

ASPECT CONSULTING ENGINEERS LTD

DESIGN CALCULATIONS

CLIENT	Cambridge Holdings Ltd
PROJECT	Fredora Avenue, Hayes, London
CONTRACT NUMBER	P / DER / 966
CALCULATION REFERENCE	P / DER / 966 shts 1 - 4 inclusive
DESCRIPTION	Drainage Calculations
DESIGNED BY	S. Walker
CHECKED BY	L. Meakin

Rev.	Reason for revision	Date
O	Issue for Planning submission	15.12.14
A		
B		
C		

Lathkill House, RTC Business Park, London Road, Derby DE24 8UP t:01332 258836

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	Using table 1 to determine the preliminary storage layer depth																																																																								
	Subbase is required to store 6hrs rainfall (mm) for a 1 in 100 year return period																																																																								
	so $(200\text{mm} \times 84\text{m}^2) + 37\text{m}^2 = 53.8\text{mm deep subbase.}$																																																																								
	The subbase depth above can be rationalised as an outflow of 5l/sec from the subbase has been that is an acceptable rate from Local Authority.																																																																								
	A 1 in 100 year rainfall = 63.50mm																																																																								
	Rainfall into subbase																																																																								
	Rainfall rate x area = $63.50\text{mm} \times 84\text{m}^2 = 5.334\text{m}^3$																																																																								
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	So for 84m^2 the pro rata discharge is $5/\text{sec}/\text{Ha} \times 84\text{m}^2 / 10000\text{m}^2 = 0.042/\text{sec}$																																																																								
	Convert to hours hence $0.042/\text{sec} \times 3600 = 151/\text{hour}$																																																																								
	Flow out of subbase = $151/\text{h} \times 6\text{hrs} / 1000 = 0.91\text{m}^3$																																																																								
	Water storage = $5.334\text{m}^3 - 0.93\text{m}^3 = 4.4\text{m}^3$																																																																								
	Thickness of Open Graded Granular Subbase Required																																																																								
	Assuming 30% void ratio = $30 / 100 = 0.3$ (only 30% of the subbase is available to store water).																																																																								
	So total volume of subbase required = $4.4\text{m}^3 / 0.3 = 14.68$ say 15m^3																																																																								
	Therefore : Total Volume = subbase depth x area																																																																								
	so subbase depth = total volume / area = $15\text{m}^3 / 84 = 0.178$ or 178mm say 180mm																																																																								
	Structural Design of Permeable Paving.																																																																								
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	From preceeding table loading catagories fro the site are:					
	Cat 1 - Cars/Domestic Drive					
	From Interpave information the detention/tanked system is designated C					

DESIGN CHART
SYSTEM C

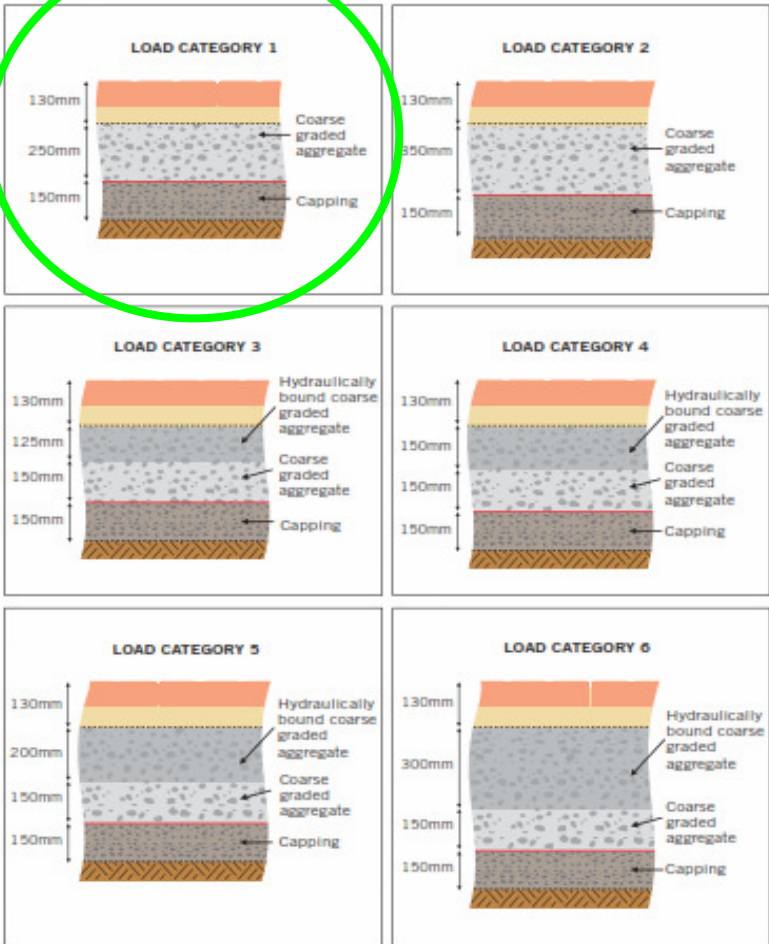


Figure 24: Design chart for System C (detention) permeable pavements (on subgrade $\geq 5\%$ equilibrium moisture content CBR).

PLEASE NOTE THAT THE SUBBASE THICKNESSES ARE INDICATIVE AND REFERENCE SHOULD BE MADE TO THE HYDRAULIC CALCULATIONS.

[illegible]