

Diaphragms or Anti-Seep Collars for CSP

In levees, dams and on culverts in deep valleys or under high fills there is a good possibility that water will at some point pond at the upstream end increasing the likelihood of saturation of the embankment fill and in a worse case scenario a washout of the fill. Water in the fill will naturally flow along the outer walls of the pipe where backfills typically are granular, free draining material that may not be fully consolidated. This flow condition is referred to as piping and can lead to the removal of the supporting back fill envelope from around the pipe.

Piping can be prevented by constructing non permeable headwalls at the culvert entrance and diaphragms or anti-seep collars that block the external flow along the culvert length. Diaphragms are typically constructed of flat corrugated sheets that are directly welded to the pipe or welded to couplers that are secured to the pipe in the field. Bolt on diaphragms help to reduce freight costs and should be located at least one metre from pipe joints. Diaphragms are placed at varying intervals along the pipe depending on conditions. Considering settlements that can occur in the fill and the high hydrostatic pressures that develop all pipe and couplers should be of a design that resists leakage and pull apart



ONE PIECE ANTI SEEP COLLAR WELDED TO PIPE

Minimum Dimensions for CSP Anti Seep Collars Nominal Dimensions in mm			
Pipe Diam. D	F	W	H
300	600	1800	1800
400	700	1900	1900
450	760	1980	1980
500	840	2050	2050
600	900	2130	2130
700	1070	2200	2200
800	1100	2300	2300
900	1200	2400	2400
1000	1350	2500	2500
1200	1520	2750	2750

* NOMINAL DIMENSIONS SHOWN MAY BE USED FOR ANY PIPE DIAMETER LISTED



ANTI SEEP DIAPHRAGM ON DEEP FILL CULVERT

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Notes:

1. See profile along centerline of principal spillway, sheet ___ of ___ for the location and spacing of the antiseep collars.
2. Unassembled antiseep collars shall be marked by painting or tagging to identify matching pairs.
3. A dimpled band or band fabricated from smooth steel shall be used for helical pipe.
4. The laps between all sections of the antiseep collar and between the pipe and connecting band shall be caulked with a heavy coat of fibrated mastic or a neoprene gasket. Use latex caulk for openings greater 3 mm.
5. Each antiseep collar shall be furnished with either two 11 mm diameter rods with standard connecting lugs or a two-piece dimpled coupling band with 50 x 50 x 5 mm angles and 6 x 114 mm carriage bolts.
6. Use 9 x 25 mm machine bolts to connect the upper and lower halves of the antiseep collar.
7. For pipe diameters of 300 to 800 mm steel collar thickness shall be 1.6 mm. For pipe diameters of 900 to 1200 mm steel collar thickness shall be 2.0 mm

