PROJECT MANUAL INDEX

FOR

COUNTY WIDE ROOF REPAIRS & REPLACEMENT SPECIFICATIONS & ARCHITECTURE DETAILS:

FOR

ORANGE COUNTY GOVERNMENT
ADMINISTRATIVE SERVICES FISCAL AND OPERATIONAL SUPPORT
400 E. South Street, 5th FL
Orlando, FL 32801

PREPARED BY:

A/R/C ASSOCIATES, INCORPORATED
601 North Fern Creek Avenue - Suite 100
Orlando, Florida 32803
(407) 896-7875 FAX # (407) 898-6043

Date: -

A/R/C Project No: 15036.00

Bidding Requirements, Contract Forms, and Conditions of the Contract

Division 00 – Procurement and Contracting Requirements

Divisions 2 - Site Work

Division 3 - Concrete

Division 4 - Masonry

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Division 6 - Wood and Plastics

Division 7 - Thermal and Moisture Protection

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Division 9 – Finishes

Division 22 - Mechanical

Division 26 - Electrical

Division and Section Numbers listed in the Table of Contents and items of work included in each section conform in general with the CSI Master format. Section numbers listed are merely for identification and may not be consecutive. The Contractor shall check the pages with the index completeness. If any pages are missing or illegible, request replacements.

PROJECT DRAWING INDEX

FOR

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Date: August 1, 2015

A/R/C Project No: 15036.00

A/R/C Project No: 10047.00

DETAILS (8-1/2 x 11 Format)

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Detail numbers listed are merely for identification and may not be consecutive. The Contractor shall check the pages with the Index for completeness. If any pages are missing or illegible; request replacements.

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Conditions observed by A/R/C Associates

B. Bidder Responsibility.

1.2 RELATED SECTIONS:

A. Section 01 11 00 - SUMMARY OF WORK

1.3 PROJECT/SITE CONDITIONS:

A. A field investigation was conducted by A/R/C Associates, during which time the exposed conditions were observed and the under-roof conditions were determined to the best extent observable without destructive methods. Much of the construction material information has been furnished to A/R/C by the Owner in the form of construction record drawings and specifications. A/R/C offers no assurance that all varying conditions have been discovered, or that the Owner-furnished information is accurate. It shall be the responsibility of each bidder to make additional inspections as they may judge to be a necessity.

B. The approximate dimensions shown for each roof area are the result of reconstruction of the building design drawings from Owner records and field measurements taken by A/R/C Associates. This information is given to assist prospective bidders in establishing the approximate scope of the project. As a pre-requisite for bidding the project, however, all dimensions shall be field verified by each Bidder so that the dimensions and areas utilized in bidding the project will be confirmed or corrected by the bidder.

C. Additional Information Available: Various testing and investigative reports may have been performed by the Owner previously and/or in conjunction with the performance of other work which may be available for review at the Owner's Facilities Department. We believe most pertinent information available from these sources has already been integrated into these bidding and construction documents.

D. A/R/C Associates, Incorporated performed a site investigation on - at these facilities, to verify site and construction conditions.

E. Condition of Structure

1. The Owner assumes no responsibility for actual condition of the structure.
2. Conditions existing at time of inspection for bidding purposes will be maintained by Owner in so far as practicable. However, variations may occur by Owner's operations.
3. Prior to bidding, inspect and verify visible existing conditions of Project, including elements subject to damage or to movement during reroofing.

a. Conflicts and problems shall be reported to the Architect for resolution prior to bidding. Failure to report these conflicts places the responsibility on the Prime Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.

4. During construction, inspect conditions affecting installation of Products, or performance of work.

a. Report unsatisfactory or questionable conditions to Architect in writing; do not proceed with work until Architect has provided further instructions.

PART 2 PRODUCTS

(not applicable)

PART 3 EXECUTION

(not applicable)

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Description of Areas to be Demolished.
2. Demolition Contractor Qualifications
3. Regulatory Requirements
4. Scheduling
5. Project Conditions
6. Preparation
7. Demolition Requirements

B. Related Sections:
1. Section 01 11 00 – Summary of Work

1.2 DESCRIPTION OF AREAS TO BE DEMOLISHED

A. All Roof Areas:
1. Remove roof top lightning protection system. Undamaged air terminals and conductor cable may be reused. Thru-deck LP fittings shall be replaced on tile roof.
2. Material to be reused shall be maintained in undamaged condition.

B. Roof Area 1/A
1. Remove existing coating from existing modified membrane.
2. Remove all existing pitch pans.

C. Roof Area 1/B
1. Remove existing shingle system and underlayment.
2. Exercise care so as not to damage adjacent roof areas during demolition.

1.3 QUALIFICATIONS

A. Demolition Contractor: Contractor having minimum of five (5) years documented experience in performing the Work of this Section.

1.4 REGULATORY REQUIREMENTS

A. Conform to applicable code for demolition of roofing, safety of adjacent structures, dust control and disposal. Conform to applicable regulatory procedures when hazardous or contaminated materials are present

B. Notify affected utility companies before starting work and comply with their requirements.

C. Do not close or obstruct roadways, sidewalks, and hydrants without permits.

1.5 SCHEDULING

A. Schedule work under the provisions of Division 1.

B. Describe demolition removal procedures and schedule.

1.6 PROJECT CONDITIONS

A. Existing Conditions:
1. Report conflicts or problems to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 PREPARATION

A. Provide, erect, and maintain temporary barriers and security devices.

B. Protect existing landscaping materials, appurtenances, structures and adjacent roofs which are not to be demolished.

3.2 DEMOLITION REQUIREMENTS

A. Conduct demolition to minimize interference with adjacent structures and occupants.

B. Any materials damaged by the demolition process that are out of the scope of work, as specified by the contract documents, must be replaced at no additional cost to the owner.

C. Cease operations immediately if adjacent structures appear to be in danger. Notify Architect. Do not resume operations until directed.

D. Conduct operations with minimum interference to public or private accesses. Maintain egress and access at all times.

3.3 DEMOLITION REQUIREMENTS

A. Remove demolished materials from site.

B. Do not burn or bury materials on site. Leave site in clean condition.

C. Upon completion, remove all temporary work.

D. Remove materials to be re-installed or retained in manner to prevent damage. Store and protect in accordance with requirements of Division 1.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Furnish labor, materials, equipment, and services necessary for the complete and proper repair of incidental surface damage, unintended low areas, rough cold joints and fastener holes in existing lightweight insulating concrete substrate.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work specified in this section.

1.2 RELATED SECTIONS

A. Section 02 41 19 - Selective Demolition: Demolition of existing roof membrane.

B. Section 02 82 13 - Hazardous Material Abatement

C. Section 06 10 53 - Rough Carpentry: Wood blocking, nailers and curbs.

D. Section 07 01 50.62 – Single-ply Thermoplastic Roofing Repairs

E. Section 07 01 50.63 – B.U.R. Repairs

F. Section 22 14 13 - Plumbing Piping: Installation of new roof drains and associated piping.

G. Section 22 14 26.13 - Plumbing Specialties: Roof Drains

H. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division I sections, apply to work in this section.

1.3 REFERENCES

A. ASTM C 138 - Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete.

B. ASTM C 150 - Portland Cement.

C. ASTM C 495 - Compressive Strength of Lightweight Insulating Concrete.

D. ASTM C 796 - Foaming Agents For use in Producing Cellular Concrete Using Preformed Foam.

E. ASTM C 896 - Foaming Agents Used in Making Preformed Foam For Cellular Concrete.

1.4 PERFORMANCE REQUIREMENTS

A. Average Thermal Resistance of System: R of 20.

B. Minimum Compressive Strength: 300 psi per ASTM C495.

C. Dry Density: 30-36 pcf per Section 7, ASTM C495.

D. Minimum Pull-Out: In compliance with Florida Building Code and State Requirements for Educational Facilities.

1.5 SUBMITTALS FOR REVIEW

A. Shop Drawings: Submit shop drawings drawn to 1/8" per foot scale minimum showing all insulation board layout and lightweight concrete thickness. Indicate layout of slopes, drain locations, and interruptions. Approval by the Architect must be obtained before pouring.

B. Product Data: Provide physical characteristics, thermal values and product limitations.

C. Manufacturer's Product Data: Submit for each product required and application instructions.

D. Submit laboratory test results for Thermal Resistance Values based on ASTM specification C177 or C518, based on a 40 degree F mean temperature.

E. Submit test reports showing compliance with FM Wind Resistance Classification.

F. Certificates: Certify that Products meet or exceed specified requirements and that density, indicated thicknesses, and thermal value and performance was achieved.

G. Manufacturer's Installation Instructions: Indicate mix instructions.

1.6 QUALITY ASSURANCE

A. Installer: Company specializing in placing lightweight concrete fill material specified in this section with minimum three years documented experience, and approved by manufacturer.

B. Maintain full-time non-working supervisor, not a workman/foreman, on job site during times that concrete work is in progress. Supervisor must have minimum of three (3) years experience in lightweight concrete work.

C. Coordinate application of insulating roof fill with application of wood cants, nailers, roofing system, roof base flashings, protruding materials, and roof accessories so complete installation is weathertight and according to warranty requirements.

D. Oven-Dry Density: Determine according to Section 7 of Test for Compressive Strength of Lightweight Insulating Concrete, ASTM C495.

1.7 REGULATORY REQUIREMENTS

A. Conform to applicable code for combustibility requirements.

B. Wind Uplift Resistance: Deck system shall be tested and comply with all FM (Factory Mutual), UL (Underwriter's Laboratories), and Florida Building Code requirements for wind uplift resistance.

C. Certification: Upon completion of roof deck work, furnish to Architect (for delivery to Owner) roof deck system manufacturer's certificate stating that concrete was placed by a certified applicator in accordance with their recommendations.

1.8 PRE-INSTALLATION MEETING

A. Conduct pre-roofing conference before the installation of the roof insulation with A/E and representatives from manufacturer of insulating concrete, EPS insulation board, roofing membrane materials, and all other related trades in attendance. At the meeting date determined, by mutual agreement, between parties concerned.

B. Convene during scheduled pre-installation meeting seven days prior to commencing work of this section.

1.9 DELIVERY, STORAGE AND HANDLING

A. Deliver material in manufacturer's original, undamaged packages or acceptable bulk containers.

B. Store packaged materials to protect them from the elements or physical damage.

1. Store materials on clean, raised platforms.

2. Store and handle materials to protect them from:

a. Moisture, whether due to rain, snow or condensation.

b. Mud, dust, sand, oil, grease and dirt.

C. Do not use cement which shows indications of moisture damage, caking, or other signs of deterioration.

D. Deliver insulation board to site with clear identification of manufacturer and shall the Factory Mutual approval label on each bundle. The Insulation Board shall be by the Foaming Agent manufacturer or a supplier approved by the manufacturer.

E. Deliver enough material to allow continuous work.

F. Handling:

1. Select and operate material handling equipment and store materials to keep from damaging existing construction or applied roofing.

2. Immediately remove and dispose of wet materials.

1.10 PROJECT/SITE CONDITIONS

A. Existing Conditions

1. Verify existing conditions, such as soundness of perimeter conditions, and varying deck and wall thickness for length of anchoring surfaces required and other visible conditions prior to bidding.

   Nailers height indicated on the details may vary from actual requirement, coordinate nailer height with lightweight concrete supplier prior to bidding.

2. Report conflicts or problems to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.

3. Replace or restore to original condition any materials or work damaged during construction.

4. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.

5. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.

B. Do not place lightweight insulating concrete on surfaces which are covered with standing water. Verify that site conditions are ready to accept work.

C. Cure cellular concrete for at least a 24 hour period beginning as soon as the concrete can withstand foot traffic. If weather conditions are hot and dry, curing shall continue for 48 to 72 hours.

D. Before starting work, protect in an approved manner paving and face of building walls adjacent to hoists and pumps. Protection shall remain in place for duration of insulating concrete work.

E. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.

1.11 ENVIRONMENTAL REQUIREMENTS

A. Do not place fill mix at ambient temperatures lower than 40 degrees F without heating mix water to 90 to 110 degrees F.

B. Do not install the lightweight insulating concrete patching compound during periods of precipitation, when air temperatures are below 32 degrees F (0ºC), or

when air temperatures are expected to fall below 32 degrees F (0ºC) any time within 24 hours following application of the product.

1.12 WARRANTY

A. Warrant to the Board that for 10 years from the date of the completion of the lightweight insulating concrete that:

1. The roof insulation system shall remain in a reroofable condition should the roof membrane require replacement.

2. The actual resistance to heat flow through the roof insulation system shall be at least 80 percent of design thermal resistance.

3. The roof insulation will remain in place even if the roof membrane sustains wind damage.

PART 2 PRODUCTS

2.1 L.W.I.C. MATERIALS

A. Manufacturers and Products, (no substitutions):

1.	Celcore:	"Celcore"
2.	Elastizell Corp.:	"Elastizell"
3.	Siplast (W.R. Grace):	"Zonolite"

B. Air Entrainment Agent: ASTM C 796, type recommended by lightweight aggregate manufacturer. Liquid concentrate shall be manufactured and be delivered to the job site with clear identification as to manufacturer and type of material.

C. Admixtures will not be used unless specifically recommended by the manufacturer.

D. Portland Cement: ASTM C 150, Type I, II OR III.

E. Water: Potable, clean and free from deleterious amounts of acid, alkali, and organic material.

F. Insulation Board: One pound density expanded polystyrene board with 25 to 35 bonding and venting slots. Deliver each bundle of two foot by four foot boards to the job site with clear identification as to the manufacturer and shall carry the FM approval label on each bundle.

G. Stepped Insulation: Thickness of the insulation board shall be as required for stepping in 1 inch increments to provide slope as indicated.

2.2 PATCHING MATERIALS

A. Manufacturers and Products, (no substitutions):

1. Siplast "zono-patch"
2. Manufactures equivalent

2.3 CONCRETE MIX

A. Provide aggregate concrete mix to comply with manufacturer's recommendations.

B. Provide cellular concrete mix with the following specifications:

Compressive Strength	Wet Density	Oven Dry Density
300 psi	38-48 lb/cu ft	30-36 lb/cu ft

C. Use minimum amount of water necessary to produce a workable mix.

D. Do not exceed maximum air content recommended by roof deck system manufacturer.

PART 3 EXECUTION

3.1 GENERAL: The following procedures are applicable to the majority of lightweight insulating concrete systems, the specific installation of each system must comply with the manufacturer's published recommendations and FM (Factory Mutual) approved procedures. If such procedures vary significantly from those specified below, submit specific procedures for review and acceptance by the Owner and Architect.

3.2 EXAMINATION

A. Verify existing conditions prior to beginning work. The applicator shall be responsible for the inspection and acceptance of the substrate as suitable for the installation of the insulation system.

B. Surfaces to receive insulating concrete shall be even, smooth, sound, free of loose material, and free from defects that might affect application.

1. Surface Finish:

a. Surface shall be bonded firmly and free from loose materials.

b. Screeded finish of surface shall be free from extreme roughness capable of interfering with proper bonding of roofing membrane and free from shrinkage and cracks.

2. Surface Dryness: Exposed surface shall look and feel substantially dry, and shall have a uniformly gray cement color.

C. To prevent damage to foam insulation board, install no more insulation board than can be covered with poured insulating concrete by end of day's work.

D. Examine substrates and conditions under which lightweight concrete work is to be performed and must notify Contractor and Architect in writing of unsatisfactory conditions.

1. Do not proceed with concrete work until unsatisfactory conditions have been corrected in a manner acceptable to installer.

E. Roof Curbs, Penetrations and Fixtures

1. Verify that curbs, vent stacks, and other roof fixtures have been raised in height as required for installation of lightweight concrete.

2. Installation of curbs, equipment supports, roof drains, framing for openings, and wood nailers shall be in place before application of material.

3. Installation of other work passing through fill or concealed shall be complete and accepted before starting the work.

4. Verify that roof drains, scuppers, and other roof penetrations and roof top equipment is protected.

3.3 EXAMINATION / PREPARATION OF SURFACES THAT REQUIRE PATCHING

A. Remove debris from the area and remove deteriorated roof deck material down to a sound substrate.

B. For improved bonding, moisten the existing lightweight insulating concrete surface with water or a 1:1 dilution of acrylic or PVA concrete bonding agent. The extent of moistening will depend on the nature of the surface to be repaired. Highly porous, dusty surfaces will require more preparation. If moistening is insufficient, the Zono-Patch will stiffen too quickly to finish.

3.4 INSTALLATION

A. Pumping: Pump concrete into place with approved equipment.

B. Mixing: Sufficient time to provide a consistent, thorough mix that will flow and screed to a smooth surface

C. Place 1/8" minimum slurry over deck surface; place insulation; use mix to fill holes and breaks.

D. Insulation Board: Place insulation board in the slurry coat.

1. Insulation board placement must be made within 30 minutes of slurry coat placement.

2. Place insulation board with joints staggered in a brick-like pattern, and tightly butted together, and placed to provides full contact of slurry to board,

causing the lightweight insulating fill to enter the locking keying openings in the Insulation Board. Under no circumstances shall the insulation board be laid dry on substrate. Remove loose boards and immediately re-grout.

E. Lightweight Insulating Fill: Within 4 hours of insulation board placement, place a minimum of 2" of lightweight insulating over the insulation board and screeded to an even surface.

F. Placement:

1. Install screeds as required to slope layout or as shown on the drawings.

2. After placing concrete, plane surface to a tolerance not exceeding 1/8" in 10' when tested with a 10' straightedge. Slope surfaces uniformly to drain as shown on drawings. Ensure that slopes indicated on the drawings are "finish" slopes, regardless of irregularities and deviations in the roof deck or substrate. No standing water will be allowed on the deck.

3. Install 1/2" per foot sloped crickets on the "high" side of roof top equipment curbs.

4. Ensure that slopes indicated on the drawings are "finish" slopes, regardless of irregularities and deviations in the roof deck or substrate. No standing water will be allowed on the deck.

G. Finishing

1. Remove high points and other surface defects which would telegraph through applied roofing systems.

a. Surface shall be bonded firmly and free from loose materials.

2. Finish top surface in acceptable condition to receive subsequent roofing application.

3.5 CURING

A. Cure in accordance with lightweight aggregate manufacturer's instructions. Spray apply manufacturer’s recommended curing compound over entire newly poured surface within 6 hours of installation.

B. Protect insulating concrete from excess evaporation of surface moisture.

C. During low humidity conditions, sprinkle water over concrete surface to aid hydration and curing.

3.6 FIELD QUALITY CONTROL

A. Unit Weight: check wet weight of concrete mixture hourly during placement operation.

B. Material Testing

1. Engage an independent testing laboratory acceptable to Architect to take samples and conduct tests to evaluate lightweight concrete. Do not use same testing service which has provided initial mix designs.

2. Testing: Make set of four (4) standard cylinders of each day's mix and test in accordance with ASTM C-495. When more than seventy-five (75) cubic yards of concrete are poured in one day, make a set of specimens of each seventy-five (75) yards.

3. Report test results to Architect, Owner, Contractor, and lightweight concrete producer within 24 hours of completion of each test.

4. Contractor will also engage an independent testing laboratory to conduct field testing of both the newly placed and existing lightweight insulating concrete prior to application of the new roofing membrane for compliance with the Florida Building Code. The results of these tests must be available before and utilized during the installation of the roof membrane system in regards to base sheet anchorage and deck ventilation required.

C. Drainage Test

1. Architect reserves the right to have the Contractor water test to verify drainage.

2. Should a section not drain within a period of fifteen minutes; low areas shall be cut out and re-poured and high areas cut back and refinished. Skim coats or over pours will not be allowed. Retest upon completion of corrections.

3.7 ADJUSTING

A. Repair deteriorated or defective work found at time of final deck inspection. Repair damages to deck.

3.8 CLEANING

A. Remove debris from work area. Clean, refinish or replace surfaces discolored or damaged by work.

3.9 PROTECTION

A. Prime contractor shall protect deck against damage until accepted by roofing applicator.

B. Where traffic must continue over exposed finished deck, protect deck using plywood sheathing.

3.10 SCHEDULE

A. General: Finish roof membrane installation shall commence within four (4) days after lightweight insulating concrete placement, base sheet, interplies and asphalt to be installed within seven (7) calendar days of pouring the lightweight concrete.

B. Lightweight concrete without roofing membrane on it shall be covered by use of plastic sheets.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Brick removal and replacement as necessary for repair and replacement of through-wall flashing as indicated by the drawings.

B. Seal all penetrations thru masonry.

C. Repointing mortar joints as selected on a unit price basis.

D. Repair of damaged masonry.

E. The extent of existing masonry restoration work is shown on the drawings.

1.2 RELATED SECTIONS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

B. Section 04 05 13.91 - Mortar and Masonry Grout

C. Section 07 62 00 - Sheet Metal Flashing and Trim.

D. Section 07 92 00 - Joint Sealers.

1.3 REFERENCES

A. ACI 530 - Building Code Requirements for Masonry Structures.

B. ACI 530.1 - Specifications For Masonry Structures.

C. IMIAC - International Masonry Industry All-Weather Council: Recommended Practices and Guide Specification for Cold Weather Masonry Construction.

D. IMIAC - International Masonry Industry All-Weather Council: Recommended Practices and Guide Specification for Hot Weather Masonry Construction.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide data on cleaning compounds and cleaning solutions.

C. Samples: Submit four samples of masonry units to illustrate color, to match existing.

D. Submit sealer manufacturer's instructions for application of water repellant and method of application.

1.5 MOCKUP

A. Provide mockup of repaired masonry.

B. Repair and repoint a masonry wall sized four (4) feet long by two (2) feet high, which includes mortar, accessories and wall openings.

C. Repeat, using same repair methods at up to three different panels, until acceptable.

D. Locate where directed.

E. Acceptable panel and method of procedure will become the standard for work of this section.

1.6 QUALITY ASSURANCE:

A. Perform Work in accordance with ACI 530 and ACI 530.1.

B. Maintain one copy of each document on site.

C. Restorer: Company specializing in masonry restoration with minimum three years documented experience.

D. Existing Conditions

1. Verify existing conditions, such as soundness of perimeter conditions, and wall thickness for length of anchoring services required and other visible conditions prior to Bidding.

2. Report conflicts and problems to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.

3. Replace or restore to original condition any materials or work damaged during construction.

4. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.

E. Restoration Specialist: Work must be performed by a firm having not less than 5 years successful experience in comparable masonry restoration projects and employing personnel

skilled in the restoration processes and operations indicated.

1.7 PRE-INSTALLATION CONFERENCE

A. Convene one week prior to commencing work of this section, under provisions of Section 01 31 00.

B. Require attendance of parties directly affecting work of this section.

C. Review conditions of installation, installation procedures, and coordination with related work.

1.8 DELIVERY, STORAGE AND HANDLING:

A. Carefully pack, handle, and ship masonry units and accessories strapped together in suitable packs or pallets or in heavy cartons. Unload and handle to prevent chipping and breakage.

B. Deliver other materials to site in manufacturer's original and unopened containers and packaging, bearing labels as to type and names of products and manufacturers.

C. Protect masonry restoration materials during storage and construction from wetting by rain, snow or ground water, and from staining or intermixture with earth or other types of materials.

D. Protect grout, mortar and other materials from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Keep containers tightly closed and away from open flames. Protect liquid components from freezing. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.

E. Do not repoint mortar joints or repair masonry unless air temperatures are between 40 degrees F (4 degrees C) and 80 degrees F (27 degrees C) and will remain so for at least 48 hours after completion of work.

F. Prevent grout or mortar used in repointing and repair work from staining face of surrounding masonry and other surfaces. Remove immediately grout and mortar in contact with exposed masonry and other surfaces.

G. Protect sills, ledges and projections from mortar droppings.

H. Repair existing masonry including replacing existing masonry with new masonry materials.

I. Rake out existing mortar from joints indicated to be repointed.

J. Repoint existing mortar joints of masonry indicated to be restored.

1.9 PROTECTION

A. Protect elements surrounding the work of this section from damage or disfiguration.

B. Immediately remove stains, efflorescence, or other excess resulting from the work of this section.

C. Protect roof membrane and flashing from damage. Lay 1/2 inch plywood on roof surfaces over full extent of work area and traffic route.

D. Provide sand or waterproof dams to divert flowing water to exterior and/or roof drains.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Maintain materials and surrounding air temperature to minimum 40 degrees F (5 degrees C) prior to, during, and 48 hours after completion of masonry work.

B. Hot Weather Requirements: IMIAC - Recommended Practices and Guide Specifications for Hot Weather Masonry Construction.

C. Do not sandblast or use any process which may create dust or dirt, when wind is over 10 mph (16 kph).

1.11 SEQUENCING

A. Sequence work under the provisions of Section 01 11 00

B. Perform repointing before cleaning masonry surfaces.

1.12 SCHEDULING

A. Schedule work under the provisions of Section 01 31 00.

B. Perform cleaning, washing, to exterior masonry between the hours of 7 am to 7 pm.

PART 2 PRODUCTS

2.1 MASONRY MATERIALS

A. Provide brick with color, surface texture and size to match existing brick work and with physical properties not less than existing units. The existing brick is a colored, utility size, precast concrete masonry unit as manufactured by A-1 Block Corporation, this product is not a stock item, and may therefore require additional production fees and scheduling allowances.

B. Provide mortar in compliance with section 04 05 13.91, match size, texture, color and

gradation of existing mortar as closely as possible.

2.2 CLEANING MATERIALS

A. Water for Cleaning: Clean, potable, free of oils, acids, alkalies, salts, and organic matter.

B. Brushes: Fiber bristle only.

C. Acidic Cleaner: Manufacturer's standard strength acidic masonry restoration cleaner composed of hydrofluoric acid blended with other acids including trace of phosphoric acid and combined with special wetting systems and inhibitors.

2.3 MORTAR MIXES - GENERAL

A. Measurement and Mixing: Measure cementitious and aggregate material in a dry condition by volume or equivalent weight. Do not measure by shovel, use known measure. Mix materials in a clean mechanical batch mixer.

B. Mixing Pointing Mortar: Thoroughly mix cementitious and aggregate materials together before adding any water. Then mix again adding only enough water to produce a damp, unworkable mix which will retain its form when pressed into a ball. Maintain mortar in this dampened condition for 1 to 2 hours. Add remaining water in small portions until mortar of desired consistency is reached. Use mortar within 30 minutes of final mixing; do not re-temper or use partially hardened material.

C. Mortar for Brick:

1. Portland Cement, ASTM, C 150-89, Type 1.
2. Hydrated Lime, ASTM C 207-88, Type S.
3. Aggregate for Mortar, ASTM C 144-89, except for joints less than 1/4" use aggregate graded with 100% passing the No. 16 sieve.
4. Water: Clean and potable.

D. For colored pigmented mortars use pre-mixed colored masonry cements of formulation required to produce matching color of existing, or if not indicated, as selected from manufacturer's standard formulations.

E. For matching mortar color use colored aggregate or metallic oxide pigments. The maximum quantity of metallic oxide pigments shall not exceed 10% of the cement content by weight.

F. Organic colors and paint pigments shall not be used.

2.4 ACCESSORIES FOR BRICK WALL

A. Copper Flashing for Masonry:

1. Provide concealed copper fabric flashing, seven (7) ounces per square foot copper

bonded to and between two (2) layers of asphalt impregnated fiberglass fabric, as shown by details to be built into masonry.

2. Acceptable manufacturers and products include the following:

a. AFCO Products, Inc. copper fabric, for flashing fully concealed in masonry.
b. WASCO/YORK copper fabric, for flashing fully concealed in masonry.
c. Fabricate thru-wall copper flashing with deformations in both directions for integral mechanical mortar bond. Fabricate and seal joints as detailed.

B. Weep Hole Filler/Vent

1. Provide polypropylene vented filler at head joint weep holes with honeycomb passage configuration the full height and depth of the head joint at 24 inches on center maximum.

2. Acceptable manufacturers and products include Hohmann & Banard, Inc. #QV - Quadro-Vent or equivalent, color: gray.

C. Separator Sheet: #15 Roofing Felt

2.5 SEALANTS AND RELATED MATERIALS

A. Sealant for Window Perimeter: One part, gun grade polyurethane sealant.

B. Joint Primer/Sealer: Provide type of joint primer/ sealer recommended by sealant manufacturer for joint surfaces to be primed or sealed.

C. Sealant Backer Rod: Provide compressible rod stock of polyethylene foam, polyurethane foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable non-absorptive material as recommended by sealant manufacturer for back-up of and compatibility with sealant. Where used with hot-applied sealant, provide heat-resistant type which will not deteriorate by sealant application temperature as indicated.

2.6 OTHER MATERIALS: All other materials, not specifically described but required for a complete and proper installation of wall shall be new, first quality of their respective kinds and subject to the approval of the Architect.

2.7 CHEMICAL CLEANING SOLUTIONS:

A. General: Unless otherwise indicated, dilute chemical cleaning materials with water to produce solutions of concentration indicated but not greater than that recommended by chemical cleaner manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surfaces to be cleaned and restored are ready for work of this section.

3.2 PREPARATION

A. Carefully remove and store fixtures, fittings, finishing hardware and accessories.

B. Close off, mask and board up areas, landscaping, materials, and surfaces not receiving work of this section to protect from damage.

C. Construct weatherproof partitions to close off occupied areas.

3.3 REBUILDING

A. Remove existing masonry as necessary and as detailed to allow repair and replacement of the existing through-wall flashing system. Cut out masonry with care in a manner to prevent damage to any adjacent remaining materials.

B. Cut out any damaged and deteriorated masonry with care in a manner to prevent damage to any adjacent remaining materials.

C. Shore, needle and/or support structure as necessary in advance of cutting out units.

D. Cut away loose or unsound adjoining masonry as directed to provide firm and solid bearing for new work.

E. Install through-wall sheet metal and copper fabric flashings as detailed by the drawings.

F. Mortar Mix: Colored and proportioned to match existing work.

G. Install built in masonry work to match and align with existing, with joints and coursing true and level, faces plumb and in line. Build in all openings, weep hole vents, accessories and fittings.

H. Install new or salvaged brick to replace broken brick. Fit replacement units into bonding and coursing pattern of existing. If cutting is required, use motor driven saw designed to cut masonry with clean, sharp unchipped edges.

I. Lay replacement brick with completely filled bed, head and collar joints. Butter ends with sufficient mortar to fill head joints and shove into place. Wet clay brick which have ASTM C 67 initial rates of absorption (suction) of more than 30 grams per sq. in. per minute. Use wetting methods which ensure that units are nearly saturated but surface dry when laid. Maintain joint width for replacement units to match existing.

J. Tool exposed mortar joints in repaired areas to form weather-resistant “CONCAVE” or “GRAPEVINE” joints.

K. Repoint new mortar joints in repaired area to comply with requirements for repointing existing masonry, except rake out joints before mortar sets.

L. Provide weepholes in the head joints of the same course of masonry bedded in the flashing mortar. Height of weepholes shall be equal to that of one brick coursing, install polypropylene weep hole filler/vent.

3.4 REPOINTING EXISTING BRICK MASONRY

A. Joint Raking

1. Cut or rake out mortar from joints to a depth of not less than 1/2" nor less than that required to expose sound, unweathered mortar.

2. Remove mortar from masonry surfaces within raked out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum or flush joints to remove dirt and loose debris.

3. Do not spall edges of masonry units or widen joints. Replace any masonry units which become damaged.

4. Cut out old mortar with motor driven saw, unless otherwise indicated.

B. Joint Pointing

1. Rinse masonry joint surfaces with water to remove any dust and mortar particles. Time application of rinsing so that at time of pointing, excess water has evaporated or run off, and joint surfaces are damp but free of standing water.

2. Apply bonding agent as recommended by the pointing mortar manufacturer, apply first layer of pointing mortar to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 1/2" until a uniform depth is formed. Compact each layer thoroughly and allow to become thumbprint-hard before applying next layer.

3. Where existing bricks have rounded edges, recess final layer slightly from face. Take care not to spread mortar over edges onto exposed masonry surfaces, or to featheredge mortar.

4. When mortar is thumbprint-hard, tool joints to "CONCAVE" or “GRAPEVINE” configuration, unless otherwise indicated. Remove excess mortar from edge of joint

by brushing.

5. Cure mortar by maintaining in a damp condition for not less than 72 hours.

3.5 CLEANING EXISTING MASONRY

A. Low Pressure Steam Cleaning: Apply pressure to masonry surfaces at all locations, maintaining uniform depth and surface texture throughout.

3.6 CLEANING NEW MASONRY

A. Verify mortar is fully set and cured.

B. Clean surfaces and remove large particles with wood scrapers, brass or nylon wire brushes.

C. Use acid solution mixed with water in accordance with manufacturer's instructions. Apply acid solution and scrub masonry with stiff fiber brushes. Do not scrub the mortar joints.

D. Protect area below cleaning operation and keep masonry soaked with water and flushed free of acid and dissolved mortar continuously for duration of cleaning.

E. Before solution dries, rinse and remove acid solution and dissolved mortar, using clean, pressurized water.

3.7 AGING

A. Rub in new masonry work to match, as close as possible, adjacent original work.

B. Use carbon black in small amounts, rubbing in well with medium bristle brush.

C. After each application, dust off surplus and wash down with low pressure hose. Allow surface to dry before proceeding with succeeding applications.

D. Continue process until acceptance.

3.8 CLEANING

A. As work proceeds and on completion, remove excess mortar, smears, droppings.

B. Clean surrounding surfaces.

3.9 SCHEDULE

A. Brick: Clean with solution, rinse with cold water.

3.10 PREPARATION:

A. General: Comply with recommendations of manufacturers of chemical cleaners for protecting building surfaces against damage from exposure to their products.

B. Protect glass, unpainted metal trim and polished stone from contact with chemical cleaners by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape. Apply masking agent to comply with manufacturer's recommendations. Do not apply liquid masking agent to painted or porous surfaces.

C. Protect unpainted metal from contact with chemical cleaners by covering them either with liquid strippable masking agent or polyethylene film and waterproof masking tape.

3.11 FINAL CLEANING

A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter using stiff nylon or bristle brushes and clean water, spray applied at low pressure.

B. Use of metal scrapers or brushes will not be permitted.

C. Use of acid or alkali cleaning agents will not be permitted.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Mortar and grout for masonry wall construction and repair.

B. Related Sections
1. Section 01 40 00 - Quality Requirements / References
2. Section 04 01 20.91 – Masonry Restoration (Rebuilding) and Cleaning.

1.2 REFERENCES

A. ACI 530 - Building Code Requirements for Masonry Structures.

B. ASTM C91 - Masonry Cement.

C. ASTM C144 - Aggregate for Masonry Mortar.

D. ASTM C150 - Portland Cement.

E. ASTM C207 - Hydrated Lime for Masonry Purposes.

F. ASTM C270 - Mortar for Unit Masonry.

G. ASTM C476 - Grout for Masonry.

1.3 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Include design mix, indicate whether the Proportion or Property specification of ASTM C270 is to be used, required environmental conditions, and admixture limitations.

C. Reports: Submit reports on mortar indicating conformance of mortar to property requirements of ASTM C270.

D. Reports: Submit reports on grout indicating conformance of component grout materials to requirements of ASTM C476.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Submit manufacturer's installation instructions under provisions of Section 01 33 00.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 530 and ACI 530.1.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect, and handle products to site under provisions of Section 01 60 00.

B. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Maintain materials and surrounding air temperature to minimum 50 degrees F prior to, during, and 48 hours after completion of masonry work.

1.7 PROJECT CONDITIONS

A. Existing Conditions:
1. Verify existing conditions, such as soundness of substrate conditions, and existing adjacent conditions to remain unchanged, as well as varying deck and wall thickness for length of anchoring services required and other visible conditions prior to bidding.
2. Report conflicts or problems to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.
3. Replace or restore to original condition any materials or work damaged during construction.
4. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.

PART 2 PRODUCTS

2.1 MATERIALS

A. Refractory Mortar: ASTM C 199

B. Mortar Aggregate: ASTM C144, standard masonry type

C. Hydrated Lime: ASTM C207, Type S

2.2 MORTAR MIXES

A. Mortar For Load Bearing Walls and Partitions: ASTM C270, Type S using the Proportion specification.

B. Mortar For Non-Load Bearing Walls and Partitions: ASTM C270, Type S using the Proportion specification.

2.3 MORTAR MIXING

A. Thoroughly mix mortar ingredients in accordance with ASTM C270 in quantities needed for immediate use.

B. Maintain sand uniformly damp immediately before the mixing process.

C. Add admixtures in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.

D. If water is lost by evaporation, re-temper only within two hours of mixing.

E. Use mortar within two hours after mixing at temperatures of 90 degrees F, or two-and-one-half hours at temperatures under 40 degrees F.

2.4 MIX TESTS

A. Test mortar and grout in accordance with Section 01 40 00.

B. Testing of Mortar Mix: In accordance with ASTM C270.

PART 3 EXECUTION

3.1 EXAMINATION

A. Request inspection of areas to be grouted.

3.2 PREPARATION

A. Apply bonding agent to existing concrete surfaces.

3.3 INSTALLATION

A. Install mortar in accordance with ASTM C 270

B. Work grout into masonry cores and cavities to eliminate voids.

C. Do not install grout in lifts greater than 16 inches, two CMU courses without consolidating grout by rodding.

D. Do not displace reinforcement while placing grout.

E. Remove excess mortar from grout spaces.

3.4 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 01 40 00.

B. Test and evaluate mortar in accordance with ASTM C780.

C. Test and evaluate grout in accordance with ASTM C1019.

D. Test mortar and masonry units to ASTM C1072; test in conjunction with masonry unit sections specified.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Removal and reinstallation of previously installed shop fabricated ferrous metal wall ladders, perimeter railings, and roof accessory supports.

B. Field modification of previously installed shop fabricated ferrous metal wall ladders, perimeter railings, and roof accessory supports.

C. Fabrication and installation any miscellaneous ferrous metal supports and/or items as defined by the project documents.

D. Fabrication and installation any miscellaneous mill finished aluminum supports and/or items as defined by the project documents.

E. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division - 1 Specification sections, apply to work of this section.

1.2 RELATED SECTIONS

A. Section 07 62 00 - Sheet Metal Flashing & Trim

B. Section 09 96 56 - Protective Coating for Exterior Metal

C. Section 09 91 13 - Painting: Paint finish.

1.3 REFERENCES

A. ANSI A14.3 - Ladders, Fixed, Safety Requirements.

B. ASTM A 36 - Structural Steel.

C. ASTM A 123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

D. ASTM A 153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

E. ASTM A283 - Carbon Steel Plates, Shapes, and Bars.

F. ASTM A 307 - Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

G. ASTM A 446/A - Specification for Steel Sheet Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.

H. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.

I. ASTM A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

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

K. ASTM B210 - Aluminum-Alloy Drawn Seamless Tubes.

L. ASTM B211 - Aluminum-Alloy Bar, Rod, and Wire.

M. ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.

N. AWS A2.0 - Standard Welding Symbols.

O. AWS D1.1 - Structural Welding Code.

P. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.

1.4 DESCRIPTION OF WORK:

A. Definition: Metal fabrications include items made from iron and steel shapes, plates, bars, strips, tubes, pipes and castings which are not a part of structural steel or other metal systems specified elsewhere.

B. Types of work in this section include metal fabrications for:

1. Wall mounted ladders.
2. Perimeter wall mounted railings.
3. Roof equipment supports and miscellaneous items.

1.5 QUALITY ASSURANCE:

A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.

B. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

1.6 SUBMITTALS FOR REVIEW

A. Section 01 33 00 - Submittals: Procedures for submittals.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

C. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

1.7 QUALIFICATIONS

A. Prepare Shop Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Florida.

B. Welders Certificates: Submit under provisions of Section 01 40 00, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

C. Shop Drawings: Submit shop drawings for fabrication and erection of miscellaneous metal fabrications. Include plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor and bolt installation by others.

1.8 JOB CONDITIONS

A. Existing Conditions

1. This project involves metal fabrication work on existing building(s). Verify existing conditions and other fabrication visible conditions prior to bidding.

2. Report conflicts and problems to the Architect prior to bidding for resolution. Failure to report these conflicts and problems places the responsibility on the Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.

3. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.

PART 2 PRODUCTS

2.1 FERROUS METALS

A. Metal Surfaces, General: For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.

B. Steel Plates, Shapes and Bars: ASTM A 36.

C. Galvanized Structural Steel Sheet: ASTM A 446, of grade required for design loading. Coating designation shall be G90.

D. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails.

E. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers and shims as

required, hot-dip galvanized, ASTM A 153.

2.2 MATERIALS - ALUMINUM

A. Extruded Aluminum: ASTM B221, Aluminum Alloy 6061, Temper T6 or Alloy 6063, Temper T5.

B. Sheet Aluminum: ASTM B209-90, Alloy 3003, Temper H14.

C. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210, Aluminum Alloy 6061, Temper T6 or Alloy 6063, Temper T5.

D. Aluminum-Alloy Bars: ASTM B211, Aluminum Alloy 6061, Temper T6 or Alloy 6063, Temper T5.3

E. Bolts, Nuts, and Washers: Stainless steel.

F. Welding Materials: AWS D1.1; type required for materials being welded.

2.3 FASTENERS

A. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.

B. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.

C. Lag Bolts: Square head type, FS FF-B-561.

D. Machine Screws: Cadmium plated steel, FS FF-S-92.

E. Wood Screws: Flat head carbon steel, FS FF-S-111.

F. Plain Washers: Round, carbon steel, FS FF-W-92.

G. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.

H. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as required.

I. Lock Washers: Helical spring type carbon steel, FS FF-W-84.

2.4 GROUT: Non-Shrink Non-Metallic, Pre-mixed, factory packaged, non-staining, non-corrosive, non-gaseous grout. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.

2.5 GALVANIZING REPAIR PAINT: High zinc dust content paint for re-galvanizing welds in galvanized steel, complying with the Military Specifications MIL-P-21035 (Ships) or SPC-Paint-20.

2.6 FABRICATION, GENERAL

A. Workmanship: Use materials of size and thickness indicated or, if not indicated, as required to produce strength and durability in finished product for use intended. Work to dimensions shown or accepted on shop drawings, using proven details of fabrication and support. Use type of materials shown or specified for various components of work.

B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise shown. Form bent metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

C. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.

D. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type shown or, if not shown, Phillips flat-head (countersunk) screws or bolts.

E. Provide components for anchorage of the fabrications of type shown, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.

F. Fit and shop assemble items in largest practical sections, for delivery to site.

G. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.

H. Galvanizing: Provide a zinc coating for those items shown or specified to be galvanized, as follows:

1. ASTM A 153-82 for galvanizing iron and steel hardware.
2. ASTM A 123 for galvanizing rolled, pressed and forged steel shapes, plates, bars and strip 1/8" thick and heavier.
3. ASTM A 386 for galvanizing assembled steel products.

I. Fabricate joints which will be exposed to weather in a manner to exclude water or provide weep holes where water may accumulate.

J. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

2.7 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.1 PREPARATION:

A. Field Measurement: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.

B. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors, which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

3.2 INSTALLATION:

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction: including, threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts with plate washers, lag bolts, wood screws and other connectors as required. Field verify existing conditions for determining proper anchorage.

B. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry or similar construction.

C. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dipped galvanized after fabrication, and are intended for bolted or screwed field connections.

D. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

E. For hollow masonry anchorage, use toggle bolts having square heads, unless directed otherwise by the specific project details.

F. For galvanized surfaces: Clean field welds, bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

G. Paint all new metal fabrications which may be visible to the public with a protective coating as defined by section 09 91 13, color to match the adjacent / surrounding single-ply roofing membrane.

3.2 The following Schedule is a list of principal items only. Refer to Drawing details for items not specifically scheduled.

Roof Top Equipment

1. Rooftop Equipment Supports and Stands.
2. Antenna Support Pipe with Weatherhead.
3. Satellite Antenna Support Stand and Stands.
4. Wall Mounted Support Brackets for Light Fixtures.
5. Deck Mounted Support Stands for Light Fixtures

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Roof curbs and curb extensions.

B. Roof perimeter nailers, blocking and trim.

C. Preservative treatment of wood.

D. Miscellaneous framing and sheathing.

1.2 RELATED SECTIONS

A. Section 01 22 00 - Unit Prices.

B. Section 07 31 13.13 - Fiberglass Shingles.

C. Section 07 62 00 - Sheetmetal Flashing and Trim.

1.3 REFERENCES

A. ALSC - American Lumber Standards Committee: Softwood Lumber Standards.

B. APA: American Plywood Association.

C. AWPA (American Wood Preservers Association) C1 - All Timber Products Preservative Treatment by Pressure Process.

D. NFPA: National Forest Products Association.

E. SPIB: Southern Pine Inspection Bureau.

1.4 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide technical data on wood preservative materials and application instructions.

C. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with the following agencies:

1. Lumber Grading Agency: Certified by ALSC.
2. Plywood Grading Agency: Certified by APA.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver to site, store, protect, and handle products under provisions of Section 01 60 00.

B. Protect materials from physical damage. Store materials on raised platform and protect from weather.

1.7 PROJECT CONDITIONS

A. Existing Conditions

1. Verify existing conditions, such as soundness of perimeter conditions, and varying deck and wall thickness for length of anchoring surfaces required and other visible conditions prior to bidding. Nailers height indicated on the details may vary from actual requirement. Coordinate nailer height with lightweight concrete supplier prior to bidding.

2. Report conflicts or problems to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.

3. Replace or restore to original condition any materials or work damaged during construction.

4. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.

5. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.

6. The bulk of the carpentry work for this project is the correction of the roof edge condition to provide a uniform 3:12 roof slope as indicated by the details, the contractor must review and be familiar with this condition prior to bidding.

PART 2 PRODUCTS

2.1 MATERIALS

A. Lumber Grading Rules: NFPA and SPIB.

B. Blocking, Studding, Nailers and Curb Extensions:

1. Southern Yellow Pine, No. 2 grade minimum, 19 percent maximum moisture content, pressure preservative treated.

2. Nominal sizes are shown or specified, except as shown by actual dimensions.

C. Moisture Content: Seasoned lumber with 19 percent maximum moisture content at time of dressing and complying with dry size requirements of PS-20, unless otherwise specified.

2.2 SHEATHING MATERIALS

A. Plywood Sheathing: APA Rated Sheathing, Thickness: 5/8" (unless noted otherwise on drawings), CDX Grade, pressure preservative treated at all locations other than roof deck, (non-pressure-treated roof deck sheathing).

2.3 ACCESSORIES

A. Fasteners and Anchors:

1. Fasteners: Zinc electroplated steel for high humidity and treated wood locations, unfinished steel elsewhere. Fastener size and penetrations into various substrates should be as follows:

a.	Wood:	1/4" screw x 2" minimum penetration.
b.	Concrete:	1/4" "tapcon" x 1-1/2" minimum penetration or 1/4" “fluted nail” x 1-1/2" minimum penetration.
c.	CMU / Brick:	1/4" “zamac” expanding drive pin type fastener with stainless steel pin x 1" minimum penetration into masonry itself, (allow for other material thicknesses, such as stucco when selecting length).
d.	Metal Deck:	1/4" screw with ½" min. penetration through deck.

2. Construction Adhesive: Cartridge "gun" dispensed structural construction adhesive, such as "Liquid Nails" or equal which complies with ASTM D3498-91.

4. Powder driven fasteners are not allowed.

2.4 FACTORY WOOD TREATMENT

A. Wood Preservative (Pressure Treatment): AWPA Treatment C1 and AWPB standard LP-2 using water borne preservative with 0.25 percent retainage.

2.5 MODIFIED BITUMEN “DRY-IN” MEMEBRANE MATERIAL

A. Material: Rubberized (SBS) asphalt bonded to a polyester reinforcing mat, 40 mil (1 mm) minimum total thickness, single-sided, self-adhesive, with a strippable treated release paper. Surface to be non-skid surface of mineral granules, fabric scrim and/or sanded.

B. Acceptable Products include:

1. Protecto Wrap Co. Rain Proof - 40
2. Architect approved equal product.

PART 3 EXECUTION

3.1 INSTALLATION

A. General:

1. Discard material with defects which might impair quality of work and units which are too small to fabricate work with minimum joints or optimum joint arrangement.

2. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted.

3. Securely attach carpentry work to substrate by anchoring and fastening as shown or as required by recognized standards. Countersink fastener heads on exposed carpentry work.

4. Use fasteners and anchorages as indicated. Make tight connections between members. Install fasteners without splitting of wood; pre-drill as required.

3.2 NAILERS AND CURB EXTENSIONS

A. Set members level and plumb, in correct position.

B. Construct curb members of single pieces.

C. Coordinate curb extensions and installation of wood nailers with roof construction work.

D. Cants, Edging and Blocking:

1. Provide wherever shown and where required for screeding or attachment of other work.

2. Form to shapes as shown and cut as required for true line and level on work to be attached. Coordinate location with other work involved.

3. Attach to substrates as required to support applied loading. Countersink bolts and nuts with washers flush with surfaces, unless otherwise shown.

4. Where new members are doubled, ends shall be lapped and thoroughly spiked to each other and to bearing members.

5. Where new members bear on concrete, securely fastened to same by bolts or lag screws on centers as called for on drawings staggered. Provide heads of all bolts or lag screws with large-head washers and countersink if required by finish conditions.

6. Round corners of wood plates where flashing occurs.

7. Use ring shanked nails, except as otherwise indicated. Make tight connections between members. Install fasteners without splitting of wood; pre-drill as required.

8. Holes drilled oversized or wallered out, shall be re-drilled.

9. Do not install wood nailers more than one day in advance from installation of roofing. For earlier installation of wood nailers than stated above, obtain prior approval from the Architect.

10. Install self-adhesive modified bitumen dry-in membrane over all wood nailers and sheathing.

E. Plywood Sheathing:

1. Install sheathing properly framed to required lines, level and rigidly secured in place.

2. Cut sheathing sections to fit. Leave 1/8" clearance between panels at side laps. Cover sheathing with self-adhesive modified bitumen dry-in membrane and seal or properly lap top horizontal edge.

3.3 SCHEDULES

A. Roof Perimeter Nailers: See project manual details for sizes and locations.

B. Curbs and Extensions: See project manual details and plans for wood sizes and locations.

C. Plywood Sheathing: See project manual details and plans for locations.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Removal of existing roofing system in preparation for a new roof membrane system.

1.2 RELATED SECTIONS

A. Section 02 41 19 - Selective Demolition.

B. Section 02 82 13 - Hazardous Material Abatement.

C. Section 07 01 50.63 - Repair Specification for Built-up Asphalt and Coal Tar Roofing Systems.

D. Section 07 53 23 - Elastomeric Sheet Roofing

E. Section 07 57 13 - Foam Roofing.

F. Section 07 01 50.62 – Thermoplastic Single-ply

1.3 UNIT PRICE - MEASUREMENT AND PAYMENT

A. New Insulation to Match Existing:
1. Basis of Measurement: By the square (foot).
2. Basis of Payment: Includes removal of existing insulation, replace with new insulation of same thickness.

B. Repair Existing Deck:
1. Basis of Measurement: By the square [foot] Basis of Payment: Includes repairing existing deck surface with covering sheet metal. replacing decking with new material of same thickness.

1.4 REFERENCES

A. ASTM C208 - Insulating Board (Cellulosic Fiber), Structural and Decorative.

1.5 QUALIFICATIONS

A. Materials Removal Firm: Company specializing in performing the work of this Section with minimum 5 years of documented experience or approved by manufacturer.

1.6 PRE-INSTALLATION CONFERENCE

A. Attend conference specified in Section 01 31 00.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Do not remove existing roofing membrane when weather conditions threaten the integrity of the building contents or may damage the roofing underlayment surface.

B. Maintain continuous temporary protection prior to and during installation of new roofing system.

1.8 SCHEDULING

A. Schedule work under the provisions of Division 01.

B. Schedule work to coincide with commencement of installation of new roofing system.

C. Remove only existing roofing materials that can be replaced with new materials as the weather will permit.

1.9 COORDINATION

A. Coordinate work under provisions of Division 01.

B. Coordinate the work with other affected mechanical and electrical work associated with roof penetrations.

PART 2 PRODUCTS

2.1 MATERIALS

A. Temporary Protection: Sheet polyethylene, provide weights to retain sheeting in position.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing site conditions under provisions of Division 01.

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

3.2 PREPARATION

A. Sweep roof surface clean of loose material. Remove loose refuse and dispose off site.

3.3 MATERIALS REMOVAL

A. Remove metal counter flashings.

B. Scrape roofing membrane surface without causing serious damage to existing deck surface.

C. Remove roofing membrane flashing down to existing curb. Cut roof membrane as indicated per detail..

3.4 TEMPORARY PROTECTION

A. Protect finished Work under provisions of Division 01.

B. Provide temporary protective sheeting over uncovered deck surfaces.

C. Turn sheeting up and over parapets and curbing. Retain sheeting in position with weights or temporary fasteners.

D. Provide for surface drainage from sheeting to existing drainage facilities.

E. Do not permit traffic over unprotected or repaired deck surface.

3.5 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Division 01.

B. Inspection will identify the exact limits to material removal.

C. Testing will identify the exact condition of existing materials and their reuse, repair or removal.

D. Test Reports: Indication of existing insulation moisture content.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Connection of new flashing to existing single-ply thermoplastic roofing system membrane where new construction abuts existing construction as indicated on the drawings.

B. Extension of existing single-ply thermoplastic roofing system membrane onto limited areas of new construction as indicated on the drawings.

C. Miscellaneous single-ply thermoplastic roofing system membrane repairs.

1.2 RELATED SECTIONS

A. Section 06 10 53 - Rough Carpentry: Wood blocking and nailers for roofing substrate profiles.

B. Section 07 01 50.63 - Built-up and Modified Bitumen Roofing Repairs.

C. Section 07 62 00 - Sheet Metal Flashing and Trim

D. Section 07 65 00 - Roof Penetration Flashing.

E. Section 07 72 00 - Roof Accessories

F. Section 07 92 00 - Joint Sealers.

1.3 REFERENCES

A. ASTM D 471-79 - Test Methods For The Effects of Rubber- Liquid Properties

B. ASTM D 751-89 - Test Method of Coated Fabrics

C. ASTM D 882-90 - Test Method for Tensile Properties of Thin Plastic Sheathing

D. ASTM D 1204-84 - Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature

E. ASTM D 2136-84 - Test Method for Coated Fabricates -Low Temperature Bend Test.

F. ASTM D 2240-86 - Test Method for Rubber Property

G. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.

H. FM (Factory Mutual) - Roof Assembly Classifications.

I. NRCA (National Roofing Contractors Association) - Roofing and Waterproofing Manual.

J. ULI (Underwriters Laboratories, Inc.) - Fire Hazard Classifications.

K. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

L. FS HH-I-1972/Gen, FS HH-I-1972/3 - Polyisocyanurate Insulation Board.

M. NFPA 255 - Test of Surface Burning Characteristics of Building Materials.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide membrane repair materials Product Data, have the Contractor submit material samples only when the Construction Manager requires such.

C. Manufacturer's Installation Instructions: Indicate special precautions required for seaming the membrane.

D. Manufacturer's Field Reports: Submit under provisions of this Section, article 1.6/C/2.

E. Manufacturer Notifications: (If Applicable) Submit repair notification to the manufacturer of existing roof system in accordance with that manufacturer’s warranty requirements. Failure to notify manufacturer places remainder of warranty obligations on the Repair Contractor.

1. Manufacturer's Installation Instructions: Indicate special precautions required for seaming the membrane for roofs to maintain a current warranty requirements.

2. Manufacturer's Certificate: Certify that products installed on warranted roofs meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual except where NRCA details differ from the project manual details.

B. Perform Work in accordance with the existing roof manufacturer’s published or written details and recommendations and the project details, the most stringent shall govern.

C. Maintain one copy of each document on site.

D. Preliminary (Pre-Product Submittal) Roofing Conference: As soon as possible after award of roofing work, meet with roofing installer, roofing membrane manufacturer, flashing and sheet metal contractor, installers of substrate construction (decks), primary mechanical, electrical, and plumbing contractors other installers of rooftop work, Design Professional, Owner, and

representatives of other entities directly concerned with performance of roofing system including (as applicable) Owner's insurers and test agencies.

1. Review and discuss:

    a. Coordination with other trades
    b. Roofing and overall construction schedule
    c. Governing regulations
    d. Insurance requirements
    e. Certification requirements
    f. Submittal requirements
    g. Warranty requirement
    h. Availability of materials, equipment and personnel
    i. Staging
    j. Inspections
    k. Testing
    l. Weather related issues (rainfall will not be considered justification for project delays)
    m. Roofing system protection
    n. General roofing application procedures

2. The Design Professional shall record discussions, including agreement or disagreement on matters of significance; furnish copy of recorded discussions to each participant. If disagreements concerning contract requirements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.

E. Pre-Application Roofing Conference: Approximately two weeks prior to scheduled commencement of roofing installation and associated work, meet at project site with roofing membrane installer, roofing membrane manufacturer, flashing and sheet metal contractor, primary mechanical, electrical and plumbing contractors, installers of deck or substrate construction to receive roofing work, installers of rooftop units and other work in and around roofing that must precede or follow roofing work, Design Professional, Owner, and other representatives directly concerned with performance of the work, including (where applicable) Owner's insurers, test agencies, and governing authorities.

1. Review and Discuss:

    a. Outstanding submittals and resolution thereof
    b. Roofing methods and procedures
    c. Roofing and overall construction schedule
    d. Availability of materials, equipment and personnel
    e. Staging
    f. Inspections
    g. Testing
    h. Weather related issues:

        1) Review weather and forecasted weather conditions

2) Procedures for coping with unfavorable conditions.
3) Night seals, water cutoffs, sealing of all penetrations and terminations.
4) Liabilities associated with potential water intrusion.
5) Rainfall will not be considered justification for project delays.

2. Tour representative areas of roofing substrates (decks). Inspect and discuss:

a. Deck condition
b. Roof drain installations
c. Curbs
d. Penetrations (existing and planned)
e. Installation of nailers and blocking (coordination with insulation)
f. Abutting walls (parapets, penthouses, girder beams, other)
g. Any other preparatory work performed by other trades
h. Significant deviations from contract drawings.

3. Substrate Acceptance: The roofing membrane manufacturer and installer shall provide written acceptance of substrate conditions prior to start of roofing membrane application. Start of insulation and roofing membrane application will be considered full acceptance of substrate conditions by the roofing membrane manufacturer and installer.

4. The Design Professional shall record discussions of conference, including decisions and agreements (or disagreements) reached, and furnish copy of record to each party attending. If disagreements concerning contract requirements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.

F. Non-Asbestos Containing Materials: Provide only roofing materials which are completely free of asbestos.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with five years current documented experience. Materials provided for repairs shall be identical to the existing roofing materials in place, or be certified as compatible by the original manufacturer for use with the existing materials in place.

B. Applicator: A single installer specializing in performing the work of this section with three current years documented experience and approved in writing by system manufacturer a minimum of 10 days prior to Bidding.

1. Original Manufacturer's Warranty Period: If the existing roof system is still within the original manufacturer's warranty period, all repairs and modifications to the roof system shall be done by an applicator approved in writing by the original manufacturer a minimum of 10 days prior to Bidding.

2. Original Applicator's Warranty Period: If the existing roof system is still within the original applicator's warranty period, all repairs and modifications to the roof system shall be done by an applicator approved in writing by the original applicator a minimum of 10 days prior to Bidding.

C. Manufacturer's Field Inspection and Services

1. Manufacturer of the roofing materials shall provide qualified personnel to observe field conditions of surfaces and installation, quality of workmanship as applicable, and to make appropriate recommendations.

2. Representative shall submit written reports within three days to Design Professional listing observations, recommendations and other related comments.

1.7 CERTIFICATION

A. Materials: For each material specified with a standard or reference material designation, certification labels shall appear on each package of bulk-shipments to project with certificate of compliance.

B. Older roof systems no longer under warranty: Materials provided for repairs shall be of the same type as the existing roofing materials in place, and be certified as compatible for use with the existing materials in place by the manufacturer/ supplier of the repair materials.

C. Installer: Provide two copies of all certification to Owner prior to beginning roofing work.

D. The Contractor shall have pull tests conducted on the job site with the specified fasteners to determine the pull-out resistance of the existing deck. Submit the data to the Owner.

1.8 NOTIFICATION TO OWNER

A. Twenty-four hours prior to the commencement of scheduled repairs, send written notification to Owner regarding time Contractor's crew will be present on site. Indicate duration or time to perform repairs. Notification by Contractor is not required for emergency roof repairs. Notifications may be faxed to the Owner.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver to site, store, protect, and handle products under provisions of Section 01 60 00.

B. Deliver material in manufacturer's original, unopened containers with manufacturer's labels intact and legible.

C. Deliver material requiring fire resistance classification to the job with labels attached and packaged as required by labeling service.

D. Store and handle materials to protect them from.

1. Moisture, whether due to precipitation, or condensation.
2. Damage by construction traffic.
3. Temperatures over 110 degrees F or below 40 degrees F.
4. Direct sunlight.
5. Mud, dust, sand, oil and grease.

E. Comply with fire, safety, and environmental protection regulations.

F. Take special precautions against traffic on roofing when ambient temperature is above 80 degree F. Avoid heavy traffic on the work during installation.

1.10 PROJECT CONDITIONS

A. Environmental Requirements:

1. Proceed with roofing work only when existing and forecast weather conditions will permit work to be performed in accordance with manufacturers' recommendations and warranty requirements.

2. Comply with manufacturer's recommended minimum and maximum installation temperatures. Do not proceed with roof installation during threatening or unfavorable weather conditions. If roofing work cannot be performed, provide the necessary protection to keep building watertight.

   a. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during the same day.

   b. Do not apply roofing membrane when ambient temperature is below 40 degrees Fahrenheit (F).

3. Rainfall consistent with the historical averages shall be anticipated in the project schedule and will not be given consideration for delay claims.

   a. Historical average for the days on which rainfall would interfere with performance of roofing work is based on the NOAA records from August 1996 through July 2002. Rainfall of 0.10 inch or more was designated as a historical rainday. Raindays to be anticipated within the project planning and schedule for each month are as follows:

1)	January:	3.0 days	7)	July:	10.5 days
2)	February:	3.5 days	8)	August:	13.5 days

3)	March:	3.5 days	9)	September:	13.0 days
4)	April:	3.5 days	10)	October:	9.5 days
5)	May:	7.0 days	11)	November:	3.0 days
6)	June:	12.5 days	12)	December:	5.0 days

b. Verified raindays in excess of the historical average for each month may be considered as a basis for award of a time extension for completion of the work by the Contractor. Extension of time only may be awarded, additional costs for delay of work due to weather delays will not be considered.

B. Existing Conditions:

1. Contractor shall accept the conditions of the job site as they exist and perform his work accordingly. Any adverse condition which might affect the performance of the work described in these specifications must be brought to the attention of the Design Professional in writing immediately upon its discovery and no later than when it could have reasonably been expected to be observed or discovered.

2. Contractor shall be held responsible for protecting all adjacent construction from damage. Existing structures or installations damaged by operations connected with this work shall be replaced or repaired by the Contractor to the satisfaction of the Design Professional and at no additional cost to the Owner.

3. Contractor shall field verify all measurements (dimensions, elevations) and conditions necessary for proper installation of work covered by this Section. Exact measurements are Contractor's responsibility.

1.11 COORDINATION

A. Coordinate work under provisions of Division 1.

1.12 WARRANTIES

A. Applicator's Warranty: Furnish per the attached pages.

PART 2 PRODUCTS

2.1 THERMOPLASTIC ROOFING SYSTEM

A. Manufacturer

1. Obtain primary thermoplastic roofing from a single manufacturer to match the existing membrane and provide secondary materials only as recommended by the manufacturer of the primary material, as specified.

2. The Drawings are generic and not based on a specific manufacturer. Detail deviations will be accepted so as to permit utilization of the selected manufacturer's standard products and details when, in the Design Professional's judgment, such deviations do not materially detract from design concept or intended performance. Submit proposed deviations to Design Professional for approval in writing prior to ordering materials that are in the category of substitutions.

3. Match existing Manufacturer (verify manufacturer of existing membrane prior to construction);

    a. Fibertite by Seaman Corporation, mechanically fastened to meet FM 1-90 wind uplift requirements.

2.2 Flashing Tape: double sided, extruded or preformed, cross-linked butyl rubber, self adhesive tape, 1/8" minimum thickness, 3/4" minimum width unless noted otherwise on the drawings.

1. Pecora Corporation — Extru-Seal Glazing Tape
2. Tremco Construction Products — 440 II Tape
3. Equivalent products as approved by the Owner and Design Professional.

2.3 INSULATION

A. Polyisocyanurate Insulation: Closed cell glass fiber reinforced type, conforming to the following (tapered and non-tapered):
    1. Board Size: 4 x 4 feet, (4 x 8 feet if mechanically attached).
    2. Tapered insulation at crickets will vary due to varied roof slopes, determine in field taper needed to provide a 1/4" per foot slope to each side of obstruction, minimum thickness to be 0".
    3. Tapered System Slope: Typically installed as required to provide a 1/4” per foot finished roof slope in a single sloping direction.
        a. 1/8” per foot existing slope, install a 1/8” per foot tapered insulation system, provide ¼” per foot tapered insulation system at crickets between primary scuppers.
        b. Crickets over a ¼” per foot system, install a ½” per foot taper system.
    4. Compressive Strength: 25 psi per ASTM C 165
    5. Facing: Factory applied skin of glass fiber facing on both faces.
    6. Board Edges: Square.
    7. Water Absorption: In accordance with ASTM C209, 1 percent by volume maximum.
    1. Foam Core Flame Spread: 25 Max. - ASTM E-84 (Tunnel Test).
    2. ULI Fire Rating: Conform to the current ULI, Class A, Roof/Ceiling fire rated assemblies (see current ULI "Fire Resistance Directory").

B. Tapered Perlite Edge Strips For Use at Crickets Within Roof System: 1/2" per foot tapered preformed units, as approved for use within a 20 year warranted roof system by the roofing manufacturer, of material with the following characteristics:
   1. Board Density: 8 lb/cu ft.
   2. Board Size: 2x4 feet.
   3. Board Thickness/slope: ½" per foot slope for all crickets.
   4. Compressive Strength: Minimum 35 psi.
   5. Water Absorption: In accordance with ASTM C 209, 1.5 percent by volume maximum.
   6. Board Edges: Square.
   7. ULI Fire Rating: Conform to the current ULI, Class A, Roof/Ceiling fire rated assemblies (see current ULI "Fire Resistance Directory").

2.4 GYPSUM ROOF BOARD (Options)

A. Gypsum Roof Board (Glass fiber reinforced/faced gypsum): as approved for use within a 20 year warranted roof system by the roofing manufacturer, with the following characteristics:
   1. Board Type: manufacturer standard product for use over polyisocyanurate insulation and over metal decks.
   2. Manufacturer and Product: Georgia-Pacific Corporation, Gypsum Division, Dens-Deck Prime Roof Board or approved equal.
   3. Board Size: 4 feet x 4 feet x 1/4" minimum thickness.
   4. Compressive Strength: Minimum 35 psi.
   5. Water Absorption: In accordance with ASTM C 1177-91
   6. Board Edges: Square.
   7. UL Fire Rating: Conform to the current UL, Class A, Roof/Ceiling fire rated assemblies (see current UL "Fire Resistance Directory").

B. Gypsum Roof Board (Glass fiber reinforced with no face layer) : as approved for use within a 20 year warranted roof system by the roofing manufacturer, with the following characteristics:
   1. Board Type: manufacturer standard product for use over polyisocyanurate insulation and over metal decks.
   2. Manufacturer and Product: United States Gypsum Company, Securock Roof Board or approved equal.
   3. Board Size: 4 feet x 4 feet x 1/4" minimum thickness.
   4. Compressive Strength: Minimum 1,250 psi.
   5. Water Absorption: 10 In accordance with ASTM C 473
   6. Board Edges: Square.
   7. UL Fire Rating: Conform to the current UL, Class A, Roof/Ceiling fire rated assemblies (see current UL "Fire Resistance Directory").

2.5 MISCELLANEOUS MATERIALS: All other materials and accessories, not specifically described, but required for a complete and proper installation of roofing, shall be products of, or recommended by the manufacturer of, the primary material and subject to the approval of the Design Professional.

A. WALKWAY PAD: Provide a durable slip resisting walkway pad for roof maintenance. Pad to allow drainage from beneath or solidly heat welded to membrane or seam taped. Available in both pads and rolls

PART 3 EXECUTION

3.1 GENERAL

A. Manufacturer's Installation/repair Requirements.

1. In addition to the specified procedures, the roofing installer shall repair roofing in accordance with the procedures required by the roofing material manufacturer for the proper execution of the work.

2. The roofing installer shall review the specified repair procedures for possible conflicts, prior to Bidding, for resolution by Design Professional.

B. Watertightness is Imperative.

1. The work specified shall not preclude the use of procedures that will maintain the building watertight. Therefore, the Contractor, while conforming to these contract documents, shall utilize skill and procedures to keep water out of these buildings while construction is in progress.

3.2 EXAMINATION

A. Examine substrate and conditions over which roofing repairs is to be performed, and notify Design Professional in writing of any unsatisfactory conditions.

B. Verify roof membrane is clean and dry, remove all debris, dirt and foreign matter from roof membrane prior to performing repairs.

3.3 THERMOPLASTIC ROOF REPAIRS

A. Field membrane repairs

1. Adjoining patch repairs shall overlap the fastened edge a minimum of 4" maintaining proper shingling to avoid back water seams. (See manufacturer's details for fastener spacing location.)

B. Procedural

1. Fasten the leading edge of the roll according to specified fastener spacing requirements prior to overlapping the next roll. Lap rolls a minimum of 4" and a maximum of 6", staggering the factory seams so that each seam will fall an equal distance between the factory seams, roll to roll. When circumstances required that a roll be cut and reset, field

reversing the first tab is permissible providing that after the fasteners have been installed through the reversed tabs. The tab is then fully welded to the overlying membrane prior to the attachment of the tail.

2. Fasten the side laps of the roll with two fasteners and stress plates per panel. (See manufacturer's details for proper spacing and location of side lap fastener pattern.) Allow a minimum of 2" from the edge of the stress plate to the edge of the overlapping membrane side lap to leave sufficient room to apply the field welded seam (minimum 1.5“) and to avoid back water seams or water dams.

3. All side laps should be checked to insure proper fastening position and overlap application. All seams are to be cleaned of any foreign materials (dirt, oils, moisture or the like) with manufacturer's approved cleaning solvent and a clean cotton cloth. Allow approximately five (5) minutes for the solvent to dry before initiating the field welder for the seams.

4. All field seams shall be welded with an automatic hot air welder approved by the manufacturer. Test welds on scraps or practice material shall be performed daily prior to field weld start-up to insure correct machine heat and speed settings. All finished seams shall be a homogenous bond with a minimum width of 1.5".

5. Daily inspection by the job foreman or supervisor of all completed field welded seams, details, repairs and the like shall be made to assure quality of application and that any operator training requirements are accomplished and equipment problems are immediately resolved.

6. All field welds, at seams, details, repairs and the like are to be probed with a dull pointed instrument, at the end of each day's work or prior to start-up each day. Repair any areas with a hand welder and roller.

3.4 CLEANING

A. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.

B. Repair or replace defaced or disfigured finishes caused by work of this section.

1. Trash and scraps are a hazard and shall be collected and disposed of immediately.

2. The applicator shall remove all masking protection equipment, materials and debris from the work and storage areas and leave those areas in an undamaged and acceptable condition.

3.5 PROTECTION

A. Protect building surfaces against damage from roofing work.

B. Where traffic must continue over finished roof membrane, protect surfaces.

C. Upon completion of roofing work (including associated work) advise Owner of recommended procedures for surveillance and protection of roofing during remainder of construction period. At the end of the construction period, or at a time when remaining construction work will in no way affect or endanger roofing, make a final inspection of roofing and prepare a written report to Owner and Design Professional describing nature and extent of deterioration or damage, if any, found in the work.

D. Repair or replace deteriorated or defective work found at time of final inspection. Repair damages to roofing which occurred subsequent to roofing installation and prior to final inspection. Repair or replace the roofing and associated work to a condition free of damage and deterioration at time of substantial completion.

END OF SECTION

APPLICATOR WARRANTY FOR ROOFING REPAIRS

Whereas_____

of (Address)_____

herein called the "Roofing Contractor", has performed roofing, flashing and sheet metal and associated ("work") on following project:

Owner:_____

Address:_____

Name and Type of Building:_____

Address:_____

Area of Work:_____

Date of Acceptance:_____

Warranty Period: Two Years Date of Expiration:_____

AND WHEREAS Roofing Contractor has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period.

NOW THEREFORE Roofing Contractor hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work, and as are necessary to maintain said work in watertight condition.

This Warranty is made subject to the following terms and conditions.

1. Specifically excluded from this Warranty are damages to roofing work and other parts of the building, and to building contents, caused by: a) lightning, windstorm; b) fire; c) failure of roofing system substrate or structure (including cracking, settlement, excessive deflection, deterioration, and decomposition). When work has been damaged by any of the foregoing causes, Warranty shall be null and void until such damage has been repaired and until cost or repairs has been paid by the Owner or by another responsible party as so designated.

2. The Roofing Contractor is responsible for damage to work covered by this Warranty, and is not liable for consequential damages to building or building contents, resulting from leaks or faults or defects of work.

3. The Owner shall promptly notify Roofing Contractor of observed, known or suspected leaks, defect or deterioration. The Contractor shall guarantee to respond to all notifications within twenty-four (24) hours and to make all such repairs as deemed necessary to correct said leaks or defects to a satisfactory condition to the Owner. Repairs shall be made by workman in the current employment of the Contractor. Subcontracting of repair work is not permitted.

4. This Warranty is recognized to be the only warranty of Roofing Contractor on said work, and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to him in cases of roofing failures. Specifically, this Warranty shall not operate to relieve Roofing Contractor of responsibility for performance of original work in accordance with requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

IN WITNESS THEREOF, this instrument has been duly executed this

_____day of_____, 20__

_____
Roofing Contractor Firm

(SEAL)

_____
Signature of Authorized Person

_____
Title

_____
Witness

REPAIR SPECIFICATION FOR BUILT-UP AND MODIFEID BITUMEN ROOFING SYSTEMS SECTION 07 01 50.63

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Connection of new flashing to existing built-up and modified bitumen roofing system membrane where new construction abuts existing construction as indicated on the drawings.

B. Extension of existing built-up and modified bitumen roofing system membrane onto limited areas of new construction as indicated on the drawings.

C. Miscellaneous built-up and modified bitumen roofing system membrane repairs.

D. Walk pad removal and replacement (adhesive application)

1.2 RELATED SECTIONS

A. Section 06 10 53 - Rough Carpentry: Wood blocking and nailers for roofing substrate profiles.

B. Section 07 01 50.62 - Single-Ply Thermoplastic Roofing Repairs.

C. Section 07 62 00 - Sheet Metal Flashing and Trim

D. Section 07 65 00 - Roof Penetration Flashing.

E. Section 07 72 00 - Roof Accessories

F. Section 07 92 00 - Joint Sealers.

1.3 REFERENCES

A. ASTM C 165: Recommended Practice for Measuring Compressive Properties of Thermal Insulations.

B. ASTM C 518: “Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

C. ASTM E 96: Test Methods for Water Vapor Transmission of Materials.

D. ASTM D 5: Penetration of Bituminous Materials.

E. ASTM D 36: Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus).

F. ASTM D 41: Specification for Asphalt Primer Used in Roofing and Waterproofing.

G. ASTM D 92: Test for Flash and Fire Points by Cleveland Open Cup.

H. ASTM D 312: Specification for Asphalt Used in Roofing.

I. ASTM D 412: Rubber Properties in Tension.

J. ASTM D 1668: Glass Fabrics (Woven and Treated) for Roofing and Waterproofing.

K. ASTM D 573: Standard Test for Rubber - Deterioration in an Air Oven.

L. ASTM D 751: Standard Test Methods for Coated Fabrics.

M. ASTM D 2178: Asphalt Glass Felt Used in Roofing and Waterproofing.

N. ASTM D 2523: Standard Practice for Testing Load-Strain Properties of Roofing Membranes.

O. ASTM D 4586: Specification for Asphalt Roof Cement, Asbestos Free.

P. ASTM D 4601: Base Sheets, Inorganic, Asphalt Coated (for built-up roofs).

Q. ASTM D 4073: Standard Test Method for Tensile-Tear Strength of Bituminous Roofing Membranes.

R. ASTM D 4798: Standard Test Method for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials (Xenon-Arc Method).

S. ASTM D 5147: Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material.

T. ASTM D 6163-98: Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bitumen Sheet Materials using Glass Fiber Reinforcements.

U. ASTM D 6164-98: Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bitumen Sheet Materials using Polyester Reinforcements.

V. ASTM D 6222-98: Standard Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using Polyester Reinforcements.

W. ASTM D 6298-98: Standard Specification for Fiberglass Reinforced Styrene-Butadiene-Styrene (SBS) Modified Bituminous Sheets with a Factory Applied Metal Surface.

X. ASTM E 84: Surface Burning Characteristics of Building Materials.

Y. FM 4470 - Base ply fasteners to meet Factory Mutual Research Approval Standard #4470

Z. NRCA/ARMA - Manual of Roof Maintenance and Roof Repairs.

AA. NRCA (National Roofing Contractors Association) - The NRCA Roofing and Waterproofing

Manual.

BB. ULI (Underwriters Laboratories, Inc.) - Fire Hazard Classifications.

1.4 SYSTEM DESCRIPTION

A. Repairs to built-up gravel and smooth surfaced built-up coal tar or asphalt built-up roofing using hot methods.

B. Repairs to modified bitumen roofing systems utilizing hot and cold process techniques.

C. Remove existing walk pads, supplement in “like-kind” as necessary and reinstall in a full bed of modified bitumen adhesive.

1.5 SUBMITTALS

A. Product Data: Provide membrane materials, base flashing materials, insulation, vapor retarders and protective coating.

B. Samples: Submit two sample 10 lb containers of roofing aggregate.

C. Submit manufacturer’s recommended primers.

D. Manufacturer Notifications: (If Applicable) Submit repair notification to the manufacturer of existing roof system in accordance with that manufacturer’s warranty requirements. Failure to notify manufacturer places remainder of warranty obligations on the Repair Contractor.

1. Manufacturer's Installation Instructions: Indicate special precautions required for seaming the membrane for roofs to maintain a current warranty requirements.

2. Manufacturer's Certificate: Certify that products installed on warranted roofs meet or exceed specified requirements.

3. Manufacturer's Field Reports: Submit a Manufacturer's field report as follows:

a. Reports: Indicate procedures followed, ambient temperatures and wind velocity during application, and special conditions that occurred during the repairs.

E. All products used shall be asbestos free.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Manual of Roof Maintenance and Roof Repairs except where NRCA requirements differ from the project manual requirements.

B. Perform Work in accordance with the existing roof manufacturer’s published or written details

and recommendations and the project details, the most stringent shall govern.

C. Maintain one copy of each document on site.

D. Preliminary (Pre-Product Submittal) Roofing Conference: As soon as possible after award of roofing work, meet with roofing installer, roofing membrane manufacturer, flashing and sheet metal contractor, installers of substrate construction (decks), primary mechanical, electrical, and plumbing contractors other installers of rooftop work, Design Professional, Construction Manager, and representatives of other entities directly concerned with performance of roofing system including (as applicable) Owner's insurers and test agencies.

1. Review and discuss:

   a. Coordination with other trades
   b. Roofing and overall construction schedule
   c. Governing regulations
   d. Insurance requirements
   e. Certification requirements
   f. Submittal requirements
   g. Warranty requirement
   h. Availability of materials, equipment and personnel
   i. Staging
   j. Inspections
   k. Testing
   l. Weather related issues (rainfall will not be considered justification for project delays)
   m. Roofing system protection
   n. General roofing application procedures

2. The Design Professional shall record discussions, including agreement or disagreement on matters of significance; furnish copy of recorded discussions to each participant. If disagreements concerning contract requirements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.

E. Pre-Application Roofing Conference: Approximately two weeks prior to scheduled commencement of roofing installation and associated work, meet at project site with roofing membrane installer, roofing membrane manufacturer, flashing and sheet metal contractor, primary mechanical, electrical and plumbing contractors, installers of deck or substrate construction to receive roofing work, installers of rooftop units and other work in and around roofing that must precede or follow roofing work, Design Professional, Construction Manager, and other representatives directly concerned with performance of the work, including (where applicable) Owner's insurers, test agencies, and governing authorities.

1. Review and Discuss:

   a. Outstanding submittals and resolution thereof

b. Roofing methods and procedures
c. Roofing and overall construction schedule
d. Availability of materials, equipment and personnel
e. Staging
f. Inspections
g. Testing
h. Weather related issues:

1) Review weather and forecasted weather conditions
2) Procedures for coping with unfavorable conditions.
3) Night seals, water cutoffs, sealing of all penetrations and terminations.
4) Liabilities associated with potential water intrusion.

2. Tour representative areas of roofing substrates (decks). Inspect and discuss:

a. Deck condition
b. Roof drain installations
c. Curbs
d. Penetrations (existing and planned)
e. Installation of nailers and blocking (coordination with insulation)
f. Abutting walls (parapets, penthouses, girder beams, other)
g. Any other preparatory work performed by other trades
h. Significant deviations from contract drawings.

3. Substrate Acceptance: The roofing membrane manufacturer and installer shall provide written acceptance of substrate conditions prior to start of roofing membrane application. Start of insulation and roofing membrane application will be considered full acceptance of substrate conditions by the roofing membrane manufacturer and installer.

4. The Design Professional shall record discussions of conference, including decisions and agreements (or disagreements) reached, and furnish copy of record to each party attending. If disagreements concerning contract requirements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.

F. Non-Asbestos Containing Materials: Provide only roofing materials which are completely free of asbestos.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with five years current documented experience. Materials provided for repairs shall be identical to the existing roofing materials in place, or be certified as compatible for use with the existing materials in place by the original manufacturer if the existing roofing system is still within the original warranty period.

B. Older roof systems no longer under warranty: Materials provided for repairs shall be of the same type as the existing roofing materials in place, and be certified as compatible for use with the existing materials in place by the manufacturer/ supplier of the repair materials.

C. Applicator: A single installer specializing in performing the work of this section with three current years documented experience and approved in writing by system manufacturer a minimum of 10 days prior to Bidding.

1. Original Manufacturer's Warranty Period: If the existing roof system is still within the original manufacturer's warranty period, all repairs and modifications to the roof system shall be done by an applicator approved in writing by the original manufacturer a minimum of 10 days prior to Bidding.

2. Original Applicator's Warranty Period: If the existing roof system is still within the original applicator's warranty period, all repairs and modifications to the roof system shall be done by an applicator approved in writing by the original applicator a minimum of 10 days prior to Bidding.

D. Manufacturer's Field Inspection and Services (Warranty Work Only)

1. Manufacturer of the roofing materials shall provide qualified personnel to observe field conditions of surfaces and installation, quality of workmanship as applicable, and to make appropriate recommendations.

2. Representative shall submit written reports, within seven days of visit to Contractor and Construction Manager listing observations, recommendations and related comments.

1.8 REGULATORY REQUIREMENTS

A. Provide materials complying with governing regulations and codes installed to comply with the following:

1. UL Listing: Provide roofing system materials and component materials that have been tested for application and slopes indicated and are listed by Underwriters Laboratories, Inc. (UL) for Class A external fire exposure.

a. Provide roof covering materials bearing UL Classification Marking on bundle, package, or container containing that materials have been produced under UL's Classification and Follow-up Service.

2. FM Listing: Provide only roofing systems and component materials which have been evaluated and shown to meet the requirements of Factory Mutual for fire spread, wind up-lift and hail damage, and which are listed and approved for FM I-135 classification (FM I-150 for roof elevations in excess of 96 feet) in the current "Factory Mutual Research Corporation (FMRC) Approval Guide".

a. Provide roof-covering materials bearing FM approval marking on bundle, package or container indicating that material has been subjected to FM's examination and follow-up inspection service.

b. Reroofing systems over existing lightweight insulating concrete do not require Factory Mutual Listing, but shall comply with Factory Mutual standards and the requirements of the South Florida Building Code.

B. Wind Up-lift Criteria and Related Provisions:

1. Factory Mutual Compliance: FM Wind Up-lift System Classifications required by this Section are based on field up-lift pressures obtained from the Florida Building Code (High Wind Zones) requirements, ASCE 7, and from Factory Mutual Property Loss Prevention Data Sheets 1-7 and 1-28.

a. FM Property Loss Prevention Data Sheet 1-49:

1) Gauges of metal, fastener types and spacing, and method of attachment shall comply with FM Property Loss Prevention Data Sheet FM 1-49 recommendations, or the Project specifications and details. The most stringent shall govern. Increased fastener density is not required for fasteners used to secure felts which are fully mopped to vertical surfaces.

2. ASCE 7 Compliance: Minimum design pressures required by this Section for Miami Dade County Product Control Notice of Acceptance are based on Wind Load Uplift Pressure Calculations performed in accordance with the requirements of ASCE 7.

3. The roofing contractor together with the membrane manufacturer shall be responsible for verifying adequate fastening of the roofing system based on wind uplift pressures calculated for the specific project and/or location. The Roofing Membrane Manufacturer shall submit a certified letter, signed jointly by the Roofing Contractor, attesting to compliance with up-lift requirements required by this section.

1.9 CERTIFICATION

A. Materials: For each material specified with a standard or reference material designation, certification labels shall appear on each package of bulk-shipments to project with certificate of compliance.

B. Installer: Provide two copies of all certification to Construction Manager prior to beginning roofing work.

C. The Contractor shall have pull tests conducted on the job site with the specified fasteners to determine the pull-out resistance of the existing deck. Submit the data to the Construction Manager.

1.10 NOTIFICATION TO Construction Manager

A. Twenty-four hours prior to the commencement of scheduled repairs, send written notification to Construction Manager regarding time Contractor's crew will be present on site. Indicate duration or time to perform repairs. Notification by Contractor is not required for emergency roof repairs. Notifications may be faxed to the Construction Manager.

1.11 DELIVERY, STORAGE, AND HANDLING

A. If site storage is required, store rolls, cans and drums of cements, primers, and coatings, on end and over clean raised platforms.

B. Store and handle materials to protect them from.

1. Moisture, whether due to precipitation, or condensation.
2. Temperatures over 110 degrees F or below 40 degrees F.
3. Direct sunlight.
4. Mud, dust, sand, oil and grease.

C. Comply with fire, safety, and environmental protection regulations.

D. Do not store materials on roof decks, nor position roofing installation equipment on roof decks, in concentrations exceeding design live loads.

E. Take special precautions against traffic on roofing when ambient temperature is above 80 degree F. Avoid heavy traffic on the work during installation.

1.12 PROJECT CONDITIONS

A. Environmental Requirements:

1. Proceed with roofing work only when existing and forecast weather conditions will permit work to be performed in accordance with manufacturers' recommendations and warranty requirements.

2. Comply with manufacturer's recommended minimum and maximum installation temperatures. Do not proceed with roof installation during threatening or unfavorable weather conditions. If roofing work cannot be performed, provide the necessary protection to keep building watertight.

a. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during the same day.

b. Do no apply roofing membrane when ambient temperature is below 40 degrees Fahrenheit (F).

A. Existing Conditions:

1. Contractor shall accept the conditions of the job site as they exist and perform his work accordingly. Any adverse condition which might affect the performance of the work described in these specifications must be brought to the attention of the Design Professional in writing immediately upon its discovery and no later than when it could have reasonably been expected to be observed or discovered.

2. Contractor shall be held responsible for protecting all adjacent construction from damage. Existing structures or installations damaged by operations connected with this work shall be replaced or repaired by the Contractor to the satisfaction of the Design Professional and at no additional cost to the Owner.

3. Contractor shall field verify all measurements (dimensions, elevations) and conditions necessary for proper installation of work covered by this Section. Exact measurements are Contractor’s responsibility.

1.13 COORDINATION

A. Coordinate work under provisions of Division 1.

1.14 WARRANTIES

A. Applicator's Warranty: Furnish per the attached pages.

PART 2 PRODUCTS

2.1 MATERIALS, GENERAL

A. Insurance and Code Requirements: Provide materials complying with governing regulations, installed to comply with Underwriters Laboratories Class A and FM I-135 wind up-lift requirements.

1. Comply with Factory Mutual I-135 wind up-lift requirements.

B. Obtain primary built-up and modified bitumen roofing materials from a single manufacturer to match the existing membrane and provide secondary materials only as recommended by the manufacturer of the primary material, as specified.

1. The Drawings are generic and not based on a specific manufacturer. Detail deviations will be accepted so as to permit utilization of the selected manufacturer's standard products and details when, in the Design Professional's judgment, such deviations do not materially detract from design concept or intended performance. Submit proposed deviations to Design Professional for approval in writing prior to ordering materials that are in the category of substitutions.

2.2 SHEET MATERIALS

A. Strip-In Flashing: ASTM D-2178-88, Type IV glass fiber felt

B. Ply Felt Flashing: ASTM D-2178-88, Type IV glass fiber felt

C. Roof Membrane: ASTM D-2178-88, Type IV glass fiber felts.

D. Dry-In Felt: ASTM D226, #15 organic felt.

E. Base Sheet: ASTM D-4601, Type II, non perforated glass fiber base sheet.

F. Vented Base Sheet For Use Over Lightweight Concrete Decks: ASTM D-4897, Type G-2 coated base sheet with course granular surfacing.

G. Modified Bitumen Membrane: Granular surfaced (SBS) membrane; 140 mil minimum thickness; reinforced with fiberglass, polyester or combination of both. Granular surface to match existing granule color. Smooth surface flashing to comply to previous requirements.

2.3 INSULATION

A. Polyisocyanurate Insulation: Closed cell glass fiber reinforced type, conforming to the following (tapered and non-tapered):
   1. Board Size: 4 x 4 feet, (4 x 8 feet if mechanically attached).
   2. Tapered insulation at crickets will vary due to varied roof slopes, determine in field taper needed to provide a 1/4" per foot slope to each side of obstruction, minimum thickness to be 0".
   3. Tapered System Slope: Typically installed as required to provide a 1/4” per foot finished roof slope in a single sloping direction.
      a. 1/8” per foot existing slope, install a 1/8” per foot tapered insulation system, provide ¼” per foot tapered insulation system at crickets between primary scuppers.
      b. Crickets over a ¼” per foot system, install a ½” per foot taper system.
   4. Compressive Strength: 25 psi per ASTM C 165
   5. Facing: Factory applied skin of glass fiber facing on both faces.
   6. Board Edges: Square.
   7. Water Absorption: In accordance with ASTM C209, 1 percent by volume maximum.
   1. Foam Core Flame Spread: 25 Max. - ASTM E-84 (Tunnel Test).
   2. ULI Fire Rating: Conform to the current ULI, Class A, Roof/Ceiling fire rated assemblies (see current ULI "Fire Resistance Directory").

B. Tapered Perlite Edge Strips For Use at Crickets Within Roof System: 1/2" per foot tapered preformed units, as approved for use within a 20 year warranted roof system by the roofing manufacturer, of material with the following characteristics:
   1. Board Density: 8 lb/cu ft.

2. Board Size: 2x4 feet.
3. Board Thickness/slope: ½" per foot slope for all crickets.
4. Compressive Strength: Minimum 35 psi.
5. Water Absorption: In accordance with ASTM C 209, 1.5 percent by volume maximum.
6. Board Edges: Square.
7. ULI Fire Rating: Conform to the current ULI, Class A, Roof/Ceiling fire rated assemblies (see current ULI "Fire Resistance Directory").

2.4 GYPSUM ROOF BOARD (Options)

A. Gypsum Roof Board (Glass fiber reinforced/faced gypsum): as approved for use within a 20 year warranted roof system by the roofing manufacturer, with the following characteristics:
1. Board Type: manufacturer standard product for use over polyisocyanurate insulation and over metal decks.
2. Manufacturer and Product: Georgia-Pacific Corporation, Gypsum Division, Dens-Deck Prime Roof Board or approved equal.
3. Board Size: 4 feet x 4 feet x 1/4" minimum thickness.
4. Compressive Strength: Minimum 35 psi.
5. Water Absorption: In accordance with ASTM C 1177-91
6. Board Edges: Square.
7. UL Fire Rating: Conform to the current UL, Class A, Roof/Ceiling fire rated assemblies (see current UL "Fire Resistance Directory").

B. Gypsum Roof Board (Glass fiber reinforced with no face layer) : as approved for use within a 20 year warranted roof system by the roofing manufacturer, with the following characteristics:
1. Board Type: manufacturer standard product for use over polyisocyanurate insulation and over metal decks.
2. Manufacturer and Product: United States Gypsum Company, Securock Roof Board or approved equal.
3. Board Size: 4 feet x 4 feet x 1/4" minimum thickness.
4. Compressive Strength: Minimum 1,250 psi.
5. Water Absorption: 10 In accordance with ASTM C 473
6. Board Edges: Square.
7. UL Fire Rating: Conform to the current UL, Class A, Roof/Ceiling fire rated assemblies (see current UL "Fire Resistance Directory").

2.5 BITUMINOUS MATERIALS

A. Asphalt Bitumen: ASTM D312, Type III.

B. Asphalt Primer: ASTM D41.

C. Coal Tar Pitch: ASTM D 450, Type I

D. Plastic Cement: ASTM D2822 Type II, cutback asphalt type.

E. Modified Bituminous Flashing Adhesive: ASTM D3019-85 Type III.

2.6 MECHANICAL FASTENERS

A. Roofing Nails: Galvanized, hot dipped or non-ferrous type, size as required to suit application.

B. For Fastening Vented Base Sheet to Lightweight Concrete Deck: Lightweight concrete base ply fastener with FM I-90 discs. Base ply fastener shall comply with Factory Mutual Approval Standard #4470.

C. For Fastening Base Sheet to Wood Deck: Rawl deck screw with FM I-90 discs.

D. For Fastening Insulation to Metal Decks: #12 deck screw; FM 4470 coated; 3“ FM I-90 disc; screw length sufficient to penetrate deck 1“. Insulation fasteners shall be supplied by roof membrane manufacturer on warranted roofs.

E. For All Other Locations: Provide size, type, material and finish as required, matching material being fastened. Fasteners used on warranted roof systems shall be an approved fastener used by membrane manufacturer.

2.7 ACCESSORIES

A. Cant Strip: Perlite, preformed to 45 degree angle.

B. Vent Pipe Flashing: Prefabricated pipe flashing of 2.5 lb. per square foot common pig lead having a 4" flange.

C. Conduit/Condensate Line Supports: 3000 psi concrete, smooth exposed finish, 8" wide x 16" long x 2" thick; free of surface defects.

D. Lead Drain Flashing: 36" square flashing of 4 lb. common DE-silvered pig lead sheet.

E. Walk Pads: traffic resistant polymer modified bitumen sheet, polyester reinforced, surfaced with mineral granules.

F. Flashing Tape: double sided, extruded or preformed, cross-linked butyl rubber, self adhesive tape, 1/8" minimum thickness, 3/4" minimum width unless noted otherwise on the drawings.

1. Pecora Corporation — Extru-Seal Glazing Tape

2. Tremco Construction Products — 440 II Tape

3. Equivalent products as approved by the Construction Manager and Design Professional.

2.8 PITCH PAN FILLER

A. Pitch Pan Filler (Pitch pans are not approved for use on new roofs. Special and specific written approval from the design professional is required for use on existing roofs.): Firestone S-10 RubberGard two part urethane pourable sealer (no substitutions allowed) installed over Five Star non-shrink grout (by U.S. Grout, Corporation) or approved equal.

2.9 JOINT SEALANTS: Refer to Section 07 90 00 – Joint Protection

2.10 SURFACING

A. Aggregate: ASTM-D-1863, Size and color to match existing roof aggregate.

B. Protective Cover Coating: Fibrated, Aluminum type.

2.11 MISCELLANEOUS MATERIALS:

A. All other material and accessories, not specifically described, but required for a complete and proper installation of roofing, shall be products of, or recommend by the manufacturer of the primary material and subject to the approval of the Construction Manager.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is dry and clean.

3.2 INSTALLATION REQUIREMENTS

A. Protect other work from spillage of bitumen roofing asphalt materials and prevent liquid materials from entering or clogging drains and conductors. Replace or restore other work damaged by installation of modified bitumen sheet roofing system work.

B. Work to be performed by a manufacturer approved applicator.

3.3 BITUMEN HEATING (Large Scale Repairs or Re-Flashing of Equipment Curbs)

A. Heat bitumen in accordance with bitumen manufacturer's requirements.

B. For aggregate surfaced pour coats of asphalt, limit application temperature to minimum required for proper embedment of aggregate and maximum which will permit retention of a coating of weight required.

3.4 BASIC REPAIRS - Basic Small Scale Repair Techniques (Cold Application)

A. Remove gravel surfacing down to the felts. Clean and dry surface 24" around the damaged area.

B. Preparation: Brush prime surface using asphaltic primer.

C. Apply plastic cement into the deficiency.

D. Embed required number of felts over deficiency. For three ply roof system, cover deficiency using 3 plies of felt. Each ply shall overlap the preceding ply by 6".

E. Re-apply new gravel surfacing in a layer of mastic.

3.5 BASIC REPAIRS - Basic Large Scale Repair Techniques (Hot Bitumen Application)

A. Remove gravel surfacing down to the felts. Clean and dry surfaces 24" around the damaged area.

B. Preparation: Brush prime exposed membrane surface using asphaltic or coal tar primer.

C. Replace damaged insulation.

D. Embed required number of felts over repair area in hot bitumen. With an existing three ply roof repair using three plies of felt. Each ply shall overlap the preceding ply by 6".

E. Re-apply new gravel surfacing in a flood coat of hot bitumen.

3.6 SPECIFIC REPAIRS

A. Surface Conditions - Gravel Surfaced Built-Up Roofs:

1. Remove loose aggregate, debris and dirt.

2. Repair any membrane surfaces damaged.

3. Trim and dispose of any loose or curled felt.

4. For small scale repairs (less than 3 feet in area), apply plastic cement and embed new gravel over area.

5. For large scale Repairs (greater than 3 feet in area), apply a 60# per square flood coat of hot bitumen over roof surface. Embed new gravel into the asphalt at a rate of 400# per square.

B. Alligatoring or Cracking

1. Light Checking/Crazing:

a. Clean surface and remove thick pieces of bitumen.
b. Prime surface
c. Apply an asphalt emulsion to surface ensuring that fissures are filled.
d. Reinstall surfacing or coat surface with fibrated aluminum coating.

2. Heavy Checking/Deep Crazing to Felts:

a. Clean surface and remove thick pieces of bitumen.
b. Prime surface
c. Apply an asphalt emulsion to surface ensuring that fissures are filled. While emulsion is fluid, inlay a fiber glass mat over area.
d. Reinstall surfacing or coat surface with fibrated aluminum coating.

C. Surface Slippage - Flow of Bitumen and Aggregate

1. Clean around drains or wall scupper.

2. Remove surfacing aggregate and install gravel stop/pitch dam.

3. Strip-in dam and, re-apply surfacing as listed in Basic Repairs.

3.7 MEMBRANE CONDITION

A. Blisters - Built-Up Asphalt or Coal Tar Roofing:

1. Remove gravel surfacing down to the felts. Clean and dry surfaces 24" from around damaged area.

2. Remove entire blister where until the existing ply felts are found well adhered together.

3. Preparation: Brush prime surface using asphaltic primer.

4. Apply plastic cement into blister void. Allow mastic to be slightly raised above adjacent surface.

5. Embed required number of felts over deficiency. Each ply shall overlap the preceding ply by 6".

6. Re-apply surfacing as listed in Basic Repairs.

B. Blisters - Cap Sheet or Modified Bitumen Roofing:

1. Brush loose granules away from the blister.

2. Prime surface with asphaltic primer.

3. X cut roof surface. Fold membrane back and apply modified bitumen adhesive in void.

4. Press membrane back into adhesive.

5. Install new modified bitumen cap target in adhesive over primed area. Ensure that membrane is firmly seated into modified bitumen adhesive.

6. A torch grade material may be applied in lieu of cold applied SBS. Do not use mastic in void when using a torch. Remove material from void entirely.

C. Ridging, Wrinkling, Buckling, fishmouths and Splits:

1. Remove gravel surfacing down to the felts. Clean and dry surfaces 12" around the damaged area.

2. Repair as indicated in Basic Repair Proceeders.

3. Membrane Splits: Membrane splits are normally associated with building expansion or membrane tension. This type of problem requires the addition of an expansion joint or area divider. Severe or long membrane splits shall be brought to the attention of the Construction Manager, Design Professional and Owner prior to repairing.

D. Punctures or Ruptures:

1. Remove gravel surfacing 24" around puncture.

2. Clean and Prime surface.

3. Embed required number of felts over deficiency. Repair as listed in Basic Repairs.

E. Membrane Slippage

1. Strapping Technique:

a. Remove roof gravel. Gravel shall be removed in 12" width and running entire parallel to the roof slope the entire length of the roof. Strapping runs shall be space 15 feet apart.

b. Nail 6" o.c. through a new strip of 6" wide Type IV felt. Nail parallel to slope.

c. Apply a layer of mastic over length and width of strip. Pull half of sheet over fasteners than fold other side over preceding.

d. An additional 12" roof ply shall be mopped over strapping in hot bitumen.

e. Apply new aggregate surfacing in a flood coat of hot bitumen.

3.8 FLASHING REPAIRS

A. Punctures or Holes:

1. Three course over puncture or hole using reinforcing polyester membrane and flashing adhesive. Coat exposed asphalt with fibrated aluminum coating.

B. Deteriorated Base Flashing:

1. Remove loose and damaged roof material. Prime surface with asphaltic primer.

2. Apply modified bitumen adhesive to vertical surface and, set modified bitumen flashing into place. Tuck flashing under metal counterflashing. Hand rub flashing into adhesive. Back nail along top.

3. Three course side laps and over fasteners using reinforcing polyester membrane and flashing adhesive.

4. Coat exposed asphalt with fibrated aluminum coating.

C. Flashing Blisters:

1. Clean then prime surface over and around blister with asphaltic primer.

2. Check each repair area for moisture damage and replace any damaged or deteriorated cant strips.

3. X cut over blister. fold flashing outward and trowel modified bitumen adhesive into void. Fold back and press membrane into adhesive.

4. Apply modified bitumen adhesive to vertical surface and, set modified bitumen flashing into place. Tuck flashing under metal counterflashing. Hand rub flashing into adhesive. Back nail along top.

5. Three course side laps and over fasteners using reinforcing polyester membrane and flashing adhesive. Coat exposed asphalt with fibrated aluminum coating.

D. Open Flashing Laps:

1. Install adhesive into lap and, firmly press together.

2. Check each repair area for moisture damage and replace any damaged or deteriorated cant strips.

3. Nail lap down vertical lap.

4. Three course over lap and fasteners using reinforcing polyester membrane and flashing adhesive. Coat exposed asphalt with fibrated aluminum coating.

E. Ridging or Wrinkling Flashing:

1. Patch using Basic Repair Techniques.

F. Falling and Buckled Flashing:

1. Apply modified bitumen adhesive to surface behind fallen flashing.

2. Check each repair area for moisture damage and replace any damaged or deteriorated cant strips.

3. Secure top of flashing to wall 4" on center.

4. Three course side laps and over fasteners using reinforcing polyester membrane and flashing adhesive. Coat exposed asphalt with fibrated aluminum coating.

3.9 COUNTERFLASHING

A. Reglet Flashing:

1. Clean wall reglet. Remove caulking from wall and counterflashing surfaces.

2. Reset counterflashing into reglet joint, and secure with lead wedges at 4" o.c. Apply sealant at metal overlap.

3. Apply urethane sealant over reglet joint and tool.

B. Surface Mounted Counter Flashing:

1. Remove sealant from counterflashing metal and wall.

2. Apply sealant to over lap joints and reset counterflashing.

3. Prime surface of existing wall as required to insure optimum adhesion. Secure counterflashing to wall using drive pins or tapcons with metal backed neoprene washers.

4. Apply urethane sealant to receiver joint and tool.

3.10 METAL COPING AND CURB CAPS

A. Ensure coping is properly attached to wall. Do not mechanically attach coping thru the top. Verify coping receiver is hand tong at clips or at continuous cleat. Re-secure mechanically fastened coping thru the vertical surface at 8" o.c.

B. Remove sealant from metal surface at end lap. Reseal using urethane sealant and tool.

C. Holes in coping:

1. Thoroughly clean scale around deteriorated area.

2. Prime surface with asphaltic primer. Apply 3 beads of sealant on each side of deteriorated area.

3. Install a cover plate. Use pressure turn downs at each side of plate, and tong plate at bottom edges over coping to secure. Cover plate material shall be same as coping metal.

3.11 ROOF EDGING/FASCIA

A. Remove gravel surfacing down to the felts. Clean and dry surfaces 18" from the damaged area. Remove cover plate at laps and, clean and reinstall in beads of sealant.

B. Brush prime surfaces using asphaltic primer.

C. Apply plastic cement over primed area. Embed 2 ply of Type IV felts over flange. Each ply shall overlap the preceding ply by 6". Re-apply surfacing as listed indicated in Basic Repairs.

3.12 PITCH PANS/FLANGE MOUNTED ROOF PENETRATIONS.

A. Remove gravel surfacing 16" around flange. Ensure metal and roof surfaces are clean and dry.

B. Brush prime surfaces using asphaltic primer.

C. Apply plastic cement over primed area. Strip-in flanges using 2 plies of felt. Each strip-in ply shall overlap the preceding ply by 6". Re-apply surfacing using method listed in Basic Repairs.

D. Use modified bitumen flashing cement when repairs are performed to modified bitumen roof system. A torch may be used if compatible with material.

3.13 EXPANSION JOINT COVERS

A. Clean residual sealant from each side of neoprene splice and, reseal with urethane sealant.

B. Joint Cover Replacement:

1. Remove gravel surfacing and membrane 24" around joint. Clean metal surfaces of expansion joint flanges.

2. Prime metal flanges only using factory splice primer.

3. When metal is dry, brush splice adhesive over same area primed metal flanges and neoprene bellows. Apply adhesive to one side of splice strip.

4. When adhesive is dry, install splice strip (adhesive side down) firmly in place. Apply sealant to edges of splice strip.

5. Strip-in flange as specified in Basic Repairs.

3.14 CLEANING

A. In areas where finished surfaces are soiled by work of this section, clean those surfaces.

1. Remove trash, scraps and spudded roof gravel from roof.

3.15 PROTECTION

A. Protect building surfaces against damage from roofing work.

B. Repair or replace any roofing and associated materials damaged during the work to a condition free of damage and deterioration.

END OF SECTION

APPLICATOR WARRANTY FOR ROOFING REPAIRS

Whereas_____

of (Address)_____

herein called the "Roofing Contractor", has performed roofing, flashing and sheet metal and associated ("work") on following project:

Owner:_____

Address:_____

Name and Type of Building:_____

Address:_____

Area of Work:_____

Date of Acceptance:_____

Warranty Period: Two Years Date of Expiration: _____

AND WHEREAS Roofing Contractor has contracted (either directly with Construction Manager or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period.

NOW THEREFORE Roofing Contractor hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work, and as are necessary to maintain said work in watertight condition.

This Warranty is made subject to the following terms and conditions.

1. Specifically excluded from this Warranty are damages to roofing work and other parts of the building, and to building contents, caused by: a) lightning, windstorm; b) fire; c) failure of roofing system substrate or structure (including cracking, settlement, excessive deflection, deterioration, and decomposition). When work has been damaged by any of the foregoing causes, Warranty shall be null and void until such damage has been repaired and until cost or repairs has been paid by the Owner or by another responsible party as so designated.

2. The Roofing Contractor is responsible for damage to work covered by this Warranty, and is not liable for consequential damages to building or building contents, resulting from leaks or faults or defects of work.

3. The Owner shall promptly notify Roofing Contractor of observed, known or suspected leaks, defect or deterioration. The Contractor shall guarantee to respond to all notifications within twenty-four (24) hours and to make all such repairs as deemed necessary to correct said leaks or defects to a

satisfactory condition to the Construction Manager. Repairs shall be made by workman in the current employment of the Contractor. Subcontracting of repair work is not permitted.

4. This Warranty is recognized to be the only warranty of Roofing Contractor on said work, and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to him in cases of roofing failures. Specifically, this Warranty shall not operate to relieve Roofing Contractor of responsibility for performance of original work in accordance with requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

IN WITNESS THEREOF, this instrument has been duly executed this

_____day of_____, 20_____.

_____
Roofing Contractor Firm

(SEAL)

_____
Signature of Authorized Person

_____
Title

_____
Witness

PART 1 GENERAL

1.1 SUMMARY

A. Section includes surface preparation and field application of elastomeric roof coatings for use over new and existing granule surfaced modified bitumen roofing, flashing and metal fabrications as indicated on the drawings.

B. Drawings and general provisions of contract, including the General Conditions and Division-1 Sections.

C. Work to be accomplished consists of coating existing granule surfaced modified bitumen roofing, flashing and metal fabrication surfaces where indicated by the drawings and details.

D. Roof coating system design shall be adjusted by the manufacturer as appropriate for the specific project conditions and requirements.

E. Provide a Ten (10) year manufacturer's weathertightness warranty upon completion of this work.

1.2 RELATED SECTIONS

A. Section 07 01 50.63 - Repair Specification for Built-up & Modified Bitumen Roofing Systems

B. Section 07 01 50.19 - Preparation for Reroofing

C. Section 07 62 00 - Sheet Metal Flashing and Trim

D. Section 07 92 00 - Joint Sealer

E. Section 09 91 13 - Painting

1.3 QUALITY ASSURANCE

A. Applicator:
   1. Obtain written certification from manufacturer of the coating certifying that Applicator is approved by manufacturer for installation of specified system.
   2. Applicator must maintain full-time supervisor (not a working foreman), on job site during all times that work is in progress. Supervisor must have a minimum of three years experience in coating work similar to nature and scope of specified work.

B. Manufacturer's Field Inspection and Services:

1. Manufacturer of the coating materials shall provide qualified personnel to observe field conditions of surfaces and installation, quality of workmanship as applicable, and to make appropriate recommendations.
2. Representative shall submit written reports to the Architect and Applicator listing their observations and recommendations, including any concerns which may affect their ability to warrant the application.
3. Manufacturer shall inspect finished work, including any necessary corrections, prior to their final acceptance of the work for warranty coverage.

1.4 SUBMITTALS

A. Product Data: Submit product specifications, data sheets, installation instructions and general recommendations from coating manufacturer, including data that each material intended for use on this project complies with requirements.

B. Installer's Certifications: Provide copy of written certification to the Architect from the coating system manufacturer prior to beginning coating work.

C. Material Certification: For each material specified with a standard or reference material designation, certification label shall appear on each package of bulk shipped to project with certification of compliance.

D. Submit samples of the manufacturer’s ten (10) year product and weathertightness warranty (including labor and material), and the Applicator’s five (5) year workmanship warranty prior to beginning coating work.

E. Applicator shall submit a physical sample of the completed system that shows all the products proposed for use, in the proper sequence, and their representative dry film thickness (mils) to accurately illustrate the system to be installed.

1.5 DELIVER, STORAGE, HANDLING:

A. Delivery:
1. Deliver material in manufacturer's original, unopened containers with manufacturer's labels intact and legible.
2. Deliver enough material to allow continuous work.

B. Storage:
1. Store materials on clean, raised platforms in an interior location.
2. Store and handle materials to protect them from:
   a. Moisture, whether due to precipitation or condensation.
   b. Damage by construction traffic.
   c. Temperatures over 110 degrees F.
   d. Temperatures below 65 degrees F.
   e. Direct sunlight.

1.6 PROJECT/SITE CONDITIONS:

A. Existing Conditions:

1. This project involves coating of existing modified bitumen roof and flashing surfaces. Verify existing surface conditions are acceptable.
2. Report conflicts or problems to the Architect prior to bidding for resolution. Failure to report these conflicts or problems places the responsibility on the Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.
3. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.
4. Verify the proposed methods, processes and materials are appropriate for use with the actual project conditions.

B. Weather Conditions:
1. Do not apply materials when the temperature of surfaces to be coated and the surrounding air temperatures are below 45 degrees F, (7 degrees C) unless otherwise permitted by coating manufacturer's printed instructions.
2. Do not apply coating material in rain, fog, or mist; or when relative humidity exceeds 85%; or to damp or wet surfaces, or if these conditions are imminent within 24 hours.

PART 2 PRODUCTS

2.1 Approved Manufacturers and Products: The roof coating system shall be a cold process, fluid applied, complete assembly using compatible materials from a single manufacturer. **No substitutions are permitted.**

2.2 Base and Finish Coat: An aliphatic polyurethane based coating intended to be applied in a minimum of two coats, select one of the following:

A. ER Systems. – EraKote Coating System

B. Republic Powered Metals (RPM) – GeoGard coating System

2.3 Flashing Compound: An acrylic latex flashing compound consisting of a highly concentrated, acrylic resinous plastic emulsion with inert mineral pigments capable of trowel or brush consistency intended for repairs and patching as approved by the primary coating manufacturer.

2.4 Reinforcement Fabric: A stitchbonded polyester textile fabric manufactured for cold process repairs and reinforcement of areas of excessive cyclic movement, and existing cracks and/or crazing. 2.5 oz./sq. yd. minimum weight as approved by the primary coating manufacturer.

2.5 Related Products:

A. Cleaning agents, modifying compounds, rust inhibitors, rust converters, stain blockers, sealants, and other related products; and procedures for their use shall be as recommended by the primary coating manufacturer.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

A. Manufacturer's Installation Requirements:
1. In addition to the specified procedures, the installer shall be responsible for the installation of the elastomeric coating materials in accordance with the procedures required by the coating material manufacturer for the proper execution of the work and the issuance of the specified weathertightness warranty.
2. The coating installer shall review the specified procedures for possible conflicts, for resolution, prior to bidding.

3.2 PREPARING SURFACES:

A. Verify that all surfaces are properly prepared to accept the work of this section. Confirm that all significant modified bitumen roof repairs have been completed.

B. Remove existing failed joint sealants and replace with new urethane sealant and/or the acrylic patching compound as recommended by the primary coating manufacturer.

C. Clean surfaces by pressure washing with clean water (use an admixture of surface cleaner as necessary), passed through a high pressure (2,400 psi min.) sprayer/washer to remove all oils, grease, foreign and loose materials, or surface contaminates that could adversely affect adhesion of the new coatings. Mildew, mold or algae should be treated with bleach during the pressure washing process. Allow surface to dry completely.

D. Mask off windows, louvers, vents, equipment, weep holes, and other surfaces that are not to receive the applied coating system. Protect adjacent and downwind surfaces as necessary to protect from coating application and overspray.

3.3 COATING SYSTEM APPLICATION

A. Ensure surface is free of all surface contaminates, and all surface preparation is complete.

B. Apply the specified polyurethane base coat by brush, roller, or spray techniques depending on surface texture as directed by the coating manufacturer. Apply at a rate of no less than two (2) gallons per 100 square feet, depending on surface porosity and the manufacturer’s requirements for issuance of the specified warranty. Allow to properly cure prior to application of subsequent coats.

C. Inspect base coat application; correct any application defects as necessary prior to application of finished wall coating products.

3.4 CLEAN-UP AND INSPECTION:

A. Clean-up:

1. During progress of work remove from project site discarded materials, rubbish, cans and rags resulting from work.
2. Upon completion of work, clean all spattered surfaces. Remove spattered materials by proper methods of washing and scraping, using care not to damage finished surfaces.

B. Inspection: Prior to Owner inspection and acceptance of the coating application, the coating manufacturer's technical representative shall inspected the finished work, and issue written confirmation to the Owner and Architect that the finished application is acceptable, and the specified warranty will be issued for the project.

3.5 PROTECTION

A. Protect work of other trades. Correct damage by cleaning, repairing or replacing, as directed by Architect. Leave work in undamaged condition.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Batt insulation for filling exterior curb walls and expansion joints.

1.2 RELATED SECTIONS

A. Section 06 10 53 - Rough Carpentry

1.3 REFERENCES

A. ASTM C665 - Mineral Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

B. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.

C. NFPA 255 - Test of Surface Burning Characteristics of Building Materials.

D. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

1.4 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide data on product characteristics, performance criteria and limitations.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.5 PROJECT CONDITIONS

A. Existing Conditions

1. Verify existing conditions, such as soundness of perimeter conditions, and varying deck and wall thickness for length of anchoring services required and other visible conditions prior to Bidding.

2. Conflicts and problems shall be reported to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.

3. Replace or restore to original condition any materials or work damaged during construction.

1.6 COORDINATION

A. Coordinate work under provisions of Division 1.

PART 2 PRODUCTS

2.1 MATERIALS

A. Batt Insulation: ASTM C665; preformed glass fiber batt conforming to the following:

1. Thermal Resistance: R-11 for curbs & expansion joints.
2. Facing: Faced on one side with asphalt treated Kraft paper.
3. Flame/Smoke Properties: In accordance with ASTM E84.

B. Insulation Fasteners: Galvanized nails or electroplated staples. Length to suit insulation thickness, capable of securely and rigidly fastening insulation in place.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Division 1.

B. Verify that substrate and adjacent materials are dry and ready to receive insulation.

3.2 INSTALLATION

A. Install insulation in accordance with insulation manufacturer's instructions and Division 1.

B. Install in exterior walls and spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Install with factory applied vapor retarder membrane facing conditioned side of building spaces. Lap ends and side flanges of membrane between framing members.

E. Staple or nail facing flanges in place at maximum 6 inches oc.

3.3 SCHEDULES

A. Curb & Expansion Insulation: R-11 batt.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Granular surfaced asphalt shingle roofing.

B. Self-adhesive modified bitumen underlayment, eave, valley, and ridge protection.

C. Associated metal flashing and accessories.

1.2 RELATED SECTIONS

A. Section 06 10 53 - Rough Carpentry

B. Section 07 01 50.19 - Preparation for Re-Roofing

C. Section 07 62 00 - Sheet Metal Flashing and Trim

1.3 REFERENCES

A. ASTM A 361/A 361M-85 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process for Roofing and Siding.

B. ASTM B209 - 209M - Aluminum and Aluminum-Alloy Sheet and Plate.

C. ASTM D 224 - Smooth-Surfaced Asphalt Roll Roofing (Organic Felt).

D. ASTM D 225 - Asphalt Shingles Surfaced with Mineral Granules.

E. ASTM D 226 - Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.

F. ASTM D 228 - Testing Asphalt Roll Roofing, Cap Sheets and Shingles.

G. ASTM D1970 - Standard Specification for Self-Adhering Modified Bituminous Steep Roofing Underlayment.

H. ASTM D 3018 - Class A Asphalt Shingles Surfaced with Mineral Granules.

I. ASTM D3161 - Standard Test Method for Wind Resistance of Asphalt Shingles (Organic or Fiberglass).

J. ASTM D 3462 - Asphalt Shingles Made From Glass Felt and Surfaced With Mineral Granules.

K. ASTM D 4586 - Asphalt Roof Cement, Asbestos Free.

L. ASTM E108 - Standard Test Method for Fire Resistance.

M. Metro-Dade - Product Control Notice of Acceptance - current

N. NRCA - Steep Roofing Manual.

O. UL 55B - Class C Asphalt Organic-Felt Sheet Roofing and Shingles.

P. UL 580 - Tests for Wind Uplift Resistance of Roof Assemblies.

Q. UL 790 - Tests for Fire Resistance of Roof Covering Materials.

R. UL 997 - Tests for Wind Resistance of Roof Covering Materials.

1.4 SUBMITTALS FOR REVIEW

A. Section 01 33 00 - Submittals: Procedures for submittals.

B. Shop Drawings: Indicate metal flashing, jointing methods and locations, fastening methods, locations, and installation details.

C. Product Data: Provide data indicating material characteristics, performance criteria, limitations.

D. Samples: Submit two samples of each shingle color indicating color range and finish texture/pattern; for color selection.

1.5 SUBMITTALS FOR INFORMATION

A. Section 01 33 00 - Submittals: Procedures for submittals.

B. Manufacturer's Instructions: Indicate installation criteria and procedures.

C. Manufacturer's Certificate of Compliance: Provide Certificate of Compliance from an independent laboratory indicating that the asphalt fiberglass shingles made in normal production meet or exceed the requirements of:

1. ASTM E108/UL 790, Class A Fire Resistance
2. ASTM D3161/UL 997, Type I Wind Resistance
3. ASTM D3462 - High Tear Resistance
4. Metro-Dade - Product Control Acceptance

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Steep Roofing Manual and manufacturer's installation requirements.

B. Maintain one copy of document on site.

C. Only shingles that conform to the referenced testing and quality standards will be allowed for

use on this project.

D. Manufacturer's label shall contain the reference to the appropriate ASTM and UL standards, and indicate Metro-Dade approval.

1.7 REGULATORY REQUIREMENTS

A. Conform to all applicable codes and UL 790 for fire resistance, also UL 580 and ASTM D 3462 wind uplift requirements for shingle types specified.

B. Conform to all applicable code and regulations of jurisdictional authorities, including Standard Building Code (Installation of Roof Coverings).

1.8 MOCK-UP

A. Section 01 40 00 - Quality Control: Requirements for mock-up.

B. Provide mockup of **200 square feet**, including preliminary roof, eave protection, shingle installation, valley flashing, and associated flashing.

C. Locate where directed.

D. Mockup may remain as part of the Work.

1.9 PROJECT CONDITIONS

A. Existing Conditions

1. Verify existing conditions, such as soundness of perimeter conditions, and varying deck and wall thickness for length of anchoring surfaces required and other visible conditions prior to bidding.
2. Report conflicts or problems to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.
3. Replace or restore to original condition any materials or work damaged during construction.
4. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.
5. Failure to install the work in strict accordance with provisions of this Section is subject to total rejection of work specified herein.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Material and Equipment: Environmental conditions affecting products on site.

B. Do not install eave edge protection, preliminary roof, and shingles when surface, ambient air, or wind chill temperatures are below 45 degrees F.

1.11 EXTRA MATERIALS

A. Section 01 77 00 - Closeout Procedures.

B. Provide **1000 square feet** of extra shingles of each color selected.

1.12 WARRANTY

A. Manufacturer's Warranty: Furnish the shingle manufacturer's **40 year** warranty for the Work of this section involving a commercial or institutional Owner.

B. Applicators Warranty: Furnish per completed form at the end of this section.

PART 2 PRODUCTS

2.1 ASPHALT SHINGLES

A. Manufacturers:

1. Elk Corporation - "Prestique Plus".
2. GAF Corporation - "Original Timberline Shingles".
3. Owens Corning - "Oakridge 40 Shadow".
4. Tamko - "Heritage 40 Shingles"

B. Fiberglass Shingles:

1. ATM D 3018-72, Type I; U.L. Class A: and fungus resistant.
   a. Shingle to incorporate a recognized industry standard algae resistant component, such as 3M Algae Block, Algae Eater, or similar.
2. "Architectural" type shingle, approximate size of 36" long x 12" wide by 5" exposure.
3. Approximate weight of 260 lbs/square. minimum.
4. Self sealing U.L. listed for wind resistance.
5. Hip and Ridge Shingle: Pre-cut manufacturer's standard or job cut from a three tab field shingle.
6. Color Selection: A single color shall be selected from manufacturer's standard colors.
7. Color Selection: Color to be approved by Owner.

C. Bituminous Plastic Cement: ASTM D 4586, Type II.

D. Other Materials: All other materials, not specifically described but required for a complete and proper installation of shingles shall be new, first quality of their respective kinds, and subject to the approval of the Architect.

2.2 ROOF UNDERLAYMENT SHEET MATERIAL

A. Material: Rubberized (SBS) asphalt bonded to a polyester reinforcing mat, 40 mil (1 mm) minimum total thickness, single-sided, self-adhesive, with a strippable treated release paper. Surface to be non-skid surface of mineral granules, fabric scrim and/or sanded.

or

B. Material: Rubberized (SBS) asphalt bonded to a reinforcing polymeric film top surface, 60 mil (1.5 mm) minimum total thickness, single-sided, self-adhesive, with a strippable treated release paper. Surface to be non-skid surface of mineral granules, fabric scrim and/or sanded.

C. Acceptable Products are limited to:

1. Protecto Wrap Co. Rain Proof - 40
2. Tamko TW Metal and Tile Underlayment.
3. Architect approved equal product.

2.3 ACCESSORIES

A. Fasteners:

1. Hot dipped galvanized or aluminum 11 or 12 ga. barbed shank, 3/8" head, sharp pointed conventional roofing nails, of sufficient length to penetrate through the wood decking, (1-1/4 inch minimum length).

B. Primer for metal and concrete:

1. Primer for all metal, concrete and masonry surfaces, (no primer required for wood or plywood), to be Protecto-Wrap #80 or #100 primer, or as recommended by the manufacturer.

2.4 FLASHING FABRICATION

A. Form flashing to protect roofing materials from physical damage and shed water.

B. Form sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.

C. Hem exposed edges of flashing minimum 1/4 inch on underside.

PART 3 EXECUTION

3.1 INSPECTING AND PREPARING SURFACES:

A. General:

1. Assure that surfaces to which shingles are to be applied are uniform, smooth, sound,

clean, dry and free of irregularities.

2. Verify that installation of metal flashing and attic insulation has been completed as required prior to beginning shingle work. Do not install shingle roofing until all vent stacks and other penetrations through roofing have been installed and are securely fastened against movement. Coordinate with the sheet metal installer.
3. Verify that work of other trades that penetrate roof deck has been completed.
4. Do not start work until unsatisfactory conditions are corrected.

B. Inspection:

1. Examine substrates and conditions under which roofing work is to be performed and shall notify the Contractor and Architect in writing of unsatisfactory conditions.
2. Do not proceed with roofing work until unsatisfactory conditions have been corrected in a manner acceptable to the roofer.

C. Wood Decks:

1. Verify that existing wood deck has been prepared.
2. Verify that defective wood decks has been removed and replaced.

D. Broom clean deck surfaces under preliminary roof prior to their application.

3.2 INSTALLATION - PRELIMINARY ROOF & VALLEY PROTECTION

A. Apply single-sided, self-adhering, modified bitumen flashing strip at edge of roof, lap down fascia 1 1/2 inches minimum. Place eave edge and rake edge metal flashing tight with fascia boards over flashing tape. Weather lap joints and secure flange with nails per Section 07620.

B. For "Closed-Cut" or "Woven" valleys, first place one ply of single-sided, self-adhering, modified bitumen underlayment, minimum 36 inches wide, centered over valleys. Lap joints minimum 6 inches. Follow waterproofing membrane manufacturer's instructions.

C. Prime valley metal, top side only, as recommended by the membrane manufacturer. Install metal valley flashing per Section 07 62 00 and as shown on the drawings. Extend valley metal a minimum of 1 inch beyond edge metal at center of valley.

D. Apply a self adhering, rubberized asphalt membrane preliminary roof over the entire deck in accordance with manufacturer's instructions. Extend preliminary roof to center of valley and cut. Overlap hip ridges with preliminary roof membrane from each roof plane by a minimum of 8 inches.

E. Weather lap and seal watertight with manufacturer recommended modified bitumen adhesive / mastic / cement items projecting through or mounted on roof. Do not allow solvent based cements to contact the modified bitumen membrane.

3.3 APPLYING STARTER STRIP:

A. Starter Strip:

1. Use shingles with tabs cut off as a starter strip. Starter strip shingles shall be flush with edge of the eaves and rake.
2. Nail starter strip using same spacing as for shingles, and locate nails about 1" up from the bottom edge.
3. Avoid nailing where cut-outs will occur on the first course of shingles.

B. Chalk Lines:

1. Snap chalk lines to guide application and maintain level lines parallel with the eaves and ridge.
2. Hip Roofs: Strike vertical chalk line. Apply shingles left and right as described in the application instructions.

C. Trimming Shingles:

1. Cut-Off at rakes and eaves flush.

3.4 NAILING:

A. “Architectural” Shingles: Six nails per shingle.

3.5 APPLYING SHINGLES:

A. Chalk Lines:

1. Snap chalk lines parallel to the edge (rake) of roof 6", 12", 18", 24" 30" and 36" in from the edge.
2. Horizontal chalk lines should be snapped every other row 10" apart.
3. Use these guides to keep the shingle cut-outs in alignment during application.

B. Shingles:

1. First Course: Start the first "course" (or "row") with a full shingle. Align it to the 36" chalk line with the butt edge flush with the starter course edge.
2. Second Course: Cut 6" off the outside edge of the next course and align it to the 30" chalk line.
3. Third Course: Cut 12" off the outside edge of the next course and align it to the 24" chalk line.
4. Succeeding Courses: Repeat this pattern on up the roof cutting 6" off each succeeding row. When the last piece is installed, which is 6" wide, return to eaves and apply full shingle in each row up the roof. Start the seventh row with a full shingle at the rake repeating the above pattern. Caution: A cut-out must never come over a cut-out in the row immediately below.
5. Alternate offsets of 4" and 5" are also acceptable.
6. For best distribution of color blend, each row shall be run at least four shingles across the

roof before proceeding to the next row.

C. Vent Pipes:

1. Apply shingles up to vent pipe.
2. Set flange of vent pipe flashing fabrication in a 1/4" thick bed of cement.
3. Cut hole in next shingle to go over pipe and set in plastic cement. Rest of shingles are then cut around the sleeve and all are set in plastic cement.

D. Hips and Ridges:

1. Hip and Ridge Shingles can be cut from the manufacturer's standard three tab shingles matching those used to cover roof. Cut 3 ridge shingles per 3 tab shingles. Bend each shingle equally over the ridge.
2. If weather is cold, warm shingles until flexible to prevent cracking.
3. Apply a continuous 11 inch wide strip of modified bitumen, mineral granule surfaced cap sheet the entire length of the hip or ridge immediately prior to installation of the ridge shingles.
4. Start on end of ridge opposite prevailing wind. Expose shingles 5", using two nails each, 5 ½" from the exposed butt end and 1" from the side edges.
5. Start hips at bottom. Apply ridge after hips are installed. Finish with last ridge cap piece set in plastic cement. Do not leave any nails exposed.

3.6 INSTALLATION OF METAL FLASHING AND SHEET METAL:

A. General:

1. Installation of metal flashing and sheet metal shall be by the sheet metal installer; the roofer shall coordinate the installation to allow proper attachment of the shingles.
2. Metal “step-flashing” shall be installed by the roofer and interleaved in sequence with the shingles for the proper weathered lap.
3. The roofer shall review the flashing details for additional roofing installation requirements.

3.7 ADJUST AND CLEAN:

A. Replace damaged shingles.

B. Remove excess shingles and debris from project site.

3.8 FIELD QUALITY CONTROL

A. Field inspection will be performed under provisions of Section 01 40 00.

B. Visual inspection of the Work will be provided by Owner. If conditions do not meet approval, notify the Architect.

3.9 PROTECTION OF FINISHED WORK

A. Protect finished work under provisions of Section 01 50 00.

B. Do not permit traffic over finished roof surface.

END OF SECTION

APPLICATOR WARRANTY FOR ROOFING

Whereas _____

of (Address)_____

herein called the "Roofing Contractor", has performed roofing, flashing and sheet metal and associated ("work") on following project:

Owner:_____

Address: _____

Name and Type of Building:_____

Address: _____

Area of Work: _____

Date of Acceptance:_____

Warranty Period: **Two Years** Date of Expiration: _____

The Roofing Contractor hereby certifies to the Owner as a “Final Statement of Compliance” that the finished roof membrane (and insulation) system was installed in compliance with the approved contract documents.

AND WHEREAS Roofing Contractor has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks, faulty or defective materials, roofing components deemed faulty or in disrepair, and workmanship for designated the Warranty Period.

NOW THEREFORE Roofing Contractor hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work, and as are necessary to maintain said work in watertight condition.

This Warranty is made subject to the following terms and conditions.

1. Specifically excluded from this Warranty are damages to roofing work and other parts of the building, and to building contents, caused by:

    a) lightning, windstorm
    b) fire
    c) failure of roofing system substrate or structure (including cracking, settlement, excessive deflection, deterioration, and decomposition).

d) When work has been damaged by any of the foregoing causes, Warranty shall be null and void until such damage has been repaired and until cost or repairs has been paid by the Owner or by another responsible party as so designated.

2. The Roofing Contractor is responsible for damage to work covered by this Warranty, and is not liable for consequential damages to building or building contents, resulting from leaks or faults or defects of work.

3. The Owner shall promptly notify Roofing Contractor of observed, known or suspected leaks, defect, disrepair or deterioration. The Contractor shall guarantee to respond to all notifications within twenty-four (24) hours and to make all such repairs as deemed necessary to correct said leaks or defects to a satisfactory condition to the Owner. Repairs shall be made by workman in the current employment of the Contractor. Subcontracting of repair work is not permitted.

4. The definition of faulty roofing components or roofing in disrepair includes, but is not limited to the following:

   A. Blisters in roofing.
   B. Cracks or ridging in roofing membranes.
   C. Delamination, shears or tears in membrane.
   D. Defects in the quality of work or materials.
   E. Leaks of any kind.

5. This Warranty is recognized to be the only warranty of the Roofing Contractor on said work, and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to him in cases of roofing failures. Specifically, this Warranty shall not operate to relieve Roofing Contractor of responsibility for performance of original work in accordance with requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

IN WITNESS THEREOF, this instrument has been duly executed this

_____day of_____, 20____.

_____
Roofing Contractor Firm

(SEAL)

_____
Signature of Authorized Person

_____
Title

_____
Witness

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Built-up coal tar roof system placed over a gypsum lightweight or structural concrete deck surface, membrane roofing, gravel, base flashing, and cant strips.

B. The general provisions of the Contract, including General and Supplementary Conditions and Division 1 Requirements, apply to work of this section.

C. Manufacturer's Notice of Intent to Issue Roof Warranty form, a single form is to be submitted by each bidder within the Bid Submittal package.

D. Applicator Warranty for Roofing form, to be submitted upon completion of the project.

E. Fastening Pattern Submittal Document, to be completed by manufacturer, and submitted by contractor with pre-construction submittals for review and approval.

F. Code Compliance Submittal Document, to be completed by manufacturer, and submitted by contractor with pre-construction submittals for review and approval.

1.2 RELATED SECTIONS:

A. Section 06 10 53 - Rough Carpentry.

B. Section 07 01 50.19 - Preparation for Re-Roofing.

C. Section 07 62 00 - Sheet Metal Flashing and Trim: Counter flashing and edge metal.

D. Section 22 14 26.13 - Plumbing Specialties: Roof drains.

1.3 REFERENCES

A. ASTM C 177 - Test Method for Steady-State Thermal Transmission Properties by Means of the Guarded Hot Plate.

B. ASTM C 208 - Insulating Board (Cellulosic Fiber), Structural and Decorative.

C. ASTM C 209 - Standard Test Methods for Cellulosic Fiber Insulating Board

D. ASTM C 726 - Mineral Fiber and Mineral Fiber, Rigid Cellular Polyurethane Composite Roof Insulation Board.

E. ASTM C 728 - Perlite Thermal Insulation Board.

F. ASTM C 984 - Perlite Board, Rigid Cellular Polyurethane Composite Roof Insulation.

G. ASTM C 1002 - Steel Drill Screws for the Application of Gypsum Board.

H. ASTM C 1013 - Membrane Faced Rigid Cellular Polyurethane Roof Insulation.

I. ASTM D 41 - Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.

J. ASTM D 43 - Creosote Primer Used in Roofing, Dampproofing, and Waterproofing.

K. ASTM D 227 - Coal-Tar-Saturated Organic Felt Used in Roofing and Waterproofing.

L. ASTM D312 - Asphalt Used in Roofing.

M. ASTM D 450 - Coal-Tar Bitumen Used in Roofing, Dampproofing and Waterproofing.

N. ASTM D 549 - Test Methods for Rosin in Paper and Paperboard.

O. ASTM D 1863 - Mineral Aggregate for Use on Built-up Roofs.

P. ASTM D 2178 - Asphalt Glass Felt Used in Roofing and Waterproofing.

Q. ASTM D 2626 - Asphalt Saturated and Coated Organic Felt Base Sheet Used for Roofing.

R. ASTM D 4022 - Specification for Coal Tar Roof Cement.

S. ASTM D 4601 - Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.

T. ASTM D 4586 - Specification for Asphalt Roof Cement, Asbestos Free.

U. ASTM D 4897 - Specifications for Asphalt-Coated Glass Fiber Venting Base Sheet Used in Roofing

V. ASTM D 4990 - Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.

W. ASTM D 6163: Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bitumen Sheet Materials Using Glass Fiber Reinforcements.

X. ASTM D 6164: Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bitumen Sheet Materials Using Polyester Reinforcements.

Y. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.

Z. ASTM E 96 - Water Vapor Transmission of Materials.

AA. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.

BB. FM (Factory Mutual) - Roof Assembly Classifications.

CC. FM 4470 - Base ply fasteners to meet Factory Mutual Research Approval Standard #4470

DD. NRCA (National Roofing Contractors Association) - Roofing and Waterproofing Manual.

EE. ULI (Underwriters Laboratories Industries) - Fire Hazard Classifications.

FF. FS HH-I-1972/Gen, FS HH-I-1972/3 - Polyisocyanurate Insulation Board.

GG. NFPA 255 - Test of Surface Burning Characteristics of Building Materials.

HH. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

1.4 SYSTEM DESCRIPTION

A. Built-up Coal Tar Roofing System:

1. Over Structural Concrete Deck: Four (4) ply premium coal tar coated glass fiber membrane roof system applied in hot coal tar bitumen over a fully adhered, multiple course, rigid board insulation system. Insulation to be over a SBS modified bitumen, polyester reinforced preliminary roof membrane mopped in hot asphalt over a fully primed structural concrete deck. Finish roof system with a multiple ply granular surfaced modified bitumen flashing system, and “double rock” aggregate surfacing.

2. Over Lightweight Insulating Concrete Deck: Four (4) ply premium coal tar coated glass fiber membrane roof system applied in hot coal tar bitumen over a fully adhered, multiple course, rigid board insulation system. Insulation to be over a SBS modified bitumen, polyester reinforced preliminary roof membrane mopped in hot asphalt over a mechanically fastened venting base sheet on lightweight insulating concrete deck. Finish roof system with a multiple ply granular surfaced modified bitumen flashing system, and “double rock” aggregate surfacing.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

C. Product Data: Submit manufacturer's technical product data, installation instructions and recommendations for each type of roofing product required. Include data substantiating that materials comply with requirements.

1. For coal tar, provide label on each container or certification with each load bulk bitumen, indicating flash point (FP), finished blowing temperature (FBT), softening point (SP) and equiviscous temperature (EVT).

2. For bulk coal tar, submit manufacturer's certification indicating that bulk bituminous materials (if any) delivered to project comply with required standards. Include quantity, statistical and descriptive data for each product. Submit certificate with each load before it is used.

D. Submit three (3) samples of each fastener type specified.

E. Submit three (3) strips of full roll width samples of each roofing sheet material specified.

F. Submit three (3) 3-lb. samples of aggregate surfacing material.

G. Submit Material Safety Data Sheets for all roofing products.

H. Manufacturer's Field Reports: Submit under provisions of Section 01 40 00:

1. Indicate procedures followed; ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.

I. All products used shall be asbestos free.

1.6 QUALITY ASSURANCE

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

B. Maintain one copy of document on site.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.

B. Installer Qualifications

1. A single Installer ("Roofer") shall perform the work of this section; and shall be a firm with not less than 5 years of successful experience in installation of built-up roofing systems similar to those required for this project and which is acceptable to or licensed by manufacturer of primary roofing materials.

2. Obtain written certification from manufacturer of BUR system certifying that Installer is approved by manufacturer for installation of specified roofing system. Provide copy of certification to Architect prior to award of roofing work.

3. Installer must maintain full-time supervisor/foreman on job site during times that roofing work is in progress. Supervisor must have minimum of 5 years experience in roofing work similar to nature and scope to specified roofing.

1.8 REGULATORY REQUIREMENTS

A. Conform to applicable code for roof assembly fire hazard requirements and regulations of jurisdictional authorities, including the Florida Building Code - Chapter 15, Roofs and Roof Structures, and Chapter 16, Structural Loads.

B. All roofing materials to be Class A as tested in compliance with ASTM E 108 -Standard Test Methods for Fire Tests of Roof Coverings

C. FM: Roof Assembly Classification, Class 1 Construction. Roof membrane shall resist 143 mph wind uplift according to basic wind load pressures as calculated in accordance with ASCE 7-10 and the Florida Building Code requirements, fifth (2014) edition

D. Material Safety Data Sheets: For all roofing products.

1.9 CERTIFICATION

A. Materials: For each material specified with a standard or reference material designation, certification labels shall appear on each package of bulk-shipments to project with certificate of compliance.

B. Installer: Provide two copies of all certification to Architect prior to beginning roofing work.

C. Code Compliance Submittal Document: The manufacturer and/or contractor shall submit the code compliance data to the Architect and Owner for review and approval before installation of any roofing materials utilizing the form attached at the end of this section.

D. Insurance Certification: Assist the Owner in preparation and submittal of roof installation acceptance Certification necessary concerning fire and extended coverage insurance on roofing and associated Work.

1.10 MOCKUP

A. Provide mockup of roof membrane system and associated components and accessories under provisions of Section 01 40 00.

1.11 PRE-INSTALLATION CONFERENCE

A. Convene meeting one week prior to commencing work of this section at project site, with 72 hours minimum notice to participants. Meeting to include Contractor, Roofer, and Subcontractors, governing authorities, test agencies, the Owner's Insurer, product manufacturers, Architect and the Owner Representative.

B. Review requirements, Contract Documents, submittals, sequencing, availability of materials and installation facilities, proposed installation schedule, requirements for inspections and testing or certifications, forecasted weather conditions, governing regulations, insurance requirements, and proposed installation procedures.

C. Record discussion on matters of significance; furnish copy of recorded discussions to each participant. Discuss roofing system protection requirements for construction period extending beyond roofing installation.

D. Coordination

1. Organize the work so the work can simultaneously proceed on the various aspects of the work such as demolition, blocking, roofing and flashing, and sheet metal, etc., so as at the end of each day the portion(s) of the project worked on that day will be complete.

2. Roof area shall be substantially complete prior to beginning another roof area; utilize multiple crews for multiple roof area construction. Phasing of roof construction by area is not permitted.

1.12 DELIVERY, STORAGE, AND HANDLING

A. Deliver to site, store, protect, and handle products under provisions of Section 01 60 00.

B. Deliver material in manufacturer's original, unopened containers with manufacturer's labels intact and legible.

C. Deliver material requiring fire resistance classification to the job with labels attached and packaged as required by labeling service.

D. Deliver enough material to allow continuous work.

E. Store rolls, cans and drums of cements, primers, and coatings, on end and over clean raised platforms.

F. Store and handle materials to protect them from.

1. Moisture, whether due to precipitation, or condensation.
2. Damage by construction traffic.
3. Temperatures over 110 degrees F or below 40 degrees F.
4. Direct sunlight.
5. Mud, dust, sand, oil and grease.

G. Select and operate material handling equipment and store materials to keep from damaging existing construction or applied roofing. Immediately remove and dispose of wet materials.

H. Comply with fire, safety, and environmental protection regulations.

I. Do not store materials on roof decks, nor position roofing installation equipment on roof decks, in concentrations exceeding design live loads.

J. Take special precautions against traffic on roofing when ambient temperature is above 80 degree F. Avoid heavy traffic on the work during installation.

1.13 ENVIRONMENTAL REQUIREMENTS

A. Do not apply roofing membrane during unsuitable weather when ambient temperature is below 40 degrees Fahrenheit.

B. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

1.14 PROJECT CONDITIONS

A. Existing Conditions

1. The roofing applicator and sheet metal installer shall verify existing conditions, such as soundness of perimeter conditions, and varying deck and wall thickness for length of anchoring services required and other visible conditions prior to Bidding.

2. Report conflicts and problems to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Prime Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.

3. Replace or restore to original condition any materials or work damaged during construction.

4. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.

5. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.

1.15 SAFETY REQUIREMENTS

A. All work shall be in compliance with OSHA safety standards and regulations with emphasis on Section 29 CFR 1910, including but not limited to the following DCPS regulations.

1. Provide facility administrator one day prior notice before commencing with work or moving to new areas.

2. Proper identification and clothing, to work at all times. Only the facility administrator is permitted in the facility.

3. The Contractor shall provide sufficient temporary barricades in order to contain passage ways around tankers, trash chutes, hoisting areas and areas below roof edges where work is conducted.

4. Fire extinguishers are required, one on the ground and one on the roof deck.

5. Tankers shall have an attendant at all times.

6. Remove tankers at the end of each work day.

7. Seal all possible seepage areas, before using bituminous materials.

8. Power driven shot fasteners are not permitted.

9. Do not leave hot mops on roofs after work hours. Remove at the completion of each work day.

10. No tankers shall be placed next to exterior building opening allowing fumes to enter the building. No use of asphalt on roofs at intake ventilator, etc., schedule work around such items to not allow fumes to enter the building.

11. No tankers shall be placed on roof decks, ground locations shall be selected by the Contractor and the Project Manager, and shall be approved by the Facility Administrator.

12. The following equipment is the minimum needed to protect staff and occupants if roofing is done while facility is occupied.

    a. Tar tanker must have thermometer to prevent tar from being over-heated (usually over 450 to 500 degrees F and have insulated lines to keep tar hot).

    b. All equipment in good work order.

13. All pipe joints attached to the asphalt pump shall be mop-yarn tied to ensure any leaks do not spray out of the barricade areas.

14. All pumps shall use rigid pipes.

15. No flammable or explosive substance or equipment for repairs or alterations shall be introduced in a building of normally low or ordinary hazard classification while the building is occupied unless the condition of use and safeguards provided are such as not to create any additional hazard or handicap to egress beyond the normally permissible conditions in the building.

16. Protect building and adjacent surfaces from bitumen spillage and repair or replace damaged materials at no cost to Owner.

17. All toxic substances enumerated in the Florida Substance List established pursuant to S.442.103 that are to be used in the construction, repair or maintenance of educational facilities are restricted to usage according to the following provisions:

    a. Before any such substance may be used, the Contractor shall notify the project manager in writing at least three working days prior to using the substance. The notification shall contain:

        1) The name of the substance to be used;

        2) Where the substance is to be used; and

        3) When the substance is to be used.

18. The project manager shall take all reasonable actions to ensure that the Contractor complied with the safety precautions and handling instructions set forth in the material safety data sheet for each substance used by the Contractor so that usage of the substance poses no threat to the health and safety of the building occupants and the general public.

19. Refer to Section 01 31 00 - Coordination, Part 1, Article 1.31 - Safety Coordination for additional regulations.

B. Contractor shall take all possible measures to prevent the entry of noxious fumes or odors

into the interior of the building during performance of the work. This shall include, but not be limited to, closing and sealing windows, doors, intake louvers, exhaust vents; as well as the use of temporary ductwork to relocate air intake points and wind barricades. Contractor may also choose to adjust the rooftop kettle location based on prevailing wind patterns with the Owner Representatives approval.

1.16 ENVIRONMENTAL REQUIREMENTS

A. Do not apply roofing membrane during unsuitable weather when ambient temperature is below 40 degrees Fahrenheit.

B. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day

C. Proceed with roofing work when existing and forecasted weather conditions permit work to be performed in accordance with requirements of this section and warranty compliance requirements.

1.17 COORDINATION

A. Coordinate work under provisions of Section 01 31 00.

B. Coordination: Organize the work so the work can simultaneously proceed on the various aspects of the work such as demolition, blocking, roofing and flashing, and sheet metal, etc., so as at the end of each day the portion(s) of the project worked on that day will be complete.

C. Coordinate the work with installation of associated counterflashing installed by other sections as the work of this section proceeds.

1.18 SEQUENCING

A. Organize operations so work can simultaneously proceed on the various aspects including roofing, cants and flashing so at the end of each day the work done that day will be substantially complete.

B. Roof area shall be substantially complete prior to beginning another roof area; utilize multiple crews for multiple roof area construction. Phasing of roof construction by area is not permitted.

C. Sequence equipment removal with covering of deck openings with plywood strong enough to prevent injuries from falling through. Contractor shall install waterproof covering over plywood and tie-in to existing membrane to achieve complete watertightness.

1.19 WARRANTIES

A. Applicators Warranty: Furnish on executed form included.

B. Manufacturer's Warranty: 20 year total roof system warranty inclusive of roofing materials from deck to finish membrane (Refer to Manufacturer’s Notice of Intent to Issue Roof

Warranty at end of this Section).

PART 2 PRODUCTS

2.1 MATERIALS, GENERAL

A. Insurance and Code Requirements: Provide roof materials and systems which comply with all governing regulations, installed to comply with Underwriters Laboratories Class A, as well as ASCE 7-10 and the Florida Building Code requirements, fifth (2014) edition wind up-lift requirements.

B. Obtain primary built-up membrane roofing materials from a single manufacturer. Provide secondary materials only as recommended by the manufacturer of the primary material, and additionally as specified.

2.2 MANUFACTURERS - SHEET AND BITUMEN MATERIALS

A. Approved Systems:

1. Honeywell Commercial Roofing Systems:

a. Over lightweight insulating concrete deck: Based on Coal Tar Membrane System Specification RP-51 TC (four (4) plies of tar coated premium fiberglass felts with flood of hot bitumen and aggregate surfacing over an approved rigid insulation system). Insulation system to fully adhered to a modified bitumen preliminary roof membrane over a mechanically fastened vented base sheet. Flashing application shall be based on Infinitee Flashing Specification No. I-500-C (cold application).

b. Over structural concrete deck: Based on Coal Tar Membrane System Specification RP-51 TC (four (4) plies of tar coated premium fiberglass felts with flood of hot bitumen and aggregate surfacing over an approved rigid insulation system). Insulation system to fully adhered to a modified bitumen preliminary roof membrane over a prepared and fully primed structural concrete deck. Flashing application shall be based on Infinitee Flashing Specification No. I-500-C (cold application).

2. Koppers Industries, Inc.:

a. Over lightweight insulating concrete deck: Based on Tar-Glas Membrane System Specification 495-4 (four plies of tar coated premium fiberglass felts with flood of hot bitumen and aggregate surfacing over an approved rigid insulation system). Insulation system to fully adhered to a modified bitumen preliminary roof membrane over a mechanically fastened vented base sheet. Flashing application shall be based on Koppers Flashing Specification No. 182 (hot or cold application).

b. Over structural concrete deck: Based on Tar-Glas Membrane System Specification 495-4 (four plies of tar coated premium fiberglass felts with flood

of hot bitumen and aggregate surfacing over an approved rigid insulation system). Insulation system to fully adhered to a modified bitumen preliminary roof membrane over a prepared and fully primed structural concrete deck. Flashing application shall be based on Koppers Flashing Specification No. 182 (hot or cold application).

B. Manufacturer

1. Obtain primary built-up membrane roofing from a single manufacturer. Provide secondary materials only as recommended by the manufacturer of the primary material, and additionally as specified.

C. Insurance and Code Requirements: Provide materials complying with governing regulations, installed to comply with Underwriters Laboratories Class A and FM I-150, ASCE 7-10 and the Florida Building Code requirements, fifth (2014) edition wind up-lift requirements.

2.3 SHEET MATERIALS

A. Premium Coal-Tar coated Glass Fiber Felts: ASTM D 2178/D 4490, Type VI.

B. Vented Glass Fiber Base Sheet: ASTM D 3672/D 4897, Type II.

C. Base Sheet: ASTM D 4601, Type II, non-perforated.

D. Modified Bitumen Flashing: Manufacturer's premium white granular surfaced modified bitumen flashing sheet-mastic application:

1. Honeywell Specification No. I-500-C
2. Koppers Flashing Specification No. 182
3. Or Approved Equal.

E. Dry-In Membrane: RainProof-40 self-adhering, 40 mil thick, polyester reinforced, SBS modified asphalt waterproofing and underlayment membrane sheet as manufactured by Protecto Wrap Company (Denver, CO), or approved equal.

F. Modified Bitumen Preliminary Roof Membrane: Smooth surfaced SBS modified bitumen membrane “interply” sheet intended for hot asphalt mopped application, membrane shall be a minimum of 120 mils, and weight not less than 70 lbs. per 100 square feet. SBS membrane ply shall be reinforced with a 160 gram/square meter non-woven polyester mat(s), shall conform to the requirements of ASTM D 6164, Type I, Grade S, and be a component within a Class A roofing system as tested in compliance with ASTM E 108. Acceptable manufacturer's and products are as follows:

1.	Firestone	Firestone SBS Smooth
2.	GAF	Ruberoid (Torch) Smooth
3.	Johns Manville	Dynalastic 180 S
4.	MB Technology	SF 160 PSA
5.	Soprema	Sopralene 180
6.	Tamko	Awaplan Versa-Smooth
7.	US Intec	Intec Flex S

8. As approved and recommended by the primary roof manufacturer.

2.4 RIGID BOARD INSULATIONS

A. Polyisocyanurate Roof Insulation, conforming to the following:

1. Board Size: 48" x 48" maximum for fully adhered boards
2. Board Thickness at Base Layer: 2-1/2" thickness.
3. Facing: Factory applied skin of black fiber-reinforced facing on both faces.
4. Board Edges: Square.
5. Compression Resistance: Minimum 20 psi in accordance with ASTM C 1621.
6. Water Absorption: In accordance with ASTM C 209, 1.0 % by volume maximum.
7. Moisture Vapor Transmission: ASTM E 92, less than one (1) Perm.
8. Product Density: ASTM D 1622, Nominal 2.0 lbs./cu. ft.
9. Thermal Resistance Value: R = 18.0 per 2-1/2" inches of total thickness.
10. Flame Spread (foam core): ASTM E 84, 25 (based on full 10 min. test)
11. ULI Fire Rating: Class A, Roof/Ceiling fire rated assemblies
12. Service Temperature: -100°F to 250°F Max.
13. Product: As approved and recommended by the primary roof manufacturer.

B. High Density Fiberboard Insulation: Non-tapered high density (wood) fiberboard rigid insulation board with the following characteristics:

1. Board Density: Lbs/sf (1" thickness), 1.7 maximum
2. Board Size: 48" x 48" maximum for fully adhered boards
3. Board Thickness: 1/2" thickness
4. Compressive Strength: Minimum 30 psi.
5. Water Absorption: ASTM C 209, 7% by volume (maximum).
6. Board Edges: Square.
7. Thermal Resistance Value: R = 1.3 per 1/2" inch of total thickness
8. ULI Fire Rating: Class A, Roof/Ceiling fire rated assemblies.
9. Product: As approved and recommended by the primary roof manufacturer.

C. Tapered Edge Strips for use with tapered insulation: 12" wide, 1/4" per foot tapered pre-formed units of material compatible with insulation (Perlite or Wood Fiberboard).

D. Batt Insulation: ASTM C 665; preformed glass fiber batt conforming to the following:

1. Thermal Resistance: R of 19 for walls. R of 13 for expansion joint curbs.
2. Facing: Faced on one side with asphalt treated Kraft paper.
3. Flame/Smoke Properties: In accordance with ASTM E84.

2.5 BITUMINOUS MATERIALS

A. Coal-Tar Pitch Bitumen: ASTM D 450, Type I.

B. Asphalt: Steep asphalt, ASTM D-312 Type IV, except as otherwise recommended by manufacturer.

C. Primer: ASTM D 43.

D. Plastic Cement: ASTM D 4586, Type II, cutback asphalt type.

E. Coal Tar Mastic: ASTM D 4022, processed coal tar base type.

2.6 MECHANICAL FASTENERS

A. For Fastening Base Flashing To Wood Substrates: Stainless steel annular threaded 11 or 12 gage shanks, 1" long, driven through minimum of 30 gage 1" diameter flat stainless steel cap.

B. For Fastening Vented Base Sheet to Lightweight Concrete Deck: Lightweight concrete base ply fastener with FM 1-90 discs. Comply with Factory Mutual Approval Standard #4470.

C. For All Other Locations: Provide size, type, material and finish as required matching material being fastened.

2.7 PREFABRICATED METAL CURBS - Approved Products:

A. The Pate Company.

B. Custom Curb, Inc.: Model CRC-3 (Basis of Specification).

2.8 PREFABRICATED EQUIPMENT SUPPORTS - Approved Products:

A. The Pate Company.

B. Custom Curb, Inc.

2.9 ACCESSORIES

A. Fiber Cants and Tapered Edge Strips: Provide rigid mineral-wool, perlite, and/or fiberboard cants and tapered edge strips, factory asphalt impregnated on all sides as recommended and approved by the roofing membrane manufacturer.

1. Fiber cants preformed to 45 degree angle with minimum 2-3/4" face by 1" thick x 48" long for use at all parapet, wall, and base flashing conditions.

B. Vent Pipe Flashing: Prefabricated pipe flashing of 4 lb. per square foot common pig lead having a 4 inch flange.

C. Support Pipe Flashing: Prefabricated soldered stainless steel pipe flashing and extension assembly with integral deck flange manufactured by S.B.C. Industries

D. Flashing Tape: Double sided, extruded or preformed, cross-linked butyl rubber, self adhesive tape. 1/8" minimum thickness, 3/4" minimum width unless noted otherwise on the drawings.

1. Pecora Corporation Extru-Seal Glazing Tape.

2. Tremco Construction Products 440 II Tape.
3. Equivalent products as approved by the Owner and Architect..

E. Conduit/Condensate Line Supports: 3000 psi concrete, smooth exposed finish, 8 inch wide x 16 inch long x 2 inch thick; free of surface defects.

2.10 PITCH PAN FILLER

A. Two Part Urethane Sealant - Approved Products:

1. Firestone S-10 RubberGard Pourable Sealer.
2. No substitutions allowed.

B. Non-Shrink Grout - Approved Products:

1. Euco N.S., Euclid Chemical Co.
2. Crystex; L&M Construction Chemicals
3. Masterflow 713; Master Builders
4. Five Star Grout; U.S. Grout Corp.
5. Upcon; Upco Chem. Div., USM Corp.
6. Propak; Protex Industries, Inc.

2.11 SEALANTS: As specified in Section 07900.

2.12 SEALANT PRIMER: Recommended by sealant manufacturer to suit application.

2.13 JOINT CLEANER: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

2.14 BACKER ROD: Extruded polyolefin foam made of a nonabsorbing outer skin and a highly resilient interior network of open and closed cells which will not out-gas when ruptured.

2.15 AGGREGATE: ASTM-D-1863, Size No. 6 river washed gravel, white, dry and free of dust.

2.16 PRECAST CONCRETE PADS FOR ROOF TOP EQUIPMENT: wire mesh reinforced with 3000 p.s.i.

2.17 FIBRATED ALUMINUM COATING: Fibrated reflective coating with asphalt cut-back base, fiberglass fibers, and leafing-type aluminum pigment; complying with ASTM D 2824, Type III.

2.18 FUME RECOVERY/ABATEMENT SYSTEM FOR KETTLES: (Not required for tankers) A system designed to remove and filter asphalt fumes at kettles shall be Aercology FRS-6000 as supplied by National Tool and Equipment, Inc., Boardman, Ohio (216) 629-8665 or Garlock Fumeguard Asphalt Fume Elimination System, as supplied by Garlock Equipment Company, 2601 Niagara Lake, Minneapolis, MN 55447, (612) 553-1935. System shall be utilized to filter fumes at all operating kettles and for every roof area being reroofed.

2.19 MISCELLANEOUS MATERIALS: All other material and accessories, not specifically described, but required for a complete and proper installation of roofing, shall be products

of, or recommended by the manufacturer of the primary material and subject to the approval of the Architect.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION

A. Total Installation Concept

1. The specified system is a total roofing system, not a patched up, chopped up, spliced or added to or on roofing system. Therefore, this type of application will not be acceptable.

2. If a section of roof requires reworking or patching, the entire area of section of roofing shall be replaced. This shall mean from edge or expansion joint to edge or expansion joint in both directions.

B. Manufacturer's Installation Requirements

1. In addition to the specified procedures, the roofing installer shall be responsible for the installation of the roofing in accordance with the procedures required by the roofing Material Manufacturer for the proper execution of the work and issuance of the warranty.

C. Watertightness Imperative

1. The work specified herein shall not preclude the use of procedures that will maintain the building watertight. Therefore, the Contractor, while conforming to these contract documents, shall utilize skill and procedures to keep water out of these buildings while construction is in progress.

2. At end of each day's roofing installation and/or prior to the onset of inclement weather, the new section of roofing shall be temporarily sealed with cut-offs to the unfinished substrates, projections through the roof and to the surrounding intersections so that no moisture may enter roofing or into structure before work resumes. Remove cutoffs before work resumes.

3. Cut-Offs: 2 plies of roofing felt set in full moppings of hot bitumen; remove at beginning of next day's work.

D. Coordination

1. Coordinate work so that no more existing roof membrane is removed than can be totally replaced, with base sheet, to a waterproof condition within one day's working time and/or prior to the onset of inclement weather. Removal of existing membrane and installation of the base sheet shall be considered one continuous operation and shall be a temporary stopping point.

2. Coordinate work so that no more taper board or rigid insulation is installed than can

be covered with ply-felt and to a waterproof condition within one day's working time and/or prior to the onset of inclement weather. Installation of taper board or rigid insulation and ply-felt shall be considered one continuous operation and shall be a temporary stopping point.

E. Protect other work from spillage of built-up roofing bitumen materials and prevent liquid materials from entering or clogging drains and conductors. Replace/restore other work damaged by installation of built-up roofing system work.

F. Insurance/Code Compliance: Install system for (and test where required to show) compliance with governing regulations and with the following requirements:

1. Class “A” per ASTM E 108, and comply with ASCE 7-10 and the Florida Building Code requirements, fifth (2014) edition wind up-lift resistance.

G. Coordinate the installation of insulation, roofing sheets, flashing, stripping, coatings and surfacings, so that membrane edges are not exposed to precipitation or exposed overnight. Provide cut-offs at end of each day's work to cover exposed felts and insulation.

H. The contractor shall take care to cover fresh air intakes to the building on a temporary basis while hot bitumen is being applied. Coordinate with and advise Owner’s representative as to time and location of intakes being covered. Remove covering at end of each work day and/or end of job.

3.2 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secured.

C. Verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains or eaves.

D. Verify adjacent precast concrete roof members do not vary more than 1/4 inch in height. Verify grout keys are filled flush.

E. Verify deck surfaces are dry. Verify flutes of metal deck are clean and dry.

F. Confirm dry deck by moisture meter with 12 percent moisture maximum.

G. Verify roof openings, curbs, pipes, conduit, sleeves, ducts, roof drains and vents through roof are solidly set, and cant strips are in place.

H. Notify the Architect of any deck needing replacement or any condition encountered that would be detrimental to continued operation.

I. Curbs and Nailers

1. Inspect existing nailers for damage or deterioration. Immediately notify Architect of conditions detrimental to continued operations.

2. Existing nailers to remain as shown on the Drawings.

3. Verify that new curbs and nailers are in place and properly installed.

3.3 EXISTING STRUCTURAL CONCRETE DECK

A. Test the deck dryness as follows:

1. Heat bitumen to EVT and pour about a cupful onto the surface.

2. If the bitumen bubbles, reject the surface as too wet.

3. After the bitumen has cooled, try peeling it off the surface. If it does peel off, reject the surface as either not clean or as too wet.

B. Prime by brushing or spraying on with primer at a minimum rate of 1/2 gal. per square (100 square feet).

3.4 PREPARATION - EXISTING LIGHTWEIGHT CONCRETE DECK

A. Verify with the Owner that an independent lab has tested fasteners to be used to verify pull out strength and fastener pattern as designed is in compliance with the project requirements and the Florida Building Code.

B. Drill 3/4" diameter holes on 24" centers through the lightweight concrete and metal deck so holes are open to underside of metal deck to ventilate deck,(as directed by Architect for areas of wet or damp lightweight concrete - see Unit Prices).

C. Smooth rough spots and sweep all surfaces clean.

3.5 BITUMEN HEATING

A. Heat and apply bitumen in accordance with equiviscous temperature method ("EVT Method") as recommended by the manufacturer. Do not raise temperature above minimum normal fluid-holding temperature necessary to attain EVT (+ 25 degrees F or 14 degrees C, at point of application) more than one hour prior to time of application. Discard bitumen which had been held at temperature exceeding finished blowing temperature (FBT) for a period exceeding 3 hours.

B. Determine flash point, finished blowing temperature and EVT of bitumen, either by information from bitumen producer or by suitable tests, and determine maximum fire-safe handling temperature and do not exceed that temperature in heating bitumen; but in no case heat bitumen to temperature higher than 25 degrees F (14 degrees C) below flash point.

C. For aggregate surfaced pour coats of bitumen, limit application temperature to minimum required for proper embedment of aggregate and maximum which will permit retention of a coating of weight required.

D. Each kettle or BUR tanker shall have both thermostatic controls and an accurate, visible thermometer. Keep kettle lid closed except when adding bitumen.

3.6 BITUMEN MOPPING

A. Solid Mopping: For interply mopping 20 lbs. of coal tar (±25 percent) per roof square between sheets.

1. Solidly mop bitumen between and under layers of sheets and insulation board so at no point do boards touch sheet.

2. Solidly mop about 1/4" thick and at least 1/2" beyond both edges of sheet so the sheet is completely set in bitumen.

3. Solidly mop with solid wave of bitumen running in front of the roll about 6 inches wide and approximately 1/4" thick.

B. Do not allow bitumen to penetrate substrate joints and enter building or damage insulation or other construction.

3.7 LAYING FELTS

A. Ply Sheets Installation: Install ply sheets, lapped (shingled) with coal tar moppings between sheets so that ply sheet does not touch ply sheet. Shingle in proper direction to shed water on each section of roof area.

1. Extend ply sheets to the top of the cant or as shown on the drawings.

B. Squeegee or broom with a 36" wide squeegee or broom, all full width felts into hot bitumen and lay without wrinkles, buckles, kinks or dry laps. Squeegeeing shall occur directly behind the ply felt embedment.

1. All work (felt laying, brooming or squeegee, and mopping) shall be done from dry side, not newly installed felt side.

2. No traffic, including foot traffic, shall be allowed on newly installed fiberglass ply felts until they have had sufficient time to cool to a point that bitumen displacement no longer occurs upon point loading.

C. When beginning a membrane roofing installation, appropriate width starting strips of felts shall be used at the starting point to achieve the specified ply build-up at that point so that successive ply felt applications will produce the ply requirements.

D. Overlap ends of all connecting plies (endlaps) not less than 10 inches. End striping or taping of these laps is not permitted.

3.8 APPLICATION OF PRELIMINARY ROOF AT LIGHTWEIGHT CONCRETE DECK

A. Loose lay rosin-sized sheathing paper where deck ventilation holes have been drilled, then roll out base sheet. Mechanically Fasten Base Sheet to Lightweight Concrete:

1. Start with an 18" width, at the low edge, followed by full width sheets.

2. Lap the base sheet 4 inches at ends and edges.

3. Base Sheet: Mechanically fasten per the project details or as directed by the roofing membrane manufacturer, (utilize the pattern shown by the project details as the basis of bidding in all cases).

B. Solidly mop in asphalt a single ply of a smooth surfaced, SBS modified bitumen, polyester reinforced membrane to the base sheet.

3.9 APPLYING PRELIMINARY ROOF TO STRUCTURAL CONCRETE DECK

A. Fully prime concrete deck with ASTM D 41 primer.

B. Solidly mop in asphalt a single ply of a smooth surfaced, SBS modified bitumen, polyester reinforced membrane to structural concrete deck:

1. Apply membrane sheet by starting with 18" width at the low edge, followed by full width sheets.

2. Lap the membrane sheet 4 inches at ends and edges.

3.10 PREPARATION FOR INSULATION APPLICATION

A. The Contractor shall verify field dimensions for determining of positive slope.

B. Install only as much insulation board in any one day as can be covered by the completed membrane in the same day.

C. Prior to insulation board application, ensure preliminary roof (or existing deck) is clean and dry. Remove excess dust, loose granules and foreign materials from surface of preliminary roof by brooming and powered blowers or vacuums.

D. Contractor shall insure that slopes indicated on the drawings are "finish" slopes, regardless of irregularities and deviations in the roof deck or substrate.

3.11 APPLICATION OF RIGID INSULATION SYSTEM

A. Solidly mop in hot asphalt (ASTM D 312, Type IV), the first course of the flat (or tapered) polyisocyanurate rigid board insulation over the preliminary roof membrane.

B. Solidly mop in hot asphalt (ASTM D 312, Type IV), any subsequent or filler courses of the flat (or tapered) polyisocyanurate rigid board insulation over the first insulation course.

C. Solidly mop in hot asphalt (ASTM D 312, Type IV), a single course of flat high density fiberboard fiberboard rigid insulation over the preceding course(s) of polyisocyanurate rigid board insulation.

3.12 APPLYING ROOF MEMBRANE SYSTEM TO RIGID INSULATION SYSTEM

A. Four Ply Sheet Procedures Over Structural Concrete Deck.

1. At the low edge adhere one 9 inch wide ply felt in hot bitumen.
2. Over it adhere one 16 inch wide ply felt in hot bitumen.
3. Over these two, adhere one 27 inch wide ply felt in hot bitumen.
4. Over these three, adhere one full width ply felt in hot bitumen.
5. Continue to apply subsequent full width plies in a shingle fashion in hot bitumen.

3.13 APPLYING ACCESSORIES

A. General

1. Coordinate installation of set-on accessories.
2. Review details for special installation requirements.

B. Set-On Accessories

1. Where small roof accessories are set on the membrane, set metal flanges in a 1/4" thick bed of coal tar plastic cement, and seal penetration of membrane with bead of plastic cement to prevent flow of coal tar from membrane.

2. Where tapered edge strips with slopes exceeding 1/4" per foot are used to conceal anchorage flanges, the strip-in plies are to utilize the same membranes as the base flashing system at the wall.

C. Edge Detail

1. Provide a folded back envelope at edges and penetrations of built-up roofing membrane where it is not turned up on a tapered strip, so as to provide positive protection against flow of coal tar into building or off the edge.

2. Seal corners and other interruptions of envelope with large beads of plastic cement to provide positive protection against flow of coal tar.

D. Pitch Pans

1. Strip-in as specified above.
2. Clean metal with aromatic solvent de-greaser.
3. Fill pan with non-shrink grout to within 3" of top.
4. After grout has set, fill to top with urethane pitch pan filler.

E. Metal Flashings: Flanges of metal flashing on the roof surface shall be primed and

stripped-in with alternate trowelings of cement and two-ply strip-in flashing so that the first strip extends not less than 4" beyond the outer edge of the flange and the second strip not less than 8".

F. Vent Pipe Flashing

1. Set metal flange in a 1/4" thick bed of cement and fasten to deck securely.

2. Top of sleeve shall be bent over and extended down into the vent pipe a minimum of 1 inch.

3. Strip-in as specified for set-on accessories.

3.14 FLASHING FOR PARAPET WALLS AND VERTICAL CURBS

A. Two-ply base flashing shall be installed by cold process adhesive or "hot mopping" felts in steep asphalt per roofing manufacturer's standard detail.

1. At nailable wall substrates, apply a ASTM D 4601, Type II glass fiber base sheet, mechanically fastened with roofing nails with 1 inch diameter heads, to the wall prior to the installation of the base flashing system.

B. Paint all exposed plastic cement and coal tar with a coating of Fibrated Aluminum Coating. The outside corners of curb flashing shall be stripped with a membrane flashing and Fibrated Aluminum Coating. Verify with membrane manufacturer if stripping is required at the wall flashing end joints.

3.15 COORDINATION OF MEMBRANE AND SHEET METAL INSTALLATION

A. Organize operations so work can simultaneously proceed on the various aspects including roofing, cants and flashings so at the end of each day the work done, that day will be substantially complete.

B. Installation of metal flashing and sheet metal shall be by the sheet metal installer; the roofer shall coordinate the installation to allow proper attachment of roofing.

C. Review flashing and sheet metal details for additional roofing installation requirements.

D. Provide Stripping Where Metal Flanges Are Set on Roofing: one ply of fiberglass felt strip-in flashing set in a full bed of coal tar plastic cement and extended onto the deck 4".

E. Counter Flashings: Counter flashings, cap flashings, expansion joints and similar work to be coordinated with membrane work, are specified in other sections of these specifications.

F. Roof Accessories: Miscellaneous sheet metal accessory items, including insulation vents and other devices, and major items of roof accessories (if any) to be coordinated with membrane work, are specified in other sections of these specifications.

3.16 INSTALLATION OF FLASHING AT SHEETMETAL

A. Installation of metal flashing shall be coordinated by the roofer, installed by the sheetmetal installer. Review the flashing details for additional roofing installation.

B. Flange of gravel stop on the roof surface, shall be primed and stripped-in with an 8" wide strip-in flashing set in coal tar plastic cement, followed by a 12" wide strip of base flashing set in coal tar plastic cement.

C. Flanges of metal flashing on the roof surface, shall be primed and stripped-in with alternate trowelings of coal tar plastic cement and two-ply strip-in flashing so that the first strip extends not less than 4" beyond the outer edge of the flange and the second strip not less than 8".

3.17 APPLYING SURFACING OVER ENTIRE MEMBRANE

A. Membrane Inspection:

1. Prior to surfacing of any roof area, the Architect will review the surface condition of the membrane for wrinkles, buckles, kinks, dry lap, fishmouths, or other surface irregularities.

2. Corrective measures for surface irregularities as determined by the Architect shall be completed prior to surfacing.

3. Surfacing over metal flashing flanges shall not commence until all sheet metal work installation has been completed and reviewed by the Architect.

4. Roof membrane shall not be exposed for more than 12 hours prior to installation of aggregate surfacing, except at cut-offs and roof edges. Those areas shall be glaze-coated with bitumen until such time work re-commences or flashing is installed.

B. Aggregate Surfacing:

1. Promptly after completion of membrane, edge treatment, flexible flashing, and set-on accessories in each substantial area of roofing, flood coat surface with 80 lbs. of coal tar per square with pouring dippers. Sprinkle dipper shall not be used.

2. While each small area is hot and fluid, cast an average of 400 lbs. of gravel per square in a uniform course. 80 percent of gravel shall be embedded in coal tar.

3. After the initial aggregate surfacing has cooled, sweep and vacuum all loose aggregate from the roof surface.

4. Flood coat surface for a second time with 100 lbs. of coal tar per square with pouring dippers, (minimum required to fully embed aggregate). Sprinkle dipper shall not be used.

5. While each small area is hot and fluid, cast an average of 400 lbs. of gravel per square in a uniform course. 60 percent of gravel shall be embedded in coal tar.

3.18 PROTECTION OF ROOFING

A. Upon completion of roofing work (including associated work) Installer shall advise Contractor of recommended procedures for surveillance and protection of roofing during remainder of construction period. At the end of the construction period, or at a time when remaining construction work will in no way affect or endanger roofing (at Contractor's option), the Installer shall make a final inspection of roofing and prepare a written report (to Contractor with copy to Owner and Architect) describing nature and extent of deterioration or damage, if any, found in the work.

B. Installer shall repair or replace (as required) deteriorated or defective work found at time of final inspection. Installer shall be engaged by Contractor to repair damages to roofing which occurred subsequent to roofing installation and prior to final inspection. Repair or replace the roofing and associated work to a condition free of damage and deterioration at time of substantial completion.

3.19 CLEAN-UP

A. General

1. Trash and scraps are a hazard and shall be collected and disposed of immediately.

2. The applicator shall remove all masking protection equipment, materials and debris from the work and storage areas and leave those areas in an undamaged and acceptable condition.

3. New sod shall be placed in an acceptable blending of the edges of new sod to existing surrounding sod in all areas damaged by storing of materials and construction traffic.

END OF SECTION

MANUFACTURER'S NOTICE OF INTENT TO ISSUE ROOF WARRANTY

Whereas _____ herein called the "Roofing System Manufacturer" hereby gives notice to:

Owner: _____

Address: _____

of its Notice of Intent to issue its Roof Warranty, to the Owner for the Project,

Project: _____

Address: _____

incorporating the Manufacturer's _____

_____

roofing system or product is installed in accordance with the Contract Documents.

Manufacturers' Notice of Intent to Issue Roof Warranty in conformance with the Contract Documents shall be executed by the manufacturer and attached to the bid form. Each Bidder may only submit a single form, designating a single roof manufacturer, and shall include items 1 and 2 as follows:

1. A detailed description of the components of the manufacturer's system proposed and a list of any other component and accessories, proposed for use in the system that is provided by other manufacturers or suppliers shall be attached to and submitted with this form and the bid package.

    a) A statement that the Manufacturer's Representative has reviewed the job conditions and project manual, (and visited the site if necessary), prior to the bid date. Having reviewed the above items in detail, the Representative will provide a written response to the Architect ten days prior to the bid date, if conflicts between the Manufacturer's requirements occur with the above listed documents.

2. A sample of the Manufacturer's Roof Warranty shall be attached to and submitted with this form and the bid package. The manufacturer shall delete all exceptions relative to damage from high winds in one of the two following manners:

    a) delete exceptions to damage from gale force winds and windstorms below the ASCE 7-10 and the Florida Building Code requirements, fifth (2014) edition - design requirements of ___ MPH wind uplift resistance, and application over a poured gypsum concrete deck system.

    or

    b) delete exceptions to wind damage from the maximum wind uplift pressures as calculated by the ASCE 7-10 and the Florida Building Code requirements, fifth (2014) edition and defined by the project drawings, and application over a poured gypsum concrete deck system. Wind uplift pressures at the roof for this project are identified on the overall plan drawing.

3. **20** year total roof system warranty inclusive of roofing materials, all included products and accessories, including all metal flashings, from roof deck to finish membrane, whether

supplied by the membrane manufacturer or by others. Provide a “No Dollar Limit”, single source responsibility, non-deductible roofing warranty inclusive of all material and labor.

a) If the manufacturer fails and/or refuses to issue the required roof warranty, the Contractor with Surety shall warrant to make repairs, replacement or take corrective action on the same terms as required of the manufacturer, (had the warranty been issued by the manufacturer), so that the intended warranty is delivered to the Owner.

b) The manufacturer shall modify the roof warranty to include total labor coverage for the warranty period and to cover damage to roof materials and insulation down to the roof deck resulting from water penetration.

c) The manufacturer shall modify the roof warranty to state that the Owner has the right to make emergency repairs without voiding the warranty if the manufacturer or applicator do not respond within 24 hours to notification by the Owner of a defect or leak.

d) The manufacturer shall modify the roof warranty to state that annual inspections with written reports by the Owner, and resulting maintenance, are sufficient to fulfill the periodic inspection requirements of the manufacturer’s warranty.

4. The manufacturer's Representative shall conduct a Post-Construction field inspection no earlier than eleven (11) months, and no later than twelve (12) months after the Date of Substantial Completion. Submit a written report within seven (7) days of this visit to the Owner's Maintenance Dept. listing observations, conditions and any recommended repairs or remedial action.

Further, the manufacturer acknowledges that the applicator:

Roof Applicator’s Name:_____

Address:_____
has been approved to install this roof system since _____ , ____and meets the criteria for an approved applicator listed in the Project Manual.

By signing the above, the Authorized Representative of said Manufacturer certifies and represents the Roofing System Manufacturer with the authority to contract and make the above representations to the Owner.

By:_____

Signature of Authorized Representative/Date

(SEAL)

Witness/ Date:

APPLICATOR WARRANTY FOR ROOFING

Whereas _____

of (Address)_____

herein called the "Roofing Contractor", has performed roofing, flashing and sheet metal and associated ("work") on following project:

Owner:_____

Address:_____

Name and Type of Building:_____

Address:_____

Area of Work: _____

Date of Acceptance:_____

Warranty Period: Two Years Date of Expiration:_____

The Roofing Contractor hereby certifies to the Owner as a “Final Statement of Compliance” that the finished roof membrane (and insulation) system was installed in compliance with the approved contract documents.

AND WHEREAS Roofing Contractor has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks, faulty or defective materials, roofing components deemed faulty or in disrepair, and workmanship for designated the Warranty Period.

NOW THEREFORE Roofing Contractor hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work, and as are necessary to maintain said work in watertight condition.

This Warranty is made subject to the following terms and conditions.

1. Specifically excluded from this Warranty are damages to roofing work and other parts of the building, and to building contents, caused by:

    a) lightning, windstorm;
    b) fire;
    c) failure of roofing system substrate or structure (including cracking, settlement, excessive deflection, deterioration, and decomposition).

    When work has been damaged by any of the foregoing causes, Warranty shall be null and void until such damage has been repaired and until cost or repairs has been paid by the Owner or by another responsible party as so designated.

2. The Roofing Contractor is responsible for damage to work covered by this Warranty, and is not liable for consequential damages to building or building contents, resulting from leaks or faults

or defects of work.

3. The Owner shall promptly notify Roofing Contractor of observed, known or suspected leaks, defect, disrepair or deterioration. The Contractor shall guarantee to respond to all notifications within twenty-four (24) hours and to make all such repairs as deemed necessary to correct said leaks or defects to a satisfactory condition to the Owner. Repairs shall be made by workman in the current employment of the Contractor. Subcontracting of repair work is not permitted.

4. The definition of faulty roofing components or roofing in disrepair includes, but is not limited to the following:

    A. Blisters in roofing.
    B. Cracks or ridging in roofing membranes.
    C. Delamination, shears or tears in membrane.
    D. Defects in the quality of work or materials.
    E. Leaks of any kind.

5. This Warranty is recognized to be the only warranty of the Roofing Contractor on said work, and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to him in cases of roofing failures. Specifically, this Warranty shall not operate to relieve Roofing Contractor of responsibility for performance of original work in accordance with requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

IN WITNESS THEREOF, this instrument has been duly executed this

_____day of_____, 20___.

_____

Roofing Contractor Firm (SEAL)

_____

Signature of Authorized Person Title

_____

Witness

CODE COMPLIANCE
SUBMITTAL DOCUMENT

Roofing System Manufacturer: _____

Address: _____

_____

_____

_____

Technical Director: _____

Project Name: _____

Address: _____

_____

Roofing Contractor: _____

Roofing System Name: _____

General Description of Roof Systems: _____

_____

_____

_____

_____

Insulation to be install with roof system: _____

Fasteners to be installed with roof system: _____

_____

Attach copy of Factory Mutual Approval, including approval for submitted fastener and insulation type. If no such approval is available due to deck type, provide supporting technical data to support the use of the products in the assembly.

Attach a copy of Underwriters Laboratories listing confirming that the new roof assembly is in compliance with a Class A listing over the deck types.

Attach a copy of Metro-Dade County Code Compliance Approval for the roofing system and insulation.

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Insulation, membrane roofing, base flashing, roofing membrane expansion joints, vapor retarder cant strips and counterflashing.

1.2 RELATED SECTIONS

A. Section 06 10 53 - Rough Carpentry: Wood nailers.

B. Section 07 62 00 - Sheet Metal Flashing and Trim: Counterflashing.

1.3 REFERENCES

A. ASTM C177 - Test Method for Steady-State thermal Transmission Properties by Means of the Guarded Hot Plate.

B. ASTM C578 - Preformed, Cellular Polystyrene Thermal Insulation.

C. ASTM C728 - Perlite Thermal Insulation Board.

D. ANSI/ASTM D412 - Rubber Properties in Tension.

E. ANSI/ASTM D746 - Brittleness Temperature of Plastics and Elastomeric by Impact.

F. ASTM D624 - Rubber Property - Tear Resistance.

G. ASTM D822 - Practice for Operating Light and Water-Exposure Apparatus (Carbon-Arc) Type for Testing Paint, Varnish, Lacquer, and Related Products.

H. ASTM D1004 - Initial Tear Resistance of Plastic Film and Sheeting.

I. ASTM D2240 - Rubber Property - Durometer Hardness.

J. ASTM E96 - Water Vapor Transmission of Materials.

K. Factory Mutual (FM) Engineering Corporation - Roof Assembly Classifications.

L. ASTM C578- Insulation Board, Thermal (Polystyrene).

M. National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual.

N. SPRI - Wind Design Guide for Ballasted Single Ply Roofing Systems.

O. Underwriters Laboratories (ULI) - Fire Hazard Classifications.

1.4 SYSTEM DESCRIPTION

A. Elastomeric Sheet Membrane Roofing System: One ply membrane system with preliminary roof/vapor barrier, insulation, fully adhered membrane and surface color coated finish.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Shop Drawings: Indicate setting plan for membrane joint.

C. Product Data: Provide characteristics on membrane materials, flashing materials, insulation , vapor retarder/preliminary roof.

D. Samples: Submit two 12 x 12 inch in size illustrating membrane, insulation and colored coating.

E. Manufacturer's Installation Instructions: Indicate special precautions required for seaming the membrane and applying colored coating.

F. Manufacturer's Certificate: Certify that specified products meet or exceed specified requirements.

1. Installer: Provide copy of certification to Architect prior to roofing work.

G. Manufacturer's Field Reports: Submit under provisions of Section 01 40 00.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with five current years documented experience.

B. Applicator: Company specializing in performing the work of this section with three years documented experience and approved by system manufacturer. Submit a letter from the manufacturer stating the Contractor is an approved applicator of the roof system.

1. Maintain full-time non-working supervisor/foreman, on job site while work is in progress. Supervisor must have minimum of three consecutive and, documented years experience in roofing work specified in this Section.

C. Manufacturer's Field Inspection and Services

1. Manufacturer Field Inspector: Provide qualified personnel to observe field conditions, installation, quality of workmanship as applicable, and to make recommendations.

2. Visit the Project weekly during progress of the work.

a. Pre-construction meeting.

b. Visit site once a week.

c. Called meetings.

3. Submit written reports to the Architect within three days of last observation.

1.7 REGULATORY REQUIREMENTS

A. Underwriters Laboratories, Inc. ULI: Class A Fire Hazard Classification.

B. Factory Mutual Engineering Corporation (FM): Roof wind uplift requirement of I-90.

1.8 PRE-INSTALLATION CONFERENCE

A. Convene seven days prior to commencing work of this section, under provisions of Section 01 31 00.

B. Review requirements of Contract Documents, submittals, status of coordinating work, availability of materials and installation facilities, proposed installation schedule, requirements for inspections and testing or certifications, forecasted weather conditions, governing regulations, insurance requirements, and proposed installation procedures.

C. Record discussions on matters of significance; furnish copy of recorded discussions to each participant. Discuss roofing system protection requirements for construction period extending beyond roofing installation.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver to site, store, protect and handle products under provisions of Section 01 60 00.

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

C. Deliver enough material to allow continuous work where required during the established work period, i.e., one day.

D. Store products in weather protected environment, clear of ground and moisture.

E. Store rolls, cans and drums of cements, primers, and coatings, on end.

F. Handle materials to protect them from:

1. Moisture.

2. Damage by construction traffic.

3. Temperatures over 110 degrees F.

4. Temperatures below 40 degrees F.

5. Direct sunlight.

6. Mud, dust, sand, oil, and grease.

Immediately remove and dispose of all cements, primers and coatings with a product manufacturer's date in excess of 3 months.

G. Store liquid materials, adhesives, thinners and cleaners, away from sparks, open flames, and excessive heat.

1.10 PROJECT/SITE CONDITIONS

A. Existing Conditions

1. The roofing applicator and sheet metal installer shall verify existing conditions, such as soundness of perimeter conditions, and varying deck and wall thickness for length of anchoring services required and other visible conditions prior to Bidding.

2. Conflicts and problems shall be reported to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Prime Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.

3. Replace or restore to original condition any materials or work damaged during construction.

4. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.

5. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.

1.11 ENVIRONMENTAL REQUIREMENTS

A. Do not apply roofing membrane during inclement.

B. Do not apply roofing membrane to deck surface.

C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

D. Proceed with roofing work when existing and forecasted weather conditions permit work to be performed in accordance with requirements of this section and warranty compliance requirements.

1.12 COORDINATION

A. Coordinate work under provisions of Division 1.

B. Coordinate the work with installing associated wood blocking and nailers, expansion joints and area dividers, and metal flashing as the work of this section proceeds.

1.13 SEQUENCING

A. Organize operations so work can simultaneously proceed on the various aspects including roofing, cants and flashing so at the end of each day the work done that day will be substantially complete.

B. Substantially complete each roof area prior to beginning another roof area; utilize multiple crews for multiple roof area construction. Phasing of roof construction by area is not permitted.

C. Sequence equipment removal with covering of deck openings with waterproof materials strong enough to prevent personnel and materials from falling through.

1.14 WARRANTIES

A. Applicators Warranty: Furnish on executed form included.

B. Manufacturer's Warranty:

1. 10 year total roof system warranty inclusive of roofing materials from roof deck to finish membrane.

2. Non-deductible roofing warranty inclusive of all material and labor.

C. The manufacturer shall modify the roof warranty to include total labor coverage.

D. Manufacturers' Notice of Intent to Issue Roof Warranty in conformance with plans, details and specifications shall be executed and attached to the bid form.

E. A sample of the Manufacturer's Roof Warranty shall be attached to and submitted with the Bid Proposal Form. The manufacturer shall delete all exceptions relative to wind speeds below the requirements of FM I-90 design.

PART 2 PRODUCTS

2.1 MANUFACTURERS - MEMBRANE MATERIAL

A. Carlisle Fully Adhered System.

B. Celotex Celo-I Fully Adhered System

C. Substitutions: Under provisions of Section 01 25 00.

2.2 MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane: EPDM: .045 inch thick, 25 foot wide roll; black color; conforming to the following criteria:

Properties	Test	Results
Tensile Strength:	ANSI/ASTM D412	+/- 10%
Elongation:	ANSI/ASTM D412	350
Tear Strength:	ASTM D624	175
Moisture Vapor Perms:	ASTM E96	2.0
Exposure:		
Low Temperature Brittleness:	ANSI/ASTM D746	- 75 DEG.F

B. Seaming Materials: As provided by membrane manufacturer.

C. Protective Coating: Hypalon, with silica sand; white finish coat of color.

2.3 INSULATION

A. Insulation: ASTM C208, high density wood fiber board with the following characteristics:

1.	Board Size	4 x 4 or 4 x 8 feet.
2.	Board Thickness	1 inches
3.	Board Edges	square.

B. Insulation: ASTM C578 Type VI, extruded polystyrene board with natural skin surfaces; manufactured by membrane manufacturer.

1. Thickness at all areas except “L” and “M”: 2 layers of 4 inches each layer.

2. Thickness at areas “L” and “M”: 2 layers of 3 inches each layer.

2.4 FLASHING

A. Flexible Flashing: Same material as membrane EPDM black color.

B. Pre-moulded Corners: Pre-moulded inside and outside 0.060" EPDM corners as manufactured by Portals Plus, Inc. or approved equal.

C. Counterflashing: metal, as specified in Section 07 62 00.

2.5 ACCESSORIES

A. Fiber Cant and Tapered Edge Strips: Perlite, 45 degree face, vertical height as required by existing condition and angle.

B. Vent Pipe Flashing: Manufacturer's prefabricated pipe flashing or as detailed.

2.6 PITCH PAN FILLER

A. Pourable Sealer - Approved Products:

1. Carlisle

2. Celotex Celo-I

3. Submit approved equal.

B. Non-Shrink Grout - Approved Products:

1. Euco N.S., Euclid Chemical Co.

2. Crystex; L&M Construction Chemicals

3. Masterflow 713; Master Builders

4. Five Star Grout; U.S. Grout Corp.

5. Upcon; Upco Chem. Div., USM Corp.

6. Propak; Protex Industries, Inc.

2.7 SEALANTS: As specified in Section 07 92 00.

2.8 ADHESIVES, LAP TAPES AND CEMENTS: Sheet manufacturer’s supplied and required (for warranty) products.

2.9 MISCELLANEOUS MATERIALS: All other materials and accessories, not specifically described, but required for a complete and proper installation of roofing, shall be products of, or recommended by the manufacturer of, the primary material and subject to the approval of the Architect.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

A. Total Installation Concept:

1. The specified system is a total roofing system, not a patched up, chopped up, spliced or added to or on roofing system. Therefore, this type of application will not be acceptable.

2. If a section of roof requires reworking and/or patching, the entire area or section of roofing shall be replaced. This shall mean from vertical surface to vertical surface, or roof perimeter to roof perimeter in all directions.

B. Manufacturer's Installation Requirements:

1. In addition to the specified procedures, the Contractor shall be responsible for the installation of the roofing in accordance with the procedures required by the Roofing Material Manufacturer for the proper execution of the work for issuance of the warranty.

C. Watertightness Imperative:

1. The work specified herein will not preclude the use of procedures that will maintain the buildings watertight.

   Therefore, the Contractor, while conforming to these Contract Documents, must utilize necessary procedures to keep water out of the buildings while construction is in progress.

2. At end of each day's roofing installation and prior to the onset of all inclement weather, new section of roofing shall be temporarily sealed with cut-offs to the unfinished substrates. Seal projections through the roof and to the surrounding intersections so that no moisture may enter roofing or into structure.

3. Cut-offs: At the end of each day's roofing installation, protect exposed edge of incomplete work.

3.2 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secured.

C. Verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains.

D. Verify deck surfaces are dry. Verify flutes of metal deck are clean and dry.

E. Verify roof openings, curbs, pipes, conduit, sleeves, ducts, roof drains and vents through roof are solidly set, and cant strips are in place.

3.3 PREPARATION - METAL DECK

A. Install preformed sound absorbing glass fiber insulation strips supplied, in acoustic deck

flutes.

B. Install gypsum sheathing on metal deck per manufacture’s recommendations

C. Lay with long side at right angle to flutes; stagger end joints; provide support at ends.

D. Cut sheathing cleanly and accurately at roof breaks and protrusions to provide smooth surface. Tape joints.

E. Mechanically fasten sheathing at full roof area using spacing required by FM mutual fasteners with washers per sheathing board.

****** [OR] ******

F. Mechanically fasten sheathing at roof perimeter to a distance per manufactures recommendation fasteners with washers per board.

3.1 VAPOR RETARDER APPLICATION

A. Apply vapor retarder as per manufacture’s recommendation.

B. Extend vapor retarder under cant strips and blocking to deck edge.

C. Lap flexible flashing over vapor and air barrier of wall construction to provide continuity of vapor and air barrier seal.

3.2 INSULATION APPLICATION

A. Ensure vapor retarder is clean and dry.

B. Apply adhesive to deck in accordance with adhesive and insulation manufacturer's instructions. Embed insulation into adhesive with full contact.

C. Apply adhesive to the top surface of insulation. Embed the second and third layer of insulation into adhesive, with joints staggered minimum 6 inch from joints of preceding layer.

D. Place third layer to any required slope pattern in accordance with manufacturer's instructions.

E. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter nailers and around penetrations through roof.

F. Apply no more insulation than can be covered with membrane in same day.

G. Tape joints of insulation in accordance with insulation manufacturer's instructions.

3.3 MEMBRANE APPLICATION

A. General

1. Organize the various aspects of the work so at the end of each day the area worked on that day is substantially complete.

B. Field Sheets (Prefabricated Rolls)

1. Rolls shall be installed straight to chalk lines maintaining the best lay flat characteristics possible.

2. Adjoining rolls shall overlap the fastened edge a minimum of 4" maintaining proper shingling to avoid back water seams.

C. Apply membrane in accordance with manufacturer's instructions.

D. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

E. Overlap edges and ends and seal by adhesive lap tape and/or contact adhesive (per the manufacturer), minimum 8 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.

F. Shingle joints on sloped substrate in direction of drainage Apply joint as required by manufacturer.

G. Extend membrane up walls, curbs and other flashing conditions a minimum of 8 inches onto vertical surfaces.

H. Seal membrane around roof penetrations.

3.4 FLASHING AND ACCESSORIES

A. Flash all curbs, parapets and interior walls in strict accordance with approved manufacturer's details. Pre-fabricated (moulded) cured EPDM corner pieces will be used at all inside and outside corners.

B. Clean all vents, pipes, conduits, tubes, walls, and stacks to bright bare metal. All protrusions must be properly secured to the roof deck with approved fasteners. Remove and discard pipe and drain lead flashing. Relocate penetrations a minimum of two feet clear from walls, curbs or adjacent penetrations.

C. Remove cant strips and loose wall flashing.

D. Apply flexible flashing to seal membrane to vertical elements.

E. Secure to nailers at 4 inches oc.

F. Seal flashing and flanges of items penetrating membrane.

G. Fasten all metal flashing to wood nailers or approved substrates with approved fasteners 4" O.C. staggered. Leave a space between each sheet of metal to allow for expansion.

H. The base flange of all membrane flashing shall extend out on to the plane of the deck, beyond the wood nailer to a maximum width of 8".

I. Vertical wall flashing terminations shall not exceed 30" without additional, parallel horizontal rows of termination bar between the deck and the termination point of the flashing. Spacing between horizontal rows shall not exceed 24".

J. Complete all inside and outside corner details with manufacturer approved pre-moulded EPDM corner piece.

K. Probe all seams with a dull, pointed probe to insure the weld has created a homogeneous bond.

3.5 PROTECTIVE COATING

A. Apply coating to exposed membrane materials in accordance with manufacturer's instructions.

3.6 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Division 1.

B. Correct identified defects or irregularities.

C. Require site attendance of roofing manufacturers weekly during installation of the Work.

3.7 CLEANING

A. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.

B. Repair or replace defaced or disfigured finishes caused by work of this section.

1. Trash and scraps are a hazard and shall be collected and disposed of immediately.

2. The applicator shall remove all masking protection equipment, materials and debris from the work and storage areas and leave those areas in an undamaged and acceptable condition.

3. New sod shall be placed in an acceptable blending of the edges of new sod to existing surrounding sod in all areas damaged by storing of materials and construction traffic.

a. Sod shall not be placed over existing sod. Excavate so that plane of new sod will conform. Match new sod with existing.

3.8 PROTECTION

A. Protect building surfaces against damage from roofing work.

B. Where traffic must continue over finished roof membrane, protect surfaces.

C. Upon completion of roofing work (including associated work) Contractor shall advise Owner of recommended procedures for surveillance and protection of roofing during remainder of construction period. At the end of the construction period, or at a time when remaining construction work will in no way affect or endanger roofing (at Contractor's option), the

Installer shall make a final inspection of roofing and prepare a written report (to Contractor with copy to Owner and Architect) describing nature and extent of deterioration or damage, if any, found in the work.

D. Contractor shall repair or replace deteriorated or defective work found at time of final inspection. Contractor shall repair damages to roofing which occurred subsequent to roofing installation and prior to final inspection. Repair the roofing and associated work to a condition free of damage and deterioration at time of substantial completion.

E. In areas where finished surfaces are soiled by Work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.

F. Repair or replace defaced or disfigured finishes caused by Work of this section.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Drawings, the general provisions of the Contract, including General and Supplementary Conditions and Division 1 requirements apply to work in this Section.

B. Single-ply thermoplastic roofing system, flashing and roofing accessories, integrally related to roof installation.

C. Manufacturer's Notice of Intent to Issue Roof Warranty form, to be submitted by apparent successful low bidder within 48 hours of the Bid.

D. Applicator Warranty for Roofing form, to be submitted upon completion of the project.

E. Code Compliance Submittal Document, to be completed by manufacturer, and submitted by contractor with pre-construction submittals for review and approval.

1.2 RELATED SECTIONS

A. Section 02 41 19 - Selective Demolition.

B. Section 06 10 53 - Rough Carpentry.

C. Section 07 61 13 - Metal Roofing and Siding.

D. Section 07 62 00 - Sheet Metal Flashing and Trim

E. Section 07 92 00 - Joint Sealants

1.3 REFERENCES

A. ASTM D 471 - Test Methods For The Effects of Rubber- Liquid Properties

B. ASTM D 751 - Test Method of Coated Fabrics

C. ASTM D 882 - Test Method for Tensile Properties of Thin Plastic Sheathing

D. ASTM D 1204 - Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature

E. ASTM D 2136 - Test Method for Coated Fabricates -Low Temperature Bend Test.

F. ASTM D 2240 - Test Method for Rubber Property

G. FM - Roof Assembly Classifications.

H. NRCA (National Roofing Contractors Association) - Roofing and Waterproofing Manual.

I. ULI - Fire Hazard Classifications.

J. FS HH-I-1972/Gen, FS HH-I-1972/3 - Polyisocyanurate Insulation Board.

K. ASTM E 84 - Test Method for Surface Burning Characteristics of Building Materials.

L. NFPA 255 - Test of Surface Burning Characteristics of Building Materials.

M. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

1.4 SYSTEM DESCRIPTION

A. At ½" to 1" per foot sloped Roof Areas: Apply a smooth surfaced EIP, PVC or Elvaloy thermoplastic membrane with woven polyester fabric reinforced, smooth or fleece backed, single-ply roofing membrane solidly and fully adhered to a mechanically fastened gypsum roof board over a non-tapered rigid polyisocyanurate insulation board. Rigid insulation board is to be cut and installed between the standing seams of the existing metal roof system.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide membrane materials, base flashing materials, vapor retarders and protective coating. Product Data: Have the Contractor submit material samples only when the Owner requires such.

C. Manufacturer's Installation Instructions: Indicate special precautions required for seaming the membrane.

D. Code Compliance Submittal Document: Completed to indicate compliance with the project requirements for the products and installation methods used.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Manufacturer's Field Reports: Submit under provisions of Section 01 40 00.

1. Reports: Indicate procedures followed, ambient temperatures and wind velocity during application.

G. All products used shall be asbestos free.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual except where NRCA details differ from the project manual details.

B. Work closely associated with flexible sheet roofing, including vapor barriers, insulation, flashing and counterflashing, expansion joints, and joint sealers, to be performed by the installing applicator of the primary roofing system.

C. Maintain one copy of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with five years current documented experience.

B. Applicator: A single installer specializing in performing the work of this section with three current years documented experience and approved by system manufacturer.

1. The installation shall be done by a roofer approved in writing by the manufacturer of the thermoplastic material 10 days prior to Bidding.
2. This work may not be divided and sub-contracted to multiple applicators.

C. Supervisor: Maintain a full-time non working supervisor, on job site during roofing work in progress. Supervisor shall have five current years minimum documented experience of roofing work similar to scope of specified roofing.

D. Manufacturer's Field Inspection and Services

1. Manufacturer of the roofing materials shall provide qualified personnel to observe field conditions of surfaces and installation, quality of workmanship as applicable, and to make appropriate recommendations.
2. Representative shall visit the Project once a week.
   a. Initial pre-installation meeting.
   b. Site visits at maximum of one week intervals.
   c. Prior to Substantial Completion inspection, a final inspection shall be made by manufacturer's representative.
   d. Called meetings.
3. Representative shall submit written reports, within three days of each visit to Architect listing observations, recommendations and related comments.

1.8 REGULATORY REQUIREMENTS

A. Conform to applicable code for roof assembly fire hazard requirements and regulations of jurisdictional authorities, including SREF and the Standard (Southern) Building Code.

B. All roofing materials to be Class A as tested in compliance with ASTM E 108 -Standard Test Methods for Fire Tests of Roof Coverings

C. FM: Roof Assembly Classification, Class 1 Construction. Comply with ASCE 7- and Factory Mutual wind up-lift requirements.

D. Thermal Resistance: Roofing system with thermal resistance properties of insulating materials, designated by R-values, as noted in Construction Documents.

E. Material Safety Data Sheets: For all roofing products.

1.9 CERTIFICATION

A. Materials: For each material specified with a standard or reference material designation, certification labels shall appear on each package of bulk-shipments to project with certificate of compliance.

B. Installer: Provide two copies of all certification to Architect prior to beginning roofing work.

C. Code Compliance Submittal Document: The manufacturer and/or contractor shall submit the code compliance data to the Architect and Owner for review and approval before installation of any roofing materials, utilize the form attached at the end of this section.

1.10 MOCKUP

A. Provide mockup of roof membrane system and associated components and accessories under provisions of Section 01 40 00.

1.11 PRE-INSTALLATION CONFERENCE

A. Convene meeting one week prior to commencing work of this section at project site, with 72 hours minimum notice to participants. Meeting to include Contractor, Roofer, and Subcontractors, governing authorities, test agencies, product manufacturers, Architect and the Owner Representative.

B. Review requirements, Contract Documents, submittals, sequencing, availability of materials and installation facilities, proposed installation schedule, requirements for inspections and testing or certifications, forecasted weather conditions, governing regulations, insurance requirements, and proposed installation procedures.

C. Record discussion on matters of significance; furnish copy of recorded discussions to each participant. Discuss roofing system protection requirements for construction period extending beyond roofing installation.

1.12 DELIVERY, STORAGE, AND HANDLING

A. Deliver to site, store, protect, and handle products under provisions of Section 01 60 00.

B. Deliver material in manufacturer's original, unopened containers with manufacturer's labels intact and legible.

C. Deliver material requiring fire resistance classification to the job with labels attached and packaged as required by labeling service.

D. Deliver enough material to allow continuous work.

E. Store rolls, cans and drums of cements, primers, and coatings, on end and over clean raised platforms.

F. Store and handle materials to protect them from.

1. Moisture, whether due to precipitation, or condensation.
2. Damage by construction traffic.
3. Temperatures over 110 degrees F or below 40 degrees F.
4. Direct sunlight.
5. Mud, dust, sand, oil and grease.

G. Select and operate material handling equipment and store materials to keep from damaging existing construction or applied roofing.
Immediately remove and dispose of wet materials.

H. Comply with fire, safety, and environmental protection regulations.

I. Do not store materials on roof decks, nor position roofing installation equipment on roof decks, in concentrations exceeding design live loads.

J. Take special precautions against traffic on roofing when ambient temperature is above 80 degree F. Avoid heavy traffic on the work during installation.

1.13 PROJECT CONDITIONS

A. Existing Conditions

1. The roofing applicator and sheet metal installer shall verify existing conditions, such as soundness of perimeter conditions, and varying deck and wall thickness for length of anchoring services required and other visible conditions prior to Bidding.
2. Report conflicts and problems to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Prime Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.
3. Replace or restore to original condition any materials or work damaged during construction.
4. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.
5. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.

1.14 ENVIRONMENTAL REQUIREMENTS

A. Do not apply roofing membrane during inclement weather ambient temperatures below 40 degrees F.

B. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

C. Proceed with roofing work when existing and forecasted weather conditions permit work to be performed in accordance with requirements of this section and warranty compliance

requirements.

1.15 COORDINATION

A. Coordinate work under provisions of Division 1.

B. Coordinate the work with installing associated wood blocking and nailers, roofing, expansion joints and area dividers, and metal flashing as the work of this section proceeds.

1.16 SEQUENCING

A. Organize operations so work can simultaneously proceed on the various aspects including roofing and flashing so at the end of each day the work done that day will be substantially complete.

B. Roof area shall be substantially complete prior to beginning another roof area; utilize multiple crews for multiple roof area construction. Phasing of roof construction by area is not permitted.

C. Sequence equipment removal with covering of deck openings with plywood strong enough to prevent injuries from falling through. Contractor shall install waterproof covering over plywood and tie-in to existing membrane to achieve complete watertightness.

1.17 WARRANTIES

A. Applicator's Warranty: Furnish per the attached form (two pages).

B. Manufacturer's Warranty: 20 year total roof system warranty inclusive of roofing materials, included products and accessories from deck to finish membrane (Refer to Manufacturer's Notice of Intent to Issue Roof Warranty at end of this Section).

PART 2 PRODUCTS

2.1 THERMOPLASTIC ROOFING SYSTEM:

A. Manufacturer

1. Obtain primary thermoplastic roofing from a single manufacturer and provide secondary materials only as recommended by the manufacturer of the primary material, as specified.

2. New single-ply thermoplastic roofing membrane to be an EIP, PVC or Elvaloy Thermoplastic, smooth backed, polyester scrim reinforced membrane which meets or exceeds all requirements of ASTM D-434, type III. Membrane is to be intended to be fully adhered to the underlying substrate, all seams and joints are to be heat-welded. Color is to be neutral cream or white. Approved products are as follows:

a.	Firestone Building Products	UltraPly 78 (60 mil)
b.	Duro-Last Roofing, Inc.	Duro-Last (60 mil)
c.	GAF Materials Corp.	EverGuard EGSR-60
d.	JohnsManville Roofing Systems	UltraGard SR-60
e.	Republic Powdered Metals	Cooley C-3 (60 mil)
f.	Sarnafil, Inc.	Sarnafil G327 - 60 mil
g.	Seaman Corporation	FiberTite FTR-XT

3. Contractor Option: Utilize a fleece backed, fully adhered membrane equivalent to those specified above, adhere to meet FM 1-90 and ASCE 7- wind uplift requirements using manufacturer recommended single surface adhesive.

4. The Drawings are generic and not based on a specific manufacturer. Detail deviations will be accepted so as to permit utilization of the selected manufacturer's standard products and details when, in the Design Professional's judgment, such deviations do not materially detract from design concept or intended performance. Submit proposed deviations to Design Professional for approval in writing prior to ordering materials that are in the category of substitutions.

2.2 MECHANICAL FASTENERS:

A. For mechanically fastened anchorage of the roofing membrane: Fastener type and attachment pattern to be as defined by the manufacturer based on the specific project conditions and published test reports for their product.

B. For mechanically fastened anchorage of roofing accessories to the underlying metal roof panels: #12 minimum diameter corrosion resistant "deck" screw, length to provide ½" minimum penetration through metal panel, selection of screw size to be based on the results of field testing by the fastener manufacturer at high-load locations.

C. For fastening flashing to wood: Stainless steel annular threaded, 11 or 12 gage shanks, 1" long, driven through of minimum 30 gage 1" diameter flat stainless steel cap.

D. For all other locations, provide size, type, material and finish as required, matching material being fastened.

2.3 BONDING ADHESIVE:

A. Membrane bonding adhesive shall be supplied by, or approved in writing by the roofing membrane manufacturer as acceptable for use with their products within a 20 year warranted roof system.

2.4 RIGID INSULATION BOARD:

A. Polyisocyanurate Insulation: Closed cell polyisocyanurate foam core rigid roof insulation with glass fiber reinforced facer sheets on both sides complying with ASTM C 1289, Type II, and conforming to the following:

1. Board Size: 4 feet by 4 feet maximum, square edges.
2. Insulation Thickness: 2.6 inches (minimum); 2.8 inches (min.) at roof area 4/E only.
3. Tapered Insulation at Crickets at Roof Areas 1/F, 1/G, and 1/I only: 5 layers minimum of 1/2" per foot tapered insulation, layered to form a “back-slope” of 2.5" per foot.
4. Compressive Strength: 16 PSI Min. per ASTM D1621.
5. Foam Core Flame Spread: 25 Max. per ASTM E-84.
6. Water Absorption: In accordance with ASTM C209, 1 percent by volume maximum.
7. Facing: Factory applied skin of glass fiber facing on both faces.
8. Product must be approved by the membrane manufacturer for use in their warranted roof system prior to bidding.

B. Gypsum Roof Board: Glass fiber reinforced/faced gypsum, (referred to as “Dens-deck” within the detail drawings); as approved for use within a 20 year warranted roof system by the roofing manufacturer, with the following characteristics:

1. Board Type: manufacturer standard product for use over metal deck, use only manufacturer “Pre-primed” material.
2. Manufacturer and Product: Georgia-Pacific Corporation, Gypsum Division, Dens-Deck Roof Board or approved equal.
3. Board Size: 4 feet x 8 feet x 1/2" thick.
4. Compressive Strength: Minimum 35 psi.
5. Water Absorption: In accordance with ASTM C 1177
6. Board Edges: Square.
7. UL Fire Rating: Conform to the current UL, Class A, Roof/Ceiling fire rated assemblies(see current UL "Fire Resistance Directory").

C. Batt Insulation: ASTM C665; preformed glass fiber batt conforming to the following:

1. Thermal Resistance: R of 19 for walls. R of 13 for expansion joint curbs.
2. Facing: Faced on one side with asphalt treated Kraft paper.
3. Flame/Smoke Properties: In accordance with ASTM E84.

2.5 CONDUIT PAVER BLOCKS:

A. Precast concrete units of 3000 psi concrete.

B. Smooth exposed surfaces, dense finish; free of surface voids, spalls, cracks and chipped or broken edges.

C. Sizes and profiles as shown on the drawings.

2.6 PRE-FORMED VTR BOOTS (CONES): As manufactured and/or approved by the roof membrane manufacturer.

2.7 TRAFFIC PADS: As manufactured or approved by the roof membrane manufacturer, pads shall be a contrasting color to that of the roofing membrane..

2.8 PITCH PAN FILLER

A. Two Part Urethane Sealant - Approved Products:

1. Firestone S-10 RubberGard Pourable Sealer.
2. No substitutions allowed.

B. Non-Shrink Grout - Approved Products:

1. Euco N.S., Euclid Chemical Co.
2. Crystex; L&M Construction Chemicals
3. Masterflow 713; Master Builders
4. Five Star Grout; U.S. Grout Corp.
5. Upcon; Upco Chem. Div., USM Corp.
6. Propak; Protex Industries, Inc.

2.9 FLASHING TAPE: Double sided, extruded or preformed, cross-linked butyl rubber, self adhesive tape, 1/8" minimum thickness, 3/4" minimum width unless noted otherwise on the drawings.

1. Pecora Corporation — Extru-Seal Glazing Tape
2. Tremco Construction Products — 440 II Tape
3. Equivalent products as approved by the Owner and Design Professional.

2.10 INSULATION ADHESIVE: Single component asphaltic or polyurethane foam based adhesive intended for the application of rigid insulation and sheathing boards within roofing systems. Adhesive shall have Factory Mutual and Metro Dade Product Control Approvals for use within a Class A roof system and be engineered for the project required wind uplift resistance. Acceptable products include “Insta-Stik” Professional Roofing Adhesive as manufactured by Insta-Foam Products, Inc., or approved equal.

2.11 MISCELLANEOUS MATERIALS: All other materials and accessories, not specifically described, but required for a complete and proper installation of roofing, shall be products of, or recommended by the manufacturer of, the primary material and subject to the approval of the Architect.

PART 3 EXECUTION

3.1 GENERAL

A. Total Installation Concept.

1. The specified system is a total roofing system, not a patched up, chopped up, spliced or added to or on roofing system. Therefore, this type of application will not be acceptable.
2. If a section of roof requires reworking or patching, the entire area or section of roofing shall be replaced. This shall mean from edge to edge of roof.

B. Manufacturer's Installation Requirements.

1. In addition to the specified procedures, the roofing installer shall install roofing in accordance with the procedures required by the roofing material manufacturer for the proper execution of the work and issuance of the warranty.
2. The roofing installer shall review the specified procedures for possible conflicts, prior to Bidding, for resolution by Architect.

C. Watertightness is Imperative.

1. The work specified shall not preclude the use of procedures that will maintain the building watertight. Therefore, the Contractor, while conforming to these contract documents, shall utilize skill and procedures to keep water out of these buildings while construction is in progress.
2. At the end of each day's roofing installation and prior to the onset of inclement weather, the new section of roofing shall be temporarily sealed with cut-offs to the unfinished substrates, projections through the roof and to the surrounding intersections so that no moisture may enter roofing or into structure before work resumes. Remove cutoffs before work resumes.

D. Insurance/Code Compliance: Install system for (and test where required to show) compliance with governing regulations and with the following requirements:

1. Underwriter's Laboratories Class A "Fire Classified"; as well as ASCE 7-, Standard Building Code (SBCCI) and Factory Mutual's "Class 1-90" wind up-lift resistance.

E. Coordinate the installation of insulation, roofing sheets, flashing, stripping, coatings and surfacings, so that membrane edges are not exposed to precipitation or exposed overnight. Provide cutoffs at end of each day's work to cover exposed sheets and insulation.

3.2 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secured.

C. Verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains.

D. Confirm dry deck by moisture meter with 12 percent moisture maximum.

E. Verify roof openings, curbs, pipes, conduit, sleeves, ducts, roof drains and vents through roof are solidly set, and cant strips and reglets are in place.

3.3 APPLYING BOARD INSULATION SYSTEM:

A. General:

1. The Contractor shall confirm all field dimensions for proper sizing of board in relation

to the existing roof standing seams, cut board as required to fit in between.

2. Install only as much board insulation in any one day as can be covered by the completed membrane in the same day.

B. Installation of Board Insulation and Gypsum Roof Board:

1. Firmly set units of board starting at low points.
2. Apply boards laid parallel to the existing standing seams.
3. Edge of boards shall be butted firmly to adjoining board with no gaps. Smooth any surface irregularities or unevenness between boards in top layer of boards prior to roofing.
4. Anchor insulation boards only as necessary to secure temporarily.
5. Overlay the rigid insulation with a single layer of the “Dens-Deck” Gypsum Roof Board, and mechanically fasten to the existing metal roof panels below as required by the project details and the roof board manufacturer to meet or exceed FM I-90 requirements.
6. Prior to roof membrane application, remove excess dust from surface of board insulation by brooming, blowing and/or vacuuming.

3.4 APPLYING THERMOPLASTIC ROOFING SYSTEM - FULLY ADHERED

A. General

1. Organize the various aspects of the work so at the end of each day the area completed on that day is substantially complete.

B. Field Sheets (Prefabricated Rolls)

1. Un-roll approximately 30 feet of the membrane and position the roll over the properly installed/prepared substrate. Pull the tail back over the roll to expose a workable area (approx. 30') of substrate.
2. Apply a 100% continuous coat of adhesive to the substrate, (and underside of membrane if using “contact” adhesive).

C. Procedural:

1. The amount of substrate that can be coated with a workable amount of adhesive will be determined by application method, ambient temperature, humidity and available man power.
2. To insure proper application and curing of the adhesive, it is recommended that the outside air temperature be above 40 F.
3. Adhesive may be applied by roller or by spraying.
4. Roller applied adhesive should utilize a solvent resistant 1/2" nap roller.
5. Spay applied adhesive must be spread out by roller to insure a smooth, even, 100% coverage of the substrate with no globs, puddles or similar irregularities.
6. Allow the solvents in the adhesive to dissipate to the point that the adhesive is stringy to the touch. Do not allow adhesive to “dry out” completely.

3.5 FLASHING - ALL LOCATIONS:

A. General Flashing:

1. Clean all vents, pipes, conduits, tubes, walls, and stacks to bright bare metal. All protrusions must be properly secured to the roof deck with approved fasteners. Remove and discard all lead, pipe and drain.
2. Remove all cant strips and loose wall flashing.
3. Fasten all metal flashing to wood nailers or approve substrates with approved fasteners 4" O.C. staggered. Leave a space between each sheet of metal to allow for expansion.

B. Curb and Wall Flashing

1. Flash all curbs, parapets and interior walls in strict accordance with approved manufacturer's details.
2. All flashing shall be totally adhered to approved substrate with manufacturer's approved mastic, and applied in sufficient quantity to insure total adhesion.
3. The base flange of all membrane flashing shall extend out on to the plane of the deck, beyond the wood nailer to a maximum width of 8".
4. Vertical wall flashing terminations shall not exceed 30" without additional, parallel horizontal rows of termination bar between the deck and the termination point of the flashing. Spacing between horizontal rows shall not exceed 24".
5. Complete all inside and outside corner details with a pre-punched un-reinforced corner fillet.
6. Probe all seams with a dull, pointed probe to insure the weld has created a homogeneous bond.

3.6 TRAFFIC PADS: Provide walkway protection pads at locations shown, using units of size shown or, if sizes not shown, using units of manufacturer's standard size, ½" thick. Set units in adhesive compatible with and approved by roof membrane manufacturer, or if acceptable, heat weld directly to membrane. Leave 3" clear between pads.

3.7 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 01 40 00.

B. Correct identified defects or irregularities.

C. Require site attendance of roofing and insulation materials manufacturers during installation of the Work.

3.8 CLEANING

A. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their [documented] instructions.

B. Repair or replace defaced or disfigured finishes caused by work of this section.

1. Trash and scraps are a hazard and shall be collected and disposed of immediately.
2. The applicator shall remove all masking protection equipment, materials and debris from the work and storage areas and leave those areas in an undamaged and acceptable condition.

3.9 PROTECTION

A. Protect building surfaces against damage from roofing work.

B. Where traffic must continue over finished roof membrane, protect surfaces.

C. Upon completion of roofing work (including associated work) advise Owner of recommended procedures for surveillance and protection of roofing during remainder of construction period. At the end of the construction period, or at a time when remaining construction work will in no way affect or endanger roofing, make a final inspection of roofing and prepare a written report to Owner and Architect describing nature and extent of deterioration or damage, if any, found in the work.

D. Repair or replace deteriorated or defective work found at time of final inspection. Repair damages to roofing which occurred subsequent to roofing installation and prior to final inspection. Repair or replace the roofing and associated work to a condition free of damage and deterioration at time of substantial completion.

END OF SECTION

MANUFACTURER'S NOTICE OF INTENT TO ISSUE ROOF WARRANTY

Whereas _____

herein called the "Roofing System Manufacturer" hereby gives notice to:

Owner: _____

Address: _____
of its Notice of Intent to issue its Roof Warranty, to the Owner for the Project,

Project: _____

Address: _____

incorporating the Manufacturer's _____

_____
roofing system or product is installed in accordance with the Contract Documents.

D. Manufacturers' Notice of Intent to Issue Roof Warranty in conformance with the Contract Documents shall be executed by the manufacturer and attached to the bid form. Each Bidder shall submit a single form, only from the specified manufacturer, and shall include items 1 and 2 as follows:

1. A detailed description of the components of the manufacturer's system proposed and a list of any other component and accessories, proposed for use in the system that is provided by other manufacturers or suppliers.

    a). A statement that the Manufacturer's Representative has visited this site prior to the bid date, reviewed the job conditions and project manual. Having reviewed the above items in detail, the Representative will provide a written response to the Design Professional ten days prior to the bid date, if conflicts between the Manufacturer's requirements occur with the above listed documents.

2. A sample of the Manufacturer's Roof Warranty shall be attached to and submitted with this form and the bid package. The manufacturer shall delete all exceptions relative to damage from high winds in one of the two following manners:

    a) delete exceptions to gale force winds and windstorms below the ASCE 7-10 and the Florida Building Code fifth (2014) edition - design requirements of - MPH wind uplift resistance.

    or

    b) delete exceptions to windstorms which would create the maximum wind uplift pressures as calculated by ASCE 7- and defined by the Design Wind Pressures Schedule within these project drawings, structural drawing S101.

3. **Twenty (20)** year total roof system warranty inclusive of roofing materials, all included products and accessories, including all metal flashings, from roof deck to finish membrane, whether supplied by the membrane manufacturer or by others. Provide a "No Dollar Limit", single source responsibility, non-deductible roofing warranty inclusive of all material and labor in full compliance with all the requirements of the project specifications.

a) If the manufacturer fails and/or refuses to issue the required roof warranty, the Contractor with Surety shall warrant to make repairs, replacement or take corrective action on the same terms as required of the manufacturer, (had the warranty been issued by the manufacturer), so that the intended warranty is delivered to the Owner.

b) The manufacturer shall modify the roof warranty to include total labor coverage for the warranty period and to Cover damage to roof materials and insulation down to the roof deck resulting from water penetration.

c) The manufacturer shall modify the roof warranty to state that the Owner has the right to make emergency repairs without voiding the warranty if the manufacturer or applicator do not respond within 24 hours to notification by the Owner of a defect or leak.

d) The manufacturer shall modify the roof warranty to state that annual inspections with written reports by the Owner, and resulting maintenance, are sufficient to fulfill the periodic inspection requirements of the manufacturer's warranty.

4. The manufacturer's Representative shall conduct a Post-Construction field inspection no earlier than eleven (11) months, and no later than twelve (12) months after the Date of Substantial Completion. Submit a written report within seven (7) days of this visit to the Owner's Maintenance Dept. listing observations, conditions and any recommended repairs or remedial action.

5. The manufacturer will, during the second (2^{nd}), and fifth (5^{th}), year of this warranty, inspect the roof system and provide a written Executive Summary of the Roof to the Owner.

Further, the manufacturer acknowledges that the applicator:

Roof Applicator's Name:_____

Address: _____

has been approved to install this roof system since _____, _____ and meets the criteria for an approved applicator listed in the Project Manual.

By signing the above, the Authorized Representative of said Manufacturer certifies and represents the Roofing System Manufacturer with the authority to contract and make the above representations to the Owner.

By: _____ Date: _____
Signature of Authorized Representative

Name:_____ Title: _____

Witness:_____ (SEAL)

Date: _____

APPLICATOR'S WARRANTY FOR ROOFING

Whereas _____

of (Address)_____

herein called the "Roofing Contractor", has performed roofing, flashing and sheet metal and associated ("work") on following project:

Owner:_____

Address:_____

Name and Type of Building:_____

Address:_____

Area of Work:_____

Date of Acceptance:_____

Warranty Period: Two Years Date of Expiration:_____

The Roofing Contractor hereby certifies to the Owner as a "Final Statement of Compliance" that the finished roof membrane (and insulation) system was installed in compliance with the approved contract documents.

AND WHEREAS Roofing Contractor has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks, faulty or defective materials, roofing components deemed faulty or in disrepair, and workmanship for designated the Warranty Period.

NOW THEREFORE Roofing Contractor hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work, and as are necessary to maintain said work in watertight condition.

This Warranty is made subject to the following terms and conditions.

1. Specifically excluded from this Warranty are damages to roofing work and other parts of the building, and to building contents, caused by:
   a) lightning, wind above the design limits of this project.
   b) fire;
   c) failure of roofing system substrate or structure (including cracking, settlement, excessive deflection, deterioration, and decomposition).

When work has been damaged by any of the foregoing causes, Warranty shall be null and void until such damage has been repaired and until cost or repairs has been paid by the Owner or by another responsible party as so designated.

2. The Roofing Contractor is responsible for damage to work covered by this Warranty, and is not liable for consequential damages to building or building contents, resulting from leaks or faults or defects of work.

3. The Owner shall promptly notify Roofing Contractor of observed, known or suspected leaks, defect, disrepair or deterioration. The Contractor shall guarantee to respond to all notifications within twenty-four (24) hours and to make all such repairs as deemed necessary to correct said leaks or defects to a satisfactory condition to the Owner. Repairs shall be made by workman in the current employment of the Contractor. Subcontracting of repair work is not permitted.

4. The definition of faulty roofing components or roofing in disrepair includes, but is not limited to the following:

   A. Blisters in roofing.
   B. Cracks or ridging in roofing membranes.
   C. Delamination, shears or tears in membrane.
   D. Defects in the quality of work or materials.
   E. Leaks of any kind.

5. This Warranty is recognized to be the only warranty of the Roofing Contractor on said work, and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to him in cases of roofing failures. Specifically, this Warranty shall not operate to relieve Roofing Contractor of responsibility for performance of original work in accordance with requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

IN WITNESS THEREOF, this instrument has been duly executed this

_____day of_____, 20____.

_____
Roofing Contractor Firm (SEAL)

_____
Signature of Authorized Person

_____
Title

_____
Witness

CODE COMPLIANCE
SUBMITTAL DOCUMENT

Roofing System Manufacturer: _____

Address: _____

_____

_____

_____

Technical Director: _____

Project Name: _____

Address: _____

_____

Roofing Contractor: _____

Roofing System Name: _____

General Description of Roof Systems: _____

_____

_____

_____

_____

Insulation to be install with roof system: _____

Fasteners to be installed with roof system: _____

_____

Attach copy of Factory Mutual Approval, including approval for submitted fastener and insulation type. If no such approval is available due to deck type, provide supporting technical data to support the use of the products in the assembly.

Attach a copy of Underwriters Laboratories listing confirming that the new roof assembly is in compliance with a Class A listing over the deck types.

Attach a copy of Metro-Dade County Code Compliance Approval for the roofing system and insulation.

PART 1 GENERAL

1.1 SUMMARY

1. Furnish and install fluid-applied-flashing system, comprised of a fleece and resins forming flashing base and top coat; as specified in accordance with drawings and manufacturer's requirements.

2. This flashing system may be also be considered for use by the Owner and Architect as an alternate to the indicated details at small, non-moving and/or difficult flashing conditions. Use will only be permitted on a case-by-case basis if requested in writing, reviewed, and approved in writing by the Architect.

B. Related Sections:
1. Section 07 62 00 – Sheet Metal Flashing and Trim

1.2 REFERENCES

A. ASTM International:
1. ASTM D412 – Standard Test Methods for Rubber Properties in Tension.
2. ASTM D2240 - Test Method for Rubber Property - Duration of Hardness,
3. ASTM G23 - Weatherometer Testing 2000 Hrs.
4. ASTM E96 - Water Vapor Transmission of Materials.
5. ASTM E108/UL 790 - Tests for Fire Resistance of Roof Covering Materials.
6. ASTM D413 - Adhesion Test method.
7. ASTM C297 - Flatwise Tensile Strength, after aging (according to ICBO).

B. ICBO – International Conference of Building Officials
1. ICBO Research Committee's Acceptance Criteria for Roof Systems - Water Permeability.
2. ICBO Acceptance Criteria for Special Roofing Systems - Physical Capabilities and Permanent Deformation Test.

1.3 SYSTEM DESCRIPTION

A. Fluid-Applied Roofing and Flashing System: Primers as required by manufacturer and as specified in the installation manual, elastomeric polyester resin, non-woven polyester reinforcement fabric (fleece), top seal coating and related accessories

1.4 SUBMITTALS

A. Under provisions of Section 01 33 00 submit the following:

1. Manufacturer's product data on physical and chemical properties of products, preparation of substrate required, product limitations, and cautionary requirements.
2. Manufacturer's written approval of installer firm.
3. Manufacturer's general and specific installation requirements, recommendations and procedures.
4. Manufacturer's certification that products meet or exceed specified requirements.
5. Material System Sample: Cured membrane sample and fleece sample 2" by 6".
6. Shop Drawings: Indicate joint or termination detail conditions and conditions of interface with other materials.
7. Details: Furnish manufacturer's standard details, modified standard details and special details as deemed appropriate.
8. Manufacturer's Safety Data Sheets (MSDS) on all materials, chemicals, products or substances used in the work of this section which may be constructed as hazardous by the governing bodies with jurisdiction, including State Department of Labor and Industries, or Department of Ecology, or OSHA federal and state.

1.5 QUALITY ASSURANCE

A. Qualifications:
1. Manufacturer: Company specializing in manufacturing the products specified in this section with not less than ten years documented experience. Fluid Applied Roofing and Flashing system shall have a successful proven field exposure for a minimum of ten years.
2. Installer: Company specializing in performing the work of this section approved in writing by the manufacturer.

B. Work of this section shall comply with manufacturer's general and specific instructions.

C. Field sample: Provide a 12 inch long x 8 inch wide sample of finished waterproofing membrane for approval and identification by roofing inspector. Clearly identify date and job name on the back of each sample.

1.6 REGULATORY REQUIREMENTS

A. Comply with applicable code for fire resistance ratings of roof systems and as specified.

B. Meet the requirements of the UL Class A Fire Hazard Classification.

C. Maintain at all times on the jobsite a commercial grade, currently certified Fire extinguisher.

1.7 PRE-INSTALLATION CONFERENCE

A. Under provisions of Section 01 31 00, convene on the roof for a roofing conference prior to the beginning of work for this section. Contractor, Applicator, Owner, Architect/Engineer, Roofing Consultant, governing authorities, distributor's technical services representative and other parties interested in the performance of the roofing system shall be in attendance.

B. Review Contract Documents, submittals, proposed installation schedules, job set-ups, location and storage of materials, requirements for inspection, testing, warranty, governing regulations, installation procedures and coordination with other work.

1.8 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.

B. Protect stored products from extreme temperatures, weather and sunlight in accordance with manufacturer's written recommendations.

C. All labels shall be readable with UL markings clearly visible.

D. Deliver materials in sufficient quantities to allow a continuity of the work.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Do not apply flashing system materials during inclement weather or under conditions not acceptable to the manufacturer.

B. Do not apply roofing systems materials when moisture from dew is present or if rain or moisture sources are present, forecasted or expected or when weather conditions and ambient temperatures do not permit work to be performed in accordance with manufacture's recommendations and warranty requirements.

C. Do not expose materials vulnerable to water or sun damage in quantities that can not be weatherproofed during the same day. At the end of each workday and when weather threatens provide tie-offs, approved by manufacturer's installation procedures that are proven effective in providing weathertight seal and in preventing moisture penetration.

1.10 SCHEDULING

A. Schedule work under the provisions of Division 1.

B. Schedule work to coincide with commencement of installation of new roofing system.

C. Remove only existing roofing materials that can be replaced with new materials the same day.

1.11 COORDINATION

A. Coordinate work under provisions of Division 1.

1.12 PRODUCT WARRANTY

A. Provide manufacturer's standard written warranty, signed by manufacturer of roofing system and installer, agreeing to repair or replace defective materials and workmanship within the specified warranty period.

B. Warranty Period: 20 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS

A. Soprema: Alsan Flashing.

B. Siplast: Parapro 123 Flashing System.

C. Kemper Systems: Kemperol Membrane BR/200 System.

D. Equivalent systems as approved by, and included within their 20 year weathertightness warranty the roof membrane manufacturer.

2.2 MATERIALS

A. Membrane: Cold liquid applied polyurethane reinforced waterproofing membrane with a polyester reinforced fleece.

B. Polyester Reinforcement Fleece: Reinforcement fleece shall consist of the manufacturer's supplied non-woven polyester fleece.

C. Top Coat: Fire retardant single component coating as supplied by the manufacturer.

2.3 ACCESSORIES

A. Filler: Resin type as recommended by manufacturer.

B. Primer-Sealer: Type as recommended by manufacturer and as required by UL-790 Class A testing for substrate.

PART 3 EXECUTION

3.1 GENERAL

A. Install roofing and flashing system materials and assemblies in strict accordance with manufacturer's recommendations.

B. Maintain one current copy of applicable manufacturer's installation instructions for system components and one copy of Contract Documents including system approvals on the rooftop during installation.

3.2 EXAMINATION

A. Verify that surfaces and project site conditions are ready to receive work as defined in this section.

B. Verify that area to be coated is smooth, dry and free of water, grease, oil, dirt, dust, debris, gravel, paint, asphalt, projections, depressions, loose scale, sand, curing compounds and other foreign deposits in accordance with manufacturer's recommendations.

C. Do not begin work until unsatisfactory conditions are corrected. Beginning work means installer accepts surfaces and substrates as satisfactory and ready to receive roofing materials.

3.3 PREPARATION – EXISTING METAL SURFACES

A. Remove contaminants such as, coatings and other materials that may interfere with total adhesion. Take extra precautions not to damage existing structure or adjoining surfaces. Protect adjacent materials and finishes from physical damage. Provide protection as required and remove from site at completion of work.

B. Flashings shall be abrasively cleaned or ground as required to provide a sound open abraded surface.

C. Mask off and protect adjacent finished surfaces that are not scheduled to receive the new fluid applied flashing system.

3.4 PREPARATION - EXISTING BUILT-UP ROOFING WITH GRAVEL SURFACING

A. Spud back existing gravel surfacing.

B. Flashings shall be ground for a 4 inch minimum band at all vertical termination points, to wall transitions, and 4 inches onto horizontal roof surfaces.

3.5 PREPARATION - EXISTING GRANULATED MODIFIED BITUMEN ROOFING

A. All loose granules, dust and dirt shall be removed from the surface of the membrane by brooming and power vacuuming.

3.6 PREPARATION - EXISTING CONCRETE

A. Concrete shall be abrasively cleaned to provide a sound substrate free from laitance with an open concrete surface.

B. Areas of minor surface deterioration of 0.50 inch or greater in depth, and/or spalls, voids, bug holes and other deterioration on vertical surfaces or horizontal surfaces shall be repaired in accordance with the requirements of the membrane manufacturer and the Owner or his designated representative.

3.7 PREPARATION - EXISTING MASONRY

A. Masonry walls must be hard kiln dried brick, reinforced concrete block or waterproof concrete block construction.

B. Flashings must not be applied over soft or scaling brick or concrete, faulty mortar joints, or walls with broken, damaged or leaking coping. Walls of ordinary hollow tile, or other materials which in themselves are not waterproofed, should not be accepted as suitable to receive flashings unless they are properly waterproofed, to prevent moisture infiltration from above or behind the flashing system.

3.8 FLASHINGS AND ACCESSORIES

A. Install manufacturer’s standard membrane flashings and accessories in locations indicated on the plans and in accordance with the manufacturer’s instructions. All flashing shall be tight and of adequate height to assure watertightness. Whenever possible a minimum of 6" of membrane shall be extended into flashing areas, with resin extending past end of fleece.

B. Laps/Seams: Maintain a minimum 2 inch overlap at all side laps of adjacent fleece rows and 4 inch overlaps at butt laps, tie-ins and flashings (reinforcing fleece and resin). For tie-ins onto modified bitumen, asphalt or other approved membranes, provide minimum 12 inch overlaps (reinforcing fleece and resin).

C. Seal flashings and flanges of items penetrating membrane.

3.9 MEMBRANE APPLICATION

A. Apply polyester resin to properly cleaned and primed roof deck in accordance with manufacturer’s written instructions at the rate required by manufacturer.

B. Embed sheet of polyester fleece into resin in a smooth and uniform manner. Roll fleece into resin in accordance with manufacturer's manual to remove all entrapped air, voids, and abridgements.

C. Lap side and end joints by 2 inches minimum. Allow resin to cure a minimum of one day before top coating is applied.

3.10 FINISH COAT APPLICATION

A. Apply coat of top seal coating in accordance with manufacturer's written instructions and at a rate recommended by manufacturer. Apply over the cured membrane the day following its inspection and approval by manufacturer's technical representative. Allow to cure per manufacturer's instructions.

3.11 FIELD QUALITY CONTROL

A. Field inspection will be performed under provision of Section 01 40 00.

B. Correct indentified defects or irregularities.

C. Require site attendance of Distributor's technical services representative periodically during the installation of the work for purposes of advising the installer of procedures and precautions for use of roofing materials and to ensure that all work meets the manufacturer's requirements.

3.12 CLEANING

A. Repair or replace defaced or disfigured finishes caused by work of this Section.

B. Remove trash and debris from project site under provisions of Section 01 50 00.

C. Remove equipment and parts from project site.

3.13 PROTECTION OF FINISHED WORK

A. Protect building surfaces against damage from work of this Section.

B. Protect finished work under the provision of Section 01 50 00.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Foamed-in-place polyurethane roof coating

B. Protective overcoat with aggregate.

1.2 RELATED SECTIONS

A. Section 07 01 50.63 - Built-up Asphalt Roofing Repairs

B. Section 07 62 00 - Sheet Metal Flashing and Trim: Perimeter Flashings; counterflashings to roof penetrations.

1.3 REFERENCES

A. ASTM C177 - Steady-State Thermal Transmission Properties by Means of the Guarded Hot-Plate.

B. ASTM C273 - Shear Test in Flatwise Plane of Flat Sandwich Construction or Sandwich Cores.

C. ASTM C518 - Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

D. ASTM D412 - Test Method for Rubber Properties in Tension.

E. ASTM D1621 - Compressive Properties of Rigid Cellular Plastics.

F. ASTM D1622 - Apparent Density of Rigid Cellular Plastics.

G. ASTM D1623 - Test Method for Tensile Strength and Tensile Adhesion Properties of Rigid Cellular Plastics.

H. ASTM D2126 - Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.

I. ASTM D2482 - Wax Pick Test for Surface Strength of Paper.

J. ASTM D2856 - Test Method for Open Cell Content of Rigid Cellular Plastics by the Air Pycnometer.

K. ASTM E84 - Surface Burning Characteristics of Building Materials.

L. ASTM E96 - Water Vapor Transmission of Materials.

M. ASTM E398 - Test Method for Water Vapor Transmission Rate of Sheet Materials Using a Rapid Technique for Dynamic Measurement.

N. FM (Factory Mutual Engineering Corporation) - Roof Assembly Classifications.

O. UL 790 - Tests for Fire Resistance of Roof Covering Materials

1.4 SUBMITTALS FOR REVIEW

A. Section 01 33 00 - Submittals: Procedures for submittals.

B. Product Data: Provide data on foam insulation and overcoat, physical and chemical properties, preparation of substrate required, product limitations, and cautionary requirements.

C. Samples: Submit two samples of roof finish aggregate covering, two pounds each in size illustrating color and texture.

1.5 SUBMITTALS FOR INFORMATION

A. Section 01 33 00 - Submittals: Procedures for submittals.

B. Test Reports: Provide test reports indicating that specified requirements are achieved by the products being supplied.

C. Manufacturer’s Instructions: Indicate installation requirements and procedures.

D. Manufacturer’s Certificate: Certify that Products meet or exceed specified requirements.

E. Manufacturer’s Reports: Indicate procedures followed, ambient temperatures and wind velocity during preparation, application and protection.

1.6 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

B. Applicator: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.

C. Work of this section to conform to manufacturer’s instructions.

1.7 REGULATORY REQUIREMENTS

A. Conform to applicable code for fire resistance ratings of roof system.

B. UL 790: Class A Fire Hazard Classification.

C. FM Roof Assembly Classification of Class I Construction, wind uplift requirement of I90, in accordance with FM Construction Bulletin 1-28.

1.8 PROJECT CONDITIONS

A. Section 01 31 00 - Coordination and Meetings: Pre-installation meeting.

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

C. Review installation procedures and coordination required with related Work.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Material and Equipment: Transport, handle, store, and protect products.

B. Protect stored products from ambient temperatures below 75 degrees F.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Do not install foam insulation under the following conditions:

1. When ambient temperature is below 50 degrees F.
2. When relative humidity is above 80 percent.
3. When wind velocity is above 10 mph.

B. Do not install overcoat under the following conditions:

1. When ambient temperature is below 50 degrees F.
2. When wind velocity is above 10 mph.
3. Not in rain.

1.11 WARRANTY

A. Section 01 77 00 - Closeout Procedures

B. Correct defective Work within a 10 year period after Substantial Completion for coverage of roofing system for delamination of bond, discoloration or fading, water tightness and loss of aggregate surfacing.

PART 2 PRODUCTS

2.1 FOAM INSULATION MATERIALS

A. Foam Insulation: Polyurethane type, as follows:

1. Thermal Conductivity: ASTM C177 K value of 0.075 initial at 75 degrees F.
2. Water Vapor Permeability: ASTM E96 150 perms.
3. Closed Cell Content: ASTM D2856, 90 percent.
4. Compressive Strength: ASTM D1621; 40 psi.
5. Density: ASTM D1622; 3 lb./cu ft.

B. Substrate Primer: As required by insulation manufacturer.

2.2 OVERCOAT MATERIALS

A. Overcoat: Silicone base and cover coats, color as selected, with the following properties:

Property		Value	Test Method
1.	Tensile Strength	400 psi	ASTM D412
2.	Elongation	150 percent	ASTM D412
3.	Water Vapor Permeance	150 perms	ASTM E398

B. Edge and Walkway Reinforcement: Open weave glass fiber cloth.

C. Aggregate Surfacing: ASTM D1863, Size No. 6, washed brown river gravel, dry and free of dust.

2.3 ACCESSORIES

A. Cant Strip: Perlite, preformed to 45 degree angle or spray applied foam insulation, filleted to interruptions and penetrations through roof surface.

B. Sealant: Type recommended by roofing manufacturer, color to match roofing and adjacent materials.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify deck substrate under provisions of Section 01 31 00.

B. Schedule work after all penetrations through roof are complete and perimeter conditions are ready to receive roof system.

C. Verify that deck surface is smooth and dry and repairs of existing built-up roof membrane are complete.

3.2 PREPARATION - TO EXISTING ROOF SYSTEM

A. Prepare existing roofing surface in accordance with Section 07 01 50.19 - Preparation for Re-Roofing.

B. Utilize materials or substances that will not interfere with total adhesion of foam insulation.

C. Mask off adjacent surfaces that are not scheduled to receive foam.

3.3 Insulation Installation

A. Apply primer and foam insulation in accordance with manufacturer's instructions.

B. Place insulation to 1/2 inch minimum thickness, 2 inch average thickness; plus 1/4 inch , minus zero.

C. Extend foam 2 inches up vertical intersections, fillet insulation and feather out. Form a cant of foam at perpendicular interruptions.

D. Apply foam to uniformly slope to drains minimum 1/4 inch per foot, provide 1 inch per foot slope at sump area immediately around drain.

E. Surface Flatness: 1/2 inch per 10 foot measured with a straight edge.

F. Apply foam to permit first coat of overcoat application within 24 hours. If this time limit is exceeded, prepare foam skin surface in accordance with manufacturer's instructions.

G. Develop finish skin surface to smooth and unbroken "rough orange peel" texture. Uneven surfaces are not acceptable.

H. Coordinate the work with installing associated metal flashings as the work of this section proceeds.

3.4 FLASHINGS AND ACCESSORIES

A. Coordinate installation of roof drains, sumps and related flashings.

B. Seal flashings and flanges of items penetrating membrane.

3.5 OVERCOAT INSTALLATION

A. Install overcoat in accordance with manufacturer's instructions.

B. Prepare and seal penetrations through roof with sealant.

C. Apply overcoat in two coats with dissimilar colors for each coat to a total dry film thickness of 20 mils.

D. Extend overcoat to cover foam insulation and extend 2 inches above foam termination on protrusions to a self terminating, water tight seal.

E. Install edge (6 inch wide) and walkway reinforcement in un-cured base overcoat. Apply additional overcoat over reinforcement to achieve complete cover.

F. Apply roof surface aggregate at a rate of 4 pounds per square foot in accordance with manufacturer's instructions in un-cured final overcoat.

3.6 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Control: Field inspection and testing.

B. Testing will include verification of insulation properties, thickness, coverage of overcoat, number of coats and color.

3.7 CLEANING

A. Section 01 70 00 - Contract Closeout: Cleaning installed work.

B. Remove excess insulation or overcoat from finished surfaces.

C. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.

D. Repair or replace defaced or disfigured finishes caused by Work of this section.

3.8 PROTECTION OF FINISHED WORK

A. Section 01 77 00 - Closeout Procedures: Protecting installed work.

B. Ensure roof surface is free of traffic for minimum three days after overcoat application.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Material and application methods for a standing seam metal roof system, mechanically seamed in the field, over a two layer light-gauge metal furring system over the existing metal roof system. The furring system is to be anchored through the existing roof panels, to the existing steel framing system below. Provide and install all associated flashings, including specialty fabrications as detailed.

B. Material and application methods for interlocking metal wall panel system, over a self adhesive modified bitumen waterproofing membrane over the new or existing wall sheathing, including all associated trim and flashings.

1.2 RELATED SECTIONS

A. Section 06 10 53 - Rough Carpentry

B. Section 07 54 00 - Thermoplastic Single-Ply Roofing

C. Section 07 62 00 - Sheet Metal Flashing and Trim.

D. Section 07 92 00 - Joint Sealers.

1.3 DESCRIPTION OF WORK

A. The extent of metal furring, roofing and siding system is indicated on the drawings and by provisions of this section, and is defined to include the following:

1. Engineering, design, provision, installation and anchorage of standing seam roof and siding panels.

2. Engineering, design, provision, installation and anchorage of two layer, light-gauge metal furring system to support the new standing seam roof system.

3. Design, provide and install roof panels and all associated or required accessories and anchors, trim and flashing, integrally related to roof installation.

4. Design, provide, and install metal siding panels and all associated or required accessories and anchors, trim and flashing, integrally related to siding installation.

5. Design, provide, and install two layer, light-gauge metal furring system to support the new standing seam roof system

1.4 REFERENCES

A. AA (Aluminum Association) - Aluminum Construction Manual: Aluminum Sheet Metal Work in Building Construction.

B. American Iron and Steel Institute (AISI) - Stainless Steel - Uses in Architecture.

C. ASTM A 153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

D. ASTM A 167 - Stainless and Heat-Resisting Chromium Nickel Steel Plate, Sheet, and Strip.

E. ASTM A 446/A A446/M - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.

F. ASTM A 792 - Steel Sheet, Aluminum-Zinc Alloy Coated by the Hot-Dip Process, Structural (Physical) Quality.

G. ASTM B 209 - Aluminum and Alloy Sheet and Plate.

H. C 177 - Steady-State Thermal Transmission Properties by Means of the Guarded Hot-Plate.

I. ASTM C 665 - Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.

J. ASTM E 84 - Surface Burning Characteristics of Building Materials.

K. ASTM E 96 - Water Vapor Transmission of Materials.

L. ASTM E 283 - Test Method for Rate of Air Leakage.

M. ASTM E 331 - Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

N. ASTM E 1592 - Standard Test Method for Structural Performance by Uniform Static Pressure.

O. SMACNA - Architectural Sheet Metal Manual.

P. FM - Roof Assembly Classifications.

Q. ULI - Underwriters Laboratories Industries

1.5 SYSTEM DESCRIPTION

A. The extent of metal roofing and siding system is indicated on the drawings and by provisions of this section, and is defined to include roofing, insulation, flashing and roofing accessories integrally related to roof installation.

B. Types of Panels required include the following:

1. Formed panels, for seaming during installation (roof panels).
2. Formed panels, intended for lapped-seam installation (fascia and wall panels).

1.6 DESIGN AND PERFORMANCE REQUIREMENTS

A. Insurance and Code Requirements: Provide materials complying with governing regulations, installed to comply with Underwriters Laboratories Class UL-90 wind up-lift requirements.

B. All roof system components shall be designed, sized and engineered to withstand all imposed dead and live loads as defined by the Florida Building Code (FBC) 2001 and ASCE 7-. This includes the positive and negative wind pressures calculated for a 120 mph wind according to ASCE 7-, with an importance factor of 1.15. Manufacturer to use ASCE 7- as basis for wind loading, and their ASTM E-1592 test results as the basis for system performance.

C. Maximum Allowable Deflection of Panel: L/180.

D. System to accommodate, without damage to system, components, or deterioration of seals, movement within system; movement between system and perimeter components, when subject to seasonal temperature cycling with a temperature differential of 200 degrees Fahrenheit for the roof materials itself; dynamic loading and release of loads; deflection of structural support framing.

E. System shall be tested for wind driven rain in accordance with AAMA 501.1 with no leakage.

F. System shall be tested for air infiltration in accordance with ASTM E 283 at 6.24 PSF with acceptable infiltration at 0.0071 CFM/SF.

G. System to accommodate tolerances of building structural framing.

1.7 QUALITY ASSURANCE

A. Coordinated Installation: Except as otherwise indicated, perform roofing and flashing work as a single integrated unit of work, without division of responsibility between separate installers (Single-Installer responsibility required).

B. Perform work in accordance with, SMACNA, NRCA, and metal roofing manufacturer's requirements at conditions not addressed by the project details.

C. The metal roof panels provided by the supplier must have been tested for and attained a UL-90 classification and demonstrated compliance with ASTM E 1592 without the use of any exposed fasteners. Metal roofing panels to be formed on U.L. certified equipment at the manufacturer's plant or under direct supervision in the field by employees of the manufacturer.

D. Maintain one copy of each document on site.

E. Manufacturer Qualifications:

1. Provide primary products, including each type of roofing sheet, produced by manufacturers, which have produced that type product successfully for not less than five (5) years.

2. Provide secondary products which are acceptable to manufacturers of primary products.

F. Installer Qualifications:

1. A single installer shall perform the work of this section; and shall be a firm specializing in metal roofing system work for at least five (5) years, capable of showing successful installations similar to work required for project. Submit a list of projects, (with project name, location, date, size, roof system, cost and references (contact/phone numbers)), with the bid covering the last five years or a minimum of 15 projects.

2. The installation shall be performed by a roofer who has been trained by the manufacturer and then certified in writing as an installer approved by the manufacturers of the metal roofing and siding. Certificate holder must be employed by roofing contractor and be present at the jobsite for the duration of the project. Submit copy of certification with the bid.

3. Maintain full-time supervisor/foreman, not a workman/foreman, on job site during times that roofing work is in progress. Supervisor must have minimum of five (5) years experience in roofing work of same or similar products manufacturer as bid. Submit a copy of their resume with project experience with the bid.

G. Manufacturer's Field Inspection and Services:

1. Manufacturer of the roofing materials shall provide qualified personnel to observe field conditions of surfaces and installation, quality of workmanship as applicable, and to make appropriate recommendations.

2. Representative shall visit the project throughout the progress of the work as necessary to ensure the quality of workmanship, as well as the following points in time:
   a. Pre-construction meeting.
   b. Site visits at major construction segments:
      1) Structural
      2) Penetrations and accessories
      3) Paneling
      4) Trims
   c. Prior to Architect's Substantial Completion inspection, a final inspection shall be made.
   d. Attend called meetings.

3. Representative shall submit written reports within three days to Architect listing observations, recommendations and other related comments.

1.8 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Shop Drawings:

1. Submit 1/8" scale layouts of panels on walls and roofs and field assembly work. Do not use drawings prepared by the Architect for shop or erection drawings.

2. Indicate any erection details or methods which are not included or available from the

manufacturer's published details.

3. Illustrate all sections, profiles and materials to be used at all transitions and flashing conditions between roof levels, at roof penetrations or where the work of this project connects to or abuts existing construction to remain in place.

4. Do not proceed with manufacture/fabrication prior to review of the shop drawings.

C. Fasteners: Submit two samples of each fastener type.

D. Manufacturer's Installation Instructions: Indicate special precautions required for seaming the panels.

E. Product Data: Provide data on metal type, finishes, characteristics, and general recommendations from metal sheet roofing manufacturer.

F. Submit two 12x12 inch in size samples of metal roofing and wall panel material, illustrating finish.

G. Submit one 16" long sample of a seamed panel, including anchor clips, and battens (if applicable).

H. Engineers' Calculations:

1. Provide calculations which have been prepared, signed and sealed by a Florida registered Structural Engineer based on the performance and test data obtained from the manufacturer's ASTM E-1592 testing program.

2. Submit two copies of the ASTM E-1592 test results with the structural calculations for review by the Owner and Design Professional.

I. Manufacturer's Installation Instructions: Indicate special handling criteria, installation sequence, and cleaning procedures and certifications.

1.9 WARRANTY

A. Applicators Warranty: Furnish on executed form included at the end of this Section.

B. Manufacturer's Warranty: 20 year materials and total roof (weather tight) system performance warranty inclusive of roofing materials from deck to finish membrane. The Warranty terms and conditions are to comply with the "Manufacturer's Notice of Intent to Issue Roof Warranty" form included at the end of this section.

C. Warrant finish color coating against cracks, checks or peeling and, blister, flake, chip, or otherwise lose adhesion, and will not chalk in excess of eight (8) units, or fade in excess of five (5) NBS units.

1. Color change determination shall be made in accordance with ASTM D-2244, paragraph 4.3.2.4, by comparing exposed panels and unexposed panels from a given batch.

D. Metal roof system, inclusive of all components furnished by this manufacturer, shall not deflect structurally in excess of L/180.

E. Leak free.

1. Specifically excluded from manufacturer's warranty are damages to the work caused by:

a. Penetration of the roof associated with vents, equipment or other causes if performed without prior approval from Roofing System Manufacturer. Such approval will not be unreasonably withheld.

b. Winds in excess of the design requirements.

c. Lightning

d. Fires

e. Vandalism

f. Corrosive or aggressive atmosphere such as chemical fumes or direct salt spray. However, the atmosphere at this project, on the date of bidding, is to be hereby acknowledged by the manufacturer, as within the definition of normal atmospheric conditions.

2. When work has been damaged by any of the above listed causes, the warranty shall be null and void until such damage has been repaired by the Roofing System Manufacturer and until cost expense thereof has been paid by the Owner or by another responsible party so designated by the Owner.

3. The Roofing System Manufacturer is responsible for any and all damage, deterioration, or failure for any reason of the work covered by their warranty, except for those items specifically excluded above.

4. The Owner shall promptly notify Roofing System Manufacturer of observed, known or suspected leaks, defects, or deterioration. The Roofing System Manufacturer shall guarantee to respond to all notifications within forty eight (48) hours and to make all such repairs as deemed necessary to correct said leaks or defects. Such satisfaction will not be unreasonably withheld. Repairs shall be made by workmen in the current employment of the Roofing System Manufacturer or his authorized agent.

1.10 FIELD MEASUREMENTS

A. Verify that field measurements conform with Drawings.

1.11 COORDINATION

A. Coordinate Work under provisions of Section 01 31 00.

1.12 SEQUENCING

A. Pre-Roofing Conference

1. Prior to installation of roofing system, meet at project site with Contractor and, representatives of other entities directly concerned with performance of roofing. Coordinate so representatives of governing authorities, product manufacturers, Architect and Owner will also be present.

2. Review requirements, Contract Documents, submittals, status of coordinating work, availability of materials and installation facilities, proposed installation schedule, requirements for inspections and testing or certifications, forecasted weather conditions, governing regulations, insurance requirements, and proposed installation procedures.

3. Record discussion on matters of significance; furnish copy of recorded discussions to each participant. Discuss roofing system protection requirements for construction period extending beyond roofing installation.

1.13 JOB CONDITIONS

A. Existing Conditions

1. The roofing applicator and sheet metal installer shall verify existing conditions, such as soundness of perimeter conditions, and varying deck and wall thickness for length of anchoring services required and other visible conditions prior to Bidding. Information used in the design was obtained from original design drawings, existing records and site inspections.

2. Conflicts and problems shall be reported to the Architect prior to Bidding, for resolution. Failure to report these conflicts and problems places the responsibility on the Prime Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.

3. Replace or restore to original condition any materials or work damaged during construction.

4. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.

5. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.

B. Weather

1. Proceed with roofing work when existing and forecasted weather conditions permit work to be performed in accordance with manufacturer's recommendations and warranty requirements.

1.14 DELIVERY, STORAGE, AND HANDLING

A. Deliver to site, store, protect and handle products under provisions of Section 01 60 00.

1. Deliver material in manufacturer's original, unopened containers with manufacturer's labels intact and legible.

2. Deliver material requiring fire resistance classification to the job with labels attached and packaged as required by labeling service.

3. Deliver enough material to allow continuous work.

B. Storage:

1. Store rolls, cans and drums of cements, primers, and coatings, on end.

2. Store materials at an angle so that any water will drain from panels, minimum 1" per foot slope.

3. Store and handle materials to protect them from:
   a. Moisture, whether due to precipitation or condensation.
   b. Damage by construction traffic.
   c. Temperatures over 110 degrees F.
   d. Temperatures below 40 degrees F.
   e. Direct sunlight.
   f. Mud, dust, sand, oil, grease and dirt.

4. Store materials according to manufacturer's printed instructions.

C. Handling:

1. Select and operate material handling equipment and store materials to keep from damaging existing construction or applied roofing.

2. Comply with fire, safety, and environmental protection regulations.

3. Do not store materials on roof decks, nor position roofing installation equipment on roof decks, in concentrations exceeding 20 lbs./SF.

4. Avoid heavy traffic on the work during all phases of installation. Roof panels shall support walking loads without excessive distortion or telegraphing of the structural supports. Panels shall support a 250 pound load concentrated on a four square inch area at the center of the panel without buckling or permanent distortion.

D. Stack preformed and prefinished material to prevent twisting, bending, warping, surface damage, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

E. Prevent contact with materials which may cause discoloration or staining.

PART 2 PRODUCTS

2.1 INSURANCE AND CODE REQUIREMENTS

A. Provide materials complying with governing regulations, installed to comply with Underwriters Laboratories Class UL-90 wind up-lift requirements.

1. Roof system shall be engineered to resist - mph wind uplift according to the basic wind load pressures in FBC, ASCE 7, and Florida Dept. of Education SREF, (latest editions), with an importance factor of 1.15.

2.2 METAL ROOFING AND SIDING SYSTEM MATERIALS

A. Manufacturer:

1. Obtain primary metal roofing from a single manufacturer.
Provide secondary materials only as recommended by the manufacturer of the primary material, and additionally as specified.

2. Acceptable wall panel manufacturers/products:

a. Centria Roof Systems - 1W-11A Utility Panel
b. Fabral (Alcan Building Products) - Decor-Flush Panel
c. Imetco (Innovative Metals Company, Inc.) - PW-130 Wall Panel
d. Merchant & E vans, Inc. - Wall Panel #311-12 Series
e. Metal Sales Manufacturing Corporation - Soffit Panel
f. Morin Corporation - MOR-WALL Panels A-12
g. Steelox Systems, Inc. - Steelox TLR Wall Panel.

3. Acceptable roof panel manufacturers/products:

a. Centria Roof Systems - SDP 200 Roof Panel
b. Fabral (Alcan Bldg. Products) - Stand 'N Seam.
c. Imetco (Innovative Metals Company, Inc.) - Series 300 Roof Panel
d. Merchant & Evans, Inc. - Zip-Rib Roof Panel.
e. Metal Sales Manufacturing Corporation - Magna-Loc Roof Panel
f. Morin Corporation - SSR, Standing Seam Roof Panel.
g. Steelox Systems, Inc. - Steelox LRX Roof Panel.

2.3 RELATED MATERIALS

A. Members Fabricated by Cold Forming: ASTM A 607-91 or A 570/A-91, Grade 50.

B. Galvanized Steel Sheet (for miscellaneous use only): ASTM A 446, Grade C, except where higher strength required for performance, with G90 coating; "Class" to suit roofing manufacturer's standards.

C. Aluminum Sheets (for miscellaneous use only): ASTM B 209; 3004 alloy, H274 temper and mill finish, or as recommended by panel manufacturer and approved by the Architect.

D. Solder: 50-50 lead / tin solder, ASTM B 32.

E. Flux: Acid - Chloride type.

F. Flux Cleaner: Washing soda solution, 5% to 10%.

G. Accessories: Except as indicated as work of another specification section, provide components required for a complete roofing/siding system, including trim, coping, fascias, sills, corner units, ridge closures, clips, seam covers, battens, flashing, gutters, louvers, sealants, gaskets, fillers, closure strips and similar items. Match materials/finishes of preformed painted panels.

H. Bituminous Coating: Cold-applied asphalt mastic, SSPC paint 12, compounded for 15 mil dry film thickness per coat.

I. Paint: Manufacturer's touch-up paint, to match the color(s) of the roof, walls and trim.

J. Flashing Tape: Double sided, grey extruded or preformed, 99% solids, crosslinked polyisobutylene compound, non-sag, non-toxic, non-staining, permanently elastic self adhesive tape. 1/8" minimum thickness, 3/4" minimum width unless noted otherwise on the drawings.

1. Pecora Corporation Extru-Seal Glazing Tape
2. Tremco Construction Products 440 II Tape
3. Equivalent products as approved by the Owner and Architect.

K. Termination Bar: Aluminum ASTM B 209-90, Alloy 6061, Temper T-6, mill finish; sizes 1/8" thick by 1-1/2".

L. Sealant: One part silicone sealant as specified in Section 07 92 00, color as selected by the Design Professional. Prepare all surfaces and apply in accordance with sealant manufacturer's recommendations and section 07 92 00.

M. Modified Bitumen Underlayment Membrane & Flashing Tape: Material: Rubberized (SBS) asphalt bonded to a polyester reinforcing mat, 40 mil (1 mm) minimum total thickness, single-sided, self-adhesive, with a strippable treated release paper. Surface to be non-skid surface of mineral granules, fabric scrim and/or sanded. Factory or field cut if necessary to the size required by the details.

1. Acceptable Products include:

a. Protecto Wrap Co.. Rain Proof - 40
b. Soprema Sopralene Stick
c. Design Professional approved equal product.

2.4 ROOFING AND SIDING

A. General: Provide roofing and siding sheets roll formed to profile indicated and specified. Provide flashing, closures, fillers, metal expansion joints, ridge covers, roof panel mounting clips,

gable and eave trim, gutters and other sheet metal accessories factory formed and finished. Material and finish shall be as specified.

1. Allowances for thermal expansion: Pre-engineered metal roof system shall be designed, fabricated, and installed to allow relative movement between roof panels and purlins, gables and ridges due to thermal expansion and contraction without causing damage to the system or permanent deformation to any of the system components. Roof panel end laps shall allow panels to expand and contract without damage to end lap seams.

B. Roof Panels:

1. Material to be the following base metal in thickness as determined by the manufacturer based on panel design, fabrication and installation requirements:

   a. Base Bid: 24 gage minimum, roll formed, aluminum-zinc alloy coated steel sheet coated on both sides with a layer of aluminum-zinc alloy by continuously hot dip method (approximately 55% aluminum, 45% zinc), actual gauge to be determined based on data obtained from ASTM E-1592 testing. Triple spot minimum 0.55 oz. per square foot as determined by ASTM A 792. Panels to have a clear acrylic, factory applied, temporary surface finish (Acrylume or Galvalume-Plus) to protect panels during fabrication and installation.

   b. Alternate Bid: 24 gage minimum, roll formed, aluminum-zinc alloy coated steel sheet coated on both sides with a layer of aluminum-zinc alloy by continuously hot dip method (approximately 55% aluminum, 45% zinc). Triple spot minimum 0.55 oz. per square foot coating as determined by ASTM A 792, with a factory applied Kynar 500 (or equal) fluoropolymer finish, color as selected by Owner.

   c. Walkways W1 thru W10: 0.040" thick minimum, roll formed ASTM B 209; 3004 alloy aluminum, H274 temper, mill finish, actual thickness to be determined based on data obtained from ASTM E-1592 testing.

2. Panel Width: 12" minimum, 16" maximum, actual width to be determined based on data obtained from ASTM E-1592 testing.

3. Standing Seam Height: 3 inches maximum; 2 inches minimum.

4. Panel Side Laps: Panels shall be designed to provide full seam side laps when installed. Factory applied sealant shall be provided in female portion of seam.

5. Panel Length: all roof panels shall be continuous from top to bottom.

C. Fascia / Wall Panels:

1. Total Assembly: The field assembled fascia or wall shall consist of an exterior panel, over sheathing or hat-section wall furring channels, and miscellaneous flashing shapes and clips.

2. Material to be the following base metal in thickness as determined by the manufacturer

based on panel design, fabrication and installation requirements:

a. Base Bid: 24 gage minimum, roll formed, aluminum-zinc alloy coated steel sheet coated on both sides with a layer of aluminum-zinc alloy by continuously hot dip method (approximately 55% aluminum, 45% zinc). Triple spot minimum 0.55 oz. per square foot coating as determined by ASTM A 792, with a factory applied Kynar 500 (or equal) fluoropolymer finish, color as selected by Owner.

3. Panel length: All fascia or wall panels shall be continuous from sill to roof line.

4. Panel Type: Interlocking, flush profile style, with a minimum of two stiffening ribs/creases and flange for concealed fasteners,

D. Physical Characteristics of Coating:

1. The physical characteristics of the exterior coating shall provide resistance to failure through cracking, checking, crazing, spotting or loss of adhesion.

2. Panel Finish: Panels shall be factory painted with a full strength fluoropolymer finish. Paint shall contain 70-75% KYNAR 500 resin and applied, (0.80 mils thickness), over manufacturer's primer, (0.20 mils thickness), with a total system thickness of 1.00 mils per ASTM D 1400. Gloss to be 20-30% per ASTM d 523 at 60 degrees. Architect will select color from manufacturer's color chart. Back side shall be factory painted with a polymer paint.

3. The physical characteristics of the exterior coating shall be measured by the following laboratory weather simulating tests to obtain test results justifying a manufacturer's twenty (20) year warranty:

a. Humidity Resistance at 95°F and 100% R.H. in accordance with ASTM D 2247: 1000 hours.

b. Salt Spray Resistance at 5% Salt Fog per ASTM B 117: 1000 hours.

c. Reverse Impact Resistance in accordance with ASTM D 2794: No cracking or loss of adhesion.

d. Resistance to Accelerated Weathering - in an Atlas Model XX-R Dew Cycle Weather-O-Meter in accordance with ASTM D 822: 5000 hours.

e. Abrasion Resistance to falling sand in accordance with ASTM D 968: 65 liters minimum.

f. Chemical/Acid/Pollution Resistance

1) Chemical spot tests in accordance with ASTM D 1308 procedure 5a, for Hydrochloric Acid, Sulfuric Acid and Sodium Hydroxide: No effect.
2) Chemical spot tests in accordance with ASTM D 1308 procedure

5b, for Muriatic Acid and Tincture of Iodine: No effect.

3) Resistance to sulfur dioxide in accordance with "KESTERNICH" cyclic test, (DIN 50018 and ASTM G 87): 15 cycles minimum.

g. Gloss finish shall be maintained evenly over entire surface in accordance with ASTM D 523.

E. Standing Seam Roof Panel Mounting Clip: Manufacturer's required stainless steel or nylon coated aluminum mounting clip as required by the manufacturer. Size, shape, thickness and capacity as required to meet design loads indicated. No field modifications of, or anchorage thru the mounting clip, will be permitted which would limit the ability of the roof system to accommodate thermal movement.

1. Over a compressible substrate, (such as rigid insulation), provide a 6 inch square, 18 gage minimum, G90 galvanized steel bearing plate, or as required by the manufacturer if more stringent.

F. Sheet Panel Fasteners: Manufacturer's required fasteners.

1. Provide metal-backed neoprene washers under heads of fasteners bearing on weather side of panels.

2. Use stainless steel fasteners for exterior application and galvanized or cadmium plated fasteners for interior applications. Lock rivets where required may be aluminum or stainless steel. Use painted fasteners where fastening into painted panel or trim.

3. Locate and space fastenings for true vertical and horizontal alignment. Use proper type fastening tools to obtain controlled uniform compression for positive seal without rupture of neoprene washer.

2.5 RELATED MATERIALS

A. Members Fabricated by Cold Forming: ASTM A 607 or A 570/A, Grade 50.

B. Galvanized Steel Sheet (for miscellaneous use only): ASTM A 446-/A, Grade C, except where higher strength required for performance, with G90 coating; "Class" to suit roofing manufacturer's standards.

C. Solder: 50-50 lead / tin solder, ASTM B 32.

D. Flux: Acid - Chloride type.

E. Flux Cleaner: Washing soda solution, 5% to 10%.

PART 3 EXECUTION

3.1 GENERAL

A. Pre-engineered metal roofing system shall be installed in strict conformance with the project details and the manufacturer's instructions. Roof panels shall be installed to allow for relative movement between roof panels and ridge, gables, fascias and other components of the roof system.

3.2 ERECTION

A. Framed Openings: Provide shapes of proper design and size to reinforce opening and to carry loads and vibrations imposed, including equipment furnished under mechanical or electrical work. Securely attach to building structural frame.

3.3 ROOFING AND SIDING

A. General: Arrange and nest wall panel sidelap joints so that prevailing winds blow over, not into lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line. Protect factory finishes from damage. Samples submitted shall be used as basis for evaluating quality of work performed.

B. Provide weather seal under ridge cap/flash and seal roof panels at eave and rake with rubber, neoprene or other closures to exclude weather.

C. The use of exposed fasteners and/or screws is prohibited unless specifically required by the project details at a specific condition. Exposed fasteners, where indicated to be used by the details, shall be 1/8 inch minimum diameter stainless steel blind (“pop”) rivets with a stainless steel mandrel (pin), or #10 diameter “Scots” type stainless steel self-tapping screws with integral head and neoprene washer, (field verify length required for specific conditions).

D. Roof Panels: Secure roof panels to the existing structural deck by means of manufacturer's stainless steel clip fastened to the structural deck and securely locked into panel seam.

1. Panel seam shall be the manufacturer's standard seam for the system specified, field formed using a standard three strand minimum forming machine if necessary for the system's performance. Cracking or splitting of metal or cracking, peeling, blistering or other damage to panel coating shall not be acceptable. Panels shall be securely fastened to eave structural and sealed watertight.

E. Metal Fascia / Wall Panels: Apply elastomeric sealant continuously between metal siding panels and trim and elsewhere as necessary for waterproofing. Handle and apply sealant and back-up in accordance with sealant manufacturer's recommendations. Provide weatherseal at top and bottom of wall panels with rubber, neoprene or other closures to exclude weather.

1. Align bottoms of wall panels and fasten closure angle trim to panels with blind rivets, bolts or self drilling/self-tapping panel screws. Fasten flashing, trim around openings, etc., as indicated by the project details. Install panels plumb and true.

2. Install screw fasteners with power tool having controlled torque adjusted to compress neoprene washer tightly without damage to washer, screw threads, or panels. Install screws in pre-drilled holes. Self-drilling screws shall not be used.

F. Sheet Metal Accessories: Install sheet metal accessories in accordance with manufacturer's recommendations for positive anchorage to building and weathertight mounting.

G. Dissimilar Materials: Where aluminum surfaces come in contact with ferrous metal or other incompatible materials, keep aluminum surfaces from direct contact by applications to the other material as follows:

1. One coat of zinc chromate primer, FS TT-P-645, followed by two coats of aluminum paint, SSPC-Paint 101.

2. In lieu of two coats of aluminum paint, apply one coat of high build bituminous paint, SSPC-Paint 12, applied to a thickness of 1/16" over zinc chromate primer. Back-paint aluminum surface where impractical to paint other surface.

3.4 FABRICATION

A. Field Measurements:

1. The Contractor is responsible for details and dimensions controlled by the drawings; and shall make field measurements for verification of these dimensions.

2. The Contractor is responsible to establish and maintain these dimensions.

B. General Metal Fabrication:

1. Shop-fabricate work to greatest extent possible. Provide custom shapes as called for on drawings, of same gage, type, and finish as factory standard pieces of similar function.

2. Comply with details shown and with applicable requirements of the manufacturer.

3. Condensation: Fabricate panels for control of condensation, including vapor inclusion of seals and provisions for breathing, venting and draining.

4. Forming:
   a. Form sheet metal work accurately to sizes and profiles required to fit substrates.

   b. Form exposed sheet metal work without oil-canning, buckling and tool marks, true to line and levels indicated.

   c. Form sheet metal work in maximum lengths and keep joints to a minimum.

5. Fastening:
   a. Use fasteners (screws, nails, etc.) only as shown on drawings. Use fasteners of type and spacing in accordance with manufacturer's applicable requirements.

   b. Anchorage of all panels to resist wind uplift forces shall be as engineered by the manufacturer’s structural engineer, and reviewed and approved by the Owner and Architect.

6. Jointing:
   a. Form lock and slip joints in accordance with the manufacturer's applicable requirements.

   b. Joints are to be made so that slight adjustments of the metal work can be made and at the same time remain water tight.
7. Soldering:

   a. Edges of all sheets to be soldered shall be tinned with solder on both sides for width not less than 1½".

   b. Clean and flux metals prior to soldering.

   c. All soldering shall be done slowly with well heated irons - to heat sheet thoroughly and to sweat solder completely through full width of seam.

   d. Ample solder shall be used and seam shall show at least one full inch of evenly flowed solder.

   e. Wherever possible, all soldering shall be done in flat position.

   f. Seams on slopes steeper than 45° shall be soldered a second time.

   g. When soldering lead coated copper a liberal amount of flux shall be brushed into seams.

   h. Soldering shall be done with heavy soldering irons of blunt design, properly tinned before using.

   i. As work progresses, neutralize excess flux with 5% to 10% washing soda solution and thoroughly rinse, free of stains.

8. Welding

   a. Perform welding to comply with applicable AWS specifications for filler metals, electrodes and procedures, using methods appropriate for metals and finishes indicated.

   b. Grind exposed welds smooth and flush to match and blend with adjoining surfaces.

   c. Continuously weld all joints and seams except where other methods of joining are indicated.

   d. Weld connections which are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.

3.5 TOUCH-UP PAINTING

A. Apply manufacturer's supplied touch-up paint, at the discretion of the Architect, to any scratches or scrapes or other deficiencies in the painted metal finish.

B. All raw edges of the metal roof panels or flashing which may be left exposed due to either factory or field cutting and may be subject to corrosion are to receive manufacturer supplied touch-up paint.

3.6 CLEANING AND PROTECTION

A. Cleaning: Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration of finishes.

B. Protection: Installer shall advise Contractor of required procedures for surveillance and protection of flashing and sheet metal work during construction, to ensure that work will be without damage or deterioration, other than natural weathering, at time of substantial completion.

END OF SECTION

MANUFACTURER'S NOTICE OF INTENT TO ISSUE ROOF WARRANTY

Whereas_____herein called the "Roofing System Manufacturer" hereby gives notice to:

Owner: _____

Address: _____

of its Notice of Intent to issue its Roof Warranty, to the Owner for the Project,

Project:_____

Address:_____

incorporating the Manufacturer's_____

_____

roofing system or product is installed in accordance with the Contract Documents.

1. Manufacturers' Notice of Intent to Issue Roof Warranty in conformance with the Contract Documents shall be executed by the manufacturer and attached to the bid form. Each Bidder may only submit a single form, designating a single roof manufacturer, and shall include items 1 and 2 as follows:

    1. A detailed description of the components of the manufacturer's system proposed and a list of any other component, proposed for use in the system that is manufactured by other roofing manufacturers.

        1. A statement that the Manufacturer's Representative has visited this site prior to the bid date, reviewed the job conditions and project manual. Having reviewed the above items in detail, the Representative will provide a written response to the Architect ten days prior to the bid date, if conflicts between the Manufacturer's requirements occur with the above listed documents.

    2. A sample of the Manufacturer's Roof Warranty shall be attached to and submitted with this form and the bid package. The manufacturer shall delete all exceptions relative to damage from high winds in one of the two following manners:

        a) delete exceptions to gale force winds and windstorms below the Florida Building Code current edition and ASCE 7- design requirements of - MPH wind uplift resistance.

        or

        b) delete exceptions to windstorms which would create the maximum wind uplift pressures as calculated by ASCE 7- and defined by the Design Wind Pressures Schedule within these project drawings, structural drawing S101.

    3. **20** year total roof system warranty inclusive of roofing materials, all included products and accessories, including all metal flashings, from roof deck to finish membrane, whether supplied by the membrane manufacturer or by others. Provide a “No Dollar Limit”, single source responsibility, non-deductible roofing warranty inclusive of all material and labor.

a) If the manufacturer fails and/or refuses to issue the required roof warranty, the Contractor with Surety shall warrant to make repairs, replacement or take corrective action on the same terms as required of the manufacturer, (had the warranty been issued by the manufacturer), so that the intended warranty is delivered to the Owner.

b) The manufacturer shall modify the roof warranty to include total labor coverage for the warranty period and to cover damage to roof materials and insulation down to the roof deck resulting from water penetration.

c) The manufacturer shall modify the roof warranty to state that the Owner has the right to make emergency repairs without voiding the warranty if the manufacturer or applicator do not respond within 48 hours to notification by the Owner of a defect or leak.

d) The manufacturer shall modify the roof warranty to state that annual inspections with written reports by the Owner, and resulting maintenance, are sufficient to fulfill the periodic inspection requirements of the manufacturer's warranty.

4. The manufacturer's Representative shall conduct a Post-Construction field inspection no earlier than eleven (11) months, and no later than twelve (12) months after the Date of Substantial Completion. Submit a written report within seven (7) days of this visit to the Owner's Maintenance Dept. listing observations, conditions and any recommended repairs or remedial action.

Further, the manufacturer acknowledges that the applicator:

Roof Applicator's Name:_____

Address: _____

has been approved to install this roof system since _____, ____and meets the criteria for an approved applicator listed in the Project Manual.

By signing the above, the Authorized Representative of said Manufacturer certifies and represents the Roofing System Manufacturer with the authority to contract and make the above representations to the Owner.

By: _____ Date:_____
Signature of Authorized Representative

(SEAL)

Witness: _____ Date:_____

APPLICATOR WARRANTY FOR ROOFING AND SIDING

Whereas _____

of (Address) _____

herein called the "Roofing Contractor", has performed roofing and siding, flashing and sheet metal and associated ("work") on following project:

Owner:_____

Address:_____

Name and Type of Building:_____

Address:_____

Area of Work:_____

Date of Acceptance:_____

Warranty Period: Two Years Date of Expiration:_____

AND WHEREAS Roofing Contractor has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period.

NOW THEREFORE Roofing Contractor hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work, and as are necessary to maintain said work in watertight condition.

This Warranty is made subject to the following terms and conditions.

1. Specifically excluded from this Warranty are damages to roofing work and other parts of the building, and to building contents, caused by:

    a) lightning, windstorm
    b) fire
    c) failure of roofing system substrate or structure.(including cracking, settlement, excessive deflection, deterioration, and decomposition).

    When work has been damaged by any of the foregoing causes, Warranty shall be null and void until such damage has been repaired and until cost or repairs have been paid by the Owner or by another responsible party as so designated.

2. The Roofing Contractor is responsible for damage to work covered by this Warranty, and is not liable for consequential damages to building or building contents, resulting from leaks or faults or defects of work.

3. The Owner shall promptly notify Roofing Contractor of observed, known or suspected leaks, defect or deterioration. The Contractor shall guarantee to respond to all notifications within twenty-four (24) hours and to make all such repairs as deemed necessary to correct said leaks or defects to a satisfactory condition to the Owner. Repairs shall be made by workman in the current employment of the Contractor. Subcontracting of repair work is not permitted.

4. This Warranty is recognized to be the only warranty of Roofing Contractor on said work, and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to him in cases of roofing failures. Specifically, this Warranty shall not operate to relieve Roofing Contractor of responsibility for performance of original work in accordance with requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

IN WITNESS THEREOF, this instrument has been duly executed this

_____ day of _____, 20____.

_____
Roofing Contractor Firm (SEAL)

_____Signature of
Authorized Person Title

_____
Witness

CODE COMPLIANCE
SUBMITTAL DOCUMENT

Roofing System Manufacturer: _____

Address: _____

_____

_____

_____

Technical Director: _____

Project Name: _____

Address: _____

_____

Roofing Contractor: _____

Roofing System Name: _____

General Description of Roof Systems: _____

_____

_____

_____

_____

Insulation to be install with roof system: _____

Fasteners to be installed with roof system: _____

_____

Attach copy of Factory Mutual Approval, including approval for submitted fastener and insulation type. If no such approval is available due to deck type, provide supporting technical data to support the use of the products in the assembly.

Attach a copy of Underwriters Laboratories listing confirming that the new roof assembly is in compliance with a Class A listing over the deck types.

Attach a copy of Metro-Dade County Code Compliance Approval for the roofing system and insulation.

PART 1 GENERAL

1.1 SUMMARY

A. Section includes:

B. Drip metal, gutters, downspouts, expansion joint and parapet coping caps.

C. Counterflashing over roof system base flashing.

D. Counterflashing and extension curbs at roof mounted equipment.

E. Weatherheads, goosenecks and other metal fabrications at various roof membrane penetrations for mechanical, plumbing and electrical devices and services.

F. Materials specified in this section are for use in conjunction with roof repairs, and may be an extension of an existing detail. The intent of these specifications is to match the existing materials, configurations and finish being used. This section is intended to define the quality of materials and workmanship provided.

1.2 RELATED SECTIONS:

A. Section 06 10 53 - Rough Carpentry: Wood blocking and nailers.

B. Section 07 31 13.13 – Fiberglass Shingles

C. Section 07 14 10 – Cold Fluid Applied Roofing.

D. Section 07 61 13 – Metal Roofing and Siding

E. Section 07 01 50.62 – Single-ply Thermoplastic Roof Repairs

F. Section 07 92 00 - Joint Sealers.

G. Section 09 91 13 - Painting: Prime and finish painting.

1.3 REFERENCES:

1. ASTM International:
   a. ASTM A 167 – Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip
   b. ASTM A 480/A480M – Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet and Strip
   c. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   d. ASTM A 755/A 755M - Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products

e. ASTM A 792/A 792M – Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
f. ASTM A 924/A 924M – Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
g. ASTM B 29 – Standard Specification for Refined Lead.
h. ASTM B 32 - Standard Specification for Solder Metal.
i. ASTM B 209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
j. ASTM B 306 – Standard Specification for Copper Drainage Tube (DWV).
k. ASTM B 370 – Standard Specification for Copper Sheet and Strip for Building Construction.
l. ASTM B 749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products.
m. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
n. ASTM D 1187 – Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal.
o. ASTM D 4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
p. ASTM D4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.

2. National Roofing Contractors' Association:
   a. NRCA – National Roofing Contractors' Association Manual.
3. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):
   a. SMACNA - Architectural Sheet Metal Manual.

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Submit shop drawings for any condition not shown on plans and details.

C. Product Data: Submit data on manufactured components metal types, finishes, and characteristics.

D. Samples:
1. Submit two samples 12 x 12 inch in size illustrating a typical external corner, internal corner, material and finish.
2. Submit two samples 12 x 12 inch in size illustrating metal finish color.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA and standard details and requirements.

B. Failure to install work in strict accordance with provisions of this Section is subject to total rejection of the work specified herein.

C. Maintain copy of documents on site.

1.6 MOCK-UPS

A. Construct “in-place” sheet metal mock-ups demonstrating the following conditions as applicable and detailed in the project documents:
   1. Perimeter edge metal, splice and termination conditions.
   2. Edge metal exterior and interior corner conditions
   3. Gutter conditions: Attachment; expansion joint; splice; termination; downspout connections, etc.
   4. Typical interior wall counterflashing conditions.
   5. Parapet coping conditions and splice, etc.
   6. Roof expansion joint coping conditions:
   7. Additional conditions as may be determined by the Architect.

B. Mock-ups are to be constructed and located where designated. Upon approval mock-ups may remain as part of the work.

1.7 QUALIFICATIONS

A. Fabricator and Installer: Company specializing in sheet metal work with minimum three years documented experience.

1.8 PRE-INSTALLATION MEETINGS

A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.

B. Convene minimum one week prior to commencing work of this section.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

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

C. Prevent contact with materials causing discoloration or staining.

1.10 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate application of flashings with application of roofing, protruding material, and roof accessories to provide a complete weathertight installation according to the specified warranty requirements.

PART 2 PRODUCTS

2.1 SHEET MATERIALS

A. Stainless Steel: ASTM A 240, ASTM A 480 and ASTM A 666; Type 304, soft temper (annealed), 22 ga. or 24 ga. thickness unless otherwise specified; smooth 2B finish.

B. Copper: ASTM B 370-88, cold-rolled, 16 oz/sq.ft. (.0216"), natural finish, unless otherwise shown. Vinyl protective coating shall be on copper sheet to protect metal from premature staining from handling. The vinyl protective coating shall remain on the metal until the entire job is finished and all of the vinyl removed on the same day if possible.

C. Coated Galvanized Sheet Metal for Thermoplastic Roofs: Twenty (20) mil UV resistant PVC (polyvinyl chloride with Elvaloy®* KEE (ketone ethylene ester) membrane laminated to 24 gauge, G90 hot-dip galvanized steel (ASTM A 525). Approved for use by membrane manufacturer.

D. Coated Aluminum Sheet Metal for Thermoplastic Roofs: Twenty (20) mil UV resistant PVC (polyvinyl chloride with Elvaloy®* KEE (ketone ethylene ester) membrane laminated 0.040 thick 3003-H14 aluminum,

E. Coated Stainless Steel for Thermoplastic Roofs: Membrane manufacturer's approved coating laminated to 24 gage stainless steel, AISI Type 304, ASTM A 167-, 2B annealed finish, soft except where harder, temper required for forming or performance.

F. Aluminum-Zinc Alloy Coated Steel: (Galvalume) Coated on both sides with a layer of aluminum-zinc alloy by continuous hot-dip method (approximately 55% aluminum, 45% zinc). Triple spot minimum 0.55 oz. Per square foot as determined by ASTM A 792, 24 gage except as otherwise indicated.

G. Zinc-Coated Steel: (Galvanized) Commercial quality with 0.20% copper, ASTM A 525 except ASTM A 527 for lock-forming, G90 hot-dip galvanized, 24 gage except as otherwise indicated.

H. Aluminum: ASTM B 209, alloy 3003, temper H14, AA-C22A41 mill finish; 0.040" thick; Coping 0.050" thick.

I. Sheet Lead: Standard 0.063 inch thick lead sheet weighing 4 pounds per square foot, arsenical-antimonial and pig lead alloy meeting the requirements of ASTM B29. Use sheet lead or tubing for flashing of vent pipes, roof drain sumps and other roof penetrations noted.

2.2 ACCESSORIES

A. Termination Bar: Aluminum ASTM B-209, Alloy 6061, Temper T-6, mill finish; sizes 1/8" thick by 1-1/2" with rounded edges.

B. Sheet Metal Fasteners:
1. Fasteners: Stainless steel

2. Exposed fasteners are prohibited, and may only be used where specifically permitted by the project details or the Architect.
3. Fasteners being on weather side of metal are to be a minimum #10 size “Scots” type screw with metal-backed neoprene washer integral with the head of the screw, or 3/16” diameter minimum steel rivet.
   a. Locate and space fastenings for true vertical and horizontal alignment. Use proper type fastening tools to obtain controlled uniform compression for positive seal without rupture of neoprene washer.
4. Use stainless steel fasteners for exterior application and cadmium plated fasteners for interior applications. Use painted fasteners where fastening into painted panel or trim.

C. Fasteners: Stainless steel: Fastener size and penetrations into various substrates should be as follows:
1. Wood: ¼ inch screw x 2 inch penetration or 1 ½ inch annular ring stainless steel roofing nail.
2. Concrete: ¼ inch “zamac” nail-in x 1 ½ inch penetration.
3. Concrete Block: ¼ inch “zamac” nail-in x 1 ½ inch penetration.

D. Fastener Schedule: Anchorage for below assumed to be into wood blocking, See details for other specifics.
1. Continuous Cleats: 1 ½ inch annular ring stainless steel roofing nails at 6 inches on center maximum.
2. See Fastener Schedule sheets included as part of the project documents.
3. For all conditions not covered, refer to fastener specifications above or consult with Architect.

E. Dry-in Membrane: Forty (40) mils thick, polyester reinforced, SBS modified asphalt waterproofing and underlayment membrane sheet.
1. Protecto-Wrap “Rainproof 40”
2. Soprema “Sopralene Stick”
3. Tamko “TW Metal and Tile” underlayment
4. Architect approved (prior to bidding) equivalent product.

F. Primer: Asphaltic based primer for flanges set in adhesive.

G. Protective Backing Paint (bituminous coating): ASTM D1187, 'Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal.'; SSPC-Paint 12, Cold-Applied Asphalt Mastic (Extra Thick Film – 15 mil dft) [Society for Protective Coatings].

H. Sealant: Sealant specified in Section 07 90 00.

I. Plastic Cement: ASTM D 4586, Type I.

J. Flashing Tape (concealed application): Double sided, gray extruded or preformed, 99% solids, cross linked polyisobutylene compound, non-sag, non-toxic, non-staining, permanently elastic self adhesive tape. One eighth (1/8) inch minimum thickness, 3/4” minimum width unless otherwise noted on the drawings.
1. Pecora Corporation Extru-Seal Glazing Tape

2. Tremco Construction Products 440 II Tape
3. Equivalent products as approved by the Owner or Architect.

K. Splash Pads: Precast concrete type, of size and profiles indicated; minimum 3000 psi at 28 days, with minimum 5 percent air entrainment.

L. Downspout Boots: Stainless Steel, or

M. Downspout Boots: Extruded aluminum tubing; 0.050", mill finish.

N. Solder/Flux/Cleaner: ASTM B 32;
1. Solder: type suitable for application and material being soldered. ASTM B-32; 50/50 lead/tin type or ASTM B-32: 90/10 tin/silver type
2. Flux: Acid - Chloride type
3. Flux Cleaner: Washing Soda Solution - 5% to 10%

O. Sheet Metal Adhesive: Aluminum adhesive: SciGrip SG5000 Series adhesive, 2 component system as manufactured by SCIGRIP Americas, 600 Ellis Road, Durham, NC 27703. Contact: (887) 477-4583, (www.scigrip.com) or Architect approved equal.

2.3 FABRICATION

A. Form sections shape indicated on Drawings, accurate in size, square, and free from distortion or defects.

B. Fabricate cleats of same material as sheet metal, interlocking with sheet.

C. Form pieces in longest possible lengths.

D. Hem exposed edges on underside 1/2 inch; miter and seam corners.

E. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

F. Fabricate corners from one piece with minimum 18 inch long legs; solder for rigidity, seal with sealant.

G. Pretin edges of stainless steel sheet. Solder shop formed metal joints. After soldering, remove flux. Wipe and wash solder joints clean. Weather seal joints. (Heliarc shop formed aluminum joints).

H. Perform soldering work slowly, with properly heated irons to thoroughly heat seam material and sweat solder through full width of seam that shall show not less than 1 inch of evenly flowed solder.
1. Start soldering immediately after application of flux.
2. Solder flat locked seams.

I. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

J. Fabricate flashings to allow toe to extend 1 1/2" over wood nailers. Return and brake edges.

K. Fabricate accessories in profile and size to suit gutters and downspouts.
1. Anchorage Devices: In accordance with SMACNA requirements.
2. Gutter Supports: Brackets. Straps.
3. Downspout Supports: Brackets.

L. Seal metal joints.

2.4 FINISH (when painting is required)

A. Dissimilar Metal Isolation: Where applicable, back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mils when dissimilar metals are in contact.

B. Prepare stainless steel surfaces in accordance with Section 09 90 00 – Painting and Coating.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

C. Verify roofing termination and base flashings are in place, sealed, and secure.

D. Do not proceed with work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.2 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Install surface mounted counterflashing (reglets) to lines and levels indicated on Drawings. Seal top of counterflashing (reglets) with sealant.

C. Paint concealed metal surfaces with protective backing paint to minimum dry film thickness of 15 mils where applicable.

3.3 INSTALLATION

A. Where applicable, insert flashings into reglets to form tight fit. Secure in place with lead wedges. Seal flashings into reglets with sealant.

B. Secure flashing in place using concealed fasteners. Use exposed fasteners only where permitted.

C. Apply plastic cement compound between metal flashings and felt flashings.

D. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

E. Solder / weld per metal type metal joints for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.

F. Apply modified bitumen cement compound between metal flashing and bituminous underlayment and/or flashing membrane. At other locations utilize self-adhesive butyl flashing tape as specified above.

G. Secure gutters and downspouts in place using specified fasteners.

H. Connect downspouts to downspout boot system. Seal connection watertight.

I. Set splash blocks under downspouts.

J. Seal metal joints watertight.

3.4 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Field inspecting, testing, adjusting, and balancing.

B. Inspection will involve surveillance of Work during installation to ascertain compliance with specified requirements.

3.5 SCHEDULE

1.1 SCHEDULE

1.	Edge Metal - aluminum	Aluminum	0.040"	match existing
2.	Edge Metal - stainless steel	Stainless Steel	24 gage	Mill
3.	Edge Metal - copper	Copper Sheet	16 oz.	Natural
4.	Edge Metal - Cont Cleats	stainless steel	22 gage	Mill
5.	Coping Metal - aluminum	Aluminum	0.040"	match existing
6.	Coping Metal - stainless steel	Stainless Steel	24 gage	Mill
7.	Coping Metal - copper	Copper Sheet	16 oz.	Natural

8.	Coping Joint Covers	Matching material, one gage thinner if hemmed		
9.	Cleat/Blocking and Cants	Galvanized Steel	16 gage	Mill
10.	Scuppers - aluminum	Aluminum	0.040"	match existing
11.	Scuppers - stainless steel	Stainless Steel	24 gage	Mill
12.	Scuppers - copper	Copper Sheet	16 oz.	Natural
13.	Counterflashing - aluminum	Aluminum	0.040"	match existing
14.	Counterflashing - stainless steel	Stainless Steel	24 gage	Mill
15.	Counterflashing - copper	Copper Sheet	16 oz.	Natural
16.	Expansion Joint Covers	Stainless Steel	24 gage	Mill
17.	Abandoned Curb Covers	Stainless Steel	24 gage	Mill
18.	Gutters - aluminum	Aluminum	0.050"	match existing
19.	Gutters - stainless steel	Stainless Steel	22 gage	Mill
20.	Gutters - copper	Copper Sheet	20 oz.	Natural
21.	Downspouts - aluminum	Aluminum	0.040"	match existing
22.	Downspouts - stainless steel	Stainless Steel	24 gage	Mill
23.	Downspouts - copper	Copper Sheet	16 oz.	Natural
24.	Downspouts - vandal resistant	Extruded Aluminum	0.125"	Mill

Miscellaneous metal flashing and transitions: Stainless steel, mill finish, 24 gage; or 0.040 Aluminum (mill finish or prefinished); or 16 ounce copper as required by Architect.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Prefabricated Metal Flashing Assembly at Vent Pipes.

B. Section includes fabrication and installation of flashings for: pipes, conduits and other round items, angle irons, “H” beams, channels and square tubing; ribbon or coaxial cable for lightning protection, T.V. antennas, satellite dishes, telephone and similar penetrations; irregular shapes such as "Uni-strut"; and similar items penetrating, resting on, or anchored to the roof.

1.2 SUMMARY

A. Metal roof penetration flashing assemblies are considered an integral part of the roofing system(s) and shall be covered under the roofing membrane manufacturer’s and roofing installers guarantees and warranties.

B. All roof penetrations shall be flashed using materials, methods and details appropriate for each condition encountered, as described in this section, or if not described in this section, as recommended by S.B.C. Industries and accepted by the Design Professional.

1.3 RELATED SECTIONS

A. Section 06 10 53 - Rough Carpentry: Wood blocking and nailers for roofing substrate profiles.

B. Section 07 01 50.63 - Built-up and Modified Bitumen Roofing Repairs.

C. Section 07 01 50.62 - Single-ply Thermoplastic Roofing Repairs.

D. Section 07 62 00 - Sheet Metal Flashing and Trim.

E. Section 07 72 00 - Roof Accessories

F. Section 07 92 00 - Joint Sealers.

1.4 REFERENCES

A. AISI American Iron and Steel Institute - Stainless Steel - Uses in Architecture.

B. ASTM A 167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

C. ASTM A 653 - Steel Sheet, Zinc Coated (Galvanized), and Zinc-Iron (Galvanealed), by the Hot-Dip Process

D. ASTM B 209 - Aluminum and Alloy Sheet and Plate.

E. ASTM B 32 - Solder Metal.

F. ASTM B 486 - Paste Solder.

G. ASTM D 226 - Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.

H. ASTM D 4586 - Asphalt Roof Cement, Asbestos-Free.

I. FS O-F-506 - Flux, Soldering, Paste and Liquid.

J. NRCA National Roofing Contractors Association - Roofing Manual.

K. SMACNA - Architectural Sheet Metal Manual.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide membrane repair materials Product Data, have the Contractor submit material samples only when the Construction Manager requires such.

C. Manufacturer's Installation Instructions: Indicate special precautions required for seaming the membrane.

D. Manufacturer's Field Reports: Submit under provisions of Section 01 40 00.

1.6 QUALITY ASSURANCE

A. General: All flashings shall be designed to comply with or exceed the following:

1. National Roofing Contractors Association (NCRA) - “Roofing and Waterproofing Manual” (latest edition) except where other editions are specifically referenced.

2. Sheet Metal and Air Conditioning Contractors Association (SMACNA), Architectural Sheet Metal Manual (latest edition).

3. Manufacturer’s standard details as accepted by the Design Professional.

4. Project details as issued for bidding and construction.

B. Manufacturer Qualifications: All set-on penetration flashings shall be shop fabricated by a single manufacturer whose specialty is the fabrication of roof penetration flashings of the type specified in this section and who has been in business for a minimum of 5 years. More than 80% of the business shall be devoted to the fabrication of roof penetration flashing.

C. Installer Qualifications: Installers shall be qualified and approved by the roof penetration flashing manufacturer prior to commencement of the work.

1.7 REGULATORY REQUIREMENTS

A. Provide materials complying with governing regulations and codes installed to comply with the following:

1. UL Listing: Provide roofing system materials and component materials that have been tested for application and slopes indicated and are listed by Underwriters Laboratories, Inc. (UL) for Class A external fire exposure.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver to site, store, protect, and handle products under provisions of Section 01 60 00.

B. Deliver material in manufacturer's original, unopened containers with manufacturer's labels intact and legible.

C. Deliver material requiring fire resistance classification to the job with labels attached and packaged as required by labeling service.

D. Store and handle materials to protect them from.

1. Moisture, whether due to precipitation, or condensation.
2. Damage by construction traffic.
3. Temperatures over 110 degrees F or below 40 degrees F.
4. Direct sunlight.
5. Mud, dust, sand, oil and grease.

E. Comply with fire, safety, and environmental protection regulations.

F. Take special precautions against traffic on roofing when ambient temperature is above 80 degree F. Avoid heavy traffic on the work during installation.

1.9 PROJECT CONDITIONS

A. Existing Conditions

1. The roofing repair applicator shall verify existing conditions prior to Bidding.
2. Report conflicts and problems to the Design Professional for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Prime Contractor to complete the work in accordance with the Documents at no additional cost to the Construction Manager.
3. Replace or restore to original condition any materials or work damaged during construction.
4. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.

5. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Do not apply roofing membrane during inclement weather ambient temperatures below 40 degrees F.

B. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

C. Proceed with roofing work when existing and forecasted weather conditions permit work to be performed in accordance with requirements of this section and warranty compliance requirements.

1.11 COORDINATION

A. Coordinate work under provisions of this Section.

B. Coordinate application of flashings with application of roofing, protruding material, and roof accessories to provide a complete weathertight installation according to the specified warranty requirements.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements specified in this section, provide metal roof penetration flashing systems from one of the following manufacturers:

1. S.B.C. Industries
1765 Opa Locka Blvd.
Miami, FL 33054
Phone: 1-800-228-2580 or (305) 685-6350
FAX: (305) 685-6360

2. Thaler Roofing Specialties Products, Inc.
Ontario, Canada
Phone: (905) 677-1520

2.2 MATERIALS

A. Metal: Stainless steel, type 304, 2B, ASTM A-240

B. Solder: ASTM B32, 50% tin - 50% lead; if lead-free solder is required, tin-silver, ASTM 96.5TS.

C. Foam Tape: Closed cell foam, PSA on one side, 1/4" or 3/8" x 1" wide, ASTM D-1056.

D. Backer Rod: Open cell polyurethane.

E. Sealant: Single part urethane, ASTM C920-79.

F. Asphalt Primer: As recommended and approved by the roofing membrane manufacturer and conforming to ASTM D-41 requirements.

G. Modified Asphalt Roof Cement: As recommended and approved by the roofing membrane manufacturer.

2.3 FABRICATION

A. General

1. All deck flanges shall have full rounded corners.

2. Collar or stack portions of flashing assemblies and sealant covers for square or round pipes larger than 3" in diameter shall be fabricated from 24 gauge stainless steel. Unless noted otherwise, all other metal flashing assemblies shall be fabricated from 26 gauge stainless steel.

3. Gauges for custom fabrications not specifically described herein shall be as recommended by the roof penetration flashing manufacturer and accepted by the Design Professional.

4. Pitch pans are not to be used in lieu of any other penetration flashing in these specifications. Exceptions require special written approval by the Design Professional and will only be granted where, in the judgment of the Design Professional, no other means of positive flashing is feasible. In such cases where pitch pans are specifically approved by the Design Professional, said pitch pans shall conform to the following:

a. Fabricate from 24 gauge stainless steel, using 7-3/4" stock x girth required, forming a hemmed 3" high side with a 1/4" - 3/8" inside return at the top and a 4" deck flashing flange. Provide 2" clearance from protrusion. If pitch pan can be slipped over penetration, shop solder four corners 4-1/2" with radial corners in place. If pitch pan cannot be slipped over penetration, wrap pitch pan around penetration, and solder corners and vertical seam.

B. Fabrication of flashings for pipes, conduits and other round items penetrating, resting on or anchored to roof which allows a tubular flashing to be slipped over.

1. Form tubular flashing sleeve no less than 9" high and of proper diameter to provide 1/8" minimum - 1/4" maximum clearance from pipe or conduit.

2. Fabricate square flashing deck plate to a size 7-1/2" larger than protrusion. Punch hole of appropriate size in center and extrude surrounding material

upward 1/4" providing a continuous vertical soldering flange and solder 9" high tubular flashing sleeve. Cut 1" minimum radius on flashing plate corners.

3. Fabricate counterflashing 5" high with a diameter ½" greater than pipe or conduit.

4. Provide a conical sealant cover, sloped outward and downward at 30 degrees to 45 degrees from the horizontal plane with an inside diameter equal to pipe or conduit size and an outside diameter 1" to 2" larger.

5. Shop solder all seams watertight.

6. Provide Model P/S or C/S with standard accessory sealant cover as manufactured by S.B.C. Industries or Design Professional accepted equal product from one of the listed manufacturers.

C. Fabrication of flashings for connected pipes, conduits and other round items not allowing a tubular flashing to be slipped over.

1. Form semi-cylindrical tubular flashing sleeves (180 degrees) not less than 9" high, tightly seam intersecting halves to mate snugly. Provide a split flashing deck plate with radial corners and being formed upward to provide a continuous soldering flange for semi-cylindrical sleeve engagement. Size each unit to allow for vibration and thermal movement of pipe or conduit with 1/8" minimum x 1/4" maximum.

2. Form cylindrical counterflashing 5" high with seamed edge to a diameter 1/4" larger than 9" high sleeve.

3. Provide conical sealant cover, sloped outward and downward at 30 degrees to 45 degrees from a horizontal plane, with an inside diameter equal to pipe or conduit size and an outside diameter 2" larger.

4. Provide Model P/D or C/D with standard sealant cover as manufactured by S.B.C. Industries or Design Professional accepted equal product from one of the listed manufacturers.

D. Fabrication of flashings for angle irons, “H” beams, channels and square tubing.

1. Form a 6" high two piece angular configuration similar to penetration, but allowing 3/16" minimum to 3/8" maximum clearance in any direction. Fabricate flashing deck flanges in two pieces and shop solder to 6" angular stacks. Provide an umbrella type counterflashing conforming to protrusion which extends 3/4" at 45 degrees outward from angular stack flashing.

2. Provide Model A/D, H/D, CH/D or SQT/D, with standard sealant cover as manufactured by S.B.C. Industries or Design Professional accepted equal product from one of the listed manufacturers.

E. Fabrication of flashings for ribbon or coaxial cable for lightning protection, T.V. antennas, satellite dishes, telephone wire and similar penetrations:

1. Consult S.B.C Industries for fabrication of gooseneck type cable flashing or provide Design Professional accepted equal product from one of the listed manufacturers.

F. Fabrication of flashings for "Uni-strut" members and other irregular shaped roof membrane penetrations:

1. Consult S.B.C. Industries for fabrication of "Uni-strut" and custom or irregular shaped metal flashing assemblies. Design Professional accepted equal products from one of the listed manufacturers will be acceptable.

G. Fabrication of flashings for Sanitary vent-thru-roof (VTR) penetrations:

1. Provide stainless steel plumbing vent flashing with vandal proof cap. Provide stainless steel pipe extension where required to extend pipes to 9" above adjacent finished roof. Provide S.B.C. Industries VTR Kit or Design Professional accepted equal from listed manufacturer.

PART 3 EXECUTION

3.1 INSTALLATION

A. General:

1. All deck flanges shall be primed, set in a full fresh bed of flashing cement and stripped-in in accordance with membrane manufacturer’s recommendations and related specifications and drawings.

2. All flashings shall be shop fabricated from field measurements.

3. Clearances between penetrations (including flashing sleeves) and between penetrations and the leading edge of cants at wall or equipment base flashings shall be a minimum of 18" in compliance with NRCA Table 4 - Guide for Clearance Between Pipes/Walls/Curbs, as found in the NRCA Roofing and Waterproofing Manual (Fourth Edition).

B. Installation of flashing for pipes, conduits and other round items penetrating, resting on, or anchored to roofing.

1. Slide flashing unit over penetration and firmly embed flashing plate in full bed of mastic.

2. Counterflashing and sealant cover: Using a solvent with a rapid evaporation rate and leaving no residue, clean area of pipe directly above flashing. Wrap a single layer of 1/4" to 3/8" x 1" wide closed cell tape around pipe, 1/4" above top of

base sleeve. Wrap cap flashing around allowing top to extend 1/4" above top of tape. Apply sealant into channel at top and tool for positive runoff. Apply conical sealant cover directly above sealant.

C. Installation of flashing for connected pipes, conduits and other round items penetrating roofing or resting on roof not allowing a tubular flashing to be slipped over.

1. Base sleeves: Mate shop fabricated half sections together around pipe and solder vertical and horizontal seams watertight. Embed flashing flange in full bed of mastic.

2. Counterflashing and conical sealant cover: Using a solvent with a rapid evaporation rate and leaving no residue, clean area of pipe directly above flashing. Wrap a single layer of 1/4" to 3/8" x 1" wide closed cell foam tape around pipe 1/4" above top of base sleeve. Install cap flashing. Solder vertical seam. Apply sealant into channel and tool for positive runoff. Apply conical sealant cover directly above sealant.

D. Installation of flashing for angle, “H” beams, channels and square tubing.

1. Around the protrusion, snap or slide nesting flashing sections together, and embed flashing flange in full bed of mastic. Solder all seams and neutralize flux. At area of clearance between protrusion and top of stack flashing, insert backer rod 3/8" below top of stack flashing. Apply a liberal amount of sealant and tool for positive drainage. Install sealant cover directly above stack flashing in wet sealant.

E. Installation of flashings for ribbon or coaxial cable for lightning protection, T.V. antennas, satellite dishes, telephone and similar penetrations:

1. Follow manufacturer’s instructions for installation of cable flashing.

3.2 FIELD QUALITY CONTROL

A. Field inspection will be performed under provisions of Section 01 40 00.

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

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Fabrication and installation of custom prefabricated metal roof curbs. Prefabricated Metal Roof Curbs shall be used at all roof penetrations including but not limited to HVAC units, skylights, duct openings, pipe penetrations, column penetrations, and exhaust fans.

1.2 SUMMARY

A. The General Contractor shall provide all labor, material and equipment to completely install prefabricated Metal Roof Curbs as follows:

1. General Contractor shall be responsible for the coordination of the specific requirements of all of the involved trades.

2. General Contractor shall be responsible for handling, storage, placement and anchorage of all prefabricated roof curbs.

3. Roofing Sub-Contractor shall be responsible for the preliminary and finished flashing of all prefabricated roof curbs.

B. All prefabricated roof curbs shall be provided, installed and flashed in a manner acceptable to the roofing membrane manufacturer and shall be fully coordinated with the roofing membrane installation and scheduling requirements.

1.3 Related Sections:

A. Section 07 01 50.63 - Built-Up and Modified Bitumen Roofing Repairs.

B. Section 07 01 50.62 - Single Ply Roofing Membrane Repairs.

C. Section 07 62 00 - Sheet Metal Flashing and Trim.

D. Section 07 65 00 - Roof Penetration Flashing.

E. Section 07 92 00 - Joint Sealers.

F. Section 23 00 00 - Work of Mechanical and Plumbing Trades.

G. Section 26 05 00 - Work of Electrical Trades.

1.4 References:

A. ASTM A 526 - Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process - Commercial Quality.

B. Underwriter's Laboratories (UL) - "Building Materials Directory" (latest edition).

C. Factory Mutual Research Corporation (FMRC) "Approval Guide" (latest edition).

D. FM Property Loss Prevention Data Sheet 1-7, "Wind Forces on Buildings" (latest edition).

E. FM Property Loss Prevention Data Sheet 1-9, (latest edition).

F. FM Property Loss Prevention Data Sheet 1-28, "Wind Loads to Roof Systems and Roof Deck Securement" (latest edition).

G. Sheet Metal and Air Conditioning Contractors Association (SMACNA), Architectural Sheet Metal Manual (latest edition).

H. Manufacturer's standard details as accepted by the Design Professional.

I. Project details as issued for bidding and construction.

1.5 SUBMITTALS

A. Product/Equipment Data

1. Submit a written itemized listing of all materials proposed for use at this project and required by the Contract Documents.

2. Submit manufacturer's technical product data, installation instructions, and recommendations for each product to be used in the work.

B. Shop Drawings: Submit complete shop drawings as follows:

1. Overall roof configuration plan (min. 1/32" = 1'-0" scale) showing location of all metal roof curbs.

2. Submit manufacturer's generated schedule indicating for each curb a location designation, size, height, type, gauge of metal, slope of deck and cross reference to the work of the other involved trades.

3. Details, as necessary, to fully describe roof curb construction and installation requirements at all locations.

4. Engineer's Calculations: Provide calculations which have been prepared, signed and sealed by a Florida registered structural engineer which defines the anchorage requirements for each curb. Imposed wind loads shall be based on the specific equipment data, ASCE 7.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: All metal roof curbs shall be shop fabricated by a single manufacturer whose specialty is the fabrication of metal roof curbs of the type specified in this section and who has been in business for a minimum of 5 years. More than 50% of the business shall be devoted to the fabrication of metal roof curbs.

B. Report conflicts and problems to the Design Professional for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Prime Contractor to complete the work in accordance with the Documents at no additional cost to the Construction Manager.

C. Replace or restore to original condition any materials or work damaged during construction.

D. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.

1.7 REGULATORY REQUIREMENTS

A. Provide materials complying with governing regulations and codes installed to comply with the following:

1. UL Listing: Provide roofing system materials and component materials that have been tested for application and slopes indicated and are listed by Underwriters Laboratories, Inc. (UL) for Class A external fire exposure.

1.8 WARRANTY

A. Prefabricated metal roof curbs shall be warranted to be free of defects in materials and/or in workmanship for a period of five years.

1.9 DELIVERY, STORAGE, AND HANDLING

A. To the greatest extent possible, provide primary materials from one manufacturer.

B. Provide secondary materials as required or recommended by primary materials manufacturer.

C. Deliver materials to job site with packages dry, undamaged and intact with labels identifying manufacturer, product name and lot numbers and U.L. and FM listings when appropriate. Any damaged roofing materials shall be immediately removed from the site and properly disposed of.

D. Store and handle materials in accordance with manufacturer’s labeling and recommendations.

E. Material handling equipment shall be selected and operated so as to not to damage existing construction or materials. Do not operate or situate handling equipment in locations that will hinder smooth flow of vehicular or pedestrian traffic. roof top hoisting equipment shall be properly assembled and maintained. The equipment shall be erected and supported so that it will not damage the existing structure, roof membrane, or other building components.

1.10 SAFETY REQUIREMENTS

A. All work shall be in compliance with OSHA safety standards and regulations with emphasis on Section 29, CFR 1910.

B. Refer to Division 1 and the General Conditions of the Contract for additional Owner working regulations.

1.11 SCHEDULING

A. Schedule the work of this section to coordinate with the associated work of other trades, such as roofing, flashing, mechanical equipment, chilled water piping, skylights, hatches, and routing of electrical conduit.

1.12 COORDINATION

A. Size of curbs and required options shall be coordinated by curb manufacturer, general contractor and mechanical contractor prior to fabrication.

B. Shop drawings bearing Design Professional's approval shall be used for the fabrication of the curbs.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Custom Curb, Inc.
2. Pate Co. (The)
3. ThyCurb, Inc.
4. Roof Products & Systems Corp.

2.2 MATERIALS, GENERAL

A. Gauges and thickness of metal sheets, extrusions and components indicated in this section are considered minimum. Heavier gauges and appropriate provisions for securement shall be specified where necessary to resist wind or other imposed loads.

B. Galvanized Steel Sheet, ASTM A 526, gauge and temper required to suit structural and finish requirements, with mill finish, unless otherwise indicated.

C. Insulation: Manufacturer's standard rigid or semi-rigid glass-fiber board of 1 ½" thickness, three pound density.

D. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for above ground use, complying with AWPA C2; not less than 1 ½" (38 mm) thick.

E. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other non corrosive metal as recommended by the manufacturer. Match finish of exposed fasteners with finish of material being fastened.

1. Where removing exterior exposed fasteners affords access to building, provide nonremovable fastener heads.

F. Gasket: Manufacturer's standard tubular or fingered design of neoprene, EPDM, of PVC; or flat design of foam rubber, sponge neoprene, or cork.

G. Bituminous Coating: SSPC-Paint 12, solvent-type bituminous mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil (0.4-mm) dry film thickness per coating.

H. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

I. Elastomeric Sealant: Generic type recommended by unit manufacturer that is compatible with joint surfaces; ASTM C920, Type S, Grade NS, Class 25, and uses NT, G, A, and as applicable to joint substrates indicated, O.

J. Roofing Cement: ASTM D 4586, nonasbestos, fibrated asphalt cement designed for trowel application or other adhesive compatible with roofing system.

2.3 ROOF AND EQUIPMENT SUPPORT CURBS

A. General: Provide roof curbs capable of supporting superimposed live and dead loads, including equipment loads and other construction to be supported on roof curbs. Coordinate dimensions with rough-in information or Shop Drawings for equipment to be supported.

B. Fabrication: Unless otherwise indicated or required for strength, fabricate units from minimum 18 gauge galvanized steel, (14 gauge for curbs supporting HVAC units, or as deemed necessary by curb Manufacturer), with fully mitered and welded corners, straight style (no cant) with integral base flange.

1. Curb units to be internally reinforced with 1" x 1" x 1/8" steel angle at curbs with any side longer than 3'-0".

2. Fabricate units to minimum height of 12 inches (above finish roof) and no less than 4" above spillway of emergency overflow drain serving the same roof area.

3. Curbs shall be constructed to match slope of roof and provide a level top surface for mounting of mechanical equipment. For smoke vents, roof hatches and skylights, curb shall be parallel to roof plane unless otherwise called for.

2.4 ROOF WALKWAYS

A. Metal-Grating Type: formed-metal plank gratings consisting of C-shaped channels rolled from heavy sheet metal of thickness indicated, and punched in serrated diamond shape to produce raised slip-resistant surface and drainage holes. Provide support framing, brackets, connectors, nosings, and other accessories and components needed for complete installation. Include step units for changes in elevation.

1. Material: 0.07-inch (1.8-mm) structural-quality, galvanized steel sheet.

2. For Flat Roofs: Provide resilient, hard rubber pads under each support unit to isolate supports from and protect roof membrane.

B. For Sloped Roofs: Provide support stands designed for type of roof.

2.5 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 EXECUTION

3.1 INSTALLATION

A. Curbs shall be installed in strict accordance with manufacturer's printed instructions, NRCA standards and as detailed on the drawings.

B. Coordinate with installation of roofing system and related flashings for weather tight installation.

C. Apply bituminous paint on surfaces of units in contact with cementitious materials or dissimilar metals.

3.2 CLEAN UP

A. The Contractor shall remove from the premises all rubbish and accumulated materials of any nature not caused by others and shall leave his part of the work in a clean, orderly and acceptable condition.

B. Do not allow accumulation of empty containers or other excess items except in areas set aside for that purpose.

C. In areas where finished surfaces are soiled or damaged by work of this section, clean or repair those surfaces.

3.3 PROTECTION

A. Protect completed work against damage from work of other trades wherever possible.

B. Repair or replace any materials damaged during the work to a condition free of damage and deterioration.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Preparing substrate surfaces.

B. Sealant and joint backing.

1.2 RELATED SECTIONS

A. Section 07 31 13.13 - Fiberglass Shingles.

B. Section 07 62 00 - Sheetmetal Flashing and Trim.

1.3 REFERENCES

A. ASTM C 920 - Elastomeric Joint Sealants.

B. ASTM C 1083 - Water Absorption of Cellular Elastomeric Gaskets and Sealants.

C. ASTM D 1622 - Standard Test Method Apparent Density of Rigid Cellular Plastic.

D. ASTM D 1623 - Standard Test Method for Apparent Tensile Adhesion Properties of Rigid Cellular Plastic.

E. ASTM E 96 - Standard Test for Water Vapor Permeance.

F. SWRI (Sealant, Waterproofing and Restoration Institute) - Sealant and Caulking Guide Specification.

1.4 SCOPE OF WORK

A. Sealant work in conjunction with the specified work of other sections as noted above.

B. Remove existing sealant at the perimeter of all clerestory window frames, clean and prepare existing surfaces as required, and install new sealant (and backer rods) per the manufacturer’s recommendation at the entire perimeter of all clerestory window frames.

C. Remove existing sealant at all precast concrete wall panel joints at building 1 only, clean and prepare existing surfaces as required, and install new sealant (and backer rods) per the manufacturer’s recommendation for the entire height of all precast concrete wall panel joints.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, color availability.

C. Samples: Submit two color charts and tube samples.

D. Manufacturer's Installation Instructions: Indicate special procedures, surface preparation and perimeter conditions requiring special attention.

1.6 QUALITY ASSURANCE

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Maintain one copy of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.

B. Applicator: Company specializing in performing the work of this section with minimum 3 years documented experience approved by manufacturer.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

B. Existing Conditions

1. Verify existing conditions, such as soundness of perimeter conditions, and varying deck and wall thickness for length of anchoring services required and other visible conditions prior to Bidding.

2. Report conflicts and problems to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.

3. Replace or restore to original condition any materials or work damaged during construction.

4. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.

5. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.

1.9 COORDINATION

A. Coordinate work under provisions of Division 1.

B. Coordinate the work with all Sections.

1.10 WARRANTY

A. Provide five year warranty under provisions of Division 1.

B. Warranty: Include coverage for installed sealants and accessories which fail to achieve water tight seal and exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.1 SEALANTS

i) Silicone Sealant (Type S): ASTM C920, Grade NS, Class 25, Use single component, chemical curing, non-staining, non-bleeding, capable of continuous water immersion, non-sagging type; color as selected match adjacent finish materials.

.	Approved Manufacturer's:	Product
1.	Dow Corning	795
2.	GE	Silpruf
3.	Pecora Corporation	860 / 863 / 864
4.	Tremco	Spectrem II

B. Polyurethane Sealant (Type S): ASTM C920, Grade NS, Class 25, Use single component, chemical curing, non staining, non bleeding, capable of continuous water immersion, non sagging type; color as selected.

	Approved Manufacturer's:	Product
1.	Sika	1A
2.	Sonneborn	NP-1

C. Ethicone Sealant (Type S): ASTM C920, Grade NS, Class 25, Use single component, moisture

curing, solvent-free, non staining, non bleeding, capable of continuous water immersion, non sagging type; color as selected.

Approved Manufacturer's:		Product
1.	ChemLink	M-1
2.	Architect approved equal	

2.1 ACCESSORIES

A. Primer: Recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Backer Rod: Extruded polyolefin foam made of a nonabsorbing outer skin and a highly resilient interior network of open and closed cells which will not out-gas when ruptured.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate surfaces and joint openings are ready to receive work.

3.2 PREPARATION

A. Remove loose materials and foreign matter which might impair adhesion of sealant.

B. Clean and prime (if applicable) joints in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions.

D. Protect elements surrounding the work of this section from damage or disfiguration.

3.3 INSTALLATION

A. Install sealant in accordance with manufacturer's instructions.

B. Measure joint width and size material to achieve 2:1 width/depth ratios.

C. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

D. Apply sealant within recommended application temperature ranges. Consult manufacturer when

sealant cannot be applied within these temperature ranges.

E. Tool joints concave.

3.4 CLEANING

A. Clean work under provisions of 01 60 00.

B. Clean adjacent soiled surfaces.

3.5 PROTECTION OF FINISHED WORK

A. Protect finished installation under provisions of Division 1.

B. Protect sealants until cured.

3.6 SCHEDULE

	Location	Type	Color
A.	Metal to Metal (to be exposed)	Silicone	Color to match metal
B.	Metal to Metal (to be painted)	Urethane	Color to match metal
C.	Metal to CMU / Stucco	Urethane	Color to match CMU/Stucco
D.	CMU / Stucco Joints	Urethane	Color to match paint selected.
E.	Metal to Bitumen Materials	Ethicone	Color to match metal.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Engineering, design, drafting and structural calculations of the entire skylight system.

B. Fabrication, installation and warranty of the skylight system.

C. Skylight glass and glazing materials.

D. Skylight related flashings, anchors, brackets and insulation.

E. Skylight metal finishes.

1.2 RELATED SECTIONS

A. Section 06 10 53 - Rough Carpentry

B. Section 07 01 50.19 - Preparation for Re-Roofing.

C. Section 07 01 50.03 – B.U.R. Repairs

D. Section 07 62 00 - Sheet Metal Flashing and Trim

E. Section 09 91 13 - Painting: Field painting of flashing.

1.1 REFERENCES

A. The Aluminum Association, Inc. (AA): SAS-30, Specifications for Aluminum.

B. American Architectural Manufacturers Association (AAMA).

1. 501.1: Standard Test Method for Metal Curtain Walls for Water Penetration Using Dynamic Pressure.

2. 501.2: Field Check of Metal Curtain Walls for Water Leakage.

3. 603.8: Voluntary Performance Requirements and Test Procedures for Pigmented Organic Coatings on Extruded Aluminum.

4. 605.2: Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels.

5. 606.1: Voluntary Guide Specifications and Inspection Methods for Integral Color Anodic Finishes for Architectural Aluminum.

6. 607.1: Voluntary Guide Specification and Inspection Methods for Clear Anodic Finishes for Architectural Aluminum.

7. 809.2: Voluntary Specification for Non-Drying Sealants.

8. GDSG-1: Glass Design for Sloped Glazing.

9. SDGS-1: Structural Design Guidelines for Aluminum Framed Skylights.

10. TSSGG-1: Two Sided Structural Glazing Guidelines for Aluminum Framed Skylights.

11. TIR-A9-1991: Metal Curtain Wall Fasteners.

C. American Society for Civil Engineers (ASCE).

1. ASCE 7-98: Minimum Design Loads in Buildings and Other Structures.

D. American Society for Testing and Materials (ASTM).

1. A 193: Specification for Alloy-Steel and Stainless Steel Bolting Materials for High Temperature Service.

2. A 307: Specification for Carbon Steel Externally Threaded Standard Fasteners.

3. B 209: Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

4. B 211: Specification for Aluminum and Aluminum-Alloy Bar, Rod and Wire.

5. B 221: Specification for Aluminum-Alloy Extruded Bar, Rod, Wire, Shape and Tube.

6. C 1036: Specification for Flat Glass.

7. C 1048: Specification for Heat-Treated Flat Glass.

8. E 283: Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors.

9. E330: Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.

10. E331: Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.

11. E 773: Test Method for Seal Durability of Sealed insulating Glass Units.

12. E 774: Specification for Sealed Insulating Glass Units.

E. Glass Association of North America (GANA): Glazing Manual.

F. Insulating Glass Certification Council (IGCC): Classification of Insulating Glass Units.

G. U.S. Consumer Product Safety Commission (CPSC): 16 CFR 1202 Architectural Glazing Standards and Related Materials.

1.2 SYSTEM DESCRIPTION

A. Design Requirements:

1. Extruded aluminum framing members shall have an integral gutter system for positive drainage of condensation.

2. The skylight system shall utilize flush glazed exterior joints on all horizontal purlins.

3. Rafters shall have a screw slot for the attachment of exterior retainer bars with ¼-20 stainless steel screws at 9" on center.

4. The framing system shall utilize extruded hinged components at the sill, hip and/or ridge locations.

5. "4-sided", totally flush glazed system with factory applied structural silicone. All structural silicone is to comply with the sealant manufacturers recommendations.

B. Performance Requirements:

1. Structural members shall be designed in accordance with the Florida Building Code, ASCE 7-.

2. The deflection on any structural member in the plane normal to glass surface when subjected to the specified loads shall not exceed L/175 of its clear span. Deflection within the length of any individual glass panel shall not exceed ¾".

3. Parallel to glazing plane deflection of framing member when carrying full design load shall not exceed an amount reducing the glazing unit bite below 75% of the design dimension and shall not reduce the edge clearance to less than 1/8" nor shall it damage or impair the function of any joint seal.

4. Provide for expansion and contraction of components resulting from an ambient temperature change of 180 degrees F (+/- 90 degrees F) without causing buckling, excessive stresses on glazing, structural elements or fasteners, failure of seals, reduction of performance or other detrimental effects.

5. No water penetration shall occur when system is tested in accordance with ASTM E 331 using a differential static air pressure of 20% of inward acting (positive) design wind load, but not less than 15psf. Water penetration is defined as the appearance of uncontrolled water other than condensation occurring on the interior surface of any part of the skylight.

6. Air infiltration shall be limited to not more than 0.01cfm. per square foot of assembly when tested in accordance with ASTM E 283 at 6.24psf. static air pressure difference.

7. Where permitted by code, a 1/3 increase in allowable stress for wind or seismic load shall be acceptable, but not in combination with any reduction applied to combined loads. In no case shall the allowable values exceed the yield stress.

8. The skylight framing is to be designed so that no horizontal “Thrust” reactions occur due to balanced vertical design loads. Supporting members will be designed to resist horizontal loads due to wind and unbalanced vertical loading.

1.3 SUBMITTALS

A. Submit one set of sepias and two (2) copies of shop drawings showing plans, elevations and details required to fully describe the skylight construction for the architect’s review and approval before starting fabrication.

B. Submit structural calculations prepared in accordance with ASCE 7- and with AA SAS-30, bearing the seal of a structural engineer qualified in the design of self supporting skylight assemblies and licensed in the state of Florida. Engineer shall be an employee of the skylight manufacturer and located full time at the skylight manufacturers production facility.

C. Submit results of infiltration tests as described in section 1.04 B (5) & (6) stated above.

D. Submit 1 12” x 12” samples of each type of glass.

E. Submit one (1) manufacturer’s samples of each type of sealant.

F. Submit two (2) 6” long samples of principal extrusions.

G. Submit two (2) manufacturer’s samples of each type of aluminum finish.

H. Submit three (3) sets of as-built drawings and maintenance and cleaning instructions upon completion of the skylight installation.

1.4 QUALITY ASSURANCE

A. Work of this section is to be design, fabricated and installed by a company with a minimum of ten (10) years of continuous, uninterrupted experience in work of similar scope and magnitude.

1.5 WARRANTY

A. Submit a written warranty, executed by the skylight manufacturer, certifying that the skylight is to be free of defects in design, materials and construction and that the skylight is to be free of water leakage for a period of ten (10) years from the date of skylight completion.

B. Warrant glass against defective materials, delamination, seal failure and defects in manufacture in compliance with the glass manufacturer’s standard warranties. Glass breakage is not warranted.

C. Warrant finishes against peeling, checking, cracking, flaking or blistering according to the coating manufacturer's standard warranty.

D. Warrant structural sealants according to the sealant manufacturer's standard warranties.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Contract documents are based on the SYSTEM 2000 skylight framing system by Architectural Skylight Co., Inc., Waterboro, Maine. Telephone 800-345-7899 / 207-247-6747, FAX 207-247-6754.

B. Substitute manufacturers will be considered under the provisions of section 01 25 00 and when the following conditions have been met:

1. Substitute manufacturers pre-qualify in writing no later than ten (10) days prior to the bid closing date.

2. Project specific skylight details are submitted to the architect for review and approval.

3. Complete specifications and structural calculations showing member sizes, design loads and loads applied to the structure are submitted for review and approval.

4. Substitute manufacturers submit materials which demonstrate that they have successfully performed the design, manufacture and installation of skylight projects similar in scope over the previous eight (8) years and that they comply with all performance specifications.

5. Substitute manufacturers submit proof of financial capability.

2.2 MATERIALS

A. Principal framing members: Fabricated from 6063-T5, 6063-T6 or 6061-T6 extruded aluminum. Sizes, shapes and profiles per Architectural Skylight Co., Inc. standard components.

B. Snap on covers and non-supporting trim .060" minimum thickness 6063-T6 extruded aluminum.

C. Structural formed metal members shall be ASTM B 209 5052-H34 or ASTM B 221 6061-T6 aluminum.

D. Gaskets shall be continuous and shall be an extruded EPDM, silicone compatible rubber, shore A hardness: 70 (+/-5), tensile strength: 950 psi, color: black.

E. Setting blocks shall be an extruded EPDM, silicone compatible rubber, shore A hardness: 85 (+/-5), color: black.

F. Fasteners:

1. Fasteners for attachment of exterior retainer bars shall be ASTM A 193 B8 300 series stainless steel screws.

2. Fasteners used to connect framing members shall be ASTM A 193 B8 300 series stainless steel or ASTM B 2100 2024-T4 aluminum.

3. Fasteners used to anchor the skylight to the support structure shall be ASTM A 193 B8 300 stainless steel screws.

G. Flashings shall be ASTM B 209 5005-H34 or 5052-H34 aluminum, .030" minimum thickness.

H. Exposed metal finish shall comply with the following:

1. Class I clear anodic coating: Type AAM10C22A41 clear anodized coating, 0.7 mil thickness minimum, in compliance with AAMA 607.1.

I. Sealants:

1. Structural flush glazed joints shall be a high performance silicone sealant applied in accordance with the sealant manufacturer's instructions. Color: black.

2. Weatherseal joints shall be a neutral cure medium modulus silicone sealant applied in accordance with the sealant manufacturer's instructions. Color: black.

3. Unexposed, low movement flashing joints shall be a non-drying, non-skinning, non-oxidizing, non-bleeding curtain wall sealant meeting AAMA 809.2.

J. Glass:

1. Standard certification requirements:

a. Float Glass: ASTM C 1036.

b. Heat Treated Glass: ASTM C1048, with surface stress of 5000psi, +/- 1500psi.

c. Laminated Glass: Two lites of equal thickness bonded with a polyvinyl butyral (PVB) interlayer, meeting criteria of ANSI Z97.1-1984 and CPSC 16 CFR 1201 for safety glazing.

d. Insulating Glass: CBA rated by the Insulating Glass Certification Council when tested in accordance with ASTM E 773 and E 774. Dual edge seals with silicone secondary seal. Exterior lite is to be heat strengthened; interior lite to be laminated glass.

2. Performance Requirements:

a. Probability of breakage not to exceed 8/1000 for vertical glass and 1/1000 for

sloped glass upon first application of design pressures or due to anticipated thermal stresses.

3. Glazing Unit Composition:

a. 1 1/8" insulated glass consisting of a ¼" gray tinted, heat-strengthened lite, a ½" dual sealed airspace, and a 3/8" clear, heat-strengthened, laminated lite with a .030" pvb interior. A Solarscreen 2000 low-e coating and a ceramic frit coating (1/8" white holes) are applied to the outside surface of laminated glass (within the air space).

2.3 FABRICATION

A. Retainer bars shall be attached with gasketed stainless steel fasteners spaced at a maximum of 9" on center.

B. Setting blocks and spacers shall be located and sized in accordance with the GANA Glazing Manual. At no point shall the glazing come in contact with the frame fasteners.

C. The skylight shall have properly located condensation gutters and weep holes provided for drainage of condensation to the exterior.

D. Unless otherwise approved, skylight units shall be factory assembled and glazed.

PART 3 EXECUTION

3.1 EXAMINATION

A. Prior to installation, inspect the support and adjacent construction to verify that they are properly prepared to receive the work. Report in writing any error in the work. No work shall proceed until all errors and deviations are corrected.

3.2 PREPARATION

A. Surface contact between aluminum and dissimilar materials shall receive a protective coating of asphaltic paint or elastomeric isolator to prevent electrolytic action.

3.3 INSTALLATION

A. Install all items plumb, straight, square level and in their elevation, plane and location and in proper alignment with other work.

B. The skylight shall be erected and glazed by the manufacturer or an experienced installer authorized by the manufacturer familiar with the manufacturer's systems and installation procedures.

C. The skylight shall be designed to accommodate tolerances of the building structural members

and clearances shown on final approved shop drawings. All parts of the erected work, when completed, shall be within the following tolerances:

1. Maximum variation from plane or location shown on final shop drawings: 1/8" per 12ft. or ½" on any total length.

2. Maximum offset from true alignment between two identical members butting end to end in line: 1/32".

D. Anchorage to the structure shall be in accordance with final shop drawings. Supporting brackets shall be so designed as to provide three dimensional adjustment and accurate location of the components.

E. Sealant materials shall be used in accordance with the manufacturer's printed instructions and shall be applied by mechanics specially trained and experienced in their use. Before applying sealant, all dirt, dust, moisture and all foreign matter shall be completely cleaned from surfaces it will contact. Adjoining surfaces must be masked to obtain a clean and neat appearance. Sealants shall be tooled to fill the joint and provide a smooth finished surface.

3.4 FIELD WATER TEST

A. Field test for water leakage in accordance with AAMA 501.2, in areas as indicated on the contract drawings. There shall be no uncontrolled water leakage as defined in AAMA 501. Testing is to be performed by the manufacturer's authorized personnel. Water supply and pressure at the test specimen is to be provided by the General Contractor.

3.5 PROTECTION AND CLEANING

A. At time of installation, clean skylight frames and associated metals and glass. Final cleaning, if required, is not to be included by the skylight manufacturer.

B. The temporary protection of the skylight during the installation or after the installation is complete (including protection from the work of other trades), is not the responsibility of the skylight manufacturer.

END OF SECTION

PART 1 GENERAL

1.1 WORK INCLUDED

A. Portland cement plaster at all existing locations where cracks and loose stucco occur.

B. Remove existing soffit insulation and replace with new stucco.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 07 92 00 - Sealants

B. Section 09 91 13 - Painting

1.3 REFERENCES

A. ASTM: C 150 - Specification for Portland Cement.

B. ASTM: C 206 (1992) - Standard Specification for Finishing Hydrated Lime.

C. ASTM: C 897 - Standard Specification for Aggregate Job-Mixed Portland Cement-Based Plasters.

D. ASTM: C 926 - Application of Portland Cement-Based Plaster.

E. ASTM: C 1063 - Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster.

1.4 SUBMITTALS

A. Procedure: Submit in accord with Section 01 33 00.

B. Certificates: Manufacturer's certification that materials conform to Specifications requirements.

C. Product Data: Manufacturer's written recommendations for mix proportions utilizing an acrylic emulsion bonding agent to replace some of the mixing water.

D. Installers Qualifications: Submit qualifications of installer to demonstrate a minimum of five (5) years continuous experience under company name performing stucco restoration.

1.5 JOB CONDITIONS

A. Existing Conditions

1. Verify existing conditions, such as soundness of perimeter conditions, and varying wall thickness for length of anchoring services required and other visible conditions prior to Bidding.

2. Report conflicts and problems for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.

3. Replace or restore to original condition any materials or work damaged during construction.

4. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.

5. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.

1.6 PRE-INSTALLATION CONFERENCE

A. Convene one week prior to commencing work of this section, under provisions of Section 01 30 00.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver to site, store, protect and handle products under provisions of Section 01 60 00.

1. Store materials on raised platforms above ground.

2. Store and handle materials to protect them from:

a. Moisture, whether due to precipitation or condensation.
b. Damage by construction traffic.
c. Mud, dust, sand, oil, grease and dirt.

3. Store materials according to manufacturer's printed instructions.

B. Handling:

1. Select and operate material handling equipment and store materials to keep from damaging existing construction.

2. Comply with fire, safety, and environmental protection regulations.

1.8 COORDINATION

A. Coordinate Work under provisions of Section 01 30 00.

1.9 SEQUENCING

A. Pre-Construction Conference

1. Prior to work of this Section, meet at project site with Contractor and, representatives of other entities directly concerned with performance work. Coordinate so representatives of governing authorities, product manufacturers, Architect and Owner will also be present.

2. Review requirements, Contract Documents, submittals, status of coordinating work, availability of materials and installation facilities, proposed installation schedule, requirements for inspections and testing or certifications, forecasted weather conditions, governing regulations, insurance requirements, and proposed installation procedures.

3. Record discussion on matters of significance; furnish copy of recorded discussions to each participant. Discuss wall system protection requirements for construction period extending beyond installation.

PART 2 PRODUCTS

2.1 PLASTER MATERIALS

A. Portland Cement Plaster: Florida Super Stucco and Florida Fibered Stucco manufactured by LaFarge Corporation, Tampa, Florida or an Architect approved manufactured brand conforming to: ASTM C 926-90; ASTM C 91-91, Type S.

1. All But Finish Coat: Florida Fibered Stucco, or add 3/8 pound of reinforcing fibers to each stucco batch during mixing process.

2. Finish Coat: Florida Super Stucco.

B. Portland Cement: ASTM C 150-89, from one source.

C. Hydrated lime: ASTM C 206-84, Type S.

D. Reinforcing fibers for plaster mixes: Hi-Tech Stucco Fibers manufactured by Hi-Tech Fibers, Edgefield, S.C.

E. Bonding agent:

1. Acrylbond by Lambert Corporation, Orlando, Florida.

2. Cement-Stucco Bond by Dana Marine Laboratory, Tampa, Florida

3. Acrylic Admix 101 by Larsen Products Corp., Rockville, MD.

4. Acryl 60 by Thoro, Miami, FL

F. Water: Potable, clean, and free from substances harmful to plaster.

G. Sand for Portland cement plaster: ASTM C 897.

H. Sealant: As specified in Section 07 92 00.

2.2 Metal Lath

A. Secured to Masonry:

1. Self-furring 3.4 pound diamond mesh lath, dimpled 1-1/2" on center each way, zinc.

B. Trim (USG Designations) Metal-Zinc Alloy

1. Casing beads - #66 with expanded flange.

2. Expansion/control joints - Style #15.

3. Corner beads - Double - X w/ 1/8" nose.

2.3 Metal Lath Fasteners

A. Secured to Masonry/Concrete:

1. Hot-dipped galvanized power actuated or hand driven fasteners, with 3/8" diameter beads, through galvanized washers, spaced 16" on center horizontally and 6" on center vertically - pull out resistance of each fastener shall be 50 pounds.

PART 3 EXECUTION

3.1 WORKMANSHIP/INSTALLATION-STUCCO

A. Cracks in bonded substrate less than 1/16" shall have knife grade sealant applied in accordance with Section 07 92 00. Cracks in bonded substrate greater than 1/16" shall be ground to remove loose material and to create a joint to receive one part polyurethane sealant in accordance with Section 07 92 00.

B. The scope of work shall provide for the repair of stucco areas greater than 1.0 sq. foot. Remove loose stucco back to solidly adhered stucco surface. Use 3/8" x 8" rebar to make soundings to determine location of hollow/non-adhered areas.

1. Make joinings flush, smooth and uniform, without visible lap marks.

C. Do not plaster when temperature is above 95 degrees F., or below 45 degrees F. Temperature may be as high as 95 degrees F. during curing.

D. Maintain plaster surface planes within allowable tolerances;

1. Allowable tolerances: Finish all plaster surfaces to true and even plane within tolerance of 1/8 in. in 5 ft. - 0 in. as measured by a straight edge placed at any location on surface.

E. Mock-Up: Create for Architect’s approval an in-place mock-up of each different condition.

3.2 INSPECTION

A. Verify that surfaces to be plastered are free of dust, loose particles, oil, and foreign matter which would affect bond of plaster coats.

3.3 PROTECTION

A. Cover, or otherwise protect finish materials subject to damage by plaster.

B. Cover and protect adjacent areas from plaster stains, including areas which will be covered by other finish materials.

3.4 MEASURING AND MIXING

A. Measuring: Proportion and measure ingredients in suitably calibrated devices which can be easily and accurately checked at any time. Shovel measurements are not permitted.

1. First Coat: one 78 pound bag of fibered stucco, 2-1/4 to 3-1/4 parts by volume sand.

2. Second/finish Coat: one 78 pound bag of Super Stucco and 2-1/4 to 3 parts by volume sand, fine texture.

B. Mixing (All 2 coats):

1. Follow manufacturer's directions:

a. Approved bonding agent shall be added, diluted 50/50 with water. Follow Architect approved manufacturer's, volume/bag, recommendation of bonding agent.

2. Total mixing time for each batch should be approximately 5 minutes. Mix only amount that can be used within 45 minutes. Do not leave unused, mixed plaster to harden in mixer or containers.

3. If reinforcing fibers are not already contained in cement stucco bags, add reinforcing fibers to mixer by hand sprinkling, for complete dispersion throughout mix, during last minutes of mixing cycle. Add fibers for both scratch coat and brown coat mixes.

a. Add 3/8 pound (6 oz.) of fibers per 78 pound bag of stucco mix.

4. No retempering of stucco will be permitted.

3.5 PLASTERING

A. Two coat application on unit masonry and solid concrete surfaces:

1. Apply 3/8" in. thick, and score vertical surfaces horizontally on vertical surfaces. Apply with sufficient pressure to key and fully embed lath.

2. After initial set, maintain moist surface until application of second coat.

3. Apply second coat as soon as first coat will support weight.

B. Second coat:

1. Apply with sufficient material and pressure to ensure tight contact with, and complete coverage of base coat and to the thickness to equal the total thickness of the adjacent stucco. Float repair area to even, true plane.

2. After initial set, maintain moist surface until application of third (finish) coat.

C. Finish Texture: to match existing.

3.6 Corner transitions shall not be tooled to form joints. Flush stucco to edge of adjoining wall. Rod/float stucco flush to edge and finish as required in 3.5.C.

3.7 CURING PLASTER

A. Keep protected as much as possible for duration of curing period (14 days).

3.8 PATCHING AND COMPLETION

A. Complete entire work to satisfaction of Architect.

B. Neatly patch or replace damaged plaster surfaces after the various trades have left the Work.

C. Remove broken or damaged plaster. Match adjoining work in plane, finish and texture, without perceptible joints.

D. At completion of work, remove excess plaster from beads, screeds, base, trim, and adjoining work, and leave work clean.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surface preparation and field application of paints for replacement wood fascia or touch-up of existing painted surfaces.

B. Surface preparation and field application of paints for use over newly grouted exterior scupper openings and exposed deck fasteners.

1.2 RELATED SECTIONS

A. Section 06 10 53 - Rough Carpentry.

B. Section 07 62 00 - Sheet Metal Flashing and Trim.

1.3 REFERENCES

A. ASTM D 16-91 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.

B. PDCA (Painting and Decorating Contractors of America) - Painting - Architectural Specifications Manual.

C. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.

1.4 DEFINITIONS

A. Conform to ASTM D 16-91 for interpretation of terms used in this Section.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide data on all finishing products.

C. Samples: Submit manufacturer's color chart illustrating range of colors available for each surface finishing product scheduled.

D. Samples: Submit two samples, 6x6 inch in size illustrating selected colors for each color selected.

E. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum five years experience.

B. Applicator: Company specializing in performing the work of this section with minimum 3 years documented experience.

1.7 REGULATORY REQUIREMENTS

A. Conform to code for flame and smoke rating requirements for finishes.

1.8 FIELD SAMPLES

A. Provide field sample of paint under provisions of Section 01 33 00.

B. Provide field sample panel, fascia edge metal, illustrating special coating color, texture, and finish.

C. Locate where directed.

D. Accepted sample may remain as part of the Work.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver to site, store, protect and handle products under provisions of Division 1.

B. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

C. Container label to include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

D. Store paint materials at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.10 PROJECT CONDITIONS

A. Existing Conditions

1. The Bidder shall verify existing conditions prior to Bidding.

2. Conflicts and problems shall be reported to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Prime Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.

3. Replace or restore to original condition any materials or work damaged during construction.

4. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.

5. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.

1.11 ENVIRONMENTAL REQUIREMENTS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Do not apply exterior coatings during rain or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

C. Minimum Application Temperatures for Latex Paints: 45 degrees F (7 degrees C) for interiors; 50 degrees F (10 degrees C) for exterior; unless required otherwise by manufacturer's instructions.

1.12 EXTRA MATERIALS

A. Provide 1 gallons of each color and type to Owner.

B. Label each container with color, type, texture, locations, in addition to the manufacturer's label.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers - Paint

1. Benjamin Moore
2. Devoe and Reynold.
3. Porter Paint.
4. Pratt & Lambert.
5. Sherwin-Williams.

B. Manufacturers - Primer: Manufacturer's specified prime for use with metals, stucco wood and other building materials.

C. Substitutions: Under provisions of Section Division 1.

2.2 MATERIALS

A. Coatings: Ready mixed, lead free, except field catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating; good flow and brushing properties; capable of drying or curing free of streaks or sags.

B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

2.3 FINISHES

A. Refer to schedule at end of section for surface finish schedule.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Division 1.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. Test shop applied primer for compatibility with subsequent cover materials.

3.2 PREPARATION

A. Correct defects and clean surfaces which affect work of this section.

B. Seal with shellac and seal marks which may bleed through surface finishes.

C. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

D. Uncoated Steel and Iron Surfaces: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints are cleaned. Prime and paint after repairs.

E. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Prime metal items including shop primed items.

3.3 APPLICATION

A. Apply products in accordance with manufacturer's instructions.

B. Do not apply finishes to surfaces that are not dry.

C. Apply each coat to uniform finish.

D. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.

E. Vacuum clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.

F. Allow applied coat to dry before next coat is applied.

3.4 FIELD QUALITY CONTROL

A. Field inspection will be performed under provisions of Section 01 40 00.

3.5 CLEANING

A. Clean work under provisions of Section 01 50 00.

B. Collect waste material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

3.6 PAINT SCHEDULES

A. Exterior Masonry Surfaces(Patching):

1. Two coats of acrylic masonry paint. Color to match existing wall.

B. Exterior Metal finishes:

1. One coat of metal primer.
2. Two coats of a acrylic metal paint. Color to match existing parapet wall counterflashing.

C. Wood - Painted (Opaque):

1. One coat of latex primer sealer.
2. Two coats of latex enamel. Sheen to match existing

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This specification is intended to provide general guidelines regarding the application of listed materials as manufactured by Sigma Coatings (a division of PPG Industries) and available through CSL, Coatings, Surfaces and Linings, 659 Ashley Court, Cheshire, Connecticut 06410.

1.2 QUALITY ASSURANCE

A. Applicators Qualifications

1. Applicator shall have knowledge and general understanding of metal roof deck design as well as Sigma Coatings products specified for this project.

2. Applicator shall have business stability and own, or have access to the equipment necessary for successful completion of the project.

B. Technical service on application and suitability of Sigma Coating is available by contacting Mr. Gregory M. Artura, National Manager, for projects utilizing CSL, Coatings, Surfaces and Linings, 659 Ashley Court, Cheshire, Connecticut 06410. Telephone: (203) 271-9224.

1.3 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide technical data indicating chemical characteristics, performance characteristics, substrate preparation, limitations and product availability.

C. Manufacturer's Installation Instructions: Indicate special procedures, surface preparation and perimeter conditions requiring special attention.

1.4 PRE-INSTALLATION CONFERENCE

A. Convene one week prior to commencing work of this section at project site with Contractor, Roofer, and Subcontractors, governing authorities, product manufacturers, Architect and Owner.

B. Review requirements, Contract Documents, submittals, sequencing, availability of materials and installation facilities, proposed installation schedule, requirements for inspections and testing or certifications, forecasted weather conditions, governing regulations, insurance requirements, and proposed installation procedures.

C. Record discussion on matters of significance; furnish copy of recorded discussions to each participant. Discuss roofing system protection requirements for construction period extending beyond roofing installation.

D. Review preparation procedures and coordinating and scheduling required with related Work.

1.5 PROJECT/SITE CONDITIONS

A. Occupancy: Owner will occupy premises during the work. Cooperate with the Owner to minimize conflict and to facilitate Owner's operations.

B. Existing Conditions

1. Report conflicts and problems to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.

C. Condition of Structure:

1. The Owner assumes no responsibility for actual condition of the structure.

2. Conditions existing at time of inspection for bidding purposes will be maintained by Owner as practicable.

D. Traffic:

1. Do not obstruct or interfere with roads, streets, walks and other adjacent occupied or used facilities. without permission from authorities having jurisdiction during removal of debris. Provide alternate routes around closed or obstructed traffic ways if required.

2. Erect warning signs around the work space and at every point of potential entry from the outside.

3. Limit access to the roof to only authorized workers and, personnel and maintain a roof access log sheet.

E. Utility Services:

1. Maintain existing utility services affected by work.

2. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by Owner. Provide temporary services during interruptions to existing utilities and systems.

F. Environmental Requirements:

1. Do not remove roofing or apply coating during inclement weather.

2. Perform work in accordance to Federal, State and local laws and regulations.

1.6 COORDINATION

A. Coordinate work under provisions of Section 01 31 00.

B. Coordinate the work with installing associated wood blocking and nailers, roofing, expansion joints and area dividers, and metal flashing as the work of this section proceeds.

1.7 SEQUENCING

A. Organize operations so work can simultaneously proceed on the various aspects including roofing and mechanical work so at the end of each day the work done that day will be substantially complete.

1.8 PRODUCT STORAGE AND HANDLING

A. Storage of Materials:

1. Store materials in accordance with manufacturer's recommendations.

2. Store materials so that they will not freeze.

B. Handling and Protection of Materials:

1. Meet requirements of manufacturer's recommendations for handling and protection of materials during installation.

2. Handle materials so that they will not be contaminated by foreign materials.

PART 2 PRODUCTS

2.1 COATING SYSTEM

A. Coating: SigmaCover CSF Coating 5484 (low odor) - Two component solvent free amine cured epoxy coating for maintenance and new construction.

B. Material is available from CSL, Coatings, Surfaces and Linings, 659 Ashley Court, Cheshire, Connecticut 06410, Telephone: (203) 271-9224. (Contact: Mr. Gregory M. Artura)

C. Principal Characteristics: Basic Data at 68°F (20°C)

1.	Mass density	Approximately 11.0 lbs/gal
2.	Solids Content by Volume	Approximately 100%
3.	VOC (before thinning by formula)	0.0 lbs/gal
4.	VOC (before thinning by EPA method 24)	1.1 lbs/gal
5.	Recommended dry film thickness	12 - 24 mils
6.	Theoretical Spreading Rate @ 1 MDFT	1604 sq ft/gal
7.	Touch dry after	4 hours
8.	Minimum interval before overcoating	24 hours
9.	Maximum interval before overcoating	20 days
10.	Full Cure after	5 days
11.	Temperature resistance (dry)	250°

12.	Shelf Life (Cool and Dry place	Minimum 12 months
13.	Flashpoint (T.C.C.)	Base: >200°F (93°C) Hardener: >200°F (93°C)
14.	Color and Gloss	Black

2.2 ACCESSORY MATERIALS

A. Clean-up thinner: #90=53, Flash point: 80°F (27°C)

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Before bringing material onto the roof, check equipment, deck preparation, sealing of openings, etc.

C. Maintain emergency fire exits during the work. Establish alternate fire exits if required.

3.2 PREPARATION

A. Prepare roof area and surfaces to receive work.

B. Seal roof top air intake vents or other openings within a radius of twenty (20) feet from the work. Seal using 6 mil poly and duct tape.

C. Coordinate HVAC system control requirements with the Building Owner. If possible, the buildings being affected by deck remediation work should be put into positive air pressure to prevent odor penetration.

D. Deck Preparation

1. Surface preparation shall be in accordance with standard methods developed by the Steel Structures Painting Council (SPCC). The methods and definitions are different only in the method of cleaning. For purposes of this specification, it is the level of cleanliness that will be enforced.

    a. Surface Preparation Specification No. 2-(SSPC-SP-2) - Hand Tool Cleaning
    b. Surface Preparation Specification No. 3-(SSPC-SP-3) - Power Tool Cleaning

E. Methods:

1. Use Hand tool/Power tool cleaning to remove all loose mill scale, loose paint, and other loose detrimental matter. It is not intended that adherent mill scale and paint be removed by this process. Mill scale, rust and paint are considered adherent if they cannot be removed by lifting with a dull putty knife.

2. Power brooms must be outfitted with wire brushes, nylon bristles will not clean effectively.

3. Use impact hand tools/power tools to remove stratified rust (rust scale).

4. Use impact hand tools/power tools to remove weld slag.

5. Use hand wire brushing, hand abrading, hand scraping, or other similar non-impact methods to remove all loose mill scale all loose or non-adherent rust and all loose paint (SSPC-SP-2)

6. Use power wire brushing, power abrading, power impact or other power rotary tools to remove all loose mill scale, all loose or non-adherent rust, and all loose paint. Do not burnish the surface (SSPC-SP-3)

7. Operate power tools in a manner that prevents the formation of burrs, sharp ridges and sharp cuts (SSPC-SP-3).

8. After hand/power tool cleaning and prior to painting, remove dirt, dust or similar contaminants from the surface. Acceptable methods included brushing, blow off with clean, dry air or vacuum cleaning.

3.3 APPLICATION

A. Watertightness Imperative:

1. The work specified herein will not preclude the use of procedures that will maintain the buildings watertightness. Therefore, the Contractor, while conforming to these Contract Documents, must utilize necessary procedures to keep water out of the buildings while work is in progress.

2. At end of each day's work or shift and prior to the onset of all inclement weather, roofing shall be temporarily sealed with cut-offs to the unfinished substrates. Seal projections through the roof and to the surrounding intersections so that no moisture may enter roofing or into structure before work resumes. Remove cut-offs before work resumes.

B. Safety Precautions

1. This product contains flammable solvents and/or other hazardous chemical ingredients and must be used with caution. Applicator shall observe all health and safety precautions as listed on the Material Safety Data Sheet during storage, handling, application, drying and disposal.

C. Coating applicator shall follow manufacturer’s application instructions. Instructions may be obtained from CSL, Coatings, Surfaces and Linings, 659 Ashley Court, Cheshire, Connecticut 06410, Telephone: (203) 271-9224. (Contact: Mr. Gregory M. Artura)

D. Mixing Material

1. Mixing ratio: By weight: Base to Hardener 85 : 15
By volume: Base to Hardener 79.2 : 20.8

2. When mixing, the temperatures of base and hardener should be at least 68°F (20°C).

3. At lower temperature the viscosity will be too high for spray application.

4. **No thinner shall be used.**

E. Pot life: One (1) hour at 68°F (20°C).

F. Relative Humidity: 95% maximum for general maintenance applications.

G. Airless Spray:

1. Heavy duty single feed airless spray equipment, preferably 60:1 pump ratio and suitable high pressure hoses should be used. In-line heating or insulated hoses may be necessary to avoid cooling down of paint in hoses at low air temperature. Application with 45:1 airless spray equipment is possible provided in-line heated high pressure hoses are used or if ambient and material temperatures are above 75°F (23°C).

2. Hoses should be 3/8" I.D. minimum, but a 1/4" I.D. whip end section may be used for ease of application. A maximum length of 50 feet is suggested. Best results will be obtained using a 0.019" - 0.021" tip. Use approximately 4,000 psi at 68°F (20°C) and 3,000 psi at 86°F (30°).

3. All application equipment must be cleaned immediately after use. All paint inside the spraying equipment must be removed before the pot life time has expired.

H. Thinning Requirements:

1. **No thinner shall be added to the CSF Coating 5484 at anytime.**

2. Clean-up thinner: #90 - 53, Flashpoint: 80°F (27°C)

I. Be sure to wait at least 15 minutes from the time of completion of application before starting the re-roofing operation.

3.4 CLEANING

A. When cleaning out equipment or before spraying material **Do Not** spray out thinner onto the roof deck. Thinner should be sprayed into a thinner bucket.

3.5 PROTECTION

A. Replace or restore to original condition any materials or work damaged during application.

B. Properly mask surfaces not designated to receive the system or otherwise protected against accidental spillage or application of the material to those areas.

C. Protect building surfaces against damage from demolition work.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Drawings and general provisions of contract, including the General Conditions and Division-1 Sections.

B. Work to be performed consists of coating existing metal roof panels after cleaning and preparation on an “as-needed” basis as defined within section 01 22 00

1.2 RELATED SECTIONS

A. Section 07 62 00 - Sheet Metal Flashing And Trim

B. Section 07 90 00 - Joint Sealer

1.3 QUALITY ASSURANCE:

A. Installer:

1. Obtain written certification from manufacturer of the coating certifying that Installer is approved by manufacturer for installation of specified system.

2. Installer must maintain full-time supervisor (not a working foreman), on job site during times that work is in progress. Supervisor must have a minimum of three years experience in coating work similar to nature and scope of specified work.

B. Manufacturer's Field Inspection and Services:

1. Manufacturer of the coating materials shall provide qualified personnel to observe field conditions of surfaces and installation, quality of workmanship as applicable, and to make appropriate recommendations.

2. Representative shall submit written reports to Architect listing observations and recommendations.

1.4 SUBMITTALS:

A. Product Data: Submit product specifications, installation instructions and general recommendations from coating manufacturer, including data that materials comply with requirements.

B. Installer's Certifications: Provide copy of certification to Architect prior to beginning coating work.

C. Material Certification: For each material specified with a standard or reference material designation, certification label shall appear on each package of bulk shipped to project with certification of compliance.

1.5 DELIVERY, STORAGE, HANDLING:

A. Delivery:

1. Deliver material in manufacturer's original, unopened containers with manufacturer's labels intact and legible.

2. Deliver enough material to allow continuous work.

B. Storage:

1. Store materials on clean, raised platforms in an interior location.
2. Store and handle materials to protect them from:

a. Moisture, whether due to precipitation or condensation.
b. Damage by construction traffic.
c. Temperatures over 110 degrees F.
d. Temperatures below 50 degrees F.

1.6 PROJECT/SITE CONDITIONS:

A. Existing Conditions:

1. This project involves coating of existing masonry parapet wall surfaces. Verify existing conditions.

2. Report conflicts or problems to the Architect prior to bidding for resolution. Failure to report these conflicts or problems places the responsibility on the Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.

3. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.

B. Weather Conditions:

1. Do not apply materials when the temperature of surfaces to be coated and the surrounding air temperatures are below 45 degrees F, (7 degrees C) unless otherwise permitted by coating manufacturer's printed instructions.

2. Do not apply coating material in rain, fog, or mist; or when relative humidity exceeds 85%; or to damp or wet surfaces.

PART 2 PRODUCTS

2.1 Approved Manufacturers and Products: **No substitutions are permitted.**

A. The Flood Company, VIP Division - VIP #8000 Series LAST-O-COAT

B. Porter Paint Co. - 6000 Series PORTER-FLEX Elastomeric Coating.

C. Thoro Systems Products - THOROLASTIC Elastomeric Coating.

2.2 Cleaning Agent:

A. Cleaning agent and cleaning procedures selected by the applicator to meet the requirements for cleaning preparing the existing metal roofing surfaces shall be as recommended by the coating manufacturer.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS:

A. Manufacturer's Installation Requirements:

1. In addition to the specified procedures, the installer shall be responsible for the installation of the elastomeric coating materials in accordance with the procedures required by the coating material manufacturer for the proper execution of the work.

2. The coating installer shall review the specified procedures for possible conflicts, for resolution, prior to bidding.

3.2 PREPARING SURFACES:

A. Prepare adjacent building surfaces in order to accept work

3.3 ADJUST AND CLEAN:

A. Clean-up:

1. During progress of work remove from project site discarded materials, rubbish, cans and rags resulting from work.

2. Upon completion of work, clean all spattered surfaces. Remove spattered materials by proper methods of washing and scraping, using care not to damage finished surfaces.

3.4 PROTECTION

A. Protect work of other trades. Correct damage by cleaning, repairing or replacing, as directed by Architect. Leave work in undamaged condition.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes surface preparation and field application of a two-part acrylic polyurethane high performance enamel coating system for use over existing factory finished exterior metal roof & wall panels and trim, and new mill finish metal roofing and trim.

1.2 RELATED SECTIONS

A. Section 07 01 50.63 - Built-Up Roof Repairs

B. Section 07 61 13 - Metal Roofing

C. Section 07 62 00 - Sheet Metal Flashing and Trim.

1.3 REFERENCES

A. ASTM D 16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.

B. PDCA (Painting and Decorating Contractors of America) - Painting - Architectural Specifications Manual.

C. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.

1.4 DEFINITIONS

A. Conform to ASTM D 16 for interpretation of terms used in this Section.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide data on all finishing products, including Material Safety Data Sheets. Inform Owner of any safety or odor concerns associated with these products which may effect hotel guest and/or activities.

C. Samples: Submit three samples, 6x18 inch in size illustrating selected colors for each color selected.

D. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum of five years documented experience.

B. Applicator: Company specializing in performing the work of this section with minimum 3 years documented experience with this, or very similar coatings.

1. Submit a list of roof refurbishment projects, (with project name, location, date, size, coating system, cost and references (contact/phone numbers)), with the bid within the last three (3) years and a minimum aggregate total metal roof refurbishment of 50,000 square feet, (either a single or multiple projects).
2. Non-compliance with this requirement in the opinion of the Owner, will be considered adequate justification to disqualify a bid from further consideration.

C. The metal roofing coating application work shall be performed by an applicator who has been trained by the manufacturer and then certified in writing as an applicator approved by the manufacturer of the metal roof refurbishment coating. Certificate holder must be employed by coating contractor and be present at the jobsite for the duration of the project.

D. Maintain full-time supervisor/foreman, not a working foreman, on the job site during times that coating application work is in progress. Supervisor must have minimum of three (3) years experience in roof refurbishment work using the same or very similar products as specified. Submit a copy of their resume with project experience upon request by the Owner or Architect

1.7 FIELD SAMPLES

A. Provide field sample of coating under provisions of Section 01 33 00.

B. Provide field sample panel, fascia edge metal, illustrating special coating color, texture, and finish.

C. Locate where directed.

D. Accepted sample may remain as part of the Work.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver to site, store, protect and handle products under provisions of Division 1.

B. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

C. Container label to include manufacturer's name, type of coating, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

D. Store coating materials at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.9 PROJECT CONDITIONS

A. Existing Conditions
   1. The Bidder shall verify existing conditions prior to Bidding.
   2. Conflicts and problems shall be reported to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Prime Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.
   3. Replace or restore to original condition any materials or work damaged during construction.
   4. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.
   5. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.

1.10 ENVIRONMENTAL REQUIREMENTS

B. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the coating product manufacturer.

C. Do not apply exterior coatings during rain or when relative humidity is outside the humidity ranges required by the coating product manufacturer.

D. Minimum Application Temperatures for Coatings: 45 degrees F (7 degrees C) for interiors; 50 degrees F (10 degrees C) for exterior; unless required otherwise by manufacturer's instructions.

1.11 EXTRA MATERIALS

A. Provide 1 gallon of each color and type to Owner. Label each container with color, type, texture, locations, in addition to the manufacturer's label.

1.12 WARRANTY

A. Provide manufacturer’s 7 year product warranty against product failure, including both material and labor.
   1. The Warranty terms and conditions are to comply with the “Manufacturer’s Notice of Intent to Issue Coating Warranty” form included at the end of this section. This form is also to be used to certify the bidder as an approved applicator.
   2. The warranty shall be governed by the laws of the State of Florida. The sole and exclusive venue for any litigation arising from or related to this Warranty or any work performed under the terms of this Warranty, shall be in Broward County, Florida.

B. Applicator to provide a 2 year warranty to the Owner against problems due to preparation and/or application methods.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers - Coating
1. Jones-Blair Industrial Coatings, No Substitutions.
2. Florida/Georgia contact - Pete Williams 423-580-4941, pwilliams@jones-blair.com

2.2 MATERIALS

A. First Coat Primer: Jones-Blair Ureprime Primer, Product # 33010.
1. Utilize specialty primers for specific conditions as directed by the manufacturer's technical representative - some field testing may be necessary for product selection.

B. Finish Top Coat: Jones-Blair Acrylithane MRC Urethane Enamel, (gloss finish).

C. Coatings: Field mixed; lead free, pre-tinted, catalyzed coatings. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating; good flow and brushing properties; capable of drying or curing free of streaks or sags.

D. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions under provisions of Division 1.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. Test shop applied primer for compatibility with subsequent cover materials.

3.2 PREPARATION

A. Correct defects and clean surfaces which affect work of this section. Remove all residue from soldering and other fabrication activities.

B. All surfaces must be sound, dry, clean and free of oil, dirt, grease, wax, mildew, loose or flaking paint and other surface contaminants. Remove loose, peeling, flaking or scaling paint and rust by scraping, sanding or wire brush or blasting.

3.3 APPLICATION

A. General Requirements:

1. Apply products in accordance with manufacturer's instructions.
2. Do not apply finishes to surfaces that are not dry.
3. Apply each coat to uniform finish.
4. Apply each coat of coating slightly darker than preceding coat unless otherwise approved.
5. Vacuum clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.
6. Allow applied coat to dry before next coat is applied.

B. Prefinished Metal Surfaces:

1. First Coat Primer: 3.0 mils dry film thickness (DFT) of 33010 (white) Ureprime HS2.
2. Finish Top Coat: 3.0 mils DFT of Acrylithane C-HS in the desired color for finish coat. Recoat as necessary for full coverage without any “shadowing” or “read-through” per the coating manufacturer’s recommendations.

3.4 FIELD QUALITY CONTROL

A. Field inspection will be performed under provisions of Section 01 40 00.

3.5 CLEANING

A. Clean work under provisions of Section 01 50 00.

B. Collect waste material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

END OF SECTION

MANUFACTURER'S NOTICE OF INTENT TO ISSUE COATING WARRANTY

Whereas_____herein called the "Roof Refurbishment Coating System Manufacturer" hereby gives notice to:

Owner: ORANGE COUNTY
Address: -

of its Notice of Intent to issue its Coating Warranty, to the Owner for this Project,

Project: -

incorporating the Manufacturer's_____

_____

coating system or product when installed in accordance with the Contract Documents.

I. Manufacturers' Notice of Intent to Issue Coating Warranty in conformance with the Contract Documents shall be executed by the manufacturer and submitted to the Owner with the bid documents. Each Bidder may only submit a single form, designating a single coating manufacturer, and shall include items 1 and 2 as follows:

1. A detailed description of the components of the manufacturer's system proposed and a list of any other component, proposed for use in the system that is manufactured by other roofing manufacturers.

2. A statement that the Manufacturer's Representative has reviewed the documents prior to the bid date, including the job conditions, proposed details, and application requirements. Having reviewed the above items in detail, the Representative will provide written notification to the Architect prior to bidding if any conflicts between the project documents and the Manufacturer's requirements exist which would prevent the issuance of the required warranty.

3. A sample of the Manufacturer's Coating Warranty shall be attached to and submitted with this form and the bid package. The manufacturer shall also submit to the Architect a clarification letter defining their definitions of "Fade" or “Color Change” as referenced in their warranty.

4. **7 year** total coating system warranty inclusive of coating materials and all associated products and accessories, including all specialty products, from substrate to finish, whether supplied by the coating manufacturer or by others as approved components of the coating system. Provide a single source responsibility, non-deductible coating warranty inclusive of all materials and products.

   a) If the manufacturer fails and/or refuses to issue the required

coating warranty, the Contractor with Surety shall warrant to make repairs, replacement or take corrective action on the same terms as required of the manufacturer, (had the warranty been issued by the manufacturer), so that the intended warranty is delivered to the Owner.

b) The warranty shall be governed by the laws of the State of Florida. The sole and exclusive venue for any litigation arising from or related to this Warranty or any work performed under the terms of this Warranty, shall be in Broward County, Florida.

5. The manufacturer's Representative shall conduct a Post-Construction field inspection no earlier than eleven (11) months, and no later than twelve (12) months after the Date of Substantial Completion. Submit a written report within seven (7) days of this visit to the Owner's Maintenance Dept. listing observations, conditions and any recommended repairs or remedial action.

By signing the above, the Authorized Representative of said Manufacturer certifies and represents the Coating System Manufacturer with the authority to contract and make the above representations to the Owner.

By: _____ Date: _____
Signature of Authorized Representative

(SEAL)

Witness: _____

Date: _____

MANUFACTURER'S NOTICE OF APPLICATOR'S CERTIFICATION

Whereas_____herein called the "Roof Refurbishment Coating System Manufacturer" hereby gives notice to:

Owner: ORANGE COUNTY
Address: -

As the Owner for the Roof Repairs and Roof Reconstruction Project at:

-

incorporating the Manufacturer's_____

_____
coating system or product which is to be installed in accordance with the Contract Documents

Manufacturers' Notice of Applicator's Certification form in conformance with the Contract Documents shall be executed by the manufacturer and submitted to the Owner with the bid documents.

The manufacturer acknowledges that the applicator:

Coating Applicator's Name: _____

Address: _____

has been approved to install this roof system since _____, ____and meets the criteria for an approved applicator listed in the Project Manual.

By signing the above, the Authorized Representative of said Manufacturer certifies and represents the Coating System Manufacturer with the authority make the above representations to the Owner.

Name: _____ Title: _____

By: _____ Date: _____
Signature of Authorized Representative

Witness: _____

Date: _____

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Piping insulation, jackets and accessories.

B. Thermal insulation of roof drain and overflow piping to minimize condensation within interior of building.

C. Noncombustible pipe insulation to fully wrap all PVC plastic pipe and fittings within a return air ceiling plenum to comply with surface burning characteristics of ASTM E 84 and Florida Mechanical Code, section M602.2.1

1.2 REFERENCES

A. ASTM C 585 - Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System).

B. ASTM C 921 - Properties of Jacketing Materials for Thermal Insulation.

C. ASTM E84 - Surface Burning Characteristics of Building Materials.

D. NFPA 255 - Surface Burning Characteristics of Building Materials.

E. UL 723 - Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS

A. Submit under provisions of Section 01 33 00

B. Product Data: Provide product description, list of materials and thickness for each service, and locations.

C. Samples: Submit two samples of any representative size illustrating each insulation type.

D. Manufacturer's Installation Instructions: Indicate procedures which ensure acceptable workmanship and installation standards will be achieved.

1.4 QUALITY ASSURANCE

A. Materials: Flame spread/smoke developed rating of 25/50 or less in accordance with ASTM E 84 to be considered a non-combustible material within the return air ceiling plenum.

B. Existing Conditions

1. Verify existing conditions, such as soundness of perimeter conditions, and varying deck and wall thickness for length of anchoring services required and other visible conditions prior to Bidding.

2. Report conflicts and problems to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Contractor to complete the work in accordance with the documents at no additional cost to the Owner.

3. Replace or restore to original condition any materials or work damaged during construction.

4. Surfaces not designated to receive the system shall be properly masked or otherwise protected against accidental spillage or application of the material to those areas.

5. Failure to install the work in strict accordance with provisions of this Section, is subject to total rejection of work specified herein.

1.5 QUALIFICATIONS

A. Applicator: Company specializing in performing the work of this section shall have a minimum three years experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver to site, store, protect, and handle products under provisions of Division 1.

B. Deliver materials to site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

C. Store insulation in original wrapping and protect from weather and construction traffic.

D. Protect insulation against dirt, water, chemical, and mechanical damage.

PART 2 PRODUCTS

2.1 GLASS FIBER INSULATION

A. Manufacturers:

1. Knauf.
2. Certainteed
3. Johns Manville
4. Owens Corning

B. Insulation: ASTM C 547; 1½ inch thick, rigid molded, noncombustible.

1. 'K' ('ksi') value : ASTM C 335-89, 0.23 at 75 degrees F.
2. Maximum Moisture Absorption: 0.2 percent by volume.
3. Surface Burning Characteristics: Flame Spread less than 25, Smoke Developed less than 50 per ASTM E 84

C. Vapor Barrier Jacket

1. White kraft paper reinforced with glass fiber yarn and bonded to aluminized film.
2. Moisture Vapor Transmission: ASTM E 96; 0.02 perm inches.
3. Secure with self sealing longitudinal laps and butt strips.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that piping has been tested before applying insulation materials.

B. Verify that surfaces are clean, foreign material removed, and dry.

3.2 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. On exposed piping, locate insulation and cover seams in least visible locations.

C. Insulate pipes conveying fluids:

1. Provide vapor barrier jackets, factory applied or field applied.
2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe.
3. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations.
4. Insulate entire system including fittings and bottom of roof drains (around deck).

D. Inserts and Shields:

1. Insert Location: Between support shield and piping and under the finish jacket.
2. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
3. Shields: Galvanized steel between pipe hangers and inserts.

E. Finish insulation at supports, protrusions, and interruptions.

3.3 TOLERANCE

A. Insulation materials used shall provide thermal resistance within 10 percent at normal conditions, as materials indicated, and comply with surface burning characteristics of ASTM E 84.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Installation of roof drain piping and pipe fittings.

B. Installation of new roof drains and replacement of existing roof drains with new.

C. Installation of new overflow drain pipes.

D. Installation of new HVAC condensate pipes.

E. Modification of existing vent pipes

1.2 PRODUCTS INSTALLED BUT NOT FURNISHED IN THIS SECTION

A. Section 22 07 19 - Piping Insulation.

B. Section 22 14 26.13 - Plumbing Specialties: Roof drains.

1.3 REFERENCES

A. ASTM D 1785 - PVC Plastic Pipe, Schedule 40.

B. ASTM D 2466 - PVC Plastic Pipe Fittings, Schedule 40.

C. ASTM D 2855 - Making Solvent-Cemented Joints with PVC Pipe and Fittings.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Product Data: Provide data on pipe materials, pipe fittings, and accessories. Provide manufacturers catalog information.

1.5 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Division 1.

B. Record actual locations of installed piping runs.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section shall have a minimum five years experience.

B. Installer: Company specializing in performing the work of this section shall have a minimum three years documented experience

1.7 REGULATORY REQUIREMENTS

A. Perform Work in accordance with Florida Department of Education and current National Plumbing code requirements.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver to site, store, protect and handle products under provisions of Section 01 60 00.

B. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 PRODUCTS

2.1 PIPING AND ACCESSORIES

A. PVC Pipe: ASTM D 2729, Schedule 40 DWV; Type I, four, six and eight (4, 6 & 8) inch pvc pipe:

1. Fittings: Schedule 40 pvc.
2. Joints: ASTM D 2855-90, solvent weld with ASTM D 2564 solvent cement.

B. Clevis Hangars: Carbon steel; plain finish; size to accommodate four, six and eight (4, 6 & 8) inch pvc pipe and one and one-half (1½) inch pipe insulation:

C. C Clamps: Low carbon steel with hardened steel cup point set screw; plain finish;

D. Continuous Threaded Rod: Low carbon steel; plain finish; rod diameter sized for clevis hangars and beam clamps; length to accommodate pipe slope and ceiling space.

E. HVAC Unit Condensate Pipe:

1. Pipes and “P” Traps: Schedule 40 PVC.

F. No-Hub Couplings; Used with vent pipe extensions

1. Cast Iron, Steel and PVC Pipe Extension Couplings: Anaco SD Series 4000 Husky, or Clamp-All Torque 125 No-Hub Coupling.

2. Glass Acid waste Pipe Extension Couplings (if applicable): Corning - QVF Process System; Pyrex Brand Drain lie Glass pipe and Fittings for Acid Waste.

a. Beaded Glass End to Flush Cut end Glass Coupling;
b. Beaded Glass End to Beaded Glass End Coupling;

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions under provisions of Division 1.

B. Verify locations of new roof drains and drain piping. Coordinate with roofing applicator to interface roof drains with roof work. Locate and mark locations of new roof drains on roof surface and confirm acceptability of locations with architect before installations.

3.2 PREPARATION

A. Cut pipe to required length and remove burrs.

B. Remove scale and dirt, on inside and outside, before assembly.

C. Prepare piping connections to equipment.

3.3 CUTTING AND PATCHING

A. All labor required for cutting and patching of roof decks, walls, ceilings, floors and sidewalks shall be furnished by the plumbing installer.

3.4 INSTALLATION OF NEW ROOF DRAINAGE SYSTEM

A. Install roof drains in accordance with the manufacturer's instructions and in locations indicated on drawings.

B. Support each roof drain using two 2 inch by 2 inch by 3/16 inch support angle. Angles shall be installed when drains fall between or a maximum of one (1) foot away from structural members. Install between structural support members and clamp angles to support members.

C. Installation of Piping and Accessories

1. Install drain piping in accordance with applicable plumbing code and recognized industry practices. Provide a permanent leakproof piping system.

2. Install each pipe run with minimum joints and couplings. Align piping accurately at connections, within 1/16 inch misalignment tolerance.

3. Locate interior conductor piping runs, vertically and horizontally. Avoid diagonal runs where possible. Orient runs parallel with walls and column lines. Locate using diagrams, details and notations if not otherwise indicated. Run piping in shortest route which does not obstruct usable space or block access for servicing building and its equipment. Hold piping close to walls, overhead construction, columns and other structural and permanent-enclosures elements of building; limits clearance to 1 inch outside insulation. Piping shall be concealed from view unless noted.

D. Installation of Hangars, Supports, Anchors and Shields:

1. Install pipe hangars, support rods, clamps and attachments to support piping properly from building structure: Install supports at each structural member (steel joist or beam) and not to exceed 6 feet oc. install hanger at each change in direction of piping.

2. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers and other accessories.

3.5 EXISTING VENT PIPE MODIFICATIONS

A. Relocation: Relocate vent pipes 2 feet from all roof edges or roof-top equipment.

B. Extensions: Extend vent pipes minimum of 8 inches above finished roof membrane. Extend pipes from below roof deck.

C. Extensions Above Deck: Extend roof deck, vent pipes routed through concrete beams above roof deck.

3.6 HVAC CONDENSATE DRAIN PIPE

A. Install PVC condensate lines and p traps on every unit requiring such. Run condensate lines to closest roof drain.

3.7 ERECTION TOLERANCES

A. Slope piping to drain at minimum slope of 1/4 inch per foot (2%) for piping 3 inch and smaller, and 1/8 inch per foot (1%) for piping 4 inches and larger. Piping may require a specific positive drainage slope for ceiling space limited in height which has been noted on the . Contact architect if conflicts occur due to ceiling cavity height.

3.8 TESTING

A. Test existing and new roof drains. Rod out exiting drains before reroofing and every drain after reroofing work is completed. Plug and fill the complete drainage system with water to level of highest drain or opening above roof. System shall hold test water 30 minutes without leaks.

3.9 ROOF DRAIN PIPING INSULATION

A. After successful testing of roof drainage system, insulate piping and existing piping system as specified in this section.

B. Rod out all roofing drains and test existing and new system for leaks.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Roof Drains: Installation of new, replacement of existing and/or refurbishment.

B. Related Sections
1. Section 02 41 16 - Selective Demolition: Demolition of existing roof membrane.

2. Section 07 51 13- Built-Up Asphalt Roofing: Preliminary roof membrane.

****OR****

3. Section 07 54 00 - Modified Bitumen Capped Asphalt Built-Up Roofing: Preliminary roof membrane.

1.2 REFERENCES

A. ANSI (American National Standards Institute)
1. A112.21.2 - Roof Drains

1.3 DESCRIPTION OF WORK

A. Remove and re-install the existing roof drain assemblies as required by the increased deck thickness and refurbish. Replace damaged or deteriorated drains as required or install new drains where indicated on plans. New and replacement drains shall be per product description in Part 2 of this Section.

1.4 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.

C. Manufacturer's Installation Instructions: Indicate assembly and support requirements.

1.5 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Division 1.

1.6 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Division 1.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver to site, store, protect and handle products under provisions of Division 1.

B. Accept roof drains on site in original factory packaging. Inspect for damage.

1.8 PROJECT/SITE CONDITIONS

A. Existing Conditions:
1. Verify existing conditions, such as soundness of perimeter conditions, and varying deck and wall thickness for length of anchoring services required and other visible conditions prior to Bidding
2. Report conflicts and problems to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.

PART 2 PRODUCTS

2.1 ROOF DRAINS (Replacement)

A. Manufacturers:
1. J.R. Smith Model 1010 (Basis of Design)
2. Zurn
3. Josam
4. Wade

B. Roof Drains:
1. Body: Lacquered cast iron with sump. Threaded bottom or optional side discharge outlet suitable for application.
2. Dome: Removable cast iron with vandal proof screws.
3. Accessories: Membrane flange and membrane clamp with integral gravel stop, with adjustable under deck clamp and roof sump receiver.
4. Nipple: Single end threaded Cast iron or steel nipple of sufficient length (min. 8") for use with no-hub connection to PVC. Type per drain manufacturer.

2.2 ROOF DRAINS (Refurbishment)

A. Manufacturers:
1. The contractor shall provide new replacement components from the original manufacturer of the existing drain assembly.

B. Roof Drain Refurbishment
1. Replace exposed parts of drain (includes studs, nuts, bolts, clamping rings. domes and associated hardware).
2. Replacement parts shall be from the original manufacturer of the drain being refurbished.
3. Provide removable cast iron dome with vandal proof screws.
4. Rust inhibitive coating.
5. Application tools.

PART 3 EXECUTION

3.1 PREPARATION

A. Verify that all existing roof leader piping has been cleaned and tested for proper operation prior to proceeding with the installation of roof drains

B. Coordinate cutting and forming of roof construction to receive drains.

3.2 INSTALLATION

A. New Roof Drains:
   1. Install roof drains and connecting piping in accordance with description in Section 22 14 13 and with roof drain manufacturer's instructions

B. Roof Drain Refurbishment
   1. Verify that the seal between the existing roof leader piping and the roof drain body is secure and watertight; both prior to and upon completion of the roof drain refurbishment.
   2. Remove all existing components to expose drain body casting. Clean, wire brush, and/or sandblast the cast drain body as required achieving SSPC Commercial Blast SP6 surface preparation conditions or better.
   3. Apply a minimum of two coats of an epoxy rust inhibiting primer and finish coat to the roof drain body, install all new components as listed above.

3.3 TESTING

A. Test existing and new roof drains. Rod out existing drains before reroofing and every drain after reroofing work is completed. Plug and fill the complete drainage system with water to level of highest drain or opening above roof. System shall hold test water 30 minutes without leaks.

3.4 ROOF DRAIN INSULATION

A. After successful testing of roof drainage system, insulate piping and existing piping system as specified in Section 22 07 19.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Basic Mechanical Requirements specifically applicable to Division 23 Sections, in addition to Division 1 - General Requirements.

1.2 DESCRIPTION OF WORK

A. The extent and location of work is described by provisions of this section and includes the following:
   1. Removal and reinstallation of roof top equipment.
   2. Removal of all cables, conduits, pipes, fixtures, and such items related to this trade as governed and required by the specified roof installation; raising of curbs and supports; reinstallation and re-connection of all said equipment.

1.3 WORK SEQUENCE

A. Install work in stages to accommodate Owner's occupancy requirements during the construction period coordinate mechanical schedule and operations with Owner and Architect.

1.4 SUBMITTALS

A. Submit under provisions of Division 1.

B. Submit shop drawings and product data grouped to include complete submittals of related systems, products, and accessories in a single submittal.

C. Mark dimensions and values in units to match those specified.

1.5 REGULATORY REQUIREMENTS

A. Conform to applicable Florida Building Code.

1.6 PROJECT/SITE CONDITIONS

A. Existing Conditions
   1. This project involves mechanical work on existing building(s). Verify existing conditions and other visible conditions prior to bidding.
   2. Report conflicts and problems to the Architect prior to bidding for resolution. Failure to report these conflicts and problems places the responsibility on the Prime Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.
   3. Failure to install the work in strict accordance with provisions of this Section is subject to total rejection of work specified herein.
   4. Failure to install the work in strict accordance with provisions of this Section is

subject to total rejection of work specified herein.

B. Utility Services
   1. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by Owner and authorities having jurisdiction.
   2. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

C. Install Work in locations shown on Drawings, unless prevented by Project conditions.

1.7 SEQUENCING AND SCHEDULING

A. Construct Work in sequence under provisions of Section 01 11 00.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 ROOF-TOP EQUIPMENT PROCEDURE

A. Operate mechanical equipment in the presence of representatives of the Contractor and representatives of the Owner prior to any demolition, or prior to disconnecting any mechanical equipment or wiring in order to establish that all these systems are in proper working order at the start of the project. This would establish the degree of responsibility that this Contractor will have when they are required to place these mechanical/electrical systems back in working order at the end of the project.

B. Removal
   1. Prior to disconnection of any mechanical equipment, prepare a performance log (attached at end of this Section) for each item of equipment. Submit log sheet with any comments as to existing problems to the Architect or Architect's representative.
   2. Temporarily remove existing roof top equipment as required to perform work. Use all means necessary to protect equipment during removal.
   3. Store equipment in a secure place for reinstallation.

C. Reinstallation
   1. Reinstall mechanical equipment in accordance with the manufacturer's instructions.
   2. Reconnect electrical and control wiring to equipment and comply with equipment manufacturer's instructions.
   3. Reinstallation and reconnection of equipment shall comply with governing mechanical codes.
   4. Start up equipment after reinstallation. Prepare performance log for each unit at start-up and submit to the Architect.

D. Coordination with Roofing

1. Cables, conduits, pipes, fixtures, and such related items shall not be in direct contact with roof membrane, roofing sheet metal, and related roofing accessory items, except as shown on drawings and as specified.

END OF SECTION

PERFORMANCE LOG DATA SHEET: EXHAUST FAN

Date:_____ Time: _____

Project: _____

Prime Contractor: _____

Mechanical Subcontractor: _____

Exhaust Fan:_____

Equipment Manufacturer: _____

Model Number: _____

Serial Number: _____

Location: _____

Rated Voltage: _____

Fan Motor Amperage Actual:_____

Fan R.P.M.: _____

General Description of physical appearance of the unit and associated duct work:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

PERFORMANCE LOG DATA SHEET: AIR CONDITIONING EQUIPMENT

Date: _____ Time: _____

Project: _____

Prime Contractor: _____

Mechanical Subcontractor: _____

Air Conditioning Equipment:_____

Equipment Manufacturer: _____

Model Number: _____

Serial Number: _____

Location: _____

Description of Control System: _____

Operating Voltage: _____

Fan Amperage: Rated _____ Actual: _____

For R.P.M.

Compressor Amperage: Rated: _____ Actual: _____

Evaporator Motor Amperage: Rated: _____Actual: _____

Pressure: Suction:_____ Oil:_____ Discharge:_____

Evap. Air Temp. F: Entering:_____ Leaving:_____

Coil Condition - Evaporation: _____

Coil Condition - Condenser: _____

General description of physical appearance units: _____

_____

_____

_____

_____

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Basic Electrical Requirements specifically applicable to Division 26 Sections, in addition to Division 1 - General Requirements.

1.2 SCOPE OF WORK

A. Electrical Contract work includes:
1. Disconnection and reconnection of roof top equipment.
2. Removal of all abandoned cables, conduits, pipes, fixtures, and such items related to this trade as governed and required by the specified roof installation; raising of curbs and supports.
3. Extension of branch circuit and equipment connections due to raising of curbs and supports.
4. Reinstallation and reconnection of all said equipment to be retained.
5. Relocation of roof top cables and conduit to below deck.

1.3 WORK SEQUENCE

A. Install work in to accommodate Owner's occupancy requirements during the roof replacement period. Coordinate electrical schedule and operations with Owner and Architect/Engineer and other Trades.

1.4 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Electrical work to be done by a licensed electrical contractor. The electrical supervisor shall be present while work is being performed.

C. Submit shop drawings and product data grouped to included complete submittals of related systems, products and accessories in a single submittal.

D. Mark dimensions and values in units to match those specified.

1.6 REGULATORY REQUIREMENTS

A. Electrical: Conform to NFPA 70, National Electrical Code, (N.E.C.), - Current Edition.

B. Life Safety: NFPA 101 Life Safety Code, Current Edition.

C. Electrical work to be done by a licensed electrical contractor. The electrical supervisor shall be present while work is being performed.

D. Install all work in accordance with the latest edition of all applicable regulations and governing codes including the Florida Building Code (current edition).

1.7 PROJECT CONDITIONS

A. Existing Conditions:
1. This project involves electrical work on existing building(s). Verify existing conditions and other visible conditions prior to bidding.
2. Report conflicts and problems to the Architect prior to bidding for resolution. Failure to report these conflicts and problems places the responsibility on the Prime Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.
3. Failure to install the work in strict accordance with provisions of this Section is subject to total rejection of work specified herein.

B. Install Work in locations shown on Drawings, unless prevented by Project conditions.

C. All dimensions indicated on the drawings are based on project record drawings and field measurements. Make necessary reasonable adjustments to quantities in field in order to provide a complete project.

D. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of Owner and Architect/Engineer before proceeding.

1.8 SEQUENCING AND SCHEDULING

A. Construct Work in sequence under provisions of Section 01 11 00.

B. Coordinate all work with Roofing Contractor.

C. Notify Owner, in writing, at least 48 hours in advance of any service interruptions.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS THAT WORK BE COMPLETE

A. Provide same products or type of construction as that in existing equipment.
1. Generally, Contract Documents do not define products or standards of workmanship present in existing installation. The Contractor shall determine products by inspection/testing and workmanship by use of the existing as a sample for comparison.

B. Presence of a product, finish, or type of equipment requires that reinstallation shall be performed as necessary to make work complete and consistent with identical standards of quality of existing product.

2.2 Anchors and Fasteners: Use anchors and fasteners of a type designed and intended for use in the base material to which the material or support is to be attached and capable of supporting the intended load and withstanding any associated stresses and vibrations. Do not use wooden plugs for fastening.

PART 3 EXECUTION

3.1 INSPECTION AND PREPARATION

A. Inspection:
1. Examine conditions under which electrical work is to be performed and notify Prime Contractor and Architect in writing of unsatisfactory conditions.
2. Do not proceed with electrical work until unsatisfactory conditions have been corrected.
3. All electrical equipment and systems should be operated in the presence of representatives of the Contractor and representatives of the Owner prior to any demolition, or prior to disconnecting any electrical wiring in order to establish that all these systems are in proper working order at the start of the project. This will establish the degree of responsibility that this Contractor will have when they are required to place these electrical systems back in working order at the end of the project.

B. Disconnection:
1. List and disconnect existing roof top conduits as shown on the drawings.
a. Prior to disconnection of any electrical system, prepare a checklist of existing system conditions.
b. Submit the checklist with any comments to the Architect.

3.2 INSTALLATION

A. General:
1. Use good workmanship in the installation of all electrical materials and equipment.
2. Install equipment level, plumb and true with the structure and other equipment.
3. Firmly secure all materials in place.
4. Materials embedded in concrete or masonry or otherwise part of the structure are considered sufficiently supported.
5. Use hardware and accessory fittings of a type designed, intended and appropriate for the use and complement the items with which they are used.

B. Wiring Methods:
1. Install all wiring in conduit or approved raceways unless otherwise indicated.

2. Firmly and securely fasten conduits to or support from the building or structural member. Use changes and supports that are standard catalog items of a type compatible with the suitable for the intended use. Twisted wire hangers and supports are not acceptable.
3. Do not pull conductors into conduits until all work which may cause damage to the wires is completed. Install wire and cables so as not to damage the insulation or cable sheath. Pull all conductors to be installed in a raceway together.
4. Keep conductor splices to a minimum. Provide splices and taps with at least the equivalent mechanical strength and insulation as the conductors. Provide splice and tap devices of the proper size and type for the use and compatible with the conductor material.

C. Reconnection: Reconnect electrical systems as specified above, and test for proper operation.
1. Reinstallation and reconnection of equipment and systems shall comply with governing electrical codes.
2. Prepare a checklist of system conditions after reconnections.
3. Submit the checklist with any comments to the Architect.

D. Electrical conduits, pipes, wires, cables, fixtures, and such related items shall not be in contact with roof membrane, roofing sheet metal, and related roofing accessory items, except as shown on drawings and as specified.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Air terminals and interconnecting conductors.

B. Grounding and bonding for lightning protection.

1.2 RELATED SECTIONS

A. Section 07 61 013- Metal Roofing and Siding

B. Section 07 54 00 - Thermo-Plastic Single-Ply Roofing.

C. Section 07 62 00 - Sheet Metal Flashing and Trim

D. Section 26 05 00 - Basic Electrical Requirements.

1.3 REFERENCES

A. LPI-175 - Lightning Protection Installation Standard.

B. LPI-176 - Lightning Protection System Material and Components Standard.

C. LPI-177 - Inspection Guide for LPI Certified Systems.

D. NEC - National Electric Code.

E. NFPA 78 - Lightning Protection Code.

F. UL 96 - Lightning Protection Components.

G. UL 96A - Installation Requirements for Lightning Protection Systems.

1.4 SYSTEM DESCRIPTION

A. Lightning Protection System: Conductor system protecting the entire roof area of this project, and consisting of air terminals on roofs, roof-mounted mechanical equipment, parapets, bonding of structure and other metal objects; grounding electrodes; and interconnecting conductors. System to be compatible with the new roofing system installed and acceptable to the roofing manufacturer due to their warranty requirements.

1.5 DESCRIPTION OF WORK

A. Removal of existing and installation of new lightning protection system.

B. Installation and anchorage of the lightning protection system must be as illustrated in

the project details to avoid contributing to future water infiltration problems. Any installed materials damaged by the installation of the lightning protection system will be replaced at the contractor's expense.

1. Provide a support pad, such as a precast concrete paver, at all points of anchorage for cables and air terminals within the field of the thermoplastic single-ply roof, designate locations required in field for installation by the roofing contractor.
2. Provide a non-penetrating support, such as a "clamp-on" anchorage clip, at all points of anchorage for cables and air terminals within the field of the metal roof and/or siding system, designate locations required in field for installation by the roofing contractor.

C. Upon completion of the installation of the Lightning Protection System, the entire lightning protection system shall be certified and a U.L. Master Label issued for the system. Installing contractor shall provide the necessary engineering drawings to perform, and permit, the work necessary to reach this goal. Provide and install any additional material and equipment as required to install a U.L. Master Label certified system.

1.6 SUBMITTALS FOR REVIEW

A. Section 01 33 00 - Submittals: Procedures for submittals.

B. Shop Drawings: Indicate layout of air terminals, grounding electrodes, and bonding connections to structure and other metal objects. Include terminal, electrode, and conductor sizes, and connection, termination and anchorage details.

C. Product Data: Provide dimensions and materials of each component, and include indication of listing in accordance with UL 96.

1.7 SUBMITTALS FOR INFORMATION

A. Section 01 33 00 - Submittals: Submittals for information.

B. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

C. Submit certificate of compliance from authority having jurisdiction, Underwriter's Laboratories, Lightning Protection Institute indicating approval of lightning protection systems.

1.8 PROJECT CLOSEOUT SUBMITTALS

A. Section 01 77 00 - Closeout Procedures: Submittals for project closeout.

B. Record actual locations of air terminals, grounding electrodes, bonding connections, and routing of system conductors in project record documents.

1.9 QUALITY ASSURANCE

A. Perform Work in accordance with NFPA 78.

B. Perform Work in accordance with UL 96A and provide Master Label.

C. Perform Work in accordance with LPI-175 and provide LPI Certification.

D. Maintain one copy of each document on site.

1.10 QUALIFICATIONS

A. Manufacturer: Company specializing in lightning protection equipment with minimum five years documented experience and member of the Lightning Protection Institute.

B. Installer: Authorized installer of manufacturer with minimum five years documented experience on projects utilizing UL Master Label lightning protection systems and certified by the Lightning Protection Institute.

1.11 PROJECT CONDITIONS

A. Existing Conditions

1. Verify existing conditions, such as soundness of perimeter conditions, and varying deck and wall thickness for length of anchoring surfaces required and other visible conditions prior to bidding.

2. Report conflicts or problems to the Architect for resolution prior to Bidding. Failure to report these conflicts and problems places the responsibility on the Contractor to complete the work in accordance with the Documents at no additional cost to the Owner.

3. It is unknown as to whether the current lightning protection system currently carries a U.L. Master Label, this should be verified in the field by the contractor prior to bidding. The contractor shall take the current conditions into account, and plan for any additional work and/or investigation required to provide a U.L. Master Label for the new lightning protection system upon completion.

4. Replace or restore to original condition any materials or work damaged during construction.

1.12 REGULATORY REQUIREMENTS

A. Product Listing: UL 96 and LPI-176.

1.13 PRE-INSTALLATION CONFERENCE

A. Section 01 31 00 - Coordination and Meetings: Pre-installation meeting.

B. Convene one week minimum prior to commencing work of this section.

1.14 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings.

1.15 COORDINATION

A. Section 01 31 00 - Coordination and Meetings.

B. Coordinate work with roofing and exterior and interior finish installations.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Harger Lightning Protection, Inc.

B. Heary Brothers Lightning Protection, Inc.

C. Thompson Lightning Protection, Inc.

D. East Coast Lightning Equipment, Inc.

E. Section 01 60 00 - Materials and Equipment: Product options and substitutions. Substitutions permitted per section 01 25 00.

2.2 COMPONENTS

A. Air Terminals: Air terminals shall be 1/2" by 12" for Class 1 installations and 5/8" by 12" for Class 2 installations solid aluminum and shall extend at least 10 inches above the object to be protected. All air terminal bases shall be cast aluminum. The air terminals shall be spaced so as not to exceed 20' apart around the outside perimeter of the roof or the ridge and not over 50 feet apart through the center of flat roof areas. The air terminals in the center roof area shall be 5/8" by 24" solid aluminum.

1. All air terminal bases at parapet level shall be mechanically attached to the interior vertical face of the coping cap as per details.

2. Air terminals in the center of the thermoplastic single-ply roof area shall be by mechanically attached to a precast concrete paver which is to be adhered to the roofing system by means of roofing manufacturer approved mastic.

3. Air terminals in the center of the metal panel roof area shall be by mechanically attached to a “clamp-on” type support clip or block secured to the standing seam between panels.

B. Decorations: None

C. Grounding Rods: Solid aluminum.

D. Ground Plate: Aluminum.

E. Conductors: Conductors shall consist of UL listed 28 strands of 14 gauge aluminum wire weighing 115 lbs. per 1000 feet minimum, and installed in accordance with the UL Code. Conductor sizes shall be sized for Class type as mandated by height requirements.

F. Cable Connections: Bolted pressure clamp type shall be used. Crimp type connections shall not be used. All connectors to be cast aluminum.

G. Anchor Plates for Conductors: Aluminum with the bases required for mechanical attachment to flashing metal and roof-top concrete paver installations.

PART 3 EXECUTION

3.1 INSTALLATION

A. Prior to installation, the lightning protection contractor shall identify the location of cable and air terminals connection plates to the roofing contractor in order that the precast concrete mounting pavers can be installed on the roof surfaces. The roofing contractor shall provide 6" x 6" pavers for cable connectors and air terminal connector plates. Pavers are to be fully adhered to the an additional piece of cap sheet membrane which has been fully adhered .

B. Lightning protection contractor to provide the approximate number of pads required to the roofing contractor for bidding purposes.

C. Install in accordance with NFPA 78, UL 96A, and LPI-175.

D. Connect conductors using mechanical connectors and/or a exothermic welding process. Protect adjacent construction elements and finishes from damage.

E. Bond exterior metal bodies on building to lightning protection system, and provide intermediate level interconnection loops 60 feet (18 m) on center.

F. During installation, no penetration of the roofing membrane and/or flashing components by mechanical fasteners is permitted, adhesive attachment of the base and anchor plates is required. Mechanical attachment to the parapet coping skirt metal shall be as detailed in the project manual.

G. Where any part of the protection system is exposed to mechanical injury, it shall be protected by a nonconductive material. If metal pipe or tubing is used for protecting conductors, the conductor shall be electrically connected to the pipe or tubing at both ends. Conceal down conductors in PVC (Schedule 40) conduit.

H. Connect Copper equipment to aluminum surfaces using UL recognized bimetal transition fittings. Lead coating is not acceptable as a bimetal transition fitting.

I. Roof Conductors: A perimeter cable shall be installed around the entire main roof, and all penthouses and cooling towers. Each perimeter cable shall be connected to at least (2) down leads, providing a two-way path to ground for each air terminal. All center roof air terminals shall be interconnected with conductors to the outside perimeter cable. Conductors on the flat roof areas may be run exposed. Ground connections shall be made around the perimeter of each roof and to the main down conductor at a maximum distance of 100'-0" on center.

J. Down Conductors: Existing shall be used where properly tested and approved for UL labeling. New down conductors shall be concealed installed in 1" PVC (Schedule 40) conduit. Each perimeter roof cable shall be connected to at least two down leads. The average distance between down leads shall not exceed 100' from upper roof to lower roof, or from roof to ground terminals. Irregularly shaped structures may require extra down conductors to provide a two-way path to ground from each air terminal.

K. Interconnection of Metals: All metal bodies within 6' of the conductor shall be bonded to the system with proper fittings and conductor. Connections between dissimilar metals shall be made with UL recognized bimetallic connections.

1. Bonding of all metallic objects and systems at roof levels and elsewhere on the structure shall be complete. Primary bonds for metal bodies of conductance shall be bonded with appropriate fittings and full-size conductor; and shall consist of, but not limited to the following: Roof exhaust fans, HVAC units with related piping ductwork, exhaust vents and any other roof piping systems, cooling towers, and rail systems, window washing tracks, antenna mast for TV, radio or microwave, flag poles, roof handrails and/or decorative screens, roof ladders, skylights, metal plumbing stacks, etc. Exterior architectural metal fascia and/or curtain walls or mullions, which extend the full height of the structure shall also be bonded, if not inherently bonded thru the building frame.

2. Metal bodies of inductance located within 6' of a conductor or object with secondary bonds, shall be bonded with secondary cable and fittings. Typical of these are: roof flashings, parapet coping caps, gravel guards, isolated metal building panels or siding, roof drains, down spouts, roof insulation vents and any other sizeable miscellaneous metals, etc.

L. Concealed Conductors: All concealed conductors shall be installed in 1" PVC (Schedule 40) Conduit.

M. Fasteners: Conductor fasteners shall be UL recognized type of non-corrosive metal, have ample strength to support conductors and shall be spaced not to exceed 3'-0" centers. Adhesive type cable fasteners shall be spaced every 3'-0".

N. Roof Penetration: Wherever the cable penetrates the roof, a stainless steel sleeve type flashing system with a PVC gooseneck entrance conduit shall be furnished by the lightning protection contractor and installed by the roofing contractor. Wood nailing blocks shall be furnished and installed by the general contractor. All patching and masonry work shall be furnished and installed by the general contractor.

O. Grounding: The system shall be connected to the existing grounding terminals located at the base of the structure. Ground connections shall be made around the perimeter of the structure and in no case shall average over 100'-0" apart. Ground terminals shall be 5/8" in diameter and shall be driven to a minimum depth of 32'-0". One ground shall have connection to the water system where the water supply enters the building. In case of rock ledge or other conditions making it impossible to comply with the above, trenching or a copper ground plate will be permitted; providing it will meet UL requirements.

P. Common Grounding: Provide necessary common grounds between the lightning protection system and the electric and telephone service entrance cables, TV and radio antenna grounds.

Q. Remodel Work: Provide removal and reinstallation of existing system as required to perform new construction. Provide temporary connections required to maintain existing lightning protection affected by new construction. Permanently bond together any existing systems to new system.

3.2 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Assurance: Field inspection, testing, and adjusting.

B. Obtain the services of Underwriters Laboratories, Inc. to provide inspection and labeling of the lightning protection system in accordance with UL 96A.

C. Perform inspection and testing in accordance with LPI-177.

3.3 PROJECT COMPLETION: At the completion of the project, deliver the following to the Owner:

A. Three copies of the As-built Drawings.

B. UL Master Label; attached to the building per Owner’s direction.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Application of soft wash, chemical roof cleaning products and low pressure rinse to remove black streaks, dirt, mildew, algae, lichens, moss, fungus on modified bitumen, single-ply, metal and non-porous roof systems.

1.2 PERFORMANCE REQUIREMENTS

A. Provide labor and equipment necessary for application of products per manufactures recommendations.

B. Trim or cut back small amounts of vegetation overhanging roof system. Coordinate on-site with owner for extensive growth.

1.3 SUBMITTALS

A. Refer to DIVISION 1, Section 01 30 00 for submittal procedures and qualification Requirements.

1.4 QUALITY ASSURANCE

A. Qualifications: Contractor will provide equipment satisfactory to accomplish the assigned task and will provide workmen with experience in pressure washing surfaces on restoration projects of similar type and nature.

1.5 REFERENCES

A. USDA 657-152 HT-69 1992- How to recognize & control sooty molds

B. CERCLA – SARA Hazard Category

C. Sara Section 313

D. Toxic substance control act TSCA 12(b)

E. OSHA – 29 CFR 1910.1200

1.6 DEFINITIONS

A. Soft Roof Washing – Cleaning specified exterior using water at a pressure 200 psi or below.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver to site, store, protect and handle products under provisions of Division 1.

B. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

C. Container label to include manufacturer's name, type of cleaner brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, , and instructions for diluting.

D. Protect from freezing. Always keep the container tightly closed and store in a cool dry place at temperatures between 40-80°F (4-27°C).

1.8 ENVIRONMENTAL REQUIREMENTS

A. Disposal should be in accordance with applicable, regional, national and local laws and regulations

PART 2 PRODUCTS

2.1 APPROVED APPLICATIONS

A. Verify products can be used with type of roof membranes. Following type of products are acceptable for cleaning and maintenance.
   a. Oxygen based – Potassium-free , for use on fungus and algae
   b. Chlorine bleach – diluted with water – removed with soft wash, for use on mildew, mold, fungus and algae.
   c. Copper sulphate – diluted with water – removed with soft wash, for use on mildew, mold, fungus and algae.
   d. Emulifiers – removal of dirt, grime and grease along galvanized roofing.
   e. Tri-sodium phosphate – dilute with water per instructions – removed with a soft wash. Removes mold & mildew.
   f. Eco-friendly cleaners – No heavy metals, lye or phosphates.
   g. Scrapper – Mechanical remover.
   h. Brushes – Long handled non-metallic brushes for use on membranes.

2.2 APPROVED PRODUCTS

A. Concentrates - Confirm with roof manufactures acceptable cleaning products and methods for type of system to avoid voiding warranties in place. Concentrate cleaners for outdoor use only. Products include:

   1. QSE Pro Roof Cleaning
   2. Zinsser
   3. Gaco Western
   4. Wet and forget
   5. Oxiclean
   6. Spray and forget
   7. Simply Green

8. Lindermann

B. Detergents/household Cleaners (For Painted Surfaces) – Products should be have no more than 0.5% phosphate and dissolved into five (5) gallons of warm water for one (1) cup of cleaner per recommendation.

1. Tide
2. Household Ammonia

C. Chemical Cleaners (For Unpainted Galvalume) – Use with a wet sponge or rag per manufactures recommendations

1. Bon Ami
2. Clorox Soft Scrub
3. Oakite 84m

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify the areas to be pressure washed and determine acceptable to Manufactures and approved techniques for surface conditions.

B. Periodic Maintenance should be conducted. Areas of concern are:

1. Valleys – For build-up of windblown debris, which can block free drainage and cause water to back up under the panels instigating damage to the paint.
2. Roof Penetrations – Build-up of windblown debris and cracking of penetration seal along flashing “boot”.
3. Trims and Flashing- Loose or missing trim work.

3.02 PREPARATION

A. Remove heavy deposits of dirt, leaves and other debris from the roof using broom or air broomer then inspect the entire roof surface and flashings for any open seams, tears, cuts, etc.

B. Repairs these flaws so water is not blown in under membrane during cleaning process.

3.03 APPLICATION

A. **Pre-application**:

1. Treat heavy areas of stain per manufactures recommendations before fully cleaning roof areas.

B. **Single-ply Membrane Only**:

2. Use pressure-washing equipment set with a maximum pressure of **200 PSI or** hose with maximum pressure of 65 psi. Apply to designated areas 6" minimum from surface as necessary to clean, but without causing unnecessary damage to that particular membrane or to adjacent membrane and materials. If necessary to protect adjacent surfaces and materials, erect temporary waterproof barriers.

3. Diluted chemicals shall be used to remove fungus, mold, lichens, algae, mildew, dirt and other existing deteriorated surface materials. In locations where pressure washing or soft washing is unsuccessful in removing certain stains, special cleaners shall be used and worked into the surface with a scrubbing brush before rinsing off. All cleaning agents shall be environmentally safe or diluted to such an extent.

    a. Visual inspect membrane for physical damage, tears or holes. Any exposure of the insulation system below the membrane will require patching before entire roof cleaning.
    b. Identify type of stain problem such as; dirt, algae, moss, lichens, mold or grease. Use the appropriate type of cleaner per manufactures recommendations.
    c. Apply cleaning agent per manufactures recommendations and concentration.
    d. Rinse application: Rinse stains as directly as possible;
        1) Garden hose with an adjustable spray nozzle
        2) Water Hose (Garden Hose Powered)
        3) Pressure Washer (using 80/10 tip fan spray max. psi 200)
        4) Water broom (pressure washer powered max. psi 200)

B. **Modified Bitumen Membrane and Shingle**

1. Diluted chemicals shall be used to remove fungus, mold, lichens, algae, mildew, dirt and other existing deteriorated surface materials. In locations where soft washing is unsuccessful in removing certain stains, special cleaners shall be used and worked into the surface with a scrubbing brush before rinsing off. All cleaning agents shall be environmentally safe or diluted to such an extent.

    a. Visual inspect membrane for physical damage, tears or holes. Any exposure of the insulation system below the membrane will require patching before entire roof cleaning.
    b. Identify type of stain problem such as; dirt, algae, moss, lichens, mold or grease. Use the appropriate type of cleaner per manufactures recommendations.
    c. Apply cleaning agent per manufactures recommendations and concentration.
    d. Rinse application: Rinse stains as directly as possible;
        1) Garden hose with an adjustable spray nozzle

2) Water Hose (Garden Hose Powered)
3) Pressure Washer (using 80/10 tip fan spray max. psi 200)
4) Water broom (pressure washer powered max. psi 200)

C. **Painted/Coated Metal Panels** - Mild solutions or detergents can be used for removal of most dirt. Mechanical scrubbing with sponge or a very soft bristle brush and low pressure spray washers can be used in conjunction. **(Do not use wire brushes, steels wool, sandpaper, scouring powders or industrial solvents).**

1. PPG Surfaces (Coil & Extrusion) & PVDF Resin Based Surfaces:

a. Hot or Cold Detergent Solutions - A 5% solution in water of commonly used commercial and industrial detergents will not have any deleterious effect on a Coil or Extrusion surface. These solutions should be followed by an adequate rinse of water. Use cloth, sponges or a soft bristle brush for application. Cleaning should be done on the shaded side of the building or, ideally, on a mild, cloudy day.

b. Solvents - Most organic solvents are flammable and/or toxic, and must be handled accordingly. Keep away from open flames, sparks and electric motors. Use adequate ventilation, protective clothing and goggles. Remove non-water soluble deposits (tar, grease, oil paint, graffiti, etc.) from Coil & Extrusion surfaces using these solvents with caution:

c. Alcohols –
1) Denatured alcohol (ethanol)
2) Isopropyl (rubbing) alcohol
3) Methanol (wood alcohol)

d. Petroleum Solvents –
1) VM&P naphtha
2) Mineral spirits
3) Turpentine (wood or gum spirits)

e. Aromatic Solvents - (These solvents should be used with caution on a Coil & Extrusion surfaces. Limit contact to five minutes. Test a small area first.)
1) Xylol (xylene)
2) Toluol (toluene)

f. Ketones, Esters, Lacquer Thinner –
1) Xylol (xylene)
2) Toluol (toluene)

g. Ketones, Esters, Lacquer Thinner (These solvents should be used with great caution on a Coil or Extrusion surface. Limit contact to one

minute. Test a small area first. Panel manufacturer and coating supplier are not responsible for damage from unrestricted use of these).-

1) Methyl ethyl ketone (MEK)
2) Methyl isobutyl ketone (MIBK)
3) Ethyl acetate (nail polish remover)
4) Lacquer thinner

h. Acetone/Paint Remover - *Do not use acetone or paint remover on Coil or Extrusion surfaces.*

i. Chemical Solutions (Hydrochloric acid (10% muriatic acid), diluted with ten volumes of water, may assist in removing rust or alkali mortar stains from Coil & Extrusion surfaces. Limit contact to five minutes. Caution: Acid solutions are corrosive and toxic. Flush all surfaces with water after use. Oxalic acid solutions or acetic acid (vinegar) may be used for the same purpose. Flush with water after use. Laundry bleach may assist in removing certain stain)-

1) Sodium hypochlorite solution (laundry bleach, Clorox)
2) Hydrochloric acid (muriatic acid)
3) Oxalic acid, Acetic acid (vinegar)

j. Mildew Removal **-** Remove mildew with a basic solution of the following:

1) 1/3 cup detergent (Tide, for example)
2) 2/3 cup trisodium phosphate (Soilex, for example)
3) 1 quart sodium hypochloride, 5% solution (Clorox, for example) Rinse with clear water immediately.

k. Excess Sealant - Removal Precautions should be taken to prevent sealants from getting on the painted surface. Sealants may be very difficult to remove. If any does get on a Coil or Extrusion surface, it should be removed promptly with a solvent such as alcohol or a naphtha type.

Caution: It may be possible for solvents to extract materials from sealants which could stain the painted surface or could prove harmful to sealants; therefore, these possible effects must be considered. Test a small area first

3.04 FIELD QUALITY CONTROL

A. The Owner reserves the right to visit and inspect the progress of the work and to ensure the adequate protection of occupied and unoccupied areas adjacent to the site of the work.

3.05 SPECIAL REQUIREMETS

A. Special care shall be taken at areas of the building with vulnerable joints which may allow water to penetrate the structure and/or enter occupied spaces. Care must also be taken to minimize over-spray, especially during windy conditions.

B. The operation of noisy equipment may be restricted between certain hours of the day. A time frame will be established for the work to maximize production and minimize inconvenience for facility occupants.

3.06 PROTECTION

A. Protect work of other trades. Correct damage by cleaning, repairing or replacing, as directed by Architect. Leave work in undamaged condition.

B. Protect plant and grass areas that are susceptible to chemicals used for cleaning.

END OF SECTION