SECTION 03250

CONCRETE ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Requirements for providing concrete accessories shown and specified herein such as waterstops, dovetail anchor slots, cast-in-place reglets, inserts, joint filler, preformed joint seal, joint sealant and neoprene pads.

B. Products Installed: Waterstops, dovetail anchor slots, cast-in-place reglets, inserts, joint filler, preformed joint seal, joint sealant and neoprene pads.

C. Related Work Specified in Other Sections Includes:

1. Section 03100 - Concrete Formwork
2. Section 03200 - Concrete Reinforcement
3. Section 03310 - Cast-in-Place Concrete

1.2 REFERENCES

A. Codes and standards referred to in this Section are:

1. AASHTO - Standard Specifications for Highway Bridges

2. ASTM A 240 - Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels

3. ASTM A 536 - Standard Specifications for Ductile-Iron Castings

4. ASTM D 412 - Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension

5. ASTM D 3545 - Test Methods for Alcohol Content and Purity of Acetate esters by Gas Chromatography

6. ASTM D 3575 - Test Methods for Flexible Cellular Materials Made From Olefin Polymers

7. CRD-C513 - Specifications for Rubber Waterstops

8. CRD-C572 - Specifications for Polyvinyl Chloride Waterstop

9. Fed. Spec.
TT-S-00227 - Sealing Compound, Elastomeric Type, Multicomponent (for Calking, Sealing, and Glazing in Buildings and Other Structures)

10. Fed. Spec.
TT-S-00230 - Sealing Compound, Elastomeric Type, Single Component (for Calking, Sealing, and Glazing in Buildings and Other Structures)

1.3 SUBMITTALS

A. General: Provide all Work related submittals, including the following, as specified in Division 1.

B. Product Data and Information:

1. Manufacturer's Data and Specifications: Submit printed manufacturer's data and specifications for each item used on this project.

2. Samples: Provide one sample of each item used.

3. Joint Sealant and Preformed Joint Seal: Indicate special procedures, surface preparation and perimeter conditions requiring special attention. All products in contact with potable water, shall be "NSF Standard 61" certified. Submit certified material records indicating approval for use with potable water.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle all products and materials as specified in Division 1 (and as follows:)

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Acceptable manufacturers are listed below. Other manufacturers of equivalent products may be submitted.

1. Joint Filler

a. Sonoflex F Foam by Sonneborn Building Products
b. PVC Joint Filler No. 327 by A.C. Horn

2. Sealant Backup Material

   a. Sealtight Backer Rod
   b. Sonofoam Backer Rod

3. Preformed Joint Seal

   a. Evazote 380, ESF by Epoxy Industries

4. Wedge Inserts

   a. Type F-7 by Dayton Superior, Miamisburg, OH

5. Dovetail Anchor

   a. A.A. Wire Products Co.
   b. Dur-O-Wal Inc.

6. Flashing Reglets

   a. Standard reglets by Beehive Anchoring System

2.2 MATERIALS

A. Extruded Waterstops: Provide waterstops made of extruded polyvinyl chloride unless otherwise shown or specified.

1. Do not use any reclaimed plastic material in their manufacture.

2. Provide plastic waterstops meeting the requirements of CRD-C572, except as modified herein. Provide a Shore A/10 durometer hardness between 73 and 79, the tensile strength not less than 1850 psi, and specific gravity not more than 1.38.

3. Unless otherwise shown, use waterstops for construction joints which are flat, at least 6 inches wide, and not less than 3/8-inch thick at the thinnest section. Provide these waterstops with ribbed longitudinal strips.

4. Unless otherwise shown, provide waterstops for expansion joints at least 9 inches wide and not less than 1/4-inch thick at the narrowest point and not less than 3/8-inch thick immediately adjacent to the center of the waterstop. Provide the waterstop with ribbed longitudinal strips with a 3/4-inch inside diameter hollow bulb center. Limit joint movement to 1/4-inch under a tensile force of not more than 500 pounds per lineal inch.

B. Stainless Steel Waterstops: Provide stainless steel waterstops where shown or specified.

1. Fabricate stainless steel waterstops from ASTM A 240 Type 316, 20 gauge stainless steel, conforming to the dimensions and profiles shown.

2. Prefabricate and miter corners and intersections for all stainless steel waterstops. Make only butt joints in the field.

C. Rubber Waterstops: Provide rubber water stops where shown or specified.

1. Provide rubber water stops of either the molded or extruded type, fabricated from a high grade tread type compound, either SBR or natural rubber, conforming to CRD-C513.

2. Provide water stops for construction joints at least 6 inches wide and 3/8-inch thick and with solid end bulbs 3/4-inch in diameter.

3. Provide water stops for expansion joints 9 inches wide and 3/8-inch thick and with solid end bulbs 1-inch in diameter and a hollow center bulb 1-1/2 inches in diameter with a 3/4-inch diameter center cavity.

D. Expansion Joint Filler: Use joint filler for all expansion joints.

1. Provide a closed cell polyethylene or PVC joint filler of the thickness shown.

E. Joint Sealant Requirements: Finish expansion joints with a joint sealant where shown or specified.

1. Joint sealant materials may be either a single component urethane compound meeting the requirements of Fed. Spec. TT-S-00230C, or a 2-component urethane compound meeting the requirements of Fed. Spec. TT-S-00227E, except as modified in this specification.

2. Provide the urethane sealant of 100 percent polymer, non-extended, containing no solvent, lime, or coal tar. Color as selected by the ENGINEER, but not black. Conform sealant properties to the following:

	Property	Value	Test Method
a.	Maximum final cure	3 days	--
b.	Minimum tensile strength	140 to 200 psi	ASTM D 412
c.	Minimum elongation	400%	ASTM D 412

	Property	Value	Test Method
d.	Modulus at 100% elongation	40-60 psi	ASTM D 412
e.	Shore A hardness	25-40	ASTM D 2240
f.	Solid content	98-100%	--
g.	Peel strength	20-40 lb/in.	Fed. Spec. TT-S-00230C Fed. Spec. TT-S-00227E
h.	Minimum recovery	80-90%	Fed. Spec. TT-S-00230C Fed. Spec. TT-S-00227E
i.	Initial tack-free cure	24-48 hrs.	Fed. Spec. TT-S-00230C Fed. Spec. TT-S-00227E

3. Provide primer as recommended by the manufacturer of the sealant, subject to approval.

4. Provide fillers and backup materials in contact with sealant which are nonimpregnated and free from asphalt, creosote, oil or extractable plasticizers. Use a backup material of a closed cell polyethylene foam rod with a diameter 1/4-inch larger than the joint width.

F. Preformed Joint Seal: Provide a preformed joint seal where shown or specified.

1. Provide joint material which is resilient, non-extrudable, impermeable, closed-cell, cross-linked, ethylene vinyl acetate, low density, polyethylene copolymer, nitrogen blown material which is ultraviolet light, weather and wear resistant, and which is concrete beige in color.

2. Conform material properties with the following:

	Property	Value	Test Method
a.	Density, pcf	2.8 to 3.4	ASTM D 3575 Suffix: W, Method A
b.	Water Absorption total immersion 3 months	0.02% by volume	ASTM D 3575 Suffix: L

	Property	Value	Test Method
c.	Tensile Strength	125 psi	ASTM D 3575 Suffix: T
d.	Elongation before breaking	255%	ASTM D 3575 Suffix: T
e.	Working Temperature	-94 to 160 F	--

G. Neoprene Pads: Use neoprene pads as shown or required where slabs or beams must be prevented from bonding to footings, walls, columns or other rigid parts of the structure.

1. Use neoprene pads of a structural grade meeting the requirements of Section 25, Division 2 of the AASHTO Standard Specifications for Highway Bridges.

2. Do not use neoprene pads thinner than 1/4-inch.

H. Wedge Inserts: Make wedge inserts for 5/8-inch and 3/4-inch bolts of ductile iron conforming to ASTM A 536.

I. Dovetail Anchors: Provide dovetail anchors of one of the following types:

1. Dovetail anchors having a 3/16-inch by 1-inch by 1/2-inch stainless steel dovetail section with 3/16-inch diameter stainless steel wire.

2. Dovetail anchor slots of 24 gauge galvanized steel 1-inch by 1-inch by 5/8-inch throat. Fill anchor slots.

J. Flashing Reglets: Provide flashing reglets of 24 gauge galvanized steel foam filled reglets.

PART 3 EXECUTION

3.1 INSTALLING OF WATERSTOPS

A. Assembly of Extruded Waterstops: Prefabricate corners and intersections for all waterstops. Make only butt joints in the field. Miter and assemble corners and intersections with approved equipment, as described for field joints.

1. Make field joints by cutting the ends of the sections to be spliced so they will form a smooth even butt joint. Heat the cut ends with the splicing tool until the plastic melts. Press the two ends together until the plastic cools. Do splicing in a way that limits damage to the continuity of the ribbed strips.

2. Carry waterstops in the walls into lower slabs and join them to the waterstops in the slabs. Make all waterstops continuous. Set waterstops accurately to the position and line shown. Hold edges securely fixed in position at intervals of not more than 24 inches so that they will not move during the placing of the concrete. Do not drive nails through the waterstops.

B. Prefabricated Stainless Steel Waterstops: Prefabricate corners and intersections for all stainless steel waterstops. Make only butt joints in the field. Miter and weld corners and intersections.

1. Provide field joints having a nominal 1-inch lap joint, with the exposed edge welded or brazed on each side.

2. Make field joints with PVC waterstops as shown.

3. At expansion joints, seal the base of the expansion section of the waterstop with at least one layer of 2-inch wide duct tape.

4. Carry waterstops in the walls into lower slabs and join them to the waterstops in the slabs. Make all waterstops continuous. Set waterstops accurately to the position and line shown. Hold edges securely fixed in position at intervals of not more than 24 inches so that they will not move during the placing of the concrete. Do not drive nails through the waterstops.

C. Splices: Use splices made in the manufacturer's plant where possible for rubber waterstops.

1. Use a preformed rubber union or fitting and splicing cement as recommended by the manufacturer when splices are made.

2. Carry waterstops in the walls into lower slabs and join them to the waterstops in the slabs. Make all waterstops continuous. Set waterstops accurately to the position and line shown. Hold edges securely fixed in position at intervals of not more than 24 inches so that they will not move during the placing of the concrete. Do not drive nails through the waterstops.

D. Joint Filler Placement: Place joint filler for expansion joints against the completed portion of the work before the concrete for the next section is placed.

1. Fasten the filler to the hardened concrete with a compatible adhesive in accordance with manufacturer's instructions. Extend the filler through the

thickness of the wall or slab and make it flush with the finished surface, except where a preformed joint seal or joint sealant is shown.

2. In joints having a waterstop, fit the filler accurately on each side of the waterstop to prevent the intrusion of concrete.

E. Preparation of 2-Component Sealants: Mix 2-component joint sealant using a slotted paddle and slow speed mixer for 5 to 8 minutes, continually working paddle from top to bottom until the sealant color is uniform. Scrape down the side of the container and paddle blade several times during the mixing operation to ensure uniform mixing.

1. Properly prepare joint surfaces by removing all foreign matter and concrete laitance so that concrete surfaces are structurally sound, clean, dry, and free of all oil, grease, wax, waterproofing compounds or form release materials prior to the application of primer and sealant.

2. Prime all concrete joint surfaces and all surfaces exposed to water prior to sealing, with no exceptions. Prime all other surfaces as recommended by the manufacturer of the sealant. Provide the prime as recommended by the manufacturer of the sealant, subject to approval. Apply the primer by either brushing or spraying on the joint surfaces. Apply and install the sealant within 2 to 24 hours after the application of primer.

3. For horizontal joints, install the sealant by pouring directly from a suitable shaped can or by flowing from a bulk-loading gun.

4. Fill vertical joints from a gun, starting from the bottom, to avoid bridging and the formation of air voids.

5. Fill overhead joints from a gun, by laying a bead along each side of the joint and then filling the middle. Immediately after installation, tool in the sealant in order to establish firm contact with joint surfaces and to provide a smooth sealant surface. Tool in accordance with the manufacturer's instructions.

6. Control joint depth with the use of joint fillers and backup materials. Make joint widths and sealant depths as shown. Do not exceed 1/2-inch for sealant depth.

F. Preformed Joint Seal Surface Preparation: Properly prepare joint surfaces by removing all foreign matter and concrete laitance so that concrete surfaces are structurally sound, clean, dry, and free of all oil, grease, wax, water-proofing compounds or form release materials.

1. Blast clean or saw cut all existing concrete surfaces to expose a clean bare concrete surface. Allow new concrete to be well cured, and attain a minimum of 80 percent of the specified strength before installing sealant.

2. Apply bonding adhesive, as recommended by the manufacturer to the concrete surfaces in strict compliance with the manufacturer's recommendations. Install the joint material under a compression of 25 percent and in one continuous operation, in accordance with manufacturer's recommendations. Do all splices and directional changes using heat welding method as recommended by the manufacturer.

G. Unbonded Joints: Use unbonded horizontal joints as shown or required where slabs of beams must be prevented from bonding to footings, walls, columns or other rigid parts of the structure.

1. Prevent bonding by use of structural grade neoprene pads placed over the bearing surface of the footing, wall or other supporting part of the structure so as to isolate it from the new concrete being placed.

H. Encasing Inserts: Encase wedge inserts, flashing reglets and dovetail anchor slots in the concrete as shown. Take special care to place and maintain them to the proper lines and grades and to compact concrete thoroughly around them to prevent the passage of water. Set these items before placing concrete and thoroughly brace them to prevent movement during the progress of the work. Provide dovetail anchor slots spaced not more than 16 inches apart for all concrete walls faced with masonry.

END OF SECTION

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