



**EXHIBIT A:
SPECIFICATIONS FOR ROOFERS
(Excerpted from Construction Specification Institute's MasterFormat)**

SECTION 07 1000 PREPARATION FOR RE-ROOFING

- Part 1 General
 - 1.1 Section Includes A. Removal of existing roofing system in preparation for a new roofing system.
 - 1.2 Project Conditions
 - A. Schedule Work to coincide with commencement of installation of new roofing system.
 - B. Remove only existing roofing materials that can be replaced with new materials the same day.
 - C. Coordinate the work with other affected mechanical and electrical work associated with roof penetrations.
 - D. Protect building and landscaping from damage.
 - 1.3 Material Ownership
 - A. Assume Ownership of demolished materials and remove from Project site and dispose of legally, unless indicated to be reused, reinstalled, or otherwise to remain Owner's property.
 - 1.4 Quality Control
 - A. Work of this section must be completed by the same Installer of the new roofing system.
 - B. When determined present, the Installer must be legally qualified to perform the removal of asbestos containing roofing materials.
 - 1. Comply with governing PA notification regulations. Comply with hauling and disposal regulations of authorities having jurisdiction.
 - 2. Maintain receipt and acceptance of hazardous wastes by licensed landfill facility.
 - 1.5 Environmental Requirements
 - A. Schedule Work to coincide with commencement of installation of new roofing system.
 - B. Maintain continuous temporary protection prior to and during installation of new roofing system.
- 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 that existing roof surface is clear and ready for work of this section.
 - 3.2 Preparation
 - A. Sweep roof surface clean off loose matter.
 - B. Remove loose refuse and dispose of offsite.
 - 3.3 Material Removal
 - A. Remove metal counter flashings, where necessary.
 - B. Remove existing roofing system to wood decking.
 - C. Repair existing wood deck surface to provide smooth working surface for new roof system.
 - 3.4 Temporary Protection
 - A. Provide temporary protective sheeting over uncovered deck surfaces.



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- B. Turn sheeting up and over parapets and curbing. Retain sheeting in position with weights.
- C. Provide for surface drainage from sheeting to existing drainage facilities.
- D. Do not permit traffic over unprotected or repaired deck surface.

SECTION 07 3000 ASPHALT SHINGLE ROOFING

Part 1 General

1.1 Section Includes

- A. Asphalt shingle roofing.
- B. Attic ventilation.
- C. Underlayment.
- D. Associated metal flashings and accessories.

1.2 References

- A. American Society for Testing and Materials (ASTM)– ASTM D226 Asphalt Saturated Organic Felt Used in Roofing and Waterproofing.
- B. ASTM D2178 Asphalt Glass Felt used in Roofing and Waterproofing.
- C. ASTM D3018 Class A Asphalt Shingles Surfaced with Mineral Granules
- D. ASTM D4586 Standard Specification for Asphalt Roof Cement, Asbestos-Free.
- E. ASTM F1667 Driven Fasteners: Nails, Spikes, and Staples
- F. National Roofing Contractors Association (NRCA)–MS104 NRCA Steep Roofing Manual.
- G. Underwriters Laboratories Inc. (UL)–Roofing Materials and Systems Directory.
- H. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)–SMACNA Architectural Sheet Metal Manual.

1.3 Submittals

- A. Product Data: Provide data indicating material characteristics, performance criteria, and limitations.
- B. Shop Drawings: For metal flashings, indicate specially configured metal flashings.
- C. Samples: Provide samples of standard colors of metal flashings, edge trim, shingles, etc., indicating color range and finish/ texture/ pattern for color selection.
- D. Manufacturer's Instructions: Indicate installation criteria and procedures.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.4 Quality Assurance

- A. Perform Work in accordance with the commendations of the NRCA Steep Roofing manual.
- B. Products required to comply with fire resistance criteria: UL listed and labeled.
- C. Comply with all state and local building codes for roofing materials, installation, and inspections.

1.5 Environmental Requirements

- A. Do not install shingles, underlayment, or protection membranes when surface temperatures are below 45 degrees F.

1.6 Delivery and Storage

- A. Deliver materials in manufacturer's unopened bundles or containers with the manufacturer's brand and name clearly marked there on.
- B. Shingle bundle wrapping shall be the label of Underwriters Laboratories, Inc.
- C. Store shingles in accordance with manufacturer's printed instructions. Store roll goods on end in an upright position.



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D. Keep materials dry, covered completely, and protected from the weather.

Part 2 Products

- 2.1 Shingles: Minimum 30-year warranty, Architectural shingle, Class A self-sealing; fungus resistant fiberglass strip shingle roofing over manufacturer's approved under-layment based on slope of roof.
- A. Conforming to ASTM D3018 Type I – Self Sealing; UL certification of ASTM D 3462, ASTM D316 / UL 997 60-mph Wind Resistance and UL Class A Fire Resistance; and complying with local and Florida Building Codes.
 - B. Shingles comprised of a glass fiber mat base with ceramic-ally colored UV resistant mineral surface granules across entire face of shingle; algae resistant copper coated granules with a weight of 205 pounds per square.
 - C. Utilize shingle manufacturer's recommended eave, valley, ridge, etc., protection.
 - D. Acceptable shingle manufacturers include Certain -Teed, GAF, Owens Corning, or approved equal.
 - 1. Color to be selected by the Owner from the manufacturer's standard colors.
- 2.2 Attic Ventilation: Type accepted by roofing manufacturer and installed according to manufacturer's recommendations, as specified, and according to federal, state, and local building codes, whichever is stricter.
- A. Unless otherwise indicated provide one square foot of net free vent area per 150 square feet of attic area to be vented.
 - B. Provide one square foot of net free vent area per 300 square feet of attic area to be vented when the ventilation is balanced between the lower (eave) and upper (ridge) portion of the attic such that a minimum of 40% and no more than 50% of the required net free vent area is provided in the upper portion of the attic.
 - C. All openings greater than 1/8 inch must be screened to prevent insect penetration and louvered to protect against the entrance of rain and snow.
- 2.3 Underlayment: Type accepted by roofing shingle manufacturer and installed according to local and Florida Building Code subsections 1507.3.8.1 and 1507.3.8.2. Two layers of underlayment are required when roof slope is less than 4 inches rise in 12 inches. Shingle manufacturer's recommended eave, valley, ridge, etc., protection shall be utilized.
- A. Fiberglass Felt: ASTM D2178.
 - B. Organic Felt: ASTM D226, Type 1.
 - C. Modified Bitumen: ASTM D1970.
- 2.4 Flashing, Edge/ Rake Trim, etc.
- A. Extruded aluminum complying with ASTM B221, not less than 0.078 inch (2mm) thick with two coat fluoropolymer finish or approved equal.
- 2.5 Fasteners
- A. Roofing Nails: As approved by roofing manufacturer and compliant with local and Florida State building codes.
 - 1. ASTM F1667; Type 1, Style 20 galvanized steel, deformed shanks, with heads 3/8 inch to 7/16-inch diameter.
 - 2. Use nails 1 ¼ inches long for shingles and ¾ inch long for felt.
- 2.6 Accessories
- A. Plastic Cement: ASTM D45856, Type 1.



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Part 3 Execution

3.1 Examination

- A. Verify existing conditions prior to beginning work of this section.
- B. Verify that deck is of sufficient thickness to accept fasteners and meeting local and state building codes.
- C. Verify that roof penetrations and plumbing stacks are in place and flashed to deck surface.
- D. Verify roof openings are correctly framed.
- E. Verify deck surfaces are dry, free of ridges, warps, or voids.

3.2 Preparation

- A. Seal roof deck joints wider than 1/16 inch with deck tape.
- B. At areas where eave protection is to be adhered to substrate, fill knots holes and surface cracks with latex filler.
- C. Broom clean deck surfaces before installing under-layment or eave protection.
- D. Install eave edge flashing light with fascia boards. Weather-lap joints 2 inches and seal with plastic cement. Secure flange with nails spaced 6 inches on center.
- E. Roof accessories, vent pipes, attic vents, and other projections through the roof must be in place and roof flashing installed or ready for installation before laying shingles.

3.3 Fabrication of Metal Work

- A. Form all metal work true to shape, accurate in size, square, and free from distortion or defects.
- B. Form all metalwork in longest possible lengths. Pre-finished extruded shapes are preferred.
- C. Hem exposed edges of all metal work on underside 1/2 inch, miter and seam corners.

**SECTION 07 5000
MODIFIED BITUMINOUS MEMBRANE ROOFING**

Part 1 General

1.1 Section Includes

- A. Modified bituminous roofing membrane, conventional application.
- B. Deck sheathing.
- C. Base flashings.
- D. Roofing accessories.

1.2 References

- A. ASTM D41 – Standard Specification for Asphalt Primer Used in Roofing, Damp proofing, and Waterproofing.
- B. ASTM D312 – Standard Specification for Asphalt Used in Roofing.
- C. ASTM D6164 – Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
- D. National Roofing Contractors Association (NRCA) - ML104 – NRCA Roofing and Waterproofing Manual.



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- E. US Environmental Protection Agency(EPA)– EPA600/R13/116Method for the Determination of Asbestos in Bulk Building Materials.
- F. Cool Roof Rating Council (CRRC): CRRC Product Rating Program

1.3 Submittals

- A. Product Data: Provide manufacturer's product data for membrane and bitumen materials, base flashing materials, and surfacing.
 - 1. Manufacturer's Installation Instructions: Highlight any special procedures required for this project.
 - 2. Manufacturer Certificate: Certify that products meet or exceed specified requirements.
 - 3. Manufacturer's Field Reports: Indicate procedures followed.
 - 4. Manufacturer Certificate(s)indicating compliance with local, State, and Miami-Dade County requirements.
- B. Shop Drawings: Provide manufacturer's drawings for standard details, indicating how they will be used for project and modifications necessary due to alternative conditions. Indicate interface with other materials.
- C. Samples: Submit 2 samples(6x 6 inches) illustrating granule surfaced sheet.
- D. Installer's qualification data is to be submitted with Bids.
- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
 - 1. Submit Contractor's Roofing Warranty, Section 017810.

1.4 Quality Assurance and Control

- A. Perform Work in accordance with NRCA Roofing and Water proofing Manual and manufacturer's instructions.
- B. Installer Qualifications: Company specializing in performing the work of this section with all applicable State of Florida licenses and insurance.
- C. Product / Material Qualifications:
 - 1. Obtain products from single manufacturer or from sources recommended by manufacturer for use with roofing system and incorporated in manufacturer's warranty.
 - 2. Provide manufacturer's certification that field applied bituminous coatings and mastics, and field applied roof coatings comply with limits for Volatile Organic Compounds (VOC)per the National Volatile Organic Compound Emission Standards for Architectural coatings.

1.5 Performance Requirements

- A. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.
- B. Roofing System Energy Performance Requirements: Provide a roofing system identical to components that have been successfully tested by a qualified independent testing and inspection agency to meet the following requirements:
 - 1. Energy Performance: Meet the requirements established by Energy Star and initial solar reflectance not less than 0.70 and emissivitynotlessthan0.75when tested according to

1.6 CRRC-1. Pre-Installation Meeting

- A. Convene one week before starting work of this Section. Meeting will be held at the job site and shall be attended by the Contractor, Subcontractor(if any),designated HCD personnel, and Owner.
- B. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.7 Delivery, Storage, and Protection



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- A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
- B. Store products in weather protected environment, clear of ground and moisture.

1.8 Project Conditions

- A. Coordinate the work with installation of associated flashings and counter flashings as the Work of this Section proceeds.
- B. Do not apply roofing membrane during unsuitable weather.
- C. Do not apply roofing membrane when ambient temperature is below 40 degrees F.
- D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weather proofed the same day.

1.9 Warranty

- A. See Section 017800 for additional warranty requirements.
- B. Correct defective Work within a five (5) year period after the issuance date of the final payment on the Project.
- C. Provide twenty-year manufacturer's material and labor warranty to cover failure to prevent penetration of water.
- D. Roofing System Energy Performance Requirements: Provide a roofing system identical to components that have been successfully tested by a qualified independent testing and inspection agency to meet the following requirements:
 - 1. Energy Performance: Meet the requirements established by Energy Star and initial solar reflectance not less than 0.70 and emissivity not less than 0.75 when tested according to CRRC-1.

1.10 Pre-Installation Meeting

- A. Convene one week before starting Work of this Section. Meeting will be held at the job site and shall be attended by the Contractor, Subcontractor (if any), designated HCD personnel, and Owner.
- B. Review preparation and installation procedures and coordinating and scheduling required with related Work.

1.11 Delivery, Storage, and Protection

- A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
- B. Store products in weather protected environment, clear of ground and moisture.

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- E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weather proofed the same day.

1.13 Warranty

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- B. Correct defective Work with in a five (5) year period after the issuance date of the final payment on the Project.



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- C. Provide twenty-year manufacturer's material and labor warranty to cover failure to prevent penetration of water.

Part 2 Products

2.1 Manufacturers:

- A. Certain Teed—Basis of Design
- B. GAF- product meeting or exceeding criteria specified and Basis of Design.
- C. Siplast- product meeting or exceeding criteria specified and Basis of Design.
- D. Or approved equal product meeting or exceeding criteria specified and Basis of Design.

2.2 Roofing – Conventional Application

- A. Modified Bituminous Roofing: Two ply roofing membrane system -mechanically fastened base ply and self- adhered cap sheet.

2.3 Membrane, Sheet Materials, and Adhesives

- A. Base Ply: Basis of Design, CertainTeed – Flintastic SA Nail base
 - 1. SBS Modified Bitumen, meeting ASTM D4601, Type II and CGSB 37 GP-56M Type2b, Class C, Grade1.
 - 2. Thickness: 60milsper ASTMD5147
 - 3. Tensile Strength: 65 / 40lbs/inch per ASTM D5147 @ 73 degrees F MD/XD.
 - 4. Elongation: 6%/5 % per ASTM D5147 @ 73 degrees F MD/XD.
- B. Cap Sheet: Basis of Design, CertainTeed – Flintastic SA Cap Cool Star
 - 1. SBS Modified Bitumen, meeting ASTMD6164, GradeG, Type1, D7505 and CGSB37, GP-56m, Type1a, Class A, Grade1.
 - 2. Thickness: 160mils.
 - 3. Tensile Strength per ASTMD5147:
 - a. At 73.4+/-3.6 degrees F MD/XD: 80/55lbs/inch.
 - b. At 0+/-3.6 degrees F MD
 - c. /XD: 115/90lbs/inch.

2.4 Manufacturers:

- A. Certain Teed—Basis of Design
- B. GAF- product meeting or exceeding criteria specified and Basis of Design.
- C. Siplast- product meeting or exceeding criteria specified and Basis of Design.
- D. Or approved equal product meeting or exceeding criteria specified and Basis of Design.

2.5 Roofing – Conventional Application

- A. Modified Bituminous Roofing: Two ply roofing membrane system -mechanically fastened base ply and self- adhered cap sheet.

2.6 Membrane, Sheet Materials, and Adhesives

- A. Base Ply: Basis of Design, Certain Teed— Flintastic SA Nail base
 - 1. SBS Modified Bitumen, meeting ASTM D4601, Type II and CGSB 37 GP-56M Type2b, Class C, Grade1.
 - 2. Thickness: 60milsper ASTMD5147
 - 3. Tensile Strength: 65 / 40lbs/inch per ASTM D5147 @ 73 degrees F MD/XD.
 - 4. Elongation: 6%/5 % per ASTM D5147 @ 73 degrees F MD/XD.



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- B. Cap Sheet: Basis of Design, Certain Teed – Flintastic SA Cap Cool Star
 - 1. SBS Modified Bitumen, meeting ASTM D6164, Grade G, Type 1, D7505 and CGSB 37, GP-56m, Type 1a, Class A, Grade 1.
 - 2. Thickness: 160 mils.
 - 3. Tensile Strength per ASTM D5147:
 - a. At 73.4 +/- 3.6 degrees F MD/XD: 80/55 lbs/inch.
 - b. At 0 +/- 3.6 degrees F MD
 - c. /XD: 115/90 lbs/inch.
 - 4. Elongation per ASTM D5147:
 - a. At 73.4 +/- 3.6 degrees F MD/XD: 60%/65%
 - b. At 0 +/- 3.6 degrees F MD/XD: 40%/40%.
 - 5. Dimensional Stability: 0.5% per ASTM D5147.
 - 6. Low Temperature Flex: Pass @ 0 degrees F per ASTM D5147.
 - 7. Tear Strength: 110 / 80 lbs. at 73.4 +/- 3.6 degrees F per ASTM D5147.
 - 8. Top Surface: Highly reflective Cool Star granules (Energy Star approved).
 - 9. Initial Solar Reflectance: CRRC- 0.70 and ASTM E1980 – 86.
 - 10. Aged Solar Reflectance: CRRC-0.59 and ASTM E1980-69.
 - 11. CRRC Thermal Emittance: 0.90.
 - 12. Modified Bitumen Coating: Non-oxidized (flux) asphalt, blended with elastomeric styrene-butadiene-styrene (SBS) polymer.
 - 13. Support Mat: High performance, puncture and tear resistant non-woven polyester and fiberglass scrim combination mat.

- 2.7 Bituminous Materials
 - A. Primer: ASTM D41, asphalt type, as approved by roofing manufacturer.
 - B. Adhesive: ASTM D4479, Typell, as approved by roofing manufacturer.

- 2.8 Attic Ventilation: Type accepted by roofing manufacturer and installed according to manufacturer's recommendations, as specified, and according to federal, state, and local building codes, whichever is stricter, when attic space exists.
 - A. Unless otherwise indicated provide one square foot of net free vent area per 150 square feet of attic area to be vented.
 - B. Provide one square foot of net free vent area per 300 square feet of attic area to be vented when the ventilation is balanced between the lower (eave) and upper (ridge) portion of the attic such that a minimum of 40% and no more than 50% of the required net free vent area is provided in the upper portion of the attic.
 - C. All openings greater than 1/8 inch must be screened to prevent insect penetration and louvered to protect against the entrance of rain and snow.

- 2.9 Flashing, Edge/ Rake Trim, etc.
 - A. Extruded aluminum complying with ASTM B221, not less than 0.078 inch (2mm) thick with two coat fluoropolymer finish or approved equal.

- 2.10 Accessories
 - A. Cant and Edge Strips: Asphalt impregnated wood fiberboard, compatible with roofing material; cants formed to 45 degree angle.
 - B. Sealants: As recommended by roofing manufacturer.
 - C. Fasteners: As recommended by roofing manufacturer and compliant with local and Florida building codes.



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Part 3 Execution

3.1 Examination

- A. Verify that surfaces and site conditions are ready to receive Work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system. Sweep decks to broom clean condition.
- D. Verify deck surfaces are dry.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.
- F. Remove projections that might damage roofing materials.

3.2 Wood Deck Preparation

- A. Verify flatness and tightness of joints of wood decking. Fill knot holes with latex filler.
- B. Confirm dry deck by moisture meter with 12 percent moisture maximum.
- C. Replace any damaged or missing decking. Match existing decking in material and thickness.
- D. Prepare decking as required by roofing membrane manufacturer to provide specified warranty.
- E. When indicated in the Scope of Work Write Up, install roof deck insulation and cover board per Section 072000.
- F. Roof accessories, vent pipes, attic vents, and other projections through the roof must be in place and roof flashing installed or ready for installation before laying shingles.

3.3 Membrane Application

- A. Mechanically attach base ply membrane and self-adhered cap membrane in accordance with manufacturer's instructions and compliant with all local and Florida State building codes.
- B. All plies of membrane roofing shall be installed smooth, free from air pockets, wrinkles, fish-mouths, or tears. Ensure full bond of membrane to substrate.
- C. All membrane installation shall include lapped and sealed edges, with ends permanently waterproof.
- D. At end of day's operation, install waterproof cut-off. Remove cut-off before resuming roofing operations.
- E. At intersections with vertical surfaces:
 - 1. Extend membrane over cant strips and up a minimum of 8 inches onto vertical surfaces.
 - 2. Insert base flashing into reglets secure and counter flash.
- F. Around roof penetrations, mop in and seal flanges and flashings with flexible flashing.
- G. Coordinate installation of roofing and historic scupper, drain locations and related flashings.
- H. Roof Edges and Terminations:
 - 1. Where nailers occur at roof edges or penetrations to receive metal base flashing, apply a continuous strip of under-layment over the nailers before the first ply sheet is applied.
 - 2. After membrane is installed turn the under-layment back over the roofing, and secure in place with cold applied adhesive before installation of metal edges extending out onto the membrane are installed.
 - 3. Where cants occur (at vertical surfaces), cut off roofing sheets two inches above top of cant strips, except where roof accessories have integral cants, extend membrane over cant and up vertical surface to top of curb or nailer.
 - 4. Where fascia-cant occurs at roof edges, extend membrane beyond outside cant face and cut off at outside after base flashing is installed.
 - 5. Where Reglet occurs at vertical surfaces, extend plies roofing sheets up into reglet and full depth of the reglet.



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- I. Base Flashing:
 1. Provide built-up base flashing over cants as necessary to make Work watertight.
 2. Apply flashing on top of roofing, up face of cant and up the face of the vertical surface at least 8 inches above the roofing but not more than 14 inches above the roofing, generally full height beneath counter flashing or top of curb flashing.
 - a. At fascia-cants, extend to top of cant and cut off at top of cant.
 - b. At reglet, extend full depth into the reglet.
 3. Use two plies of modified bituminous sheet.
 - a. Extend the first ply four inches out on the roofing, and the second ply three inches beyond the first ply. Lap ends three inches with joints broken 18 inches in each ply. Use smooth surface modified bituminous sheet for first ply.
 - b. Use granular surfaced modified bitumen cap sheet for second ply.
 4. Set base flashing in a solid application of cold-applied adhesive.
 - a. Set cap sheet in cold applied adhesive with laps sealed with cold applied adhesive.
 - b. Except for venting roof edges, seal the top edge of the base flashing with roof cement.
 5. Except at metal fascia cants, secure top edge of base flashing with nails on a line approximately one inch below top edge, spaced not more than eight inches on center.
 - a. Cover nail heads with roof cement.
 - b. Cover the top of the base flashing with metal counter flashing.
 - c. At the fascia cants secure the top edge of the flashing with fascia compression clamps.

3.4 Cleaning

- A. Remove bituminous markings from finished surfaces.
- B. In areas where finished surfaces are soiled by bitumen or other source of soiling caused by work of this Section, consult manufacturer of surfaces for cleaning advice and confirm to their documented instructions.
- C. Repair or replace defaced or damaged finishes caused by Work of this Section.

3.5 Protection of Finished Work

- A. Protect installed roofing and flashings from construction operations.
- B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

SECTION 07 6200 GUTTERS AN DOWNSPOUTS

Part 1 General

1.1 Section Includes

- A. Gutters and downspouts
- B. Accessories

1.2 References

- A. ASTM A653: Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process.
- B. ASTM A792: Standard Specification for Steel Sheet, 55 percent Aluminum Zinc Alloy Coated by the Hot Dip Process.
- C. ASTM A924: Standard Specification for General Requirements for Steel Sheet, Metallic Coated by the Hot Dip Process.



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D. ASTM B370: Standard Specification for Copper Sheet and Strip for Building Construction.

1.3 Submittals

A. Product Data and sizing calculation.

1.4 Quality Assurance

- A. Manufacturer Qualifications: Manufacturer shall have a minimum of five (5) years' experience in the production of sheet metal gutters and downspouts.
- B. Installer Qualifications: Installer shall have a minimum of five (5) years' experience installing gutters and downspouts to be installed on this Project.

1.5 Delivery, Storage, and Handling

A. Store materials on dry, level, firm, and clean surface.

Part 2 Products

2.1 Materials

- A. Coil Stock: Match composition of roof flashing to prevent galvanic reaction.
 - 1. Steel: G90 galvanized steel in accordance with ASTM A653 and A924.
 - 2. Aluminum: Formed and coated aluminum coil stock; 3105H24.

2.2 Gutters

- A. K Style Gutter Fabrication:
 - 1. Sized for capacity of roof area, in no case smaller than existing gutters being replaced.
 - 2. Length: Continuous.
 - 3. Thickness: Steel 24 gauge; Aluminum 0.040 inch.
 - 4. Corners: Provide mitered corners, lapped, sealed and riveted. Corners shall extend a minimum of 12 inches from the corner in each direction. Lap joint and sealant where connecting to continuous gutter. Match material, shape and finish of gutter.

2.3 Downspouts

- A. Rectangular Downspout Fabrication:
 - 1. Sized for capacity of roof and flow from gutters, in no case smaller than existing downspouts being replaced.
 - 2. Length: Continuous one piece to fit existing conditions.
 - 3. Texture: Corrugated.
 - 4. Material Thickness: Steel 24 gauge; Aluminum 0.040 inch.

2.4 Accessories

- A. End Caps: match Material, shape and finish of gutter.
- B. Outlet Tubes: Match material and shape of down spout.
- C. Gutter Guard: Provide leaf-guard over open gutters.
- D. Gutter Support:
 - 1. Hidden Gutter Hanger: Manufacturer's standard hidden hanger matching gutter material.
- E. Downspout Support:
 - 1. Exposed Strap: Matching down spout material, finish, and color.
 - 2. Miscellaneous downspout components: Provide all necessary elbows, downspout offset sections, and pop rivets as required for a complete installation. All miscellaneous components shall match downspouts.



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- F. Fasteners: Of sufficient length to penetrate minimum 1 inch into substrate. Material to match gutters and down spouts to prevent galvanic reaction.
- G. Sealants: Tripolymer, single component sealant as recommended by manufacturer at gutter joints.
- H. Splash pads: Precast concrete.

2.5 Finish

- A. Exterior Coating: Silicon Modified Polyester (SMP) applied to exposed side. Color shall be white, ivory, or bronze, unless otherwise indicated.
- B. Interior coating: Manufacturer's standard primer wash coat.

Part 3 Execution

3.1 Preparation

- A. Verify that substrates are in place and ready for installation of gutters and downspouts.

3.2 Installation

- A. Install work securely in place and provide for expansion and contraction of components using lapped and sealed joints.
- B. Do not install damaged components.
- C. Separate dissimilar metals to prevent galvanic action through the use of bituminous coating or other permanent separation recommended by SMACNA.
- D. Space expansion joints in gutters as recommended by manufacturer.
- E. Rivet joints where required for strength, exposed rivet shall match gutter or downspout color.
- F. Torch cutting of components is not allowed.
- G. Gutters:
 - 1. Install gutter supports at no more than 24 inches on center.
 - 2. Slope gutters evenly to downspouts; provide end caps at gutter ends and seal watertight per manufacturer's instructions.
 - 3. Install outlet tubes at all downspout locations, seal watertight.
 - 4. Apply joint sealants at gutter joints in manufacturer's installation instructions.
 - 5. Install leaf-guard system.
- I. Downspouts:
 - 1. Install downspouts, provide elbows and offsets, and secure downspouts to wall construction using downspout supports spaced no more than 10 feet on center. Maximum distance of downspout support from top or bottom of downspout shall be 2 feet. Provide a 45-degree elbow at bottom of downspout to direct water away from wall surface or foundation.
 - 2. Install splash pans under downspouts.

3.3 Cleaning and Protection

- A. Remove damaged, defective or improperly installed materials. Replace with new materials installed per requirements of this Section.
- B. Clean finished surfaces according to manufacturer's written instructions; maintain clean condition.



**EXHIBIT A:
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(Excerpted from Construction Specification Institute's MasterFormat)**

SECTION 07 9000 JOINT SEALANTS

Part 1 General

1.1 Section Includes

A. Sealants

1. Sealing of joints in exterior envelope to prevent the entry or escape of water or air.
2. Sealing joints on the interior of the building to prevent the passage of water or air from space to space or between adjacent building materials.
3. Joints of a nature similar to that of joints indicated shall be sealed with same sealer, whether or not specifically indicated or scheduled to be sealed.

B. Joint Backing

1.2 References

- A. ASTM C717 – Standard Terminology of Building Seals and Sealants.
- B. ASTM C834 – Standard Specification for Latex Sealants.
- C. ASTM C920 – Standard Specification for Elastomeric Joint Sealants.
- D. ASTM C1311 – Standard Specification for Solvent Release Sealants.
- E. ASTM C 1193 – Standard Guide for Use of Joint Sealants.
- F. ASTM E84 – Surface Burning Characteristics of Building Materials.
- G. Sealant, Waterproofing and Restoration Institute (SWRI) – The Professionals' Guide
- H. Environmental Protection Agency (EPA) – 40 CFR 59 National Volatile Organic Compound Emission Standards for Consumer and Commercial Products.

1.3 Definitions

- A. M Type Substrates: Cast-in-place concrete, concrete masonry units, clay brick, masonry mortar, natural stone.
- B. G Type Substrates: Glass and transparent plastic glazing sheets.
- C. A Type Substrates: Metals, porcelain, glazed tile, and smooth plastics.
- D. O Type Substrates: Wood, unglazed tile, substrates not included under other categories.
- E. T Type Substrates: Surfaces bearing pedestrian or vehicular traffic.
- F. NT Type Substrate: Non-traffic bearing surfaces.

1.4 Submittals

- A. Product Data: Provide listing of products to be used and manufacturer's data for each joint sealer, indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, color availability, and installation instructions.

1.5 Delivery, Storage, and Handling

- A. Deliver materials in original containers or bundles with labels showing manufacturer, product name or designation, color, shelf life, and installation instructions.

1.6 Project Site Conditions

- A. Environmental Limitations: do not install sealants if any of the following conditions exist:
- B. Dimensional Limitations: do not install sealers if joint dimensions are less than or greater than that recommended by sealant manufacturer.



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- C. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

Part 2 Products

2.1 Sealants

- A. High Movement Silicone Sealant: One- or two-part, ASTM C920, Grade NS, Class 25, Use NT, plus movement capability of 50 percent in extension, 50 percent in compression.
 - 1. Products:
 - a. Dow Corning Corporation—Dow Corning 790 or 795.
- B. Mildew Resistant Silicone Sealant: One-part ASTM C920, Type S, Grade NS, Class 25, Use NT, formulated with fungicide for interior use on nonporous substrates.
 - 1. Products:
 - b. Dow Corning Corporation—Dow Corning 786.
- C. Butyl sealant:
 - 1. Products: Comply with ASTM C1311.
 - c. Tremco Butyl Sealant.
- D. One-part Non sag Urethane Sealant: ASTM C920, Type S, Grade NS, Class 25, Use NT.
 - 1. Products:
 - d. Bostic—Chem-Calk 900.
 - e. Pecora Corporation—Dynatroll-XL.
 - f. Sika Corporation—Sikaflex 1a.
 - g. Sonneborn BASF Building Products—Sonolastic NP1.
- E. Pedestrian Paving Joints and Interior Floor Joints:
 - 1. One-Part Pourable Urethane Sealant for Traffic bearing use(T):
 - h. Products:
 - 2. Bostic—ChemCalk 950.
 - 3. Pecora Corporation—Urexpan NR-201.
 - 4. Sonneborn BASF Building Products—Sonolastic SL1.
 - 5. Multipart Pourable Urethane Sealant for Traffic bearing use(T):
 - a. Products: Pecora Corporation—Urexpan NR200.
 - 6. Sika Corporation—Sikaflex 2cSL
 - 7. Sonneborn BASF Building Products—Sonolastic SL2.
 - 8. Non sag Urethane Sealant for Traffic bearing use(T):
 - a. Products:
 - 9. Pecora Corporation—Dynatred.
 - 10. Sika Corporation—Sikaflex 1a.
- G. Latex Sealants:
 - 1. Acrylic Latex Emulsion Sealant: One-part, non-sag, mildew resistant, paintable, complying with ASTM C834.
 - a. Products:
 - 2. Bostic—Chem-Calk 600.
 - 3. Pecora Corporation—AC-20+Silicone.
 - 4. Sonneborn BASF Building Products—Sonolac.

2.2 Accessories

- A. Primer: Non staining type, as recommended by joint sealant manufacturer.
- B. Joint Cleaner: Noncorrosive and non-staining type, recommended by sealant manufacturer; not damaging to substrates, and compatible with joint forming materials.



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- C. Backer Rods: Flexible, nonabsorbent, compressible polyurethane foam, either open cell or non-gassing closed cell, unless otherwise restricted by sealant manufacturer; preformed to appropriate size and shape.
- D. Bond Breaker Tape: Self-adhesive, polyethylene or other plastic tape, unless otherwise restricted by sealant manufacturer; suitable for preventing sealant adhesion .
- E. Masking Tape: nonabsorbent, non-staining.
- F. Tooling Agents: Approved by sealant manufacturer; non-staining to sealant and substrate.
- G. Weep/ Vent Products: Round plastic tubing; medium density polyethylene of thickness appropriate to joint.

2.3 Sealant Colors

- B. Sealant colors are to be selected from manufacturer's full range of available colors for each respective sealant and adjacent substrate to match adjacent substrates final color.

Part 3 Execution

3.1 Examination

- A. Examine joints for characteristics that may affect sealant performance, including configuration and dimensions.
- B. Verify that joint backing and release tapes are compatible with sealant and substrate.
- C. Coordinate for repair and resolution of unsound substrate materials.
- D. Inspect for uniform joint widths and that dimensions are within tolerance established by sealant manufacturer.

3.2 Preparation

- A. Prepare joints in accordance with manufacturer's instructions and SWRI.
- B. Cleaning: Just before starting sealant installation, clean joints as follows:
 - 1. Remove loose materials and foreign matter which might impair adhesion of sealant including, but not limited to, dust, dirt, coatings, paint, oil, and grease.
 - 2. Dry out damp and wet substrates thoroughly.
 - 3. Clean A-type and G-type substrates by chemical or other methods that will not damage the substrate.
 - 4. Remove loose particles by brushing and by blowing with oil-free compressed air.
 - 5. Use methods which will not leave residues that will impair adhesion.
 - 6. Concrete: Remove laitance and form-release coatings.
 - 7. Do not cut or damage joint edges.
- C. Prime joint substrates where required by manufacturer's recommendations.
 - 1. Apply primer prior to installation of back-up rod or bond breaker tape.
 - 2. Use brush or other approved means that will reach all parts of joints. Avoid application to or spillage onto adjacent substrate surfaces.
- D. Masking Tape: Use masking tape to keep primers and sealants off of adjacent surfaces which would be damaged by contract or by cleanup. Remove tape at the end of each day.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- E. Protect elements surrounding the Work of this Section from damage or disfigurement.
- F. Install fillers where needed to provide proper joint depth or support for sealant backers.
- G. Do not beg in joint sealant work until unsatisfactory conditions have been corrected.

**EXHIBIT A:
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3.3 Installation

A. Backers:

1. Install backing material, to form joints enclosed on three sides as required for specified depth of sealant.
2. Where deep joints occur, install filler to fill space behind the backing rod and position the rod at proper depth.
3. Cut fillers to proper depth for installation of backing rod and sealants.
4. Install backing rod, without puncturing the material, to a uniform depth, within plus or minus 1/9 inch of sealant depth specified.
5. Where space for backing rod does not exist, install bond breaker tape strip at bottom (or back) of joint so sealant bonds only to two opposing surfaces.
6. Install backers at depth required to result in shape and depth of installed sealant which allows the most joint movement without failure.
 - a. Make backers continuous, without gaps, tears, or punctures.

B. Sealants:

1. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
2. Comply with sealant manufacturer's installation instructions and recommendations, except where more restrictive requirements are specified.
3. Gunnable and Pour-able Sealants: Comply with recommendations of ASTM C1193.
4. Apply sealants only when ambient temperature is between 40 and 100 degrees F.
5. Do not install sealant type listed by manufacturer as not suitable for use in locations specified.
6. Avoid dropping or smearing sealant on adjacent surfaces.
7. Apply sealants with nozzle size to fit joint width.
8. Shape and Depth: Use methods recommended by manufacturer; completely fill the joint; make full contact with bond surfaces; tool non sag sealants to smooth surface eliminating air pockets.
 - a. Use concave joint shape shown in Figure 8 in ASTM C1193, where not otherwise indicated.
 - b. Depth of sealant at center of joint, unless otherwise required by the Contract Documents or recommended by manufacturer:
9. For joints up to ¼ inch wide: Depth equal to width.
10. For joints ¼ inch to ½ inch wide: Depth equal to ¼ inch.
11. For joints over ½ inch wide: Depth equals to ½ the width but not deeper than ½ inch.
 - a. Contact depth: Twice the depth of sealant at center of joint, unless otherwise required.

3.4 Field Quality Control

- A. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements.
- B. Replace sealant which is improperly installed or damaged during construction process.

3.5 Cleaning

- A. Clean adjacent soiled surfaces adjacent to joints as Work progresses and before sealants set using methods and materials approved by manufacturers of sealants and of surfaces to be cleaned.
- B. Leave adjacent surfaces in a clean and unstained condition.

3.6 Protection of Finished Work

- A. Protect sealants from contamination and damage until cured.
- B. Remove and replace damaged sealants.

**EXHIBIT A:
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- 3.7 Schedule
- A. General
 - 1. Seal joints in exterior envelope to prevent the entry or escape of water or air, prior to painting.
 - 2. Seal joints on the interior of the building to prevent the passage of water or air from space-to-space or between adjacent building materials and assemblies, prior to painting.
 - 3. Joints of nature similar to that of joints indicated shall be sealed with same sealer, whether specifically indicated to be sealed or not, unless the Project does not include work in that area.
 - B. Typical Exterior Joints:
 - 1. Including, but not limited to, wall joints, joints around perimeter of frames, joints around pipes, ducts, conduit penetrating exterior walls, joints in wash surfaces of pre-cast concrete, cast stone, cut stone, or concrete or brick masonry, and exterior joints for which no other sealant is indicated.
 - 2. Use high movement silicone sealant unless otherwise indicated.
 - C. Metal Flashings:
 - 1. Including, but not limited to, joints in flashing, edge trim, fascia, coping, where flashing is inserted into reglet in wall, top edge of surface mounted reglets, and between these items and adjacent construction.
 - 2. Use high movement silicone sealant.
 - D. Exterior door Thresholds: Set thresholds in butyl sealant.
 - E. Typical Interior Joints:
 - 1. Including, but not limited to:
 - a. Between walls or partitions and adjacent case work, fixed shelving, fixed equipment, lighting fixtures, etc.
 - b. Between concrete or masonry or other material and the perimeters of frames of doors, windows, access panels, etc.
 - c. Between hollow metal jambs and resilient flooring.
 - d. Around penetrations such as electrical boxes, plumbing, cabinets, ducts, and other openings in concrete or masonry walls or partitions. Comply with recommendations and details in USG Corporation's "Gypsum Construction Handbook".
 - e. Interior joints for which no other sealant is indicated.
 - 2. Use acrylic emulsion latex sealant.
 - 3. Between concrete or masonry walls or partitions and adjacent columns, pilasters, walls, partitions, floors, ceilings, rother construction use: One-part,non-sag urethane sealant.
 - F. Joints in Interior Wet Areas:
 - 1. Including, but not limited to, toilet rooms, bathrooms, break rooms, kitchens, and between walls or other surfaces and adjacent plumbing fixtures, fittings, and casework.
 - 2. Use mildew resistant silicone sealant.
 - G. Joints in Floor or Wall Tile:
 - 1. IncludinglocationsspecifiedinSection093000.
 - 2. Use urethane sealant, Use T for floor joints, use NT for wall joints.
 - 3. Backer: Backer rod.
 - 4. Joint shape: Flush joint configuration.
 - 5. Color: Match adjacent grout color, unless otherwise indicated.
 - H. Pedestrian Paving Joints and Interior Floor Joints:
 - 1. Use urethane sealant for Use T.
 - 2. Use bond breaker tape.
 - 3. Backer: Joint filler as recommended by sealant manufacturer.
 - 4. Joint shape: Flush joint configuration.