

SECTION 07 57 13
SPRAY POLYURETHANE FOAM ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. All requirements for the installation of Spray Polyurethane Foam Roofing

1.02 RELATED REQUIREMENTS

- A. The Contractor for this work is referred to the "Contract Terms and Conditions", "Form of Proposal", "Contract Drawings", and all "Amendments and Addenda" thereto, if any, all of which are hereby made part of the Contract Documents

1.03 GENERAL

- A. Prior to submission of bid, visit the work site to verify the existing conditions, dimensions and quantities as set forth in the Contract Documents. The bidders may gain access to the work area for inspection purposes by visiting the Office of the Development Superintendent. The contract drawings may rely on existing building and site blueprints for their dimensions and the depiction of existing conditions. It is the Contractor's responsibility to take field measurements and verify all dimensions and field conditions. The Contractor's Base Bid, as accepted by NYCHA, includes the total cost of all the work required by the Contract Documents. There will be no adjustments of the contract price due to field measurements and conditions differing from those shown on the Contract Drawings.
- B. The roofing replacement requires A MINIMUM COMPLETE MANUFACTURER'S NO DOLLAR LIMIT 20 YEAR GUARANTEE ON INSTALLATION AND MATERIALS. At the beginning of the Contract and prior to beginning work on the roofing replacement, the Contractor as a certified Manufacturer's installer is to register with the manufacturer for a 20 year guarantee and provide a copy of that registration at the pre-construction meeting and prior to start of work. The final guarantee must be provided to the Authority prior to the close out of the Contract. The ND 20 year guarantee must extend for the full 20 years. All materials, components and installations must be acceptable to and not void the roofing Manufacturer's 20 year N.D.L. GUARANTEE ON INSTALLATION and MATERIALS
- C. The work to be performed under this specification shall include but is not limited to the following: Attend necessary job meetings and furnish competent and full time supervision, experienced roofing and spray foam mechanics, all materials, tools, and equipment necessary to complete, in an acceptable manner, the roof installation in accordance with this specification. Comply with the latest written application instructions of the manufacturer of the primary roofing products. In addition, application practice shall comply with requirements and recommendations contained in the latest edition of the Handbook of Accepted Roofing Knowledge (HARK) as published by the National Roofing Contractors Association.
- D. Local Regulations: Conform to regulations of public agencies, including any specific requirements of the city and/or state of jurisdiction.
- E. Manufacturer Requirements: The primary roofing materials manufacturer shall provide direct trained company personnel to attend necessary job meetings, perform periodic inspections as necessary, and conduct a final inspection upon successful completion of the project.
- F. Recommended Maintenance: In addition to the guarantee, furnish to the Owner the manufacturer's printed recommendations for proper maintenance of the specified roof system including inspection frequencies, penetration addition policies, temporary repairs, and leak call procedures.
- G. Manufactures Code Requirement of uplift for Roofing System and Components:
- H. Roofing manufactures have FM-90 tests for wind uplift on all of their roofing assemblies. The NYC code standard requires a minimum uplift resistance of 30lbs per sq. ft., anywhere on a roof. But the code also requires, an industry & Code standard wind uplift analysis using criteria such as building type, height, wind zone, to calculate the actual wind uplift on each building's

roofing. Based on that calculation for each building the required resistance to uplift can exceed the minimum required 30lbs per sq. ft. resistance. Therefore the roofing manufacturer providing the roofing materials, guarantee and certifying the installer must provide as part of their submissions of the roofing system:

1. A certification letter with analysis, for each building, that their proposed FM-90 tested roofing assembly will resist the minimum calculated uplift resistance for each building.
- I. Manufactures of roofing components like fascia, fascia sumps and coping as well as those components' installation must conform to minimum FM-I-90 and or ANSI/SPRI ES-1 wind uplift testing. Those components depending on building height, zone and type, are required to meet at a minimum 110mph wind uplift resistance. The Contractor must provide the component manufacture a scaled shop drawing of each fascia edge with building height, address and the components configuration, showing fasteners and substrate anchoring (blocking/concrete slab etc.) in order to be certified ES-1 testing. The manufacturer may have already tested a particular configuration or they may have to provide a new test and certification. Once that ES-1 test and certification is complete for each configuration, the Contractor, as part of required submissions, must send the finalized shop drawing with the Manufacture's certification of passing the minimum 110 mph ES-1 testing.

1.04 SCOPE OF WORK

- A. This work shall consist of replacing the existing roofing and performing related work as shown on the drawings and described herein with Spray Polyurethane Foam on: Wood Roof Decks, Metal Decks, Concrete bulkhead Roofs, Balcony Canopy Slabs, Community Center Canopy and Residential Entry Canopies
- B. SLOPED FOAM INSULATION SHOP DRAWING:
- C. Provide a survey. The Contractor shall have Licensed Surveyor perform a survey of roof elevations/slopes, door saddle heights, heights of weep holes curbs, parapets and railing above the roof deck. Any penetrations of the roofing while the survey is being conducted must be immediately patched with granulated SBS sheet and compatible modified flashing cement.
- D. Provide a sloped foam shop drawing: The Contractor shall then send that Survey on a scaled roof plan to the Roofing Manufacturer providing the 20 Year Guarantee and coordinate with the Roofing Manufacturer's designer to obtain a sloped insulation drawing. The Contractor shall then incorporate the Manufacturers insulation drawing into a Shop Drawing. Additional details must accompany this sloped foam shop drawing. To coordinate overall design see details on drawings A-501.00 to A-506.00 and provide any other details to complete the design. This Shop Drawing must be submitted to and approved by NYCHA and the Roofing Manufacturer prior to commencement of work.
 1. The wood decks of the apartment building's main roofs are already pitched towards the drains and have insulated spaces below. Therefore they will only require the minimum thickness of spray foam with no slope to the foam to attain drainage.
 - a. The Apartment Buildings' Bulkhead as well as the Community Center are un-insulated concrete slab/ metal deck with filler and require design of the foam to slope 1/8" per foot and to obtain a minimum average R 25 under the NYS Energy Code and HUDCF24 R.
 - b. The Apartment Buildings' top floor canopies over 6th floor balconies as well as the Community Center canopy and Residential Entry canopies are concrete slabs and only require a sloped foam design utilizing the minimum foam thickness.

NOTE:

1. There is a NYC code and NYCHA required minimum from the top of railing or parapet to top of newly finished roofing. See roofing details for more information
2. The Silicone topping for the foam and granules must be white.
- E. All ROOF (including canopies) AND BALCONY AREA DRAINS:
 1. Prior to commencement of work, the Contractor, Development Superintendent and Contract Inspector shall conduct a joint survey to determine which (if any) of the drain lines are blocked.

2. Attach to the minutes of the survey meeting, three copies of a form listing the condition of each drain line and signed by the Development Superintendent & Contractor.
 3. Contractor shall provide all tools, equipment, and manpower required to evaluate and shall clean out or replace (entire or portion of) every blocked drain and drain line (leader).
 4. No roofing or balcony work shall commence until the Contractor and Development Superintendent certify in writing to NYCHA Brooklyn Staten Island Program Unit that all roof or balcony drain lines are in working order and free of blockages. Any subsequent blockages encountered shall be the responsibility of the Contractor and will be treated as a punch list item.
 5. Clean debris and all foreign matter from the drain bodies.
 6. Provide wood protection plugs in roof drains during roofing work. Remove them at the end of each work day and once work is completed.
 7. Provide new retrofit roof drains at concrete canopy slabs (except at residential entry canopies) and replacement roof drains at metal and wood decks.
 8. Balcony and residential entry canopy area drain covers shall be removed and replaced with like-kind drain covers. Locate new drain cover screws at existing screw holes in existing drain body.
 9. If located in cellar or crawl space replace all existing roof leaders and drain traps.
- F. COORDINATION WITH ASBESTOS REMOVAL AND TEMPORARY WATERPROOFING
1. As asbestos abatement and parapet removal is completed provide temporary re-flashing or waterproofing/protection at abated and removal areas to protect the roof, roof edge and building from water infiltration until new railing is installed and re-roofing begins. See Drawings S-502 and A-101 and A-102 for more information.
 - a. Note: Some materials are asbestos contaminated and require Asbestos Abatement by an abatement contractor following abatement protocols. See asbestos abatement specification Section 02 82 13.
 - b. Removal of mastic waterproofing and base flashing may require areas of underlying masonry work repair.
 - c. Where directed by NYCHA field representative rake and re-point defective mortar joints in uncovered parapet and bulkhead walls.
 - d. Where directed by NYCHA field representative replace or repoint damaged brick in uncovered parapet and bulkhead walls.
- G. WORK TO BE COMPLETED IN CHRONOLOGICAL ORDER PRIOR TO START OF ROOFING REPLACEMENT:
1. All asbestos abatement/encapsulating and temporary waterproofing
 2. Masonry/Brickwork repairs, new concrete curb with new railings must be completed prior to starting roofing work.
 3. Parapet replacement with new perimeter railing
 4. All temporary waterproofing
 5. All brickwork above
- H. ROOFING REMOVAL AND REPLACEMENT
1. GENERAL: Remove where it exists, existing built-up roofing membrane, roofing insulation, cant strips, water stopping, vapor barrier base and metal cap flashing, flashing/gravel stops, fascia and roofing cement down to the existing wood roof deck and metal deck w/ filler (Community center), regardless of the number of plies and insulation (where present).
 2. PREPARATION OF DECK As removal proceeds and Prior to re-roofing depending on the existing substrate the contractor shall do the following:
 - a. Wood Roof Deck Sheathing and Joists:
 - 1) Replace roof sheathing and damaged joists are to be repaired or replaced. See Division 06, Section 06 16 00.
 - 2) Provide temporary granulated base sheet with seams and vertical/ horizontal edges sealed only. The temporary SBS base sheet is not to be adhered to the wood deck.

- 3) Remove all temporary roofing protection prior to re-roofing on all buildings.
3. Preparation of concrete decks at apartment building bulkhead roofs, top floor canopies over balconies, Community Center main roof including canopy, and Residential Entry canopies:
 - a. Fill depressions and patch cracks on slabs and slab edges.
4. Metal deck at Community Center: Mechanically fasten 1/2" overlay board to receive new foam roofing as portions of existing roofing are removed.
 - a. Provide blocking and nailers and accessories to complete the new roofing installation.
 - b. For wood deck, provide nails and fastened SBS adhered base sheet to deck prior to spray foam application.
 - c. Provide new stainless steel fascia/gravel stops, cap flashing, sumps and scuppers with downspouts and splash block on new walkway pad as shown on contract drawing. All items must be compatible with roofing manufacturer's 20 NDY year guarantee.
 - d. Provide new bulkhead door saddle.
 - e. Provide new walkway pad at bulkhead doors.
5. SPRAY FOAM ROOFING:
 - a. Prepare and prime substrate roofs, metal, concrete and other materials with manufacturer's designated primers prior to applying spray foam.
 - b. For wood deck, provide nails and fastened SBS adhered base sheet to deck prior to spray foam application.
 - c. Provide Silicone Coating and Granule Application.

1.05 ENVIRONMENTAL REQUIREMENTS

- A. The following minimum weather condition must be present at the beginning of the application:
 1. The Polyurethane Foam applications shall not proceed during periods of inclement weather.
 2. Do not apply the Polyurethane foam when substrate or ambient air temperatures are below 50 degrees F. unless specifically approved in writing by the polyurethane foam manufacturer and following their cold weather guidelines.
 3. Do not apply protective Coatings when temperatures are below 40 degrees F. or surface moisture / visible dampness present on the surface to be coated.
 4. Prior to applying the coatings, check the polyurethane foam to insure that the surface is dry. Apply protective coatings in accordance with the coatings manufacturer's application instruction.
 5. Wind barriers should be used if wind conditions could affect the quality of the polyurethane foam or protective coating installation. Under no circumstances shall the polyurethane foam be applied when wind speeds exceed 15 miles per hour.

1.06 PHASING WORK AND SCHEDULING / COORDINATION OF ROOFING REMOVAL AND REPLACEMENT TO PROTECT THE ROOF:

- A. Coordination With Asbestos Removal: See above – 1.-02 D: Coordination with Asbestos Removal and Temporary Waterproofing as well as Drawings A-101, A-102, A-103 and S-502.
- B. Coordination with General Roofing Removal
 1. The Contractor shall provide protection of all areas exposed to water infiltration where roofing removal takes place.
 - a. FOR WOOD DECKS (Apartment Building Main Roof)
 - 1) For initial waterproofing provide Granulated SBS base sheet set in roofing adhesive and utilizing roofing cement at penetrations.
 - 2) Prior to applying foam, mechanically fasten base sheet to wood deck in manufacturer's suggested pattern as permanent base sheet. The manufacturer's approved spray foam roofing contractor to be responsible for fastening the fully adhered SBS base sheet.

- 3) The foam roofing contractor shall be responsible for the securement of the SBS sheet.
- b. FOR METAL DECK (Community Center Roof)
 - 1) Provide 1/2" thick overlay board fastened to the Metal deck plus temporary Granulated Torch down SBS protection at Perimeter where parapet is being removed and at junction of Community Center roof and High rise building wall. Utilize roofing cement at penetrations and horizontal seams.
 - 2) Only torch the seams of the SBS sheets to permit removal as foam application proceeds.
 - 3) As general removal and re-roofing proceeds only remove as much temporary and existing roofing as can have 1/2" thick overlay board fastened to the metal deck and spray foam applied over top. Lap foam onto remaining roofing 12" until entire roof has been replaced with spray foam
- c. FOR CONCRETE BULKHEAD DECKS AT MAIN ROOFS: Remove existing roofing, provide temporary Torch down granulated SBS with seams and edges adhered and SBS sheet bent over roof slab and nailed and cinched/secured around perimeter with rope. Remove this temporary waterproofing and prime deck prior to applying spray foam.
- C. FOR CONCRETE CANOPIES and BALCONY ROOFS (at top Floor of Apartment Building): remove roofing - no temporary protection is required except to flash the junction between slab and building wall. All temporary roofing protection to be removed

1.07 REQUIREMENTS PRIOR TO START OF JOB

- A. Notification: Give a minimum of five (5) days notice to the owner and manufacturer prior to commencing any work and notify both parties on a daily basis of any change in work schedule.
- B. Permits: Obtain all permits required by local agencies and pay all fees which may be required for the performance of the work.
- C. Safety: Familiarize every member of the application crew with all fire and safety regulations recommended by OSHA, NRCA and other industry or local governmental groups.

1.08 SUBMITTALS

- A. The Contractor shall provide manufacturer's information for all products listed herein, shop drawings for all fabricated components and assemblies, samples for all materials used, and guarantees/warranties as described in Division 01 General, Section 01 33 00.
- B. No work shall begin, or any materials be ordered, until receipt of written approval from the Authority on all requested materials, items, Submissions or Shop Drawings. Final approved copies of all Shop Drawings must be completed without added corrections, in pencil or ink.
- C. In Field Mock-Ups of standard installations:
 1. Pipe Penetration (vent stack)
 2. Conduit Penetration
 3. Mechanical Penetration (curb)
 4. Bulk Head Flashing
 5. Roof Drain Flashing
 6. Gravel Stop/ Fascia
 7. Fire Escape (basket and metal fascia)
 8. AC Unit Flashing at window/ low roof

1.09 QUALITY ASSURANCE

- A. All work to be performed in accordance with the material manufacturers' published specifications. Designer is to be advised of any discrepancies prior to commencement of work.
- B. A manufacturer's representative field technician needs to be on site at the start of the foam application, and at all phases which include a minimum of three in progress inspections and final inspection.

- C. Submit documentation that the roofing membranes comply with the appropriate ASTM standard for the specific material type.
- D. Materials used in this section, including primers are fully compatible.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver all roofing materials to the site in original containers or unopened package, with factory seals intact.
- B. Containers shall be stored out of the weather and direct sunshine where the temperatures are within the limits specified by the manufacturer.
- C. All materials shall be stored in compliance with local fire and safety requirement.

1.11 FIELD CONDITIONS

- A. Weather
 - 1. Proceed with roofing only when existing and forecasted weather conditions permit.
 - 2. Follow the Polyurethane Foam manufacturer's specifications for minimum and maximum ambient, material and substrate temperatures.
 - 3. Do not apply coating unless temperatures fall within the manufacturer's published range.

1.12 WARRANTY

- A. The Roofing membrane manufacturer, based on the system described within this specification, shall furnish the following warranty for this project: 20 -Year Material and Workmanship Warranty (No Dollar Limit-NDL)
- B. The roofing manufacturer warrants the roofing system shall remain free from workmanship defects and that the roofing membrane shall remain free from any manufacturing defects which would affect the watertight integrity of the roof system for a period of 20 years (from date of completed installation). Scope of warranty shall be limited to cost of materials and labor to restore the roof to watertight condition. Installing contractor must be approved by the manufacturer of the roofing system for installation of its 20 year NDL roof systems and all aspects of manufacturer's requirements for NDL warranties with respect to said project must be complied with, as outlined in manufacturer's published guidelines
- C. Contractor hereby warrants that roofing system will be installed in a workmanlike manner in accordance with manufacturer specifications and industry standards, and will remain in a watertight condition and leak proof.

1.13 DECK / SLAB REQUIREMENTS

- A. Weight limits on Roof Slab Do not overload any portion of the building either by use of or placement of equipment, storage of debris or storage of materials.
- B. The roof deck/slab must be sound, smooth, dry, and free from deformation.
- C. All roof deck/slab surfaces must be free of loose material, grease, soft asphalt, and other materials that could interfere with foam adhesion.
- D. The roof deck/slab must be suitable for the type of roofing system selected and must meet all the deck requirements.

1.14 PRE-INSTALLATION CONFERENCE

- A. Prior to scheduled commencement of the roofing installation and associated work, conduct a meeting at the project site with the installer, NYCHA field representative, the roofing Manufacturer's technical representative and any other persons directly involved with the performance of the work. The installer shall record conference discussions to include decisions and agreements reached (or disagreements), and furnish copies of recorded discussions to each attending party. The main purpose of this meeting is to review foreseeable methods and procedures related to roofing work.

1.15 REGULATORY REQUIREMENTS

- A. All work shall be performed in a safe, professional manner, conforming to all federal, state and local codes.
- B. Exterior Fire Test Exposure: Provide a roofing system that will achieve a rating for roof slopes indicated.
- C. UL Class A
- D. Windstorm Classification: Provide a roofing system which will achieve a wind uplift rating, as listed in the current FM Approval Guide. Of FM-I-90
- E. Conform to applicable New York Building code for roof assembly fire hazard.

PART 2 PRODUCTS

2.01 GENERAL

- A. No asbestos-containing materials shall be permitted for any use, as either a temporary or permanent part of construction.
- B. Provide materials recognized to be of generic type indicated and tested to show compliance with the physical properties, and /or performances specified herein.
- C. Materials shall be compatible in every way with all other components of the roofing system. Substitutions will not be permitted after approved descriptive data and/or shop drawings have been acted upon and distributed.
- D. Sprayed Polyurethane Foam is not recommended for lightweight or insulating concretes unless tests have been made to determine that adequate adhesion can be obtained or unless a fastener over layment is installed.

2.02 ROOFING & FLASHING FOR AREAS WHERE ROOFING MATERIALS HAVE BEEN ABATED OR REMOVED

- A. Metal deck at Community Center: Temporary Torch Down to 1/2" thick Overlay Board, Mechanically Fastened to Metal Deck.
 - 1. Underlying 1 ply torch down SBS / water stopping (Styrene-Butadiene-Styrene) waterproofing membrane shall meet ASTM D6163 Type I, Grade S.
 - 2. Poly Iso insulation with 1/2" overlay board on top (for torch down protection) all adhered with compatible roofing adhesive.
 - 3. Top (Cap) Torch down SBS temporary and final/ permanent waterproofing - white granulated (Styrene-Butadiene-Styrene) waterproofing membrane shall meet ASTM D6163 Type I, Grade G.
 - 4. Primer: Manufacturer's recommended Torch down primer.
- B. WOOD DECK: Remove temporary waterproofing prior to foam application
 - 1. Base Sheet:
 - a. Plies of Granulated Reinforced SBS modified granulated surfaced sheet incorporating a flexible fiber glass/polyester composite mat, ASTM D6221-G.
 - b. Base sheet adhesive: Adhere base sheet with manufacturer's compatible roofing adhesive.
- C. CONCRETE BULKHEAD ROOF DECKS (Apartment Buildings): Temporary primed and Torch Down directly to Concrete deck
 - 1. Top (Cap) Torch down SBS temporary and final/permanent waterproofing - white granulated (Styrene-Butadiene-Styrene) waterproofing membrane shall meet ASTM D6163 Type I, Grade G.
 - 2. Primer: Manufacturer's recommended Torch down primer.
- D. BASE SHEET FASTENERS ON WOOD DECK JUST PRIOR TO FOAM APPLICATION: Stainless steel 1 1/4" long, spiral large head roofing nails

2.03 CONCRETE DECK PATCHING COMPOUND

- A. Quick setting Polymer modified cementitious compound such as thoro HB2 repair mortar by ThoRoc, Degussa Building System, Emaco R320 by Master Builder, or approved equal shall be used to patch the concrete slab.

2.04 SHEATHING

- A. Pressure treated with non-arsenic preservative, fire retardant, manufactured with exterior glue, grade C-C exterior and APA stamped and rated for roof sheathing. Thickness of minimum 3/4 inch and match thickness to existing sheathing and to suit existing spacing between existing joists for the required design load. In addition see Division 06, Section 06 16 00.

2.05 BRICKS

- A. Shall match the existing sound brick in size, shapes, texture, color and strength & durability with adjoining bricks. The face brick shall be type FBS, Grade S.W. and shall comply with ASTM C216 the inside wythe brick shall comply with ASTM C62. Brick shall be sound whole, clean new clay or shale brick. No under-burnt or over-burnt bricks will be permitted. Also, see Division 04, Section 04 20 00.

2.06 MORTAR

- A. For Masonry Joint Repairs: Shall be Type N Mortar as per ASTM C-270 consisting of a stiff mixture of one (1) part Portland Cement (ASTM C-150 Type 1), one (1) part lime putty (ASTM C-5) and five (5) parts clean white sand (ASTM C-144). Compressive strength of the mortar shall be 750 psi at 28 days. Color of mortar shall match the existing mortar. No admixtures shall be permitted. Mortar shall be accurately proportioned and machine mixed. The Authority has the option to test the mortar at its own expense. Mortar samples will be taken at regular intervals, and tested for compressive strength. If the mortar is sub-standard, remove the masonry built with the sub-standard mortar and replace the same with the new mortar. Do not use re-tempered mortar.

2.07 DOOR AND FRAME: SEE DIVISION 08, SECTION 08 11 13.

2.08 BULKHEAD DOOR SADDLE

- A. New saddle shall be break-formed to match the existing saddles and shall be made of 1/4" thick checkered plate steel (galvanized after fabrication). The steel shall conform to ASTM A36 and galvanizing to ASTM A123.
- B. Existing saddles shall be carefully cut with an acetylene torch at the junction with the door jambs at both ends.
- C. New saddle shall be welded to the metal frames at both ends with a continuous fillet weld for the full length of the joint. The weld shall be ground as required to allow for proper closure of the doors.
- D. After the welding, the welded areas shall be touch-up with galvanizing paint (Galvicon or equal as approved by the Authority).

2.09 WOOD BLOCKING

- A. Wood nailers if required shall be pressure treated with water borne Copper preservatives. New wood blocking shall match the thickness of the existing. Fasteners for use in copper preserved wood shall be stainless steel to prevent galvanic action and premature corrosion. In addition see division 06, Section 06 16 00.

2.10 SHEET METAL

- A. The fascia and cap flashing system should have their own guarantee but must be compatible with and covered by the roofing manufacturer's 20 year guaranteed roofing system. Proof of the guarantees must be provided as part of the shop drawing submission (see below). The Fascia, sump, coping and cap flashing metal systems shall be stainless steel and have ES-1 wind resistance testing certification and in accordance with local requirements.

- B. Gauges for stainless steel sheet shall be U.S. Standard. Gauges for non-ferrous metals shall be B&S. Stainless steel shall be type 304 (2D) dull, non-reflective finish, conforming to Federal Specification QQ-S-766 (dead soft fully annealed and meet manufacture's requirements)

Fascia / Gravel Stop (Stainless Steel)	24 Gauge
Fascia Cover Plate (Stainless Steel)	24 Gauge
Fascia Anchor Bar (Stainless Steel)	24 Gauge
Cap Flashing (Stainless Steel)	24 Gauge
Metal Base (Stainless Steel)	24 Gauge
Sumps / Scuppers and Leaders (Stainless Steel)	24 Gauge
Continuous Cleat (Stainless Steel)	20 Gauge

- C. If solder is used for stainless steel shall be 40% lead and 60% tin (new materials) and shall conform to ASTM B-32. Flux shall meet Federal Specifications O-F-506.
- D. Fascia/gravel stops shall be with a concealed, internal anchor bar/ cleat and a fascia cover. The fascia system must be compatible with and covered under the roofing manufacturers 20 years guarantee.
- E. Fold back exposed edges of sheet metal to form a 1/2" wide hem on the side concealed from view.
- F. Fascia-gravel stops and cap flashing shall be in lengths not exceeding 10 feet.
- G. Fascia-gravel stops, sump and Cap flashing shall have shop fabricated corners. All corners shall be mitered and shall be prefabricated in one piece with soldered or welded seams. The finish work shall be leak proof under all weather conditions.
- H. Secure flange of sheet metal work fastened to wood nailers with stainless steel wire slating nails at a maximum of 6 inches on center in a line 1 inch from edge of the flange.
- I. Cap flashing as shown on drawings shall 2 piece and either:
1. Regletted Cap: 2 part with receiver/inside leg regletted before roofing is started and cap (exterior leg) snapped into place and secured with stainless steel pop rivets or tamper proof screws 12"o.c.
 2. Through wall Cap: 2 part with receiver/inside masonry leg installed by brick removal and replacement above existing cap flashing but before start of roofing and cap (exterior leg) snapped into place and secured with stainless steel pop rivets or tamper proof screws 12"o.c.
- J. Fascia Sump down Spout and Leaders @ Roofs: Leaders shall be 3" x 4" 20 gauge stainless steel and carry water from Downspout down to elbow and splash block with pad on roof below. Accessories shall include: Leader clips, elbows, end caps, inside miters, outside miters, Leader/downspout seal, Leaf screen and miscellaneous supports. Fascia Sump must be integral one piece extension of fascia system
- K. Splash pans: 24 ga. stainless steel with 4" perimeter flange to allow pan to be secured in foam. Front of pan to have corrugated ridges to break/slow down water flow
- L. Manufacture's shop drawings with the Contractor's Company and review dates must be submitted for review and final approval by NYCHA or NYCHA's A/E during the submissions

process for the Fascia, sump and cap flashing metal systems. No fabrication is permitted before receiving approval of the shop drawings.

M. Fascia / Sumps shall be installed by the manufacturer's pre-certified installer or at minimum the manufacturer's representative must be present and approved the sample installation of all metal systems.

1. Acceptable Manufacturers for Fascia/ Gravel Stops and Cap Flashing (or equal):

- a. METAL - ERA, INC. (Basis of Design)
16000 Airport Road, Waukesha, WI 53188
Phone: (262) 549 - 6900
Fax: (262) 549 - 6009
Internet: www.metalera.com <http://www.metalera.com>
- b. B & B SHEET METAL : 25-40 50th Ave LIC NY,11101, Phone 718 433 2501
- c. W.P. HICKMAN SYSTEMS INC
P.O. Box 15005, Asheville, NC 28813
Phone: (828) 676 - 1700
Fax: (828) 676-2330
Internet: www.wph.com <http://www.wph.com>

2.11 SPRAY FOAM ROOFING PRIMER

A. Where required for manufacturer's warrantee/ guarantee the manufacturer's field technician to approve when & where primer is required for warrantee and guarantees. Primer shall be recommended by the manufacturer of the spray foam materials providing the 20 year guarantee. Primer shall be of quick drying, water base acrylic primer. Type of primer to be used shall be formulated and specified by the foam manufacture to permit foam to bond to specific substrates (concrete, metal, wood, bituminous etc.).

2.12 RETROFIT & REPLACEMENT ROOF DRAINS

- A. Retrofit Roof Drains (Concrete deck.): #16 gage/type 304 integral Stainless steel body (bowl) and mounting flange with drain stem with a neoprene gasket at its end which is inserted into the existing drain bowel/leader. For metal decks Drain stem diameter to be determined via surveying sizes of existing leaders into which the stem will be inserted. The clamping ring and dome are cast iron and are fasten to the integral mounting flange with tamper proof stainless steel screws. ZURN model RD2150. Provide lead flashing flange to assist in securing down roofing membrane @ roof drains penetrations.
- B. B. Roof Drain Replacement At METAL (Community Center) & Wood Deck (Apt Building Main Roof) -Shall match the size and capacity of existing and consist of a low profile cast iron dome as combination clamping device and body with no HUB connection to leader. There shall be two under deck clamping devices which hold the replacement bowl in place. Domes shall be secured in place with brass or stainless steel tamperproof bolts, and vandal proof hardware as manufactured by Jay R. Smith, Zurn or approved equal.
- C. Roof Drain Traps: Shall be cast iron, running trap with double hub vent cleanout (Code 7265) as Manufactured by Tyler Pipe or approved equal. New trap shall cut into each riser. Pipe diameter is to match existing size.

2.13 POLYURETHANE FOAM

- A. Shall be a two-component system made by combining an isocyanate (A) component with a polyol component. Design for use as self-adhering, seamless, high insulating, spray applied rigid polyurethane foam roof system. 20 year guaranteed spray foam roofing system by Covestro (previously Bayer), B.A.S.F., GE Weather seal, Gaco Western or approved equal.
- B. The polyurethane foam shall be 3.0lb/cu.ft. density and have a UL class "A" listing when sprayed in place. Following is the minimum physical properties when cured:

Properties	Value	ASTM Test
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Density, sprayed-in-place, p.c.f.	3.0 pcf or lb per cubic ft.	D1622
Compressive Strength	40-50 psi or lb/ sq. inch	D1621
Open Cell Content	Less than 10%	D2856
*Thermal Conductivity - R Value	6.2 to 6.5	C518
Flame Spread	Less than 75 FSI	E84

*To comply with NYC Energy Conservation Code (NYC ECC)

2.14 SILICONE PROTECTIVE COATING

- A. Shall be White Silicone Polymer Elastomeric Coating, with a high moisture vapor permeability and are classified as breathable coating. The silicone roofing membrane shall be 30 dry mil. minimum. Apply one to three (3) coats of elastomeric to achieve minimum thickness. Coat shall be contrasting colors (alternated). The elastomeric coating shall be a liquid applied material that is specifically designed for application over polyurethane foam. It shall be UL 790 listed in conjunction with the polyurethane foam.

Properties	Value	ASTM Test
Tensile Strength	350 psi (min.)	D412
Elongation	150 to 200%	D412
Hardness	50, Shore A (min.)	D2240
Tear Resistance	30 lb./in / 21 ply	D1004 / D-624
Moisture Vapor Transmission	5.3 Perms	D-96
Fire Resistance of System	Less than 75 Fsi	D-84

- B. Acceptable Spray Foam Roofing Manufacturers (or equal):
1. Covestro (previously Bayer Material Science) Baysystemsspray.com with GE weather seal silicone surfacing/flashing, Robert Burwasser, NYC representative, Tel: 212 689 4440 / 917 287 4370, robert.burwasser@covestro.com <mailto:robert.burwasser@covestro.com>
 2. BASF Polyurethane Foam Enterprises LLC, Moses M. Clark Jr., moses.clark@basf.com <mailto:moses.clark@basf.com>, Business: (800) 888-3342, Fax: (315) 449-2617, Mobile: (315) 263-4665, Mailing Address: 13630 Water tower Circle, Minneapolis, MN 55441
 3. Gaco Western, 200 West Mercer St., Suite #202, Seattle, WA 98119, Phone: (800) 331-0196, Internet: www.gaco.com <http://www.gaco.com>

2.15 WALKWAY PAD PROTECTIVE COVERING

- A. Weather resistant, breathable, resilient pad composed of synthetic rubber stands shall be installed to create additionally protected roof areas and secured with foam to foam roof or silicone-based, solvent free, single component waterproofing elastomeric moisture-curing sealant combined with a reinforcing agent such as Gaco Flex SF 2036 walking pad or equal.

2.16 GRANULES

- A. No.11 screen size, ceramic – white coated roofing granules.

2.17 CONCRETE FASTENERS

- A. Use power actuated, stainless steel pin fasteners with a 36 mm diameter steel washer. Fasteners shall penetrate 1-1/2" into concrete and shall be spaced approximately 16" o.c. except at corners and terminations of mailers and blocking where they shall be installed 4" from end points. Because of galvanic action fasteners must be stainless steel when used for fastening CCA wood blocking. HILTI stainless steel Model DNI72P8536 or approved equal

2.18 SEALANT

- A. Where required for manufacturer's warrantee and guarantee, sealant shall be a 1 component urethane meeting Federal Specification TT-S-00230c, Type II, Class A. It shall be one of the following:
1. Sonolastic NP-1 by BASF Corp.
 2. Sikaflex No.1A by Sika Chemical Corp.
 3. Sealant for silicone coated roof system shall be a pigmented silicone sealant to match the finish color of the system as made by Dow Corning or Momentiv. In addition see Division 07, Section 07 90 00.

2.19 OVERLAY BOARD

- A. (staggered and mechanically fastened to metal decks prior to applying spray foam) – Shall be rigid 1/2" thick high density DensDeck Prime by -Pacific (GP) or approved equivalent and compatible with roof manufacturer's guarantee.

PART 3 EXECUTION

3.01 GENERAL

- A. Spray Polyurethane Foam, commonly referred to as SPF is a spray-applied insulating foam plastic that is installed as a liquid and then expands many times its original size.
- B. Spray Polyurethane Foam (SPF) roofing consists of an application of specifically designed foam covered with an elastomeric coating to protect the foam from Ultra-Violet rays.
- C. Examine surface for inadequate anchorage, foreign material, moisture, and unevenness which would hinder proper drainage and proper installation of roof system, as specified.

3.02 BRICKWORK REPLACEMENT

- A. In areas as designated by NYCHA for the removal and replacement of brickwork (including bricks behind removed flashing), the contractor shall carefully remove the damaged bricks by saw cutting the joints without damaging adjacent sound brick. Cut the joints by HEPA vacuum attached saw only. To ensure that no internally damaged bricks remain, the contractor shall inspect the side of adjacent sound brick for cracks and shall replace all cracked bricks as directed by NYCHA.
- B. New abutting brick surfaces shall be thoroughly wetted and inserted in full bed of fresh mortar. Immerse new brick in water so as to be damp when laid. Tie new brickwork to the back-up walls and columns with masonry ties and anchors and toothed into existing brickwork.
- C. Mortar joints shall be neatly and smoothly finished. No brick replacement shall be done in temperatures below 40° F OR ABOVE 90° F unless directed by NYCHA field inspector.
- D. In addition see Division 04

3.03 REPOINTING BRICKWORK

- A. In areas of work, saw cut all mortar joints until sound material is reached (Min. 3/4"). Use only HEPA vacuum attached saw.
- B. After removal of mortar, saturate all masonry with clean water and, while joints are still moist, fill the entire width of the joints with mortar, including the area of the junction between the original mortar and brick. Tool all joints while moist to obtain a concave surface, match new mortar joints with the adjoining joints by color, size and texture.
- C. Do not perform pointing in temperature below 40° F unless adequate means are provided for heating the materials and protecting the work as per the New York City Building Code.
- D. The contractor shall take all precautions for dust control as directed by NYCHA.
- E. In addition see Division 04.

3.04 FASCIA-GRAVEL STOPS, CAP FLASHING & OTHER ROOFING ACCESSORIES

- A. Sheet Metal Fascia-Gravel Stops

1. Remove existing fascia-gravel stops where specified, patch the concrete edge as required and install new fascia-gravel stops with crimped drip edge for stiffening. Install spill out scuppers as shown on Detail Drawings.
 2. Extend flanges of gravel stop 4" beyond the edge. Securely nail to wood nailer with stainless steel nails at a maximum 4 inches on center, in a row 1 inch from the edge of the flange.
 3. Where exposed face nailing is indicated, use stainless steel screw-tite spiral thread nails spaced at a maximum of 2 feet on center with the heads soldered over. Do not solder over nail heads when securing to soffits.
 4. Gravel stop shall be secured with stainless steel anchors to new concrete curb.
 5. Nails securing the flange to wood blocking shall have a minimum of 1 inch penetration and shall be spaced 16" on center
 6. Anchor bar/ cleat for fascia shall be continuous. Stainless steel anchor shall have a minimum penetration as per manufacturer to meet ES-1 wind resistance.
 7. Provide a 6" cover plate over all joints; cover plate shall be formed to properly fit the profile of the fascia gravel stop.
- B. SHEET METAL FASCIA-GRAVEL STOPS
1. Remove existing fascia-gravel stops where specified, patch the concrete edge as required and install new fascia-gravel stops with crimped drip edge for stiffening. Install spill out scuppers as shown on Detail Drawings.
 2. Extend flanges of gravel stop 4" beyond the edge. Securely nail to wood nailer with stainless steel nails at a maximum 4 inches on center, in a row 1 inch from the edge of the flange.
 3. Where exposed face nailing is indicated, use stainless steel screw-tite spiral thread nails spaced at a maximum of 2 feet on center with the heads soldered over. Do not solder over nail heads when securing to soffits.
 4. Gravel stop shall be secured with stainless steel anchors to new concrete curb.
 5. Nails securing the flange to wood blocking shall have a minimum of 1 inch penetration and shall be spaced 16" on center
 6. Anchor bar/ cleat for fascia shall be continuous. Stainless steel anchor shall have a minimum penetration as per manufacturer to meet ES-1 wind resistance.
 7. Provide a 6" cover plate over all joints; cover plate shall be formed to properly fit the profile of the fascia gravel stop.
- C. INSTALLATION OF METAL THROUGH WALL AND REGLETED CAP FLASHING.
1. New 2 piece Through wall cap flashing (Within Bulkhead / Mech. Room masonry Walls and as shown on drawings):
 - a. To support brickwork, pin @vertical mortar joints of fourth course of face brick above existing cap flashing into the back up masonry(Hilti epoxy anchored pins 24:" o.c).
 - b. Remove 3 courses of brick below down to cap flashing
 - c. If through wall flashing exists cut flashing leaving a 2" horizontal tab and bend up.
 - d. Provide a bead of silicone sealant and fasten the top edge of the new stainless steel through wall to back up masonry and bend the existing tab back down
 - e. Horizontally overlap each section of through wall 4"
 - f. Replace or reuse removed, undamaged brick providing prefabricated weep holes 30" o.c.
 2. Regleted Cap Flashing:
 - a. Cut existing cap flashing. Cut the reglet 2 inches deep under existing cap flashing for the full thickness of the existing mortar joint. The horizontal flange of the new cap flashing shall be not less than 2 1/2" long, shall be turned up approximately 1/4" @ the rear and inserted minimum 2", into the reglet, (below the existing cap flashing) and secured with lead wedges at a maximum of 16 inches on center. The reglet space shall be filled with cement mortar 1/2 inch from the face of the wall and the remaining space filled with caulking.

- b. Shape cap flashing to lie flat over base flashing, so that it covers the top of the base flashing not less than 4". Individual lengths of cap flashing shall be lapped 4" and left unsoldered.
- D. INSTALLATION OF FASCIA/GRAVEL STOP, AT BULKHEAD ROOF.
- 1. Remove the existing fascia-gravel stops, patch concrete Bulkhead edge as required. Install new gravel stops w/ fascia with crimped drip edge for stiffening fascia.
 - 2. Extend flanges of gravel stops 4" and flanges for continuous gravel stops 5" onto the roof. Securely nail to wood nailers with stainless steel nails at a maximum 4 inches on center, in a row 1" from the edge of the flange. Strip in flashing sheet over edge and set horizontal flange in roofing cement.
 - 3. Stainless steel anchors used to secure gravel stops to concrete or to building exteriors shall be as per fascia manufacturer or 1-1/2" long.
 - 4. Cleats shall be continuous. Cleat anchors shall have a minimum penetration of 1-1/2 inches into new wood blocking, and shall be of a type approved by the Authority. All anchors shall develop minimum pullout strength of 50 lbs for fascia gravel stops and 100lbs for gutter gravel stops.
 - 5. Block to secure fascia flanges and continuous gutter flanges shall match the thickness of the insulation above the concrete slab. Nails shall have minimum penetration of 1", and shall be placed 16" o.c.
 - 6. Provide a 6" cover plate over all joints; cover plate shall be formed to properly fit the profile of the fascia-gravel stop or gutter- gravel stop.
- E. STAINLESS STEEL LEADER AND SPLASH PAN:
- 1. Leaders shall be 5" in diameter (or sized to fit new scupper and existing cast iron downspouts) and carry from scuppers. Accessories shall include: leader, clip, elbows, end cap inside miters, leader/sump seal, leader straps and miscellaneous support.
 - 2. Leader straps shall be secured to existing building with 3/8" diameter stainless steel expansion anchors with vandal proof heads
 - 3. Install splash pan and scupper before the roof has been completely surfaced with ceramic granules
 - 4. Install the splash pans and scuppers into the top coat of silicon rubber before curing
 - 5. Cover flange with two layers of silicone rubber weather coating.
- F. WOOD BLOCKING:
- 1. Where old blocking is rotted, deteriorated, or missing, use new blocking of the proper size.

3.05 NEW ROOFING AND ROOFING ACCESSORY INSTALLATION

- A. GENERAL Surfaces to receive new roofing or flashing materials shall be smooth, clean, firm, frost free and dry and primed with manufacture's specified. Do not install when ambient temperatures are less than 50°F.unless with written permission and following requirements of spray foam manufacture

3.06 SUBSTRATE PREPARATION

- A. Verify that all deck and substrate s free from deformities or defects with no excessive deflection or movement.
- B. CONCRETE DECK (BULKHEAD & CANOPY ROOFS) -
 - 1. Repairing roof slab surface: Any damaged areas and depressions shall be repaired and treated with patching compound as follows:
 - a. Remove all debris
 - b. Remove any deteriorated material down to sound substrate.
 - c. For improved bonding, moisten the existing lightweight concrete surface with water. If moistening is insufficient, the product will stiffen too quickly to finish.
 - d. Treat cracks greater than 1/8" (3 mm) in width in accordance with the concrete patch.
 - e. Patch w/quick setting Polymer modified cementitious compound.
 - f. Finish to a smooth transition to a workman-like manner.
- C. WOOD ROOF DECK (also see Section 06 16 00)

1. Replace wood deck and deteriorated staging. Repair or replace underlying joists-See Section 06 16 00
 2. Install new fully adhered SBS base sheet additionally fastened with spiral large head nails, 1 ¼" long, prior to spray foam application. The spiral large head nails shall be fastened by manufacturer's approved spray foam contractor. Nails fastened 2'-0" o.c. as per manufacturer's recommendations.
 3. Fasten all edges of SBS base sheet 12" o.c. with spiral large head nails, 1 ¼" long.
- D. METAL DECK at COMMUNITY CENTER: Provide 1/2" overlay board staggered and mechanically fastened down through asphalt fill into the metal deck following the manufacturer's recommended fastening pattern prior to applying foam. For transverse corridor under the center of the roof and where metal deck has concrete fill instead of asphalt, continue the 1/2" overlay board fastened into the concrete fill with expansion fasteners again following the roofing manufacturer's recommended fastening pattern.

3.07 PREPARATION PRIMER

- A. Prime the concrete deck by spray applied in multi-direction passes to ensure uniform film build and to avoid pin holing. Final cured dry film thickness must be free of cracks or blister. Generally one application of approximately 1/2 of a gallon per 100 square feet.
- B. Prime other materials using manufacture's designated primer(metal, concrete wood)and recommended tools such as brushes or rollers

3.08 INSTALLATION OF RETROFIT AND REPLACEMENT ROOF DRAINS

- A. RETROFIT DRAINS. Retrofit drains occur at concrete slabs. Locations are at canopies, balcony roofs, and the concrete portion of the community center roof.
 1. Remove existing drain parts leaving drain bowl/body in place, clean and primed with foam metal primer.
 2. Install initial layer of Spay foam
 3. Insert gasket end of drain stem into exist bowl/leader connection
 4. Fill mounting hole into foam with sealant and fasten down stainless steel mounting flange of drain assembly into down through foam insulation and into concrete deck using stainless steel concrete screws (like Red Head).
 5. Install another tapered layer of foam over the flange so that water flows to drain and finish with 3 coat silicone topping carrying the silicone as flashing down into drain bowl.
 6. Screw down clamping ring and dome.
- B. REPLACEMENT DRAINS. Replacement drains occur at the metal deck portion of the Community Center roof and the main apartment building roofs (wood decks).
 1. Remove existing drain parts and cut carefully cut out drain bowl so as to not damage leader connection below.
 2. For wood decks, replace sheathing at drain body opening of the deck as well provide additional block as required to provide a solid opening to secure the underside clamps of the drain body .
 3. Insert the replacement drain body making watertight no hub connection and tightening the body clamps to secure the body in place.
 - a. NOTE: Clamp lengths will have to be longer for metal decks to accommodate thicker deck profile)
 4. Foam and then flash into the drain body.

3.09 POLYURETHANE FOAM APPLICATION

- A. Inspection
 1. Prior to application of foam, the surface shall be inspected to insure that conditions required for polyurethane foam application have been met as per spray foam roofing manufacturer and NYCHA
- B. Application -

1. The spray polyurethane foam shall be applied in accordance with the manufacturer's specifications and instructions.
2. Contractor to dry the concrete roof slab and foam to concrete roof slab (including concrete roof canopies). Coordinate with roofing manufacturer representative to inspect and approve prior to commencement of spray foam application. For wood deck, contractor to dry the deck and foam to substrate. Coordinate with roofing manufacturer representative to inspect and approve prior to commencement of spray foam application.
3. Areas to be built-up to remove ponding water are to be filled in with spray polyurethane foam before the specified thickness of polyurethane foam is applied to the entire roof surface.
4. The spray polyurethane foam must be applied in a minimal pass thickness of 1" inch.
5. Spray polyurethane foam thickness shall be a minimum of one and a half (1-1/2") inch. The polyurethane foam shall be applied uniformly over the entire surface with a tolerance of plus 1/4" per inch of thickness, except where variations are required to insure proper drainage or to complete a feathered edge.
6. FOR APARTMENT BULKHEAD CONCRETE ROOF SLABS, and COMMUNITY CENTER CONCRETE ROOF SLAB/ METAL DECKS WHERE THE FOAM IS PROVIDING INSULATION ---THE AVERAGE R VALUE OF THE SPRAY FOAM MUST ACHIEVE AN R25.
7. The spray polyurethane foam shall be uniformly terminated a minimum of four (4) inches above the roofline at all penetrations except drains, walls (including curbs), or building junctions. Foamed in place cants shall be smooth and uniform to ensure positive drainage.
8. Applicator shall be careful not to cover weep holes. All weep holes blocked by the application of the foam roofing shall be unblocked by the roofing contractor, and all repairs made to the surrounding application, at no expense to the Authority.
9. The deck itself (wood deck) or application of foam onto the deck shall have sufficient slope to eliminate excessive ponding water. Ponding is defined as "the accumulation of water in low-lying areas that exceeds the manufacturer's specification and/or contract documents." If the substrate does not have sufficient slope, then the ponding water must be eliminated by building up in slope by the application of polyurethane foam, channeling the polyurethane foam or by the proper placement of drains, or a combination thereof. Any such areas not addressed by the roofing shop drawings shall be brought to the attention of the Authority prior to application of the polyurethane foam.
10. The polyurethane foam application shall not proceed during periods of inclement weather. The applicator shall not apply the polyurethane foam below the temperature and/or humidity specified by the manufacturer for ambient air and substrate. Wind barriers shall be used if wind conditions could affect the quality of installation.
11. The spray polyurethane foam shall be applied in accordance with the manufacturer's specification and instructions.
12. The minimum thickness of polyurethane foam in any area shall be completed prior to the end of each day. If due to weather conditions more than 24 hours elapse between polyurethane foam and coating application, the polyurethane foam shall be inspected for UV degradation, oxidation, or contamination. If any of the above conditions exist, the surface shall be prepared in conformity with the recommendations of the manufacturer issuing the warranty.
13. CONCRETE SLAB
 - a. Prior to commencement of spray foam application the Contractor is to remove as much area of SBS temporary waterproofing which was torched only at seams and then prime the exposed concrete deck with the designated primer
14. WOOD DECK
 - a. Prior to beginning spray foam application the contractor is to correct adhesion & fastening deficiencies in SBS base sheet, including but not limited to; bubbling, fish mouths & improper sealed seams and SBS base sheet fastening to deck.
 - b. The spray foam roofing contractor shall be responsible for securement of SBS sheet.

- c. Then for as much area as can be completed with spray foam in a day the contractor shall then nail with roofing nails the perimeter of each sheet 12" oc. and prime the sheet with the designated foam primer and apply foam.
15. METAL DECK: After 1/2" overlay board is fastened to deck apply spray foam.
16. The initial application of spray foam must be a maximum of 1" thick to reduce overheating and lateral stress from expansion of the foam on the torch down adhesion.

3.10 FOAM SURFACE FINISH

- A. The final sprayed polyurethane foam surface shall be "smooth, orange peel, coarse orange peel or verge of popcorn." Polyurethane foam surfaces termed "popcorn" or "tree bark" are not acceptable. These
- B. Area shall be removed and re-foamed to an acceptable surface.
- C. Damage or defects to the polyurethane foam surface shall be repaired prior to the protective coating application.
- D. Polyurethane foam surface shall be free of moisture, frost, dust, debris, oil, tars, grease or other materials that will impair adhesion of the silicone protective coating.

3.11 SILICONE PROTECTIVE COATING

- A. Inspection
 - 1. Prior to application of protective coating, the polyurethane foam shall be inspected for suitability of base coat application. The polyurethane shall be clean, dry, and sound.
- B. Application
 - 1. Base Coat.
 - a. The basecoat shall be applied the same day as the polyurethane foam application when possible. In no case shall less than two hours elapse between application of the polyurethane foam and application of the base coat. If more than 24 hours elapse prior to the application of base coat, the polyurethane foam shall be inspected for UV degradation.
 - b. The polyurethane foam shall be free of dust, dirt, contaminants and moisture before application of the base coat.
 - c. The base coat shall be applied at a uniform thickness with the rate of application being governed by the polyurethane foam surface texture. Coating shall be applied at such a rate as to give the minimum dry film thickness specified by the protective coating manufacturer.
 - d. The coating shall be allowed to cure and be inspected for pinholes, thinly coated areas, uncured areas or other defects. Any defects should be repaired prior to subsequent applications. The base coat shall be free of dirt, dust, water, or other contaminants before application of the topcoat.
 - e. The coating application shall not proceed during periods of inclement weather. The applicator shall not apply the protective coating below the temperature and/or above the humidity specified by the manufacturer for ambient air and substrate. Wind barriers shall be used if wind conditions could affect the quality of installation.
 - 2. Subsequent Coat (2nd) and top coat (3rd)
 - a. Application - Subsequent coating should be applied in a timely manner to insure proper adhesion between coats. Surface texture of polyurethane foam will affect dry film thickness additional material may be required in areas of coarse foam profile
 - b. Inspection - The cured dry film thickness of the finished multiple coat application shall be checked by taking slit sample and examining under magnification. Areas that are found to have less than the thickness specified shall require additional coating.

3.12 GRANULE FINISH APPLICATION

- A. The Contractor shall apply roofing granules in a finish coat of silicone coating. A minimum of 10 dry mils of silicone coating is required to hold the granules.

- B. The Contractor shall apply roofing granules, using suitable compressed air equipment, uniformly at a rate of approximately 40 lbs. Per 100 sq. ft. of roof area.
- C. The Contractor shall apply roofing granules immediately after the additional coating application to obtain maximum wet out and embedment.
- D. The Contractor shall, after coating has fully cured, remove all loose granules using a soft bristled broom.
- E. The Contractor shall, for all bare spots in granulated surface, fill by applying additional coating and granules in these areas.

3.13 INSTALLATION OF NEW BULKHEAD DOOR SADDLES

- A. Carefully cut existing saddles to be removed with an acetylene torch at the junction with the door jambs.
- B. New saddles shall be made of 1/4" thick checkered plate steel (galvanized after fabrication) and fit as shown. The steel shall conform to ASTM A36 and galvanizing to ASTM A446.
- C. Weld new saddles to the metal frame with a continuous fillet weld for the full length of the joint. The weld shall be ground to allow for proper closure of the doors.
- D. Touch-up welded areas with galvanizing paint (Galvicon or equal as approved by the Authority). Then prime and provide two coats of Alkyd enamel

3.14 WALKWAY PAD

- A. The Contractor shall provide and install factory formed "Spaghetti type" walkway pads at Door Bulkheads rooftop equipment. Spot adhere the pads or rolls to the finished Roofing Surface with foam.

3.15 APPLICATION OF SEALANT

- A. Preparation:
 1. Clean, prepare and size joints in accordance with manufacturer's instructions. Remove any loose materials and other foreign matter which might impair adhesion of sealant.
 2. Verify that joints shaping materials and release tapes are compatible with sealant.
 3. Examine joint dimensions to achieve required width/depth ratios not to exceed 1"x 1" cross section.
 4. Use backer rod to achieve required joint depth, to allow sealant to perform properly.
 5. Prime the joint with sealant manufacture's required sealant.
- B. Backer Rod Installation
 1. Solidly fill joints which are open to depth greater than 1-1/2" with backer rod to within 1/2" of surface. Install with approximately 30% compression
 2. The joints less than 1/4" wide omit backer rod and use bond breaker. If backer rod is used do not project beyond 1/2" below depth of space in any point.
 3. Do not stretch, twist, puncture or tear backer rod. Use single diameter rod, butt joint of backer rods at intersections.
- C. Sealant:
 1. Apply sealants in accordance with manufacturer's instructions in joints using pressure gun with nozzle cut to fit joint width. Make sure sealant is deposited in uniform, continuous beads without gaps or air pocket.
 2. Tool joints to required configuration within 10 minutes to sealant application, if masking materials are used remove immediately after tooling.

3.16 CLEANING AND DISPOSAL

- A. Remove bituminous materials from all finished surfaces.
- B. Repair or replace defaced or disfigured finishes caused by work of this section.
- C. It is the Contractor's responsibility to remove from the job site, and as necessary, safely dispose of all excess materials and debris as a result of the work completed under this Section.

- D. In areas where finished surfaces are soiled by bitumen or any other source of soiling caused by work of this section, consult Manufacturer of surfaces for cleaning advice and conform to their documented instructions. Remove all debris daily from roof and the grounds.
- E. Upon completion of the work and / or at the end of each working day, the Contractor shall remove all hazardous or flammable materials and assume ownership of all debris resulting from the work, remove it from the premises, and legally dispose of it.
- F. Upon completion of the work, or when directed by the Inspector, the Contractor shall thoroughly clean all surfaces of all rooms and spaces, including all exterior areas, which have become soiled as a result of the work of the Contract.
- G. As the work in various areas is completed, said areas shall be broom cleaned and all rubbish, debris, excess materials, tools and scaffolding shall be removed.
- H. The Contractor shall clean all paint sots, oils, plaster and stains from floors, walls, woodwork, glass, hardware metal work and all similar items upon completion. Dust control procedures as hereafter specified shall be employed throughout all work of this contract.
- I. Drop cloths and other protective devices shall be kept clean at all times.
- J. Leave premises broom clean at end of each day. Keep dirt and debris to a minimum in the construction repair areas. Wet down dust with water spray where necessary.
- K. Work Area Preparation: Cover entrances to the work area with a single layer of 6 mil polyethylene sheets taped to the top and weighted at bottom. Place drop cloths of 6 mil polyethylene sheets adjacent to surfaces to be disturbed. The drop cloth shall be at least 5 feet wide.

3.17 DUST CONTROL PROCEDURES

- A. Use wet methods when demolishing walls or other components that produce dust during demolition. Mist all surfaces to be disturbed with a fine spray of water.
- B. For demolition, use only power tools equipped with a HEPA vacuum collection system capable of trapping and retaining 99.97% of all particles 0.3 micrometers in diameter or greater.
- C. Wrap all materials to be removed in 6 mil polyethylene bags tied with at least 5" long plastic ties. Alternatively, clean by wet methods or HEPA vacuum prior to transport from the work area.
- D. Avoid spreading dust and debris outside the work area.
- E. Provide 6 mil polyethylene's sheeting to completely cover all windows where work is scheduled to be done at the beginning of each day, and remove at the end of each day. Use 5/8" thick plywood to protect window glass when condition permit in the field as directed by the Inspector.

3.18 PROTECTION AND CLEANING

- A. Contractor and contractor's crew members shall observe and enforce all appropriate safety and fire department regulations during installation and handling of roofing materials.
- B. Protect all partially and fully completed roofing work from other trades until completion. Whenever possible, stage materials in such a manner that foot traffic is minimized over completed roof areas. When it is not possible to stage materials away from locations where partial or complete installation has taken place, temporary walkways and platforms shall be installed in order to protect all completed roof areas from traffic and point loading during the application process.
- C. Provide protection against staining and mechanical damage for newly applied roofing and adjacent surfaces throughout this project.
- D. Limited Access: Prevent access by the public to materials, tools and equipment during the course of the project.
- E. Debris Removal: Remove all debris daily from the project site and take to a legal dumping area authorized to receive such materials.

- F. Site Condition: Complete, to the NYCHA Field Inspector's satisfaction, all job site clean-up including building interior where applicable, exterior and landscaping where affected by the construction.

END OF SECTION

SAMPLE