Drainage Statement

Phase 6, Green Park Village, Reading

Client

Berekely Homes
200 Longwater Avenue
Green Park
Reading
RG2 6GB
7143/2.3F
First Issue: 26th October 2018

Consulting Engineers

GTA Civils Ltd
66a Church Walk, Burgess Hill
West Sussex RH15 9AS
Tel: 01444 871444
Fax: 01444 871401

1.0 INTRODUCTION

This report has been prepared in relation to the proposed drainage scheme submitted for the development of Phase 6 of the development at Green Park Village, Reading.

The aim of this report is to explain the detailed site drainage design, including the SuDS components, that are shown on the proposed site drainage layout drawings submitted with this document.

This report has been specifically designed to provide information to enable discharge of conditions 27, and 28 of the consent:

(27) Development shall not commence until a drainage strategy detailing any on and/or off site drainage works, has been submitted to and approved by, the local planning authority in consultation with the sewerage undertaker. No discharge of foul or surface water from the site shall be accepted into the public system until the drainage works referred to in the strategy have been completed.

(29) Prior to commencement of each phase or part of a phase full details of the method of disposal of foul sewage for that phase shall be submitted to and approved in writing by the Local Planning Authority. The development shall be carried out in accordance with the approved details.

2.0 LIMITATIONS

This report has been prepared for Berkeley Homes (Western) Ltd in relation to the proposed Green Park Village development at Reading. No responsibility is accepted to any third party for all or part of this study in connection with this or any other development.

3.0 EXISTING DRAINAGE

The site is currently unoccupied and comprises of spoil heaps and waste ground.

There are no existing drainage runs on site and all surface water runs overland and into the lake.

4.0 PROPOSED DRAINAGE

Condition 27:

The following drawings contained in Appendix A show the proposed drainage and details:

G259-GTA-SW-00-DR-C-96-1060 and 1061	-	Site Drainage Sheets 1 and 2
G259-GTA-SW-00-DR-C-96-1070, 1071 and 1072	-	Drainage details Sheets 1, 2 and 3
G259-GTA-SW-00-DR-C-96-1014	-	Phase 6 Section 104 layout

The total site impermeable area has been calculated as 1.593 Ha.

Greenfield runoff for the 1.593 Ha impermeable area has been calculated as 5.4 l/s. A restriction rate of 4.5l/s has been proposed which is slightly less than the 1 in 1 year greenfield rate of 4.6l/s.

The planning drainage strategy prepared by Glanville consulting engineers split the Phase 6 area into Phase 6a (north section) and Phase 6b (south section). The Phase 6a north section was restricted to 5l/s, whilst the Phase 6b area discharged to soakaways, subject to further investigation. Since then soakaways have been ruled out due to the made ground in the Phase 6b area and high groundwater levels.

Therefore, both Phase 6a and 6b all now discharge to a single outlet to the lake at 4.5l/s.

Microdrainage calculations in Appendix B shows no flooding of the system in a 1 in 100 year + 40% critical storm event.

Peak storage within the tank totals 1026m/cubed, with a tank capacity of 1152m/cubed.

As there it has been demonstrated that the surface water can be disposed of without increased risk of flooding it is proposed that planning condition 27 is deemed to be satisfied.

Peak storage volumes requirements are as follows:

Storm Event	**Peak Storage Volume requirement m.cu**
1 in 30 year	542
1 in 100 year + 40%	1026

5.0 PROPOSED FOUL DRAINAGE DESIGN

Condition 29:

Foul water is proposed to drain by gravity to the existing Thames Water sewer laid as part of Phase of the development as per the drainage layout drawings 1060 and 1061. A Section 104 application has been made to Thames Water for the new sewers as shown on drawing 1014.

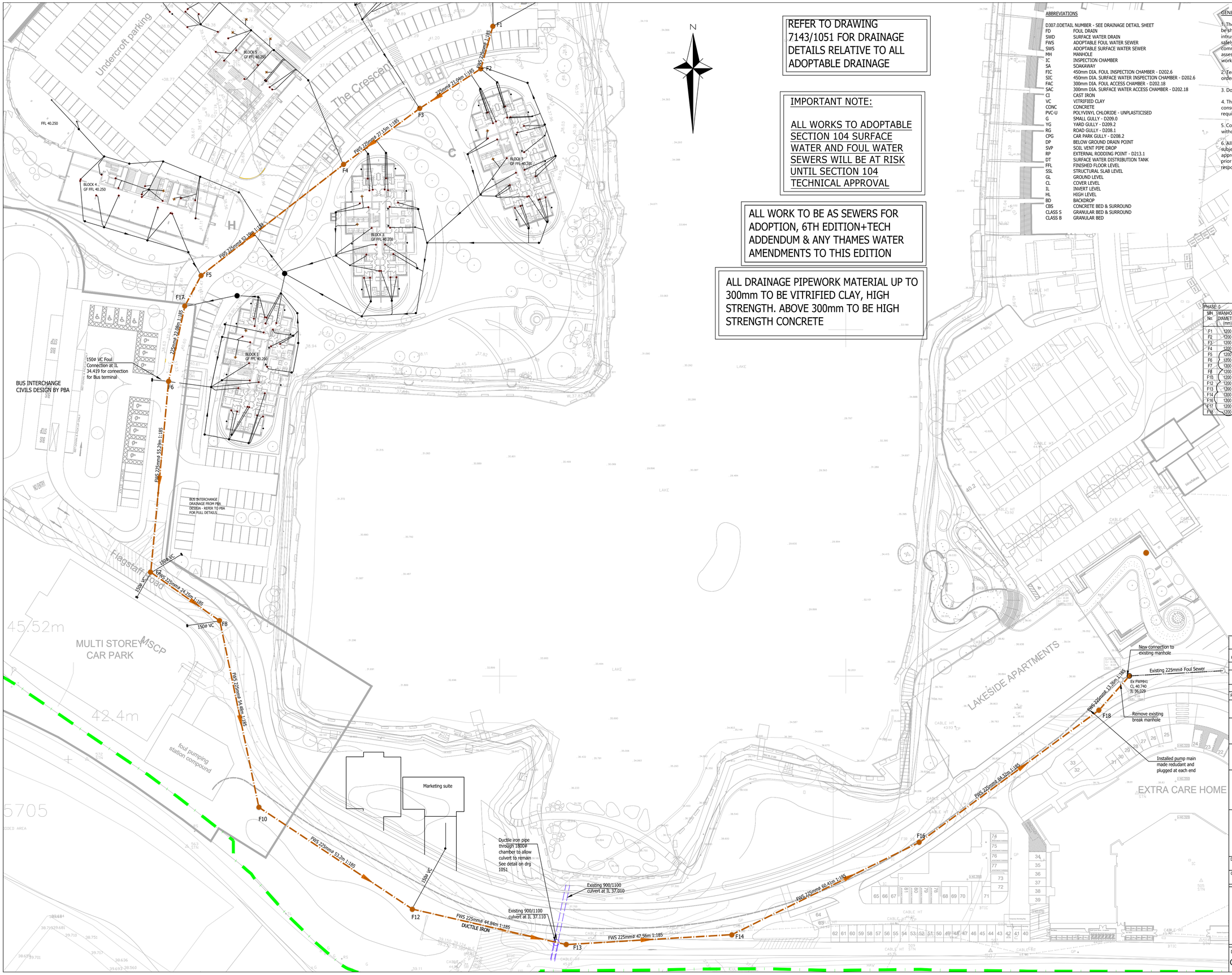
Report by:

Martin Roberts I.Eng ACIWEM MCIHT

GTA Civils Ltd

APPENDIX A – SITE DRAINAGE LAYOUTS

G259-GTA-SW-00-DR-C-96-1060 and 1061	-	Site Drainage Sheets 1 and 2
G259-GTA-SW-00-DR-C-96-1070, 1071 and 1072	-	Drainage details Sheets 1, 2 and 3
G259-GTA-SW-00-DR-C-96-1014	-	Phase 6 Section 104 layout



REFER TO DRAWING 7143/1051 FOR DRAINAGE DETAILS RELATIVE TO ALL ADOPTABLE DRAINAGE

IMPORTANT NOTE:

ALL WORKS TO ADOPTABLE SECTION 104 SURFACE WATER AND FOUL WATER SEWERS WILL BE AT RISK UNTIL SECTION 104 TECHNICAL APPROVAL

ALL WORK TO BE AS SEWERS FOR ADOPTION, 6TH EDITION+TECH ADDENDUM & ANY THAMES WATER AMENDMENTS TO THIS EDITION

ALL DRAINAGE PIPEWORK MATERIAL UP TO 300mm TO BE VITRIFIED CLAY, HIGH STRENGTH. ABOVE 300mm TO BE HIGH STRENGTH CONCRETE

ABBREVIATIONS

D307.0	DETAIL NUMBER - SEE DRAINAGE DETAIL SHEET
FD	FOUL DRAIN
SWD	SURFACE WATER DRAIN
FWS	ADOPTABLE FOUL WATER SEWER
SWS	ADOPTABLE SURFACE WATER SEWER
MH	MANHOLE
IC	INSPECTION CHAMBER
SA	SOAKAWAY
FIC	450mm DIA. FOUL INSPECTION CHAMBER - D202.6
SIC	450mm DIA. SURFACE WATER INSPECTION CHAMBER - D202.6
FAC	300mm DIA. FOUL ACCESS CHAMBER - D202.18
SAC	300mm DIA. SURFACE WATER ACCESS CHAMBER - D202.18
CI	CAST IRON
VC	VITRIFIED CLAY
CONC	CONCRETE
PVC-U	POLYVINYL CHLORIDE - UNPLASTICISED
G	SMALL GULLY - D209.0
YG	YARD GULLY - D209.2
RG	ROAD GULLY - D208.1
CPG	CAR PARK GULLY - D208.2
DP	BELOW GROUND DRAIN POINT
SVP	SOIL VENT PIPE DROP
RP	EXTERNAL RODDING POINT - D213.1
DT	SURFACE WATER DISTRIBUTION TANK
FFL	FINISHED FLOOR LEVEL
SSL	STRUCTURAL SLAB LEVEL
GL	GROUND LEVEL
CL	COVER LEVEL
IL	INVERT LEVEL
HL	HIGH LEVEL
BD	BACKDROP
CBS	CONCRETE BED & SURROUND
CLASS S	GRANULAR BED & SURROUND
CLASS B	GRANULAR BED

GENERAL NOTES

1. The location, size, depth and identification of existing services that may be shown or referred to on this drawing have been assessed from non intrusive observations , record drawings or the like. The contractor shall safely carry out intrusive investigations, trial holes or soundings prior to commencing work to satisfy himself that it is safe to proceed and that the assessments are accurate. any discrepancies shall be notified to gta prior to works commencing.

2. Tender or billing drawings shall not be used for construction or the ordering of materials.

3. Do not scale. All dimensions and levels to be site confirmed.

4. This drawing shall be read in conjunction with all relevant architects, consultants drawings and specifications, together with H&S plan requirements.

5. Copyright : This drawing must not be copied, amended nor reproduced without the prior written agreement of gta.

6. All drawings specifications and recommendations made by gta are subject to Local Authority and other relevant Statutory Authorities approval. Any works or services made abortive due to the client proceeding prior to these approvals is considered wholly at the Clients risk. gta hold no responsibility for resulting abortive works or costs.

KEY

- Existing Foul Drainage
- Private Foul Drainage
- Adoptable Foul Drainage S104
- Adoptable Foul Sewer Manhole S104
- Agreement Boundary

PHASE 6

MH No	MANHOLE DIAMETER (mm)	MANHOLE TYPE	COVER LEVEL (m)	INVERT LEVEL (m)	DEPTH TO SOFFIT (m)	EASTING (m)	NORTHING (m)
F1	1200	Type D	40.321	39.098	0.998	469698.066	170287.614
F2	1200	Type D	40.10	39.029	0.846	469694.58	170275.358
F3	1200	Type D	40.10	38.915	0.96	469676.936	170263.898
F4	1200	Type E	40.10	38.767	1.108	469654.947	170247.728
F5	1200	Type E	40.543	38.437	1.881	469613.778	170215.645
F6	1200	Type B	40.690	38.263	2.203	469604.394	170185.087
F7	1200	Type B	40.26	37.963	2.072	469599.260	170129.977
F8	1200	Type B	40.30	37.832	2.243	469619.149	170116.102
F10	1200	Type B	40.235	37.534	2.476	469630.477	170062.109
F12	1200	Type B	39.875	37.246	2.404	469674.831	170032.711
F13	1200	Type B	39.71	37.000	2.485	469719.267	170022.464
F14	1200	Type B	39.675	36.741	2.709	469767.095	170025.344
F16	1200	Type A	39.70	36.414	3.061	469821.296	170052.020
F17	1200	Type B	40.611	38.383	2.003	469609.087	170206.826
F18	1200	Type A	40.70	36.067	4.408	469873.108	170090.130

Rev.	Amendments	Date	Dsn	Chk
C2	MHs 5,6,7,8,10,12,13,14,16,17 & 18 Revised to 1200ø	24.10.18	MR	GK
C1	CONSTRUCTION ISSUE Drawing re-numbered	21.9.18	GK	MR
B	Cover levels adjusted	30.8.18	GK	MR
A	Layout adjusted to move out of road where possible	14.08.18	MR	GK
-	Initial issue	22.6.18	MR	SL

Status: CONSTRUCTION

Client: BERKELEY HOMES

Architect: BROOKES

Project: PHASE 6 GREEN PARK VILLAGE

Title: PHASE 6 SECTION 104 LAYOUT

Date: JUNE 2018 | Scale @ A1: 1/500

Clients Ref. | Project Ref. 7143

gtaCivils Consulting Engineers
Gloucester House, 66a Church Walk, Burgess Hill, West Sussex, RH15 9AS
Tel.01444 871444 Web: www.gtacivils.co.uk

Drawing Number: G259-GTA-SW-00-DR-C-96-1014 | Rev. C2

DESIGN NOTES

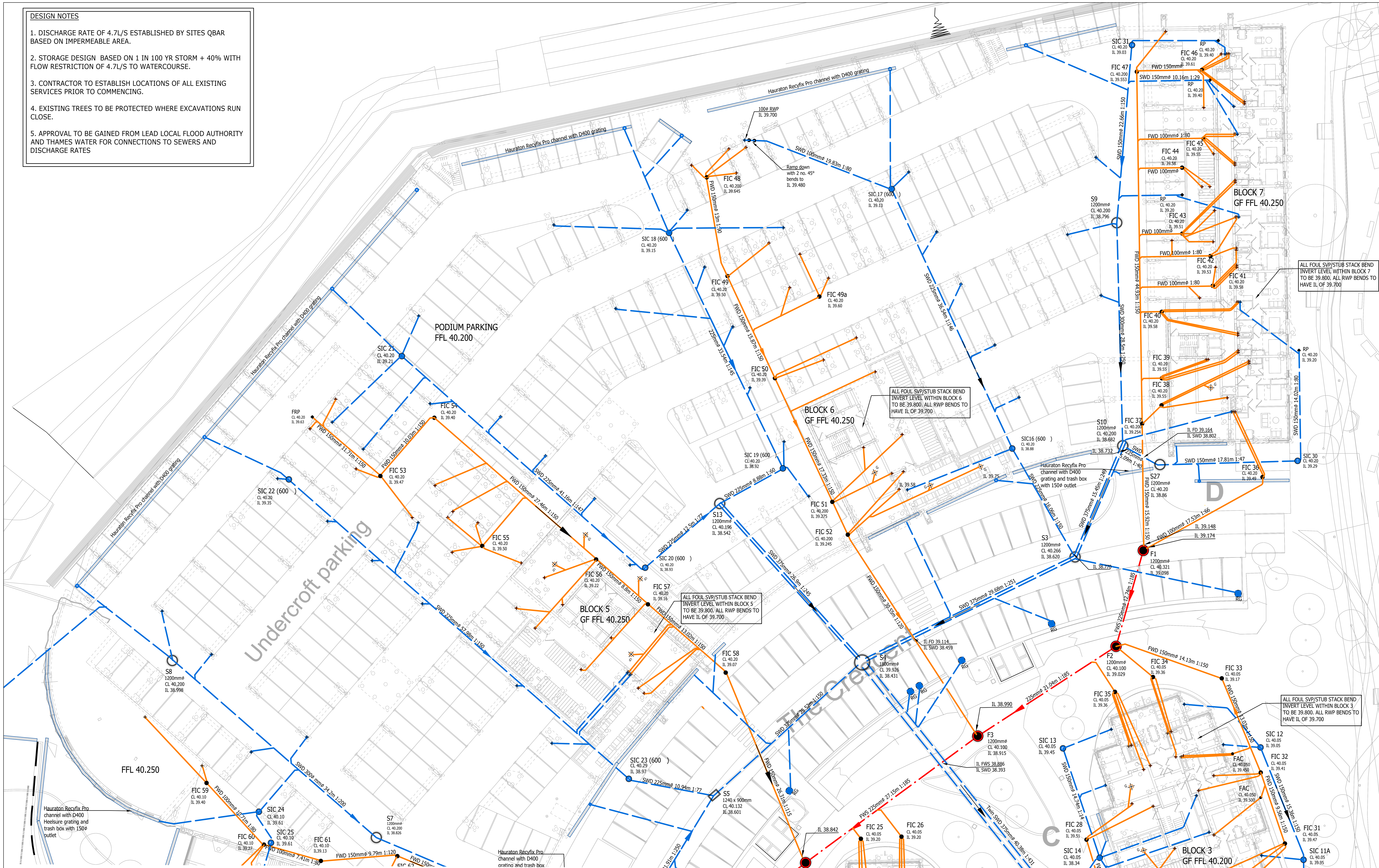
1. DISCHARGE RATE OF 4.7L/S ESTABLISHED BY SITES QBAR BASED ON IMPERMEABLE AREA.

2. STORAGE DESIGN BASED ON 1 IN 100 YR STORM + 40% WITH FLOW RESTRICTION OF 4.7L/S TO WATERCOURSE.

3. CONTRACTOR TO ESTABLISH LOCATIONS OF ALL EXISTING SERVICES PRIOR TO COMMENCING.

4. EXISTING TREES TO BE PROTECTED WHERE EXCAVATIONS RUN CLOSE.

5. APPROVAL TO BE GAINED FROM LEAD LOCAL FLOOD AUTHORITY AND THAMES WATER FOR CONNECTIONS TO SEWERS AND DISCHARGE RATES



GENERAL NOTES

1. The location, size, depth and identification of existing services that may be shown or referred to on this drawing have been assessed from non intrusive observations , record drawings or the like. The contractor shall safely carry out intrusive investigations, trial holes or soundings prior to commencing work to satisfy himself that it is safe to proceed and that the assessments are accurate. any discrepancies shall be notified to gta prior to works commencing.

2. Tender or billing drawings shall not be used for construction or the ordering of materials.

3. Do not scale. All dimensions and levels to be site confirmed.

4. This drawing shall be read in conjunction with all relevant architects, consultants drawings and specifications, together with H&S plan requirements.

5. Copyright : This drawing must not be copied, amended nor reproduced without the prior written agreement of gta.

6. All drawings specifications and recommendations made by gta are subject to Local Authority and other relevant Statutory Authorities approval. Any works or services made abortive due to the client proceeding prior to these approvals is considered wholly at the Clients risk. gta hold no responsibility for resulting abortive works or costs.

ABBREVIATIONS

D307.0	DETAIL NUMBER - SEE DRAINAGE DETAIL SHEET
FD	FOUL DRAIN
SWD	SURFACE WATER DRAIN
MH	MANHOLE
IC	INSPECTION CHAMBER
SA	SOAKAWAY
FIC	450mm DIA. FOUL INSPECTION CHAMBER - D202.6
SIC	450mm DIA. SURFACE WATER INSPECTION CHAMBER - D202.6
FAC	300mm DIA. FOUL ACCESS CHAMBER - D202.18
SAC	300mm DIA. SURFACE WATER ACCESS CHAMBER - D202.18
CI	CAST IRON
VC	VITRIFIED CLAY
CONC	CONCRETE
PVC-U	POLYVINYL CHLORIDE - UNPLASTICISED
G	SMALL GULLY - D209.0
YG	YARD GULLY - D209.2
RG	ROAD GULLY - D208.1
CPG	CAR PARK GULLY - D208.2
DP	BELOW GROUND DRAIN POINT
SVP	SOIL VENT PIPE DROP
RP	EXTERNAL RODDING POINT - D213.1
DT	SURFACE WATER DISTRIBUTION TANK
FFL	FINISHED FLOOR LEVEL
SSL	STRUCTURAL SLAB LEVEL
GL	GROUND LEVEL
CL	COVER LEVEL
IL	INVERT LEVEL
BD	BACKDROP
CBS	CONCRETE BED & SURROUND
CLASS S	GRANULAR BED & SURROUND
CLASS B	GRANULAR BED

REFER TO DRAWING 1070 FOR DRAINAGE DETAILS RELATIVE TO ALL PRIVATE DRAINAGE

SPECIFICATION NOTES

1. ALL ADOPTABLE SEWERS SHALL BE CONSTRUCTED TO THE STANDARDS LAID DOWN IN "SEWERS FOR ADOPTION" 6th EDITION, AND THAMES WATER SPECIFICATIONS, WITH A VIEW TO ADOPTION UPON COMPLETION.
2. BEFORE CONNECTIONS ARE MADE TO EXISTING DRAINAGE, IT'S LEVEL IS TO BE CHECKED AND CONFIRMED AGAINST LEVELS SHOWN ON THIS DRAWING AND THIS OFFICE INFORMED OF ANY SIGNIFICANT DIFFERENCE. **NOTE - NO NEW CONNECTIONS ARE TO BE MADE TO THE EXISTING PUBLIC SEWERS UNTIL A SECTION 106 AGREEMENT HAS BEEN APPROVED BY THAMES WATER.**
3. ALL SEWERS WITH LESS THAN 1.2m OF COVER WHEN LAID BENEATH THE ROADS, OR 0.9m OF COVER IN OTHER AREAS, SHALL BE PROTECTED WITH CONCRETE IN ACCORDANCE WITH EITHER OF THE DETAILS SHOWN ON THE STANDARD DRAWING PROVIDED (FOR BEDDING TYPE LOCATIONS, REFER TO SEWER SECTIONS).
4. THE MINIMUM SIZE OF PIPE CONNECTING GULLIES TO THE DRAINAGE SYSTEM SHALL BE 150mm DIA. LAID AT A MINIMUM GRADIENT OF 1 IN 80.
5. IN ORDER TO MAINTAIN THE SATISFACTORY FUNCTIONING OF THE DRAINAGE SYSTEM, ALL ROAD AND YARD GULLIES ARE TO BE "TRAPPED".
6. ALL NON ADOPTABLE LATERALS BENEATH THE HIGHWAY SHALL BE BACKFILLED WITH LEAN MIX CONCRETE UNLESS OTHERWISE AGREED WITH THE HIGHWAYS ENGINEER.
7. THE DESIGN IS SUCH THAT WATER FROM PRIVATE AREAS DOES NOT SHED TO ADOPTABLE AREAS AND VICA VERSA.
8. ALL PRIVATE SEWERS ARE TO BE 100mm DIA. UNLESS OTHERWISE STATED. THE PRIVATE DRAINAGE DESIGN ON THE PLAN HAS BEEN BASED ON THE PRINCIPLES OF A uPVC SYSTEM. IT CAN BE ADAPTED TO SUIT A STONEWARE SYSTEM BUT REFERENCE SHOULD BE MADE TO THIS OFFICE BEFORE AMENDMENTS ARE MADE.
9. ALL PRIVATE DRAINAGE TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS APPROVED DOCUMENT "H" BRITISH STANDARD 8301, AND TO THE SATISFACTION OF THE BUILDING CONTROL SECTION.
10. MANHOLES SITUATED WITHIN AREAS ACCESSIBLE TO MOTOR VEHICLES ARE TO BE FITTED WITH SUITABLE STRENGTH COVERS AND FRAMES.
11. WHERE DRAINS PASS THROUGH FOUNDATIONS, A FLEXIBLE JOINT SHOULD BE PROVIDED WITHIN 150mm OF THE FACE OF THE STRUCTURE. WHERE TYPE Z MANHOLES ARE EMPLOYED OR CONCRETE SURROUND IS ADDED TO OTHER MANHOLES, A ROCKER PIPE OF MAX 600mm IN LENGTH SHALL BE PROVIDED EITHER SIDE OF THE MANHOLE, LAID AT A SLIGHTLY STEEPER GRADIENT TO ALLOW FOR SETTLEMENT.
12. STUB STACKS FITTED WITH AIR ADMITTANCE VALVES MAY BE USED INSTEAD OF SOIL AND VENT PIPES, SUBJECT TO THE ARCHITECTS APPROVAL (EXCEPT WHERE THE DRAINAGE CONNECTION EXCEEDS 10m BEFORE CONNECTING WITH ANOTHER VENTILATED DRAIN OR INSPECTION CHAMBER OR MANHOLE). HEAD OF DRAIN VENT PIPES MUST NOT BE FITTED WITH AIR ADMITTANCE VALVES.
13. SHALLOW PRIVATE DRAINS MAY REQUIRE PROTECTION USING CONCRETE SURROUND OR PAVING SLABS BRIDGING THE TRENCH SUBJECT TO THE BUILDING INSPECTOR'S REQUIREMENTS.
14. APPROPRIATE MEASURES (TO BE AGREED WITH THE BUILDING CONTROL SECTION, ARE TO BE TAKEN TO DISCOURAGE RODENT ENTRY INTO THE PROPERTIES.
15. WHERE DRAIN RUNS PASS CLOSE TO BUILDINGS OR THEIR INVERT LEVELS ARE BELOW FOUNDATION LEVEL, THEN THE TRENCHES ARE TO BE BACKFILLED IN ACCORDANCE WITH THE STANDARD DETAIL PROVIDED.
16. REFERENCE SHOULD BE MADE TO THE STRUCTURAL ENGINEERS DETAILS FOR ALL ASPECTS OF FOUNDATION DESIGN AND CONSTRUCTION.
17. BEFORE DETERMINING THE AMOUNT OF FACE BRICKWORK TO EACH UNIT, CONSIDERATION MUST BE GIVEN TO THE PROPOSED FINISHED GROUND LEVELS IN THE VICINITY OF THE PROPERTY. THE LEVELS SHOWN ON THIS DRAWING HAVE BEEN DESIGNED UPON THE PARAMETERS SET DOWN IN THE APPROVED DOCUMENT 'M' OF THE BUILDING REGULATIONS 2000 (2004 EDITION).
18. THE CONTRACTOR IS TO KEEP A RECORD OF ANY VARIATIONS MADE ON SITE, INCLUDING THE RELOCATION OF SEWERS OR DRAINS, SO THAT AN AS CONSTRUCTED DRAWING CAN BE PREPARED UPON COMPLETION OF THE PROJECT.
19. THE CONTRACTOR SHOULD CHECK ALL DIMENSIONS ON SITE.
20. IT IS THE SUBCONTRACTORS RESPONSIBILITY TO ENSURE COMPLIANCE WITH CURRENT BUILDING REGULATIONS AND CODES OF PRACTICE.

KEY

- Existing Foul Drainage
- Existing Storm Drainage
- Adoptable Storm Drainage S104
- Adoptable Foul Drainage S104
- Private Storm Drainage
- Private Foul Drainage
- FWMH — Adoptable Foul Sewer Manhole
- FWMH — Adoptable Foul Sewer Manhole - Type 3
- SWMH — Adoptable Storm Sewer Manhole
- SWMH — Adoptable Storm Sewer Manhole - Type 3
- FWMH bdIL — Manholes fitted with Backdrop Connection
- FIC — 450mm Foul Plastic Inspection Chamber
- SIC — 450mm Storm Plastic Inspection Chambe
- FAC — 300mm Foul Water Access Chamber
- RP — Foul Water Rodding Point
- RP — Storm Water Rodding Point
- Foul Drain connection to SVP/SS
- Rain Water Pipe 100 unlesss noted otherwise
- RG — Private Road Gully
- YG — Private Yard Gully
- Channel Drain
- Direction of Fall

FOR CONTINUATION SEE DRAWING No. 1061

Rev	Amendments	Date	Dsn	Chk
T1	Drawing re-numbered. Drain connections added, site layout updated. TENDER ISSUE	21.9.18	MR	SL
A	Additional drainage channels	30.8.18	MR	SL
-	Initial issue for comment	17.8.18	MR	SL

Status: TENDER

Client: BERKELEY HOMES

Architect: BROOKES

Project: PHASE 6 GREEN PARK VILLAGE

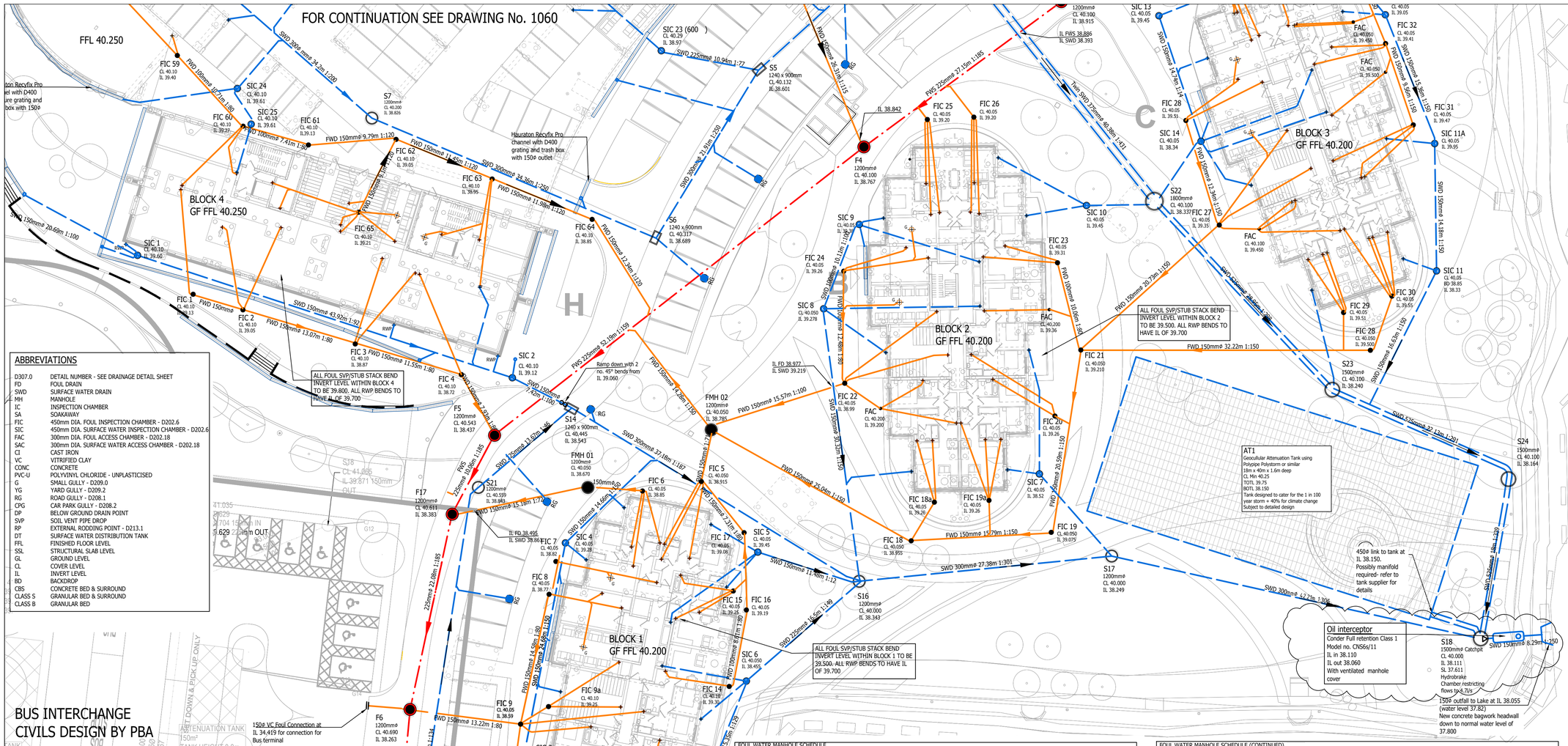
Title: SITE DRAINAGE SHEET 1 OF 2

Date: JULY 2018 | Scale @ A1: 1/250

Clients Ref. | Project Ref.: 7143

gtaCivils Consulting Engineers
Gloucester House, 66a Church Walk,
Burgess Hill, West Sussex, RH15 9AS
Tel.01444 871444 Web: www.gtacivils.co.uk

Drawing Number: G259-GTA-SW-00-DR-C-96-1060 | Rev.: T1



ABBREVIATIONS

D307.0	DETAIL NUMBER - SEE DRAINAGE DETAIL SHEET
FD	FOUL DRAIN
SWD	SURFACE WATER DRAIN
MH	MANHOLE
IC	INSPECTION CHAMBER
SA	SOAKAWAY
FIC	450mm DIA. FOUL INSPECTION CHAMBER - D202.6
SIC	450mm DIA. SURFACE WATER INSPECTION CHAMBER - D202.6
FAC	300mm DIA. FOUL ACCESS CHAMBER - D202.18
SAC	300mm DIA. SURFACE WATER ACCESS CHAMBER - D202.18
CI	CAST IRON
VC	VITRIFIED CLAY
CONC	CONCRETE
PVC-U	POLYVINYL CHLORIDE - UNPLASTICISED
G	SMALL GULLY - D209.0
YG	YARD GULLY - D209.2
RG	ROAD GULLY - D208.1
CPG	CAR PARK GULLY - D208.2
DP	BELOW GROUND DRAIN POINT
SVP	SOIL VENT PIPE DROP
RP	EXTERNAL RODDING POINT - D213.1
DT	SURFACE WATER DISTRIBUTION TANK
FFL	FINISHED FLOOR LEVEL
SSL	STRUCTURAL SLAB LEVEL
GL	GROUND LEVEL
CL	COVER LEVEL
IL	INVERT LEVEL
BD	BACKDROP
CBS	CONCRETE BED & SURROUND
CLASS S	GRANULAR BED & SURROUND
CLASS B	GRANULAR BED

DESIGN NOTES

1. DISCHARGE RATE OF 4.7L/S ESTABLISHED BY SITES QBAR BASED ON IMPERMEABLE AREA.

2. STORAGE DESIGN BASED ON 1 IN 100 YR STORM + 40% WITH FLOW RESTRICTION OF 4.7L/S TO WATERCOURSE.

3. CONTRACTOR TO ESTABLISH LOCATIONS OF ALL EXISTING SERVICES PRIOR TO COMMENCING.

4. EXISTING TREES TO BE PROTECTED WHERE EXCAVATIONS RUN CLOSE.

5. APPROVAL TO BE GAINED FROM LEAD LOCAL FLOOD AUTHORITY AND SOUTHERN WATER FOR CONNECTIONS TO SEWERS AND DISCHARGE RATES

FOUL WATER MANHOLE SCHEDULE

ID	EASTING	NORTHING	CL	IL	SUMP	DEPTH	MH/IC SIZE	COVER SIZE	COVER GRADE
FIC02	469580.226	170231.321	40.100	39.130		0.970	450ø	450X450	B125
FIC02	469585.774	170229.592	40.100	39.050		1.050	450ø	450X450	B125
FIC03	469598.283	170225.786	40.100	38.870		1.230	450ø	450X450	B125
FIC04	469609.448	170222.395	40.100	38.720		1.380	450ø	450X450	B125
FIC05	469636.834	170210.470	40.050	38.915		1.135	450ø	450X450	B125
FIC06	469630.281	170209.415	40.050	38.850		1.200	450ø	450X450	B125
FIC07	469620.634	170201.564	40.050	38.820		1.230	450ø	450X450	B125
FIC08	469619.875	170197.909	40.050	38.770		1.280	450ø	450X450	B125
FIC09	469614.825	170169.730	40.050	39.000		1.050	450ø	450X450	B125
FIC09a	469619.811	170185.404	40.100	39.250		0.850	450ø	450X450	B125
FIC09b	469616.703	170183.451	40.050	38.590		1.460	450ø	450X450	B125
FIC11	469621.850	170168.371	40.050	39.160		0.890	450ø	450X450	B125
FIC12	469622.602	170169.680	40.050	39.250		0.800	450ø	450X450	B125
FIC13	469627.515	170167.270	40.050	38.230		1.820	450ø	450X450	B125
FIC14	469639.941	170187.649	40.100	39.300		0.800	450ø	450X450	B125
FIC15	469640.398	170198.278	40.050	39.250		0.800	450ø	450X450	B125
FIC16	469641.854	170196.162	40.050	39.190		0.860	450ø	450X450	B125
FIC17	469641.600	170204.773	40.050	39.080		0.970	450ø	450X450	B125
FIC18	469660.212	170203.863	40.050	38.955		1.095	450ø	450X450	B125
FIC18a	469662.796	170208.165	40.050	39.260		0.790	450ø	450X450	B125
FIC19	469675.815	170204.809	40.050	39.075		0.975	450ø	450X450	B125
FIC19a	469668.881	170208.366	40.050	39.260		0.790	450ø	450X450	B125
FIC20	469676.224	170217.757	40.050	39.260		0.790	450ø	450X450	B125
FIC21	469679.109	170225.110	40.050	39.210		0.840	450ø	450X450	B125
FIC22	469652.810	170221.408	40.050	38.990		1.060	450ø	450X450	B125
FIC23	469676.510	170234.826	40.050	39.310		0.740	450ø	450X450	B125
FIC24	469652.697	170233.889	40.050	39.260		0.790	450ø	450X450	B125
FIC25	469662.013	170250.781	40.050	39.200		0.850	450ø	450X450	B125
FIC26	469667.192	170251.045	40.050	39.200		0.850	450ø	450X450	B125
FIC27	469694.535	170239.029	40.050	39.350		0.700	450ø	450X450	B125
FIC28	469711.360	170225.077	40.050	39.500		0.550	450ø	450X450	B125
FIC28	469690.811	170250.669	40.050	39.510		0.540	450ø	450X450	B125
FIC29	469708.379	170229.283	40.050	39.510		0.540	450ø	450X450	B125
FIC30	469713.765	170231.109	40.050	39.550		0.500	450ø	450X450	B125
FIC31	469716.147	170250.175	40.050	39.470		0.580	450ø	450X450	B125
FIC32	469713.061	170259.235	40.050	39.410		0.640	450ø	450X450	B125
FIC33	469708.090	170271.275	40.050	39.170		0.880	450ø	450X450	B125
FIC34	469699.304	170271.437	40.050	39.360		0.690	450ø	450X450	B125
FIC35	469694.448	170269.547	40.050	39.360		0.690	450ø	450X450	B125
FIC36	469713.284	170296.973	40.200	39.490		0.710	450ø	450X450	B125
FIC37	469697.915	170303.802	40.200	39.250		0.950	450ø	450X450	D400
FIC38	469700.391	170306.140	40.200	39.550		0.650	450ø	450X450	B125
FIC39	469700.437	170309.601	40.200	39.550		0.650	450ø	450X450	B125
FIC40	469700.423	170318.084	40.200	39.580		0.620	450ø	450X450	B125
FIC41	469706.931	170321.408	40.200	39.580		0.620	450ø	450X450	B125
FIC42	469706.633	170325.204	40.200	39.530		0.670	450ø	450X450	B125
FIC43	469703.045	170328.080	40.200	39.510		0.690	450ø	450X450	B125
FIC44	469703.012	170336.493	40.200	39.580		0.620	450ø	450X450	B125
FIC45	469705.754	170340.201	40.200	39.550		0.650	450ø	450X450	B125
FIC46	469705.546	170348.978	40.200	39.610		0.590	450ø	450X450	B125
FIC47	469697.237	170348.749	40.200	39.550		0.650	450ø	450X450	D400
FIC48	469642.321	170335.263	40.200	39.645		0.555	450ø	450X450	B125
FIC49	469644.985	170322.642	40.200	39.500		0.700	450ø	450X450	D400
FIC49A	469656.705	170320.029	40.200	39.600		0.600	450ø	450X450	D400
FIC50	469651.033	170309.607	40.200	39.390		0.810	450ø	450X450	D400
FIC51	469658.361	170293.811	40.200	39.275		0.925	450ø	450X450	D400
FIC52	469660.335	170289.620	40.200	39.245		0.955	450ø	450X450	D400
FIC53	469600.664	170297.111	40.200	39.470		0.730	450ø	450X450	B125
FIC54	469607.554	170304.555	40.200	39.400		0.800	450ø	450X450	B125
FIC55	469613.669	170288.175	40.200	39.500		0.700	450ø	450X450	B125
FIC56	469628.211	170286.451	40.200	39.220		0.980	450ø	450X450	B125
FIC57	469634.823	170280.722	40.200	39.160		1.040	450ø	450X450	B125

FOUL WATER MANHOLE SCHEDULE (CONTINUED)

ID	EASTING	NORTHING	CL	IL	SUMP	DEPTH	MH/IC SIZE	COVER SIZE	COVER GRADE
FIC58	469644.751	170272.002	40.200	39.070		1.130	450ø	450X450	B125
FIC59	469578.467	170257.908	40.100	39.400		0.700	450ø	450X450	B125
FIC60	469585.795	170250.036	40.100	39.270		0.830	450ø	450X450	B125
FIC61	469593.068	170247.947	40.100	39.130		0.970	450ø	450X450	B125
FIC62	469602.834	170248.567	40.100	39.050		1.050	450ø	450X450	D400
FIC63	469613.536	170244.152	40.100	38.950		1.150	450ø	450X450	B125
FIC64	469624.672	170239.657	40.100	38.850		1.250	450ø	450X450	D400
FIC65	469598.679	170240.465	40.100	39.210		0.890	450ø	450X450	B125
FMH01	469624.199	170209.805	40.050	38.670		1.380	1200mmø	600X600	D400
FMH02	469637.935	170216.229	40.050	38.785		1.265	1200mmø	600X600	D400

SURFACE WATER MANHOLE SCHEDULE

ID	EASTING	NORTHING	CL	IL	SUMP	DEPTH	MH/IC SIZE	COVER SIZE	COVER GRADE
S03	469689.354	170286.775	40.266	38.620		1.646	1200mmø	600X600	D400
S04	469662.170	170273.308	39.926	38.431		1.495	1800mmø	600X600	D400
S05	469643.283	170256.354	40.132	38.601		1.531	1240X900mm	1220X685	D400
S06	469631.739	170237.622	40.317	38.689		1.628	1240X900mm	1220X685	D400
S07	469600.140	170250.933	40.200	38.826		1.374	1200mmø	600X600	D400
S08	469574.105	170273.543	40.200	38.998		1.210	1200mmø	600X600	D400
S09	469694.676	170329.460	40.200	38.796		1.404	1200mmø	600X600	D400
S10	469695.438	170300.973	40.200	38.682		1.518	1200mmø	600X600	D400
S13	469643.987	170293.596	40.198	38.542		1.656	1200mmø	600X600	D400
S14	469623.364	170218.581	40.196	38.543		1.653	1240X900mm	1220X685	D400
S16	469654.425	170199.352	40.000	38.343		1.657	1200mmø	600X600	D400
S17	469682.549	170202.162	40.000	38.249		1.751	1200mmø	600X600	C250
S18	469723.652	170192.980	40.000	38.111	37.611	2.389	1500mmø	600X600	C250
S20	469604.220	170164.510	40.405	39.183		1.222	1200mmø	600X600	C250
S21	469610.261	170210.005	40.559	38.843		1.716	1200mmø	600X600	D400
S22	469687.307	170241.678	40.100	38.337		1.763	1800mmø	600X600	C250
S23	469707.130	170220.692	40.100	38.240		1.860	1500mmø	600X600	C250
S24	469726.742	170210.736	40.100	38.164		1.936	1500mmø	600X600	C250
S27	469700.186	170298.573	40.200	38.860		1.340	1200mmø	600X600	D400
SIC01	469573.823	170234.492	40.100	39.600		0.500	450ø	450X450	B125
SIC01a	469631.876	170165.990	40.050	39.450		0.600	450ø	450X450	B125
SIC02	469615.786	170222.019	40.100	39.120		0.980	450ø	450X450	B125
SIC03	469616.970	170179.403	40.050	39.450		0.600	450ø	450X450	B125
SIC04	469621.697	170203.636	40.050	39.280		0.770	450ø	450X450	B125
SIC05	469643.131	170202.604	40.050	39.450		0.600	450ø	450X450	B125
SIC06	469641.849	170188.243	40.050	39.450		0.600	450ø	450X450	B125
SIC07	469674.493	170211.312	40.050	38.520		1.530	450ø	450X450	B125
SIC08	469650.461	170229.704	40.050	39.278		0.772	450ø	450X450	B125
SIC09	469654.432	170239.097	40.050	39.380		0.670	450ø	450X450	B125
SIC10	469679.743	170241.206	40.050	39.450		0.600	450ø	450X450	B125
SIC11	469718.735	170233.920	40.050	38.330		1.720	450ø	450X450	B125
SIC11A	469718.524	170248.099	40.050	39.950		0.100	450ø	450X450	B125
SIC12	469713.029	170262.445	40.050	39.050		1.000	450ø	450X450	B125
SIC13	469687.811	170262.331	40.050	39.450		0.600	450ø	450X450	B125
SIC14	469692.498	170248.352	40.050	38.340		1.710	450ø	450X450	B125
SIC16	469681.330	170300.626	40.200	38.880		1.320	600ø	600X600	D400
SIC17	469665.932	170333.763	40.200	39.130		1.070	600ø	600X600	D400
SIC18	469637.517	170328.168	40.200	39.150		1.050	600ø	600X600	B125
SIC19	469652.055	170298.081	40.200	38.920		1.280	600ø	600X600	B125
SIC20	469634.472	170285.398	40.200	38.920		1.270	600ø	600X600	D400
SIC21	469603.400	170312.428	40.200	39.210		0.990	450ø	450X450	D400
SIC22	469588.981	170296.675	40.200	39.350		0.850	600ø	600X600	D400
SIC23	469632.377	170258.437	40.200	38.970		1.230	600ø	600X600	D400
SIC24	469585.152	170254.235	40.100	39.610		0.490	450ø	450X450	B125
SIC25	469586.692	170250.263	40.100	39.610		0.490	450ø	450X450	B125
SIC30	469717.768	170299.052	40.200	39.290		0.910	450ø	450X450	B125
SIC31	469696.624	170352.159	40.200	39.030		1.170	450ø	450X450	B125

GENERAL NOTES

1. The location, size, depth and identification of existing services that may be shown or referred to on this drawing have been assessed from non intrusive observations , record drawings or the like. The contractor shall safely carry out intrusive investigations, trial holes or soundings prior to commencing work to satisfy himself that it is safe to proceed and that the assessments are accurate. any discrepancies shall be notified to gta prior to works commencing.

2. Tender or billing drawings shall not be used for construction or the ordering of materials.

3. Do not scale. All dimensions and levels to be site confirmed.

4. This drawing shall be read in conjunction with all relevant architects, consultants drawings and specifications, together with H&S plan requirements.

5. Copyright : This drawing must not be copied, amended nor reproduced without the prior written agreement of gta.

6. All drawings specifications and recommendations made by gta are subject to Local Authority and other relevant Statutory Authorities approval. Any works or services made abortive due to the client proceeding prior to these approvals is considered wholly at the Clients risk. gta hold no responsibility for resulting abortive works or costs.

KEY

- Existing Foul Drainage
- Existing Storm Drainage
- Adoptable Storm Drainage S104
- Adoptable Foul Drainage S104
- Private Storm Drainage
- Private Foul Drainage
- FWMH — Adoptable Foul Sewer Manhole
- FWMH — Adoptable Foul Sewer Manhole - Type 3
- SWMH — Adoptable Storm Sewer Manhole
- SWMH — Adoptable Storm Sewer Manhole - Type 3
- FWMH BACK — Manholes fitted with Backdrop Connection
- FIC — 450mm Foul Plastic Inspection Chamber
- SIC — 450mm Storm Plastic Inspection Chamber
- FAC — 300mm Foul Water Access Chamber
- RP — Foul Water Rodding Point
- RP — Storm Water Rodding Point
- Foul Drain connection to SVP/SS
- Rain Water Pipe 100 unlesss noted otherwise
- RG — Private Road Gully
- YG — Private Yard Gully
- Channel Drain
- Direction of Fall

FOR SPECIFICATION NOTES, REFER TO DRAWING 1060

REFER TO DRAWING 1070 FOR DRAINAGE DETAILS RELATIVE TO ALL PRIVATE DRAINAGE

Rev	Amendments	Date	Dsn	Chk
T2	Oil interceptor added to SW outfall	01.10.18	MR	SL
T1	Drawing re-numbered. Drain connections added, site layout updated. TENDER ISSUE	21.9.18	MR	SL
A	Additional drainage channels	30.8.18	MR	SL
-	Initial issue for comment	17.8.18	MR	SL

Status: TENDER

Client: BERKELEY HOMES

Architect: BROOKES

Project: PHASE 6 GREEN PARK VILLAGE

Title: SITE DRAINAGE SHEET 2 OF 2

Date: AUGUST 2018 | Scale @ A1: 1/250

Clients Ref. | Project Ref. 7143

gtaCivils Consulting Engineers
Gloucester House, 66a Church Walk, Burgess Hill, West Sussex, RH15 9AS
Tel.01444 871444 Web: www.gtacivils.co.uk

Drawing Number: G259-GTA-SW-00-DR-C-96-1061 | Rev. T2

APPENDIX B – MICRO DRAINAGE OUTPUTS

ICP SUDS Mean Annual Flood

Input

Return Period (years)	100	Soil	0.400
Area (ha)	1.593	Urban	0.000
SAAR (mm)	700	Region Number	Region 6

Results	**l/s**
QBAR Rural	5.4
QBAR Urban	5.4
Q100 years	17.3
Q1 year	4.6
Q30 years	12.3
Q100 years	17.3

©1982-2018 Innovyze

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Surface Network 1

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	22.378	0.112	199.8	0.129	5.00	0.0	0.600	o	300	Pipe/Conduit	
1.001	34.362	0.137	250.1	0.129	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	21.912	0.088	250.1	0.030	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.003	25.517	0.170	150.1	0.046	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.000	28.498	0.114	250.0	0.149	5.00	0.0	0.600	o	300	Pipe/Conduit	
2.001	15.446	0.062	249.1	0.149	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.002	30.340	0.121	250.7	0.116	0.00	0.0	0.600	o	375	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	5.34	38.938	0.129	0.0	0.0	0.0	1.11	78.4	17.5
1.001	50.00	5.92	38.826	0.258	0.0	0.0	0.0	0.99	70.0	34.9
1.002	50.00	6.28	38.689	0.288	0.0	0.0	0.0	0.99	69.9	39.0
1.003	50.00	6.57	38.601	0.334	0.0	0.0	0.0	1.48	163.1	45.2
2.000	50.00	5.48	38.796	0.149	0.0	0.0	0.0	0.99	70.0	20.2
2.001	50.00	5.70	38.682	0.298	0.0	0.0	0.0	1.14	126.3	40.4
2.002	50.00	6.15	38.621	0.414	0.0	0.0	0.0	1.14	125.9	56.1

©1982-2018 Innovyze

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Surface Network 1

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
3.000	16.815	0.067	251.0	0.135	5.00	0.0	0.600	o	300	Pipe/Conduit	
3.001	14.400	0.059	244.1	0.135	0.00	0.0	0.600	o	375	Pipe/Conduit	
3.002	27.146	0.111	244.6	0.135	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.004	40.541	0.094	431.3	0.000	0.00	0.0	0.600	oo	375	Double Pipe	
1.005	28.953	0.097	298.5	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
1.006	22.675	0.076	298.4	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
1.007	16.011	0.053	302.1	0.000	0.00	0.0	0.600	o	525	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)
3.000	50.00	5.28	38.668	0.135	0.0	0.0	0.0	0.99	69.8	18.3
3.001	50.00	5.49	38.601	0.270	0.0	0.0	0.0	1.16	127.6	36.6
3.002	50.00	5.88	38.542	0.405	0.0	0.0	0.0	1.15	127.5	54.8
1.004	50.00	7.35	38.431	1.153	0.0	0.0	0.0	0.87	191.3	156.1
1.005	50.00	7.73	38.337	1.153	0.0	0.0	0.0	1.29	279.5	156.1
1.006	50.00	8.02	38.240	1.153	0.0	0.0	0.0	1.29	279.6	156.1
1.007	50.00	8.23	38.165	1.153	0.0	0.0	0.0	1.28	277.8	156.1

©1982-2018 Innovyze

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Surface Network 1

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
4.000	50.966	0.340	149.9	0.124	5.00	0.0	0.600	o	300	Pipe/Conduit	
4.001	14.888	0.300	49.6	0.094	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.002	22.620	0.090	251.3	0.142	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.003	15.682	0.052	301.6	0.080	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.004	27.381	0.091	300.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.005	42.205	0.141	299.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.008	7.793	0.031	251.4	0.000	0.00	0.0	0.600	o	525	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)
4.000	50.00	5.66	39.183	0.124	0.0	0.0	0.0	1.28	90.6	16.8
4.001	50.00	5.77	38.843	0.218	0.0	0.0	0.0	2.24	158.1	29.5
4.002	50.00	6.16	38.543	0.360	0.0	0.0	0.0	0.99	69.8	48.7
4.003	50.00	6.45	38.396	0.440	0.0	0.0	0.0	0.90	63.6	59.6
4.004	50.00	6.95	38.343	0.440	0.0	0.0	0.0	0.90	63.7	59.6
4.005	50.00	7.73	38.252	0.440	0.0	0.0	0.0	0.90	63.9	59.6
1.008	50.00	8.32	38.111	1.593	0.0	0.0	0.0	1.41	304.8	215.7

©1982-2018 Innovyze

Online Controls for Surface Network 1

Hydro-Brake® Optimum Manhole: S18, DS/PN: 1.008, Volume (m³): 9.4

Unit Reference	MD-SHE-0093-4700-1639-4700	Sump Available	Yes
Design Head (m)	1.639	Diameter (mm)	93
Design Flow (l/s)	4.7	Invert Level (m)	38.111
Flush-Flo™	Calculated	Minimum Outlet Pipe Diameter (mm)	150
Objective	Minimise upstream storage	Suggested Manhole Diameter (mm)	1200
Application	Surface		

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.639	4.7	Kick-Flo®	0.830	3.4
Flush-Flo™	0.407	4.3	Mean Flow over Head Range	-	3.9

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)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.0	0.600	4.2	1.600	4.6	2.600	5.8	5.000	7.9	7.500	9.6
0.200	3.9	0.800	3.6	1.800	4.9	3.000	6.2	5.500	8.3	8.000	9.9
0.300	4.2	1.000	3.7	2.000	5.2	3.500	6.7	6.000	8.6	8.500	10.2
0.400	4.3	1.200	4.1	2.200	5.4	4.000	7.1	6.500	9.0	9.000	10.5
0.500	4.3	1.400	4.4	2.400	5.6	4.500	7.5	7.000	9.3	9.500	10.8

©1982-2018 Innovyze

Storage Structures for Surface Network 1

Cellular Storage Manhole: S18, DS/PN: 1.008

Invert Level (m) 38.150 Infiltration Coefficient Side (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Base (m/hr) 0.00000 Safety Factor 2.0

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	720.0	720.0	1.600	720.0	905.6	1.700	0.0	905.6

©1982-2018 Innovyze

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Site Location GB 469496 170207 Cv (Summer) 0.740
FEH Rainfall Version 2013 Data Type Point Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Infil. Flow (l/s)	Maximum Vol (m³)	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000	S8	120 minute 2 year Summer I+0%	40.200	39.010	-0.228	0.000	0.13		0.075	17.569	9.0	OK
1.001	S7	120 minute 2 year Summer I+0%	40.200	38.933	-0.193	0.000	0.27		0.288	35.139	17.6	OK

©1982-2018 Innovyze

2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Surface Network 1

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Infil. Flow (l/s)	Maximum Vol (m³)	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.002	S6	120 minute 2 year Summer I+0%	40.108	38.805	-0.184	0.000	0.32		0.449	39.221	19.6	OK
1.003	S5	120 minute 2 year Summer I+0%	40.323	38.701	-0.275	0.000	0.16		0.400	45.487	22.5	OK
2.000	S9	120 minute 2 year Summer I+0%	40.200	38.877	-0.219	0.000	0.16		0.172	20.292	10.4	OK
2.001	S10	120 minute 2 year Summer I+0%	40.200	38.797	-0.260	0.000	0.20		0.430	40.585	20.4	OK
2.002	S3	120 minute 2 year Summer I+0%	40.293	38.748	-0.248	0.000	0.25		0.463	56.374	28.0	OK
3.000	S11	120 minute 2 year Summer I+0%	40.198	38.755	-0.213	0.000	0.16		0.093	18.386	9.4	OK
3.001	S12	120 minute 2 year Summer I+0%	40.197	38.714	-0.262	0.000	0.18		0.375	36.772	18.4	OK
3.002	S13	120 minute 2 year Summer I+0%	40.195	38.675	-0.242	0.000	0.24		0.466	55.142	27.2	OK
1.004	S4	120 minute 2 year Summer I+0%	40.208	38.613	-0.193	0.000	0.44		2.082	157.034	76.5	OK
1.005	S22	600 minute 2 year Winter I+0%	40.100	38.551	-0.311	0.000	0.09		3.931	288.441	20.0	OK
1.006	S23	600 minute 2 year Winter I+0%	40.100	38.550	-0.215	0.000	0.09		3.360	287.901	19.7	OK
1.007	S24	600 minute 2 year Winter I+0%	40.100	38.549	-0.141	0.000	0.09		3.664	286.685	19.3	OK
4.000	S20	120 minute 2 year Summer I+0%	40.381	39.247	-0.236	0.000	0.10		0.066	16.889	8.6	OK
4.001	S21	120 minute 2 year Summer I+0%	40.462	38.910	-0.233	0.000	0.11		0.148	29.691	15.0	OK
4.002	S14	120 minute 2 year Summer I+0%	40.270	38.674	-0.169	0.000	0.40		0.224	49.020	24.5	OK
4.003	S15	120 minute 2 year Summer I+0%	40.000	38.556	-0.140	0.000	0.55		0.425	59.919	29.7	OK
4.004	S16	600 minute 2 year Winter I+0%	40.000	38.551	-0.092	0.000	0.13		0.834	110.094	7.7	OK
4.005	S17	600 minute 2 year Winter I+0%	40.000	38.550	-0.002	0.000	0.12		1.934	109.768	7.4	OK
1.008	S18	600 minute 2 year Winter I+0%	40.000	38.548	-0.088	0.000	0.02	0.0	278.213	257.907	4.3	OK

©1982-2018 Innovyze

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Site Location GB 469496 170207 Cv (Summer) 0.740
FEH Rainfall Version 2013 Data Type Point Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Infil. Flow (l/s)	Maximum Vol (m³)	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000	S8	120 minute 30 year Summer I+0%	40.200	39.047	-0.191	0.000	0.27		0.118	36.450	18.7	OK
1.001	S7	120 minute 30 year Summer I+0%	40.200	38.991	-0.135	0.000	0.58		0.674	72.899	37.3	OK

©1982-2018 Innovyze

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

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Infil. Flow (l/s)	Maximum Vol (m³)	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.002	S6	600 minute 30 year Winter I+0%	40.108	38.937	-0.051	0.000	0.15		1.735	128.861	9.1	OK
1.003	S5	600 minute 30 year Winter I+0%	40.323	38.936	-0.040	0.000	0.07		2.090	148.679	10.5	OK
2.000	S9	600 minute 30 year Winter I+0%	40.200	38.938	-0.158	0.000	0.07		0.308	66.756	4.7	OK
2.001	S10	600 minute 30 year Winter I+0%	40.200	38.937	-0.120	0.000	0.09		1.627	133.234	9.4	OK
2.002	S3	600 minute 30 year Winter I+0%	40.293	38.937	-0.059	0.000	0.12		1.649	184.560	13.0	OK
3.000	S11	600 minute 30 year Winter I+0%	40.198	38.937	-0.031	0.000	0.07		0.299	60.231	4.2	OK
3.001	S12	600 minute 30 year Winter I+0%	40.197	38.937	-0.039	0.000	0.08		1.521	119.933	8.5	OK
3.002	S13	600 minute 30 year Winter I+0%	40.195	38.936	0.019	0.000	0.11		1.933	179.078	12.6	SURCHARGED
1.004	S4	600 minute 30 year Winter I+0%	40.208	38.936	0.130	0.000	0.20		9.465	506.661	35.4	SURCHARGED
1.005	S22	600 minute 30 year Winter I+0%	40.100	38.934	0.072	0.000	0.15		9.670	497.696	33.8	SURCHARGED
1.006	S23	600 minute 30 year Winter I+0%	40.100	38.933	0.168	0.000	0.15		7.157	491.467	32.9	SURCHARGED
1.007	S24	600 minute 30 year Winter I+0%	40.100	38.932	0.242	0.000	0.16		5.933	486.284	32.1	SURCHARGED
4.000	S20	120 minute 30 year Summer I+0%	40.381	39.276	-0.207	0.000	0.21		0.100	35.034	17.9	OK
4.001	S21	120 minute 30 year Summer I+0%	40.462	38.942	-0.201	0.000	0.24		0.224	61.607	31.7	OK
4.002	S14	600 minute 30 year Winter I+0%	40.270	38.937	0.094	0.000	0.18		1.177	160.475	11.2	SURCHARGED
4.003	S15	600 minute 30 year Winter I+0%	40.000	38.936	0.240	0.000	0.25		2.119	194.277	13.4	SURCHARGED
4.004	S16	600 minute 30 year Winter I+0%	40.000	38.935	0.292	0.000	0.23		1.687	192.833	13.1	SURCHARGED
4.005	S17	600 minute 30 year Winter I+0%	40.000	38.933	0.381	0.000	0.22		2.615	190.433	12.9	SURCHARGED
1.008	S18	600 minute 30 year Winter I+0%	40.000	38.932	0.296	0.000	0.02	0.0	542.060	263.594	4.3	SURCHARGED

©1982-2018 Innovyze

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model FEH Site Location GB 469496 170207 Cv (Summer) 0.740
FEH Rainfall Version 2013 Data Type Point Cv (Winter) 0.840

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

Profile(s) Summer and Winter
Duration(s) (mins) 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Infil. Flow (l/s)	Maximum Vol (m³)	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.000	S8	960 minute 100 year Winter I+40%	40.200	39.646	0.408	0.000	0.07		0.795	106.778	4.7	SURCHARGED
1.001	S7	960 minute 100 year Winter I+40%	40.200	39.645	0.519	0.000	0.14		2.418	211.728	9.3	SURCHARGED

©1982-2018 Innovyze

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

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Infil. Flow (l/s)	Maximum Vol (m³)	Discharge Vol (m³)	Pipe Flow (l/s)	Status
1.002	S6	960 minute 100 year Winter I+40%	40.108	39.644	0.655	0.000	0.17		3.699	233.315	10.2	SURCHARGED
1.003	S5	960 minute 100 year Winter I+40%	40.323	39.643	0.667	0.000	0.08		3.781	268.396	11.6	SURCHARGED
2.000	S9	960 minute 100 year Winter I+40%	40.200	39.644	0.548	0.000	0.08		1.897	122.362	5.3	SURCHARGED
2.001	S10	960 minute 100 year Winter I+40%	40.200	39.644	0.587	0.000	0.10		3.283	242.941	10.6	SURCHARGED
2.002	S3	960 minute 100 year Winter I+40%	40.293	39.643	0.647	0.000	0.13		3.014	336.426	14.5	SURCHARGED
3.000	S11	960 minute 100 year Winter I+40%	40.198	39.644	0.676	0.000	0.08		1.098	111.020	4.9	SURCHARGED
3.001	S12	960 minute 100 year Winter I+40%	40.197	39.643	0.667	0.000	0.10		2.583	220.609	9.7	SURCHARGED
3.002	S13	960 minute 100 year Winter I+40%	40.195	39.643	0.726	0.000	0.13		3.010	329.604	14.4	SURCHARGED
1.004	S4	960 minute 100 year Winter I+40%	40.208	39.642	0.836	0.000	0.23		10.818	924.291	39.4	SURCHARGED
1.005	S22	960 minute 100 year Winter I+40%	40.100	39.640	0.778	0.000	0.17		10.918	913.990	39.2	SURCHARGED
1.006	S23	960 minute 100 year Winter I+40%	40.100	39.639	0.874	0.000	0.17		8.407	906.189	38.8	SURCHARGED
1.007	S24	960 minute 100 year Winter I+40%	40.100	39.638	0.948	0.000	0.19		7.180	899.975	38.8	SURCHARGED
4.000	S20	960 minute 100 year Winter I+40%	40.381	39.645	0.162	0.000	0.05		0.517	103.479	4.6	SURCHARGED
4.001	S21	960 minute 100 year Winter I+40%	40.462	39.645	0.502	0.000	0.06		4.419	178.217	7.8	SURCHARGED
4.002	S14	960 minute 100 year Winter I+40%	40.270	39.644	0.801	0.000	0.20		2.207	293.767	12.5	SURCHARGED
4.003	S15	960 minute 100 year Winter I+40%	40.000	39.642	0.946	0.000	0.28		2.918	357.149	15.3	SURCHARGED
4.004	S16	960 minute 100 year Winter I+40%	40.000	39.641	0.998	0.000	0.26		2.486	355.068	15.2	SURCHARGED
4.005	S17	960 minute 100 year Winter I+40%	40.000	39.639	1.087	0.000	0.25		3.414	352.024	15.1	SURCHARGED
1.008	S18	960 minute 100 year Winter I+40%	40.000	39.637	1.001	0.000	0.02	0.0	1026.013	458.647	4.5	SURCHARGED

©1982-2018 Innovyze