Section 814. PAVED DITCHES

814.01 Description. Construct paved ditches using cobble, concrete or hot mix asphalt (HMA).

814.02 Materials. Use materials meeting the following.

- HMA Mixture .................................... 501
- Concrete, Grade P2 ................................. 601
- Mortar, Type R-3 ................................. 702
- Curing Compound ................................. 903
- Steel Reinforcement ............................... 905
- Geotextile Liner .................................. 910
- Cobblestones .................................... 916

HMA Paved Ditches. Use HMA with a maximum air void content of two percent and performance grade 52-34 asphalt cement. Secure the Engineer’s approval for HMA mixture.

Concrete Paved Ditches. Do not exceed one and one half hours between introduction of the mixing water and placement of the concrete. If additional time is required, use a retarding admixture selected from the Qualified Products List. Do not exceed the manufacturer’s recommended maximum initial set time. Do not retemper. The Engineer will not allow additional compensation for any admixture.

814.03 Construction.

A. Preparation of Base. Excavate, shape, and compact the base to the required cross section and elevation. For concrete paved ditches, excavate to permit the installation and bracing of forms. Dispose of surplus excavated material according to subsection 205.03.P.

Where specified, line the ditch bottom with geotextile wide enough to cover the ditch bottom. Do not use longitudinal seams. Start at the down slope end of the ditch and shingle lap geotextile a minimum of two feet.

B. Plain Cobble Ditch. Place cobblestones or broken concrete on the prepared base with longest dimensions parallel with the centerline of the ditch and smallest faces upward. Place the outer rows first using the larger stones. Place the stones or broken concrete by hand, with staggered joints. Tamp with a tamper weighing not less than 30 pounds until pieces are firmly and uniformly bedded in the base.
C. **Grouted Cobble Ditch.** Use mortar with a consistency that can be placed with a mason’s trowel.

Begin work at the down slope end of the ditch. Place a layer of mortar on the prepared base thick enough to embed the lower half of the cobblestones or broken concrete and fill the spaces between the stones. Place the stones or broken concrete according to subsection 814.03.B. Add and consolidate mortar to fill all voids to within one inch of the top of the stones or pieces of broken concrete, leaving the top surface exposed. Cure and protect the grout according to subsection 814.03.E.5.

D. **HMA Paved Ditch.** Do not place HMA on a frozen grade. Place the HMA mixture not less than 2 inches thick (not less than 220 pounds per square yard) on the prepared base and cover the ditch bottom and side slopes.

Place HMA using either mechanical or hand methods, as approved by the Engineer. Compact the material to a smooth finish using a roller, mechanical compactor, or hand tamper. Check the ditch grade during paving to ensure positive drainage and no ponding of water.

E. **Concrete Paved Ditches.**

1. **Forms.** Use wood or metal forms, straight and free from warp, and sufficiently strong to resist deflecting during concrete placement. Place forms the full depth of the concrete. Concrete placed at a depth below the ditch subgrade may be cast neat to the earth, as approved by the Engineer.

2. **Steel reinforcement.** Place steel reinforcement according to subsection 802.03.C.

3. **Placing and Finishing Concrete.** Wet the base immediately before placing concrete. Consolidate the concrete along the faces of the forms and next to the joints. Tamp the concrete surface to remove all voids, strike off, and float to the required grade and cross section.

   Round all edges and joints to a radius of $\frac{1}{4}$ inch with an approved finishing tool. Remove edging and finishing tool marks with a float and soft bristle brush.

   The weather and temperature limitations of subsection 602.03.T will apply.
814.03

4. **Joints.** Construct plane-of-weakness joints according to subsection 803.03.D.

5. **Curing and Protection.** Cure the concrete for a minimum of 4 days by keeping it continuously wet, or by applying transparent membrane curing compound meeting subsection 903.06.B.

814.04 **Measurement and Payment.**

<table>
<thead>
<tr>
<th>Contract Item (Pay Item)</th>
<th>Pay Unit</th>
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</thead>
<tbody>
<tr>
<td>Ditch, Plain Cobble</td>
<td>Square Yard</td>
</tr>
<tr>
<td>Ditch, Grouted Cobble</td>
<td>Square Yard</td>
</tr>
<tr>
<td>Paved Ditch, HMA</td>
<td>Square Yard</td>
</tr>
<tr>
<td>Paved Ditch, Conc</td>
<td>Square Yard</td>
</tr>
</tbody>
</table>

**Ditch, Plain Cobble; Ditch, Grouted Cobble; Paved Ditch, HMA; and Paved Ditch, Conc** will be measured in place. Payment includes furnishing and placing geotextile liner, when specified, and removing and disposing of surplus materials for the installation of the liner, cobble, HMA, and concrete.