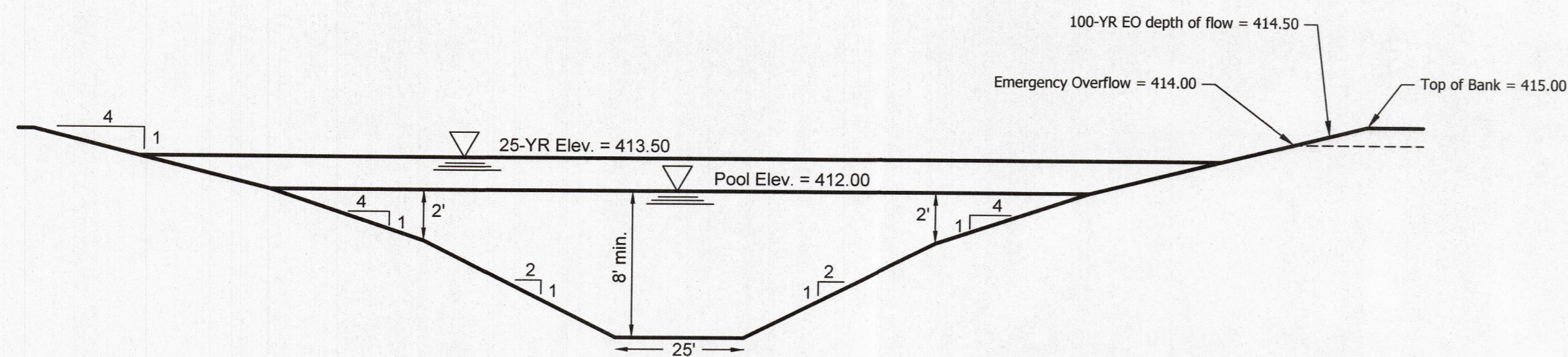


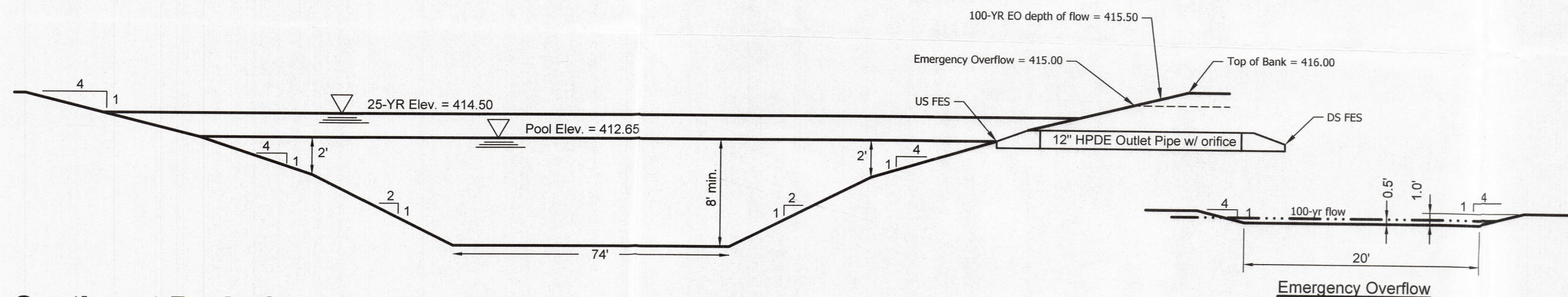
**Northeast Basin Cross Section C-C**

No Scale



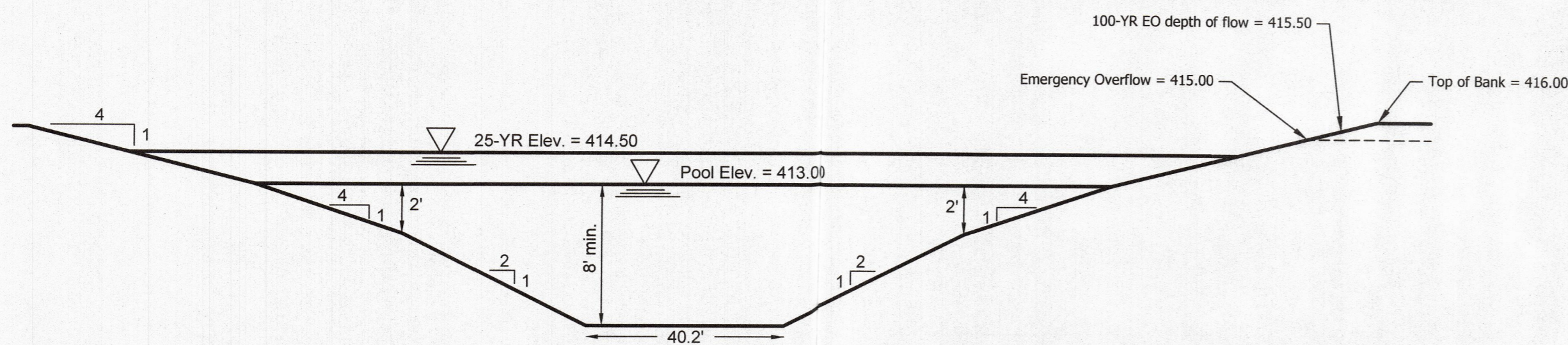
**Northeast Basin Cross Section D-D**

No Scale



**Southeast Basin Cross Section E-E**

No Scale

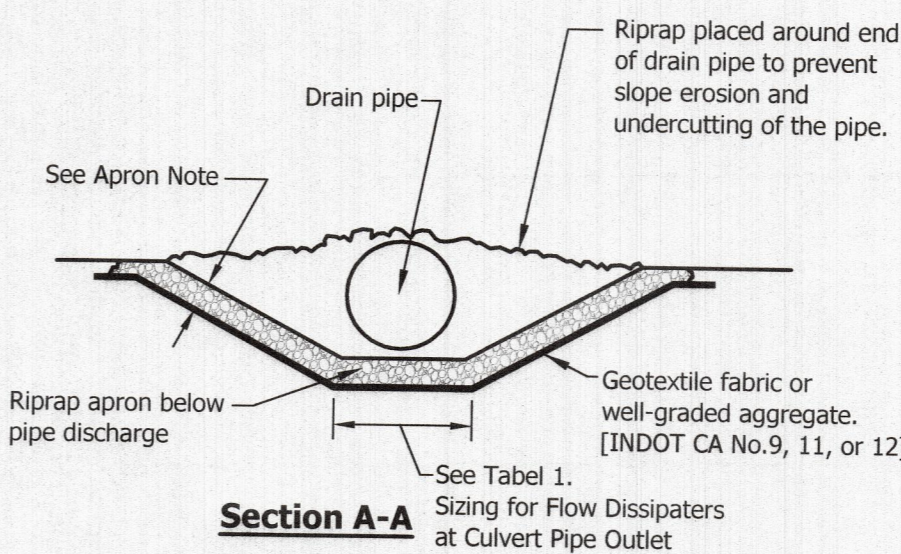


**Southeast Basin Cross Section F-F**

No Scale

Note:

No tree limbs, trunks, refuse from legally burnt vegetation, or construction waste, demolition materials, or other man made material may be buried within the area in which an impounding structure will be located. Notice shall be placed on construction drawings noting the prohibition to the burying of any such materials. Certain natural materials such as large rocks may be located in the bottom of wet basins in order to provide fish habitat or habitat breeding areas provided that such materials are not included within the calculations for required storage volumes and will not block outlet structures.



**Section A-A**

- Apron Note:**
- Length and width determined according to tailwater conditions.
  - Aligned straight with channel flow. If curve is necessary to align apron with the receiving stream, locate the curve in the upstream section of the apron.
  - Plunge pool (used with higher velocity flows).
  - Thickness
    - 1.2 times the maximum stone diameter for a  $d_{50}$  stone size of 15 inches or larger.
    - 1.5 times the maximum stone diameter for a  $d_{50}$  stone size of 15 inches or less.

**Table 1. Sizing for Flow Dissipaters at Culvert Pipe Outlets**

Pipe Size	Average Riprap Diameter	Apron Width <sup>1</sup>	Apron Length <sup>2</sup>
8 in.	3 in.	2 to 3 ft.	5 to 7 ft.
12 in.	5 in.	3 to 4 ft.	6 to 12 ft.
18 in.	8 in.	4 to 6 ft.	8 to 18 ft.
24 in.	10 in.	6 to 8 ft.	12 to 22 ft.
30 in.	12 in.	8 to 10 ft.	14 to 28 ft.
36 in.	14 in.	10 to 12 ft.	16 to 32 ft.

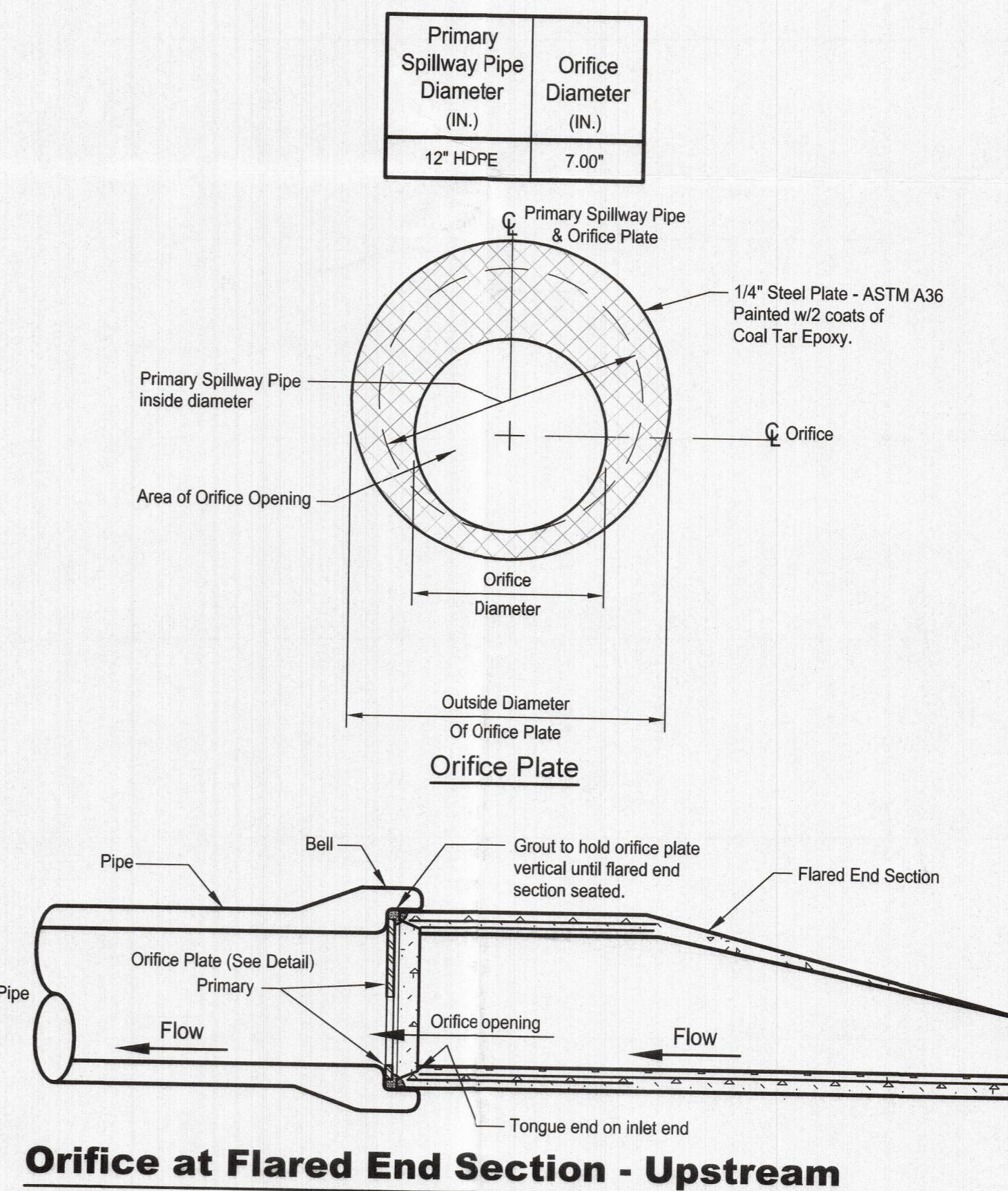
- For larger or higher flows consult a registered engineer.
- Apron width at the narrow end of apron (pipe or channel outlet).
- Select length taking into consideration the low flow (no pressure head) or high flow (pressure head) conditions of the culvert pipe.

**Riprap**

- Hard, angular, highly weather resistant.
  - Specific gravity of at least 2.5.
  - Size and gradation that will withstand velocities of storm water discharge flow design.
  - Well-graded mixture of stone with 50 percent of the stone pieces, by weight, larger than the  $d_{50}$  size and diameter of the largest stone equal to 1.5 times the  $d_{50}$  size.
- Installation:**
- Divert surface water runoff around the structure during construction so that the site can be properly dewatered for foundation preparation.
  - Excavate foundation and apron area subgrades below design elevation to allow for thickness of the filter medium and riprap.
  - Compact any fill used in subgrade preparation to the density of surrounding undisturbed soil material.
  - Smooth subgrade enough to protect geotextile fabric from tearing.
  - Place geotextile fabric or aggregate bedding material (for stabilization and filtration) on the compacted and smoothed foundation.
  - Blend riprap smoothly to surrounding grade. If the channel is well defined, extend the apron across the channel bottom and up the channel banks to an elevation of six inches above the maximum tailwater depth or the top of the bank, whichever is less.
  - If geotextile fabric tears when placing riprap, repair immediately by laying and stapling a piece of fabric over damaged area, overlapping the undamaged areas be at least 12 inches.
  - Construct a small plunge pool within the outlet apron. (Riprap aprons must be level with or slightly lower than the receiving channel and should not produce an overfall or restrict flow of the water conveyance structure.)

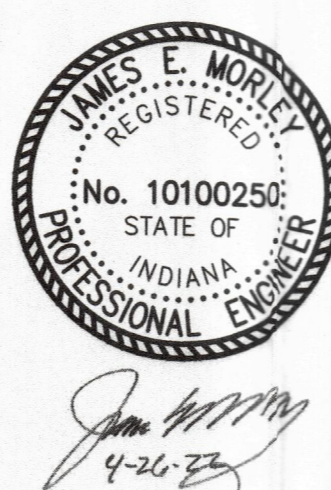
**Outlet Protection and Grade Stabilization**

No Scale



**Orifice at Flared End Section - Upstream**

No Scale



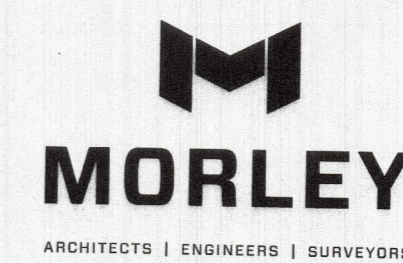
Revisions		
No.	By	Date

All ideas, designs, calculations, and arrangements indicated or represented by this drawing are owned by and are the property of Morley and Associates, Inc. and were created as instruments of service for use on and in connection with the specified project. Morley and Associates retains all common law, statutory law and other rights, other than the project. They shall not be disclosed to or be used by any other person or firm without the written prior consent of Morley and Associates, Inc.

Written dimensions on these drawings shall have precedence over scale dimensions. Contractors shall verify and be responsible for all dimensions and conditions on the job and Morley and Associates, Inc. must be notified of any variations from the dimensions and conditions shown by these drawings.

If differences exist between electronic files and the signed and sealed hard copy drawings, the hard copy shall govern.

4800 Rosebud Ln., Newburgh, IN 47630 812.464.9885 Phone 812.464.2514 Fax morleycorp.com



Project:	Eleanor's Place	Scale: As Noted
Sheet Title:	Drainage Details - 2 Vanderburgh County, IN	Designed By: JEM Job Number: 11822.4.001-B
		Drawn By: CRS Date: 4.26.2022
		File Name: 11822 Civil Base
		Sheet Number: C505

Received by the Vanderburgh County Surveyor's Office

APR 26 2022

Time 10:00 AM Initials AR