



CROSSSECTION

Pipe Diameter _____ inches
 Pipe Length _____ feet
 Pipe Material _____

Fracture Opening Size Inches	IDOT Riprap Grad. No.
Up To 5"	RR3
Up to 8"	RR4
Up To 10"	RR5

Notes:

- Set pipe directly over central fracture location. Select pipe diameter according to drainage area of sinkhole, using selection guide table below. Pipe material to be dual wall polyethylene (ASTM F2306 or F2648), PVC (ASTM F949, D1785 or D2241), or concrete well casing.
- Geotextile (non-woven, needle punched) Minimum criteria:
 Grab tensile strength (lb) ASTM D 4632 _____ 202
 Elongation at failure (%) ASTM D 4632 _____ ≥ 50
 Trapezoidal tear strength (lb) ASTM D4533 _____ 79
 Puncture strength (lb) ASTM D 6241 _____ 433
 Ultraviolet light (% retained strength) ASTM D 4355 _____ min 50
 Apparent opening size (AOS) ASTM D 4751 _____ max 0.22 mm (US sieve #70)
 Permittivity sec⁻¹ ASTM D 4491 _____ min 0.70
- Geotextile shall be cut in a "X" pattern to fit over the vertical drain pipe to cover rock fracture outside of the pipe.
- Any geotextile splices shall overlap a minimum of 18 inches.
- Poured concrete may be used in place of riprap, gravel and geotextile.
- The riprap gradation for the base shall depend on the size of the fracture opening. See table this page for sizing. Riprap may be IDOT Quality Designation A or B.
- A 2 inch layer of bentonite may be placed in the compacted earthfill. Bentonite can be placed as one 2 inch thick layer or incorporated into the earthfill. The bottom of the bentonite layer must be at least 3 inches above the geotextile.
- Excavation shall extend a minimum of 2 feet laterally from each side of the crevice opening and laid back to 1:1 slope or flatter.
- Seed a minimum 30 foot vegetated buffer around the inlet pipe according to the Critical Area Planting Specifications. In non-cropped areas, seed the surface of the filled sinkhole and all disturbed areas.

Guide To Select Pipe Size	
Drainage Area, Acres	Minimum Pipe Dia. Inches
≤ 5	10"
5.1-15	12"
15.1-25	24"
> 25	36"

Date _____
 Drawn M. QUINONES 11/1/13
 Designed _____
 Checked _____
 Approved _____

VERTICAL DRAIN FOR SINKHOLES

