



E-RETE (MALAYA) SDN. BHD.

CONCRETE POROUS PIPES

General

The use of E-RETE Concrete Porous Pipes for under drainage is a great advantage in both efficiency and economy. Their strengths are much greater than the ordinary clay subsoil pipes, and INCREASE WITH AGE, remaining unaffected by the absorption of moisture.

The unique property of concrete porous pipes is that infiltration of water takes place over the entire surface. A concrete porous pipe underdrain enjoys the best characteristics of a rubble drain with the additional advantage of a central duct for rapid removal of water. The porosity is so remarkable that small drains may be connected to larger ones merely by placing the end of the former over the latter without the need for piercing the wall of the main to enable it to receive the flow from its subsidiaries.

Specification

E-RETE Concrete Porous Pipes are manufactured to both the Malaysian Standard MS 525 : 1986 and British Standard BS 1194 : 1969.

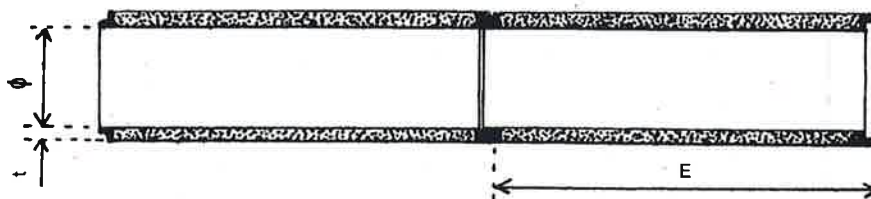
Description

E-RETE Concrete Porous Pipes are produced from finest quality materials on up-to-date equipment by a combination of high frequency vibration and extrusion method.

E-RETE Concrete Porous Pipes are strong, highly porous and of consistent quality. They exceed by a large margin all tests as set out for porous pipes in the above two standard specifications.

E-RETE Concrete Porous Pipes have rebated or ogee joints formed from using a special mix to ensure alignment and prevent silt, roots, etc, from entering the pipe line.

E-RETE Concrete Porous Pipes are available in sections tabulated below:—



Nominal Diameter	Wall Thickness	Effective Length	Approximate Weight Per Unit	MS 525:1986 or BS 1194:1969 Infiltration Rate (Minimum)	Crushing Proof Test Load (Minimum)
ϕ mm	t mm	E mm	kg	$\ell / \text{min m}$	N/m
100	22	455	8	52	20200
150	25	455	14	105	20200
225	38	455	28	158	20200
300	38	455	38	263	20200



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Concrete Porous Pipes



Load Testing of Porous Pipes

Porosity Test of Porous Pipes



Application

E-RETE Concrete Porous Pipes are being used under road verges and railway lines for subsoil drainage and the removal of surplus water. Porous pipes are also used extensively for aerodrome drainage. They may be widely spaced, thus saving in cost and a minimum surface disturbance; and as the continuous infiltration principle banishes the possibility of subsidence, the risk of dangerous depressions in the surface of the aerodrome over the drainage system is absent.

E-RETE Concrete Porous Pipes are used extensively on Highways, Housing Sites, Aerodromes, Recreation Grounds, Race Tracks, Agricultural Land, Tennis Courts, open grounds, etc. They ensure rapid removal of all surplus water, yet by capillary action, retain sufficient moisture in the soil to promote a healthy condition of the turf.



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(3) Relation between Depth and Effective Drainage Area:

Depth mm	Drain Intervals		
	Impervious soil m	Semi-impervious soil m	Pervious soil m
1800	7.2 — 10.8	14.4 — 18.0	18.0 — 21.6
1500	6.0 — 9.0	12.0 — 15.0	15.0 — 18.0
1200	4.8 — 7.2	9.6 — 12.0	12.0 — 14.4
900	3.6 — 5.4	7.2 — 9.0	9.0 — 10.8
600	2.4 — 3.6	4.8 — 6.0	6.0 — 7.2
450	1.8 — 2.7	3.6 — 4.5	4.5 — 5.4

The above table is arrived at by applying the rule which states:—

A drain will effect the soil on either soil of it to a distance equal in impervious soil to 2 - 3 times its depth, in semi-impervious soil 4 - 5 times, and in pervious soil 5 - 6 times.

(4) Pipe Capacities

Pipe Diameter mm	Various Falls				
	1/500	1/300	1/200	1/100	1/50
100	2.147	2.778	3.410	4.925	6.819
150	6.819	8.713	10.734	15.154	21.468
225	20.836	27.024	32.833	46.724	66.297
300	39.652	47.987	62.509	87.512	125.017

The above table gives the maximum rate of free flow in litres per second, in the various falls.

(5) Length of Pipes Required to Drain One Hectare of Land

Drain Intervals, m	2.5	3	4	5	6	8	10	13	16	20
Length m	4000	3333	2500	2000	1667	1250	1000	1429	625	500



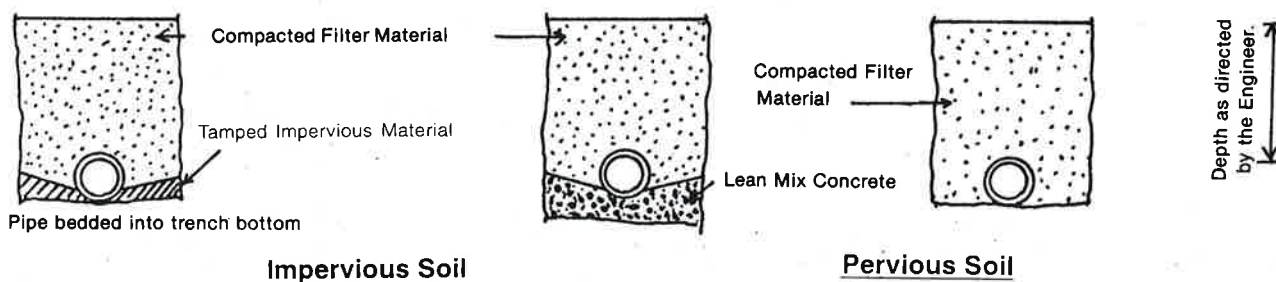
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Advantages of using E-rete Porous Pipes

- (a) Will function efficiently and permanently without attention, provided a pipe of sufficient capacity is selected.
- (b) Need little or no maintenance.
- (c) Obviate necessity of close pipe lines.
- (d) When use in agricultural land:
 - (i) A considerable saving in land area
 - (ii) Several small field can be joined into one, allowing larger machines to be used with subsequent economy.
 - (iii) The danger of live stocks falling into ditches is entirely eliminated.
 - (iv) The "piped ditch" can be located where it is required, as E-RETE Concrete Porous Pipes are strong enough to withstand heavy load.

Useful Information

(1) Typical Installation of Pipe Under drain



All pipes shall be laid in a trench

Minimum trench width = O.D. Pipe + 150 mm or 300mm,

A 0.125 mm thick polythene sheet or other suitable materials impervious seal to be placed on top of the compacted filter material to prevent ingress of surface water or migration of pavement materials where directed by the Engineer.

(2) Depth of Pipes

The depth of pipes depends on site conditions and so shall be laid as directed by the Engineer, but the following depths are recommended:

Impervious soil — 450 to 600 mm

Pervious Soil — 750 to 900 mm