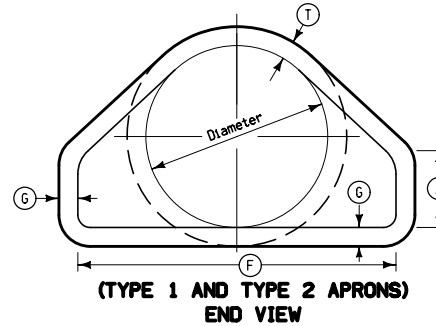
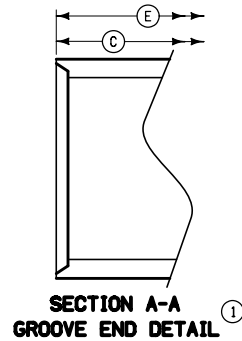
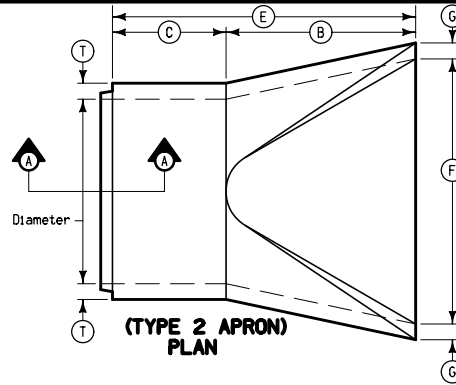
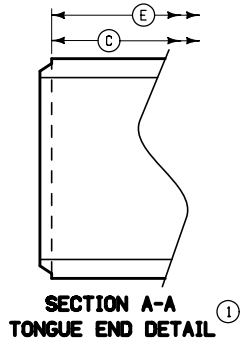
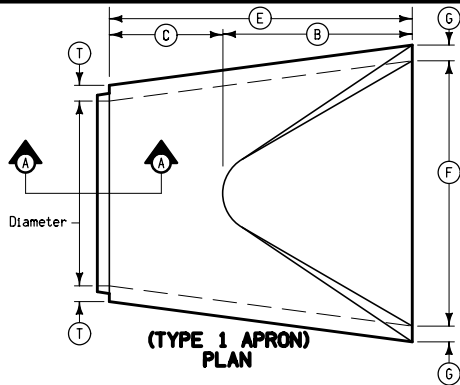
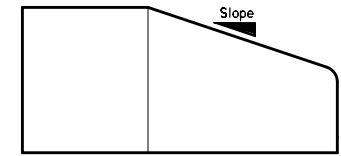




Dimension 'E' shown is minimum and shall be considered the design length. Any difference between the actual length of concrete apron installed and the length indicated hereon shall be appropriately adjusted for in the length of concrete culvert pipe furnished.

When specified in the contract documents, pipe apron guards shall be installed as shown on RF-26. Pipe apron guards will not be measured separately for payment, but shall be included in the contract unit price for "Concrete Aprons."

- ① Tongue end used on inlet end section. Groove end used on outlet end section. Comply with AASHTO M 170 for tongue and groove dimensions.



SIDE VIEW

| TYPE 1 APRONS |       |         |           |           |           |        |        |        |
|---------------|-------|---------|-----------|-----------|-----------|--------|--------|--------|
| DIAM.         | SLOPE | A       | B         | MINIMUM   |           | F      | G      | T      |
|               |       |         |           | C         | E         |        |        |        |
| 12"           | 2.4:1 | 4"      | 2'-0"     | 4'-7/8"   | 6'-7/8"   | 2'-0"  | 2"     | 2"     |
| 15"           | 2.4:1 | 6"      | 2'-3"     | 3'-10"    | 6'-1"     | 2'-6"  | 2 1/4" | 2 1/4" |
| 18"           | 2.3:1 | 9"      | 2'-3"     | 3'-10"    | 6'-1"     | 3'-0"  | 2 1/2" | 2 1/2" |
| 21"           | 2.4:1 | 9"      | 3'-0"     | 3'-1 1/2" | 6'-1 1/2" | 3'-5"  | 3"     | 3"     |
| 24"           | 2.5:1 | 9 1/2"  | 3'-7 1/2" | 2'-6"     | 6'-1 1/2" | 4'-0"  | 3"     | 3"     |
| 27"           | 2.5:1 | 10 1/2" | 4'-1"     | 2'-0"     | 6'-1 1/2" | 4'-4"  | 3 1/2" | 3 1/2" |
| 30"           | 2.5:1 | 12"     | 4'-6"     | 1'-7 3/4" | 6'-1 3/4" | 5'-0"  | 3 1/2" | 3 1/2" |
| 36"           | 2.5:1 | 15"     | 5'-3"     | 2'-9"     | 8'-0"     | 6'-0"  | 4"     | 4"     |
| 42"           | 2.5:1 | 21"     | 5'-3"     | 2'-9"     | 8'-0"     | 6'-6"  | 4 1/2" | 4 1/2" |
| 48"           | 2.5:1 | 24"     | 6'-0"     | 2'-0"     | 8'-0"     | 7'-0"  | 5"     | 5"     |
| 54"           | 1.8:1 | 27"     | 5'-0"     | 3'-0"     | 8'-0"     | 7'-6"  | 5 1/2" | 5 1/2" |
| 60"           | 1.6:1 | 29 1/2" | 5'-0"     | 3'-0"     | 8'-0"     | 8'-0"  | 5 1/2" | 6"     |
| 66"           | 1.7:1 | 30"     | 6'-0"     | 2'-3"     | 8'-3"     | 8'-0"  | 5 1/2" | 6"     |
| 72"           | 1.6:1 | 30"     | 6'-6"     | 1'-9"     | 8'-3"     | 9'-0"  | 6"     | 7"     |
| 78"           | 1.8:1 | 36"     | 7'-6"     | 1'-9"     | 9'-3"     | 9'-6"  | 6 1/2" | 7 1/2" |
| 84"           | 1.3:1 | 29 1/2" | 6'-9"     | 2'-6 1/2" | 9'-3 1/2" | 10'-0" | 6 1/2" | 8"     |

| TYPE 2 APRONS |       |         |           |           |           |        |        |        |
|---------------|-------|---------|-----------|-----------|-----------|--------|--------|--------|
| DIAM.         | SLOPE | A       | B         | MINIMUM   |           | F      | G      | T      |
|               |       |         |           | C         | E         |        |        |        |
| 12"           | 2.4:1 | 4"      | 2'-0"     | 4'-7/8"   | 6'-7/8"   | 2'-0"  | 2"     | 2"     |
| 15"           | 2.4:1 | 6"      | 2'-3"     | 3'-10"    | 6'-1"     | 2'-6"  | 2 1/4" | 2 1/4" |
| 18"           | 2.3:1 | 9"      | 2'-3"     | 3'-10"    | 6'-1"     | 3'-0"  | 2 1/2" | 2 1/2" |
| 21"           | 2.4:1 | 9"      | 3'-0"     | 3'-1 1/2" | 6'-1 1/2" | 3'-5"  | 3"     | 3"     |
| 24"           | 2.5:1 | 9 1/2"  | 3'-7 1/2" | 2'-6"     | 6'-1 1/2" | 4'-0"  | 3"     | 3"     |
| 27"           | 2.5:1 | 10 1/2" | 4'-1"     | 2'-0"     | 6'-1 1/2" | 4'-4"  | 3 1/2" | 3 1/2" |
| 30"           | 2.5:1 | 12"     | 4'-6"     | 1'-7 3/4" | 6'-1 3/4" | 5'-0"  | 3 1/2" | 3 1/2" |
| 36"           | 2.5:1 | 15"     | 5'-3"     | 2'-9"     | 8'-0"     | 6'-0"  | 4"     | 4"     |
| 42"           | 2.5:1 | 21"     | 5'-3"     | 2'-9"     | 8'-0"     | 6'-6"  | 4 1/2" | 4 1/2" |
| 48"           | 2.5:1 | 24"     | 6'-0"     | 2'-0"     | 8'-0"     | 7'-0"  | 5"     | 5"     |
| 54"           | 1.9:1 | 24 1/2" | 5'-5"     | 2'-7"     | 8'-0"     | 7'-6"  | 5 1/2" | 5 1/2" |
| 60"           | 1.4:1 | 24 1/2" | 5'-0"     | 3'-0"     | 8'-0"     | 8'-0"  | 5 1/2" | 6"     |
| 66"           | 1.7:1 | 30"     | 6'-0"     | 2'-3"     | 8'-3"     | 8'-0"  | 5 1/2" | 6"     |
| 72"           | 1.4:1 | 24"     | 6'-6"     | 1'-9"     | 8'-3"     | 9'-0"  | 6"     | 7"     |
| 78"           | 1.8:1 | 36"     | 7'-6"     | 1'-9"     | 9'-3"     | 9'-6"  | 6 1/2" | 7 1/2" |
| 84"           | 1.5:1 | 23 1/2" | 7'-6 1/2" | 1'-9"     | 9'-3 1/2" | 10'-0" | 6 1/2" | 8"     |

Contract Item:  
Apron, Concrete

Tabulations:  
104-3  
104-5C

|                                                                                                                                                                                                                                                               |                          |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--|
| <p>Iowa Department of Transportation</p> <p><b>STANDARD ROAD PLAN</b></p> <p>REVISIONS: Corrected 'A' dimension. Removed references to RF-1. Removed language added to Specifications.</p> <p><i>Deanna Mufst</i><br/>APPROVED BY DESIGN METHODS ENGINEER</p> | REVISION<br>9   10-18-11 |  |
|                                                                                                                                                                                                                                                               | <b>RF-3</b>              |  |
|                                                                                                                                                                                                                                                               | SHEET 1 of 1             |  |
|                                                                                                                                                                                                                                                               | <b>CONCRETE APRONS</b>   |  |