SECTION 079200 - JOINT SEALANTS

Spec Note: Verify and retain required measurement unit required for project.

1. GENERAL
	* + 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

* + - * 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			1. SUMMARY
				1. Section Includes:

Silicone joint sealants.

Nonstaining silicone joint sealants.

Urethane joint sealants.

Mildew-resistant joint sealants.

Polysulfide joint sealants.

Butyl joint sealants.

Latex joint sealants.

* + - 1. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + - * 1. Preinstallation Conference: Conduct conference at **[Project site] <Insert location>**.
			1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each joint-sealant product.

Including manufacturer’s installation instructions.

Retain “Sustainable Design Submittals” if project has sustainable design requirements.

* + - * 1. Sustainable Design Submittals:
				2. Quality Control Submittals:

Installer’s Qualifications Data: Affadavit required under Quality Assurance Article

Company Field Advisor Data: Name, Business Address and Telephone Number of Company Field Advisor

Edit “Samples” paragraph below to suit Project requirements.

* + - * 1. Samples:

Joint Fillers: 24 inches long full section.

Gaskets: 24 inches long full section.

Joint Primer/Sealer/Conditioners: 1 pint.

Backer Rods: 24 inches long full section.

Bond Breaker Tape: 24 inches long full section.

Sealants: 1 pint or standard tube

Retain "Samples for Initial Selection" and "Samples for Verification" paragraphs for two-stage Samples.

* + - * 1. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
				2. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
				3. Joint-Sealant Schedule: Include the following information:

Joint-sealant application, joint location, and designation.

Joint-sealant manufacturer and product name.

Joint-sealant formulation.

Joint-sealant color.

* + - * 1. Qualification Data: For qualified testing agency.
				2. Product Test Reports: For each kind of joint sealant, for tests performed by **[manufacturer and witnessed by a qualified testing agency] [a qualified testing agency]**.
				3. Preconstruction Laboratory Test Schedule: Include the following information for each joint sealant and substrate material to be tested:

Joint-sealant location and designation.

Manufacturer and product name.

Type of substrate material.

Proposed test.

Number of samples required.

Retain "Preconstruction Laboratory Test Reports" and "Preconstruction Field-Adhesion-Test Reports" paragraphs below if specifying preconstruction testing in "Preconstruction Testing" Article.

* + - * 1. Preconstruction Laboratory Test Reports: From sealant manufacturer, indicating the following:

Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.

Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.

* + - * 1. Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

Retain "Field-Adhesion-Test Reports" paragraph below if Contractor is responsible for field quality-control testing.

* + - * 1. Field-Adhesion-Test Reports: For each sealant application tested.
				2. Sample Warranties: For special warranties.
			1. QUALITY ASSURANCE
				1. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

Omit below if sealant work is insignificant.

The persons installing the sealants and their supervisor shall be personally experienced in the installation of sealants and shall have been regularly employed by a company engaged in the installation of sealants for a minimum of two years.

Furnish to the Director the names and addresses of five similar projects which the foregoing people have worked on during the past two years.

Furnish a letter from the sealant manufacturer, stating that the foregoing people are authorized to install the manufacturer's sealant materials and that the manufacturer's specifications are applicable to the requirements of this Project.

* + - * 1. Product Testing: Test joint sealants using a qualified testing agency.

Testing Agency Qualifications: Qualified according to ASTM C1021 to conduct the testing indicated.

Test and validate sealants used for exterior weathersealing per the Sealant Waterproofing Restoration Institute (SWRI).

* + - * 1. Container Labels: Include manufacturer's name, trade name of product, kind of material, federal specification number (if applicable), expiration date (if applicable), and packaging date or batch number.
				2. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.
			1. PRECONSTRUCTION TESTING

Testing in "Preconstruction Laboratory Testing" paragraph below is performed off-site by sealant manufacturer. Tests require many Samples, and some tests may require up to seven weeks to complete. If retaining below, also retain "Preconstruction Laboratory Test Reports" paragraph in "Informational Submittals" Article. Add other testing as required.

* + - * 1. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

ASTM C794 test in "Adhesion Testing" subparagraph below is included as part of ASTM C920 testing required for elastomeric sealants in this Section; retain below to require additional testing for specific substrates if required.

Adhesion Testing: Use ASTM C794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

Compatibility Testing: Use ASTM C1087 to determine sealant compatibility when in contact with glazing and gasket materials.

Retain "Stain Testing" subparagraph below especially for silicones applied to marble, limestone, granite, sandstone, brick, or other porous substrates.

Stain Testing: Use ASTM C1248 to determine stain potential of sealant when in contact with **[stone] [masonry] <Insert substrate>** substrates.

Submit manufacturer's recommended number of pieces of each type of material, including joint substrates, joint-sealant backings, and miscellaneous materials.

Schedule sufficient time for testing and analyzing results to prevent delaying the Work.

For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.

Retain subparagraph below if generic test data are acceptable.

Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.

Testing in "Preconstruction Field-Adhesion Testing" paragraph below is performed on-site, either on field-constructed mock-ups or on actual construction, but far enough in advance of sealant work to allow curing of sealants and retesting if necessary. If retaining below, also retain "Preconstruction Field-Adhesion-Test Reports" paragraph in "Informational Submittals" Article.

* + - * 1. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:

Locate test joints where indicated on Project or, if not indicated, as directed by Director’s Representative.

Conduct field tests for each kind of sealant and joint substrate.

Notify Director’s Representative seven days in advance of dates and times when test joints will be erected.

Retain first subparagraph below if required. Before retaining, determine availability of manufacturer's representative.

Arrange for tests to take place with joint-sealant manufacturer's technical representative present.

First method in "Test Method" subparagraph below is the first of four test methods recommended in Appendix X1.1 in ASTM C1193. Second method is one of two destructive test methods recommended in ASTM C1521. Revise below if another test method is more appropriate for Project joint conditions.

Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.

For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.

Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

* + - 1. FIELD CONDITIONS
				1. Do not proceed with installation of joint sealants under the following conditions:

Humidity and Moisture: Do not install the Work of this Section under conditions that are detrimental to the application, curing and performance of the material.

When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer **[or are below 40 deg F]**.

When joint substrates are wet.

Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.

Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

Omit subparagraph below if no interior work.

Ventilation: Provide sufficient ventilation wherever sealants, primers, and other similar materials are installed in enclosed spaces. Follow manufacturer's recommendations.

* + - 1. WARRANTY

When warranties are required, verify with Director’s Representative's that special warranties stated in this article are not less than remedies available to Director’s Representative under prevailing local laws.

* + - * 1. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

Verify available warranties and warranty periods for joint-sealant installation.

Warranty Period: **[Two]** years from date of Substantial Completion.

* + - * 1. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

Verify available warranties and warranty periods for joint sealants.

Warranty Period: **[Five]** years from date of Substantial Completion.

* + - * 1. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.

Disintegration of joint substrates from causes exceeding design specifications.

Mechanical damage caused by individuals, tools, or other outside agents.

Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

* + - * 1. Product Warranties

Silicone Sealant: 20 years weatherseal warranty.

Polyurethane: 5 year weatherseal warranty.

Sealants for granite, marble and limestone: 20 year non-stain warranty.

1. PRODUCTS
	* + 1. JOINT SEALANTS, GENERAL
				1. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

Retain Sustainable design text and update as required if project has sustainable requirements.

* + - * 1. Colors of Exposed Joint Sealants: As selected by Director’s Representative from manufacturer's full range.
				2. Colors of Concealed Joint Sealants: provide the natural color which has the best overall performance characteristics.

Confirm listed materials and products below and update as necessary to make current.

* + - 1. SILICONE JOINT SEALANTS

Coordinate paragraphs in this article with "Joint-Sealant Schedule" Article.

* + - * 1. Silicone, S, NS, 100/50, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Use NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Dowsil; 790 Silicone Building Sealant

Or equal.

* + - * 1. Silicone, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Dowsil; 756 SMS Building Sealant (cold weather application)

Dowsil; 791

Dowsil; 795

Dowsil; Contractors Concrete Sealant (CCS)

GE Construction Sealants; SCS2000 SilPruf Sealant

Or equal.

* + - * 1. Silicone, S, NS, 35, NT: Single-component, nonsag, plus 35 percent and minus 35 percent movement capability. nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 35, Use NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Dowsil; Contractors Weatherproofing Sealant (CWS)

GE Construction Sealants; SWS Sealant

Or equal.

* + - * 1. Silicone, S, NS, 100/50, T, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Uses T and NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Pecora Corporation; 300SL

Dowsil; NS Parking Structure Sealant.

Or equal.

* + - * 1. Silicone, M, SL, 100/50, T, NT: Multicomponent, self-levelling, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type M, Class 100/50, Uses T and NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Dowsil; Parking Structure Sealant FC or SL

Or equal.

* + - * 1. Silicone: Single-component sealant for high temperatures.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Dowsil; 736 Heat Resistant Sealant

Dowsil; Hi-Temp Sealant Red

Henkel Adhesives; Loctite SI 596

Tremco Incorporated; TremPro 644 HT

Or equal.

* + - 1. NONSTAINING SILICONE JOINT SEALANTS

Coordinate paragraphs in this article with "Joint-Sealant Schedule" Article.

* + - * 1. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C1248.
				2. Silicone, Nonstaining, S, NS, 100/50, NT: Nonstaining, single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Use NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Pecora Corporation; 890FTS.

Pecora Corporation; 890NST.

Or equal.

* + - * 1. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Pecora Corporation; 864NST.

Pecora Corporation; 895NST.

Or equal.

* + - 1. URETHANE JOINT SEALANTS

Coordinate paragraphs in this article with "Joint-Sealant Schedule" Article.

* + - * 1. Urethane, S, NS, 50, NT: Single-component, nonsag, nontraffic-use, plus 50 percent and minus 50 percent movement capability, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Tremco Incorporated; Dymonic 100

Or equal.

* + - * 1. Urethane, S, NS, 35, NT: Single-component, nonsag, plus 35 percent and minus 35 percent movement capability, non-traffic-use, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 5, Use NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Bostik; Chem-Calk 915

Master Builders Solutions; MasterSeal NP1

Or equal.

* + - * 1. Urethane, S, NS, 35, T: Single-component, nonsag, plus 35 percent and minus 35 percent movement capability, traffic-use, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 5, Use T.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Sika Corporation; Sikaflex-1a

Or equal.

* + - * 1. Urethane, S, NS, 25, NT: Single-component, nonsag, nontraffic-use, plus 25 percent and minus 25 percent movement capability, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Bostik; Chem-Calk 916 Textured.

Or equal.

* + - * 1. Urethane, S, NS, 25, T, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 25, Uses T and NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Sika Corporation; Sikaflex Textured Sealant

Tremco Incorporated; Vulkem 116

Or equal.

* + - * 1. Urethane, S, P, 35, T: Single-component, pourable, plus 35 percent and minus 35 percent movement capability, traffic, urethane joint sealant; ASTM C920, Type S, Grade P, Class 35, Uses T.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Tremco Incorporated; Vulkem 45SSL

Or equal.

* + - * 1. Urethane, S, P, 25, T: Single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic-use, urethane joint sealant; ASTM C920, Type S, Grade P, Class 25, Uses T.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Sika Corporation; Sikaflex-1c SL

Or equal.

* + - * 1. Urethane, M, NS, 50, T: Multicomponent, nonsag, plus 50 percent and minus 50 percent movement capability, traffic -use, urethane joint sealant; ASTM C920, Type M, Grade NS, Class 50, Uses T.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Pecora Corporation; Dynatrol II

Or equal.

* + - * 1. Urethane, M, NS, 25, T, NT: Multicomponent, nonsag, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type M, Grade NS, Class 25, Uses T and NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Sika Corporation; Joint Sealants; Sikaflex 2c NS EZ Mix.

Or equal.

* + - * 1. Urethane, M, P, 35, T, NT: Multicomponent, pourable, plus 35 percent and minus 35 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type M, Grade P, Class 35, Uses T and NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Tremco Incorporated; Vulkem 445SSL.

Or equal.

* + - * 1. Urethane, M, P, 25, T, NT: Multicomponent, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type M, Grade P, Class 25, Uses T and NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Pecora Corporation; Urexpan NR 200.

Tremco Incorporated; THC 900/901.

Sika Corporation; Sikaflex-2c SL

Or equal.

* + - 1. MILDEW-RESISTANT JOINT SEALANTS

Coordinate paragraphs in this article with "Joint-Sealant Schedule" Article.

* + - * 1. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
				2. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Dowsil; 786

Dowsil; Tub/Tile/Ceramic Sealant

GE Construction Sealants ; SCS1700 Sanitary

Bostik; Tub & Tile Caulk

Or equal.

* + - * 1. Silicone, Mildew Resistant, Neutral Curing, S, NS, 50, NT: Mildew-resistant, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Pecora Corporation; 898NST Sanitary Silicone

Or equal.

* + - 1. POLYSULFIDE JOINT SEALANTS

Coordinate paragraphs in this article with "Joint-Sealant Schedule" Article.

* + - * 1. Polysulfide, M, NS, 25, T, NT: Multicomponent, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, polysulfide joint sealant; ASTM C920, Type M, Grade NS, Class 25, Use NT.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Pecora Corporation; Synthacalk GC2+

Sika Duoflex NS

Or equal.

* + - 1. BUTYL JOINT SEALANTS

Coordinate paragraphs in this article with "Joint-Sealant Schedule" Article.

* + - * 1. Butyl-Rubber-Based Joint Sealants: ASTM C1311.

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Pecora Corporation; BC-158.

PTI; 707.

Tremco; Butyl Sealant.

Or equal.

* + - 1. LATEX JOINT SEALANTS

Coordinate paragraphs in this article with "Joint-Sealant Schedule" Article.

In addition to Type OP (for opaque sealants containing color or extended pigments) in "Acrylic Latex" paragraph below, ASTM C834 includes Type C (for clear or translucent sealants). Also, in addition to Grade NF (not tested for low-temperature flexibility) in paragraph below, ASTM C834 includes Grades minus 18 deg C and zero deg C (for sealants that comply with requirements for flexibility at minus 18 deg C and zero deg C, respectively).

* + - * 1. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.

Products: Subject to compliance with requirements, provide the following:

Bostik; Duo-Sil.

GE Construction Sealants; All Weather Pro Sealant.

Pecora Corporation; AVW-920; AC-20.

Or equal.

* + - 1. MISCELLANEOUS SEALANTS
				1. Flame and smoke resistant intumescent sealant:

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Metacaulk MC 150+ Firestop Sealant,

3M Fire Barrier Caulk CP 25WB+,

Dowsil; Smoke Seal 800SL

Or equal.

Security sealants: a flexible pick resistant sealant, for Correctional Services and Office of Children and Family Services projects in appropriate locations.

* + - * 1. Security Sealants:

Two part, non-sag, 25% total joint movement, elastomeric polyurethane;

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Pecora Corporation; Dynaflex.

Or equal.

One-component 25% total joint movement, elastomeric, aliphatic, polyurethane;

Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

Pecora Corporation; Dynaflex SC,

Master Builders Solutions; MasterSeal CR 195

Or equal.

Use sealant in kitchens or similar spaces where S.S. floor grates abut tile or brick flooring and when resistance to thermal shock is required.

* + - * 1. Hydrophobic hybrid polyurethane; Roadware Flexible Cement II, 2100 Wentworth Avenue, South Saint Paul, Minnesota 55075, (612) 457-6122.
				2. Pre-formed Sealant: Preformed paintable sealant strips of open cell, compressible urethane foam, saturated with non-drying, non-staining, and non-migrating butylene compound.
			1. JOINT FILLERS

Use paragraph below for slabs with extreme shrinkage.

* + - * 1. Self-Expanding Cork Joint Filler: Resilient, non-extruding type pre-molded cork units; ASTM D 1752, Type III.

Use paragraph below for normal slabs.

* + - * 1. Cork Joint Filler: Resilient, non-extruding type pre-molded cork units; ASTM D 1752, Type II.

Use paragraph below for precast panel joints not compatible with silicone sealants.

* + - * 1. Closed Cell Neoprene Joint Filler: ASTM D 1056, Class SC (oil resistant and medium swell), 2 to 5 psi compression deflection.

Use paragraph below for existing joints.

* + - * 1. Expanded Polyethylene Joint Filler: Flexible, compressible, closed-cell polyethylene of not less than 10 psi compression deflection (25 percent).

Use paragraph below for pavements, walks, and curbs. Suitable for irregular surfaces.

* + - * 1. Closed Cell Polyurethane Joint Filler: Resilient, compressible, semi-rigid; W.R. Meadows Ceramar or A.C. Horn Closed Cell Plastic Foam Filler, Code 5401.
			1. GASKETS

Use paragraph below for large paving expansion joints.

* + - * 1. Hollow Neoprene Gasket: Hollow or compartmentalized neoprene extrusion, designed to withstand compression to 40 percent of normal width without extrusion from joint, and with full recovery; heavy, durable top member, suitable for long-term exposure to weather and traffic, hardness of 55 Shore A; ASTM D 2628.
				2. Adhesive Closed-Cell PVC Gasket: Closed-cell, flexible, self-adhesive, non-extruding, polyvinylchloride foam gaskets; ASTM D 1667.
			1. JOINT-SEALANT BACKING

Retain, at minimum, one of first three options in "Cylindrical Sealant Backings" paragraph below; if retaining more than one, also retain fourth option. Verify, with joint-sealant manufacturers, the suitability of each material for sealants selected. Type O sealant backings, which are open-cell urethane foams, are unsuitable for horizontal surfaces. See the Evaluations.

* + - * 1. Cylindrical Sealant Backings: ASTM C1330, **[Type C (closed-cell material with a surface skin)] [Type O (open-cell material)] [Type B (bicellular material with a surface skin)] [ or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated]**, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
				2. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.
			1. MISCELLANEOUS MATERIALS

Retain "Primer" paragraph below if joint priming is required.

* + - * 1. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

Retain “Security Sealant Primers” if security sealants are included in the project.

For Security Sealant (two part):

Pecora Corporation; No. P-100 for non-porous substrates.

Pecora Corporation; No. P-75 or P-200 for porous substrates.

Or equal.

For Security Sealant (one component):

Pecora Corporation; No. P-100 for non-porous substrates.

Pecora Corporation; No. P-75 for porous substrates.

Master Builder’s Solutions; MasterSeal P173 and P 176 for porous or non- porous substrates.

Or equal.

* + - * 1. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way and formulated to promote optimum adhesion of sealants to joint substrates.
				2. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
1. EXECUTION
	* + 1. EXAMINATION
				1. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
				2. Proceed with installation only after unsatisfactory conditions have been corrected.
			2. PREPARATION
				1. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

Retain porous substrates in first four subparagraphs below if applicable. Insert additional items to suit Project.

Concrete.

Masonry.

Unglazed surfaces of ceramic tile.

Exterior insulation and finish systems.

**<Insert other porous joint substrate>**.

Remove laitance and form-release agents from concrete.

Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

Retain nonporous substrates in subparagraphs below if applicable. Insert additional items to suit Project.

Metal.

Glass.

Porcelain enamel.

Glazed surfaces of ceramic tile.

**<Insert other nonporous joint substrate>**.

* + - * 1. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
				2. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.
			1. INSTALLATION OF JOINT SEALANTS
				1. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
				2. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
				3. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

Do not leave gaps between ends of sealant backings.

Do not stretch, twist, puncture, or tear sealant backings.

Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.

Retain first paragraph below for sealants installed in moving joints without sealant backings.

* + - * 1. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
				2. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

Place sealants so they directly contact and fully wet joint substrates.

Completely fill recesses in each joint configuration.

Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

* + - * 1. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

Remove excess sealant from surfaces adjacent to joints.

Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

Retain one or more of three subparagraphs below to suit joint configurations required for Project. First subparagraph makes concave configuration the default requirement; second and third subparagraphs require that other configurations be indicated on Drawings. Revise if one of the latter two configurations is the default requirement.

Provide concave joint profile per Figure 8A in ASTM C1193 unless otherwise indicated.

Provide flush joint profile at **[locations indicated on Drawings] <Insert locations>** according to Figure 8B in ASTM C1193.

Provide recessed joint configuration of recess depth and at **[locations indicated on Drawings] <Insert locations>** according to Figure 8C in ASTM C1193.

Use masking tape to protect surfaces adjacent to recessed tooled joints.

* + - 1. FIELD QUALITY CONTROL

Revise "Field-Adhesion Testing" paragraph below if Director’s Representative engages an independent testing agency to perform tests. Testing described below is generally required by sealant manufacturer if warranty is required.

* + - * 1. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

Extent of Testing: Test completed and cured sealant joints as follows:

Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.

First method in "Test Method" subparagraph below is the first of four test methods recommended in Appendix X1.1 in ASTM C1193. Second method is one of two destructive test methods recommended in ASTM C1521. Revise if another test method is more appropriate for Project joint conditions.

Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521.

For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

Inspect tested joints and report on the following:

Whether sealants filled joint cavities and are free of voids.

Whether sealant dimensions and configurations comply with specified requirements.

Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.

Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.

Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

* + - * 1. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.
			1. CLEANING
				1. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.
			2. PROTECTION
				1. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

Edit types of joint sealant in "Joint Sealant Schedule" below; coordinate with Part 2. Edit for locations and uses per project specific requirements.

* + - 1. JOINT-SEALANT SCHEDULE
				1. Joint-Sealant Application: Exterior joints in vertical and horizontal nontraffic surfaces, Type 1.

Joint Locations:

Construction joints in cast-in-place concrete.

Joints between plant-precast Architectural concrete units.

Control and expansion joints in unit masonry.

Joints in dimension stone cladding.

Joints in glass unit masonry assemblies.

Joints in exterior insulation and finish systems.

Joints between metal panels.

Joints between different materials listed above.

Perimeter joints between materials listed above and frames of **[doors] [windows] [and] [louvers]**.

Control and expansion joints in **[ceilings] [and other] [overhead surfaces]**.

**<Insert other joints>**.

Other joints as indicated on Drawings.

Joint Sealant:

Silicone, S, NS, 100/50, NT

Silicone, S, NS, 50, NT

Silicone, S, NS, 35, NT

Silicone, Nonstaining, S, NS, 100/50, NT

Silicone, Nonstaining, S, NS, 50, NT

Urethane, S, NS, 50, NT

Urethane, S, NS, 35, NT

Urethane, S, NS, 35, T

Urethane, S, NS, 25, NT

Urethane, M, NS, 50, T

* + - * 1. Joint-Sealant Application: Exterior joints in horizontal or vertical traffic surfaces.

Joint Locations:

Joint sealants in paved roads, parking lots, walkways, and curbing are specified in Section 321373 "Concrete Paving Joint Sealants."

Control and expansion joints in brick pavers.

Isolation and contraction joints in cast-in-place concrete slabs.

Joints between plant-precast Architectural concrete paving units.

Joints in stone paving units **[including steps]**.

Tile control and expansion joints.

Joints between different materials listed above.

**<Insert other joints>**.

Other joints as indicated on Drawings.

Joint Sealant:

Silicone, S, NS, 100/50, T, NT

Silicone, M, SL, 100/50, T, NT

Urethane, M, NS, 50, T

Urethane, M, NS, 25, T, NT

Urethane, M, P, 35, T, NT

Urethane, M, P, 25, T, NT

* + - * 1. Joint-Sealant Application: Exterior joints in horizontal and vertical traffic surfaces.

Joint Locations:

Plaza Decks and curbs

Pedestrian walkways

**<Insert other joints>**.

Other joints as indicated on Drawings.

Joint Sealant:

Urethane, S, P, 35, T

Urethane, S, P, 25, T

Urethane, S, NS, 25, T, NT

Silicone, S, NS, 100/50, T, NT

* + - * 1. Joint-Sealant Application: Joints at sealing pipe penetrations for piping conveying materials up to 140 degrees F and fuel oil supply and fuel dispensing systems.

Joint Sealant: Polysulfide, M, NS, 25, T, NT.

* + - * 1. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces, non-security.

Joint Locations:

Joints between plumbing fixtures and adjoining walls, floors, and counters.

Tile control and expansion joints where indicated.

**<Insert other joints>**.

Other joints as indicated on Drawings.

Joint Sealant:

Silicone, mildew resistant, acid curing, S, NS, 25, NT.

Silicone, Mildew Resistant, Neutral Curing, S, NS, 50, NT

* + - * 1. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.

Joint Locations:

Control joints on exposed interior surfaces of exterior walls.

Perimeter joints between interior wall surfaces and frames of **[interior doors] [windows] [and] [elevator entrances]**.

Joints and cracks 3/16” or less in width.

Other joints as indicated on Drawings.

Joint Sealant:

Acrylic latex

* + - * 1. Joint-Sealant Application: Concealed mastics.

Joint Locations:

Aluminum thresholds.

Sill plates.

Standing Seam Metal Roofing.

Other joints as indicated on Drawings.

Joint Sealant: Butyl-rubber based.

* + - * 1. Joint-Sealant Application: High temperature joints over 140 degrees F.

Joint Locations:

Pipe penetrations.

Joint Sealant:

Silicone: Single-component sealant for high temperatures.

* + - * 1. Joint-Sealant Application: Flame and smoke resistant joints.

Joint Locations:

Smoke partitions.

Joint Sealant:

Flame and smoke resistant intumescent sealant.

* + - * 1. Joint-Sealant Application: hydrophobic sealant in horizontal surfaces.

Joint Locations:

Kitchens or wet locations where stainless steel grates abut tile or brick flooring.

Resistance to thermal shock.

Joint Sealant

Hydrophobic hybrid polyurethane.

Use Security Sealant for Correctional Services and Office of Children and Family Services Projects.

* + - * 1. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces, security type.

Joint Locations:

Joints between plumbing fixtures and adjoining walls, floors, and counters.

Tile control and expansion joints where indicated.

**<Insert other joints>**.

Other joints as indicated on Drawings.

Joint Sealant: Security Sealants.

END OF SECTION 079200