Where D60, D30 and D10 are the respective diameters corresponding to 60%, 30%, and 10 % finer particles in the particle-size distribution curve.

A well graded material shall have a coefficient of uniformity greater than 4 for gravel and greater than 6 for sands. In addition, the coefficient of curvature shall be between 1 and 3 for both gravel and sand.

Table 5-7 below shows the gradation relationship between the base material and gravel envelope for most soils. These relationships have been found to work satisfactorily under low-head conditions

Base soil limits for d_{60} (mm)	Lower limits (mm)						Upper limits (mm)					
	Percentage passing						**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
0.050-0.100	9.52	3.0	1.07	0.38	0.3	0.074	38.1	12.0	10.0	3.0	-	0.59
0.100-0.250	9.52	4.0	1.30	0.40	0.3	0.074	38.1	15.0	13.1	3.8	-	0.59
0.250-1.000	9.52	5.0	1.45	0.42	0.3	0.074	38.1	20.0	17.3	5.0	-	0.59

Table 5-7 – Design Criteria for Gravel Envelopes

Pipe Connections

Pipe connections will be achieved using manholes.

In urban areas, the groundwater lowering pipework will generally be laid in the same trench as the storm water pipes (as long as not under road asphalt) and connect to manholes for ease of cleaning.

5.5. Hydraulic Design

The flow from a sub-soil system shall be determined by using the highest value from the following methods:

- multiplying the drainage coefficient (ranging from 2 to 5 mm/day for Abu Dhabi), by the drainage area
- using the formulae in Section 5.4.2, “Determining Discharge from Subsurface Drains”
- where irrigation is the only source of recharge to estimate the drainage rate as a fraction of the irrigation rate. This fraction is commonly taken as 10 percent.

The sizing of field drains shall be carried out using the modified version of the Manning equation:

$$d = 116 * \left(qn / S^{1/2}\right)^{3/8}$$

Where:

- d = pipe diameter in mm
- q = flow in litres per second
- S = pipe slope in m/m
- n = pipe roughness coefficient