PROJECT USE: Angela Johnson

Use for aprons serving culverts with ground slope of less than 10%.

Furnish geotextile filter conforming to subsection 714.01(a). See summary tables for class and type.

Excavation for placement of riprap shall not be measured for payment.

NOTE:

OUTLET WITHOUT DITCH

<table>
<thead>
<tr>
<th>CULVERT SIZE D (inches)</th>
<th>RIPRAP CLASS</th>
<th>LENGTH OF APRON L (feet)</th>
<th>DEPTH OF APRON H (feet)</th>
<th>ESTIMATED RIPRAP QUANTITY (CY)</th>
<th>ESTIMATED GEOTEXTILE QUANTITY (SY)</th>
</tr>
</thead>
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<td>4</td>
<td>1.5</td>
<td>1.7</td>
<td>3</td>
</tr>
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<td>2</td>
<td>6</td>
<td>1.5</td>
<td>2.2</td>
<td>9</td>
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<td>2</td>
<td>8</td>
<td>1.5</td>
<td>3.9</td>
<td>14</td>
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<tr>
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<td>24.5</td>
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OUTLET WITH DITCH

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</tbody>
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SECTION A-A

PROTECTIVE APRON AT CULVERT OUTLET WITHOUT DITCH

SECTION B-B

PROTECTIVE APRON AT CULVERT OUTLET WITH DITCH

SECTION C-C

PROTECTIVE APRON AT CULVERT OUTLET WITH DITCH

SECTION D-D

PROTECTIVE APRON AT CULVERT OUTLET WITH DITCH

SECTION E-E

PROTECTIVE APRON AT CULVERT OUTLET WITH DITCH

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

U.S. CUSTOMARY DETAIL

PLACED RIPRAP AT CULVERT OUTLETS

C251-50
NOTES TO THE DESIGNER
Last Updated: August 2020

General Information

1. **Maximum slope.** Riprap aprons shown in this drawing can be used for culvert outlets with slopes up to 10%. For steeper applications, use alternate protective aprons, such as revet mattresses.

Applicable SCRs

1. None

Typical Pay Items Used

- 25101-2200 Placed riprap, method B, class 2 and/or
- 25101-2300 Placed riprap, method B, class 3 and/or
- 25101-2400 Placed riprap, method B, class 4

- 60201-0?00 [12-inch to 48-inch] pipe culvert
- 60210-0?00 End section for [12-inch to 48-inch] pipe culvert
- Geotextile quantity is shown for information only

Updates

October 16, 2000
- Updated border to FLH Standard

February 2, 2005
- Updated to MicroStation V8

March 2009
- Added drawings of aprons in ditches
- Added quantity tables
- Moved riprap rundown at culvert inlet to template drawing

November 2010
- Revised Section C-C and quantity table for outlet with ditch

April 2011
- Eliminated riprap apron under end section

August 2014
- Updated for FP-14
- Updated border

August 2020
- Update geotextile reference