



**DRAINAGE STRATEGY
FOR
PROPOSED DEVELOPMENT
AT
1349-1351 STRATFORD ROAD
SHIRLEY B90 4EF**

JDA/338/20/3

May 2020

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03	Submission Document	14:05:20	SLT	JCD

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This report is confidential to the Client and John Davies Associates accepts no liability whatsoever to any Third Parties to whom this report or any part thereof is made known unless formally agreed beforehand by John Davies Associates.

In producing this report John Davies Associates has relied upon information provided by others, the completeness or accuracy of this information is not guaranteed by John Davies Associates. This report does not guarantee acceptance of the proposals as a whole by the relevant/receiving bodies or agencies.

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1 INTRODUCTION

- 1.0 John Davies Associates, Consulting Engineers, has been instructed by Five Homes (Shirley) Ltd to prepare a Drainage Strategy for their proposal to redevelop their site at 1349-1351 Stratford Road, Shirley B90 4EF with seven houses.
- 1.2 This Drainage Strategy has been prepared to accompany a Planning Application to the Solihull Metropolitan Borough Council for the proposed development. The Architect's Proposed Layout Plan for the development is attached as Appendix 1.
- 1.3 The existing site is two adjoining houses which have been assembled into one development site with a combined area of 1423 sq ms whose location shown by a red pin on the Site Location Plan shown in Figure 1 below.

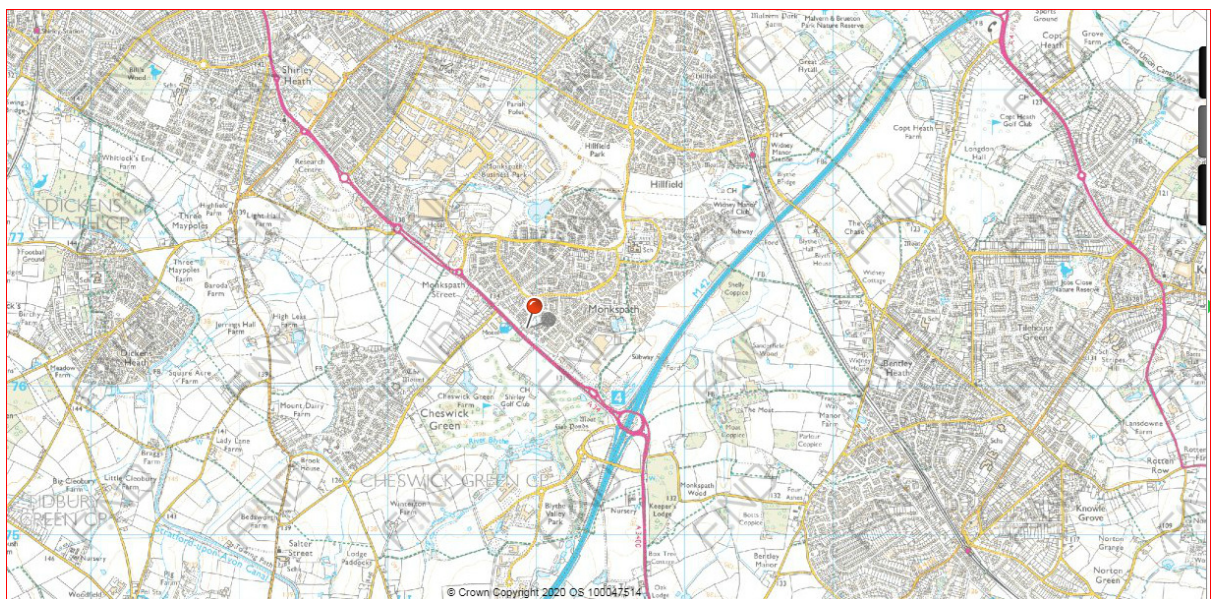


FIGURE 1 – SITE LOCATION PLAN

- 1.4 The site is rectangular in shape aligned in a north-east direction and fronting on to Stratford Road, Shirley B90 4EF. It is situated approximately 800m to the west of Junction 4 on the M42, approximately 3km south-west of Solihull Town Centre.

- 1.5 As can be seen from the site survey plan at Figure 2 it gently slopes from the front to the rear of the site.

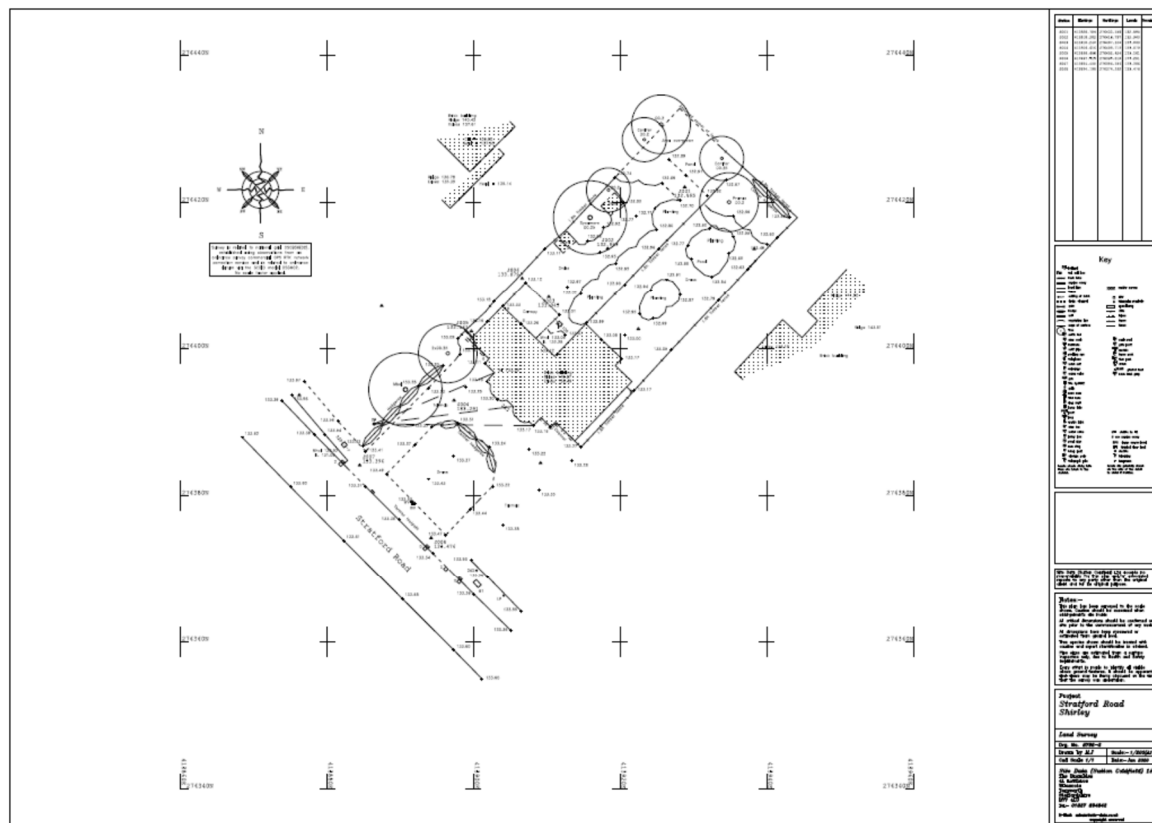


FIGURE 2 SHOWING SURVEY OF THE EXISTING SITE.

- 1.5 The Drainage strategy will set out how the existing site drains and provide an assessment of permeable and impermeable areas within the current site and associated greenfield run-off rates. It will also describe how the development will be drained to address the requirements of a planning application.
- 1.6 Once this Strategy has been approved Solihull Metropolitan Borough Council this strategy will set the design parameters for the detailed design and construction of all the surface and foul water drainage including sustainable drainage facilities.

2. THE SITE AND THE EXISTING DRAINAGE ARRANGEMENTS

- 2.1 1349-1351 Stratford Road Shirley is currently a pair of semi-detached houses with attached garages as can be seen in Photograph 1.



Photograph 1 showing the Existing Houses and Garages

- 2.2 A Drainage Survey of the existing drainage features on the site has been carried out by Midland Drainage Ltd; and a copy of their report is attached to this report.

- 2.3 Details of the existing Severn-Trent Sewers in the area have been obtained from Severn-Trent Water and these show that there are both foul and stormwater sewers under Stratford Road
- 2.3 The Drainage Survey found that the existing houses on the site have both the foul and stormwater drainage from the rear of the properties interconnected with the combined flow from No 1351 Stratford Road passing into a manhole at the rear of 1349 Stratford Road before being discharged to a manhole just in neighbouring land over the northern boundary of the site.
- 2.4 At this manhole it meets the flows from No 1347 Stratford Road and the combined flows pass forward to the Severn-Trent foul water sewer which lies under Kemerton Way.
- 2.5 The same survey found that the stormwater drainage from the front of the properties combines before running into the Foul Sewer under the footway of Stratford Road. The survey proved that this foul flows to a manhole under the footway at the access to the adjacent property where the flows turn through 90° to enter the 375mms diameter Foul Sewer under Stratford Road.
- 2.6 There are no watercourses within close proximity of the site, the nearest water feature is a large lake within the grounds of Hillfield Park, a restored landfill site approximately 800m north of the site. Due to distance and topography this is not a suitable discharge point for stormwater flows from either the existing or proposed development.
- 2.7 The River Blythe runs approximately 1km to the south and again due to distance and topography this is not appropriate for the discharge of storm water either the existing or proposed development.
- 2.8 The site lies within Flood Zone 1 and has a very low probability of flooding from any source.

3. THE PROPOSED DEVELOPMENT

- 3.1 The proposed development site, which has a gross area of 1423 sq ms (0.1423ha), envisages the demolition of the existing houses on the site and their replacement by seven new houses together with their associated access roads and parking areas all shown on the Architect's layout plan at Appendix 1.
- 3.2 A topographical survey of the existing site is attached as Appendix 2.

4.0 SUSTAINABLE URBAN DRAINAGE

- 4.1 It is a requirement of all current planning policies that all new developments are provided with Sustainable Urban Drainage systems – these are systems which mimic, as far as possible, the surface water flows arising from the site prior to its development (or redevelopment) whilst reducing the possibility of flood risk to both the redeveloped site and elsewhere in the catchment area.
- 4.2 Prior to the advent of SUDS conventional surface water drainage systems sought to remove stormwater from the development as quickly and as efficiently as possible. However, this can have a number of adverse impacts including contributing to flooding downstream of the development site, increasing the velocity and depth of flow in watercourses and rivers into which the stormwater drainage system discharges which can cause structural damage to banks, headwalls, culverts as well as flood damage.
- 4.3 Sustainable Urban Drainage endeavours to reduce the rate of runoff from a new development to “greenfield” run-off rates through the use of a number of techniques including vortex control chambers with on or offline storage behind the vortex chamber, swales, rain gardens and similar devices.

4.4 it is now Government Policy that all new developments should utilise sustainable urban drainage systems (SUDS) unless there are practical reasons for not doing so. Such drainage systems should aim to achieve greenfield run-off rates and ensure that Surface Water run-off is managed as close to its source as possible in line with the following drainage hierarchy:

1. Store rainwater for later use
2. Use infiltration techniques such as porous surfaces in non-clay areas.
3. Attenuate rainwater in ponds or open water features for gradual release
4. Attenuate rainwater by storing in sealed tanks or sealed water features for gradual release.
5. Discharge rainwater direct to a watercourse.
6. Discharge rainwater to a surface water sewer or drain.
7. Discharge rain water to the combined drain.

4.5 Incorporating SUDS into the new development will have the effect of:

- *Reducing peak flows to watercourses or sewers and potentially reducing the risk of flooding downstream.*
- *Reducing the volume, rate of discharge, and the frequency of water flowing directly to watercourses or sewers from the developed sites.*
- *Improving water quality compared with conventional surface water sewers by removing pollutants and/or reducing levels of pollutants.*
- *Allowing the development to adapt to the effects of climate change.*
- *Protecting groundwater resources from contamination.*

4.6 The rainwater falling on the roof will be directed by roof falls to the guttering which will discharge via rainwater downspouts at the front and rear of the houses. All of the rainwater downspouts will discharge into 200 litre rainwater butts, which has the effect of slowing the rate of rainwater flow into the SUDS systems. This water will be used for plant watering and external cleaning purposes.

- 4.7 The overflow from the rainwater butts at the rear of the proposed development will discharge into a drainage system comprising porous pipes wrapped in Terram and surrounded by single size stone. These porous drains will encourage some of the surface water to infiltrate into the ground which will slow the discharge of stormwater into the collector manhole located at the front south-western corner of the proposed properties.
- 4.8 The paved areas of the development will be constructed from permeable pavements with a stone storage layer beneath them which will ensure that the stormwater falling on these areas is filtered and ultimately it will receive treatment as bacteria colonise the surface of the stone storage layer. The stone storage layers are drained by a network of under drains comprising porous pipes wrapped in terram all of which ultimately discharge into the Filter Manholes which collect the rainfall from each of the two blocks of houses.
- 4.9 The Filter Manhole discharges the collected rainfall into an attenuation tank under the accessways and parking areas serving the two parts of the development. The attenuation tanks comprise 602 Permavoid Units linked together to provide 21.5 cubic metres of storage, the two tanks linked together provide 43 cubic metres which is just in excess of the 42.5 cubic metres calculated as the storage required to deal with a 1 in 100 year storm plus 30% for climate change.
- 4.10 The two attenuation tanks are linked together with the outfall from the first tank, which is located in front of Plots 4-7 being linked to the similar sized tank located under the accessway and parking areas to Plots 1-3. The outflow from this latter tank discharges into the vortex control chamber near to the boundary of the site from which the stormwater outflow will be restricted to 5 litres/sec by the vortex unit.
- 4.11 The attenuated stormwater will be discharged to the Severn-Trent Stormwater sewer under Stratford Road, in accordance with a Section 106 of the Water Industry Act Agreement.

- 4.11 In the event of a storm of greater intensity than the design storm the exceedance flows will flow by gravity across the car parking areas and discharge on to Stratford Road; the flows from the rear of the development will flow to the landscaped areas to the rear of the development.

5. STORMWATER CALCULATIONS

- 5.1 The Run-off Calculations required by Solihull MBC Drainage Department are attached as Appendix 3; these show that Q_{bar} for a 1 in 100-year storm enhanced by 30% for climate change equals 3.48 litres/sec. This figure would normally be used as the allowable discharge rate in subsequent calculations.
- 5.2 However it should be noted that HR Wallingford (the successor to the Hydraulics Research Station at Wallingford) advises that where Q_{bar} is less than 5l/sec, attenuation storage should be designed on the basis of a discharge rate of 5litres/second in order that debris and waste paper entering the stormwater drainage system cannot block the orifice of the vortex control unit. In order to overcome the possibility of the orifice plate becoming blocked filter units will be inserted into the manholes immediately upstream of the vortex control chamber.
- 5.3 Severn-Trent Water have agreed that the stormwater from the development can be discharged into their 525mms diameter pipe at a rate of 5 litres/second, subject to a Section 106 of the Water Industry Act Agreement – see email Davies/Jutla at Appendix 4.
- 5.4 Storm water falling on the development will be collected at roof level by rainwater guttering which will discharge via one or other of the rainwater downspouts. These downspouts will discharge into 200litre water butts from which water will be used for plant watering and external cleaning.

- 5.5 The overflows from the rainwater butts will discharge into a ground level gulley which will connect with a sealed pipe system which will convey the rainwater to one or other of the two Rainwater Attenuation Tanks under the car parking area at the front of the two parts of the development. From these tanks the stormwater will flow into the Vortex Chamber located in the access driveway from Stratford Road.
- 5.6 The Calculations attached as Appendix 3 show that the storage volume for the roof following a 1 in 100year storm enhanced by 30% for climate change will be 42.5 cubic metres -which will be provided by two Rainwater Attenuation Tanks each of 21.5 cubic metres capacity.
- 5.7 A vortex control unit within the Vortex Chamber will restrict the outlet flow to 5 litres/second into the existing stormwater connection to the Severn-Trent Water Stormwater Sewer under Stratford Road
- 5.8 The depth of the Severn-Trent Water Stormwater sewer which lies under Stratford Road is sufficient to allow for the stormwater to be discharged to it by gravity.

6. THE PROPOSED FOUL DRAINAGE

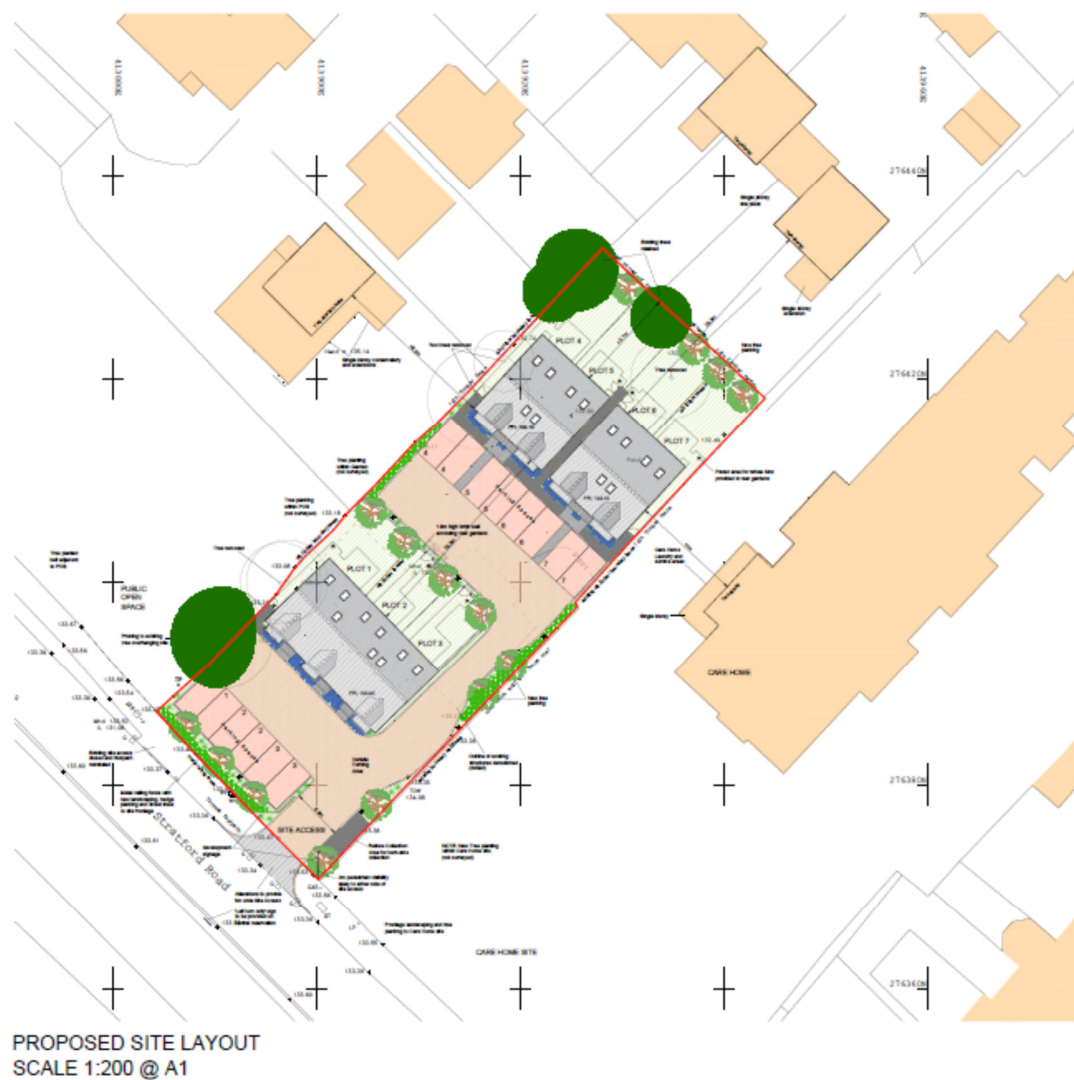
- 6.1 The foul drainage has been designed on the basis of an average foul flow rate for residential accommodation of 4000l/day per unit. This gives a foul flow of 0.324L/sec and with a peaking factor of 3 gives a maximum foul flow of 0.9722l/sec.
- 6.2 The proposed pipe sizes are more than adequate to cope with this flow rate, and they will be connected to the existing on-site foul sewer which discharges into the Severn-Trent Water foul sewer under the footway of Stratford Road in accordance with a Section 106 Agreement.

7. SUMMARY AND CONCLUSIONS

- 7.1 The proposed Stormwater Drainage system has taken into account the provisions of Policy P11 of the Solihull Local Plan which requires that all stormwater on new developments shall incorporate Sustainable Urban Drainage techniques to enable storm water to be re-used and recycled and where infiltrating the rainwater into the ground is not viable the excess flows will be attenuated prior to discharge to a Severn-Trent Water stormwater sewer.
- 7.2 The proposed Stormwater Drainage Arrangements take into account the ICP for SuDS recommendations by the use of rainwater butts to collect rainwater for re-use in plant watering and external cleaning to reduce the use of potable water.
- 7.3 As Soakaways will not work on this site the stormwater falling on the roof will be collected and passed firstly through one or other of 4 No 200litre rainwater butts and then allowed to overflow into a surface water drainage system which will direct the flows to one or other of the two linked Rainwater Attenuation Tanks from whence the rainwater will be forwarded to a Vortex Control Chamber.
- 7.4 Stormwater which falls on the parking areas and paths and which may be contaminated by oils and fuel spillages will pass through permeable paving to a stone storage layer prior to being collected in an under drainage system which will convey the collected stormwater to a Filter Manhole prior to discharge into the Attenuation Tanks on each property. The cleaned and treated rainwater then passes forward into a vortex control chamber from where the water will discharge at a rate not exceeding 5.0litres/second to the Severn-Trent Water sewer under Stratford Road.
- 7.5 During any exceptional storm events which overcome the drainage system the exceedance flows from the front of the development will flow by gravity across the drives to the properties and discharge on Stratford Road.

- 7.6 The foul flows will be collected in a sealed pipe system and discharged using an existing connection from the site to the Severn-Trent Water Foul sewer under Stratford Road.

APPENDIX 1 ARCHITECT'S LAYOUT PLAN



SCHEDULE OF ACCOMMODATION

PLOT NO.	TYPE	AREA (GIFA)
1	3-BED HOUSE	107.3sqm
2	3-BED HOUSE	107.3sqm
3	3-BED HOUSE	107.3sqm
4	3-BED HOUSE	103.1sqm
5	3-BED HOUSE	103.1sqm
6	3-BED HOUSE	103.1sqm
7	3-BED HOUSE	103.1sqm

PARKING

TOTAL 14 PARKING SPACES (200% PARKING RATIO)

KEY:

- BLOCK PAVING (ROAD) SHARED SURFACE
- CONTRASTING BLOCK PAVING (PARKING SPACES)
- SOFT LANDSCAPING / HEDGING
- SOFT LANDSCAPING / SHRUB PLANTING AND GROUND COVER, MIXED BORDER / PERENNIAL PLANTING
- NEW TREE PLANTING
- EXISTING TREE RETAINED
- BOLLARD LIGHT 1m HIGH

NOTE: LANDSCAPE STRATEGY DRAWING. DETAILS AND FULL PLANTING SCHEDULES TO BE DEVELOPED BY LANDSCAPE ARCHITECT

1:200 @A1

Project Name	1349-51 STRATFORD ROAD, SHIRLEY, SOHAM, FOR FIVE HOMES (S14) LTD
Project Address	1349-51 STRATFORD ROAD, SHIRLEY, SOHAM, FOR FIVE HOMES (S14) LTD
Project Type	RESIDENTIAL
Project Status	PLANNING PERMISSION
Project Date	10/01/2024
Project Drawn By	FLB
Project Checked By	FLB
Project Approved By	FLB



flb Architecture

APPENDIX 2

TOPOGRAPHICAL SURVEY OF EXISTING SITE

APPENDIX 3

HYDRAULIC CALCULATIONS



MasterDrain
HY 11.0

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				Sheet no. 1	
				Date 05/05/20	
Project Solihull		By	Checked	Reviewed	
Title loH 124 (Qbar(urban))Runoff calcs for SOLIHULL					

Hydrological Data:-

FSR Hydrology:-

Location = SOLIHULL

M5-60 (mm) = 19.4

Soil runoff = 0.45

WRAP = 4

Hydrological area = 4

Grid reference = SP1479

r = 0.39

SAAR (mm/yr) = 740

Area = England & Wales

Hydrological zone = 8

Soil classification for WRAP type 4

Clayey, or loamy over clayey soils with an impermeable layer at shallow depth.

Design data:-

Area = 0.001 Km² - 0.1 Ha - 1000 m² % Urbanisation = 52.50%

Calculation method:-

Runoff is calculated from:-

$$Q_{\text{BAR(urban)}} = Q_{\text{BAR(rural)}} (1 + \text{URBAN})^{2\text{NC}} [1 + \text{URBAN} \{ (21/\text{CIND}) - 0.3 \}]$$

where:-

NC varies with the value of SAAR:-

for 500 < SAAR < 1100 mm then NC = 0.92 - 0.00024 SAAR

for 1100 < SAAR < 3000 mm then NC = 0.74 - 0.000082 SAAR

CIND = 102.4 SOIL + 0.28 (CWI - 125) CWI = Catchment Wetness Index

so

CIND = 33.281

CWI = 79.288

NC = 0.742

For areas less than 50Ha, a modified calculation which multiplies the 50Ha runoff value by the ratio of the site area to 50Ha is used
Reducing factor used for these calculations is 0.002

$Q_{\text{BAR(rural)}} = 0.469 \text{ (l/s)}$

$Q_{\text{BAR(urban)}} = 1.030 \text{ (l/s)}$

$Q_{\text{BAR(urban)}}$ is then multiplied by a growth factor - GC(T) - for different storm return periods derived from EA publication W5-074/A.



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Calculated data:-

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				Sheet no. 2	
				Date 05/05/20	
Project Solihull				By	Checked
Title loH 124 (Qbar(urban))Runoff calcs for SOLIHULL					Reviewed

Mean Annual Peak Flow $Q_{BAR(urban)} = 1.03 \text{ l/s}$

Values for $Q_{BAR(urban)}$

Ret. per.	m ³ /hr	l/s	l/s/ha	Ret. per.	m ³ /hr	l/s	l/s/ha
1yr	3.151	0.875	8.752	100yr+20%	11.566	3.213	32.127
2yr	3.299	0.916	9.164	100yr+30%	12.529	3.480	34.804
5yr	4.671	1.297	12.974	100yr+40%	13.493	3.748	37.481
10yr	5.523	1.534	15.343	200yr	11.121	3.089	30.891
30yr	6.969	1.936	19.358	200yr + 30%	14.457	4.016	40.158
50yr	8.155	2.265	22.653	500yr	13.419	3.728	37.275
100yr	9.638	2.677	26.772	1000yr	15.421	4.284	42.836

Growth factors -

1yr	2yr	5yr	10yr	30yr	50yr	100yr	200yr	500yr	1000yr
0.85	0.89	1.26	1.49	1.88	2.20	2.60	3.00	3.62	4.16

The above is based on the Institute of Hydrology Report 124 to which you are referred for further details (see Sect 7). Note that the 200 year growth curve was taken from W5-074/A.

For WRAP type 1 soils, CIND can become negative for lower values of SAAR. In this case the CIND value is multiplied by -1 to return a positive value (CIND is very small at this point).



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SW

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Job No.		
Sheet no. 1		
Date 05/05/20		
By	Checked	Reviewed

Project Solihull

Title Hydrograph storage analysis (Winter profile) for SOLIHULL

Data:-

Location = SOLIHULL
M5-60 (mm) = 19.4
Soil index = 0.45
Return period = 100
UCWI = 0.0
Grid reference = SP1479
r = 0.39
SAAR (mm/yr) = 740
WRAP = 4
Climate change = +30%

Clayey, or loamy over clayey soils with an impermeable layer at shallow depth.

Percentage runoff = 95.0% (manual setting)

Imperv. area = 952 m²
Total area = 952 m²
Total runoff = 56.1 m³
Pervious area = 0 m²
Equiv area = 904 m² (Tot. area x % runoff).
Discharge rate = 5.000 l/s

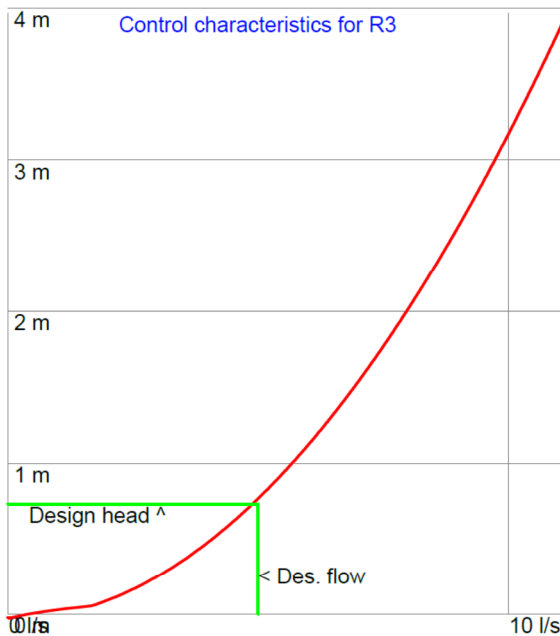
Design Head = 0.8m
Control device = R3
Max. calc. depth = 0.78 m
Mean discharge = 2.90 l/s
Peak flow = 4.94 l/s
Orifice diam = 66.1 mm
Available depth = 0.0 m³

Available system storage = 0.00 m³ under a system plane at the design head level.

Offline storage = 0.0 m³

Total storage = 40.0 m³

Peak input flow = 19.48 l/s



Head (m)	Flow (l/s)	Head (m)	Flow (l/s)
0.01	0.06	2.01	7.93
0.05	0.69	2.05	8.00
0.10	1.77	2.10	8.10
0.15	2.17	2.15	8.20
0.20	2.50	2.20	8.29
0.25	2.80	2.25	8.39
0.30	3.06	2.30	8.48
0.35	3.31	2.35	8.57
0.40	3.54	2.40	8.66
0.45	3.75	2.45	8.75
0.50	3.95	2.50	8.84
0.55	4.15	2.55	8.93
0.60	4.33	2.60	9.01
0.65	4.51	2.65	9.10
0.70	4.68	2.70	9.19
0.75	4.84	2.75	9.27
0.80	5.00	2.80	9.35
0.85	5.15	2.85	9.44
0.90	5.30	2.90	9.52
0.95	5.45	2.95	9.60
1.00	5.59	3.00	9.68
1.05	5.73	3.05	9.76
1.10	5.86	3.10	9.84
1.15	5.99	3.15	9.92
1.20	6.12	3.20	10.00
1.25	6.25	3.25	10.08
1.30	6.37	3.30	10.16
1.35	6.50	3.35	10.23
1.40	6.61	3.40	10.31
1.45	6.73	3.45	10.38
1.50	6.85	3.50	10.46
1.55	6.96	3.55	10.53
1.60	7.07	3.60	10.61
1.65	7.18	3.65	10.68
1.70	7.29	3.70	10.75
1.75	7.40	3.75	10.83
1.80	7.50	3.80	10.90
1.85	7.60	3.85	10.97
1.90	7.71	3.90	11.04
1.95	7.81	3.95	11.11
2.00	7.91	4.00	11.18

Calculation data provided by Crown Water Ltd, SL5 7NT



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SW

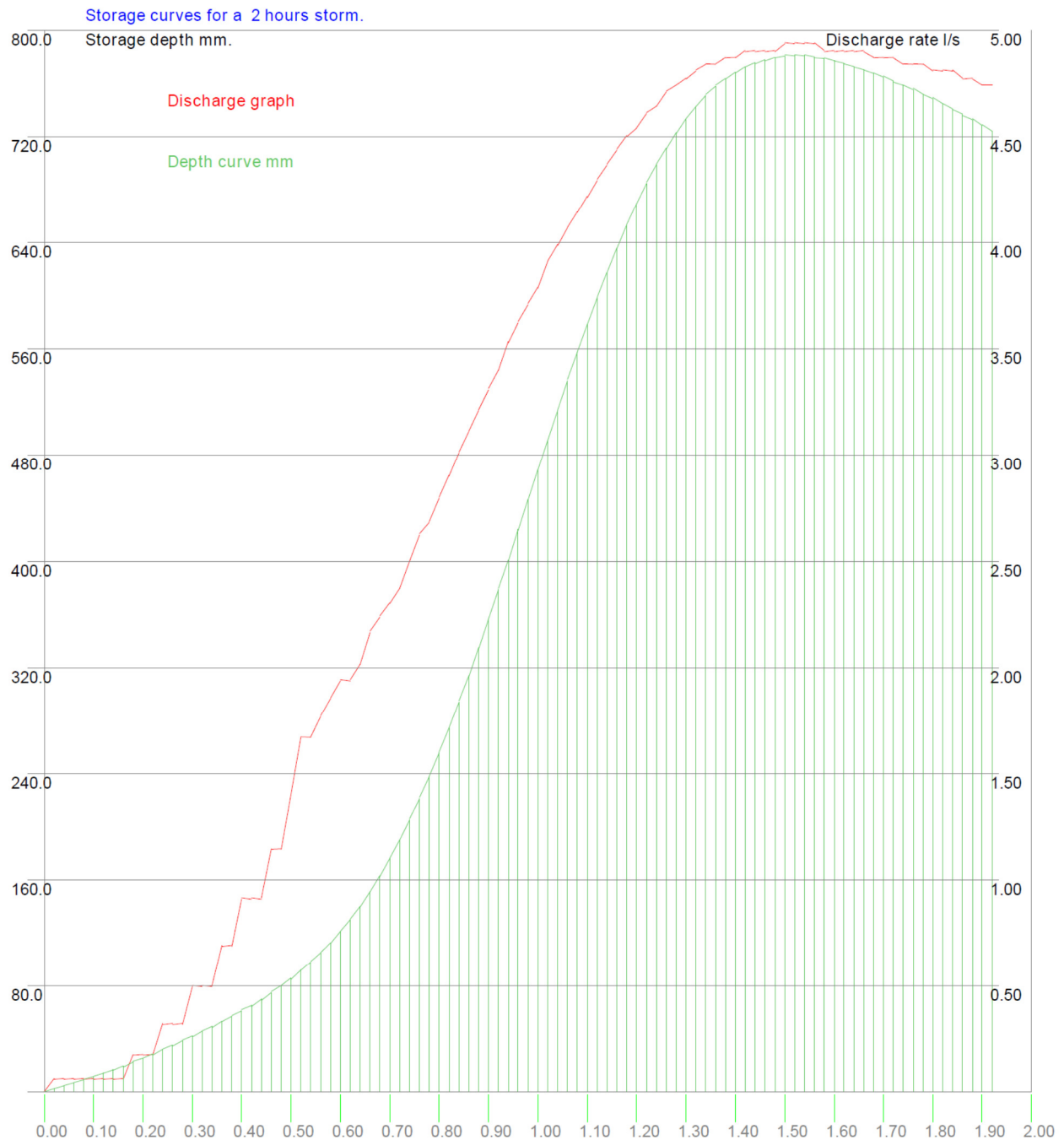
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Incremental rainfall figures.

Storm Mins	Storage Depth mm	Control Flow l/s	Storm Mins	Storage Depth mm	Control Flow l/s
1.2	2.2	0.06	61.2	491.7	3.91
2.4	4.4	0.06	62.4	514.0	3.99
3.6	6.7	0.06	63.6	536.0	4.07
4.8	8.9	0.06	64.8	557.6	4.15
6.0	11.3	0.06	66.0	578.4	4.22
7.2	13.8	0.06	67.2	598.5	4.29
8.4	16.4	0.06	68.4	617.7	4.37
9.6	19.2	0.06	69.6	635.9	4.44
10.8	22.2	0.17	70.8	653.3	4.51
12.0	25.2	0.17	72.0	669.7	4.54
13.2	28.4	0.17	73.2	685.0	4.61
14.4	31.7	0.32	74.4	698.9	4.64
15.6	35.0	0.32	75.6	711.6	4.71
16.8	38.3	0.32	76.8	723.2	4.74
18.0	41.9	0.49	78.0	733.7	4.78
19.2	45.5	0.49	79.2	742.8	4.81
20.4	49.1	0.49	80.4	751.0	4.84
21.6	52.9	0.69	81.6	758.1	4.84
22.8	56.6	0.69	82.8	763.9	4.87
24.0	60.7	0.91	84.0	768.7	4.87
25.2	64.9	0.91	85.2	772.7	4.91
26.4	69.5	0.91	86.4	775.8	4.91
27.6	74.6	1.14	87.6	778.2	4.91
28.8	79.9	1.14	88.8	779.7	4.91
30.0	85.7	1.40	90.0	780.6	4.94
31.2	91.6	1.67	91.2	780.9	4.94
32.4	97.8	1.67	92.4	780.8	4.94
33.6	104.9	1.77	93.6	780.1	4.94
34.8	112.5	1.85	94.8	778.9	4.91
36.0	120.9	1.94	96.0	777.3	4.91
37.2	129.9	1.94	97.2	775.3	4.91
38.4	139.9	2.02	98.4	773.0	4.91
39.6	151.0	2.17	99.6	770.4	4.91
40.8	163.0	2.24	100.8	767.7	4.87
42.0	175.8	2.30	102.0	765.0	4.87
43.2	189.8	2.37	103.2	762.0	4.87
44.4	204.8	2.50	104.4	758.8	4.84
45.6	220.6	2.62	105.6	755.5	4.84
46.8	237.4	2.68	106.8	752.1	4.84
48.0	255.3	2.80	108.0	748.6	4.81
49.2	274.1	2.90	109.2	745.0	4.81
50.4	293.7	3.01	110.4	741.1	4.81
51.6	314.0	3.11	111.6	737.1	4.78
52.8	334.8	3.21	112.8	732.9	4.78
54.0	356.4	3.31	114.0	728.6	4.74
55.2	378.4	3.40	115.2	724.2	4.74
56.4	400.9	3.54	116.4	719.7	4.71
57.6	423.6	3.62	117.6	715.3	4.71
58.8	446.4	3.71	118.8	710.8	4.71
60.0	469.1	3.79	120.0	706.2	4.68

Using the Get Max button causes the program to step through a series of storm durations until a maximum volume is obtained.
Each duration is sampled 600 times and the results recorded. The storm durations (hrs) are:-

0.25, 0.5, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 18, 20, 24, 30, 36, 42, 48, 54, 60, 66, 72, 84, 96, 120, 150, 175, 200, 250, 300, 375, 500, 750, 1000, 1250, 1500, 1570, 2000, 2500, 3000, 3500, 4000

It should be noted that the six hour storm frequently requested rarely demonstrates the worst case for storage.



MasterDrain
SW

John Davies
Associates
www.jdassocs.co.uk

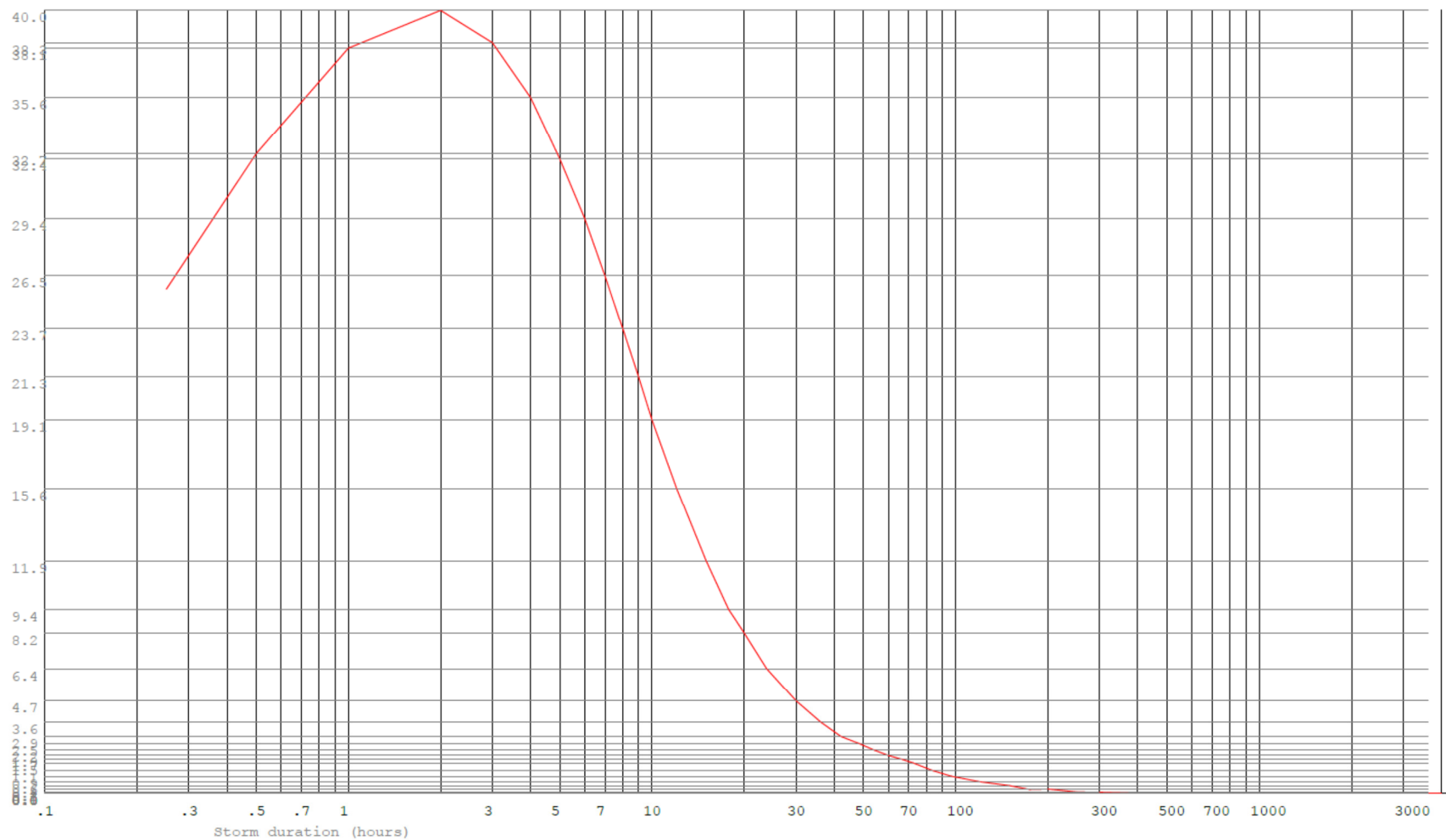
Consulting Engineers
1 St Johns Rd, Queens Park,
Chester CH4 7AL
Tel: 01244 677991
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Job No.		
Sheet no. 4		
Date 05/05/20		
By	Checked	Reviewed

Project Solihull
Title Hydrograph storage analysis (Winter profile) for SOLIHULL

Sequential storage volume at specific storm durations.

m³



APPENDIX 4

EMAIL FROM SEVERN-TRENT RE DISCHARGE RATE

John

I am safe and well, how are you ?

Having had a look at our statutory records, I have the following comments to make:

Foul Water – I have no objections to the proposed foul water flows, which based on 7 houses equates to 0.11 l/s x 2 Dry Weather Flow (DWF) and 0.33 l/s x 6 DWF, to the 225mm diameter Foul Water Sewer (FWS) in Stratford Road subject to a S106 application being made. This 225mm diameter FWS outfalls to a 375mm diameter, 300mm diameter and 375mm diameter downstream. Before the site is demolished and to avoid a lane closure in a busy road, I would suggest that you check the presence of any existing foul water drains/manholes on site otherwise a new connection will be required.

Surface Water – It is strongly recommended that soakaway/trial pit/borehole/infiltration tests are carried out, with evidence to be provided, to substantiate why soakaways cannot work. You could look at permeable paving with the outfall into the ground if the substrata is suitable for any paved areas. As we have surface water sewers in the area, it is unlikely that soakaways will work although these tests should be carried out as a matter of course.

Having had a look at the existing impermeable area (roof area) of the 2 houses to be demolished although I am unsure if there are any existing paved areas, this equates to be approximately 216.73 sq. m or 3.01 l/s on a 2 year storm with a 30% reduction being 2.11 l/s in line with standard Lead Local Flood Authority (LLFA) requirements although I am unsure if they have been consulted. Your proposed impermeable area shows a significant increase in flows which I have calculated to be approximately 1069.82 sq. m (1414.82 sq. m – 345 sq. m from garden areas) which equates to 14.87 l/s on a 2 year storm. Your plan does not show the roof areas of plots 1, 2 and 3 with plots 4, 5, 6 and 7 being 111 sq. m each (444 sq. m in total) with no paved areas shown.

There appear to be 3 surface water sewers available for connection as follows:

1. 450mm diameter Surface Water Sewer (SWS) in Stratford Road (lane closure required if a new connection). This outfalls to a 300mm diameter and 450mm diameter downstream. Due to very flat gradients downstream with the 300mm diameter having a 1 in 1204 gradient equating to 31 l/s full bore, I would advise on a proposed discharge rate of 2 l/s on a 100 year + 30% climate change storm event via a vortex flow control device.
2. 525mm diameter SWS in Stratford Road (road closure required if a new connection). If a connection can be made here if possible with this sewer behind the 225mm diameter FWS and 450mm diameter SWS, I would advise on a proposed discharge rate of 5 l/s on a 100 year + 30% climate change storm event via a hydrobrake.

3. 225mm diameter SWS in Kemerton Way. This would not involve a connection into Stratford Road. This outfalls to a 600mm diameter downstream. Due to flat gradients on the 225mm diameter SWS, I would advise on a proposed discharge rate of 2 l/s on a 100 year + 30% climate change storm event via a vortex flow control device.

It would be beneficial, if the site has not been demolished, to carry out a comprehensive drainage survey to demonstrate which SWS the existing site outfalls to. This should show the existing drainage runs, MHs, rainwater pipes, gullies, levels, the existing impermeable area which can include a CCTV survey. Normally a 30% reduction is required assuming the existing site positively connects to one of the available SWS. Once the sewers have been investigated, please submit a plan showing where you are connecting and any attenuation proposals/calculations in line with my comments which can be submitted with your S106 application.

***** IMPORTANT COVID-19 UPDATE:** Due to fast changing Government response to the Coronavirus situation the most effective way to contact me at present is by email rather than telephone. Please use the Asset Protection West team email address (net.dev.west@severntrent.co.uk). When sending an email, please quote any reference number in the subject heading. We thank you for your patience during this difficult time and we will do everything in our power to keep disruption to a minimum ***

Kind Regards

Mr Gurmakh Jutla

Modelling Co-Ordinator/Evaluation Technician

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