C. The drain pipes shall be fully perforated in rectangular shapes around the pipes in an angle of 45 degrees measured from the vertical pipe axis. Perforation should be concentrated above the horizontal centreline of the pipe.

Perforation dimensions are presented in below table

Table 25-1: Perforation Dimensions

OD	Slot Width mm		Slot Area-Min
mm	Min	Max	mm2/m
160	4	5	4500
225	4	5	6000
280	4	5	8000
315	4	5	9000

25.2.3 Gravel Envelope Materials

A. Envelopes shall be 100mm thick around the pipe drain as minimum.

B. To determine whether a material is well graded, coefficients describing the slope and the shape of the gradation curve are defined as follows:

Coefficient of uniformity, $C_u = \frac{D_{60}}{D_{10}}$

Coefficient of curvature, $C_c = \frac{(D_{30})^2}{(D_{10})(D_{60})}$

Where D_{60}, D_{30} and D_{10} are the respective diameters corresponding to 60%, 30%, and 10 % finer particles in the particle-size distribution curve.

C. The coefficient of uniformity shall be greater than 4 for gravels and greater than 6 for sands.

D. The coefficient of curvature shall be between 1 and 3 for both gravels and sands. The following table shows the gradation relationship between the base material and gravel envelope for most soils.

Table 25-2:Gradation relationship

Base soil limits for d_{60} (mm)	Lower limits (mm) Percentage passing						Upper limits (mm) Percentage passing					
	100	60	30	10	5	0	100	60	30	10	5	0
0.020-0.050	9.52	2.0	0.81	0.33	0.3	0.074	38.1	10.0	8.7	2.5	-	0.59

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