SECTION 07 90 00

JOINT PROTECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Sealants.

B. Primer.

C. Sealant backing.

D. Bond breaker.

1.02 SYSTEM DESCRIPTION

A. The work includes caulking and sealing of joints as required to seal the perimeters of openings in walls, penetrations in walls, expansion and control joints, and as required to weatherproof the station structure and other buildings.

B. The work includes interior building sealing of joints, penetrations, and openings, including acoustical and sanitary sealing, as indicated and required.

1.03 RELATED SECTIONS

A. Joint fillers and sealants for concrete slabs and paving are specified in Section 03 15 00 - Concrete Accessories.

B. Control joints in unit masonry are specified in Section 04 22 00 - Concrete Unit Masonry.

C. Expansion controls assemblies and covers for major expansion and seismic joints are specified in Section 07 95 00 - Expansion Control.

1.04 MEASUREMENT AND PAYMENT

A. General: Sealants and caulking will not be measured separately for payment but will be paid for as part of the Contract lump sum price for Architectural Work.

1.05 DEFINITIONS

A. Sealant and caulking terms specified herein comply with the definitions of ASTM C717.

B. For the work of this Section, "interior" or "interior locations" are defined as not open to the exterior. Rooms and spaces such as the station concourse and platform are open to the exterior and shall be considered as exterior spaces.

1.06 REFERENCES

A. American Society for Testing and Materials (ASTM):

1.	ASTM C717	Standard Terminology of Building Seals and Sealants
2.	ASTM C790	Standard Guide for Use of Latex Sealants
3.	ASTM C834	Specification for Latex Sealants
4.	ASTM C920	Specification for Elastomeric Joint Sealants
5.	ASTM C962	Standard Guide for Use of Elastomeric Joint Sealants

B. Federal Specifications (FS):

1.	TT-S-227	Sealing Compound, Elastomeric Type, Multi-Component (for Caulking, Sealing, and Glazing in Buildings and other Structures)
2.	TT-S-230	Sealing Compound: Elastomeric Type, Single Component (for Caulking, Sealing, and Glazing in Buildings and Other Structures)
3.	TT-S-1543	Sealing Compound, Silicone Rubber Base (for Caulking, Sealing, and Glazing in Buildings and Other Structures)

C. Underwriters Laboratories Inc. (UL):

1.	UL 1479	Fire Tests of Through-Penetration Firestops

1.07 SUBMITTALS

A. General: Refer to Section 01 33 00 - Submittal Procedures, and Section 01 33 23 - Shop Drawings, Product Data, and Samples, for submittal requirements and procedures.

B. Samples: Submit samples of each type of exposed sealant and caulking compound, keyed to the installation location. Provide fully cured samples, 12 inches long, installed between two samples of the materials to be sealed.

C. Certification: Submit manufacturer's certificate of compliance indicating that each product to be furnished complies with these Specifications, is recommended for the application indicated, and is compatible with the other materials in the joint system.

1.08 QUALITY ASSURANCE

A. Qualifications: Application/installation of sealant and caulking materials shall be by a licensed applicator skilled and experienced in the application/ installation of sealants and caulking compounds.

B. Compatibility Tests: Primers and sealants shall be tested by the manufacturer for compatibility and adherence with materials to which application is indicated. Submit test reports certifying compatibility at least 30 days before application.

C. Field Samples and Mock-Ups:

1. Provide sample application of sealants and caulking compounds at locations approved by the Engineer. Samples shall represent primary types of materials, substrate surfaces, joint size, exposure, and other conditions to be encountered in the work. Preparation, priming, application, and curing shall comply with manufacturer's recommendations for the actual conditions.

2. Samples will be visually examined for staining, dirt pickup, shrinkage, color, work quality, and appearance. Cut and pull sealant from each sample joint to examine for internal bubbles or voids, adhesion, and compatibility with substrate.

3. Schedule applications, with allowance for sufficient curing time, so that samples may be examined and necessary adjustments made at least one week before date scheduled for commencing installation of the work.

1.09 SITE CONDITIONS

A. Do not proceed with installation of sealants and caulking compounds during inclement weather unless the installation complies with the manufacturer's instructions.

B. Do not proceed with the installation of sealants under extreme temperature conditions that may cause joint openings to be near either maximum or minimum width, nor when high temperatures or high wind loads are forecast during the period required for initial or nominal cure of elastomeric sealants.

C. Schedule installation and cure of elastomeric sealants during period of relatively low temperatures (but well within manufacturer's recommended range) so that subsequent tensile stresses upon cured sealants will be minimized.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Sealants: Sealants shall be designed for adhesion to the surfaces to which they will be applied, and shall be non-staining, non-shrinking, and non-sagging, meeting the following requirements:

1. Exterior Sealant: Sealant for exterior locations shall be a silicone or polyurethane elastomeric sealant, as appropriate for the substrate conditions, meeting requirements of ASTM C920, Type S or M, Grade NS, Class 25, and Use designation as required for the location and substrate.

   a. Silicone Sealant: ASTM C920 and Fed. Spec. TT-S-230 or Fed. Spec. TT-S-1543, as applicable.

   b. Polyurethane Sealant: ASTM C920 and Fed. Spec. TT-S-227 or Fed. Spec. TT-S-230, as applicable.

2. Interior Sealant: Sealant for general sealing of interior locations shall be a single-component, gun-grade, paintable, water-base acrylic-latex, meeting requirements of ASTM C834.

3. Acoustical Sealant: Permanently plastic, paintable, synthetic polymer base sealant manufactured specifically for interior acoustical applications.

4. Sanitary Sealant: Single-component, primerless, flexible, mildew-resistant, silicone rubber, meeting requirements of Fed. Spec. TT-S-1543.

5. Fire-Resistant Sealant: Sealants used at penetrations of fire-rated walls and ceiling assemblies shall be UL listed as meeting UL 1479.

6. Sealant for Dielectric Insulation at Platform Edge Units: The electrical resistance of a 6 by 6 inch sample of sealant material shall be a minimum of 500 MΩ when tested with a 1 kV dc tester. Test shall be performed by placing the sample between two 3-by-3 inch copper electrodes. The sample shall be soaked in water 24 hours immediately prior to the test and surface dried prior to testing. Sample thickness shall be 1/2 inch.

7. Color:

   a. For fully concealed joints, provide manufacturer's standard color of sealant or caulking compound that has best overall performance characteristics for application indicated.

   b. For exposed joints, provide color indicated or, if color is not indicated, provide colors as selected by the Engineer from manufacturer's standard colors, to match or blend with adjoining materials or to match adjacent joint material as applicable.

B. Primer: Primer, when required, shall be a quick-drying, colorless, nonstaining sealer of type and consistency as recommended by the manufacturer of the sealant for the particular type of surfaces to be sealed.

C. Sealant Backing: Sealant backup or packing (backer rod) shall be a non-absorbent premolded or preformed nonstaining resilient material, such as polyethylene foam rod, or neoprene, butyl, polyurethane, or other closed cell foams or extruded rod, compatible with the sealant used. Follow sealant manufacturer's recommendations for compatibility of backer rod with sealant used. Material shall act as a bond breaker and shall be circular in cross section.

D. Bond Breaker: When required, pressure-sensitive polyethylene tape, teflon tape, or other plastic tape as recommended by the sealant manufacturer for the location, to prevent bond of sealant in heel of joint.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrate surfaces and joints to be sealed, and conditions under which work is to be performed, and correct conditions detrimental to proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

3.02 SURFACE PREPARATION

A. Joints and spaces to be sealed or caulked shall be cleaned of dirt, dust, mortar, oil, and other deleterious substances that may impair bond or adversely affect the sealing or caulking work. Where necessary, degrease with an approved solvent or commercial degreasing agent. Surfaces shall be dry before application of sealants or caulking compounds.

B. Do not apply sealants to joint surfaces previously treated with sealer, curing compound, water repellent, or other coatings, unless a laboratory durability test of bond cohesion has been performed successfully demonstrating that bond will be durable. Test method shall comply with procedures of the ASTM or FS applicable to the particular sealant.

C. Do not apply paint and other coatings to surfaces adjoining joints until sealants have been installed and are nominally cured.

D. If recommended by the manufacturer, remove paint and other coatings from surfaces to be sealed prior to sealant application. Remove coatings on metallic surfaces with a solvent that leaves no residue.

E. Joints shall be cleaned out, full width and depth. Joints shall be raked to proper depth, permitting use of sealant backing and sealant of indicated depth. Depth of joint in back of sealant shall be filled with sealant backing as specified. Sealant shall not be applied without sealant backing material, unless indicated otherwise on the Contract Drawings.

F. Joints shall be enclosed on three sides. Where grooves for adequate sealing have not been provided, suitable grooves shall be cleaned out to depth required or as indicated and cut or ground to minimum width of 1/4 inch without damage to adjoining work. Minor variations in width shall not require correction. Damaged adjacent or connecting work resulting from cutting or grinding shall be restored.

3.03 INSTALLATION/APPLICATION

A. Surface preparation of joints, application of primers, installation of sealant backing and bond breaker, and installation of sealant shall be in accordance with the sealant manufacturers' installation instructions and recommendations and the requirements of ASTM C790 and ASTM C962, as applicable.

B. Thickness of sealant shall be one-half the joint width, with a minimum thickness of 1/4 inch. Sealant shall bond the two opposing surfaces of the joint.

C. Seal joints continuously with sealant around openings in exterior walls, at control and expansion joints, and at other locations indicated or required for waterproofing the building or structure. Seal and caulk joints as indicated and as required to complete the building or structure, both exterior and interior.

D. Joints shall be filled to within specified depth from the surface with sealant backing, and the remainder of joint shall then be filled with sealant as specified. Sealant shall be forced into joints mechanically, with sufficient pressure to expel all air and provide a solid filling against the sides of joint and the sealant backing or bond breaker material.

E. Sealant shall be placed before painting operations are started. Sealant in joints adjacent to painted work shall be placed before final coat of paint is applied.

F. Sealant shall be applied when ambient temperature is between 45 degrees and 90 degrees F and when weather conditions are favorable for sealing operations.

G. Joints receiving sealant shall have sealant backing material with diameter greater than joint width, solidly placed and properly aligned, permitting pressure-applied sealant to be of uniform thickness, positively stopped, and assuring that sealant presses firmly against joint edges for adequate bonding.

H. Concrete, masonry, stucco, and other surfaces, if recommended by the sealant manufacturer, shall be primed before applying sealant. Primer shall be applied with a brush that will reach all parts of joints to be filled with sealant.

I. Sealant in joints shall be tooled flat or slightly concave. Joints in back of applied trim shall be caulked and inspected before trim is permanently installed. Sealed and caulked joints shall be neatly pointed on flush surfaces with beading tool, and internal corners with eaving tool. Excess material shall be cleanly removed.

J. Finished sealed and caulked surfaces shall be uniformly smooth and free from wrinkles and air holes.

3.04 CURING AND PROTECTION

A. Cure compounds and sealants in accordance with manufacturer's instructions to obtain maximum bond to surfaces, and cohesive strength and durability at earliest possible date.

B. Provide for protection of sealants and caulking compounds during remainder of construction period, so that they will be without deterioration or damage at time of acceptance of the work.

3.05 FIELD QUALITY CONTROL

A. Perform inspections necessary to assure proper preparation of locations and joints to receive sealants and caulking and to assure compliance with manufacturer's instructions for mixing, installation, curing, and protection.

B. After curing of exterior joints exposed to weather, test for leaks by applying a stream of water perpendicular to the surface from a 1/2-inch or 5/8-inch hose at normal city water pressure. Test at least ten percent of the exposed joint system.

C. Repair leaks and retest as directed.

3.06 CLEANING

A. Confine compounds to joint areas indicated by use of masking tapes or other precautions to prevent spillage or migration onto adjoining surfaces. Remove excess compound or sealant promptly as work progresses and clean adjoining surfaces to eliminate evidence of spillage.

END OF SECTION 07 90 00