Euro Garages Ltd: High Street, Shirley, Solihull

Drainage Strategy Report

Client: Euro Garages Ltd

Date: 14th December 2021

Project No: P15588

Goodson Associates
Fountain House
4 South Parade
Leeds
LS1 5QX

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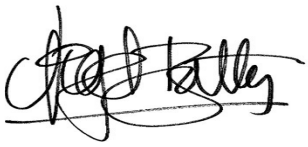
Project Number: P15588		Signature	Date
Prepared by:	Phillip Harrington		14/12/2021
Checked by:	Nigel Batty		14/12/2021

Revision:		Signature	Date
Prepared by:			
Checked by:			
Revision Notes:			

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Contents **Page**

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1.0 Introduction

Goodson Associates have been appointed by Euro Garages Ltd to prepare a Drainage Strategy for the proposed commercial re-development of the existing Esso EG Solihull Lodge Garage site at High Street, Shirley, Solihull. The purpose of this report is to describe in principle the design approach for the foul and surface water drainage systems for the development.

2.0 Existing Site

2.1 General Description

The proposed site is located off High Street in Shirley (Grid Ref: 409631, 278682). Figure 1.0 shows an aerial photograph of the area with the approximate site boundary highlighted in red.

The site is generally bounded by public highway to the north, east and south, with residential properties and associated gardens abutting the western boundary.

2.2 Site Topography

As Figure 1.0 shows, the area is a brownfield site which is currently occupied by the operating Esso petrol filling station. The site is of irregular shape and is approximately 0.09 ha in area.

The site falls in an easterly direction with levels ranging from +144.86 AOD on the western boundary to +143.96 AOD on the eastern boundary.

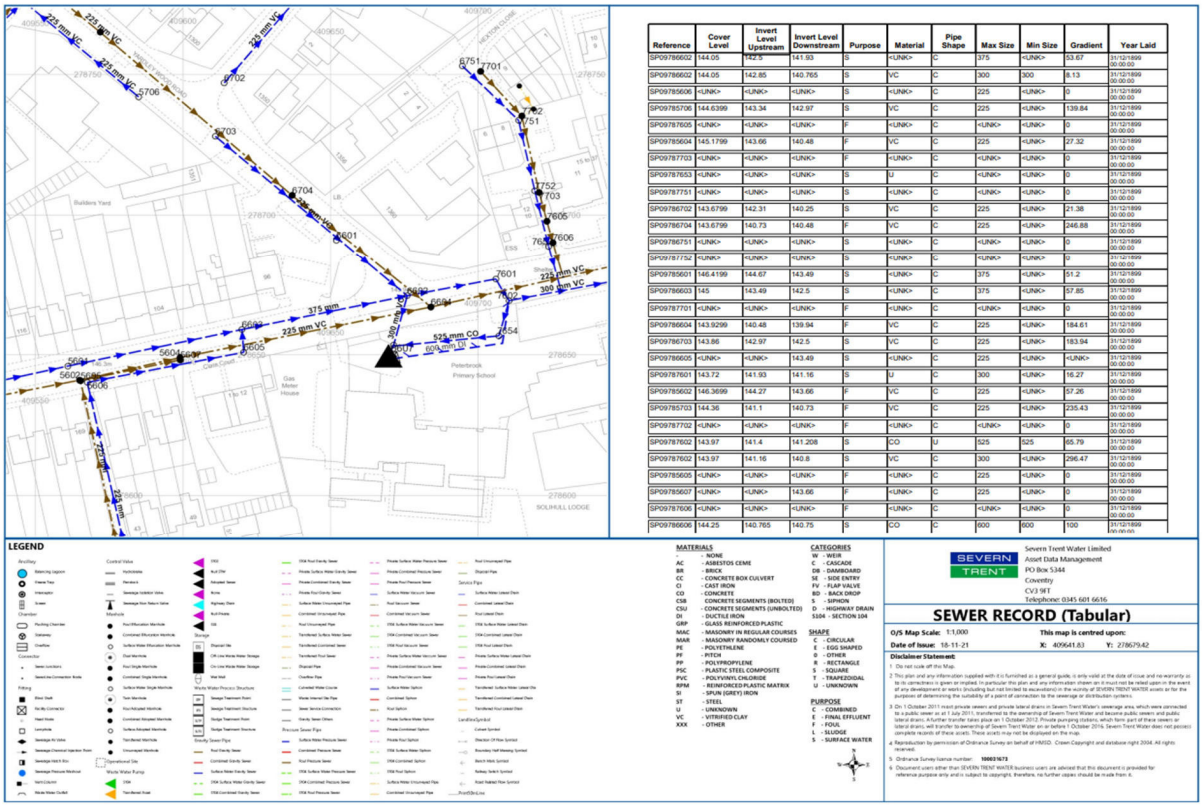
Figure 1.0 - Aerial Photograph showing the approximate site boundary

2.3 *Existing Natural Drainage Features*

There are no natural water courses running through or in close proximity to the site, with the nearest watercourse being the Stratford-upon-Avon Canal located at around 200m to the northeast and beyond that the closest natural watercourse is the River Cole located around 700m to the east.

2.4 *Existing Drainage Infrastructure*

Severn Trent records show that there are foul and surface water public sewers in close proximity to the site. An extract of this information is provided in Figure 2 below and a full copy included in the Section 6 appendices.



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SP09787605	<UNK>	<UNK>	<UNK>	F	<UNK>	C	<UNK>	<UNK>	0	31/12/1899 00:00:00
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SP09786606	144.25	140.765	140.75	S	CO	C	600	600	100	31/12/1899 00:00:00

Figure 2.0 – Severn Trent Sewer Record Plan - extract

It is proposed to connect to the existing 375mm diameter surface water sewer located within the High Street to the south of site. Foul flows will drain to the existing 225mm diameter foul sewer also within the High Street. The proposed connections will be via a new junction or utilising an existing drainage connection to the site (subject to a CCTV drainage survey).

3.0 Proposed Development

The proposed development is to consist of a convenience store building with associated carparking, access road and landscaping. There will be a total of 13 parking spaces. A copy of the architects proposed layout plan is included in the Section 6 appendices.

4.0 Flood Risk Assessment

The possible sources of flooding have been considered for the site and figures 3.0 and 4.0 below show the extent of flooding in the site location for fluvial and surface water flooding. It is indicated in Figure 3.0 that the site is within an area classified as Flood Zone 1, land having a less than 0.001% (1 in 1,000) annual probability of river or sea flooding.

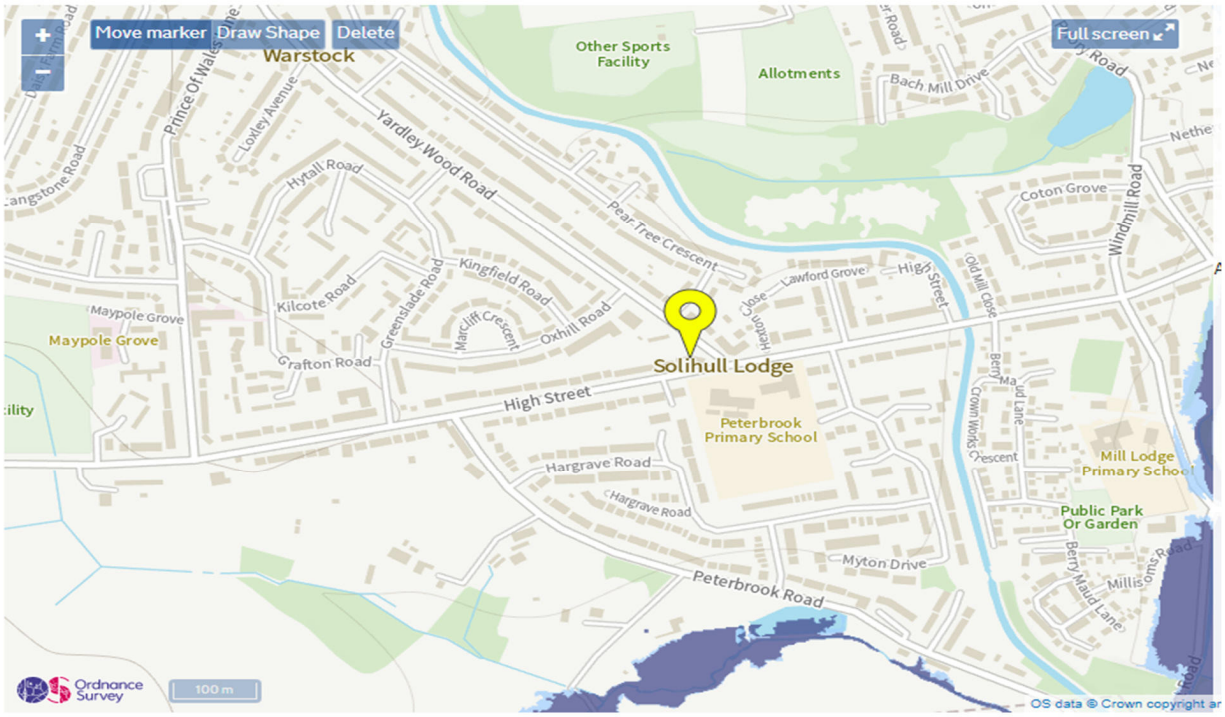


Figure 3.0 Flood Risk from Rivers and the Sea

From Figure 4.0 it appears that the site is at a very low risk of surface water flooding. The proposed development will be designed to current surface water standards and the building will be set at a slightly higher level with external areas falling away from to minimise such flood risk for the new development.

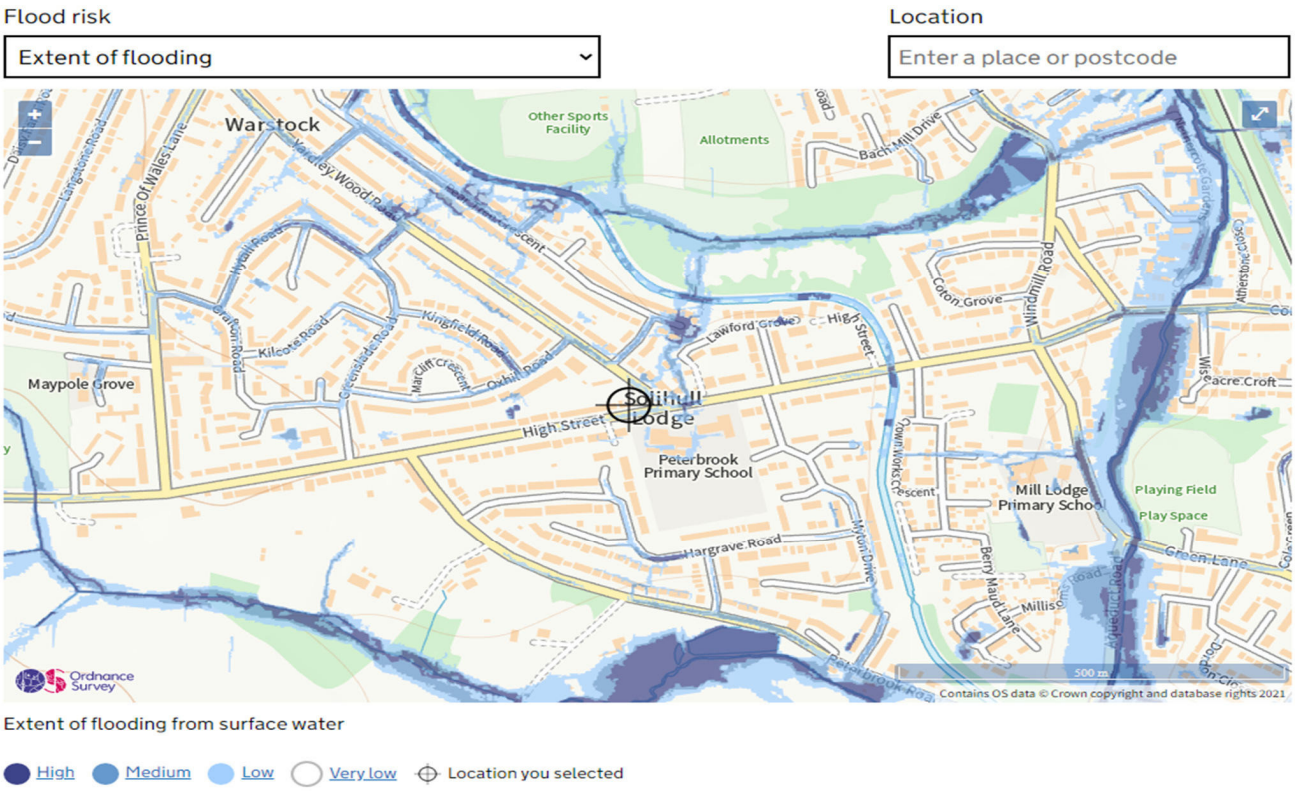


Figure 4.0 Flood Risk from Surface Water

5.0 Site Drainage

- The proposed development will have separate foul and surface water drainage systems before connecting into the public foul and surface water sewer located with the High Street, with discharge arrangements proposed as detailed below.

- Drainage layout proposals for both the on-site and off-site drainage are contained in Section 6.0 below

5.1 Foul Drainage

- The proposed foul drainage will collectively drain to the south-western corner of the site where it is proposed to discharge this into a combined sewer connection to the Severn Trent adopted combined sewer. A CCTV drainage survey will confirm the presence of any existing connections into site which may be re-used depending on depth and condition.

5.2 Surface Water System

- SuDS hierarchy has been used for the surface water design.

- The surface water design flows are calculated on the proposed new development impermeable area of 0.087ha and a design storm intensity of a 100-year return period plus 40% climate change allowance.

- There are no accessible drainage ditches, watercourses or open bodies of water that are suitable to discharge surface water run-off to without crossing third-party owned land.

- Ground records for the area indicate that the soils on the site consist of a mixture of sand and clay. The underlying sand strata may be suitable for soakaway drainage techniques. However, due to the contamination risk associated with the current use as a PFS combined with the presence of underlaying clay it is considered that soakaway drainage would provide a risk of spreading known and unknown contamination underground and would therefore not be an appropriate option for this site.

- It is proposed that the surface water from the roof and hardstanding areas will be collected and directed into the proposed surface water drainage network before discharging into the Severn Trent adopted surface water sewer to the south of the site at a discharge rate of 8.3/s based on a 30% reduction in existing surface water run-off – refer to drawing P15589-501 for details. Severn Trent Pre-development enquiry response can be found in Section 6.0.

- MicroDrainage calculations provided in Section 6.0 determine that 20.5m^3 of cellular storage will be required to achieve the desired discharge rate of 8.3l/s without flooding. A cellular storage tank will provide adequate surface water attenuation to ensure no flooding will occur during a 1 in 100 year + 40% climate change storm event.

6.0 Drawings and Calculations

Proposed Site Layout (EG Group)

241121CP-01 Topographical Survey (Chris Partington Land Surveyors)

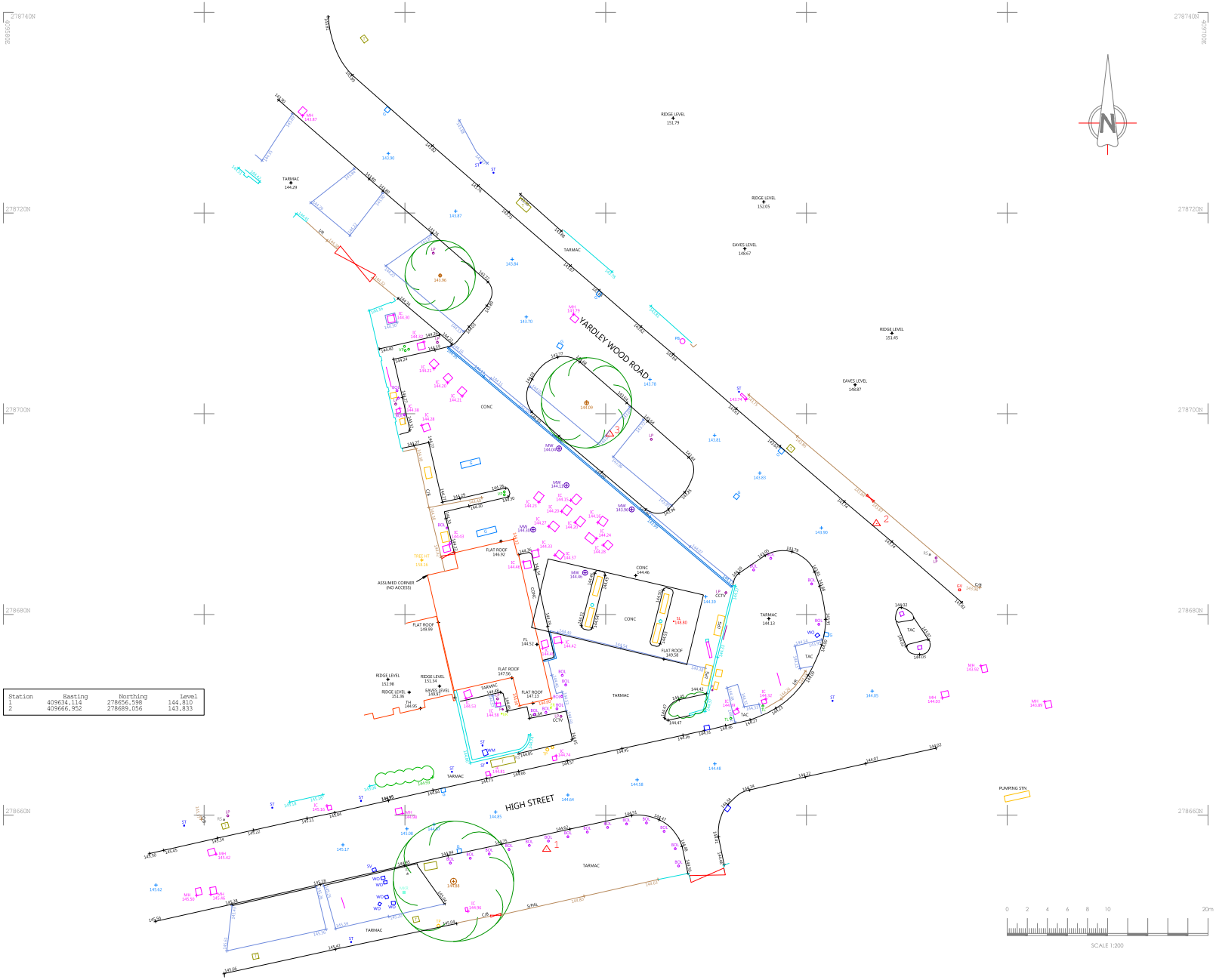
Correspondence with Severn Trent (Goodson Associates)

Severn Trent Sewer Records

P15588 Solihull High Street MicroDrainage Calculations

Impermeable Area Plan (Goodson Associates)

Drainage Layout Plan (Goodson Associates)



Station	Easting	Northing	Level
1	409634.114	278656.598	144.810
2	409666.952	278689.056	143.833

Abbreviations/Symbols (Measured Building Surveys):

C:	Window Cill Height
H:	Window Head Height
BH:	Beam Height
DH:	Door Height
COL:	Column
SVP:	Soil Vent Pipe
FL:	Floor Level
TH:	Threshold Level
CL:	Floor to Ceiling Height
	Vaulted Ceiling

Line types

	Hedge Lines
	Drainage Runs
	Overhead Electricity Cables
	Overhead Telephone Cables

Symbols

	Tree/Bush		Glass House
	Control Station		Osbm
	Borehole		
	Trial Hole		

Abbreviations (Topographic Survey):

AH:	Arch Height
AV:	Air Valve
BB:	Belisha Beacon
BOX:	Electricity Box, Cables Box, Etc.
BOL:	Bollard
BT/IC:	British Telecom Inspection Chamber
BS:	Bus Stop
BS/LP:	Bus Stop / Lamp Post
CATV:	CATV Inspection Chamber
CCTV:	Closed Circuit Television
CL:	Cellar Light
C.P/T:	Catch Pit
ER:	Earth Rod
EC:	Electricity Inspection Chamber
EP:	Electricity Pole
FH:	Fire Hydrant
FP:	Flag Pole
GV:	Gas Valve
G:	Gully
IC:	Inspection Chamber
KO:	Kerb Outlet
LP:	Lamp Post
LB:	Letter Box
LC:	Lighting Column
MKR:	Marker
MH:	Manhole
MP:	Mooring Point
MS:	Mile Stone
NYNEX:	Nynex Inspection Chamber
O/H:	Over Hang
P:	Post
PO/IC:	Post Office Inspection Chamber
R/S:	Road Sign
RE:	Rodding Eye
RTW:	Retaining Wall
S/P:	Sign Post
SNP:	Street Name Plate
ST:	Stop Tap
SV:	Stop Valve
T:	Telecom Inspection Chamber
TCB:	Telephone Call Box
TH:	Threshold Level
TL:	Traffic Light
TP:	Telegraph Pole
TROUGH:	Trough
WO:	Water Outlet
WM:	Water Meter

Fence Descriptions:

B/W:	Barbed Wire
C/B:	Close Boarded
C/BARRIER:	Crash Barrier
C/L:	Chain Link
C/P:	Chestnut Paling
C/S:	Corrugated Iron
I/R:	Iron Railing
MISC:	Miscellaneous
P/R:	Post & Rail
P/W:	Post & Wire
P/C:	Post & Chain
S/PAL:	Steel Palisade
W/M:	Wire Mesh

Survey Notes:

Coordinates and Levels related to Ordnance Survey Datum - GPS OSGB36

Revision	Date	Description

CPLS
Chris Partington Land Surveyors
44a Green Lane
Sale
Cheshire
M33 5PP
t: 0161 976 1194
www.cpls.co.uk e:survey@cpls.co.uk

Client: Euro Garages

Project: ESSO EG Solihull Lodge Site Survey

Scale	1:200	Surveyed By	C G P
		Date	24.11.21
Drawing No.	241121CP-01	Checked By	CPLS
		Date	25.11.21
		Drawn By	J C
		Date	25.11.21

WONDERFUL ON TAP

SEVERN TRENT

Severn Trent Water Ltd
Leicester Water Centre
Gorse Hill
Anstey
Leicester
LE7 7GU

Tel: 0345 266 7930
www.stwater.co.uk

Ref 1024275
Email:
Network.Solutions@SevernTrent.co.uk

Goodsons Associates
Fountain House
4 South Parade
Leeds
LS1 5QX

F.A.O: phil@goodsons.com

18th November 2021

Dear Sir/Madam,

Proposed Development: (1 commercial unit) – ESSO Petrol Garage 94 High Street, Shirley, Solihull, B90 1JS - 409667, 278671

I refer to your 'Development Enquiry Request' in respect of the above named site. Please find enclosed the sewer records that are included in the fee together with the Supplementary Guidance Notes (SGN) which refer to surface water disposal from development sites.

Protective Strip

No public sewers shown within site boundary.

Due to a change in legislation on 1 October 2011 there may be former private sewers on the site which have transferred to the responsibility of Severn Trent Water Ltd, which are not shown on the statutory sewer records, but are located in your client's land. These sewers would require protective strips of 3 metres either side of the sewer's centreline that we will not allow to be built over. If such sewers are identified to be present on the site, please contact us for further guidance.

Foul Water Drainage

The site is likely to have an existing connection to the public sewer, it might be possible to utilise the existing connection if this is in a convenient location and in good condition.

Alternatively, the 225mm foul sewers on Yardley Wood road or High Street can accommodate gravity foul flows from your development.

A connection is therefore acceptable subject to a S106 submission.

Surface Water Drainage

Under the terms of Section H of the Building Regulations 2000, the disposal of surface water by means of soakaways should be considered as the primary method. If these are found to be unsuitable, satisfactory evidence will need to be submitted. The evidence should be either percolation test results or by the submission of a statement from the SI consultant (extract or a supplementary letter).

Subject to the above, can you please provide further information, to demonstrate how the former impermeable areas on the site are currently drained, if indeed they are positively drained, identifying which impermeable areas drain to which pipeline and the connections/outfalls to the public sewerage system identified. Ideally, a drainage survey of the existing site is required.

On all brownfield site Severn Trent propose at least 30% reduction of surface water flows in comparison to the existing development's discharge. However, it is advised to discuss flow rates with the LLFA as national policy states that all developments should seek to discharge at greenfield rates where practical (5l/s/ha). Please refer to "Severn Trent Surface Water Guidance Notes" submitted with this response for further information.

Note, STW will need to be fully satisfied that all sustainable options have been satisfied before discharge to network is considered, we expect all surface water from the development to be drained in a sustainable way to the nearest watercourse or land drainage channel, subject to the developer discussing all aspects of the developments surface water drainage with the Local Lead Flood Authority (LLFA). Any discharge rate to a watercourse or drainage ditch will be determined by the LLFA / EA.

Connections

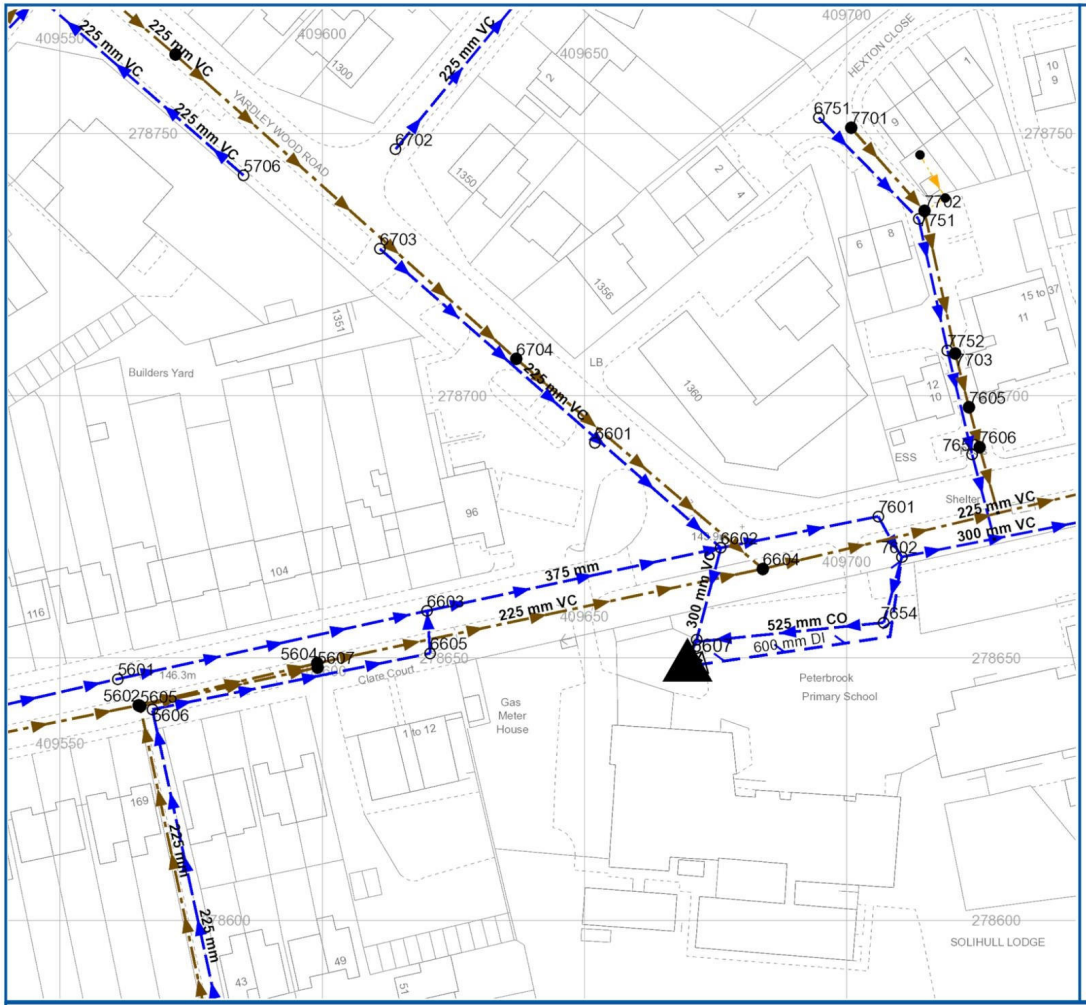
For any new connections (including the re-use of existing connections) to the public sewerage system, the developer will need to submit a Section 106 application form. Our Developer Services department are responsible for handling all new connections enquiries and applications. To contact them for an application form

and associated guidance notes please call 0800 7076600 or download from www.stwater.co.uk.

Please quote the above reference in any future correspondence (including e-mails) with STW Limited. Please note that Developer Enquiry responses are only valid for 6 months from the date of this letter.

Yours sincerely

Belal Ali
Network Solutions
Developer Services



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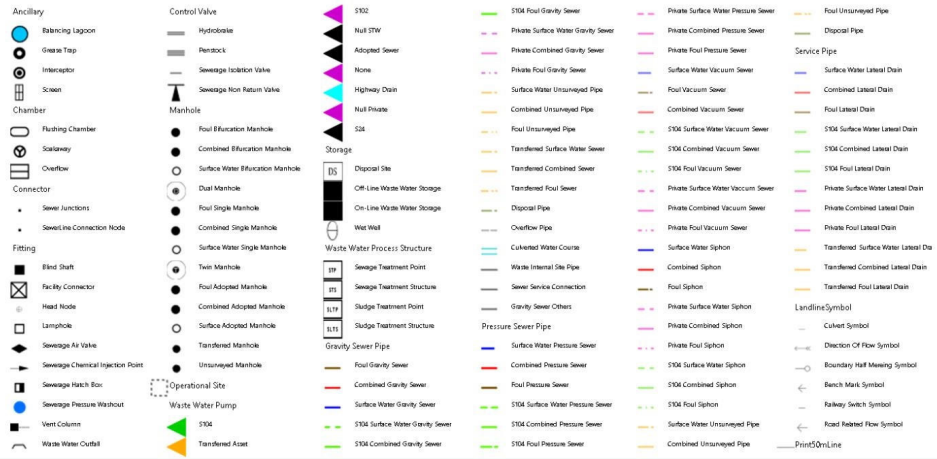
LEGEND



MATERIALS

-	- NONE
AC	- ASBESTOS CEME
BR	- BRICK
CC	- CONCRETE BOX CULVERT
CI	- CAST IRON
CO	- CONCRETE
CSB	CONCRETE SEGMENTS (BOLTED)
CSU	- CONCRETE SEGMENTS (UNBOLTED)
DI	- DUCTILE IRON
GRP	- GLASS REINFORCED PLASTIC
MAC	- MASONRY IN REGULAR COURSES
MAR	- MASONRY RANDOMLY COURSED
PE	- POLYETHLENE
PF	- PITCH
PP	- POLYPROPYLENE
PSC	- PLASTIC STEEL COMPOSITE
PVC	- POLYVINYL CHLORIDE
RPM	- REINFORCED PLASTIC MATRIX
SI	- SPUN (GREY) IRON
ST	- STEEL
U	- UNKNOWN
VC	- VITRIFIED CLAY
XXX	- OTHER

CATEGORIES

W	- WEIR
C	- CASCADE
DB	- DAMBOARD
SE	- SIDE ENTRY
FV	- FLAP VALVE
BD	- BACK DROP
S	- SIPHON
D	- HIGHWAY DRAIN
S104	- SECTION 104

SHAPE

C	- CIRCULAR
E	- EGG SHAPED
O	- OTHER
R	- RECTANGLE
S	- SQUARE
T	- TRAPEZOIDAL
U	- UNKNOWN

PURPOSE

C	- COMBINED
E	- FINAL EFFLUENT
F	- FOUL
L	- SLUDGE
S	- SURFACE WATER

Severn Trent Water Limited
Asset Data Management
PO Box 5344
Coventry
CV3 9FT
Telephone: 0345 601 6616

SEWER RECORD (Tabular)

O/S Map Scale: 1:1,000 **This map is centred upon:**

Date of Issue: 18-11-21 **X:** 409641.83 **Y:** 278679.42

Disclaimer Statement:

1 Do not scale off this Map.

2 This plan and any information supplied with it is furnished as a general guide, is only valid at the date of issue and no warranty as to its correctness is given or implied. In particular this plan and any information shown on it must not be relied upon in the event of any development or works (including but not limited to excavations) in the vicinity of SEVERN TRENT WATER assets or for the purposes of determining the suitability of a point of connection to the sewerage or distribution systems.

3 On 1 October 2011 most private sewers and private lateral drains in Severn Trent Water's sewerage area, which were connected to a public sewer as at 1 July 2011, transferred to the ownership of Severn Trent Water and became public sewers and public lateral drains. A further transfer takes place on 1 October 2012. Private pumping stations, which form part of these sewers or lateral drains, will transfer to ownership of Severn Trent Water on or before 1 October 2016. Severn Trent Water does not possess complete records of these assets. These assets may not be displayed on the map.

4

5 Ordnance Survey licence number: **100031673**

6 Document users other than SEVERN TRENT WATER business users are advised that this document is provided for reference purpose only and is subject to copyright, therefore, no further copies should be made from it.

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 21 minutes.

	Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15	min Summer	0.557	0.557	0.0	8.3	8.3	14.3	O K
30	min Summer	0.677	0.677	0.0	8.3	8.3	17.4	O K
60	min Summer	0.678	0.678	0.0	8.3	8.3	17.4	O K
120	min Summer	0.571	0.571	0.0	8.3	8.3	14.7	O K
180	min Summer	0.432	0.432	0.0	8.3	8.3	11.1	O K
240	min Summer	0.321	0.321	0.0	8.3	8.3	8.2	O K
360	min Summer	0.186	0.186	0.0	8.2	8.2	4.8	O K
480	min Summer	0.140	0.140	0.0	7.4	7.4	3.6	O K
600	min Summer	0.121	0.121	0.0	6.4	6.4	3.1	O K
720	min Summer	0.109	0.109	0.0	5.6	5.6	2.8	O K
960	min Summer	0.095	0.095	0.0	4.5	4.5	2.4	O K
1440	min Summer	0.078	0.078	0.0	3.3	3.3	2.0	O K
2160	min Summer	0.065	0.065	0.0	2.4	2.4	1.7	O K
2880	min Summer	0.057	0.057	0.0	1.9	1.9	1.5	O K
4320	min Summer	0.047	0.047	0.0	1.4	1.4	1.2	O K
5760	min Summer	0.042	0.042	0.0	1.1	1.1	1.1	O K
7200	min Summer	0.038	0.038	0.0	0.9	0.9	1.0	O K
8640	min Summer	0.035	0.035	0.0	0.8	0.8	0.9	O K

	Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15	min Summer	131.351	0.0	21.4	21
30	min Summer	86.314	0.0	28.1	31
60	min Summer	54.074	0.0	35.3	48
120	min Summer	32.762	0.0	42.7	82
180	min Summer	24.128	0.0	47.2	112
240	min Summer	19.312	0.0	50.4	142
360	min Summer	14.018	0.0	54.9	196
480	min Summer	11.175	0.0	58.3	252
600	min Summer	9.366	0.0	61.1	312
720	min Summer	8.105	0.0	63.4	372
960	min Summer	6.446	0.0	67.3	492
1440	min Summer	4.660	0.0	73.0	734
2160	min Summer	3.364	0.0	79.0	1092
2880	min Summer	2.667	0.0	83.5	1448
4320	min Summer	1.920	0.0	90.2	2200
5760	min Summer	1.519	0.0	95.1	2856
7200	min Summer	1.266	0.0	99.1	3640
8640	min Summer	1.090	0.0	102.4	4360

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control Σ (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
10080 min Summer	0.033	0.033	0.0	0.7	0.7	0.8	O K
15 min Winter	0.645	0.645	0.0	8.3	8.3	16.6	O K
30 min Winter	0.779	0.779	0.0	8.3	8.3	20.0	O K
60 min Winter	0.764	0.764	0.0	8.3	8.3	19.6	O K
120 min Winter	0.595	0.595	0.0	8.3	8.3	15.3	O K
180 min Winter	0.374	0.374	0.0	8.3	8.3	9.6	O K
240 min Winter	0.226	0.226	0.0	8.3	8.3	5.8	O K
360 min Winter	0.133	0.133	0.0	7.0	7.0	3.4	O K
480 min Winter	0.110	0.110	0.0	5.7	5.7	2.8	O K
600 min Winter	0.098	0.098	0.0	4.8	4.8	2.5	O K
720 min Winter	0.089	0.089	0.0	4.1	4.1	2.3	O K
960 min Winter	0.078	0.078	0.0	3.3	3.3	2.0	O K
1440 min Winter	0.065	0.065	0.0	2.4	2.4	1.7	O K
2160 min Winter	0.054	0.054	0.0	1.7	1.7	1.4	O K
2880 min Winter	0.048	0.048	0.0	1.4	1.4	1.2	O K
4320 min Winter	0.040	0.040	0.0	1.0	1.0	1.0	O K
5760 min Winter	0.035	0.035	0.0	0.8	0.8	0.9	O K
7200 min Winter	0.032	0.032	0.0	0.7	0.7	0.8	O K
8640 min Winter	0.030	0.030	0.0	0.6	0.6	0.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Summer	0.961	0.0	105.3	5136
15 min Winter	131.351	0.0	24.0	21
30 min Winter	86.314	0.0	31.5	32
60 min Winter	54.074	0.0	39.5	50
120 min Winter	32.762	0.0	47.9	88
180 min Winter	24.128	0.0	52.9	118
240 min Winter	19.312	0.0	56.4	142
360 min Winter	14.018	0.0	61.5	192
480 min Winter	11.175	0.0	65.3	252
600 min Winter	9.366	0.0	68.4	310
720 min Winter	8.105	0.0	71.1	372
960 min Winter	6.446	0.0	75.4	492
1440 min Winter	4.660	0.0	81.7	738
2160 min Winter	3.364	0.0	88.5	1104
2880 min Winter	2.667	0.0	93.5	1436
4320 min Winter	1.920	0.0	101.0	2204
5760 min Winter	1.519	0.0	106.5	2848
7200 min Winter	1.266	0.0	111.0	3656
8640 min Winter	1.090	0.0	114.7	4304

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control Σ (l/s)	Max Outflow (l/s)	Max Volume (m³)	Status
10080 min Winter	0.028	0.028	0.0	0.5	0.5	0.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
10080 min Winter	0.961	0.0	117.9	5104

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.100	Shortest Storm (mins)	15
Ratio R	0.400	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.087

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.029	4	8	0.029	8	12	0.029

Model Details

Storage is Online Cover Level (m) 2.000

Cellular Storage Structure

Invert Level (m) 0.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	27.0	0.0	0.801	0.0	0.0
0.800	27.0	0.0	2.000	0.0	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0137-8300-0800-8300
Design Head (m)	0.800
Design Flow (l/s)	8.3
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	137
Invert Level (m)	0.000
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	8.3	Kick-Flo®	0.562	7.0
Flush-Flo™	0.255	8.3	Mean Flow over Head Range	-	7.1

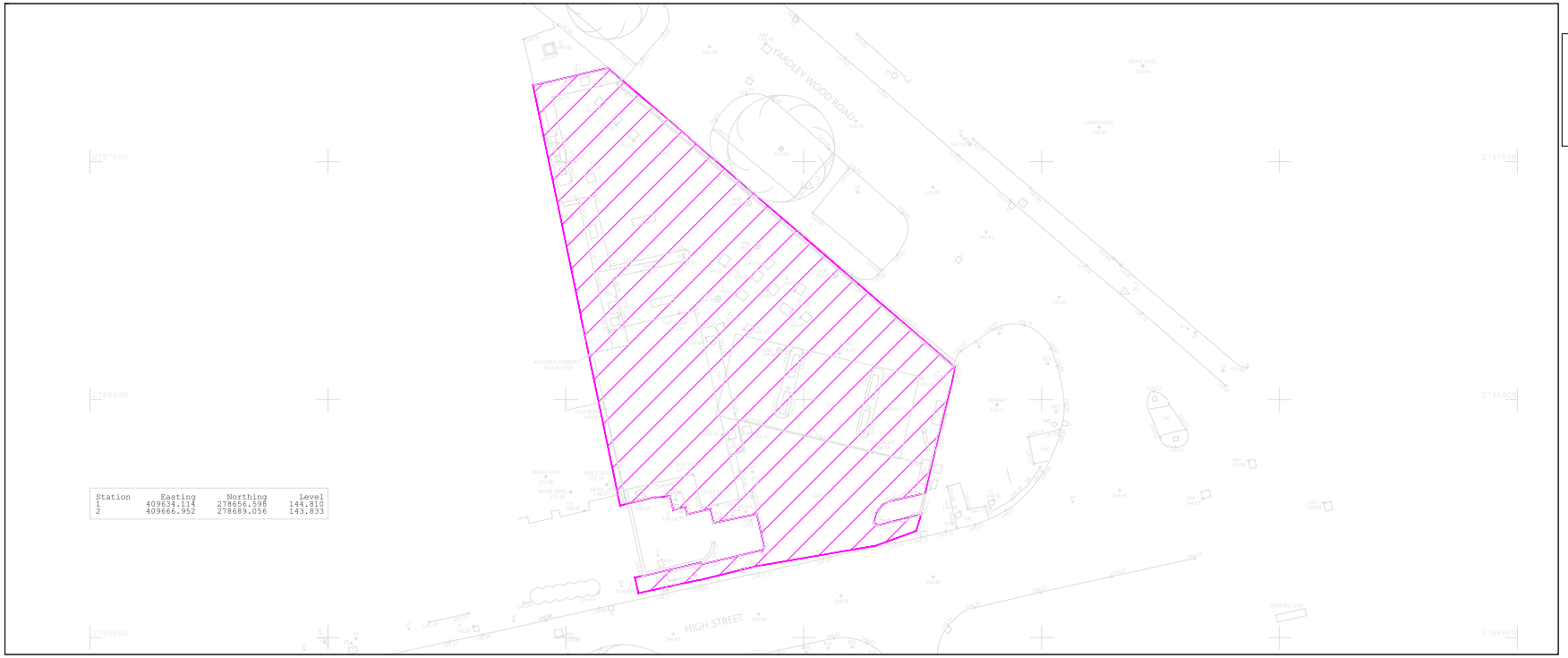
The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.9	1.200	10.0	3.000	15.5	7.000	23.3
0.200	8.2	1.400	10.8	3.500	16.7	7.500	24.1
0.300	8.3	1.600	11.5	4.000	17.8	8.000	24.8
0.400	8.1	1.800	12.2	4.500	18.8	8.500	25.5
0.500	7.7	2.000	12.8	5.000	19.8	9.000	26.2
0.600	7.3	2.200	13.4	5.500	20.7	9.500	26.9
0.800	8.3	2.400	13.9	6.000	21.6		
1.000	9.2	2.600	14.5	6.500	22.5		

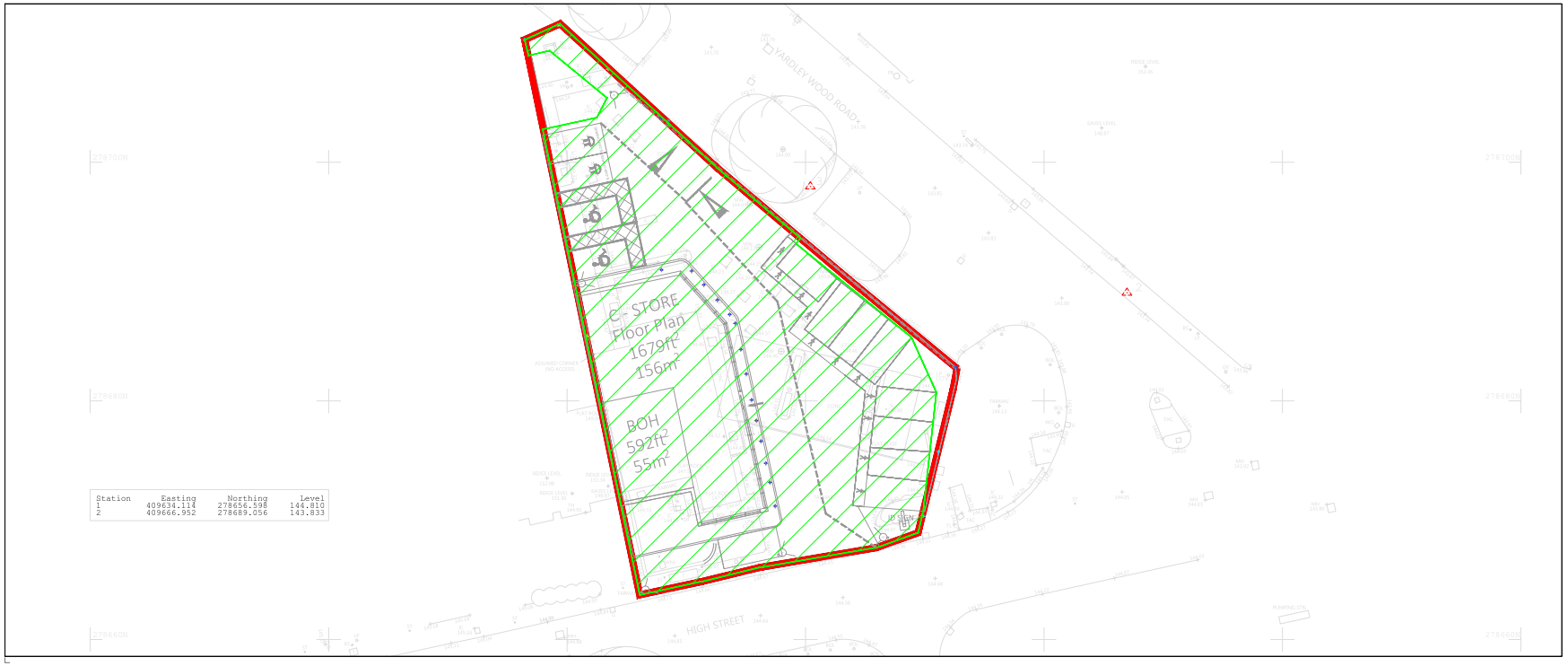
DO NOT SCALE, IF IN DOUBT ASK. DO NOT INTERROGATE CAD BASE

EXISTING IMPERMEABLE AREA:850m² (0.085 Ha)
EXISTING SW RUN-OFF: 2.78 x 0.085 x 50 = 11.8 L/S - 30% = 8.3 L/S

PROPOSED IMPERMEABLE AREA: 870m² (0.087 Ha)



Station	Easting	Northing	Level
1	409634.114	278656.598	144.810
2	409666.952	278689.056	143.833



Station	Easting	Northing	Level
1	409634.114	278656.598	144.810
2	409666.952	278689.056	143.833

REV.	DATE.	REVISION.	BY.	CHK.
-		FIRST ISSUE.	PH	NB
-	-	-	-	-

Euro Garages Ltd

Proposed Convenience Store
Solihull High Street, Shirley

Impermeable Area Plan

Goodson Associates
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Email: leeds@goodsons.com
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Consulting Civil, Structural & Transportation Engineers
Fountain House, 4 South Parade,
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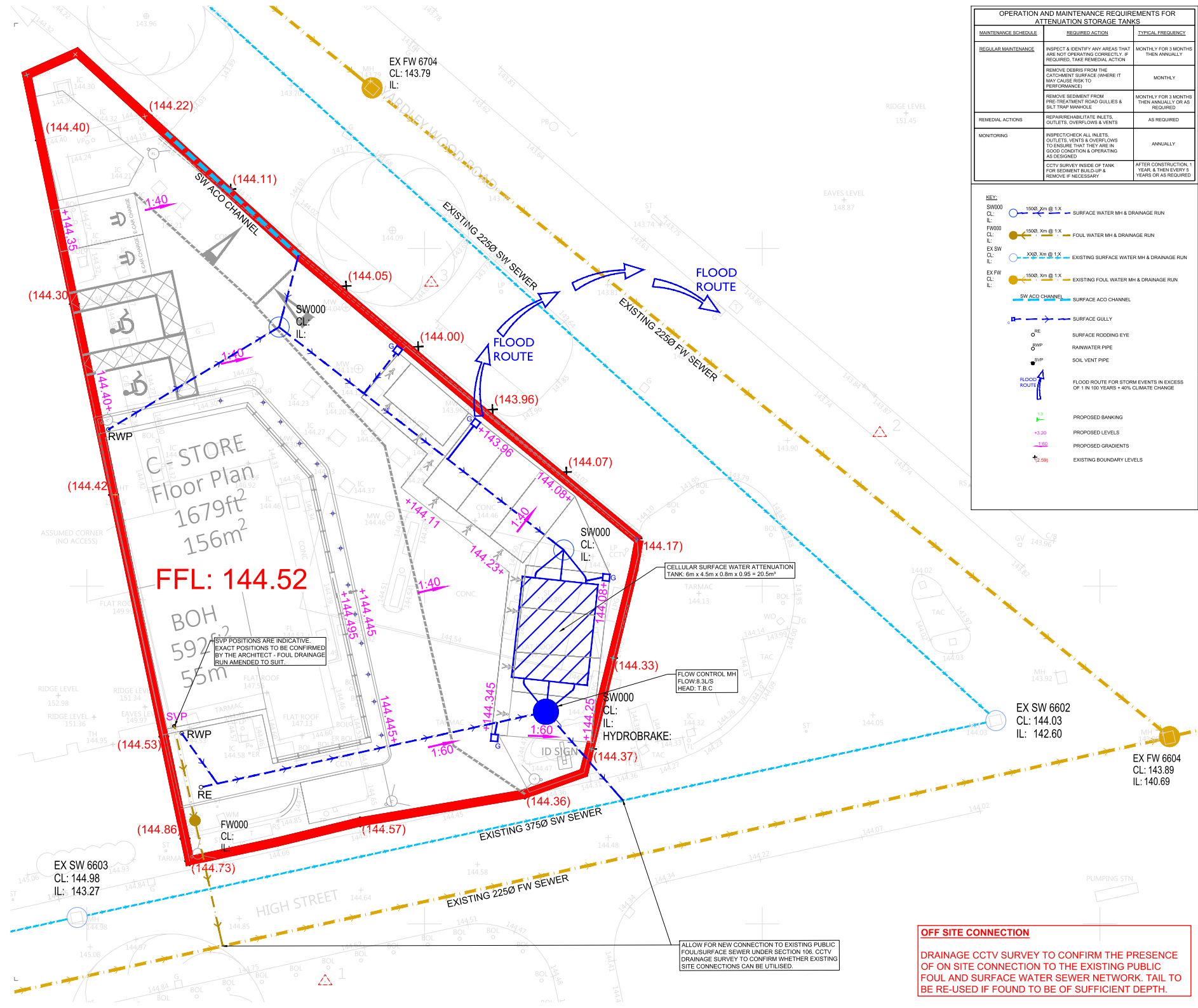
Also at Aberdeen, Edinburgh and Glasgow.

PLANNING

DATE CREATED:	SCALE:	
Dec. '21'	1:200	@ A1

CONTRACT No:	DRAWING No:	REV:
P15588	501	-



OPERATION AND MAINTENANCE REQUIREMENTS FOR ATTENUATION STORAGE TANKS		
MAINTENANCE SCHEDULE	REQUIRED ACTION	TYPICAL FREQUENCY
REGULAR MAINTENANCE	INSPECT & IDENTIFY ANY AREAS THAT ARE NOT OPERATING CORRECTLY. IF REQUIRED, TAKE REMEDIAL ACTION	MONTHLY FOR 3 MONTHS THEN ANNUALLY
	REMOVE DEBRIS FROM THE CATCHMENT SURFACE (WHERE IT MAY CAUSE RISK TO PERFORMANCE)	MONTHLY
	REMOVE SEDIMENT FROM PRE-TREATMENT ROAD GULLIES & SILT TRAP MANHOLE	MONTHLY FOR 3 MONTHS THEN ANNUALLY OR AS REQUIRED
REMEDIAL ACTIONS	REPAIR/REHABILITATE INLETS, OUTLETS, OVERFLOWS & VENTS	AS REQUIRED
MONITORING	INSPECT/CHECK ALL INLETS, OUTLETS, VENTS & OVERFLOWS TO ENSURE THAT THEY ARE IN GOOD CONDITION & OPERATING AS DESIGNED	ANNUALLY
	CCTV SURVEY INSIDE OF TANK FOR SEDIMENT BUILD-UP & REMOVE IF NECESSARY	AFTER CONSTRUCTION, 1 YEAR, & THEN EVERY 5 YEARS OR AS REQUIRED

KEY:

- SW000 CL: IL: — 150Ø, Xm @ 1:X — SURFACE WATER MH & DRAINAGE RUN
- FW000 CL: IL: — 150Ø, Xm @ 1:X — FOUL WATER MH & DRAINAGE RUN
- EX SW CL: IL: — XXØ, Xm @ 1:X — EXISTING SURFACE WATER MH & DRAINAGE RUN
- EX FW CL: IL: — 150Ø, Xm @ 1:X — EXISTING FOUL WATER MH & DRAINAGE RUN
- SW ACO CHANNEL — SURFACE ACO CHANNEL
- SURFACE GULLY
- RE — SURFACE RODDING EYE
- RWP — RAINWATER PIPE
- SVP — SOIL VENT PIPE
- FLOOD ROUTE — FLOOD ROUTE FOR STORM EVENTS IN EXCESS OF 1 IN 100 YEARS + 40% CLIMATE CHANGE
- 1:3 — PROPOSED BANKING
- +3.20 — PROPOSED LEVELS
- 1:60 — PROPOSED GRADIENTS
- (2.59) — EXISTING BOUNDARY LEVELS

DO NOT SCALE, IF IN DOUBT ASK. DO NOT INTERROGATE CAD BASE

DRAINAGE NOTES:

1. THIS DRAWING HAS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS & ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. FOR DRAINAGE DETAILS REFER TO DRAWING P15588-501.
3. FOR LOCATION OF ALL R.W.Ps & INTERNAL POP-UP's REFER TO ARCHITECTS DRAWING. ALL DOWN PIPES TO BE FITTED WITH ACCESS HANDHOLES ABOVE F.F.L. OR GROUND LEVEL.
4. ALL GULLY CONNECTIONS TO BE 150Ø U.N.O. ALL S.V.P. CONNECTIONS TO BE MINIMUM 100Ø OR TO MATCH S.V.P. DOWNPIPE IF GREATER. ALL R.W.P. CONNECTIONS TO BE 150Ø OR TO MATCH R.W.P. DOWNPIPE.
5. ALL PIPES UP TO 450Ø TO BE UPVC PIPES. PIPES GREATER THAN 450Ø TO BE CONCRETE.
6. PIPES UNDER ROADS HAVING 1200mm OR LESS COVER ARE TO BE ENCASED IN CONCRETE IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.
7. MANHOLE COVER LEVELS ARE INDICATIVE AND SHOULD BE SET TO SUIT FINISHED ROAD LEVEL AND CAMBER.
8. ALL EXTERNAL MANHOLES WITHIN ROADS TO BE FITTED WITH LOADCLASS D400 COVERS U.N.O. ALL EXTERNAL MANHOLES WITHIN SOFT LANDSCAPING TO BE FITTED WITH LOADCLASS B125 COVERS U.N.O. ALL IN ACCORDANCE WITH BS EN 124:2015 (ALL PARTS).
9. INVERT LEVELS OF EXISTING DRAINS AND MANHOLES TO BE CONFIRMED ON SITE PRIOR TO COMMENCING OPERATIONS. NO EXISTING SEWER MANHOLE TO BE OPENED OR ENTERED WITHOUT THE PERMISSION OF THE LOCAL AUTHORITY DRAINAGE DEPARTMENT AND THE ATTENDANCE OF SEWER PERSON AS REQUIRED.
10. DRAINAGE DESIGN AND INSTALLATION TO BE TO THE SATISFACTION OF THE LOCAL BUILDING CONTROL DEPARTMENT AND TO COMPLY WITH BS EN 752:2017, BS EN 1610:2015, BS EN 12056-1:2000, BS EN 12056-2:2000 and BS EN 12056-3:2000.
11. ADOPTABLE DRAINAGE WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE LATEST EDITION OF 'SEWERS FOR ADOPTION'.
12. ALL SUDS COMPONENTS TO BE MAINTAINED IN ACCORDANCE WITH CIRIA C 768.
13. SURFACE WATER ATTENUATION CRATES TO BE WAVIN AQUACELL PLUS OR SIMILAR APPROVED. TO BE INSTALLED IN LINE WITH MANUFACTURES SPECIFICATION.

SURFACE WATER ATTENUATION

PROPOSED IMPERMEABLE AREA: 870m² (0.087 Ha)

SITE AREA: 920m² (0.092 Ha)

EXISTING IMPERMEABLE AREA: 850m² (0.085 Ha)

EXISTING SURFACE WATER RUN-OFF: 2.78x0.085x50 = 11.8L/S - 30% = 8.3L/S

DISCHARGE RATE: 8.3L/S

CELLULAR TANK DIMENSIONS: 6m x 4.5m x 0.8m x 0.95 = 20.5m³

STORM EVENT: 1 IN 100YR + 40% CLIMATE CHANGE

CDM NOTES

1. ACCESS AND EGRESS TO THE SITE FROM BUSY ROAD.
2. POTENTIAL GROUND INSTABILITY IN DEEP EXCAVATIONS
3. NO HEAVY PLANT OR STOCK PILES PERMITTED OVER OR WITHIN 3m OF THE CONSTRUCTED TANK
4. TANK TO BE FULLY PROTECTED FROM SILT AND DEBRIS INGRESS DURING CONSTRUCTION, AND TO BE INSPECTED AND MAINTAINED DURING OPERATION AS DETAILED ABOVE
5. TANKS NOT DESIGNED TO RESIST UPLIFT UNTIL FULLY BACKFILLED
6. EXISTING SERVICES IDENTIFIED ON SITE.
7. ADEQUATE SEGREGATION HOARDING REQUIRED TO SEPARATE PUBLIC FROM THE CONSTRUCTION SITE.
8. ADEQUATE MEASURES REQUIRED TO CONTROL NOISE, DUST, FUMES & VIBRATION.
9. POTENTIAL HOT SPOT CONTAMINATION DUE TO PREVIOUS SITE USE.
10. COMBINED DRAINAGE CONNECTION INTO EXISTING SEWERS IN THE HIGHWAY - ADEQUATE RAMS AND SITE CONTROL REQUIRED.

REFER TO DESIGNERS HAZARD ASSESSMENTS FOR FURTHER DETAILS.

REV.	DATE.	REVISION.	BY.	CHK.
–		FIRST ISSUE.	PH	NB
-	-	-	-	-

OFF SITE CONNECTION

DRAINAGE CCTV SURVEY TO CONFIRM THE PRESENCE OF ON SITE CONNECTION TO THE EXISTING PUBLIC FOUL AND SURFACE WATER SEWER NETWORK. TAIL TO BE RE-USED IF FOUND TO BE OF SUFFICIENT DEPTH.

Euro Garages Ltd

Proposed Convenience Store
Solihull High Street, Shirley

Drainage Layout Plan

Goodson Associates
Tel: +44 (0)113 369 7925
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Web: www.goodsons.com
Consulting Civil, Structural & Transportation Engineers
Fountain House, 4 South Parade,
Leeds, LS1 5QX
Also at Aberdeen, Edinburgh and Glasgow.

PLANNING

DATE CREATED:	SCALE:	
Dec. '21'	1:100 @ A1	
CONTRACT No:	DRAWING No:	REV:
P15588	500	-