenience and tabulation.

b. Performance of the "actions" below the work item will result in an entry in the proper box on the QC record. Specification items not in the basic QC requirements must also be considered, and their acceptability grouped and documented in the "Other" box.

4. Variance Section:

a. An entry in any "Varies" box under the "Products" or "Execution" sections requires an explanation of the variance in this section. The explanation should be limited to a description of the variance only. Reasons for variance are not necessary.

b. Indicate action taken to resolve each variance to result in complying work. Certain actions resulting from variances from some of the specification requirements are included with the specified requirement. If a variance is not resolved on the same day it occurs, the number of that day's record must be entered in the space provided on records for all succeeding days, until the variance is resolved.

5. Closing Section. Sign the record at the end of the workday and submit it to the Air Force inspector.

4.2 WORK ITEMS:

WORK ITEM INDEX

WORK ITEM NR.	DESCRIPTION
1	MATERIAL MOISTURE CONTENT
2	BITUMEN TEMPERATURE
3	MATERIAL IDENTIFICATION/HANDLING
4	WEATHERING IN OF DAYS WORK
5	INCLEMENT WEATHER
6	PROTECTING COMPLETED WORK
7	SUBSTRATE PREPARATION
8	INSULATION INSTALLATION
9	PLY CONSTRUCTION
10	INTERPLY BITUMEN INTEGRITY
11	SAMPLE REMOVAL AND REPAIR

12	ENVELOPES AND BITUMEN DAMS
13	FLASHING INSTALLATION
14	SURFACING

4.3 WORK ITEM 1, MATERIAL MOISTURE CONTENT: Do not expose materials to moisture before, during, or after delivery to the site. Do not apply roofing components if moisture in any form can be seen or felt on the substrate to which the components will be applied.

4.3.1 Action: Inspect materials upon delivery for intact manufacturer's shipping containers. Verify that the vehicle delivering materials has provided protection of the materials. The vehicle must be enclosed or materials must be completely covered with tarps. Inspect materials before acceptance for evidence of contact with moisture (such as felt wrappers that are wet or stained, insulation with torn or missing transit covers, or other evidence of moisture by feel or sight). Inspect storage at the job site. Be sure enclosed storage or other storage completely protects material from moisture in any form. Observe material handling from storage area to roof. Total protection is required and must be immediately available in case of inclement weather. Delivery to the job site requires the same attention as delivery to the storage area. Mark conspicuously all materials exposed to any form of moisture and have them permanently removed from the project site. Assure that components are not applied if the hot bitumen steams, foams or bubbles. Inspect application of aggregate into flood coat for similar evidence that would indicate wet aggregate.

4.4 WORK ITEM 2, BITUMEN TEMPERATURE: Equip kettles and tankers for bitumen with automatic thermostatic controls. Post the EVT and flashpoint temperatures conspicuously on each piece of equipment that will hold hot bitumen during roofing operations. Ensure that the Contractor has an EVT measuring device on the job site in working order and checks and records the EVT temperature at the point of application hourly.

4.4.1 Action: Periodically check the accuracy of the thermostatic controls by using a portable thermometer. Periodically check bitumen temperature within tanker or kettle and at the point of application (EVT).

4.5 WORK ITEM 3, MATERIAL IDENTIFICATION/HANDLING: Use separate kettles, materials, application and transporting equipment for coal tar and asphalt products. Apply membrane to meet requirements and recommendations of the membrane manufacturer.

4.5.1 Action: Inspect equipment upon arrival at job site for condition and identification of previous use. Maintain identification of use

throughout the project. Observe the bitumen handling at the kettles and on the roof to make sure that asphalt felts are being placed in asphalt bitumen and that coal tar compatible felts are being placed in coal tar bitumen. Assure that proper type bitumen is being used for roof slope by checking the slope of the roof in the field as well as on the drawings. Review manufacturer and contract specifications for material and installation requirements and compare them with those being used.

4.6 WORK ITEM 4, WEATHERING-IN OF DAYS WORK: Where practical execute the work so that each area of the roofing system installation is completed on the same day it is begun. Included is the final roof surfacing, all bituminous and metal flashings and all related parts necessary to complete the assembly. If gravel stops or perimeter flashings are not installed on the same day as roof completion, the roof membrane at perimeters shall be nailed with large head nails approximately 12 inches on-center to perimeter wood nailers and sealed against water entry with glass fabric set in roofing cement; or, with 20 mil vinyl nailed through membrane to perimeter wood nailers. Install temporary water cutoffs and tie-ins at the end of each workday. Remove temporary cutoffs and tie-ins on resuming work so that all vertical faces of insulation are exposed.

4.6.1 Action: Determine area of work planned and make sure that enough materials are on hand to complete that area. Inspect work completed at day's end. Verify completion to include final roof surfacing, where practical, on all material installed except the area required for tie-in of future work. The tie-in area is glaze-coated with bitumen. Observe tie-in to verify that insulation joints are staggered and ply structure is continued. Verify removal of temporary work and check previously installed system for moisture.

4.7 WORK ITEM 5, INCLEMENT WEATHER: Except for expedient temporary work, do not proceed with roofing work during inclement weather.

4.7.1 Action: During bad weather, make sure that work being performed is only temporary and protects the facility and previously completed roofing system. Assure that all temporary work is removed before installation of permanent components when work is resumed.

4.8 WORK ITEM 6, PROTECTING COMPLETED WORK: Do not load or permit any part of a structure to be loaded with a weight that will adversely affect its safety. If wheeled or other traffic over the partially or fully completed roofing is unavoidable, provide and use adequate plank or plywood protection for the roofing.

4.8.1 Action: Inspect activities and methods used to transport materials over the completed or partially completed roofing system. Check

adequacy of plank or plywood to protect system. Assure that runways (such as wood planks or plywood) are used to distribute the load of materials and equipment hauling over the deck so as not to cause deflection of the deck. Check for broken welds or bends in metal decking due to materials or equipment handling.

4.9 WORK ITEM 7, SUBSTRATE PREPARATION: Removal of existing materials must result in a clean and dry substrate, except for residual stains, providing a surface suitable to apply new materials.

4.9.1 Action: Inspect substrate for excessive roughness, cracks, holes, or deteriorated material. Assure that decking or other substrate determined to be defective is repaired, replaces, or brought to the attention of the Contracting Officer. Assure that deck joints are treated to prevent bitumen drippage through the joints.

4.10 WORK ITEM 8, INSULATION INSTALLATION: Ensure that insulation boards, cant strips and tapered edge strips are adequately secured and spaced. For insulation boards on steel deck, first (bottom) layer; position insulation so that side joints between boards do not occur over deck rib opening. Stagger end joints. Secure insulation boards to the metal deck with approved mechanical fasteners according to insulation manufacturer, FM and UL requirements. Second or additional layers, cant strips and tapered edge strips; secure in full and uniform moppings of hot fluid asphalt, stagger end joints, bring boards into moderate, uniform contact at sides and ends and press insulation boards firmly into asphalt while the asphalt is hot and fluid. Offset all joints between layers in both directions.

4.10.1 Action: Ensure that the first layer of insulation is fully secured to the substrate in the specified manner according to FM I-90. Measure the distance from the inner row of fasteners to the perimeter. Count and locate fasteners with respect to insulation board. Test bond of insulation boards, cant strips, and tapered edge strips by trying to lift them after installation. Materials that are readily lifted without breaking the board or strip are not securely fastened. Observe application of asphalt by machine; assure that jets are flowing evenly and consistently. Application rate must be controlled to the rate specified by the manufacturer. Assure that long edges of insulation are parallel to and supported by the flanges and that joints do not occur over a rib opening. Assure that staggered pattern of insulation joints is begun at start of placement and develop a pattern to establish the joints at one-half the length of a full piece of insulation board. Measure joints that are not in contact to assure that the gap is less than the 3/16" requirement. Assure that contact at sides and ends of board is obtained when insulation boards are placed in hot and fluid asphalt. Assure that insulation covers entire area of deck to within 1/4" of vertical surfaces and wood insulation stops. Test bond of insulation boards, cant strips and

tapered edge strips by trying to lift them after installation. Materials that are readily lifted without breaking are not securely fastened.

4.11 WORK ITEM 9, PLY CONSTRUCTION: Apply felts shingle fashion and keep proper lap distance to result in a one-inch minimum. Maintain a straight run of felts so that kinks or fishmouths do not result, and the felts are completely flat. Once established, do not change the direction of felt application.

4.11.1 Action: Assure that felts are rolled true to premarked lines on felts. Assure that immediately upon deviating from the felt line, the roll of felt is cut and restarted with specified endlap. Do not allow roll to be forced back on line without cutting. Assure that fishmouths or kinks do not appear at the felt edges due to a run of felts other than in a straight line. Cut and patch these discrepancies as they occur or by the end of each day's work. Assure no foreign particles (aggregate, etc.) are sealed between plies. Measure lap exposure (the distance between two exposed adjacent edges) and compare this to the required felt line distances. These distances must be equal. Assure that the ply lines are parallel for entire roof area and that the direction of felt application is not changed.

4.12 WORK ITEM 10, INTERPLY BITUMEN INTEGRITY: Broom or squeegee each ply of roll goods into place, full width, while the bitumen is hot and fluid, so that felt does not touch felt and the bitumen layer does not have voids or skips. Do not walk on felts until bitumen is "set."

4.12.1 Action: Periodically during the day, check the temperature of the bitumen at the point of application. Each ply of the rolled felts must be pressed in place with a broom or squeegee the full width of the roll. Verify that brooming or squeegeeing is adequate to embed the felts into the bitumen and to make sure that bitumen is between all surface areas of the felts, including the edges. Asphalt must be continuously visible along each edge of the sheet. Do not permit walking over felts until bitumen is cooled to set temperature. Refer to NRCA Publication, Application Techniques for Glass Fiber Roofing Felts, as a recommended application procedure.

4.13 WORK ITEM 11, SAMPLE REMOVAL AND REPAIR: The Contractor must remove samples and repair the area of sample removal.

4.13.1 Action: Witness removal of test samples required by the project specification. Samples must be cut accurately, using a template. Direct removal of test samples in locations selected by the Air Force Inspector. Visually examine sample components for adhesion to each other, edge voids and presence of moisture. Record observations of defects and weight of samples on AF Form 1063. Direct and observe repair of sample area. Do not leave the sample on the roof or in the sun. Remove the sample from the roof immediately and evaluate for compliance with the Air Force Inspector.

4.14 WORK ITEM 12, ENVELOPES AND BITUMEN DAMS: Provide organic felt envelopes, or other approved methods, at gravel stop roof edges, and at deck penetrations to stop bitumen drippage.

4.14.1 Action: Before the start of felt application, assure that an organic felt strip, at least 18" wide, is set in steep asphalt or flashing cement and is applied so that half width is set on the nailer around perimeter of building and half width is lapped over the edge of the building. Assure that after felt application is complete, the overlapped section of felt is folded back over the roofing membrane and mopped down to form an envelope around the edge of the roof membrane. Assure that at all penetrations, a felt envelope or other positive means of preventing bitumen drippage is installed. Assure that flanges of metal are primed before installation into system.

4.15 WORK ITEM 13, FLASHING INSTALLATION: Flashing system according to roofing membrane manufacturer's requirements.

4.15.1 Action: Assure that proper materials are being applied and that materials are the products of the BURS manufacturer as recommended for 20-year warranted system over the substrate involved. Before start of flashing application, assure that roofing felts extend to top of cant strips. Assure that all vertical surfaces are primed before receiving flashing. The primer must be dry before applying the flashing. Check for flashing bond to all areas of contact and for overlap of all end joints. Assure that end joints between layers of flashing do not coincide during application.

4.16 WORK ITEM 14, SURFACING: The surface shall be flood-coated uniformly and aggregate surfacing applied according to roofing system manufacturer's requirements and specification.

4.16.1 Action: The surface shall be broom cleaned and free from moisture. Aggregate surfacing shall be clean and dry, and meet specification requirements.

SUBMITTAL FORM A-1

ASPHALT SYSTEM MANUFACTURER CERTIFICATION

The following statement is required from the Asphalt Roofing System manufacturer who is defined as the roof membrane manufacturer who may or may not manufacture the other system components:

"LICENSED APPLICATOR"

This is to advise you that (Roofing Contractor)_____ _____is a licensed applicator of our roofing systems and is capable of obtaining our 20-year labor and materials warranty.

PROJECT DOCUMENT REVIEW:

We have reviewed the project documents (general provisions, drawings and specifications) as they relate to the built-up roofing membrane, flashings and insulation for (Project Title and Address) _____ and certify that the built-up roofing systems listed below and described in the attached product literature are suitable for use with the roof system construction specified for this project as it relates to normal wear and tear of the elements. We further understand that change orders to this contract will be submitted for our review.

Roofing System Designation
Membrane/Insulation*

_____

INSULATION COMPATIBILITY:

We further certify that the insulations as specified are compatible with our materials and would qualify for our best materials and labor warranty.

SIGNATURE:

SBS Modified Bitumen Roofing System

Manufacturer Firm Name _____

Address _____

Authorized Representative's Signature _____

Authorized Representative's Name _____
(Print or Type)

Authorized Representative's Title _____

Date: _____

1 Atch
Membrane Manufacturer
Specification and Recommendation

*List manufacturer's name and product designation

NOTE: This submittal must be submitted and approved by the Contracting Officer prior to award of this Contract.

SUBMITTAL FORM A-2

SBS MODIFIED BITUMEN ROOFING SYSTEM MANUFACTURER CERTIFICATION

The following statement is required from the SBS Modified Roofing System manufacturer who is defined as the roof membrane manufacturer who may or may not manufacture the other system components:

"LICENSED APPLICATOR"

This is to advise you that (Roofing Contractor) _____ _____ is a licensed applicator of our roofing systems and is capable of obtaining our 20-year labor and materials warranty.

PROJECT DOCUMENT REVIEW:

We have reviewed the project documents (general provisions, and specifications) as they relate to the built-up roofing membrane, flashings and insulation for (Project Title and Address)_____ and certify that the roofing systems listed below and described in the attached product literature are suitable for use with the roof system construction specified for this project as it relates to normal wear and tear of the elements. We further understand that change orders to this contract will be submitted for our review.

Roofing System Designation
Membrane/Insulation*

_____

INSULATION COMPATIBILITY:

We further certify that the insulations as specified are compatible with our materials and would qualify for our best materials and labor warranty.

Submittal Form A-2 (Continued)

SIGNATURE:

SBS Modified Bitumen Roofing System
Manufacturer Firm Name _____

Address _____

Authorized Representative's Signature _____

Authorized Representative's Name _____
(Print or Type)

Authorized Representative's Title _____

Date:_____

1 Atch:
Membrane Manufacturer
Specification and Recommendation

*List Manufacturer's name and product designation

NOTE: This submittal must be submitted and approved by the Contracting Officer prior to award of this contract.

SUBMITTAL FORM B-1

ASPHALT BUILT-UP ROOFING (BUR) SYSTEM
20-YEAR LABOR AND MATERIAL WARRANTY/GUARANTEE

WARRANTY COVERAGE:

This system is delivered subject to a full material and workmanship warranty/ guarantee for 20 years that guarantees that the manufacturer will pay all costs necessary to maintain the built-up roofing membrane and flashing system in a water-tight condition as a result of the following causes: deterioration from ordinary wear and tear of the elements; poor workmanship on the part of the contractor; defects in materials; defects in the manufacturer's specifications; blisters, bare spots, fishmouths, wrinkles or ridges in the built-up roof; and splits in the built-up roof membrane caused by movement of the roof insulation or any other underlying surface, or material used as a base over which the roof system is applied, excluding the deck. Specific conditions that will affect warranty/guarantee coverage and exclusions from coverage are not covered by this warranty/guarantee.

The specified 20-year roof system is our 20-year system design and the insulations specified are compatible with our materials. As the manufacturer of this system, we also accept responsibility for making repairs to the roofing system at no additional cost to the government, to correct defects in, failure of, or improper application of, roof insulation used as a base over which the roof is applied, except the roof deck.

If the manufacturer fails to make required emergency and permanent repairs during the warranty/guarantee period, as stated after notice by telephone from the contracting office, the government may have the work done by others and charge the cost to the manufacturer. The warranty provisions of this contract apply notwithstanding government inspection and acceptance. A separate warranty/guarantee is required for each building. Failure to perform the work resulting in the government having the work performed will not void this warranty/guarantee.

TERMS, CONDITIONS, LIMITATIONS:

Emergency repairs shall be made within 48 hours of receipt of notice by telephone from the contracting officer and weather permitting, the manufacturer agrees to permanently repair the affected areas within 30 days by restoring them to a water-tight condition, without cost to the government. If it is determined that leaks were caused by either an exclusion from coverage or a specific condition listed below, the manufacturer will repair the defects and an equitable payment will be made by the government.

EXCLUSIONS FROM COVERAGE:

1. Natural disasters, acts of God (lightning, hurricanes, tornadoes, sustained winds exceeding 75 MPH as recorded at the nearest meteorological center, earthquakes, hail).

2. Acts of negligence or abuse and misuse by government personnel, accidents, vandalism, civil disobedience, war, or damage caused by falling objects.

3. Damage by structural failure, settlement, movement, distortion, warpage, or displacement of structure.

4. Failure of material or flashings caused by movement of metal work not supplied by manufacturer issuing warranty/guarantee.

5. Leaks caused by repairs or alterations of roof system or installation of structures, fixtures or utilities on or through roof without prior written approval of manufacturer.

6. Storage of material on roof.

7. Moisture entering roof system through walls, copings, or any part of building structure except the roof, including from adjacent building.

8. Fire.

9. Faulty construction or design of building, including parapet walls, copings, chimneys, skylights, vents, or of roof deck but specifically excluding construction above the deck, i.e., insulation, base sheets, fasteners, adhesive, vapor retarders, and so forth.

10. Infiltration or condensation of moisture in or through underlying area; vapor condensation beneath the roof greater than the acceptable ambient moisture content for the given material as established by the appropriate American Society for Testing and Materials (ASTM) standard in effect at the time of installation.

11. Damage or leaks attributable to ponding water, defined as water in ponded areas that does not drain or evaporate within a 48 hour period.

12. Under no circumstances is the manufacturer responsible for damages to the building, its contents or roof deck.

13. Membrane splits caused by structural movement.

SPECIFIC CONDITIONS THAT WILL AFFECT WARRANTY/GUARANTEE COVERAGE:

1. Failure to use reasonable care in maintenance; failure to follow manufacturer's written maintenance instructions.

2. Failure of owner to make repairs to leaks not covered by manufacturer's warranty/guarantee.

3. Repair work by any contractor other than BUR manufacturer approved contractor or use of unapproved material.

4. Changes in building usage which may affect roof performance unless approved in writing by the BUR manufacturer prior to such change.

DETERMINATION OF RESPONSIBILITY:

Receipt of notice by telephone or in writing from the contracting officer is evidence that the contracting officer has had the roof examined by a technically qualified representative of the government and has determined based on this examination, that none of the above causes apply and the manufacturer is obligated to make the repairs.

Within 30 days of receipt of the above notice by the manufacturer that a roofing system defect covered by the warranty/guarantee has been discovered, the manufacturer, to avoid application of the warranty/guarantee, must notify the contracting officer in writing of the existence of an exclusion stated herein. Failure to provide such notice will preclude the manufacturer from later disputing the coverage of the warranty/guarantee.

The Government has the right to perform both visual and nondestructive evaluations of the roof system, at government expense, any time during the warranty/guarantee period to validate water tightness of the roof system.

After the occurrence of an exclusion from coverage or a specific condition which renders the warranty/guarantee ineffective, the warranty/guarantee shall be allowed to continue as long as the government returns the roofing system to its original condition and the manufacturer is allowed to inspect or oversee the repair. The burden to establish the existence of an exclusion or specific condition is on the manufacturer.

The 20-year coverage period starts from the date the facility or roofing system is accepted by the government from the contractor.

Submittal Form B-1 (Continued)

BENEFICIARY:

It is understood by the manufacturer and contractor that the warranty/guarantee provided herein shall be for the benefit of the United States government.

BURDEN OF PROOF:

The manufacturer shall have the burden of proving by a preponderance of the evidence the existence of a condition which established an exclusion from coverage, or which would render the warranty/guarantee ineffective or null and void.

OTHER WARRANTIES:

The warranty contemplated herein shall be in addition to and not in lieu of any warranty/guarantee otherwise applicable to the work or materials used in the contract.

SIGNATURE:

Asphalt BURS Manufacturer Firm Name_____

Address_____

Authorized Representative's Signature_____

Date_____

Authorized Representative's Name_____
(Print or Type)

Title_____

Manufacturer's Warranty/Serial Number_____

for Building Number_____Located at_____

Warranty/Guarantee Expiration Date_____

1 Atch
BURS Manufacturer Specification
Description, and Recommendation

SUBMITTAL FORM B-2

SBS MODIFIED BITUMEN
20-YEAR LABOR AND MATERIAL WARRANTY/GUARANTEE

WARRANTY COVERAGE:

This system is delivered subject to a full material and workmanship warranty/ guarantee for 20 years that guarantees that the manufacturer will pay all costs necessary to maintain the built-up roofing membrane and flashing system in a water-tight condition as a result of the following causes: deterioration from ordinary wear and tear of the elements; poor workmanship on the part of the Contractor; defects in materials; defects in the manufacturer's specifications; blisters, bare spots, fishmouths, wrinkles or ridges in the roofing; and splits in the roof membrane caused by movement of the roof insulation or any other underlying surface, or material used as a base over which the roof system is applied, excluding the deck. Specific conditions that will affect warranty/guarantee coverage and exclusions from coverage are not covered by this warranty/guarantee.

The identified roof system is our 20-year system design and the insulations specified are compatible with our materials. As the manufacturer of this system, we also accept responsibility for making repairs to the roofing system at no additional cost to the Government, to correct defects in, failure of, or improper application of, roof insulation used as a base over which the roof is applied, except the roof deck.

If the manufacturer fails to make required emergency and permanent repairs during the warranty/guarantee period, as stated after notice by telephone from the contracting office, the Government may have the work done by others and charge the cost to the manufacturer. The warranty provisions of this contract apply notwithstanding government inspection and acceptance. A separate warranty/guarantee is required for each building. Failure to perform the work resulting in the Government having the work performed will not void this warranty/guarantee.

TERMS, CONDITIONS, LIMITATIONS:

Emergency repairs shall be made within 48 hours of receipt of notice by telephone from the Contracting Officer and weather permitting, the manufacturer agrees to permanently repair the affected areas within 30 days by restoring them to a water-tight condition, without cost to the Government. If it is determined that leaks were caused by either an exclusion from coverage or a specific condition listed below, the manufacturer will repair the defects and an equitable payment will be made by the Government.

Submittal Form B-2 (Continued)

EXCLUSIONS FROM COVERAGE:

1. Natural disasters, acts of God (lightning, hurricanes, tornadoes, sustained winds exceeding 75 MPH as recorded at the nearest meteorological center, earthquakes, hail).

2. Acts of negligence or abuse and misuse by Government Personnel, accidents, vandalism, civil disobedience, war, or damage caused by falling objects.

3. Damage by structural failure, settlement, movement, distortion, warpage, or displacement of structure.

4. Failure of material or flashings caused by movement of metal work not supplied by manufacturer issuing warranty/guarantee.

5. Leaks caused by repairs or alterations of roof system or installation of structures, fixtures or utilities on or through roof without prior written approval of manufacturer.

6. Storage of material on roof.

7. Moisture entering roof system through walls, copings, or any part of building structure except the roof, including from adjacent building.

8. Fire.

9. Faulty construction or design of building, including parapet walls, copings, chimneys, skylights, vents, or of roof deck but specifically excluding construction above the deck, i.e., insulation, base sheets, fasteners, adhesive, vapor retarders, and so forth.

10. Infiltration or condensation of moisture in or through underlying area; vapor condensation beneath the roof greater than the acceptable ambient moisture content for the given material as established by the appropriate American Society for Testing and Materials (ASTM) standard in effect at the time of installation.

11. Damage or leaks attributable to ponding water, defined as water in ponded areas that does not drain or evaporate within a 48 hour period.

12. Under no circumstances is the manufacturer responsible for damages to the building, its contents or roof deck.

13. Membrane splits caused by structural movement.

Submittal Form B-2 (Continued)

SPECIFIC CONDITIONS THAT WILL AFFECT WARRANTY/GUARANTEE COVERAGE:

1. Failure to use reasonable care in maintenance; failure to follow manufacturer's written maintenance instructions.

2. Failure of owner to make repairs to leaks not covered by manufacturer's warranty/guarantee.

3. Repair work by any contractor other than BUR manufacturer approved Contractor or use of unapproved material.

4. Changes in building usage which may affect roof performance unless approved in writing by the BUR manufacturer prior to such change.

DETERMINATION OF RESPONSIBILITY:

Receipt of notice by telephone or in writing from the Contracting Officer is evidence that the Contracting Officer has had the roof examined by a technically qualified representative of the Government and has determined based on this examination, that none of the above causes apply and the manufacturer is obligated to make the repairs.

Within 30 days of receipt of the above notice by the manufacturer that a roofing system defect covered by the warranty/guarantee has been discovered, the manufacturer, to avoid application of the warranty/guarantee, must notify the Contracting Officer in writing of the existence of an exclusion stated herein. Failure to provide such notice will preclude the manufacturer from later disputing the coverage of the warranty/guarantee.

The Government has the right to perform both visual and nondestructive evaluations of the roof system, at government expense, any time during the warranty/guarantee period to validate water tightness of the roof system.

After the occurrence of an exclusion from coverage or a specific condition which renders the warranty/guarantee ineffective, the warranty/guarantee shall be allowed to continue as long as the Government returns the roofing system to its original condition and the manufacturer is allowed to inspect or oversee the repair. The burden to establish the existence of an exclusion or specific condition is on the manufacturer.

The 20-year coverage period starts from the date the facility or roofing system is accepted by the Government from the Contractor.

Submittal Form B-2 (Continued)

BENEFICIARY:

It is understood by the manufacturer and Contractor that the warranty/guarantee provided herein shall be for the benefit of the United States Government.

BURDEN OF PROOF:

The manufacturer shall have the burden of proving by a preponderance of the evidence the existence of a condition which established an exclusion from coverage, or which would render the warranty/guarantee ineffective or null and void.

OTHER WARRANTIES:

The warranty contemplated herein shall be in addition to and not in lieu of any warranty/guarantee otherwise applicable to the work or materials used in the contract.

SIGNATURE:

SBS Modified Bitumen
Manufacturer Firm Name_____

Address_____

Authorized Representative's Signature_____

Date_____

Authorized Representative's Name_____
(Print or Type)

Title_____

Manufacturer's Warranty/Serial Number_____

for Building Number_____Located at_____

Warranty/Guarantee Expiration Date_____

1 Atch
Membrane Manufacturer Specification, Description, and Recommendation

SUBMITTAL FORM C

APPOINTMENT OF QUALITY CONTROLLER

_____(name) is appointed as Quality Controller on Project _____ with the authority to regulate the quality of the work so that it conforms to the Contract. The Quality Controller is authorized to order discontinuance of any operation causing nonconforming work.

The Quality Controller is experienced in the supervision and inspection of BURS construction similar to that required in this Contract. The Quality Controller understands all requirements of these specifications.

Name of Firm_____

Address_____

Telephone _____

Authorized Representative's Signature_____

Printed or Typed Name_____

Date_____

I acknowledge receipt of this letter.

Quality Controller's Signature_____

Printed or Typed Name _____

Date _____

SUBMITTAL FORM D

AS-BUILT ROOF SYSTEM SUMMARY

After completion of roofing, accurately fill in the information required on this sheet for each building. If more than one system applies to the same building, complete one sheet for each system. Submit six copies of each sheet before final acceptance.

Bldg No._____ Project No. _____

Total project area in square feet _____

Total project cost _____

Building area where this system is installed _____

Deck type_____Deck slope _____

Underlayment components (type and number) _____

Underlayment attachment _____

Insulation:

Type_____Manufacturer_____

First layer:
Thickness_____

Attachment_____

Second layer:
Thickness_____

Attachment_____

Membrane:
Manufacturer_____

Manufacturer System Designation_____

No. of Plies_____ Felt types:

Bitumen type_____ Surfacing (circle one):
Aggregate Smooth Granules

Submittal Form D (Continued)

Roof Completion Date _____

Roofing Contractor (Name, address, and phone)_____

_____

END OF SECTION

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07560

EPDM ROOFING SYSTEM

1. GENERAL:

1.1 DESCRIPTION OF WORK:

1.1.1 Furnish the administration, facilities, materials, labor, equipment, and quality control necessary to integrate the work into the total building system so that leakage into the roofing system or the building does not occur.

1.1.2 The roofing system is an assembly of components--the insulation, base sheet, roofing membrane and surfacing, flashings, blocking, and all related parts necessary to complete the assembly. All insulation and overpayment systems shall be mechanically fastened and comply with Factory Mutual Global 1-90.

1.1.3 The roofing system manufacturer is the roofing membrane manufacturer, who may or may not manufacture and market the other components of the roofing system.

1.1.4 Furnish and install a sign for the roof indicating that a warranty is in effect and who to contact.

1.2 REFERENCES: Materials shall conform to applicable ASTM standards as specified in this section. Certificates of compliance may be requested from each respective material manufacturer at the option of the contracting Officer and comply with:

1.2.1 Referenced Standards: These standards form part of this specification only to the extent they are referenced as specification requirements.

1.2.2 ASTM C 1177/C 1177M – Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2004.

1.2.3 ASTM C 1289 – Standard Specification for Faced Rigid Cellular Polyisocyanurate thermal Insulation Board; 2004.

1.2.4 ASTM D 4637 – Standard Specification for EPDM Sheet used in Single-Ply Roof Membrane; 2004.

1.2.5 CAN-ULC S770 – Standard Test Method Determination of L-Term Thermal Resistance Of Closed-Cell Thermal Insulating Foams; 2003.

1.2.6 FM 4470 – Approval Standard – Class 1 Roof Covers; 1986.

1.2.7 PS 1 – Construction and Industrial Plywood; 1995.

1.2.8 PS 20 – American Softwood Lumber Standard; 2005.

1.3 DEFINITIONS:

1.3.1 Roofing Terminology: Refer to ASTM D 1079 for definition of terms related to roofing work not otherwise defined in the section.

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

1.4 STORAGE OF MATERIALS:

1.4.1 Deliver roofing materials, insulation, and accessories in manufacturer's protective containers with labels intact and legible, and comply with manufacturer's printed instructions for storage and handling.

1.4.2 Handle rolled goods to prevent damage.

1.4.3 Store all materials on clean, raised platforms with weather-protective covering.

1.5 ENVIRONMENTAL REQUIREMENTS: Proceed with elastomeric sheet roofing work only when weather conditions comply with manufacturer's recommendations and will permit materials to be applied and cured in accordance with those recommendations. Do not exceed temperature limitations recommended by roofing manufacturer.

1.6 COORDINATION REQUIREMENTS:

1.6.1 Roofing operations shall be coordinated with sheet metal work so flashings are installed to permit continuous roof surfacing operation.

1.6.2 Roofing operations shall be coordinated with roof insulation work so that all insulation applied each day is waterproofed the same day with the complete roofing system.

1.7 SUBMITTALS:

1.7.1 Submittal Form A-3: Roofing System Manufacturer's Certifications are a qualification requirement for this contract.

1.7.2 Quality Control Designate: Submit completed Form C in accordance with Section 01300.

1.7.3 Submit product data, installation instructions, and general recommendations from manufacturer in accordance with Section 01300 for the following:

1.7.3.1 Roofing System.

1.7.3.2 Sealant.

1.7.4 Submit in accordance with Section 01300, shop drawings indicating field measured dimensions, roof plan, layout of roofing sheets, location and type of penetrations, and flashing details of perimeter and penetration conditions.

1.7.5 Warranty: Submit in accordance with Section 01300 completed Forms B-3.

1.7.6 Latest edition of Factory Mutual Global Manual 1-90.

1.7.6.1 Insulation panel plan of individual roof showing insulation panels and fastener layout that complies with Factory Mutual Global 1-90 requirements.

1.7.7 MSDS: Submit “Material Safety Data Sheet” (MSDS) for all new roofing materials that will be utilized in project.

1.7.8 Record Documents: Submit in accordance with Section 01300.

1.7.8.1 Quality Control Record (AF Form 1063).

1.7.8.2 Plan view drawing of roof, including all penetrations and accessories.

1.7.8.3 As-built Roof Summary: Submit completed Form B-3.

1.7.8.4 Submit completed Form D.

1.8 RELATED WORK:

1.8.1 Section 05310 - Metal Roof Deck

1.8.2 Section 05500 - Metal Fabrications

1.8.3 Section 06100 - Rough Carpentry

1.8.4 Section 07510 - Built-Up Roofing

1.8.5 Section 10420 - Signage

1.9 APPLICATION REQUIREMENTS:

1.9.1 Surfaces will be inspected and approved by the Contracting Officer or representative immediately prior to application of roofing and flashings; said inspection to be coordinated by the Contractor.

1.9.2 Roofing and flashings shall be applied to a smooth and firm surface free of ice, frost, moisture, dirt, projections, or any other foreign material.

1.9.3 Application of roofing shall not be performed under damp or wet conditions or excessive wind conditions as determined by the Contracting Officer or Technical Representative.

1.10 ROOF PROTECTION:

1.10.1 When wheeled or other traffic over the partially or fully completed roofing is unavoidable, use adequate plank or plywood protection for the roofing.

1.10.2 Mechanical application devices shall be mounted on pneumatic-tired wheels and shall be designed and maintained to operate without damaging the insulation or the roofing membrane.

1.11 DAILY CLEANUP: Remove all debris daily from the roof.

1.12 ACCEPTANCE OF COMPLETED WORK:

1.12.1 Acceptance of completed work will be based on its conformance to the contract. Nonconforming work will be rejected. The Air Force is not obligated to accept nonconforming work at a reduced price.

1.12.2 Start replacement or correction of rejected work within 10 calendar days after receipt of the rejection notice.

1.12.3 Contractor's receipt of a final acceptance certificate, signed and dated by the Contracting Officer, will constitute Air Force acceptance of the roofing work.

1.13 OPERATIONAL PROCEDURES:

1.13.1 Confine operations, movement of workmen and equipment, storage, materials, and debris within limits as directed by the Contracting Officer.

1.13.2 Do not load the roof or any part of the building or permit to be loaded with a weight which will cause excessive deflection or endanger safety or cause damage.

1.13.3 Protect the building and surrounding area from damage or injury. The Contractor must determine the nature of these operations and provide proper protection.

1.13.4 Repair all damage caused by the lack of such protection to the Contracting Officer's satisfaction. If the repairs are not made or the Contracting Officer determines that repairs are beyond the Contractor's ability, the Air Force will have the work done by others, and will charge the cost to the Contractor.

1.14 WARRANTY:

1.14.1 Manufacturer: Provide 20 year Manufacturer’s Limited Warranty. Warranty shall include membrane, roof insulation, and membrane accessories.

1.14.1.1 Coverage:

1.14.1.1.1 Limit of liability: No Dollar Limitation.

1.14.1.1.2 Scope of coverage: Repair any leak in the EPDM Roofing System caused by the ordinary wear and tear of the elements, manufacturing defect in manufacturer’s brand materials, and the workmanship used to install these materials.

1.14.2 Wind Warranty: Provide FM 1-90 (72MPH) wind uplift warranty. Warranty shall include membrane, roof insulation, and membrane accessories.

2. PRODUCTS:

2.1 MEMBRANE: FR Rubber Gard EPDM (Ethylene Propylene Diene Terpolymer) membrane as manufactured by Firestone Building Products Company or approved equal.

2.1.1 Fully Adhered System.

2.1.2 Tensile Strength (ASTM D-412): 1305 psi minimum.

2.1.3 Elongation %, (ASTM D-412): 300 minimum.

2.1.4 Tear Resistance (ASTM D-624): 150 lbs/in minimum.

2.1.5 Ozone Resistance (ASTM D-1149): No cracks.

2.1.6 Heat Aging, 28 days at 240 degrees F. (ASTM D-573): Tensile minimum 1205 psi, elongation 200% minimum.

2.1.7 Brittle Temperature (ASTM D-746): -49 degrees F. (-45 degrees C.).

2.1.8 Water Vapor Permeability (ASTM E-96): 2.0 perm-mils.

2.1.9 Thickness: .060 inch ± 10% (ASTM D-412).

2.1.10 Weight: .38 pounds per square foot.

2.2 ROOF FLASHING: Form Flash EPDM Membrane as manufactured by Firestone or approved equal.

2.2.1 Tensile Strength (ASTM D-412): 1305 psi minimum.

2.2.2 Elongation (ASTM D-412): 300% minimum.

2.2.3 Tear Resistance (ASTM D-624): 150 pounds per inch (26.3 N/mm) minimum.

2.2.4 Brittleness Temperature (ASTM D-746): -49 degrees F. (-45 degrees C.).

2.2.5 Weight: .35 pounds per square foot.

2.3 ROOF INSULATION: As recommended by the membrane manufacturer.

2.4 OVERLAYMENT: As recommended by the membrane manufacturer.

2.5 FASTENERS AND ACCESSORIES: As recommended by the system manufacturer.

2.5.1 Nails: Nonferrous or galvanized steel.

2.5.2 Bolts and Nuts: ASTM A307, Carbon Steel Externally and Internally Threaded Standard Fasteners; hot-dip galvanized.

2.5.3 Roofing Fasteners: Fasteners used to fasten insulation must be approved by Factory Mutual as evidenced by being listed in the Factory Mutual Approval Guide or supplements. Fasteners shall be treated to prevent corrosion according to Factory Mutual Std. 4470.

2.5.4 Sheet Metal Fasteners: Galvanized or Cadmium Plated Steel.

2.6 WOOD PRODUCTS:

2.6.1 Pressure treated lumber and plywood or as recommended by roof membrane manufacturer.

2.6.2 Field Treat site-sawn ends. Allow preservative to cure prior to placing members.

2.7 SEALANT:

2.7.1 Sealant Primer: As manufactured and recommended by the sealant manufacturer in writing. All sealants must be used with a primer. If a manufacturer does not routinely require a primer, obtain a recommendation from that manufacturer on how to fulfill this requirement.

2.7.2 Sealant Backup Material: As manufactured or recommended by the sealant manufacturer for the substrate type and joint design on this project. Unless indicated or specified otherwise, all joints must have a backup material sized to be slightly compressed in the joint when installed.

2.7.3 Color: To match the adjacent substrate.

2.7.4 Sealant type for general use: FSTT-S-230C (COM-NBS) (Feb 2, 1970) including amendment 2 (Oct 19, 1970) single component sealing compound, Type II, Class A. Sealant material must be urethane or acrylic polymer.

2.7.5 Use sealants whose date of manufacture shows they have not exceeded their shelf life. Do not use sealants with a date of manufacture more than 12 months old.

2.7.6 Warranty: Provide five-year written warranty. Submit in accordance with Section 01300.

2.7.6.1 Replace sealants which fail because of loss of cohesion or adhesion, or do not cure.

2.8 WALKWAY PADS: Shall be 30" x 30" x .300" thick polymer rubber pads with factory laminated tape applied to back side. Quick Seam Walkway pads as manufactured by Firestone Building Products Company, or approved equal.

2.8.1 Properties:

2.8.1.1 Base - Rubber Polymers

2.8.1.2 Elongation, % Min.: ASTM D-412

2.8.1.3 Parallel to Grain Flow: (DIE C) 75

2.8.1.4 Pependicular to Grain Flow: (DIE C) 75

2.8.1.5 Brittleness Temperature: ASTM D-2137 -40° F (-40° C)

2.8.1.6 Hardness Shore A: ASTM D-2240 60 ± 5

3. EXECUTION:

3.1 SUBSTRATE PREPARATION:

3.1.1 Comply with manufacturer's instructions for preparation of substrate. Clean substrate of dust, debris, and other substances detrimental to EPDM roofing work.

3.1.2 Beginning of installation means acceptance of conditions as satisfactory.

3.2 ROOF INSULATION:

3.2.1 Cut rigid insulation to fit snugly between the ribs of the existing metal roof.

3.2.2 Install only dry insulation and only as much insulation as can be covered the same day with membrane and completed.

3.3 OVERLAYMENT: As recommended by manufacturer.

3.4 WOOD INSTALLATION: Secure wood nailers and cant strips in compliance with the requirements of the insulation or membrane manufacturer.

3.5 SEALANT INSTALLATION:

3.5.1 Follow sealant manufacturer's installation requirements, except as specified herein.

3.5.2 Clean the substrate so there are no contaminants or moisture that will prevent bonding of the primer or sealant directly to the substrate.

3.5.3 Prime with sealant primer, all substrates to which sealant will be applied and allow the primer to cure. This must be done regardless of whether the sealant manufacturer requires priming.

3.5.4 Except for sheet metal joints, install sealant backup material.

3.6 MEMBRANE INSTALLATION:

3.6.1 Install membrane and accessories in accordance with membrane manufacturer's most current printed instructions for a fully adhered system.

3.6.2 Loosely lay sheet membrane over roof insulation and allow the membrane to relax 30 minutes minimum before bonding, splicing, or attaching. Evenly fold sheet back on itself after it is in its final position so as to expose the underside.

3.6.3 Apply bonding adhesive evenly to both the substrate and the membrane. Apply simultaneously to allow equal drying time; allow to dry until tacky, not to stick or string by touch of a dry finger.

3.6.4 Starting at the fold, slowly roll the coated membrane into the coated substrate evenly, so as to prevent wrinkles. Compress with stiff push broom to assure full contact. Splice adjoining sheets by lapping the edges and splicing with splice adhesive or splice tape system.

3.6.5 Complete splice between flashing and sheet roofing before bonding the flashing to vertical surface. Flash all penetrations passing through the sheet membrane.

3.7 ROOF MEMBRANE SAMPLING FOR COAL TAR AND ASPHALT SYSTEMS:

3.7.1 A minimum of one test cut 4" x 36" or 12" x 12" in dimension taken perpendicular to the long dimension of the felts is required each day of construction until a level of confidence is established between the quality controller and the inspector. A test cut of same dimensions is also required when job conditions change significantly thereafter, such as, ambient temperature, crew members, or when visual observations indicate that membrane integrity may be compromised, such as, bitumen too cool, workers walking on freshly laid felts, or continuous bitumen film not present at edge of felts. Remove the test samples before application of the surface coating at locations selected by the quality controller and/or inspector. Immediately take the sample off the roof and cool it to about 0 degrees F. (minimum). Comply with stated tolerances on interply bitumen weight, head laps and void content. If results show out of tolerance conditions, the construction process will be adjusted and an additional sample taken to verify that construction is back

within tolerance. Turn all samples over to Government representative. Turn all samples over to Government representative.

3.7.2 Sample removal and repair of the completed roof shall be done by the Contractor. Do not cut a sample from a completed membrane until it has cured for at least 2 hours. Using a template and utility knife, cut the membrane a little at a time. Ensure that you cut through the entire membrane. Any bitumen that sticks to the insulation after the sample is removed shall be carefully removed and included with the sample for weighing and analysis. Remove the cut sample slowly taking care not to bend the sample.

3.8 CONTRACTOR QUALITY CONTROL:

3.8.1 It is the responsibility of the Contractor to ensure that the designated roofing quality control person complies with all requirements relating to the roofing work. To accomplish this, the quality controller must observe work in progress, including observation of testing and measuring conducted by the Air Force inspector, and report work conditions daily on AF Form 1063, Quality Control Record. Instructions on how to use it are included in Section 07510 Built-Up Roofing, Paragraph 4 Quality Control Procedures. Work accomplished on a daily basis will be considered satisfactory only when the daily record form shows that all "variances" have been corrected and that the work is in conformance with the contract. Submit a copy of the daily AF Form 1063, Quality Control Record in the form of a submittal as per Section 01300 on a weekly basis or as instructed by the government representative.

3.8.2 Quality Assurance (QA):

3.8.2.1 As specified herein, provide the QA evidence needed to establish confidence that quality control (QC) is being performed adequately.

3.8.2.2 Except as modified and supplemented herein, follow the published requirements and written recommendations of the membrane and other materials manufacturers. Concerning methods of installation, industry practices apply only when this contract does not address the matter.

3.8.2.3 The specified QC requirements are minimums; provide additional QC, if in the opinion of the Contracting Officer, the QC is not effective enough to provide conforming work. This additional QC does not constitute a change to the contract.

3.8.2.4 The QC is subject to audit by an Air Force inspector. Provide the inspector all information necessary for this audit.

3.8.2.4.1 The Air Force is not obligated to inspect a Contractor's work or to protect a Contractor from the consequences of such work. Air Force inspection is a general examination of the Contractor's conduct and work, and is solely for the purposes of the Air Force. Air Force inspectors do not have the authority to accept any work, whether or not it is conforming. Air Force inspection is not to be construed as conclusive. Information that may be offered to the Contractor does not change the contract.

3.8.2.4.2 Air Force Agents, including inspectors, engineers and quality assurance evaluators, are not authorized to change the Contract without the written authorization of the Contracting Officer. This lack of authority extends to all situations in which the actions of these agents could be construed as constituting a change.

3.8.3 Provide quality control defined as follows:

3.8.3.1 Quality control is the regulatory process by which the Contractor measures actual quality performance, compares it with standards, and acts on the difference. The quality function is the entire collection of activities through which fitness for use is achieved.

3.8.3.2 Contractor inspection is a careful and critical investigation of all work to assure that it conforms to the contract, and to detect variances and act to correct them in time to prevent reworking and delay. This includes detailed, skillful examination and testing with immediate comparison to the requirements of the contract. On discovery of variance the Contractor shall immediately institute corrective action to eliminate the variance and to insure that all future work conforms to the requirements of the contract.

3.8.3.3 The quality controller shall have at least 5 years experience in the supervision and inspection of construction.

3.8.4 Prior to Work.

3.8.4.1 Before actual work begins, the quality controller must:

3.8.4.1.1 Read the specifications.

3.8.4.1.2 Understand the required tests and measurements.

3.8.4.1.3 Understand AF Form 1063, Quality Control Record, and reporting procedures. (See Section 4.)

3.8.4.1.4 Attend the pre-construction conference, if so required by Contracting Officer.

3.8.5 Quality Control Record: The quality controller shall complete AF Form 1063 daily. (See Section 4 of this specification).

3.8.6 Initial Inspection: (To be conducted after a representative sample of the work is complete).

3.8.6.1 Review each significant feature and segment of the work each day.

3.8.6.2 Deliver all materials to the site with packaging intact and with readable labels. Use those materials having labels that:

3.8.6.2.1 Identify the material.

3.8.6.2.2 Indicate conformance with the reference standard applicable to the material.

3.8.6.3 Do not expose materials to water (rain, snow and so forth) before, during, or after delivery to the site.

3.8.6.4 Completely cover materials with waterproof canvas tarpaulins to protect from weather and moisture. Arrange covers to prevent condensation from occurring beneath them; do not allow covers to extend onto the ground.

3.8.6.4.1 Conspicuously mark unprotected materials and permanently remove these materials from the site.

3.9 Walkway Pads: Install as per manufacturer's requirements.

SUBMITTAL FORM A-3

EPDM SYSTEM CERTIFICATION

The following statement is required from the EPDM Roofing System manufacturer who is defined as the roof membrane manufacturer who may or may not manufacture the other system components:

"LICENSED APPLICATOR"

This is to advise you that(Roofing Contractor)_____ _____is a licensed applicator of our roofing systems and is capable of obtaining our 10-year labor and materials warranty.

PROJECT DOCUMENT REVIEW:

We have reviewed the project documents (general provisions, drawings and specification) as they relate to the EPDM roofing membrane, flashings and insulation for (Project Title and Address)_____ and certify that the EPDM roofing systems listed below and described in the attached product literature are suitable for use with the roof system construction specified for this project as it relates to normal wear and tear of the elements. We further understand that change orders to this contract will be submitted for our review.

Roofing System Designation
Membrane/Insulation*

Standard: _____

10-year Type:_____

INSULATION COMPATIBILITY:

We further certify that the insulations as specified are compatible with our materials and would qualify for our best materials and labor warranty.

Submittal Form A-3 (Continued)

SIGNATURE:

EPDM Roofing System
Manufacturer Firm Name_____

Address _____

Authorized Representative's Signature _____

Authorized Representative's Name _____
(Print or Type)

Authorized Representative's Title _____

Date: _____

1 Atch:
EPDM Manufacturer Specification,
Description, and Recommendation

*List Manufacturer's name and product designation

SUBMITTAL FORM B-3

EPDM ROOFING SYSTEM

20-YEAR LABOR AND MATERIAL WARRANTY/GUARANTEE

WARRANTY COVERAGE:

This system is delivered subject to a full material and workmanship warranty/guarantee for 20 years that guarantees that the manufacturer will pay all costs necessary to maintain the built-up roofing membrane and flashing system in a watertight condition as a result of the following caused: deterioration from ordinary wear and tear of the elements; poor workmanship on the part of the Contractor; defects in materials; defects in the manufacturer's specifications; blisters, bare spots, fishmouths, wrinkles or ridges in the roofing; and splits in the roof membrane caused by movement of the roof insulation or any other underlying surface, or material used as a base over which the roof system is applied, excluding the deck. Specific conditions that will affect warranty/guarantee coverage and exclusions from coverage are not covered by this warranty/guarantee.

The specified roof system is our identified 20-year system design and the insulations specified are compatible with our materials. As the manufacturer of this system, we also accept responsibility for making repairs to the roofing system at no additional cost to the Government, to correct defects in, failure of, or improper application of, roof insulation used as a base over which the roof is applied, except the roof deck.

If the manufacturer fails to make required emergency and permanent repairs during the warranty/guarantee period, as stated after notice by telephone from the contracting office, the Government may have the work done by others and charge the cost to the manufacturer. The warranty provisions of this contract apply notwithstanding Government inspection and acceptance. Failure to perform the work resulting in the Government having the work performed will not void this warranty/guarantee.

TERMS, CONDITIONS, LIMITATION:

Emergency repairs shall be made within 48 hours of receipt of notice by telephone from the Contracting Officer and weather permitting, the manufacturer agrees to permanently repair the affected areas within 30 days by restoring them to a watertight condition, without cost to the Government. If it is determined that leaks were caused by either an exclusion from coverage or a specific condition listed below, the manufacturer will repair the defects and an equitable payment will be made by the Government.

Submittal Form B-3 (Continued)

EXCLUSIONS FROM COVERAGE:

1. Natural disasters, acts of God (lightning, hurricanes, tornadoes, sustained winds exceeding 72 mph as recorded at the nearest meteorological center, earthquakes, hail).

2. Acts of negligence or abuse and misuse by Government personnel, accidents, vandalism, civil disobedience, war, or damage caused by falling objects.

3. Damage by structural failure, settlement, movement, distortion, warpage, or displacement of structure.

4. Failure of material or flashing caused by movement, of metal work not supplied by manufacturer issuing warranty/guarantee.

5. Leaks caused by repairs or alterations of roof system or installation of structures, fixtures, or utilities on or through roof without prior written approval of manufacturer.

6. Storage of material on roof.

7. Moisture entering roof system through walls, copings, or any part of building structure except the roof, including from adjacent building.

8. Fire.

9. Faulty construction or design of building, including parapet walls, copings, chimneys, skylights, vents, or of roof deck but specifically excluding construction above the deck; i.e., insulation, base sheets, fasteners, adhesives, vapor retarders, and so forth.

10. Infiltration or condensation of moisture in or through underlying area; vapor condensation beneath the roof greater than the acceptable ambient moisture content for the given material as established by the appropriate American Society for Testing and Materials (ASTM) standard in effect at the time of installation.

11. Damage or leaks attributable to ponding water, defined as water in ponded areas that does not drain or evaporate within a 48-hour period.

12. Under no circumstances is the manufacturer responsible for damages to the building, its contents, or roof deck.

13. Membrane splits caused by structural movement.

Submittal Form B-3 (Continued)

SPECIFIC CONDITIONS THAT WILL AFFECT WARRANTY COVERAGE:

1. Failure to use reasonable care in maintenance; failure to follow manufacturer's written maintenance instructions.

2. Failure of owner to make repairs to leaks not covered by manufacturer's warranty/guarantee.

3. Repair work by any Contractor other than EPDM manufacturer approved Contractor or use of non-approved material.

4. Changes in building usage which may affect roof performance unless approved in writing by the EPDM manufacturer prior to such change.

DETERMINATION OF RESPONSIBILITY:

Receipt of notice by telephone or in writing from the Contracting Officer is evidence that the Contracting Officer has had the roof examined by a technically qualified representative of the Government and has determined based on this examination, that none of the above causes apply and the manufacturer is obligated to make the repairs.

Within 30 days of receipt of the above notice by the manufacturer that a roofing system defect covered by the warranty/guarantee has been discovered, the manufacturer, to avoid application of the warranty/guarantee, must notify the Contracting Officer in writing of the existence of an exclusion stated herein. Failure to provide such notice will preclude the manufacturer from later disputing the coverage of the warranty/guarantee.

The Government has the right to perform both visual and nondestructive evaluations of the roof system, at Government expense, any time during the warranty/guarantee period to validate watertightness of the roof system.

After the occurrence of an exclusion from coverage or a specific condition which renders the warranty/guarantee ineffective, the warranty/guarantee shall be allowed to continue as long as the Government returns the roofing system to its original condition and the manufacturer is allowed to inspect or oversee the condition is on the manufacturer.

The 20-year coverage period starts from the date the facility or roofing system is accepted by the Government from the Contractor.

Submittal Form B-3 (Continued)

BENEFICIARY:

It is understood by the manufacturer and Contractor that the warranty/guarantee provided herein shall be for the benefit of the United States Government.

BURDEN OF PROOF:

The manufacturer shall have the burden of proving by a preponderance of the evidence the existence of a condition which established an exclusion from coverage, or which would render the warranty/guarantee ineffective or null and void.

OTHER WARRANTIES:

The warranty contemplated herein shall be in addition to and not in lieu of any warranty/guarantee otherwise applicable to the work or materials used in the Contract.

SIGNATURE:

EPDM Manufacturer Firm Name _____

Address _____

Authorized Representative's Signature _____

Date _____

Authorized Representative Name _____
(Print or Type)

Title _____

Manufacturer's Warranty/Serial Number _____

for Building Number _____Located at _____

Warranty/Guarantee Expiration Date _____

1 Atch
EPDM Manufacturer Specification,
Description, and Recommendation

SUBMITTAL FORM C

APPOINTMENT OF QUALITY CONTROLLER

_____ (name) is appointed as Quality Controller on Project _____ with the authority to regulate the quality of the work so that it conforms to the Contract. The Quality Controller is authorized to order discontinuance of any operation causing nonconforming work.

The Quality Controller is experienced in the supervision and inspection of EPDM construction similar to that required in this Contract. The Quality Controller understands all requirements of these specifications.

Name of Firm _____

Address _____

Telephone _____

Authorized Representative's

Signature _____

Printed or Typed Name _____

Date _____

I acknowledge receipt of this letter.

Quality Controller's Signature _____

Printed or Typed Name _____

Date _____

SUBMITTAL FORM D

AS-BUILT ROOF SYSTEM SUMMARY

After completion of roofing, accurately fill in the information required on this sheet for each building. If more than one system applies to the same building, complete one sheet for each system. Submit six copies of each sheet before final acceptance.

Bldg No. _____ Project No. _____

Total project area in square feet _____

Total project cost _____

Building area where this system is installed _____

Deck type _____ Deck slope _____

Underlayment components (type and number) _____

Underlayment attachment _____

Insulation:

Type _____ Manufacturer _____

First layer:
Thickness _____

Attachment _____

Second layer:
Thickness _____

Attachment _____

Membrane:
Manufacturer _____

Manufacturer System Designation _____

Submittal Form D (Continued)

Roof Completion Date _____

Roofing Contractor (Name, address and phone) _____

_____

END OF SECTION

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION 07565

RUBBER ROOF COATING

1. GENERAL:

1.1 DESCRIPTION OF WORK:

1.1.1 Furnish the administration, facilities, materials, labor, equipment, and quality control necessary to integrate the work into the total building system.

1.2 STORAGE OF MATERIALS:

1.2.1 Store materials in original containers and as recommended by the manufacturer.

1.3 SUBMITTALS:

1.3.1 Product Data

1.3.2 MSDS: Submit “Material Safety Data Sheet” (MSDS) for all new roofing materials that will be utilized in project.

1.3.3 Installation Instructions

1.3.4 Warranty

2. PRODUCTS:

2.1 COATING: RC-2000 Rubber Roof Coating or approved equal.

2.1.1 Resin: Synthetic Rubber.

2.1.2 Color: Aluminum.

2.1.3 Dry Mil Thickness: 4 to 5 Mils.

2.1.4 Weight: 8.2 lbs/gal.

2.2 SEAM COMPOUND: RC-2200 Rubber Seam Compound or approved equal.

2.2.1 Resin: Synthetic Rubber.

2.2.2 Color¨ White.

2.2.3 Weight: 8.97 lbs/gal.

3. EXECUTION: Prepare existing metal surfaces for application as recommended by manufacturer.

END OF SECTION

DIVISION 10 - SPECIALITIES

SECTION 10420

SIGNAGE

1. GENERAL:

1.1 WORK INCLUDED:

1.1.1 Roof Warranty Sign.

1.2 SUBMITTALS:

1.2.1 Manufacturer's Data: Submit manufacturer's descriptive literature and specifications, including color samples of material for selection, as applicabale for approval.

1.2.2 Submit shop drawings listing sign style, lettering and overall dimensions of each sign.

1.2.3 Submit sample sign pieces of type, style, and color specified, including method of attachment.

2. PRODUCTS:

2.1 SIGN: Shall be 12" x 10" x 1/4" thick solid aluminum plate, 6061, (see 'sign attachment' at back of this specification section) with 1" rounded corners as manufactured by Bacon Signs, Inc., or approved equal.

2.1.1 Paint Finish: Paint finished aluminum plate a primer coat and a finish coat with an acrylic polyurethane paint on front and all edges.

2.1.1.1 Color shall match existing metal fascia color.

2.1.2 Lettering:

2.1.2.1 First three rows of wording shall be 3/4" high engraved 'Helvetica Bold' letters. Letters shall be routed into plate minimum 1/8" deep.

2.1.2.2 Remaining rows of wording shall by 1/2" high engraved 'Helvetica' letter. Letters shall be routed into plate minimum 1/8" deep.

2.1.2.3 Drill 4 holes at outside corners and bevel countersink for a flush flat head fastener.

2.1.3 After aluminum plate is cut, painted and engraved, apply a clear coat to front and all edges.

2.1.4 Fasteners: All fasteners shall be stainless steel.

2.1.4.1 Expansion Bolts: Minimum 3/16″ diameter x 2″ with metal expansion sleeve.

2.1.4.2 Pop Rivet: Minimum 1/8″ diameter.

3. EXECUTION:

3.1 EXAMINATION:

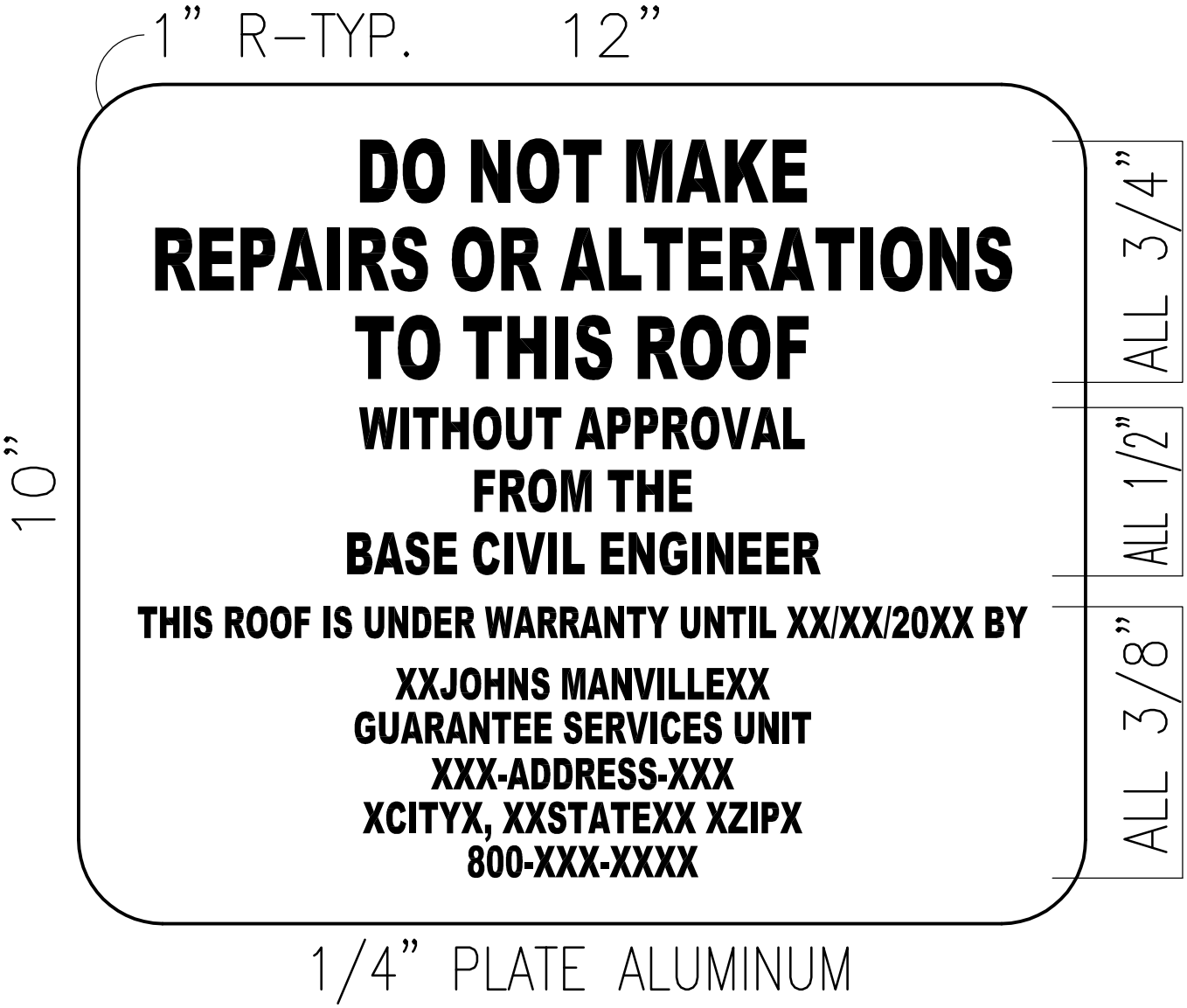
3.1.1 Verify mounting location with contracting officer.

3.1.2 Inspect surfaces to receive sign. Notify the Contracting Officer in writing if surfaces are not acceptable. Do not begin installation until unacceptable conditions have been corrected.

3.2 INSTALLATION:

3.2.1 Install signs securely in accordance with manufacturer's written instructions.

END OF SECTION



1/4" PLATE ALUMINUM

ROOF WARRANTY SIGN

SCALE: 6" = 1'-0"

DIVISION 15 - MECHANICAL

SECTION 15400

PLUMBING

1. GENERAL:

1.1 SCOPE: This Section shall include roof drains, waste and vent piping, and all fixtures, fittings, roof insulation and accessories. Contractor shall furnish all plant, labor, materials, and equipment to replace roof drains.

1.2 PROTECTION TO FIXTURES, MATERIALS, AND EQUIPMENT: Pipe openings shall be closed with caps or plugs during installation. Fixtures and equipment shall be tightly covered and protected against dirt, water, and chemical or mechanical injury. Upon completion of all work, the fixtures, materials, and equipment shall be thoroughly cleaned, adjusted, and operated.

1.3 STANDARD PRODUCTS: Material and equipment shall be the standard products of a manufacturer regularly engaged in their manufacturer. Threaded joints shall have American National taper pipe threads conforming to Federal Standard H28 with graphite or inert filler and oil, with an approved graphite compound, or with polytetrafluoroethylene tape.

1.4 SUBMITTALS: In accordance with Sections 01300, the Contractor shall submit for approval product data, to illustrate the requirements and operation of the system for the following:

1.4.1 Pipe and Pipe Fittings

1.4.2 Roof Drains

1.4.3 Roof Insulation

2. PRODUCTS:

2.1 MATERIALS: Material shall be suitable for the pressures and temperatures encountered. Pipe, and fittings shall conform to the respective publications and other requirements specified below.

2.2 DRAIN PIPING AND FITTINGS: Pipe and fittings shall match existing.

2.3 ROOF DRAINS AND EXPANSION JOINTS: Roof drains shall conform to ANSI A112.21.2 and the Uniform Plumbing Code. Roof drains shall be galvanized heavy pattern cast iron with dome and integral flange, and shall have a device

for making a water-tight connection between roofing and flashing. Mushroom dome shall be cast iron or aluminum. For aggregate surface roofing, the drain shall be provided with a flashing ring and a gravel stop. On roofs other than concrete construction, roof drains shall be complete with underdeck clamp, sump receiver, and an extension for the insulation thickness where applicable. A clamping device for attaching flashing or waterproofing membrane to the seepage pan without damaging the flashing or membrane shall be provided when required to match the building construction. Strainer openings shall have a combined area equal to twice that of the drain outlet. The outlet shall be equipped to make a proper connection to threaded pipe of the same size as the drain pipe. An expansion joint of proper size to receive the conductor pipe shall be provided. The expansion joint shall consist of a heavy cast-iron housing, brass or bronze sleeve, brass or bronze fastening bolts and nuts, and gaskets or packing. The sleeve shall have a nominal thickness of not less than 0.134 inch. Gaskets and packing shall be of durable material. Packing shall be held in place by a packing gland secured with bolts. Roof drains shall match existing or shall be Wade 3000 series or approved equal.

2.4 ROOF INSULATION: Roof insulation shall match existing.

2.5 PIPE HANGERS, INSERTS, AND SUPPORTS: Pipe hangers, inserts, and supports shall conform to MSS SP-58 and SP-69, except as specified below. Inserts shall be Type 18. Hangers shall be Type 1, 9, 10, or 11, and shall be adjustable or provided with turnbuckles, Type 13 or 15. Type 6 hangers may be used to support pipes from toilet rooms to main stacks when space does not permit the use of turnbuckles or adjustable clevis type hangers. Light duty clevis hangers shall conform to NFPA No. 13. Brackets for support of piping at walls shall be Type 31, 32, 33, or 34. Metallic pipes supported on beams or brackets shall be provided with a graphite or polytetrafloureothylene (PTFE) slide plate and cradle having a minimum thickness of 1/2 inch. Beam clamps shall be Type 20, 21, 22, 23, 28, or 29. A retainer shall be provided with Type 23. Angle iron or channel clamps shall be Type 20 with a malleable iron heel plate added.

3. EXECUTION:

3.1 GENERAL INSTALLATION REQUIREMENTS: Installation shall be as required by the Uniform Plumbing Code and as specified herein. The roof drains and roof insulation shall be installed complete with pipe, fittings, and accessories. In accordance with the Safe Drinking Water Act, the use of pipe, solder, or flux containing lead is prohibited for installation or repair or any public water supply system including plumbing facilities and buildings connected to the system. Pipe fittings may not contain more than 8.0 percent lead. This restriction does not apply where leaded joints are necessary for repair of cast iron.

3.1.1 Pipe, Fittings, and Connections:

3.1.1.1 Cutting and Repairing: Piping shall be cut and prepared as required. The work shall be carefully laid out in advance, and unnecessary cutting of construction shall be avoided. Damage to building, piping, wiring, or equipment as a result of cutting shall be repaired by mechanics skilled in the trade involved.

3.1.1.2 Protection to Fixtures, Materials, and Equipment: Pipe openings shall be closed with caps or plugs. Fixtures and equipment shall be tightly covered and protected against dirt, water, chemicals, and mechanical injury. Upon completion of the work, the fixtures, materials, and equipment shall be thoroughly cleaned, adjusted, and operated.

3.1.2 Joints: Joints shall match existing. Installation of pipe and fittings shall be made in accordance with the manufacturer's recommendations. Threaded joints shall have American Standard taper pipe threads conforming to ANSI B2.1. Only male pipe threads shall be coated with graphite or with an approved graphite compound, or with an inert filler and oil, or shall have a polytetrafluoroethylene tape applied. Mechanical couplings may be used in conjunction with grooved drain pipe. The gasket shall be molded rubber conforming to ASTM D 2000. Coupling nuts and bolts shall be steel conforming to ASTM A 183. Fittings and coupling housing for grooved pipe shall be malleable iron conforming to ASTM A 47, Grade 35510, or ductile iron conforming to ASTM A 536, Grade 65-45-12. Mechanical couplings and fittings shall be of the same manufacturer. Unions and flanges shall not be concealed in walls, ceiling, or partitions. Unions shall be used in pipe sizes 2-1/2 inches and smaller; flanges shall be used on pipe sizes 3 inches and larger.

3.1.2.1 Cast Iron Soil Pipe: Joints in cast iron soil pipe and fittings using a double-seal, compression-type molded neoprene gasket shall be provided with a modified hub as required to provide a positive seal.

3.1.2.2 Copper Tube: Joints for copper tubing shall be made with solder-type fittings. Tube shall be cut square with burrs removed. Outside surface of the tube where engaged in the fitting, and inside surface of the fitting in contact with the tube, shall be cleaned with an abrasive material before soldering. Care shall be taken to prevent annealing of tube and fittings when making connections. Solder joints shall be made with flux and wire form or paste-type solder. Core solder shall not be used. Joints in copper tube 2-1/2 inches and larger shall be made with heat applied uniformly around the entire circumference of the tube and fittings by a multi-flame torch.

3.1.2.3 Plastic Pipe: Acrylonitrile-Butadiene-Styrene (ABS) pipe shall have joints made with solvent cement. PVC and CPVC pipe shall have joints made with solvent cement elastomeric, threading, (threading of Schedule

80 Pipe is allowed only where required for disconnection and inspection; threading of Schedule 40 Pipe is not allowed), or mated flanged.

3.1.3 Pipe Hangers, Inserts, and Supports: Pipe hangers, inserts, and supports shall be furnished and installed in their proper and permanent location. Inserts shall be installed in correct locations before the concrete is poured. For wood construction, joists shall be bridged where necessary, using lag screws of the same diameter as hanger rods for hanger fasteners. For piping and tubing up to and including 1-1/4-inch nominal size, 3/4-inch wide, 18-gage (minimum) steel strap-type, ring-type, or molded thermoplastic hangers may be used and shall be secured by screw fasteners. Pipe supports for insulated pipe shall have a diameter large enough to include the insulation. Horizontal pipe hangers and supports and support spacing for horizontal piping shall be in accordance with MSS SP-69. Hangers and supports shall be installed at locations not more than 3 feet from the ends of each runout and not over 1 foot from each change in direction of piping. Metal-banded felt isolation support shall be provided for bare piping.

4. TESTS, FLUSHING, AND STERILIZATION:

4.1 TESTING OF PLUMBING SYSTEMS: Parts of existing systems which have been altered, extended, or repaired shall be tested in accordance with the Uniform Plumbing Code to disclose leaks and defects. All equipment, material, and labor required for testing a plumbing system or part thereof shall be furnished by the Contractor responsible for installing the work.

4.2 DEFECTIVE WORK: If inspection or test shows defects, such defective work or material shall be replaced or repaired as necessary and inspection and tests shall be repeated. Repairs to roof drain or drain piping shall be made with new materials. No calking of screwed joints or holes will be acceptable.

4.3 DRAIN SYSTEM TEST: Drain piping shall be tested and proved tight by normal working pressure and inspected for leaks. Any leaks in piping shall be located and repaired.

END OF SECTION