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Project No: 20170

Sheet No: 5/01

Date: Nov '20

Project: 722 Warwick Road

By: SP

Calculation of Sakerays in connection with
New Development @ 722 Warwick Road,
Reading, Berks.

Reading:-

Fig A1:-

$m_s - 60 = 20mm$

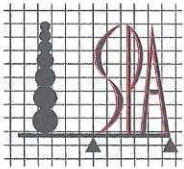
Fig A2:-

$r = 0.35$

<u>D</u>	<u>Z1</u>	<u>Z2</u>	<u>Wind</u>	<u>+30% Clit. dry</u>
10	0.50	1.91	19.1mm	24.8mm
15	0.62	1.95	24.2mm	31.4mm
30	0.80	2.00	32.0mm	41.6mm
60	1.00	2.03	40.6mm	52.8mm
120	1.23	2.01	49.5mm	64.3mm
240	1.55	1.97	61.1mm	79.4mm
360	1.65	1.94	64.0mm	83.2mm
600	1.90	1.90	72.2mm	93.9mm
1440	2.50	1.81	90.5mm	117.7mm

Average Rainfall Intensities:-

<u>D</u>	<u>i</u>
10	$24.8 \times \frac{60}{10} = 148.8mm/hour$
15	$31.4 \times \frac{60}{15} = 125.6mm/hour$
30	$41.6 \times \frac{60}{30} = 83.2mm/hour$



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Project No: 2017a

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Date: Nov 20

Project: 722 Waverick Road

By: SK

60	$52.8 \times \frac{60}{60} = 52.8 \text{ mm/hor}$
120	$64.3 \times \frac{60}{120} = 32.2 \text{ mm/hor}$
240	$79.4 \times \frac{60}{240} = 19.8 \text{ mm/hor}$
360	$83.2 \times \frac{60}{360} = 13.9 \text{ mm/hor}$
600	$93.9 \times \frac{60}{600} = 9.4 \text{ mm/hor}$
1440	$117.7 \times \frac{60}{1440} = 4.9 \text{ mm/hor}$

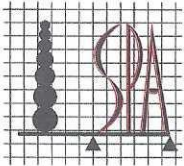
Impermeable Areas:-

Soakaway 1:-

$(2.2 \text{ m} \times 3.5 \text{ m})$	$= 8 \text{ m}^2$
$(7.5 \text{ m} \times 8.8 \text{ m})$	$= 66 \text{ m}^2$
$(1.5 \text{ m} \times 12.5 \text{ m})$	$= 19 \text{ m}^2$
$(3.5 \text{ m} \times 3.5 \text{ m})$	$= 13 \text{ m}^2$
	<u>106 m^2</u>

Soakaway 2:-

$(3.5 \text{ m} \times 1.5 \text{ m})$	$= 6 \text{ m}^2$
$(2.2 \text{ m} \times 10 \text{ m})$	$= 22 \text{ m}^2$
$(15.0 \text{ m} \times 5 \text{ m})$	$= 75 \text{ m}^2$
$(8.5 \text{ m} \times 3.5 \text{ m})$	$= 30 \text{ m}^2$
$(5.8 \text{ m} \times 4.5 \text{ m})$	$= 27 \text{ m}^2$
$(4.8 \text{ m} \times 3.4 \text{ m})$	$= 17 \text{ m}^2$
	<u>177 m^2</u>
	<u>say 180 m^2</u>



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Date: Nov 20

Project: 722 Warnick Road

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Note - All car parking areas and footpaths
to be constructed from permeable
paving.

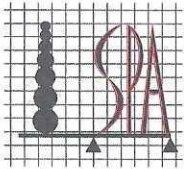
Infiltration Rates

From Structural Labs Limited Ground Investigation
Report. No. 562451 dated 24.08.16, infiltration

rates -

WS1	-	2.35×10^6 m/s
WS2	-	8.32×10^7 m/s
WS3	-	6.20×10^6 m/s
		9.46×10^6 m/s
		3 No.

$\therefore$ Average Infiltration Rate = $\underline{3.15 \times 10^6 \text{ m/s}}$



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Project No: 20170

Sheet No: 5/04

Date: Nov '20

Project: 722 Warwick Road

By: SP

Soakaway 1:-

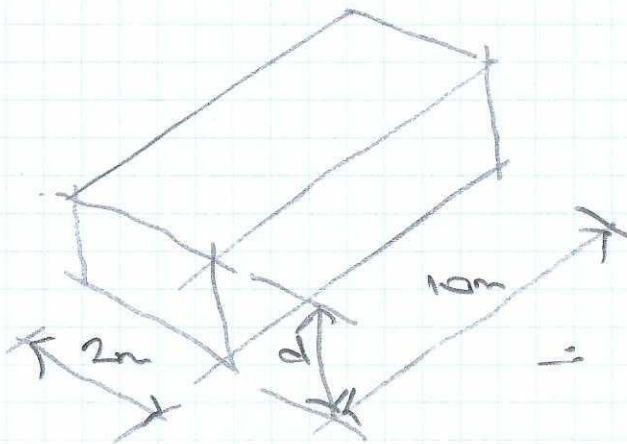
Inflow, I:-

<u>D</u>	<u>I</u>
10	$110 \times \frac{148.8}{10^3} \times \frac{10}{60} = 2.7m^3$
15	$110 \times \frac{125.6}{10^3} \times \frac{15}{60} = 3.5m^3$
30	$110 \times \frac{83.2}{10^3} \times \frac{30}{60} = 4.6m^3$
60	$110 \times \frac{52.8}{10^3} \times \frac{60}{60} = 5.8m^3$
120	$110 \times \frac{32.2}{10^3} \times \frac{120}{60} = 7.1m^3$
240	$110 \times \frac{19.8}{10^3} \times \frac{240}{60} = 8.7m^3$
360	$110 \times \frac{13.9}{10^3} \times \frac{360}{60} = 9.2m^3$
600	$110 \times \frac{9.4}{10^3} \times \frac{600}{60} = 10.3m^3$
1440	$110 \times \frac{4.9}{10^3} \times \frac{1440}{60} = 12.9m^3$

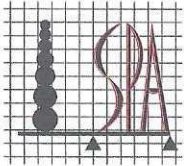
Outflow, O:-

$$area = 2(10m + 2m) \times \frac{d}{2} = 12d$$

$$q = \frac{3.15 \times 10^{-6} m/s}{}$$



$$O = 12d \times 3.15 \times 10^{-6} \times (D \times 60) = 2.27 \times 10^{-3} dD$$



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Sheet No: 5/05

Date: Nov '20

Project: 722 Warmick Road.

By: SP.

Storage, S - using water with 95% void ratio (AquaCell)

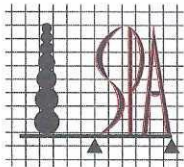
$$\therefore S = 0.95(10m \times 2m \times d) \\ = 19d.$$

$$I - O = S$$

For varying duration, D, d reqd -

<u>D</u>	<u>O</u>	<u>I - O = S</u>	<u>d.</u>
10	0.02d	2.7 - 0.02d = 19d	0.14m
15	0.03d	3.5 - 0.03d = 19d.	0.18m
30	0.07d	4.6 - 0.07d = 19d	0.24m
60	0.14d	5.8 - 0.14d = 19d.	0.30m
120	0.27d	7.1 - 0.27d = 19d.	0.37m
240	0.54d	8.7 - 0.54d = 19d.	0.45m
360	0.82d	9.2 - 0.82d = 19d.	0.46m
600	1.36d	10.3 - 1.36d = 19d	0.51m
1440	3.27d	12.9 - 3.27d = 19d.	0.58m

= Use 8m x 2m x 0.58m deep C/d
soakaway (95% void).



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Project No: 20170

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Date: Nov '20

Project: 722 Warnick Road

By: SP

Taskway 2:-

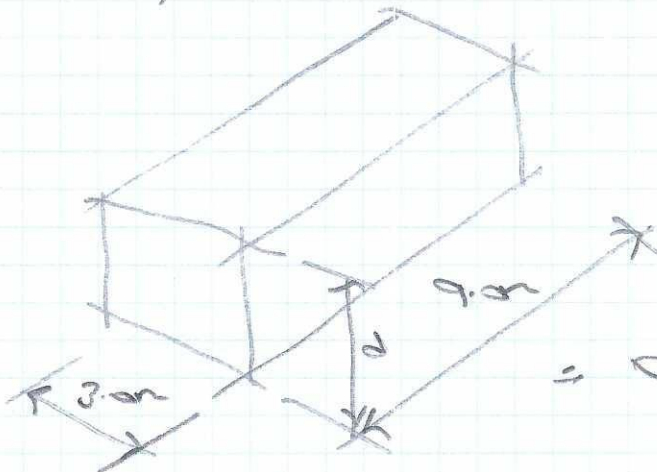
Inflow, I:- ratio = $\frac{100m^2}{110m^2} = 1.636$

<u>D</u>	<u>I</u>
10	$1.636 \times 2.7m^2 = 4.4m^2$
15	$1.636 \times 3.5m^2 = 5.7m^2$
30	$1.636 \times 4.6m^2 = 7.5m^2$
60	$1.636 \times 5.8m^2 = 9.5m^2$
120	$1.636 \times 7.1m^2 = 11.6m^2$
240	$1.636 \times 8.7m^2 = 14.2m^2$
360	$1.636 \times 9.2m^2 = 15.1m^2$
600	$1.636 \times 10.3m^2 = 16.9m^2$
1440	$1.636 \times 12.9m^2 = 21.1m^2$

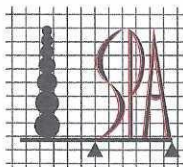
Outflow, O:-

$$O_{SSO} = 2(9m + 3m) \frac{d}{2} = 12d$$

$$f = \frac{3.15 \times 10^{-6} m/s}{}$$



$$= O = 12d \times 3.15 \times 10^{-6} \times (D \times 60) = \underline{2.27 \times 10^{-3} dD}$$



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Date: Nov '20

Project: 722 Warwick Road

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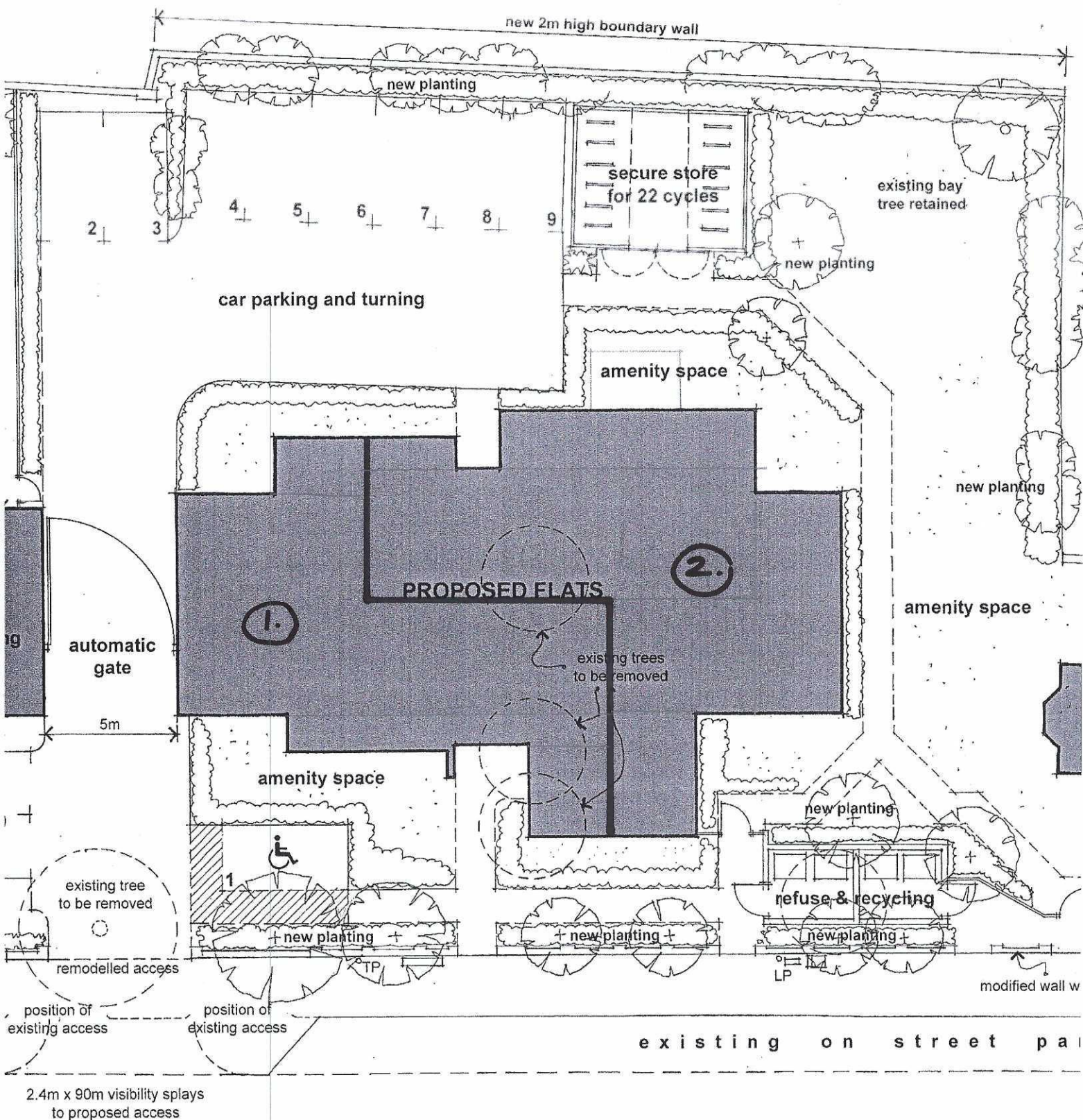
$$\text{Storage, } S = S = 0.95 (9m \times 3m \times d) \\ = \underline{25.7d}$$

$$I - O = S$$

For varying duration, D, d req'd =

<u>D</u>	<u>O</u>	<u>I - O = S</u>	<u>d.</u>
10	0.02d	4.4 - 0.02d = 25.7d	0.17m
15	0.03d	5.7 - 0.03d = 25.7d	0.22m
30	0.07d	7.5 - 0.07d = 25.7d	0.29m
60	0.14d	9.5 - 0.14d = 25.7d	0.37m
120	0.27d	11.6 - 0.27d = 25.7d	0.45m
240	0.54d	14.2 - 0.54d = 25.7d	0.59m
360	0.82d	15.1 - 0.82d = 25.7d	0.57m
600	1.36d	16.9 - 1.36d = 25.7d	0.62m
1440	3.27d	21.1 - 3.27d = 25.7d	0.73m

= Use 9m x 3m x 0.8m deep clote
sewerway (95% void)



Revision A - Additional
Contractors and subcontractors

CREATIVE SUITE
PROPOSED NEW
READING, BEH

PROPOSED SITE

GOTELE
Chartered A