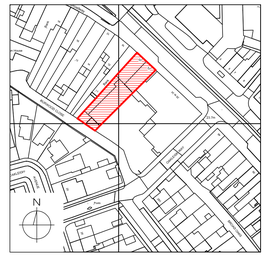
APPENDIX A

Building Survey



SITE LOCATION PLAN - SCALE 1:1250

FLAT ROOF
ROOF LIGHT
RWP
SVP
GULLY
UP
A
B

EXISTING SITE PLAN

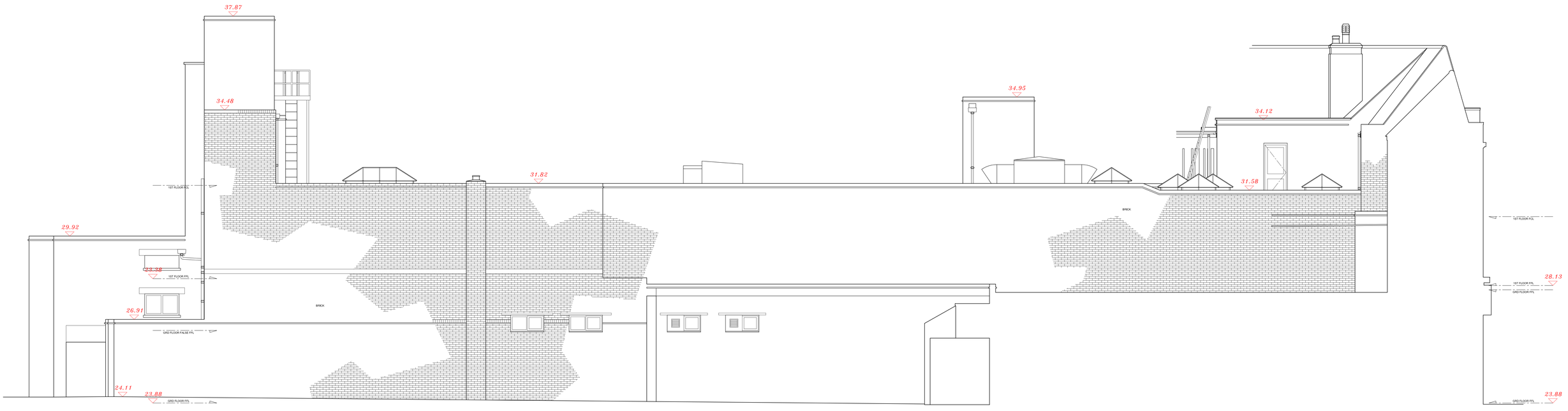
SCALE 1:50 @ A0

0 5 10 20M

JENLEA
DESIGN DEVELOPMENTS LTD
Tel : 07961 196295 e-mail jdd@jenlea.net

CLIENT :	PROJECT : 20-24 THE BROADWAY, TOLWORTH, SURREY, KT6 7HL
DESCRIPTION : EXISTING SITE PLAN	
SCALE: 1 : 50 @ A0	DATE: FEBRUARY 2020 / DRAWN BY: JDD
REF/DWG NO: JDD/BT-E1	REVISION NO: / REVISION DATE:

EXISTING SECTION A - A



EXISTING SIDE ELEVATION (EAST)

SCALE 1:50 @ A0

0 5 10 20M

JENLEA
DESIGN DEVELOPMENTS LTD
Tel : 07961 196295 e-mail jdd@jenlea.net

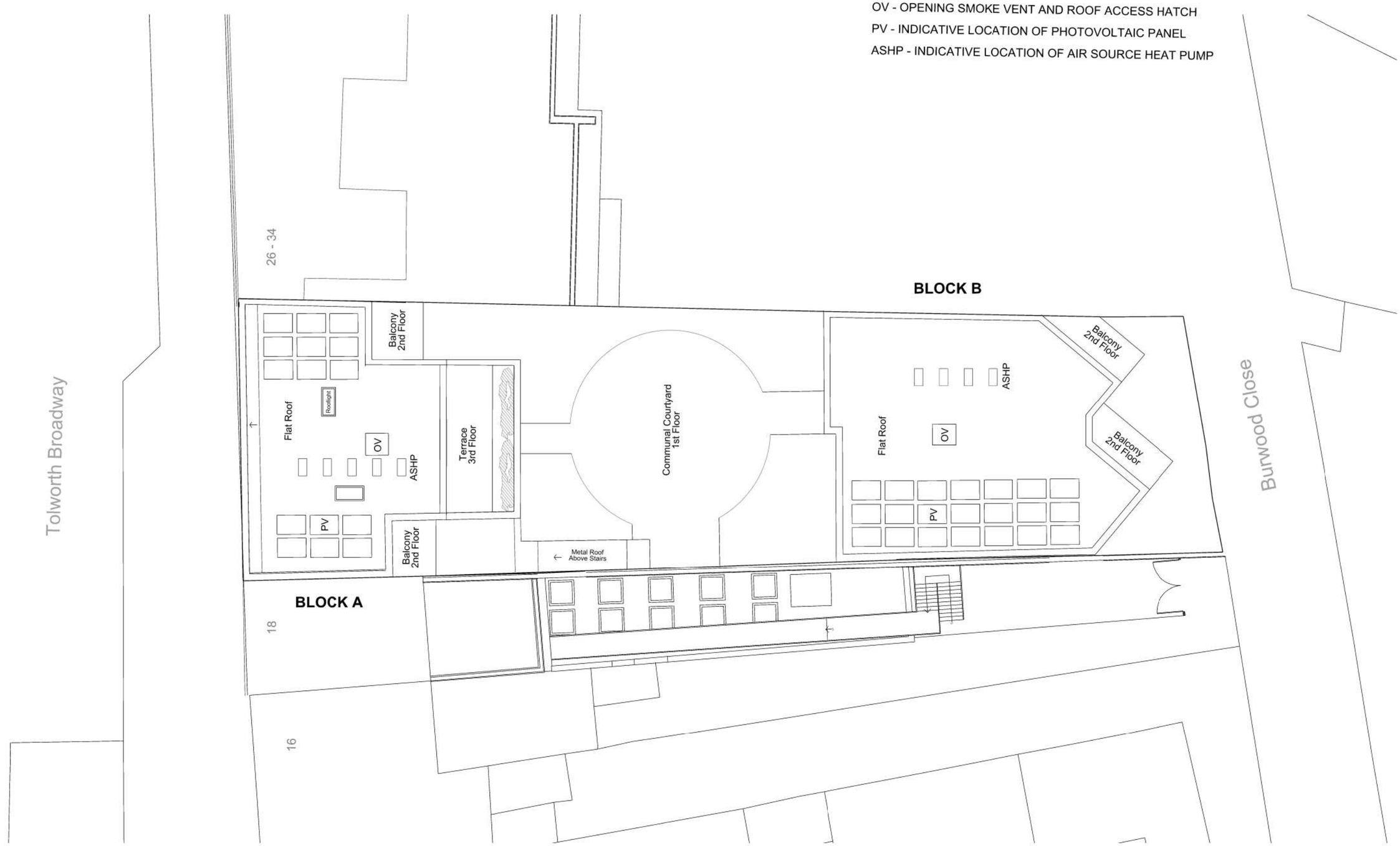
CLIENT :	PROJECT : 20-24 THE BROADWAY, TOLWORTH, SURREY, KT6 7HL
DESCRIPTION :	EXISTING SIDE ELEVATION (EAST) & SECTION A - A

SCALE: 1 : 50 @ A0	DATE: FEBRUARY 2020	DRAWN BY: JDD
REF/DWG NO: JDD/BT-E6	REVISION NO:	REVISION DATE:

APPENDIX B

Proposed Development and Impermeable Areas

OV - OPENING SMOKE VENT AND ROOF ACCESS HATCH
PV - INDICATIVE LOCATION OF PHOTOVOLTAIC PANEL
ASHP - INDICATIVE LOCATION OF AIR SOURCE HEAT PUMP



0 2 4 6 10

N

20-24 TOLWORTH BROADWAY KT6 7HL

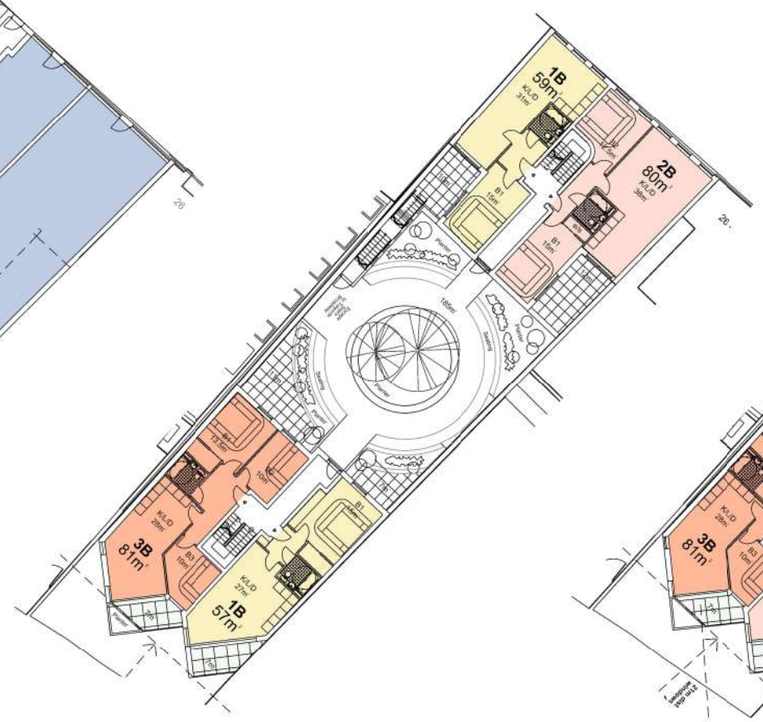
Proposed Roof Plan

G M L A r c h i t e c t s
UNIT 3,1-4 Christina Street, London, EC2A 4PA
Tel: 020 7729 9595 Fax: 020 7729 1801 info@gmlarchitects.co.uk

SCALE: 1:100@A1 1:200@A3
ISSUED FOR: PLANNING
FIRST ISSUED: 13/02/2024
DRAWN BY: MG CHECK BY: NM

5062/PA/14

Proposed
Ground Floor Plan
Scale 1:400



Proposed
First Floor Plan
Scale 1:400

Proposed
Second Floor Plan
Scale 1:400

Proposed
Third Floor Plan
Scale 1:400

Commercial Unit Class E

1 Bed Apartment

2 Bed Apartment

3Bed Apartment

0 4 8 12 20

N

20-24 TOLWORTH BROADWAY KT6 7HL

Proposed Combined Plans

G M L A r c h i t e c t s
UNIT 3,1-4 Christina Street, London, EC2A 4PA
Tel: 020 7729 9595 Fax: 020 7729 1801 info@gmlarchitects.co.uk

SCALE: 1:400@A3
ISSUED FOR: PLANNING
FIRST ISSUED: 13/02/2024
DRAWN BY: MG CHECK BY: NM

5062/PA/18

KEY:

- HARDSTANDING AREAS
- EXISTING ROOF
- SITE BOUNDARY

NOTES:

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2. DIMENSIONS MUST NOT BE SCALED FROM THE ENGINEERS DRAWINGS.
3. ALL DESIGNS, CONNECTIONS, WORKMANSHIP AND MATERIAL ARE TO COMPLY WITH THE CURRENT BUILDING REGULATIONS AND THE LATEST RELEVANT BRITISH STANDARD SPECIFICATION AND CODES OF PRACTICE OR OTHERWISE BE TO THE SPECIFIC WRITTEN APPROVAL OF THE ENGINEER.
4. THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION
5. SURFACE FLOOD ZONES ARE BASED ON ENVIRONMENT AGENCY ONLINE LONG TERM MAPS

SCALE: 1:200

P1	26.02.24	ISSUED FOR PLANNING

client: JESSONA INVESTMENT LTD

architect: GML ARCHITECTS

project: 20-24 TOLWORTH BROADWAY

title: EXISTING IMPERMEABLE AREAS

drawing number: 0752-001-P1

MAB CONSULTANCY

MAB Consultancy Ltd Wymondham Norfolk
Tel: +44 (0)7881 527107 +44 (0)1953 602524
Email: office@mabconsultingltd.com

KEY:

- HARDSTANDING AREAS
- GREEN ROOF
- IMPERMEABLE ROOF
- SITE BOUNDARY

NOTES:

1. THE DRAWINGS, DESIGN AND ALL INFORMATION CONTAINED THEREIN ARE THE SOLE COPYRIGHT OF MAB CONSULTANCY AND ANY REPRODUCTION IS FORBIDDEN UNLESS PERMISSION IS OBTAINED IN WRITING.
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4. THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION
5. SURFACE FLOOD ZONES ARE BASED ON ENVIRONMENT AGENCY ONLINE LONG TERM MAPS

SCALE: 1:200

P1	26.02.24	ISSUED FOR PLANNING

client: JESSONA INVESTMENT LTD

architect: GML ARCHITECTS

project: 20-24 TOLWORTH BROADWAY

title: PROPOSED IMPERMEABLE AREAS

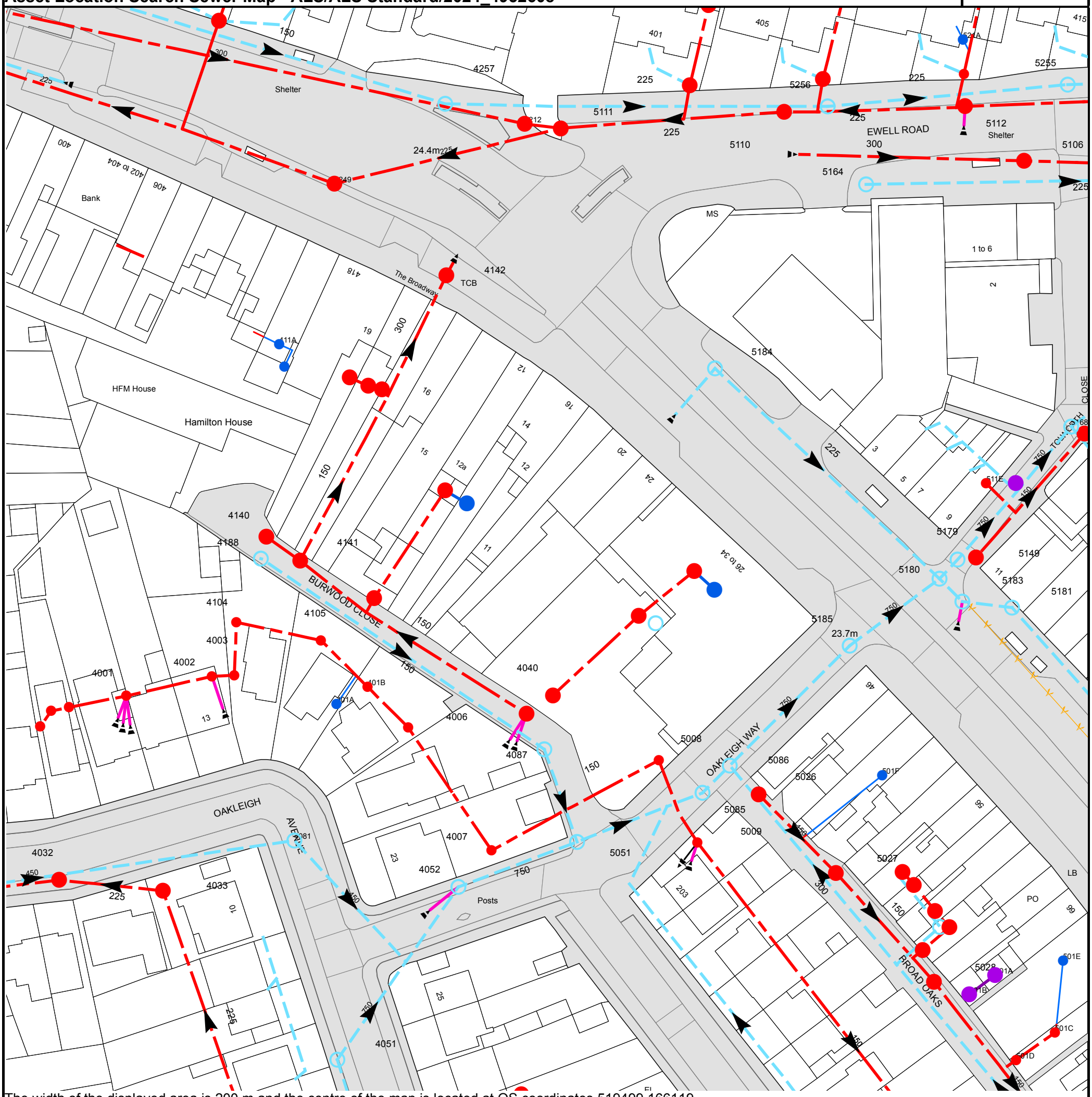
drawing number: 0752-002-P1

MAB CONSULTANCY
MAB Consultancy Ltd Wymondham Norfolk
Tel: +44 (0)7881 527107 +44 (0)1953 602524
Email: office@mabconsultingltd.com

APPENDIX C

Thames Water Asset Maps

Asset Location Search Sewer Map - ALS/ALS Standard/2024_4952608



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 519499,166119

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
5122	22.99	22.57
5168	22.89	21.92
5112	22.95	21.39
42GF	n/a	n/a
52FJ	n/a	n/a
52GF	n/a	n/a
521A	n/a	n/a
52GB	n/a	n/a
4006	n/a	n/a
4088	n/a	n/a
4090	n/a	n/a
4089	n/a	n/a
401A	n/a	n/a
4001	25.16	24.33
401B	n/a	n/a
4002	25.09	24.21
4003	25.03	24.21
4105	24.87	24.05
4104	24.99	24.16
41JG	n/a	n/a
4141	24.74	21.91
4188	24.73	23.35
4140	24.79	22.7
41JE	n/a	n/a
41JF	n/a	n/a
41IJ	n/a	n/a
41JA	n/a	n/a
41JB	n/a	n/a
41BG	n/a	n/a
411A	n/a	n/a
4142	24.55	19.25
4249	24.88	21.39
4257	24.48	22.57
4212	24.01	n/a
4040	24.21	22.3
4087	24.19	22.62
40IJ	n/a	n/a
5111	24.01	21.14
51JB	n/a	n/a
51JC	n/a	n/a
5008	24.3	23.31
52GC	n/a	n/a
51JA	n/a	n/a
51IJ	n/a	n/a
5184	23.69	22.51
5086	24.02	22.16
5110	23.52	21.3
5256	23.36	22.08
5185	23.65	22.09
5164	n/a	n/a
5180	23.65	22.03
5179	23.8	22.42
5183	23.6	22.42
5149	23.64	22.91
511E	n/a	n/a
5181	23.77	22.48
5189	n/a	n/a
5106	23.12	17.82
5255	22.95	21.93
501D	n/a	n/a
501C	n/a	n/a
501B	n/a	n/a
5028	23.51	22.66
501A	n/a	n/a
501E	n/a	n/a
50AG	n/a	n/a
50AF	n/a	n/a
50BB	n/a	n/a
50AE	n/a	n/a
50AD	n/a	n/a
5027	23.78	22.78
50AC	n/a	n/a
5009	n/a	n/a
5051	24.33	22.29
5026	24.14	22.87
5085	24.12	22.24
501F	n/a	n/a
4032	25.01	22.46
4033	24.97	22.56
4081	24.697	23.037
4051	24.5	22.51
4052	24.61	22.44
4007	n/a	n/a

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Asset Location Search - Sewer Key

Public Sewer Types (Operated and maintained by Thames Water)

Foul Sewer: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

Surface Water Sewer: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

Combined Sewer: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

- Storm Sewer
- Sludge Sewer
- Foul Trunk Sewer
- Surface Trunk Sewer
- Combined Trunk Sewer
- Foul Rising Main
- Surface Water Rising Main
- Combined Rising Main
- Vacuum
- Thames Water Proposed
- Vent Pipe
- Gallery

Other Sewer Types (Not operated and maintained by Thames Water)

- Sewer
- Culverted Watercourse
- Proposed
- Decommissioned Sewer
- Content of this drainage network is currently unknown
- Ownership of this drainage network is currently unknown

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

- Air Valve
- Meter
- Dam Chase
- Vent
- Fitting

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

- Ancillary
- Drop Pipe
- Control Valve
- Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

- Inlet
- Outfall
- Undefined End

Other Symbols

Symbols used on maps which do not fall under other general categories.

- Change of Characteristic Indicator
- Public / Private Pumping Station
- Invert Level
- Summit

Areas

Lines denoting areas of underground surveys, etc.

- Agreement
- Chamber
- Operational Site

Ducts or Crossings

- Casement

Ducts may contain high voltage cables. Please check with Thames Water.

- Conduit Bridge
- Subway
- Tunnel

Notes:

1) All levels associated with the plans are to Ordnance Datum Newlyn.
2) All measurements on the plan are metric.
3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate the direction of flow.
4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
5) 'na' or '0' on a manhole indicates that data is unavailable.
6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimeters. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology, please contact Property Searches on 0800 009 4540.

Sewer Flooding
History Enquiry

Property Searches

MAB Consultancy

24 Petunia Court

Search address supplied	20a Tolworth Broadway Surbiton KT6 7HL
Your reference	0752
Our reference	SFH/SFH Standard/2024_4952626
Received date	**26 February 2024**
Search date	**26 February 2024**

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0800 009 4540

Sewer Flooding
History Enquiry

Property Searches

Search address supplied: 20a,Tolworth Broadway,Surbiton,KT6 7HL

This search is recommended to check for any sewer flooding in a specific address or area

TWUL, trading as Property Searches, are responsible in respect of the following:-

(i) any negligent or incorrect entry in the records searched;

(ii) any negligent or incorrect interpretation of the records searched;

(iii) and any negligent or incorrect recording of that interpretation in the search report

(iv) compensation payments

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0800 009 4540

Sewer Flooding
History Enquiry

Thames Water Property Searches

History of Sewer Flooding

Is the requested address or area at risk of flooding due to overloaded public sewers?

The flooding records held by Thames Water indicate that there have been no incidents of flooding in the requested area as a result of surcharging public sewers.

For your guidance:

- A sewer is "overloaded" when the flow from a storm is unable to pass through it due to a permanent problem (e.g. flat gradient, small diameter). Flooding as a result of temporary problems such as blockages, siltation, collapses and equipment or operational failures are excluded.
- "Internal flooding" from public sewers is defined as flooding, which enters a building or passes below a suspended floor. For reporting purposes, buildings are restricted to those normally occupied and used for residential, public, commercial, business or industrial purposes.
- "At Risk" properties are those that the water company is required to include in the Regulatory Register that is presented annually to the Director General of Water Services. These are defined as properties that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system more frequently than the relevant reference period (either once or twice in ten years) as determined by the Company's reporting procedure.
- Flooding as a result of storm events proven to be exceptional and beyond the reference period of one in ten years are not included on the At Risk Register.
- Properties may be at risk of flooding but not included on the Register where flooding incidents have not been reported to the Company.
- Public Sewers are defined as those for which the Company holds statutory responsibility under the Water Industry Act 1991.
- It should be noted that flooding can occur from private sewers and drains which are not the responsibility of the Company. This report excludes flooding from private sewers and drains and the Company makes no comment upon this matter.
- For further information please contact Thames Water on Tel: 0800 316 9800 or website www.thameswater.co.uk

Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW

searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk

0800 009 4540

APPENDIX D

Existing Run-Off Rate

hrwallingford

Greenfield runoff r
estimation for si

www.uksuds.com | Greenfield runof

Calculated by:	Mark Bullen
Site name:	0752
Site location:	Tolworth Broadway

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	51.38160° N
Longitude:	0.28412° W
Reference:	1297043889
Date:	Feb 26 2024 13:59

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 0.1

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	2	2
HOST class:	N/A	N/A
SPR/SPRHOST:	0.3	0.3

Hydrological characteristics

	Default	Edited
SAAR (mm):	615	615
Hydrological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	0.16	0.16
1 in 1 year (l/s):	0.13	0.13
1 in 30 years (l/s):	0.36	0.36
1 in 100 year (l/s):	0.5	0.5
1 in 200 years (l/s):	0.59	0.59

20-24 Tolworth Broadway, Tolworth, Surbiton

Existing Discharge Rates

Surface Water Calculations

Job No. 0752

Revision 0

Contents

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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
1.000	5.000	0.050	100.0	0.068	4.00	0.0	0.600	o	225	Pipe/Conduit
1.001	5.000	0.050	100.0	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	4.06	23.000	0.068	0.0	0.0	0.0	1.31	52.0	9.2
1.001	50.00	4.13	22.950	0.068	0.0	0.0	0.0	1.31	52.0	9.2

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
1	24.100	1.100	Open Manhole	1200	1.000	23.000	225				
2	24.100	1.150	Open Manhole	1200	1.001	22.950	225	1.000	22.950	225	
Outfall	24.100	1.200	Open Manhole	0		OUTFALL		1.001	22.900	225	

No coordinates have been specified, layout information cannot be produced.

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	225	1	24.100	23.000	0.875	Open Manhole	1200
1.001	o	225	2	24.100	22.950	0.925	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	5.000	100.0	2	24.100	22.950	0.925	Open Manhole	1200
1.001	5.000	100.0	Outfall	24.100	22.900	0.975	Open Manhole	0

Simulation Criteria for Storm

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

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	2	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 530550 160450 TQ 30550 60450	Cv (Winter)	0.840
Data Type	Catchment	Storm Duration (mins)	15

Summary of Results for 15 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	1	23.077	-0.148	0.000	0.26			8.2	OK
1.001	2	23.028	-0.147	0.000	0.26			8.2	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	No
Return Period (years)	2	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 530550 160450 TQ 30550 60450	Cv (Winter)	0.840
Data Type	Catchment	Storm Duration (mins)	15

Summary of Results for 15 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	1	23.077	-0.148	0.000	0.26			8.1	OK
1.001	2	23.028	-0.147	0.000	0.26			8.2	OK

Simulation Criteria for Storm

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

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	30	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 530550 160450 TQ 30550 60450	Cv (Winter)	0.840
Data Type	Catchment	Storm Duration (mins)	15

Summary of Results for 15 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	1	23.124	-0.101	0.000	0.58			18.4	OK
1.001	2	23.075	-0.100	0.000	0.59			18.5	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	No
Return Period (years)	30	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 530550 160450 TQ 30550 60450	Cv (Winter)	0.840
Data Type	Catchment	Storm Duration (mins)	15

Summary of Results for 15 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	1	23.124	-0.101	0.000	0.58			18.4	OK
1.001	2	23.075	-0.100	0.000	0.59			18.5	OK

Simulation Criteria for Storm

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

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	100	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 530550 160450 TQ 30550 60450	Cv (Winter)	0.840
Data Type	Catchment	Storm Duration (mins)	15

Summary of Results for 15 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	1	23.145	-0.080	0.000	0.75			23.5	OK
1.001	2	23.097	-0.078	0.000	0.75			23.6	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

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

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	No
Return Period (years)	100	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 530550 160450 TQ 30550 60450	Cv (Winter)	0.840
Data Type	Catchment	Storm Duration (mins)	15

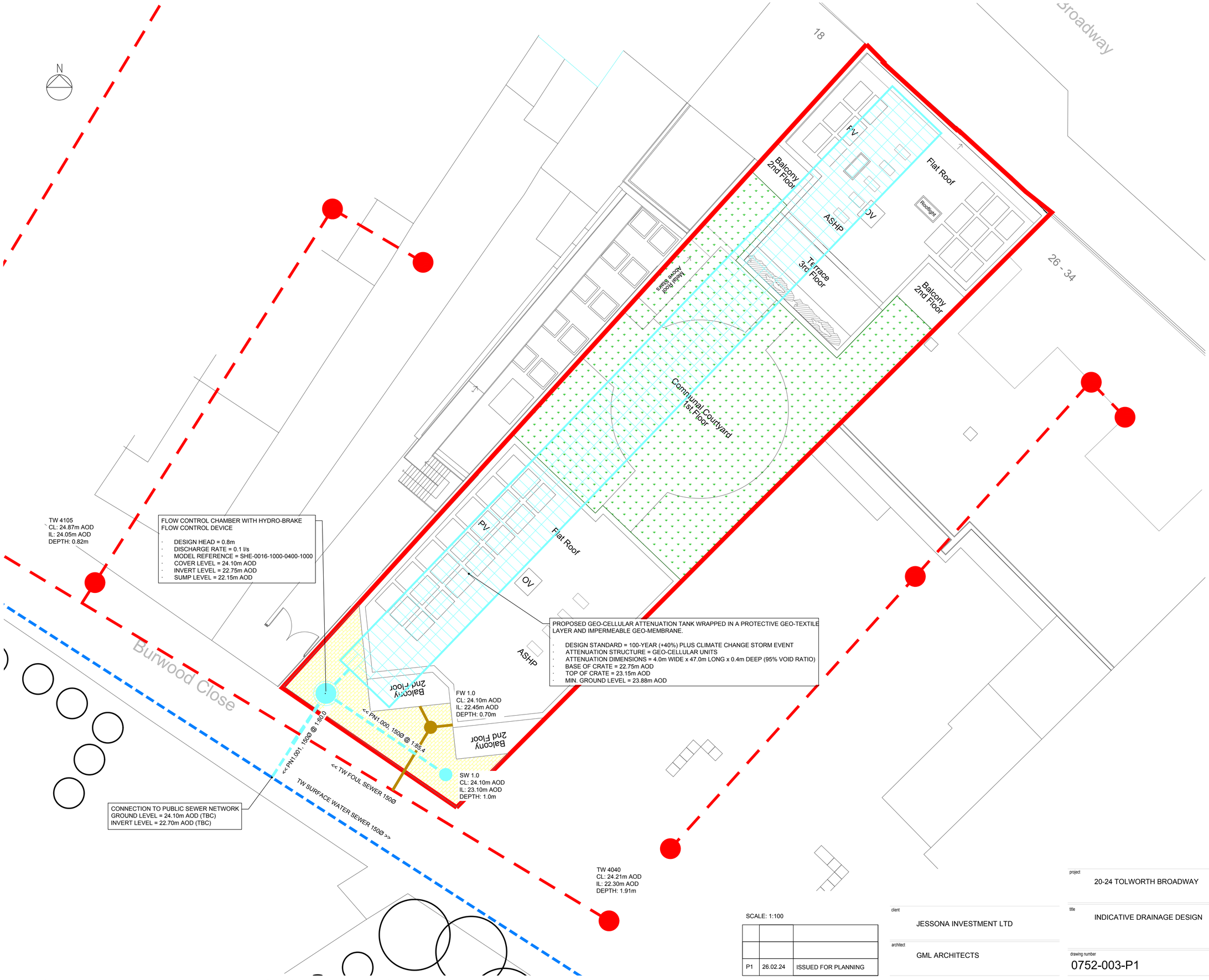
Summary of Results for 15 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	1	23.145	-0.080	0.000	0.75			23.5	OK
1.001	2	23.097	-0.078	0.000	0.75			23.6	OK

APPENDIX E

Indicative Surface and Foul Drainage Scheme



KEY:

- THAMES WATER FOUL SEWER
- THAMES WATER SURFACE SEWER
- TW FOUL MANHOLE
- TW SURFACE WATER MANHOLE
- GREEN ROOF
- PERMEABLE PAVING
- PROPOSED SURFACE WATER DRAIN
- PROPOSED FOUL DRAIN
- PROPOSED SW INSPECTION CHAMBER
- PROPOSED FW INSPECTION CHAMBER
- UNDERGROUND CELLULAR STORAGE

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SCALE: 1:100

P1	26.02.24	ISSUED FOR PLANNING

client: JESSONA INVESTMENT LTD

architect: GML ARCHITECTS

project: 20-24 TOLWORTH BROADWAY

title: INDICATIVE DRAINAGE DESIGN

drawing number: 0752-003-P1

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MAB CONSULTANCY

20-24 Tolworth Broadway, Tolworth, Surbiton

Proposed Surface Water Network

Surface Water Calculations

Job No. 0752

Revision 0

Contents

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

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
1.000	8.542	0.100	85.4	0.000	4.00	0.0	0.600	o	150	Pipe/Conduit
1.001	3.561	0.050	71.2	0.000	0.00	0.0	0.600	o	150	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	0.00	4.13	23.100	0.000	0.0	0.0	0.0	1.09	19.2	0.0
1.001	0.00	4.18	22.750	0.000	0.0	0.0	0.0	1.19	21.1	0.0

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
SW 1.0	24.100	1.000	Open Manhole	500	1.000	23.100	150				
FLOW CONTROL	24.100	1.350	Open Manhole	1200	1.001	22.750	150	1.000	23.000	150	250
PUBLIC SEWER	24.100	1.400	Open Manhole	1200		OUTFALL		1.001	22.700	150	

No coordinates have been specified, layout information cannot be produced.

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	150	SW 1.0	24.100	23.100	0.850	Open Manhole	500
1.001	o	150	FLOW CONTROL	24.100	22.750	1.200	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	8.542	85.4	FLOW CONTROL	24.100	23.000	0.950	Open Manhole	1200
1.001	3.561	71.2	PUBLIC SEWER	24.100	22.700	1.250	Open Manhole	1200

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)
1.001	PUBLIC SEWER	24.100	22.700	22.700	1200	0

Online Controls for Storm

Hydro-Brake® Optimum Manhole: FLOW CONTROL, DS/PN: 1.001, Volume (m³): 1.7

Unit Reference	MD-SHE-0016-1000-0400-1000
Design Head (m)	0.400
Design Flow (l/s)	0.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	16
Invert Level (m)	22.750
Minimum Outlet Pipe Diameter (mm)	75
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.400	0.1	Kick-Flo®	0.148	0.1
Flush-Flo™	0.071	0.1	Mean Flow over Head Range	-	0.1

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)	Depth (m)	Flow (l/s)
0.100	0.1	0.800	0.1	2.000	0.2	4.000	0.3	7.000	0.3
0.200	0.1	1.000	0.1	2.200	0.2	4.500	0.3	7.500	0.4
0.300	0.1	1.200	0.2	2.400	0.2	5.000	0.3	8.000	0.4
0.400	0.1	1.400	0.2	2.600	0.2	5.500	0.3	8.500	0.4
0.500	0.1	1.600	0.2	3.000	0.2	6.000	0.3	9.000	0.4
0.600	0.1	1.800	0.2	3.500	0.2	6.500	0.3	9.500	0.4

Storage Structures for Storm

Tank or Pond Manhole: FLOW CONTROL, DS/PN: 1.001

Invert Level (m) 22.750

Depth (m)	Area (m²)	Depth (m)	Area (m²)
0.000	178.6	0.400	178.6

Time Area Diagram at Pipe Number 1.000 for Storm

Total Area (ha) 0.005

Time (mins) From:	To:	Area (ha)
0	4	0.005

Time Area Diagram at Pipe Number 1.001 for Storm

Total Area (ha) 0.038

Time (mins) From:	To:	Area (ha)
0	4	0.038

Time Area Diagram for Green Roof at Pipe Number 1.001 (Storm)

Area (m³) 250 Evaporation (mm/day) 3
Depression Storage (mm) 5 Decay Coefficient 0.050

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.004543	32	36	0.000917	64	68	0.000185	96	100	0.000037
4	8	0.003719	36	40	0.000751	68	72	0.000152	100	104	0.000031
8	12	0.003045	40	44	0.000615	72	76	0.000124	104	108	0.000025
12	16	0.002493	44	48	0.000503	76	80	0.000102	108	112	0.000021
16	20	0.002041	48	52	0.000412	80	84	0.000083	112	116	0.000017
20	24	0.001671	52	56	0.000337	84	88	0.000068	116	120	0.000014
24	28	0.001368	56	60	0.000276	88	92	0.000056			
28	32	0.001120	60	64	0.000226	92	96	0.000046			

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	40.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 3
Number of Online Controls 1 Number of Storage Structures 1

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	2	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 530550 160450 TQ 30550 60450	Cv (Winter)	0.840
Data Type	Catchment	Storm Duration (mins)	15

Summary of Results for 15 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.121	-0.129	0.000	0.05			0.8	OK
1.001	FLOW CONTROL	22.766	-0.134	0.000	0.00			0.0	OK

Summary of Results for 30 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.121	-0.129	0.000	0.05			0.8	OK
1.001	FLOW CONTROL	22.773	-0.127	0.000	0.00			0.0	OK

Summary of Results for 60 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.118	-0.132	0.000	0.04			0.6	OK
1.001	FLOW CONTROL	22.786	-0.114	0.000	0.00			0.0	OK

Summary of Results for 120 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.116	-0.134	0.000	0.03			0.4	OK
1.001	FLOW CONTROL	22.805	-0.095	0.000	0.00			0.0	OK

Summary of Results for 180 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.115	-0.135	0.000	0.02			0.4	OK
1.001	FLOW CONTROL	22.818	-0.082	0.000	0.00			0.0	OK

Summary of Results for 240 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.113	-0.137	0.000	0.02			0.3	OK
1.001	FLOW CONTROL	22.826	-0.074	0.000	0.00			0.0	OK

Summary of Results for 360 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.110	-0.140	0.000	0.01			0.2	OK
1.001	FLOW CONTROL	22.839	-0.061	0.000	0.00			0.1	OK

Summary of Results for 480 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.108	-0.142	0.000	0.01			0.2	OK
1.001	FLOW CONTROL	22.848	-0.052	0.000	0.00			0.1	OK

Summary of Results for 600 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.107	-0.143	0.000	0.01			0.2	OK
1.001	FLOW CONTROL	22.854	-0.046	0.000	0.00			0.1	OK

Summary of Results for 720 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.106	-0.144	0.000	0.01			0.1	OK
1.001	FLOW CONTROL	22.859	-0.041	0.000	0.00			0.1	OK

Summary of Results for 960 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.105	-0.145	0.000	0.01			0.1	OK
1.001	FLOW CONTROL	22.865	-0.035	0.000	0.00			0.1	OK

Summary of Results for 1440 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.104	-0.146	0.000	0.01			0.1	OK
1.001	FLOW CONTROL	22.874	-0.026	0.000	0.00			0.1	OK

Summary of Results for 2160 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.103	-0.147	0.000	0.00			0.1	OK
1.001	FLOW CONTROL	22.880	-0.020	0.000	0.00			0.1	OK

Summary of Results for 2880 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.102	-0.148	0.000	0.00			0.1	OK
1.001	FLOW CONTROL	22.884	-0.016	0.000	0.00			0.1	OK

Summary of Results for 4320 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.102	-0.148	0.000	0.00			0.0	OK
1.001	FLOW CONTROL	22.892	-0.008	0.000	0.00			0.1	OK

Summary of Results for 5760 minute 2 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.102	-0.148	0.000	0.00			0.0	OK
1.001	FLOW CONTROL	22.898	-0.002	0.000	0.00			0.1	OK

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	40.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 3
Number of Online Controls 1 Number of Storage Structures 1

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	No
Return Period (years)	2	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 530550 160450 TQ 30550 60450	Cv (Winter)	0.840
Data Type	Catchment	Storm Duration (mins)	15

Summary of Results for 15 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.121	-0.129	0.000	0.05			0.8	OK
1.001	FLOW CONTROL	22.767	-0.133	0.000	0.00			0.0	OK

Summary of Results for 30 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.119	-0.131	0.000	0.04			0.7	OK
1.001	FLOW CONTROL	22.777	-0.123	0.000	0.00			0.0	OK

Summary of Results for 60 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.117	-0.133	0.000	0.03			0.5	OK
1.001	FLOW CONTROL	22.792	-0.108	0.000	0.00			0.0	OK

Summary of Results for 120 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.114	-0.136	0.000	0.02			0.3	OK
1.001	FLOW CONTROL	22.813	-0.087	0.000	0.00			0.0	OK

Summary of Results for 180 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.112	-0.138	0.000	0.02			0.3	OK
1.001	FLOW CONTROL	22.827	-0.073	0.000	0.00			0.0	OK

Summary of Results for 240 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.110	-0.140	0.000	0.01			0.2	OK
1.001	FLOW CONTROL	22.837	-0.063	0.000	0.00			0.1	OK

Summary of Results for 360 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.108	-0.142	0.000	0.01			0.2	OK
1.001	FLOW CONTROL	22.852	-0.048	0.000	0.00			0.1	OK

Summary of Results for 480 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.106	-0.144	0.000	0.01			0.1	OK
1.001	FLOW CONTROL	22.861	-0.039	0.000	0.00			0.1	OK

Summary of Results for 600 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.105	-0.145	0.000	0.01			0.1	OK
1.001	FLOW CONTROL	22.868	-0.032	0.000	0.00			0.1	OK

Summary of Results for 720 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.105	-0.145	0.000	0.01			0.1	OK
1.001	FLOW CONTROL	22.874	-0.026	0.000	0.00			0.1	OK

Summary of Results for 960 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.104	-0.146	0.000	0.01			0.1	OK
1.001	FLOW CONTROL	22.882	-0.018	0.000	0.00			0.1	OK

Summary of Results for 1440 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.103	-0.147	0.000	0.00			0.1	OK
1.001	FLOW CONTROL	22.892	-0.008	0.000	0.00			0.1	OK

Summary of Results for 2160 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.102	-0.148	0.000	0.00			0.1	OK
1.001	FLOW CONTROL	22.900	0.000	0.000	0.00			0.1	SURCHARGED

Summary of Results for 2880 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.102	-0.148	0.000	0.00			0.0	OK
1.001	FLOW CONTROL	22.906	0.006	0.000	0.00			0.1	SURCHARGED

Summary of Results for 4320 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.101	-0.149	0.000	0.00			0.0	OK
1.001	FLOW CONTROL	22.913	0.013	0.000	0.01			0.1	SURCHARGED

Summary of Results for 5760 minute 2 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.101	-0.149	0.000	0.00			0.0	OK
1.001	FLOW CONTROL	22.920	0.020	0.000	0.01			0.1	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	40.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 3
Number of Online Controls 1 Number of Storage Structures 1

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	30	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 530550 160450 TQ 30550 60450	Cv (Winter)	0.840
Data Type	Catchment	Storm Duration (mins)	15

Summary of Results for 15 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.133	-0.117	0.000	0.11			1.9	OK
1.001	FLOW CONTROL	22.794	-0.106	0.000	0.00			0.0	OK

Summary of Results for 30 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.133	-0.117	0.000	0.11			1.8	OK
1.001	FLOW CONTROL	22.818	-0.082	0.000	0.00			0.0	OK

Summary of Results for 60 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.129	-0.121	0.000	0.08			1.4	OK
1.001	FLOW CONTROL	22.848	-0.052	0.000	0.00			0.1	OK

Summary of Results for 120 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.122	-0.128	0.000	0.05			0.9	OK
1.001	FLOW CONTROL	22.876	-0.024	0.000	0.00			0.1	OK

Summary of Results for 180 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.120	-0.130	0.000	0.04			0.7	OK
1.001	FLOW CONTROL	22.894	-0.006	0.000	0.00			0.1	OK

Summary of Results for 240 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.118	-0.132	0.000	0.04			0.6	OK
1.001	FLOW CONTROL	22.907	0.007	0.000	0.00			0.1	SURCHARGED

Summary of Results for 360 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.116	-0.134	0.000	0.03			0.4	OK
1.001	FLOW CONTROL	22.926	0.026	0.000	0.01			0.1	SURCHARGED

Summary of Results for 480 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.115	-0.135	0.000	0.02			0.4	OK
1.001	FLOW CONTROL	22.938	0.038	0.000	0.01			0.1	SURCHARGED

Summary of Results for 600 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.113	-0.137	0.000	0.02			0.3	OK
1.001	FLOW CONTROL	22.948	0.048	0.000	0.01			0.1	SURCHARGED

Summary of Results for 720 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.111	-0.139	0.000	0.02			0.3	OK
1.001	FLOW CONTROL	22.956	0.056	0.000	0.01			0.1	SURCHARGED

Summary of Results for 960 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.109	-0.141	0.000	0.01			0.2	OK
1.001	FLOW CONTROL	22.968	0.068	0.000	0.01			0.1	SURCHARGED

Summary of Results for 1440 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.107	-0.143	0.000	0.01			0.2	OK
1.001	FLOW CONTROL	22.984	0.084	0.000	0.01			0.1	SURCHARGED

Summary of Results for 2160 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.105	-0.145	0.000	0.01			0.1	OK
1.001	FLOW CONTROL	22.997	0.097	0.000	0.01			0.1	SURCHARGED

Summary of Results for 2880 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.104	-0.146	0.000	0.01			0.1	OK
1.001	FLOW CONTROL	23.003	0.103	0.000	0.01			0.1	SURCHARGED

Summary of Results for 4320 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.103	-0.147	0.000	0.00			0.1	OK
1.001	FLOW CONTROL	23.008	0.108	0.000	0.01			0.1	SURCHARGED

Summary of Results for 5760 minute 30 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.102	-0.148	0.000	0.00			0.1	OK
1.001	FLOW CONTROL	23.012	0.112	0.000	0.01			0.1	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	40.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 3
Number of Online Controls 1 Number of Storage Structures 1

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	No
Return Period (years)	30	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 530550 160450 TQ 30550 60450	Cv (Winter)	0.840
Data Type	Catchment	Storm Duration (mins)	15

Summary of Results for 15 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.133	-0.117	0.000	0.11			1.9	OK
1.001	FLOW CONTROL	22.801	-0.099	0.000	0.00			0.0	OK

Summary of Results for 30 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.131	-0.119	0.000	0.09			1.6	OK
1.001	FLOW CONTROL	22.827	-0.073	0.000	0.00			0.0	OK

Summary of Results for 60 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.125	-0.125	0.000	0.07			1.1	OK
1.001	FLOW CONTROL	22.861	-0.039	0.000	0.00			0.1	OK

Summary of Results for 120 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.120	-0.130	0.000	0.04			0.7	OK
1.001	FLOW CONTROL	22.892	-0.008	0.000	0.00			0.1	OK

Summary of Results for 180 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.117	-0.133	0.000	0.03			0.5	OK
1.001	FLOW CONTROL	22.912	0.012	0.000	0.01			0.1	SURCHARGED

Summary of Results for 240 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.116	-0.134	0.000	0.03			0.4	OK
1.001	FLOW CONTROL	22.927	0.027	0.000	0.01			0.1	SURCHARGED

Summary of Results for 360 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.114	-0.136	0.000	0.02			0.3	OK
1.001	FLOW CONTROL	22.948	0.048	0.000	0.01			0.1	SURCHARGED

Summary of Results for 480 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.111	-0.139	0.000	0.02			0.3	OK
1.001	FLOW CONTROL	22.962	0.062	0.000	0.01			0.1	SURCHARGED

Summary of Results for 600 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.110	-0.140	0.000	0.01			0.2	OK
1.001	FLOW CONTROL	22.973	0.073	0.000	0.01			0.1	SURCHARGED

Summary of Results for 720 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.108	-0.142	0.000	0.01			0.2	OK
1.001	FLOW CONTROL	22.983	0.083	0.000	0.01			0.1	SURCHARGED

Summary of Results for 960 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.107	-0.143	0.000	0.01			0.2	OK
1.001	FLOW CONTROL	22.997	0.097	0.000	0.01			0.1	SURCHARGED

Summary of Results for 1440 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.105	-0.145	0.000	0.01			0.1	OK
1.001	FLOW CONTROL	23.016	0.116	0.000	0.01			0.1	SURCHARGED

Summary of Results for 2160 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.104	-0.146	0.000	0.01			0.1	OK
1.001	FLOW CONTROL	23.032	0.132	0.000	0.01			0.1	SURCHARGED

Summary of Results for 2880 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.103	-0.147	0.000	0.00			0.1	OK
1.001	FLOW CONTROL	23.041	0.141	0.000	0.01			0.1	SURCHARGED

Summary of Results for 4320 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.102	-0.148	0.000	0.00			0.1	OK
1.001	FLOW CONTROL	23.048	0.148	0.000	0.01			0.1	SURCHARGED

Summary of Results for 5760 minute 30 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.102	-0.148	0.000	0.00			0.0	OK
1.001	FLOW CONTROL	23.050	0.150	0.000	0.01			0.1	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	40.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 3
Number of Online Controls 1 Number of Storage Structures 1

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	100	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 530550 160450 TQ 30550 60450	Cv (Winter)	0.840
Data Type	Catchment	Storm Duration (mins)	15

Summary of Results for 15 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.138	-0.112	0.000	0.14			2.4	OK
1.001	FLOW CONTROL	22.809	-0.091	0.000	0.00			0.0	OK

Summary of Results for 30 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.137	-0.113	0.000	0.14			2.3	OK
1.001	FLOW CONTROL	22.840	-0.060	0.000	0.00			0.1	OK

Summary of Results for 60 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.133	-0.117	0.000	0.11			1.8	OK
1.001	FLOW CONTROL	22.880	-0.020	0.000	0.00			0.1	OK

Summary of Results for 120 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.125	-0.125	0.000	0.07			1.1	OK
1.001	FLOW CONTROL	22.913	0.013	0.000	0.01			0.1	SURCHARGED

Summary of Results for 180 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.122	-0.128	0.000	0.05			0.9	OK
1.001	FLOW CONTROL	22.934	0.034	0.000	0.01			0.1	SURCHARGED

Summary of Results for 240 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.120	-0.130	0.000	0.04			0.7	OK
1.001	FLOW CONTROL	22.950	0.050	0.000	0.01			0.1	SURCHARGED

Summary of Results for 360 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.118	-0.132	0.000	0.03			0.6	OK
1.001	FLOW CONTROL	22.973	0.073	0.000	0.01			0.1	SURCHARGED

Summary of Results for 480 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.116	-0.134	0.000	0.03			0.5	OK
1.001	FLOW CONTROL	22.990	0.090	0.000	0.01			0.1	SURCHARGED

Summary of Results for 600 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.115	-0.135	0.000	0.02			0.4	OK
1.001	FLOW CONTROL	23.004	0.104	0.000	0.01			0.1	SURCHARGED

Summary of Results for 720 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.114	-0.136	0.000	0.02			0.3	OK
1.001	FLOW CONTROL	23.016	0.116	0.000	0.01			0.1	SURCHARGED

Summary of Results for 960 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.112	-0.138	0.000	0.02			0.3	OK
1.001	FLOW CONTROL	23.035	0.135	0.000	0.01			0.1	SURCHARGED

Summary of Results for 1440 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.109	-0.141	0.000	0.01			0.2	OK
1.001	FLOW CONTROL	23.062	0.162	0.000	0.01			0.1	SURCHARGED

Summary of Results for 2160 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.107	-0.143	0.000	0.01			0.2	OK
1.001	FLOW CONTROL	23.084	0.184	0.000	0.01			0.1	SURCHARGED

Summary of Results for 2880 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.105	-0.145	0.000	0.01			0.1	OK
1.001	FLOW CONTROL	23.094	0.194	0.000	0.01			0.1	SURCHARGED

Summary of Results for 4320 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.104	-0.146	0.000	0.01			0.1	OK
1.001	FLOW CONTROL	23.098	0.198	0.000	0.01			0.1	SURCHARGED

Summary of Results for 5760 minute 100 year Summer (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.103	-0.147	0.000	0.00			0.1	OK
1.001	FLOW CONTROL	23.096	0.196	0.000	0.01			0.1	SURCHARGED

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.840	Foul Sewage per hectare (l/s)	0.000
Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	40.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	0.000
Hot Start Level (mm)	0	Run Time (mins)	60
Manhole Headloss Coeff (Global)	0.500	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 3
Number of Online Controls 1 Number of Storage Structures 1

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	No
Return Period (years)	100	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 530550 160450 TQ 30550 60450	Cv (Winter)	0.840
Data Type	Catchment	Storm Duration (mins)	15

Summary of Results for 15 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.138	-0.112	0.000	0.14			2.4	OK
1.001	FLOW CONTROL	22.818	-0.082	0.000	0.00			0.0	OK

Summary of Results for 30 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.135	-0.115	0.000	0.12			2.0	OK
1.001	FLOW CONTROL	22.852	-0.048	0.000	0.00			0.1	OK

Summary of Results for 60 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.129	-0.121	0.000	0.09			1.4	OK
1.001	FLOW CONTROL	22.897	-0.003	0.000	0.00			0.1	OK

Summary of Results for 120 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.122	-0.128	0.000	0.05			0.9	OK
1.001	FLOW CONTROL	22.933	0.033	0.000	0.01			0.1	SURCHARGED

Summary of Results for 180 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.119	-0.131	0.000	0.04			0.7	OK
1.001	FLOW CONTROL	22.957	0.057	0.000	0.01			0.1	SURCHARGED

Summary of Results for 240 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.118	-0.132	0.000	0.03			0.6	OK
1.001	FLOW CONTROL	22.975	0.075	0.000	0.01			0.1	SURCHARGED

Summary of Results for 360 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.116	-0.134	0.000	0.02			0.4	OK
1.001	FLOW CONTROL	23.002	0.102	0.000	0.01			0.1	SURCHARGED

Summary of Results for 480 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.114	-0.136	0.000	0.02			0.3	OK
1.001	FLOW CONTROL	23.021	0.121	0.000	0.01			0.1	SURCHARGED

Summary of Results for 600 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.112	-0.138	0.000	0.02			0.3	OK
1.001	FLOW CONTROL	23.037	0.137	0.000	0.01			0.1	SURCHARGED

Summary of Results for 720 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.111	-0.139	0.000	0.01			0.3	OK
1.001	FLOW CONTROL	23.050	0.150	0.000	0.01			0.1	SURCHARGED

Summary of Results for 960 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.109	-0.141	0.000	0.01			0.2	OK
1.001	FLOW CONTROL	23.072	0.172	0.000	0.01			0.1	SURCHARGED

Summary of Results for 1440 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.106	-0.144	0.000	0.01			0.2	OK
1.001	FLOW CONTROL	23.103	0.203	0.000	0.01			0.1	SURCHARGED

Summary of Results for 2160 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.129	-0.121	0.000	0.01			0.1	OK
1.001	FLOW CONTROL	23.129	0.229	0.000	0.01			0.1	SURCHARGED

Summary of Results for 2880 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.142	-0.108	0.000	0.01			0.1	OK
1.001	FLOW CONTROL	23.142	0.242	0.000	0.01			0.1	SURCHARGED

Summary of Results for 4320 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.150	-0.100	0.000	0.00			0.1	OK
1.001	FLOW CONTROL	23.150	0.250	0.000	0.01			0.1	SURCHARGED

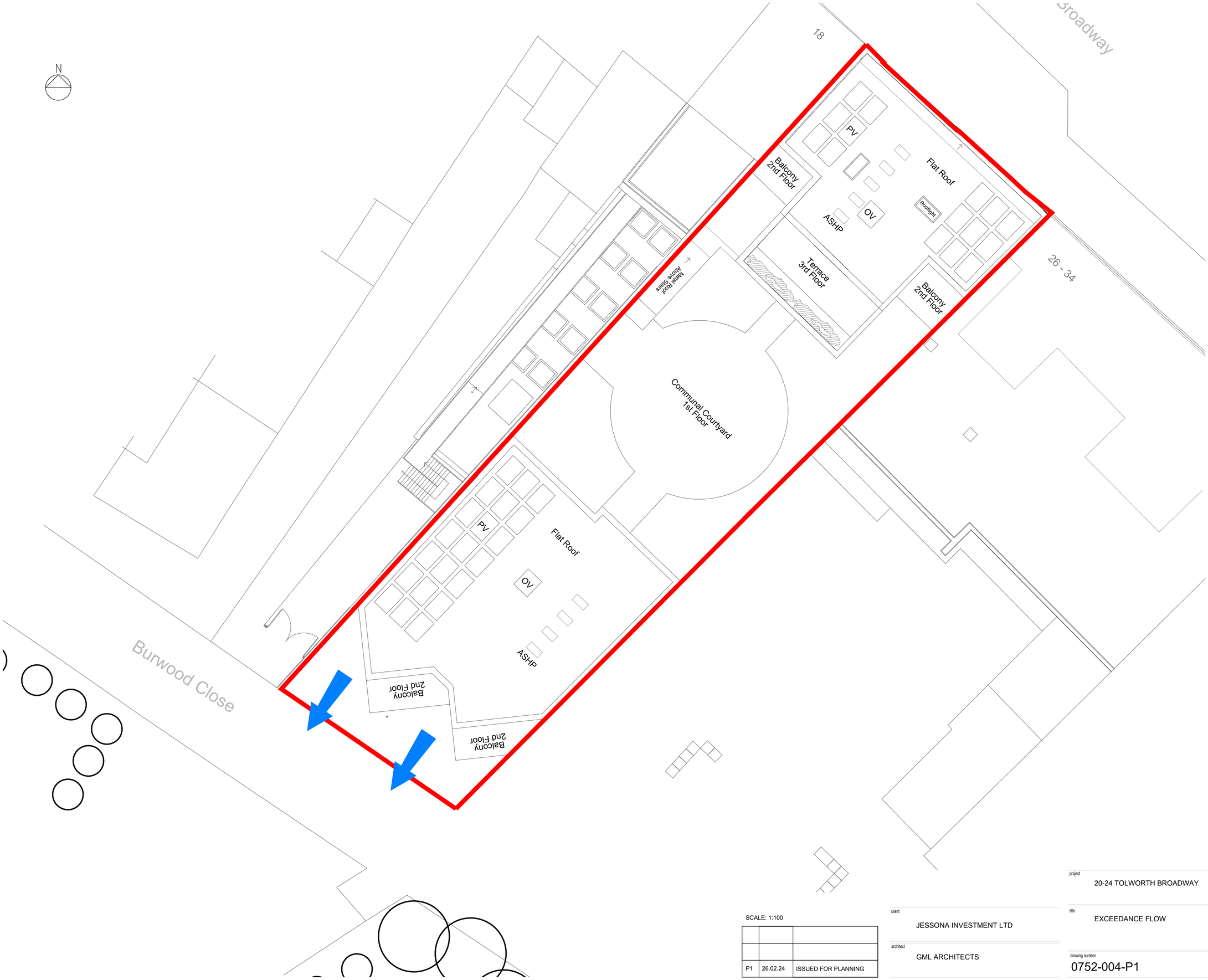
Summary of Results for 5760 minute 100 year Winter (Storm)

Margin for Flood Risk Warning (mm) 300.0 DVD Status OFF
Analysis Timestep Fine Inertia Status OFF
DTS Status ON

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	SW 1.0	23.149	-0.101	0.000	0.00			0.1	OK
1.001	FLOW CONTROL	23.148	0.248	0.000	0.01			0.1	SURCHARGED

APPENDIX F

Exceedance Event



KEY:

EXCEEDANCE FLOW PATH

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SCALE: 1:100

P1	26.02.24	ISSUED FOR PLANNING

client
JESSONA INVESTMENT LTD

architect
GML ARCHITECTS

project
20-24 TOLWORTH BROADWAY

title
EXCEEDANCE FLOW

drawing number
0752-004-P1

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APPENDIX G

Maintenance Plan

MAINTENANCE PLAN

20-24 Tolworth Broadway

for

Jessona Investment Ltd

MAB CONSULTANCY

20-24 Tolworth Broadway

MAINTENANCE PLAN

REF: 0752

Rev	Description	Date
P1	First Issue	28/02/24

MAB Consultancy (Norfolk) Ltd
Wymondham
Email: Office@MABConsultingltd.com
Tel: 07881 527107

1 GREEN ROOF MAINTENANCE

Maintenance Schedule	Required Action	Typical Frequency
Regular Inspections	Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable) membranes and roof structure for proper operation, integrity of waterproofing and structural stability.	Annually and after severe storms
	Inspect soil substrate for evidence of erosion channels and identify any sediment sources	Annually and after severe storms
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system	Annually and after severe storms
	Inspect underside of roof for evidence of leakage	Annually and after severe storms
Regular Maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	Six months and annually or as required
	During establishment (i.e. year one), replace dead plants as required	Monthly (but usually responsibility of manufacturer)
	Post establishment, replace dead plants as required (where >5% of coverage)	Annually (in Autumn)
	Remove fallen leaves and debris from deciduous plant foliage	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
	Mow grasses, prune shrubs and manage other planting (if appropriate) as required – clippings should be removed and not allowed to accumulate.	Six monthly or as required
Remedial Actions	If erosion channels are evident, these should be stabilised with extra soul substrate similar to the original material, and sources of erosion damage should be identified and controlled.	As required
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate.	As required

2 PERMEABLE PAVING MAINTENANCE

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Brushing and vacuuming	Once per year, after autumn leaf fall, or reduced frequency as required, based on site-specific observations or clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto pervious surface from adjacent impermeable areas as this is most likely to collect sediments.
Occasional Maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphosphate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial Actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracking or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure and upper substructure by remedial sweeping	Every 10-15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial Inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial actions	Three monthly-48 hr after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

3 UNDERGROUND STORAGE MAINTENANCE

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for three months, then annually.
	Remove debris from the catchment surface (where it may cause risks to performance).	Monthly
	Remove sediment from pre-treatment structures and/or internal forebays.	Annually, or as required.
Remedial Actions	Repair/rehabilitate inlets, outlet, overflows and vents.	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	Annually
	Survey inside of tank for sediment build-up and remove if necessary.	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every five years or as required

APPENDIX H

SUDS Proforma

1. Project & Site Details

Project / Site Name (including sub-catchment / stage / phase where appropriate)	20-24 Tolworth Broadway
Address & post code	20-24 Tolworth Broadway, Surbiton KT6 7HL.
OS Grid ref. (Easting, Northing)	E 19507 N 66122
LPA reference (if applicable)	
Brief description of proposed work	Part demolition of an existing building and part redevelopment to provide a part-four, part-three, part-one storey building, with nine new residential units and landscaping works
Total site Area	680 m^2
Total existing impervious area	680 m^2
Total proposed impervious area	433 m^2
Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	No
Existing drainage connection type and location	To TW surface water sewer in Burwood Close
Designer Name	Mark Bullen
Designer Position	Director
Designer Company	MAB Consultancy

2. Proposed Discharge Arrangements

2a. Infiltration Feasibility

Superficial geology classification	Kempton Park Gravel Member- Sands and Gravel
Bedrock geology classification	London Clay Formation - Clay
Site infiltration rate	NA m/s
Depth to groundwater level	3.96 m below ground level
Is infiltration feasible?	No

2b. Drainage Hierarchy

	Feasible (Y/N)	*Proposed (Y/N)*
1 store rainwater for later use	Y	
2 use infiltration techniques, such as porous surfaces in non-clay areas	N	
3 attenuate rainwater in ponds or open water features for gradual release	N	
4 attenuate rainwater by storing in tanks or sealed water features for gradual release	Y	
5 discharge rainwater direct to a watercourse	N	
6 discharge rainwater to a surface water sewer/drain	Y	
7 discharge rainwater to the combined sewer.	N	

2c. Proposed Discharge Details

Proposed discharge location	TW Surface Water Sewer in Burwood Close
Has the owner/regulator of the discharge location been consulted?	No

3a. Discharge Rates & Required Storage

	Greenfield (GF)	*Existing*	*Required*	*Proposed*

4a. Discharge & Drainage Strategy

	Page/section of drainage report
Infiltration feasibility (2a) – geotechnical	

3. Drainage Strategy

	Greenfield (GF) runoff rate (l/s)	*discharge rate (l/s)*	*storage for GF rate (m^3)*	*discharge rate (l/s)*
Qbar	0.16			
1 in 1	0.11	8.2		0.11
1 in 30	0.25	18.5		0.11
1 in 100	0.34	23.6	71	0.11
1 in 100 + CC				0.11
Climate change allowance used		40%		
3b. Principal Method of Flow Control		Hydrobrake		

3c. Proposed SuDS Measures

	Catchment area (m^2)	*Plan area (m^2)*	*Storage vol. (m^3)*
Rainwater harvesting	0		0
Infiltration systems	0		0
Green roofs	247	0	0
Blue roofs	0	0	0
Filter strips	0	0	0
Filter drains	0	0	0
Bioretention / tree pits	0	0	0
Pervious pavements	46	0	0
Swales	0	0	0
Basins/ponds	0	0	0
Attenuation tanks	387		71
Total	**680**	**0**	**71**

4. Supporting Information

Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	Section 4.4.1
Drainage hierarchy (2b)	Section 4.4.1
Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	Section 4.4.4 & Appendix E
Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	Section 4.4.4 & Appendix E
Proposed SuDS measures & specifications (3b)	Section 4.4.4 & Appendix E
4b. Other Supporting Details	*Page/section of drainage report*
Detailed Development Layout	
Detailed drainage design drawings, including exceedance flow routes	Appendix E & F
Detailed landscaping plans	Appendix B
Maintenance strategy	Appendix G
Demonstration of how the proposed SuDS measures improve:	
a) water quality of the runoff?	Section 4
b) biodiversity?	
c) amenity?	