Title: Drainage Strategy Technical Note
Date: 06th October 2023
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Revision: P2

1.0 Introduction

1.1.1 Jubb have prepared this Technical Note alongside the associated drawings and calculations to address the Drainage requirements for a full planning application in relation to the proposed redevelopment of Land at Compton Business Centre, Surrey Avenue, Camberley GU15 3DX.

1.1.2 The site is located within a wider existing industrial development called Watchmoor Point. The current site is known as Land at Compton Place Business Centre, Surrey Avenue, GU15 3DX. It is located on the southern side of Camberley town centre. The property currently comprises a development of interlinked single storey warehouse style units and a two storey office and light industrial buildings. There are existing concrete and tarmacdam hardstanding areas.

1.1.3 There are existing surface and foul water networks located within Watchmoor Road. These are currently used by the existing buildings within the industrial park to discharge their surface and foul water. The existing site currently discharges both surface and foul water via a combined pumped outfall to the Thames Water adopted network within Surrey Avenue.

1.1.4 It is proposed to demolish the existing development and construct in its place a new industrial unit with office space. The entrance is proposed to be moved from Surrey Avenue to Watchmoor Road.

2.0 Foul Water Drainage

2.1.1 A new foul water drainage network will be required to service the proposed development. The proposed network will collect and convey foul water discharge from the development to a connection point on the existing foul water sewer located within Watchmoor Road. This will remove the need to pump the effluent from the site.

2.1.2 The proposed connection point to the foul sewer is located in the southern corner of the site. This connection is to be made via a new connection within a new manhole.

2.1.3 The new foul sewerage network has been designed to accommodate the anticipated peak development flows without flooding.

2.1.4 Where the foul water pipes are located below permeable paving, the construction above the pipe will ensure the storage function of the permeable paving will not be impacted. This will also be the case for the utilities that need to be located below the permeable paving.

3.0 Surface Water Drainage

3.1.1 A new surface water drainage network will be required to service the proposed development to drain surface water runoff from the buildings, access road, car park and pedestrian hard standing areas.

3.1.2 The proposed connection point to the proposed public sewer is located to the southern corner of the site. These connections are to be made via a new connection within an existing manhole.

3.1.3 Due to the depth of the existing connection points within Surrey Avenue, and the combined nature of the existing discharge, it is proposed to move the outfall to a more suitable location within Watchmoor Road. This will remove the requirement for a pumping station and split the discharges into surface and foul water as per current guidelines.

3.2 Geology

3.2.1 A ground investigation has yet to be undertaken on the site, but an intrusive survey is planned to be carried out. A review of BGS mapping has shown the site is underlain by a bedrock of Windlesham Formation. This is a sand, silt clay mixture which is not generally known for its permeability. There are superficial deposits which could provide some permeability.

3.2.2 Due to the underlying impermeable bedrock, an infiltration method of discharge has been discounted at this point. Should it be deemed feasible following the ground investigation, the drainage design will be revisited.

3.3 Strategy

3.3.1 With the ground conditions appearing to be unfavourable to infiltration methods of surface water discharge, this method has been discounted. In line with the hierarchical SuDS approach, a watercourse discharge would be the next preferred option. The site is not in close proximity to a watercourse, therefore the next option of a surface water sewer is the next preferred option. There is an existing surface water sewer located within Watchmoor Road. This would meet the requirements of the hierarchical SuDS approach.

3.3.2 To calculate the flow rates for this development, a brownfield runoff rate has been considered. A 1 in 1 year 60 minute storm produces a flow rate of 16.88l/s. It is proposed to use a 53% reduction in this figure to 8l/s. This rate will be used for all storms up to and including the 1 in 100 year storm + 40% climate change. A copy of the calculations used to calculate this figure are included within Appendix A of this technical note.

3.3.3 The development will then require 172m^3 of attenuation. A below ground cellular storage tank will provide 112.5m^3 of attenuation. An additional 42m^3 of storage will be provided by tanked permeable paving in the car parking spaces. A copy of the calculations used to size the attenuation is included within Appendix A.

3.3.4 The levels of impermeable areas will be designed to allow water to flow towards the permeable paving areas to remove the need for linear drains or gullies. Surface water will be collected from the roofs via a conventional pipe system which will connect into the site drainage system. Yard areas will be collected via a linear drain to allow this run off to be passed through a petrol interceptor to ensure its cleanliness prior to combining with the roof and other non-yard area drainage.

3.3.5 New surface water drainage infrastructure will be implemented on site to adequately convey flows within the proposed system to prevent surface flooding. A copy of the Drainage Strategy drawing and calculations are included within the appendices of this report.

3.3.6 The drainage infrastructure will remain private and maintained by a management company post construction.

4.0 Maintenance and Management

4.1.1 To ensure that any proposed SuDS features operate effectively for its lifetime a detailed management plan for the operation and maintenance of the SuDS will be produced, prior to construction, based on Chapter 32 of Ciria C753.

4.1.2 It is anticipated that drainage for the building, carparking, landscaping, etc in private ownership will be managed and maintained privately by a management company.

4.1.3 The surface water and foul water drainage networks will not be offered to Thames Water for adoption. The onsite pipework and attenuation structures will be the responsibility of the site owners.

4.1.4 Proposed SuDS features such as permeable paving will remain private and will be maintained by a management company.

4.1.5 Details for the management and maintenance of any SuDS within the site will be agreed with the Local Authority prior to construction. A draft maintenance regime is detailed below, this will need to be confirmed once construction is complete.

General Requirements

Regular Maintenance	Frequency
Litter Collect all litter or other debris and remove from site at each site visit.	Monthly or when deemed necessary
Grass maintenance Amenity Grass – Mow all grass verges, paths and amenity grass at 35-50mm with 75mm max. All cuttings to remain in situ.	Monthly or when deemed necessary
Flood Routes Make visual inspection of proposed overland flow routes. Check that the route is not obstructed by rubbish, new features etc. Remove obstructions as necessary.	Monthly

Gullies, Manholes

Regular Maintenance	Frequency
Gully Inlets Inspect physical structure of gully removing surface obstructions and silt as necessary. Check there is no physical damage.	Monthly
Silt Trap, Inspection chambers Remove cover and inspect ensuring water is flowing freely and that the existing route for water is unobstructed. Remove debris and silt. Undertake inspection after leaf fall in autumn in which silt build up is more likely to occur.	Annually
Reactive Maintenance	**Frequency**
Replace gully grating and manhole if physical damage has occurred. If a blockage in the drainage system occurs rod the necessary region within the system to ensure the blockage is removed.	As required

Catch Pit

Regular Maintenance	**Frequency**
Silt Trap, Inspection chambers Open cover to inspect level of silt present, where required remove the excess silt.	Monthly within first year, annually thereafter
Reactive Maintenance	**Frequency**
If the level of silt is above the level of the pipes it may be necessary to mechanically extract the silt and jets the drains both upstream and downstream to ensure continued performance.	As required

Hydrobrake

Regular Maintenance	**Frequency**
Inspection Chamber Remove cover to inspect and note any high-water levels, re-inspect 24hrs later to evaluate reduction of water levels. Inspect ensuring that water is flowing appropriately through the flow control device and there are no obstructions to the flow of water immediately upstream or within the device. Remove debris and silt where necessary.	Monthly or following severe storms, within first year. Monthly for 3 months, then every 6 months.
Reactive Maintenance	**Frequency**
If a blockage within the hydrobrake unit occurs, it will need to be either jetted or replaced depending on the severity of the blockage.	As required

Permeable Paving

Regular Maintenance	Frequency
Surface Protection Remove litter and debris. Brush or suction sweep surface to remove silt build up and replace grit as required	 Monthly Annually
Bedding Replacement Lift blocks and remove bedding material. Clean geotextile and replace bedding material with new silt-free granular material.	Every 10 years or as required
Reactive Maintenance	**Frequency**
Brush or suction sweep to remove any materials left on surface. Lift and re-bed blocks where movement has occurred. In case of settlement, full reconstruction and compaction of sub-base may be required. Sub-grade should be checked to washout of fines.	As required

Petrol Interceptor

Regular Maintenance	Frequency
Inspection Chambers Remove cover and inspect ensuring water is flowing freely and that the existing route for water is unobstructed. Undertake inspection after leaf fall in autumn in which silt build up is more likely to occur.	Annually
Alarm System Run a test to the alarm system to ensure that it is still operational.	Annually
Reactive Maintenance	**Frequency**

In the instance that the alarm within the system goes off silt/oil from the interceptor is to be removed and properly disposed of offsite. In the case of an oil/chemical spill relevant pipes within the drainage system will be jetted and the oil flushed into the separator removed appropriately afterwards.	As required

Attenuation Tank

Regular Maintenance	**Frequency**
Remove cover and inspect ensuring water inflow is unobstructed and check for siltation and debris. Remove debris and silt. Undertake inspection after leaf fall in autumn in which silt build up is more likely to occur.	Annually
Review covers and surface for signs of settlement or structural degradation	Annually
Reactive Maintenance	**Frequency**
Replace inspection cover if physical damage has occurred. If siltation is impeding flow and reducing volume then the tank is to be flushed and cleared with a gully sucker or similar. Visual inspection or CCTV survey of the tank to be carried out where possible.	As required

5.0 Conclusions

5.1.1 It has been demonstrated through development of our proposed drainage strategy that the proposed development complies with the requirements of the planning authority.

Appendix A: Surface Water Calculations

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.204	4-8	0.116

Total Area Contributing (ha) = 0.320

Total Pipe Volume (m³) = 9.724

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

- Indicates pipe length does not match coordinates

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	51.208	0.341	150.2	0.125	5.00	0.0	0.600	o	300	Pipe/Conduit	
2.000	18.133	0.181	100.0	0.031	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	5.368	0.036	150.0	0.009	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	26.423#	0.176	150.1	0.009	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	5.000#	0.050	100.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
3.000	46.304	0.463	100.0	0.097	5.00	0.0	0.600	o	225	Pipe/Conduit	
3.001	22.304	0.223	100.0	0.049	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.004	6.742	0.067	100.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.005	4.703	0.047	100.1	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.67	60.850	0.125	0.0	0.0	0.0	1.28	90.5	16.9
2.000	50.00	5.30	60.790	0.031	0.0	0.0	0.0	1.00	17.8	4.2
1.001	50.00	5.74	60.459	0.165	0.0	0.0	0.0	1.28	90.6	22.3
1.002	50.00	6.08	60.423	0.174	0.0	0.0	0.0	1.28	90.5	23.6
1.003	50.00	6.13	60.247	0.174	0.0	0.0	0.0	1.57	111.1	23.6
3.000	50.00	5.59	60.850	0.097	0.0	0.0	0.0	1.31	52.0	13.1
3.001	50.00	5.87	60.387	0.146	0.0	0.0	0.0	1.31	52.0	19.8
1.004	50.00	6.22	60.089	0.320	0.0	0.0	0.0	1.30	51.8	43.3
1.005	50.00	6.28	60.022	0.320	0.0	0.0	0.0	1.31	52.0	43.3

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.005	S14	61.137	59.975	0.000	600	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.300	Storm Duration (mins)	30
Ratio R	0.400		

Online Controls for Storm

Hydro-Brake® Optimum Manhole: S8, DS/PN: 1.005, Volume (m³): 1.6

Unit Reference	MD-SHE-0133-8000-0930-8000
Design Head (m)	0.930
Design Flow (l/s)	8.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	133
Invert Level (m)	60.022
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.930	8.0
Flush-Flo™	0.282	8.0
Kick-Flo®	0.627	6.7
Mean Flow over Head Range	-	6.9

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	4.8	1.200	9.0	3.000	13.9	7.000	20.9
0.200	7.8	1.400	9.7	3.500	15.0	7.500	21.6
0.300	8.0	1.600	10.3	4.000	16.0	8.000	22.2
0.400	7.9	1.800	10.9	4.500	16.9	8.500	22.9
0.500	7.6	2.000	11.5	5.000	17.7	9.000	23.5
0.600	7.0	2.200	12.0	5.500	18.6	9.500	24.1
0.800	7.5	2.400	12.5	6.000	19.4		
1.000	8.3	2.600	13.0	6.500	20.1		

Storage Structures for Storm

Porous Car Park Manhole: S5, DS/PN: 1.002

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	8.0
Membrane Percolation (mm/hr)	1000	Length (m)	10.0
Max Percolation (l/s)	22.2	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	60.590	Cap Volume Depth (m)	0.430

Complex Manhole: S7, DS/PN: 1.004

Cellular Storage

Invert Level (m)	60.089	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	225.0	225.0	0.600	0.0	255.0
0.500	225.0	255.0			

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	25.0
Max Percolation (l/s)	69.4	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	60.589	Cap Volume Depth (m)	0.430

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.400
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.300	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S3	15 Winter	1	+0%					60.940
2.000	S6	15 Winter	1	+0%	100/15 Summer				60.841
1.001	S4	15 Winter	1	+0%	100/15 Summer				60.581
1.002	S5	15 Winter	1	+0%	100/15 Summer				60.527
1.003	5	15 Winter	1	+0%	100/15 Summer				60.368
3.000	S1	15 Winter	1	+0%	100/15 Summer				60.928
3.001	S2	15 Winter	1	+0%	100/15 Summer				60.484
1.004	S7	60 Winter	1	+0%	30/30 Winter				60.185
1.005	S8	120 Winter	1	+0%	30/15 Summer				60.178

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S3	-0.210	0.000	0.19		16.4	OK	
2.000	S6	-0.099	0.000	0.25		4.1	OK	

1 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.001	S4	-0.178	0.000	0.35		21.4	OK	
1.002	S5	-0.196	0.000	0.26		21.2	OK	
1.003	5	-0.178	0.000	0.35		21.3	OK	
3.000	S1	-0.147	0.000	0.26		12.7	OK	
3.001	S2	-0.128	0.000	0.38		18.3	OK	
1.004	S7	-0.129	0.000	0.20		7.4	OK	
1.005	S8	-0.069	0.000	0.23		7.1	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model		FSR	Ratio R 0.400
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.300	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S3	15 Winter	30	+0%					60.998
2.000	S6	15 Winter	30	+0%	100/15 Summer				60.876
1.001	S4	15 Winter	30	+0%	100/15 Summer				60.673
1.002	S5	15 Winter	30	+0%	100/15 Summer				60.602
1.003	5	15 Winter	30	+0%	100/15 Summer				60.465
3.000	S1	15 Winter	30	+0%	100/15 Summer				60.982
3.001	S2	15 Winter	30	+0%	100/15 Summer				60.570
1.004	S7	120 Winter	30	+0%	30/30 Winter				60.363
1.005	S8	120 Winter	30	+0%	30/15 Summer				60.368

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S3	-0.152	0.000	0.47		40.1	OK	
2.000	S6	-0.064	0.000	0.60		10.0	OK	

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.001	S4	-0.085	0.000	0.86		52.6	OK	
1.002	S5	-0.121	0.000	0.66		53.8	OK	
1.003	5	-0.082	0.000	0.87		53.4	OK	
3.000	S1	-0.093	0.000	0.63		31.3	OK	
3.001	S2	-0.042	0.000	0.99		47.1	OK	
1.004	S7	0.049	0.000	0.24		8.9	SURCHARGED	
1.005	S8	0.121	0.000	0.26		8.0	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.400
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.300	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	ON
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 40

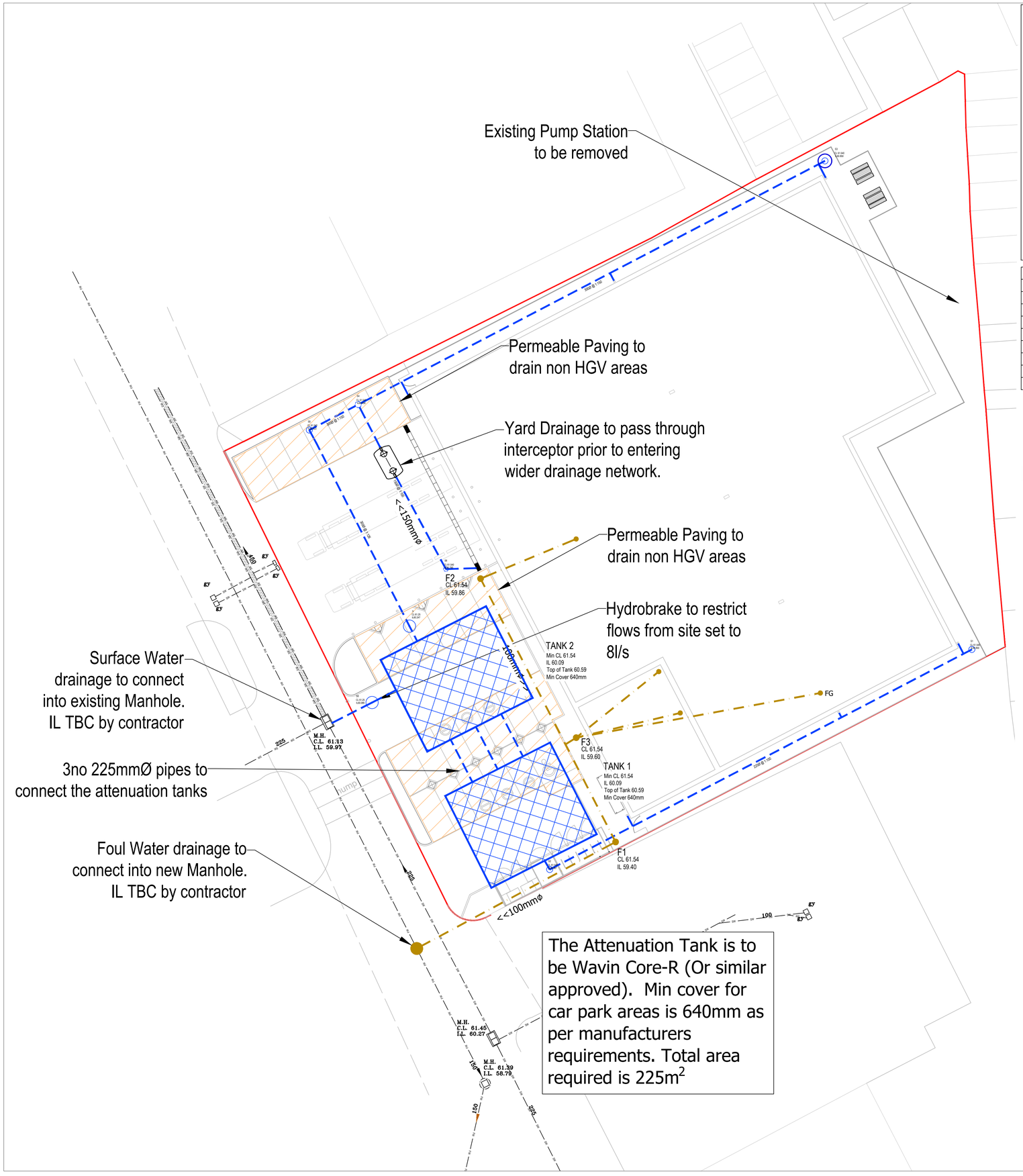
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	S3	15 Winter	100	+40%					61.090
2.000	S6	15 Winter	100	+40%	100/15 Summer				61.045
1.001	S4	15 Winter	100	+40%	100/15 Summer				60.857
1.002	S5	15 Winter	100	+40%	100/15 Summer				60.755
1.003	5	120 Winter	100	+40%	100/15 Summer				60.723
3.000	S1	15 Winter	100	+40%	100/15 Summer				61.400
3.001	S2	15 Winter	100	+40%	100/15 Summer				60.914
1.004	S7	120 Winter	100	+40%	30/30 Winter				60.722
1.005	S8	120 Winter	100	+40%	30/15 Summer				60.736

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	S3	-0.060	0.000	0.84		71.6	OK	
2.000	S6	0.105	0.000	1.02		16.9	SURCHARGED	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.001	S4	0.099	0.000	1.49		91.1	SURCHARGED	
1.002	S5	0.032	0.000	0.98		79.6	SURCHARGED	
1.003	5	0.177	0.000	0.53		32.8	SURCHARGED	
3.000	S1	0.325	0.000	1.01		50.2	FLOOD RISK	
3.001	S2	0.302	0.000	1.53		72.8	SURCHARGED	
1.004	S7	0.408	0.000	0.23		8.4	SURCHARGED	
1.005	S8	0.489	0.000	0.26		8.0	SURCHARGED	

Appendix B: Site Wide Surface Water Strategy Drawing



Key

- Existing Public Foul Water Sewer
- Existing Public Surface Water Sewer
- Proposed Surface Water Sewer
- Proposed Foul Water Sewer
- Proposed Channel Drain (RA — SO)
- Permeable Paving - Tanked
- Petrol Interceptor
- Attenuation Tank

Notes:

1. Do not scale from this drawing.
2. Location of existing utilities and drainage are indicative. Contractor to confirm location/depth of utilities on site before undertaking any construction activities.
3. No detailed GI works have been undertaken on the subject site.
4. BGS maps indicate that the site is underlain by Windlesham Formation.
5. It is anticipated that discharge via infiltration will not be viable. Therefore, it is proposed to discharge surface water runoff to a suitable existing public surface water sewer at a brownfield rate with a 50% betterment for the site's existing impermeable surfaces. The total discharge rate has been calculated to be Q = 8l/s.
6. Flows to be restricted via a hydrobrake unit or similar approved
7. Attenuation is provided to accommodate the 1 in 100 year including 40% climate change allowance rainfall event.
8. Proposed tanks are shown indicatively. The size, shape and position is subject to detail design.
9. The proposed strategy is based on the masterplan layout (7007 - 010 Revision E) and is subject to change as the masterplan is progressed.
10. Onsite ground investigation works including infiltration testing in accordance with BRE365 guidance should be undertaken across the site to inform the drainage proposals.
11. Manholes denoted as IC are Type 3 Manholes, max 1.5m deep.

SW MANHOLE SCHEDULE

MH NAME	COVER LEVEL	INVERT LEVEL	MH TYPE	MH SIZE	COVER SIZE	COVER GRADE	NOTES
S1	61.54	60.850	PPIC	600	600x600	B125	
S2	61.54	60.387	PPIC	600	600x600	D400	
S3	61.54	60.850	PPIC	600	600x600	B125	
S4	61.54	60.459	PPIC	600	600x600	D400	Paved inset cover
S5	61.54	60.423	PPIC	600	600x600	D400	Paved inset cover
5	61.54	60.100	PPIC	600	600x600	D400	
S6	61.54	60.790	PPIC	600	600x600	D400	
S8	61.25	60.089	Type B	1200	600x600	D400	Hydrobrake Manhole MD-SHE-0126-8000-1400-8000

FW MANHOLE SCHEDULE

Rev	Date	Description	By	Apvd
T3	06.10.23	Updated to suit drainage model	AK	RL
T2	04.08.23	Pipe diameters added	AH	RL
T1	07.07.23	T1 set	KG	DF
P4	13.06.23	Manhole Schedule Added, FG Adjusted	KG	RL
P3	08.06.23	Tanks and Drop Points Adjusted	KG	RL
P2	15.02.23	Levels added to drainage design	KG	RL
P1	17.08.22	Preliminary issue	KG	RL

PROJECT:
LAND AT COMPTON BUSINESS CENTRE

TITLE:
DRAINAGE
LAYOUT DRAWING

CLIENT:
REASSURE LIMITED EX LL
PROPERTY FUND

SCALE@A1:
200

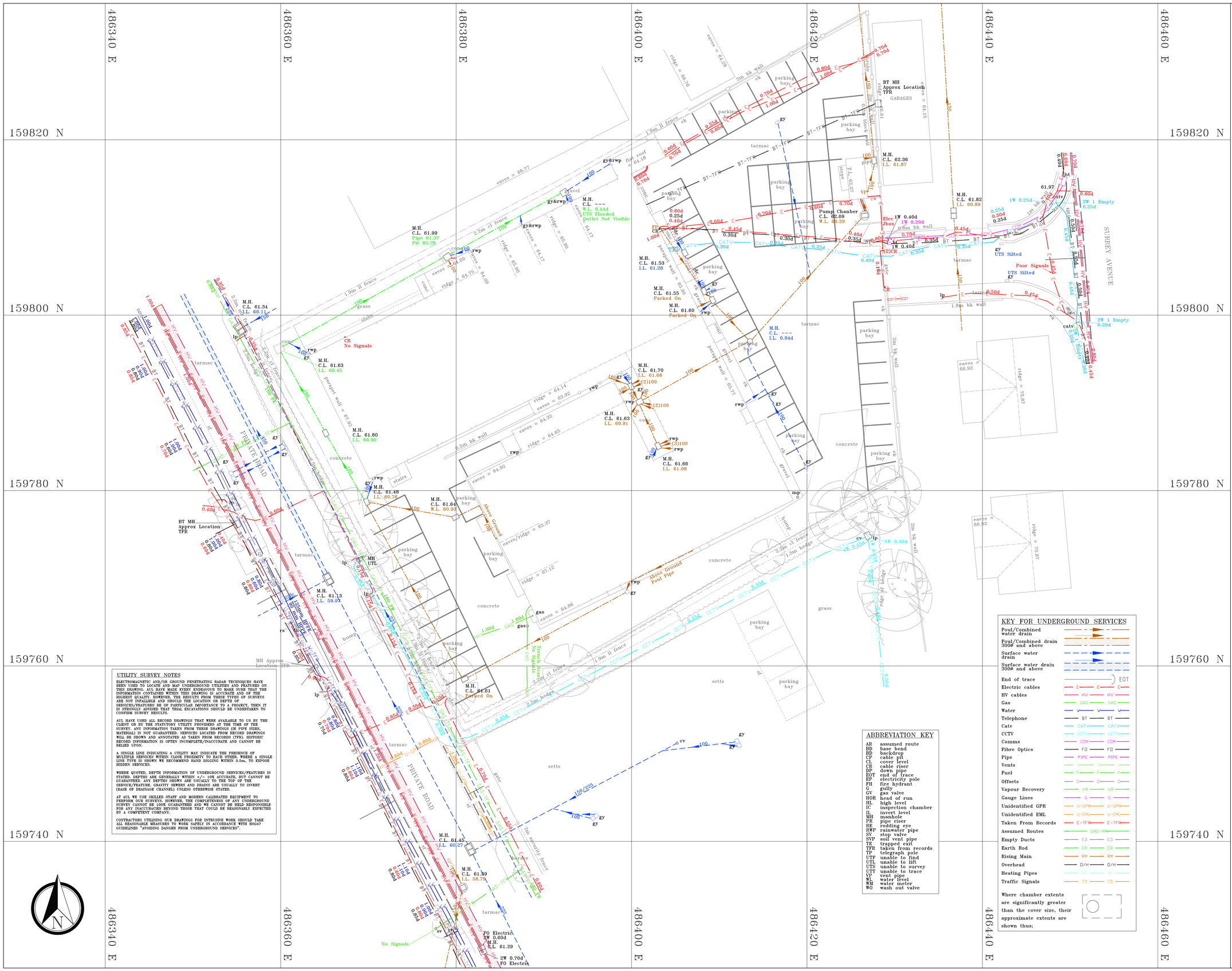
PROJECT REF:
21320

DRAWING No: **REV:**
21320-JUBB-XX-XX-DR-C-0500 T3

Revision Referencing
P = Preliminary A = Approval T = Tender C = Construction

Jubb
Bristol, Cardiff, Plymouth, Winchester
St James Court, St James Parade, Bristol BS1 3LH
jubb.uk.com
+44(0)117 922 6266

Appendix C: Existing Utility Survey



UTILITY SURVEY NOTES

ELECTROMAGNETIC AND/OR GROUND PENETRATING RADAR TECHNIQUES HAVE BEEN USED TO LOCATE AND MAP UNDERGROUND UTILITIES AND FEATURES ON THIS DRAWING. AUL HAVE MADE EVERY ENDEAVOUR TO MAKE SURE THAT THE INFORMATION CONTAINED WITHIN THIS DRAWING IS ACCURATE AND OF THE HIGHEST QUALITY. HOWEVER, THE RESULTS FROM THESE TYPES OF SURVEYS ARE NOT INFALLIBLE AND SHOULD THE LOCATION OR DEPTH OF SERVICES/FEATURES BE OF PARTICULAR IMPORTANCE TO A PROJECT, THEN IT IS STRONGLY ADVISED THAT TRIAL EXCAVATIONS SHOULD BE UNDERTAKEN TO CONFIRM SURVEY RESULTS.

AUL HAVE USED ALL RECORD DRAWINGS THAT WERE AVAILABLE TO US BY THE CLIENT OR BY THE STATUTORY UTILITY PROVIDERS AT THE TIME OF THE SURVEY. ANY INFORMATION TAKEN FROM THESE DRAWINGS (IE PIPE SIZES, MATERIAL) IS NOT GUARANTEED. SERVICES LOCATED FROM RECORD DRAWINGS WILL BE SHOWN AND ANNOTATED AS TAKEN FROM RECORDS (TPR). HISTORIC RECORD INFORMATION IS OFTEN INCOMPLETE/INACCURATE AND CANNOT BE RELIED UPON.

A SINGLE LINE INDICATING A UTILITY MAY INDICATE THE PRESENCE OF MULTIPLE SERVICES WITHIN CLOSE PROXIMITY TO EACH OTHER. WHERE A SINGLE LINE TYPE IS SHOWN WE RECOMMEND HAND DIGGING WITHIN 0.5m, TO EXPOSE HIDDEN SERVICES.

WHERE QUOTED, DEPTH INFORMATION OF UNDERGROUND SERVICES/FEATURES IS STATED. DEPTHS ARE GENERALLY WITHIN +/- 10% ACCURATE, BUT CANNOT BE GUARANTEED. ANY DEPTHS SHOWN ARE USUALLY TO THE TOP OF THE SERVICE/FEATURE. GRAVITY SEWERS AND DRAINS ARE USUALLY TO INVERT (BASE OF DRAINAGE CHANNEL) UNLESS OTHERWISE STATED.

AT AUL WE USE SKILLED STAFF AND MODERN CALIBRATED EQUIPMENT TO PERFORM OUR SURVEYS. HOWEVER, THE COMPLETENESS OF ANY UNDERGROUND SURVEY CANNOT BE 100% GUARANTEED AND WE CANNOT BE HELD RESPONSIBLE FOR ANY INACCURACIES BEYOND THOSE THAT COULD BE REASONABLY EXPECTED BY A COMPETENT COMPANY.

CONTRACTORS UTILISING OUR DRAWINGS FOR INTRUSIVE WORK SHOULD TAKE ALL REASONABLE MEASURES TO WORK SAFELY IN ACCORDANCE WITH HSG47 GUIDELINES "AVOIDING DANGER FROM UNDERGROUND SERVICES".

ABBREVIATION KEY

AR	assumed route
BD	base bend
BD	backdrop
CP	cable pit
CL	cover level
CR	cable riser
DP	down pipe
EOT	end of trace
EP	electricity pole
FH	fire hydrant
G	gully
GV	gas valve
HOR	head of run
HL	high level
IC	inspection chamber
IL	invert level
MH	manhole
PR	pipe riser
RE	rodding eye
RWP	rainwater pipe
SV	stop valve
SVP	soil vent pipe
TE	trapped exit
TFR	taken from records
TP	telegraph pole
UTF	unable to find
UTL	unable to lift
UTS	unable to survey
UTT	unable to trace
VP	vent pipe
WL	water level
WM	water meter
WO	wash out valve

KEY FOR UNDERGROUND SERVICES

Foul/Combined water drain	
Foul/Combined drain 300ø and above	
Surface water drain	
Surface water drain 300ø and above	
End of trace	EOT
Electric cables	E E E
HV cables	HV HV
Gas	GAS GAS
Water	W W W
Telephone	BT BT
Catv	CATV CATV
CCTV	CCTV CCTV
Comms	COM COM
Fibre Optics	FO FO
Pipe	PIPE PIPE
Vents	V V V
Fuel	F F F
Offsets	
Vapour Recovery	VR VR
Gauge Lines	G G
Unidentified GPR	U-GPR U-GPR
Unidentified EML	U-EML U-EML
Taken From Records	E-TFR E-TFR
Assumed Routes	GAS-AR
Empty Ducts	ED ED
Earth Rod	ER ER
Rising Main	RM RM
Overhead	O/H O/H
Heating Pipes	HP HP
Traffic Signals	TS TS

Where chamber extents are significantly greater than the cover size, their approximate extents are shown thus;

REV	REVISION	DATE	PROD	CKD
-	-	-	-	-

LEGEND

DRAINAGE
cv cover
dc drainage channel
fd foul drain
gy gully
I.C. inspection chamber
M.H. manhole
re rodding eye
rwp rainwater pipe
sd storm drain
svp soil vent pipe

LEVELS
C.L. Cover Level
F.L. Floor Level
I.L. Invert Level
OSBM Ordnance Survey Bench Mark
T.L. Threshold Level
W.L. Water Level

SERVICES
bs bus shelter
bt British Telecom
catv cable tv
ep electricity pole
fh fire hydrant
kl keep left bollard
lp lamp post
ohc overhead cable
pk phone kiosk
sv stop valve
sy stay wire
tl traffic lights
tp telegraph pole

FENCES
ba barrier
bw barbed wire
cb closeboard
ci corrugated iron
cl chainlink
cp concrete post
gt gate
ll larch lap
mp metal post
mr metal rail
pa palisade
pr post & rail
pw post & wire
wf wood fence
wp wood post

ROADS
dk drop kerbs
ek edging kerbs
rs road sign
ts tactile slabs
we wood edging
se setts
sf setts flush
sr setts raised

WALLS
bk brick wall
cw concrete wall
es edging stones
sw stone wall
tw top of wall

NOTE

GRID AND LEVELS TO ORDNANCE SURVEY.

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CLIENT	ReAssure EX LG LL Property Fund C/O Legal and General		
PROJECT	Compton Place Business Park Camberley GU15 3DY		
DRAWING	Utilities Survey		
DRW NO	2100123/01U	REV	-
DATE	December 2021	DRAWN BY	CG/JC
SCALE	1:200	SIZE	A1

AS BUILT

Appendix D: Architects Layout

notes

1:5 = 25cm	1:200 = 10m
1:10 = 50cm	1:250 = 12.5m
1:20 = 100cm	1:500 = 25m
1:50 = 2.5m	1:1250 = 62.5m
1:100 = 5m	1:2500 = 125m

UPDATED

IN ABEYANCE

Schedule of Accommodation
All areas are gross internal

Unit

Area (nett internal)		
Office GF	96.62 sq.m.	1,040.0 sq.ft.
Office FF	199.86 sq.m.	2,151.2 sq.ft.
Warehouse	1,700.00 sq.m.	18,298.6 sq.ft.
TOTAL	1,996.48 sq.m.	21,489.8 sq.ft.
Parking	26 car spaces	
Site Area	0.35 Ha	0.86 acres

no.	date	revision	by
B	02.06.23	EV charging points amended to suit 600x600 bases. Permeiter pathway amended to tarmac. kerbing shown as intent.	SR
A	12.05.23	Preliminary Issue	SR

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client

ReAssure Limited

project

Land at Compton Business Centre
Surrey Avenue
GU15 3DX

drawing

Site Plan
Proposed

scale	1:250 @ A1	drawn	sr
checked	sa	date	May 2023

no

7007 - 101B

TENDER- PRELIMINARY