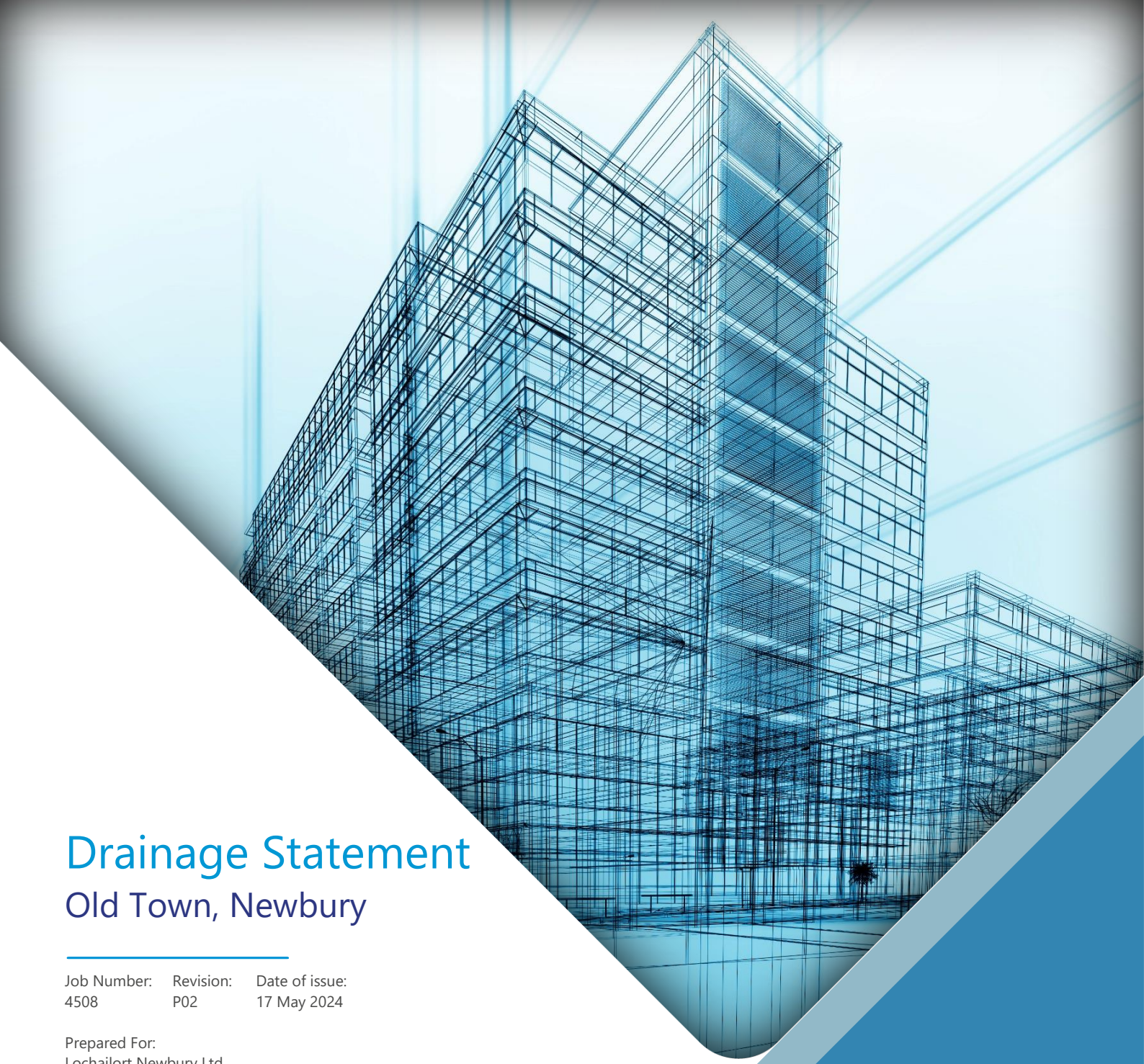

Drainage Statement

Old Town, Newbury

Job Number:	Revision:	Date of issue:
4508	P02	17 May 2024

Prepared For:
Lochailort Newbury Ltd

Document Number
4508-RBG-ZZ-XX-RP-CV-00004

Status:
S3 - For Review and Comment

We design for delivery

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Report Amendment Register

Issue Ref	Amended Section(s)	Issue/Amendment Details	Author(s)	Reviewer	Date
P01	All	First Issue	N.Brown	J.Gold	28/03/24
P02	All	For Planning	N.Brown	J.Gold	17/05/24

Natasha Brown
Graduate Engineer

Jonathan Gold
Associate

Contents

Appendices

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1. Introduction

1.1 General

Robert Bird Group (RBG) has been appointed by Lochailort to undertake the below ground drainage design works for the Old Town Development in Newbury.

This Drainage Statement has been produced in order to assist West Berkshire Council (WBC), as the Lead Local Flood Authority (LLFA) to determine the suitability of the drainage design for the planning application.

This Drainage Statement has been prepared based on the following information:

- Architect's proposed General Arrangement drawings by Woods Hardwick received 24.05.02 (Ref: 19401 1003)
- Topographical Survey Geometric Surveyors received 23.09 (Ref: 396KC503)
- Thames Water Asset Location Search by Thames Water received 20.05.18 (Ref: 1108775-Asset Location Search- 1138331)
- Ground investigation Report by Soiltechnics received 20.09.16 (Ref: STS5074-G01)
- Historic Record Drawings

Robert Bird Group cannot accept liability for the accuracy or otherwise of any information derived from third party sources.

This drainage statement should be read in conjunction with the Flood Risk Assessment (4508-RBG-ZZ-XX-RP-CV-00003) produced by RBG.

1.2 Objective of this Report

The objective of this drainage statement is to establish the proposed drainage strategy for the site for planning approval. In order to achieve this, the following information is provided:

- Site background.
- The proposed discharge strategy for the surface water drainage.
- Flow rate information and required attenuation storage.
- Proposed SuDS measures to achieve attenuation systems.
- Drawings of the surface water network layout.
- Exceedance flow route information.
- Summary of the discharge strategy for foul water.
- Drawings for the foul water network layout.

2. Proposed Development Site

2.1 Location

The site is located towards the centre of Newbury, Berkshire, site postcode RG14 5EN. The site is approximately 2.2ha in size and comprises the Kennet Shopping Centre. The Kennet Shopping Centre is a mixed two-storey and three-storey structure, which is internally partitioned into separate retail/commercial units. A multi-storey car park is present to the south-west corner and a cinema is present to the south-east.

The site lies within a predominantly commercial/retail area and is bordered by Bartholomew Street to the west, Market Street to the south and Cheap Street and Market Place to the east. Commercial buildings border the site to the north.

The Centre itself was originally built in 1974. The site is within a seven minute walk from Newbury train station, with bus stops surrounding the existing site. The A339 also runs close to the site on the right side. A part of the site is next to listing buildings.

2.2 Proposed Development

The existing buildings on site are to be demolished except for the car park and cinema. The proposed re-development consists of residential units (houses and flats), with semi-basements on a small number of the units..

The latest ground floor plans can be found in Appendix A.

2.3 Site Description

2.3.1 Topography

The local topography is relatively flat, with the site located towards the floor of a valley carrying the River Kennet, which merges into the Kennet and Avon Canal and flows west to east, some 85m to the north of the site.

The existing site is relatively flat with levels varying between 76.5 and 77.2mAOD. In general, the northern part of the site is lower with levels rising towards the south.

Refer to Appendix B for the Topographical Survey for the site.

2.3.2 Geology

The ground investigation report identified that made ground and alluvium deposits are likely to underly the site to a depth of 3-4m. Beneath these strata superficial deposits of Beenham Grange Gravel Member can be found to a depth 7-8m which are in turn underlain by the Seaford Chalk Formation, which extended to the depth of the intrusive boreholes (circa 25m deep).

Groundwater was encountered during the site investigation at depths of between 2.53 and 3.5m

2.3.3 Hydrology and Hydrogeology

The River Kennet lies approximately 100m to the north of the site which is classed as a main river by the EA.

Groundwater was encountered during the intrusive Ground Investigation. This was encountered within the made ground and alluvium deposits.

Aquifer designation mapping provided by DEFRA indicates that the site lies within a Principal aquifer zone for Bedrock and a Secondary A aquifer zone for Superficial Deposits. Groundwater vulnerability mapping provided by DEFRA indicates that the site lies in a zone that is designated as a 'Medium-High Risk', therefore any contamination entering the ground has a risk of contaminating ground water resources.

The site lies in a Groundwater Source Protection Zone designated as Zone III (Total Catchment). SPZs are defined around potable groundwater abstraction sites and the designation implies that the groundwater recharge is presumed to be discharged at the source.

2.3.4 Existing Drainage

The existing site discharges foul and surface water to the public Thames Water sewers in Cheap Street and Bartholomew Street. It is noted that the Thames Water sewers are separate systems.

Record information suggests that the surface water from the existing buildings, is discharged into the Thames Water 750mm diameter surface water sewer in Cheap Street. A number of foul water connections from the site discharge to the Thames Water 225mm diameter foul sewer in Bartholomew Street and to the Thames Water 225m diameter foul sewers in Market Place and Cheap Street.

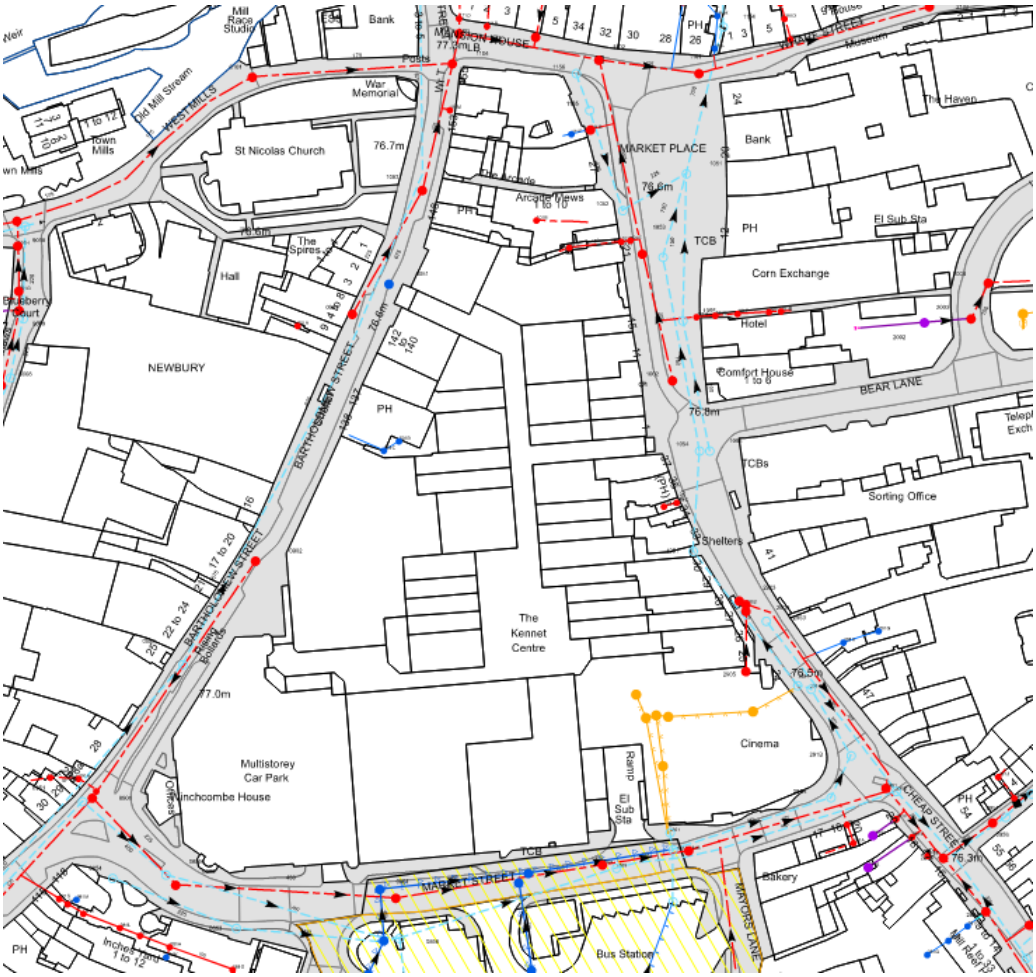


Figure 2.1: Thames Water Asset Records Plan

2.3.5 Flood Risk

Refer to the site-specific FRA (4508-RBG-ZZ-XX-RP-CV-00003) for further information on flood risk and proposed site levels.

3. Surface Water Management

This section will detail how certain SuDS are to be incorporated into the proposed design.

3.1 Policy, Standards and Guidance

The surface water management strategy will be designed to conform to the following policies, standards and guidance documents where appropriate:

- National Planning Policy Framework 2023
- BS EN 752:2008 Drains and Sewer Systems outside buildings
- CIRIA 752 The SuDS Manual
- Building Regulations Part H
- Sewerage Section Guidance- approved documents.

3.2 Surface Water Management Strategy

3.2.1 Drainage Hierarchy

In line with the policies set out in WBCs SuDS Supplementary Planning Document, surface water run-off is to be managed as close to source as possible in line with the following drainage hierarchy. Run off rates are to be restricted in line with guidance.

	SuDS technique	Proposed	Comment
Most sustainable	Store rainwater for later use	✓	Rainwater harvesting tanks will be provided, feeding a network of external water taps. Blue roofs are also proposed on the flats in the southern part of the site (they are not feasible elsewhere due to use of pitched roofs)..
	Use infiltration techniques, such as porous surfaces in non-clay areas	✗	Whilst ground is considered to be permeable, the shallow groundwater table will preclude the use of infiltration techniques.
	Attenuate rainwater in ponds or open water features for gradual release	✗	Site is too constrained to allow for open water features

	Attenuate rainwater by storing in tanks or sealed water features for gradual release	✓	Rainwater will be attenuated by means of buried tanks and blue roofs.
	Discharge rainwater direct to watercourse	✗	There are no surface water bodies close to the application site
	Discharge to a surface water sewer/drain	✓	Surface water sewers are present in Cheap Street and Bartholomew Street. It is proposed to utilise two existing site connections in Cheap Street.
Least sustainable	Discharge rainwater to the combined sewer	✗	Not required due to the presence of surface water sewers.

Table 3.1: Drainage Hierarchy

The feasibility of blue roofs and rainwater harvesting has been assessed during the concept design phase. Blue roofs are proposed on the flats but are not suitable for use on the houses as they will have pitched roofs. Rainwater harvesting at roof level is not commercially viable for the development, however rainwater storage tanks will be provided in the external realm to provide a supply for watering plants and car washing.

There is opportunity to place SuDS features within the public realm elements of the site. Bio-retention and filter drains are to be considered wherever possible.

For further information on SuDS options considered, refer to the FRA (4508-RBG-ZZ-XX-RP-CV-00003).

3.2.2 Catchment Analysis

An analysis of existing and proposed catchment areas for the site has been undertaken. The total site area of the buildings to be redeveloped is approximately 1.62ha, with this entire area currently being impermeable brownfield land. The catchment analysis has exclusion zones in which the existing drainage is assumed to remain the same.

The catchment area that has been included is 1.59ha. The whole site is not included due to the car park and the cinema being predicted to have minimal disruption and the drainage to remain as existing.

Refer to Appendix C for the catchment plans of the existing site and the proposed.

3.2.3 Climate Change

The surface water drainage has been modelling in microdrainage with a climate change factor of 40%, in line with latest government guidance.

3.2.4 Design Strategy

Surface water will be collected from roof areas via downpipes and external hard standing through channels, gullies, or porous surfaces. A pipe system will then convey the surface water to the public sewer. All surface water is to discharge to the Thames Water surface water sewer in Cheap Street via existing connections from the site that are to be retained. The rate of discharge will be limited in line with planning requirements.

The existing and greenfield flow rates from the site have been modelled. The existing rate has been calculated using the Rational Method. The existing discharge rates have been calculated using a combination of survey data and historic record drawings to establish a microdrainage model. The microdrainage calculations are included in Appendix C.

Due to the density of buildings on the site, it will not be possible to reduce the surface water discharge from the site to greenfield run-off rates whilst still maintaining a gravity discharge. A reduction of 81.0% for the 1 in 100 year storm event has been achieved. This is consistent with the discharge rate agreed by the LLFA for the previous Kennet Centre planning application (Ref. 23/02094/FULMAJ).

	Existing Site Runoff	**Greenfield Runoff rate**	**Proposed Discharge rate**	**Proposed reduction from existing**
Storm event	Discharge (l/s)	Discharge (l/s)	Discharge (l/s)	%
1 in 2 year	275.3	7.3 (Qbar)	56.3	79.5
1 in 30 year	618.4	18.7	118.2	80.9
1 in 100 year	807.5	26.3	153.1	81.0

Table 3.2: Modelled Runoff rates

The areas discharging into the Thames Water Sewer in Cheap Street remains the same. To achieve the proposed reduction in the discharge rates, attenuation storage is required to prevent flooding. The total volume of storage provided by the SuDS is given in Table 3.3 below.

SuDS Technique	**Plan Area (m^2)**	**Storage Volume (m^3)**	**Notes**
Geocellular tanks - Subbase replacement	2667	803.43	Volume taken from the depth of the crates (min 150mm)
Blue roof	336	28.56	Blue roofs are assumed to be 85mm deep.

Total storage volume: 831.99 m^3

Table 3.3: Storage volume table

The attenuation storage volumes have been set to prevent any flooding site during the 1 in 100 year storm with 40% climate change, and restrict on site flooding to areas away from buildings form storm events exceeding the 1 in 100 year.

Refer to Appendix C for the drainage calculations and Appendix D drawings 4508-RBG-XX-XX-DR-CV-87001, 4508-RBG-XX-XX-DR-CV-87002, 4508-RBG-XX-XX-DR-CV-87003 for the general arrangement plan for the proposed external surface water drainage.

3.3 SuDS Measures

The proposed surface water drainage network contains the following SuDS:

- Blue roof.

- Below ground storage.
- Oil separators.
- Rainwater harvesting tanks.

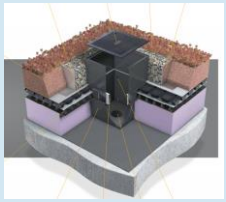
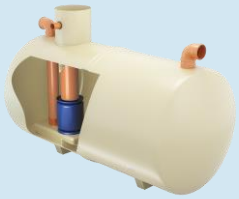
Technique	Image	Description	Advantages	Disadvantages
Blue roof		Used to attenuate water at roof level within either a cellular storage crate system above the roof itself.	The water is released slowly from the roof through the use of controls such as orifices or restricted outlet. Reduces the demand on provision of below ground attenuation, reduces the discharge rate from the site.	Impose additional dead loading to the structure which may require a small increase in structural members. No water quality treatment if used without green/brown roofs.
Below ground storage		Oversized pipes, tank systems and modular geocellular systems that can be used to create a below ground storage structure	Modular and flexible, dual usage (infiltration/storage), high void ratios, can be installed beneath trafficked and soft landscaping areas.	No water quality treatment
Oil separators		Used to remove hydrocarbons prior to discharge to sewer or watercourse.	Treatment of run-off prior to discharge.	Require regular emptying to remain effective.
Rainwater harvesting		Uses rainwater from roofs. Harvested rainwater is stored onsite and is substituted for mains supply, reducing both site discharge and potable water consumption.	Can provide source control of storm water total volume, reduces demand on mains water.	Use is dependent on demand requirements, contributing surface area, and seasonal rainfall characteristics.

Table 3.4: Proposed SuDS

3.4 Maintenance Schedule

Maintenance during the operational phase of the development is to be the responsibility of the private development and conducted by the site owner/operator.

A summary of the anticipated maintenance and operations requirements for the strategy is proposed for the site to maintain the drainage networks:

SuDS component:	**Geo-cellular boxes**

Maintenance	Action	Frequency
Regular maintenance	Check inlets, outlets, control structures, catchpits and overflows	Annually or after a large storm
Occasional tasks	Jetting and suction where silt has settled	As required
Remedial work	Reinstate	As required

SuDS component: **Blue roof**

Maintenance	Action	Frequency
Regular maintenance		
Occasional tasks	Jetting and suction where silt has settled	As required
Remedial work	Reinstate	As required

SuDS component: **Oil separator**

Maintenance	Action	Frequency
Regular maintenance	Emptying of oil and sediment	Annually or when alarm is triggered
Occasional tasks	Maintenance of alarm system	As required
Remedial work	Reinstate	As required

SuDS component:	**Rainwater harvesting**	
Maintenance	Action	Frequency
Regular maintenance	Inspection of tank for debris and sediment buildup, inspection of inlet/outlet pipes, general cleaning	Monthly or annually or after a large storm
Occasional tasks	Cleaning and replacement of filters	As required
Remedial work	Pump repairs or replacement	As required

3.5 Exceedance Routes

During extreme rainfall events, larger than 1 in 100 year storm events, surface water run-off may mobilise as overland flow routes. These flows are to be directed away from buildings and a dry escape route is proposed in the event an evacuation is required. The flow controls at the discharge points from the site will be fitted with an emergency drain down mechanism in order that water can be discharged in the event of blockage or extreme rainfall.

Refer to Appendix E for a plan showing the proposed exceedance flow routes.

4. Foul water management

4.1 Policy, Standards & Guidance

The foul water management strategy will be designed to conform to the following policies, standards and guidance documents where appropriate:

- BS EN 752:2008 Drains and Sewer Systems outside buildings
- Building Regulations Part H
- BS EN 12056-2:2000 Gravity drainage systems inside buildings
- Sewerage Sector Guidance

4.2 Foul Water Management Strategy

The Foul water is to be collected from the buildings via soil vent pipes, gullies and sub-stacks. A pipe system will then convey the foul water to the public sewer. It is intended that all foul water is to be discharged to the Thames Water foul water sewer network via existing gravity connections from the site that are to be retained. These include the following connections:

- 150mm connection to the 225mm Thames Water foul sewer in Bartholomew Street
- 100mm connection to the 225mm Thames Water foul sewer in Bartholomew Street

- 150mm connection to the 225mm Thames Water foul sewer in Market Place

Refer to the drawings 4508-RBG-XX-XX-DR-CV-88001, 4508-RBG-XX-XX-DR-CV-88002, 4508-RBG-XX-XX-DR-CV-88003 in Appendix D for the proposed foul general arrangement.

5. Conclusion

This Drainage Statement has been developed in line with the requirements of the national and local planning policy. It has set out how the surface water and foul water will be managed as part of the proposed development.

The key points identified in the report are:

- Surface water will be managed through a combination of SuDS systems, including;

  Blue roof

  Below ground attenuation tanks

  Rainwater harvesting system

  Oil separators
- Surface water will be attenuated on site to reduce the discharge rate for the 1 in 100 years storm (including Climate Change Allowance) to 81.1% of the existing flow rate.
- A maintenance regime for the SuDS systems has been identified
- Surface water flows from exceedance events (greater than 1 in 100 year) will be directed away from the building thresholds and safe evacuation routes will be provided.
- Foul water will be managed by routing all new drainage pipework to the Thames Water foul sewer system which surrounds the site via existing connections.

Refer to the Flood Risk Assessment RBG Document Reference 4508-RBG-ZZ-XX-RP-CV-00003 for details of the flood risk and mitigation strategy for the development.

Appendix A Architectural Ground Floor Site Plan

Old Town, Newbury

NOTES

1. Contractors must check all dimensions on site. Only figured dimensions are to be worked from. Discrepancies must be reported to the Architect or Engineer before proceeding. © This drawing is copyright.

2. Reproduced from OS Sitemap ® by permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office. © Crown copyright 2008. All rights reserved. Licence number 100007126.

3. Direct scaling off the drawing is permissible for planning purposes only.

N

The Globe Inn

The Arthouse

Artist's Mews

The Gallery

Eagle House

Eagle Lodge

MARKET PLACE

William Hill

Kiln House

Crown Court

The Newbury

BARTHOLOMEW STREET

Falkland Place

The Manor

Falkland Lodge

Ulv-itone House

Newburgh House

Falkland House

Essex House

Crown House

The Barn

Gerard House

Kimber House

Alma Court (One-way)

St Bartholomew House

Alma House

The Smithy

Alma Cottage

Charlton House

Dolman House

The Bellows

The Forge

Coppersmith House

Whitesmith House

Kennet House

Craven House

Chestnut House

Herborough House

Victoria House

Victoria Court

Edward House

Smith's Yard

Plenty's Place

The Fane

Winchcombe House

The Workshop

Iron Yard

Pellow House

The Catherine Wheel

CHEAP STREET

Cinema

Car Park

MARKET STREET

In (Only)

Out (Only)

Old Town Community Cycle Storage Capacity: 166 Cycles

Existing Vehicular Ramp to be made into A Pedestrian Access and Retained by the Existing Dwellings.

New Development

SCALE 1:200

REV	DESCRIPTION	DRN	CHD	DATE
■	PRELIMINARY	☐	INFORMATION	☐	TENDER
☐	CONSTRUCTION	☐	AS BUILT		

SCALE	1:200 @ A0	DATE	FEB 2024
DRAWN	AT/JPG	CHK	JAL
DRAWING NO.	19401/1003	REV	-
TITLE	Old Town, Newbury.		
DETAILS	Ground Floor Plans, Site Layout.		

LOCHAILORT

Woods Hardwick

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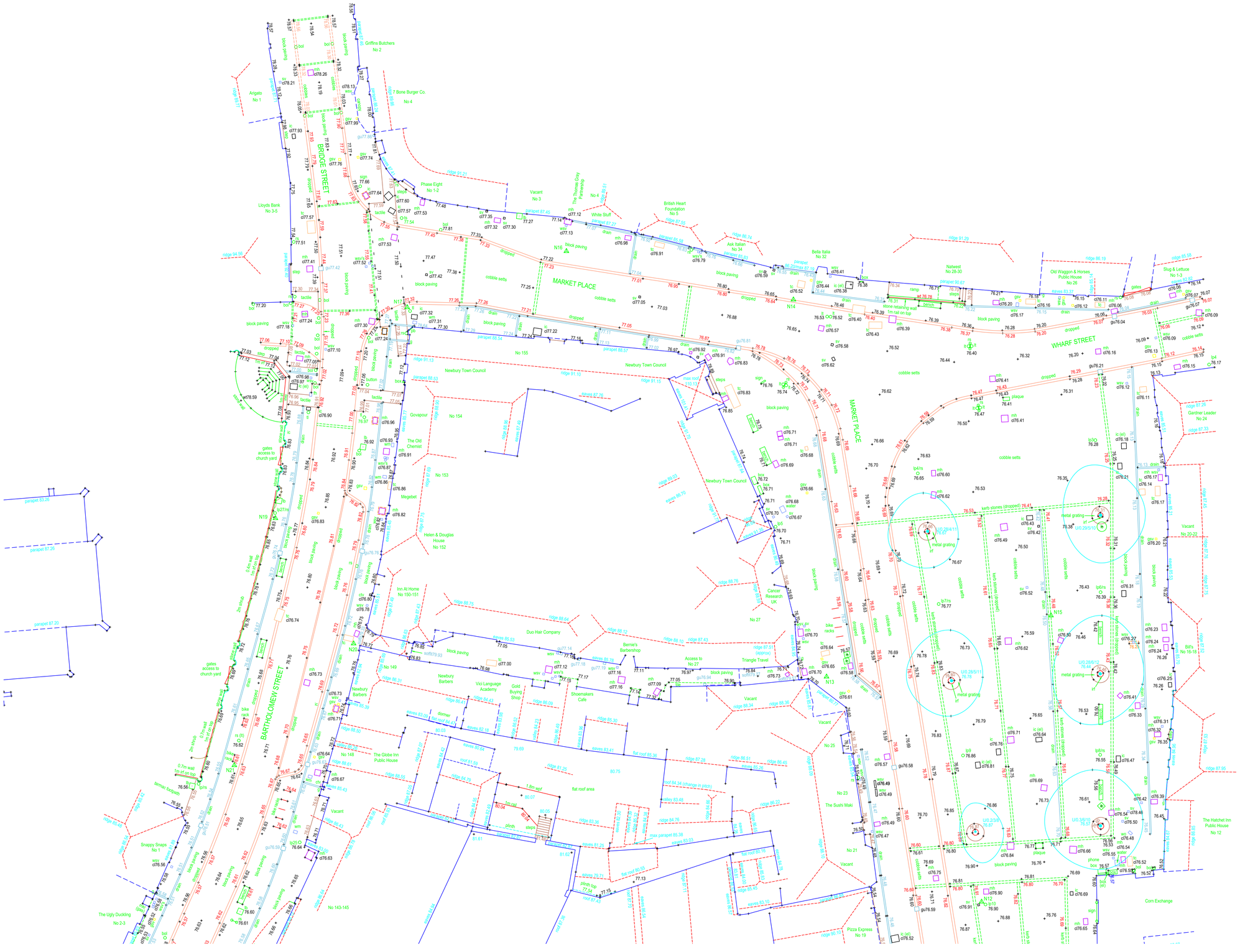
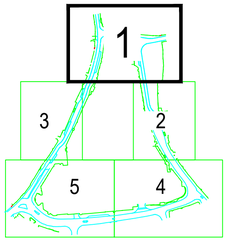
Appendix B
Topographical Survey

Old Town, Newbury





TREES

A	Ash
AL	Alder
AP	Apple
B	Beech
C	Cedar
CB	Copper Beech
CH	Cherry
CY	Cypress
E	Elm
EL	Elder
EU	Eucalyptus
F	Fir
FM	Field Maple
FR	Fruit
HZ	Hazel
HC	Horse Chestnut
HO	Holm Oak
HW	Hawthorn
HY	Holly
JM	Japanese Maple
LB	Laburnum
LM	Lime
LO	Locust Tree
LR	Laurel
M	Maple
MG	Magnolia
OK	Oak
P	Pine
PA	Palm
PL	Plane
PM	Plum
PO	Poplar
PP	Pissardii Plum
PR	Pear
R	Redwood
RD	Red Oak
RH	Rhododendron
RO	Rowan
SB	Silver Birch
SC	Sweet Chestnut
SP	Scots Pine
SU	Spruce
SY	Sycamore
U	Unidentified
W	Willow
WN	Walnut
Y	Yew

Species / Dia / Spread (max) / Ht
e.g. OK / 0.6 / 8 / 15

ABBREVIATIONS

BT	British Telecom
BOL	Bollard
CB	Control Box
CL	Cover Level
CTV	Cable Television
EL	Electric
EP	Electricity Pole
FH	Fire Hydrant
GSV	Gas Stop Valve
HT	Height
HVC	High Voltage Cable
IC	Inspection Cover
IL	Invert Level
LP	Lamp Post
MH	Man-Hole
MKR	Marker
MW	Monitoring Well
O/H	Overhead
R	Road Gully
PB	Post Box
PC	Pram Crossing
RNP	Road Name Plate
RS	Road Sign
S/A	Soakaway
ST	Stay / Strut
SV	Stop Valve (Unidentified)
TB	Telephone Box
TC	Telecom
TH	Trial Hole
TL	Traffic Light
TP	Telegraph Pole
UTL	Unable to Lift
VP	Vent pipe
WM	Water Meter
WSV	Water Stop Valve

FENCES

BWF	Barbed Wire Fence
CBF	Closed Board Fence
CF	Concrete Post
CPF	Chestnut Paling Fence
CWF	Chicken Wire Fence
IRF	Iron Railing Fence
PKF	Picket Fence
PRF	Post & Rail Fence
PWF	Post & Wire Fence
SCF	Security Fence
SP	Steel Post
WMF	Wire Mesh Fence
WPF	Wood Panel Fence

NOTES

The survey grid has been related to OS National Grid using a flat earth projection and metric scale factor of 1, centred on Station RF1. Levels are related to OS datum determined from the National GPS Network using OSGM15.

No assumptions should be made regarding the interconnection of manholes. Drainage details have been obtained from surface inspection and should be verified if of critical importance.

The position and height of adjacent buildings have been obtained using higher level reflectorless measurement and may not take account of single storey extensions or conservatories below the line of sight.

Geomatic Surveyors

siteline

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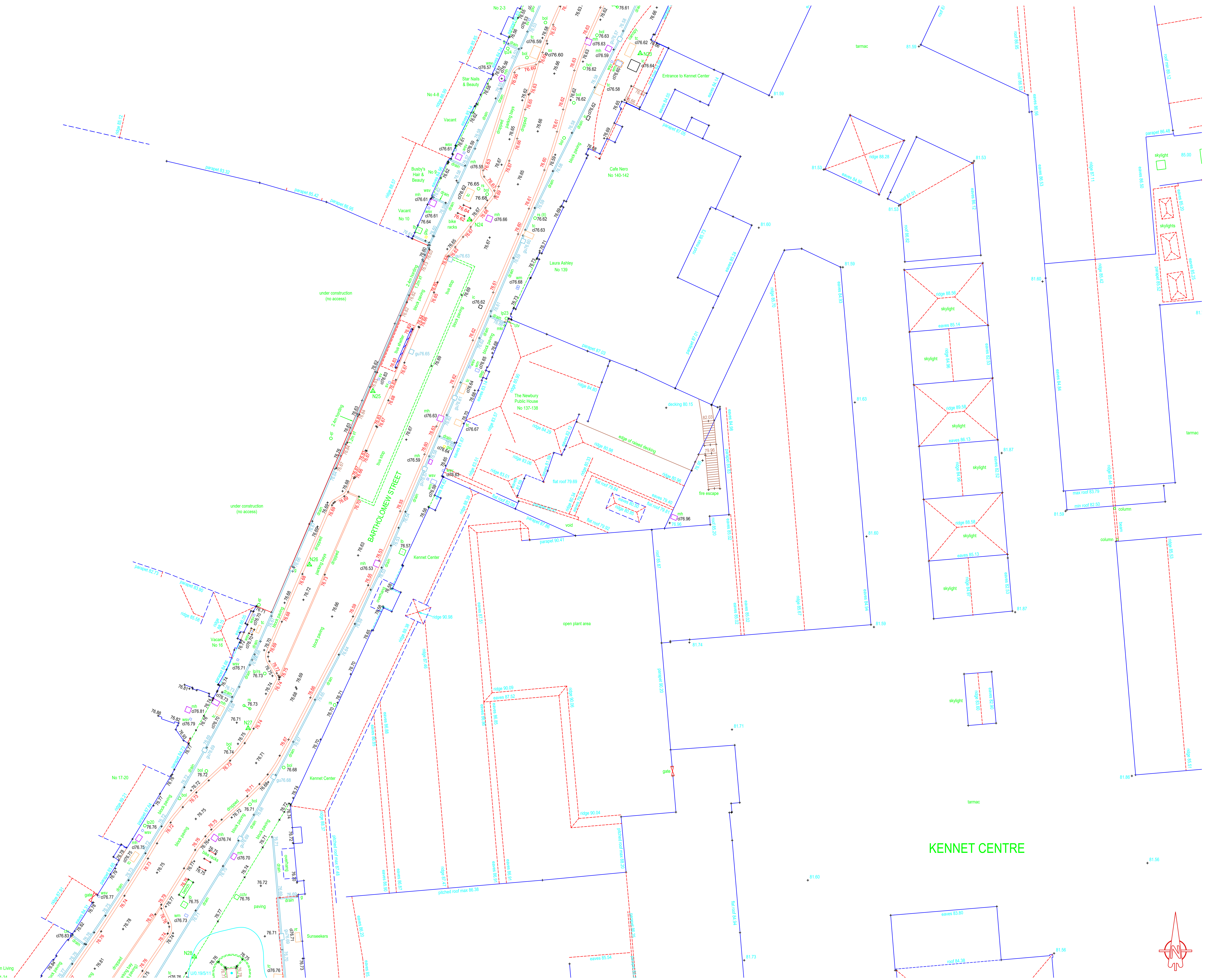
34 Parham Drive
Eastleigh
SO50 4NU

t: 023 8081 1081
w: siteline.co.uk

LOCHAILORT INVESTMENTS	Client
KENNET CENTRE NEWBURY BERKSHIRE	Contract
SITE SURVEY	Title
396KC01 - SHEET 1	Drawing Number
OCTOBER 2019	Date
1:200 (at A1)	Scale
MJR ST	Surveyor(s)



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IC	Inspection Cover
IL	Invert Level
LP	Lamp Post
MH	Man-Hole
MKR	Marker
MW	Monitoring Well
O/H	Overhead
G	Road Gully
PB	Post Box
PC	Pram Crossing
RNP	Road Name Plate
RS	Road Sign
S/A	Soakaway
ST	Stay / Strut
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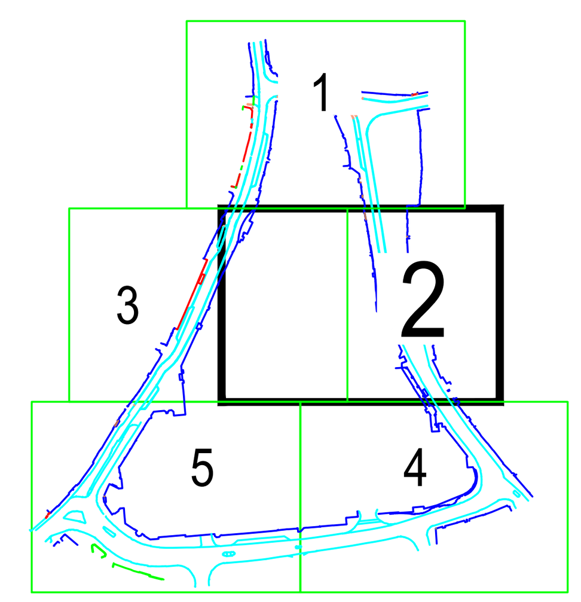

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Geomatic Surveyors

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LOCHAILORT INVESTMENTS	Client
KENNET CENTRE NEWBURY BERKSHIRE	Contract
SITE SURVEY	Title
396KC01 - SHEET 2	Drawing Number
OCTOBER 2019	Date
1:200 (at A1)	Scale
MJR ST	Surveyor(s)

TREES

A	Ash
AL	Alder
AP	Apple
B	Beech
C	Cedar
CB	Copper Beech
CH	Cherry
CY	Cypress
E	Elm
EL	Elder
EU	Eucalyptus
F	Fir
FM	Field Maple
FR	Fruit
HZ	Hazel
HC	Horse Chestnut
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SU	Spruce
SY	Sycamore
U	Unidentified
W	Willow
WN	Walnut
Y	Yew

Species / Dia / Spread (max) / Ht
e.g. OK / 0.6 / 8 / 15

ABBREVIATIONS

BT	British Telecom
BOL	Bollard
CB	Control Box
CL	Cover Level
CTV	Cable Television
EL	Electric
EP	Electricity Pole
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GSV	Gas Stop Valve
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BWF	Barbed Wire Fence
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PWF	Post & Wire Fence
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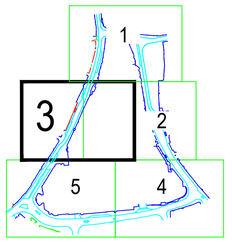

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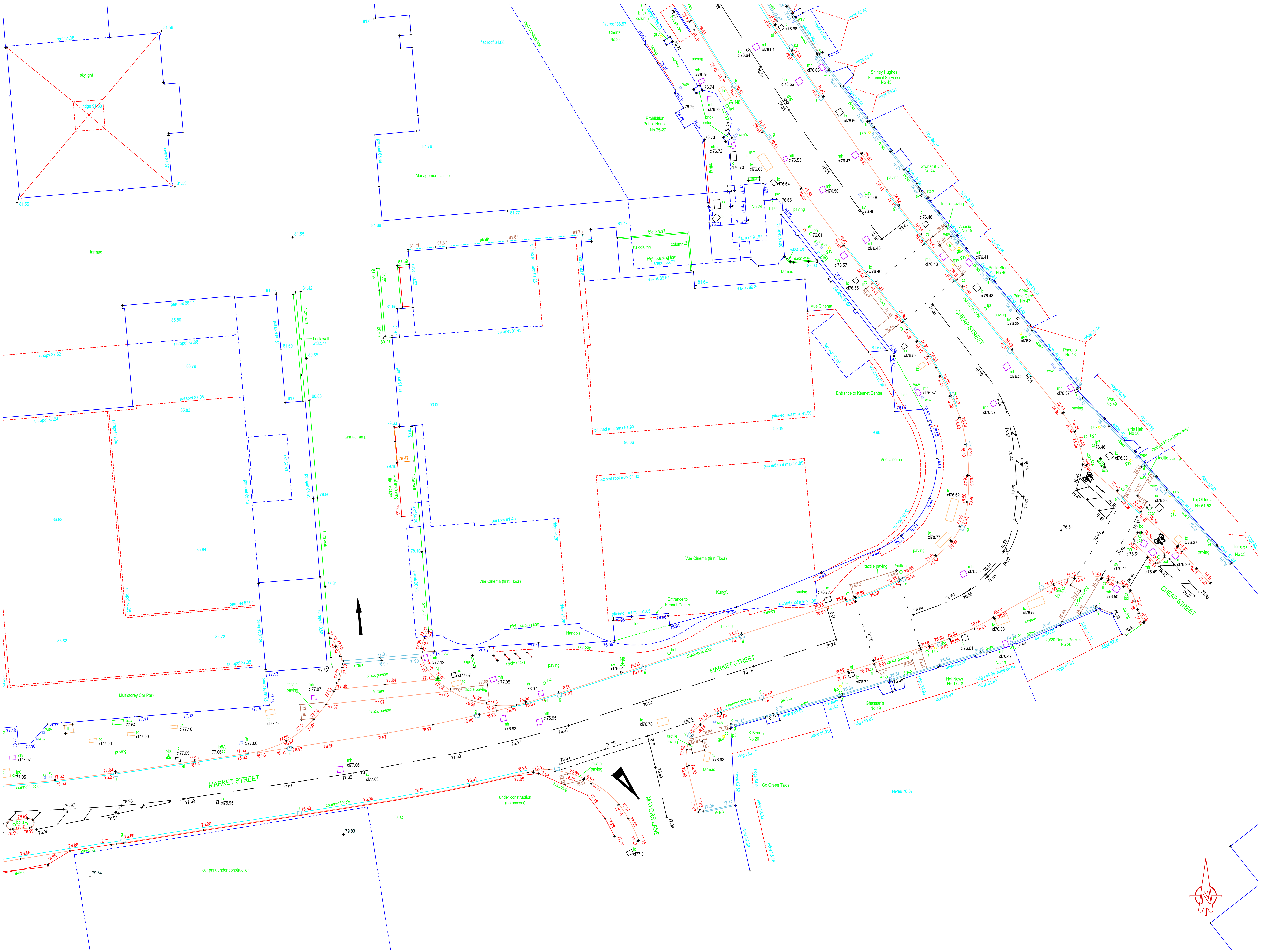
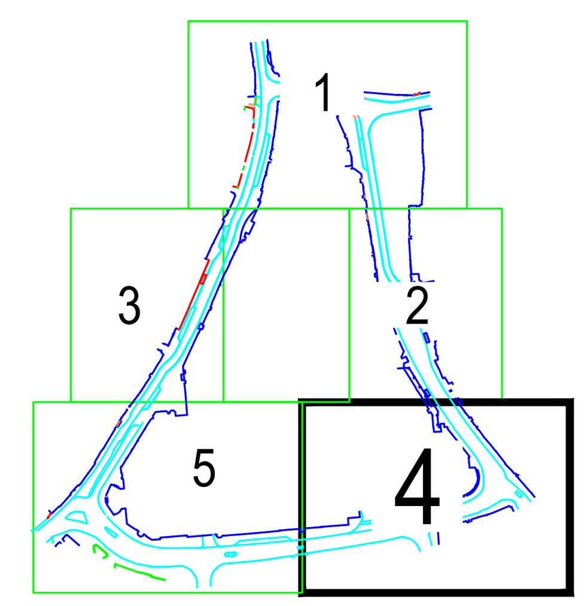
SITE SURVEY	Title
396KC01 - SHEET 3	Drawing Number
OCTOBER 2019	Date
1:200 (at A1)	Scale
MJR ST	Surveyor(s)





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396KC01 - SHEET 4	Drawing Number
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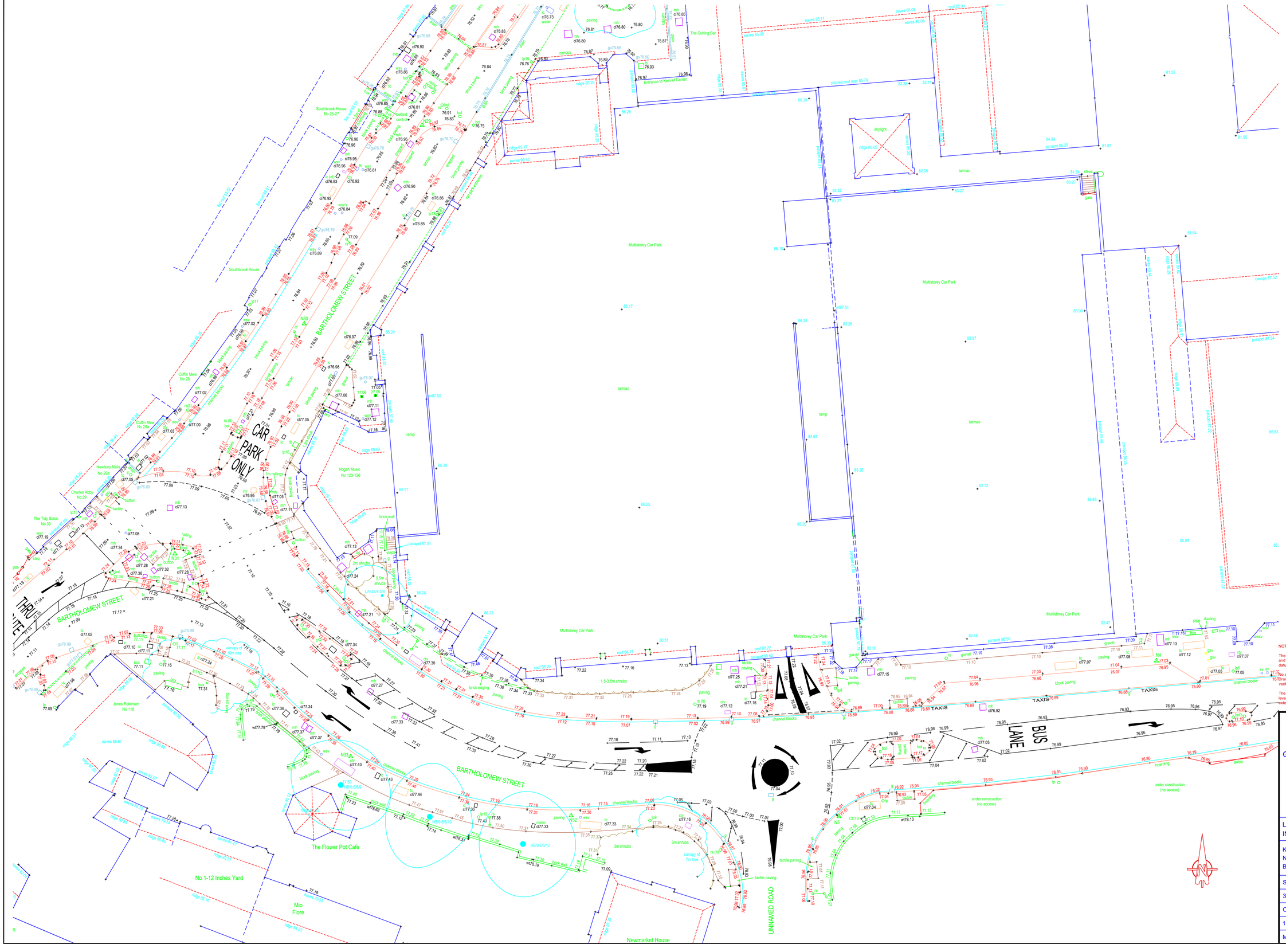
1:200 (at A1)	Scale
MJR ST	Surveyor(s)



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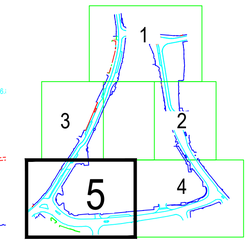

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SITE SURVEY	Title
396KC01 - SHEET 5	Drawing Number
OCTOBER 2019	Date
1:200 (at A1)	Scale
MJR ST	Surveyor(s)

Appendix C
Drainage Calcuations

Old Town, Newbury

NOTES:
1. DO NOT SCALE THIS SKETCH
2. THIS DRAWING IS BASED ON THE FOLLOWING INFORMATION:
-DRAINAGE LAYOUT: 396KC503 Stage 4 RECEIVED 04.09.23 FROM LOCHAILORT
-THAMES WATER ASSEST RECORDS: 1108775-Assest Location Search-1138331, RECEIVED 18.05.23 FROM THAMES WATER
-HISTORIC DRAWINGS:
-SURVEY INFORMATION:
3. AREAS ARE SHOWN AS INDICATIVE ONLY
4. NAMES OF MANHOLES AND PIPES BASED ON MICRODRAINAGE MODEL
5. SOME INVERT LEVELS AND GRADIENTS ASSUMED FOR MANHOLES THAT HAD NO DATA

225 ADOPTED FOUL SEWERS
675 ADOPTED STORM SEWERS
150 ADOPTED COMBINED SEWERS
150 KENNET CENTRE FOUL SEWERS
150 KENNET CENTRE STORM SEWERS

KEY:
SITE BOUNDARY
SURFACE WATER MANHOLES MODELLED IN MICRODRAINAGE
AREA TO MANHOLE
AREA NOT INCLUDED

447000mE 447050mE 447100mE 447150mE 447200mE
167150mN 167100mN 167050mN 167000mN 166950mN 166900mN 166850mN

EXISTING OUTFALL 10 FOUL WATER
EXISTING OUTFALL 11 FOUL WATER
EXISTING OUTFALL 3 SURFACE WATER
EXISTING OUTFALL 1 SURFACE WATER
EXISTING OUTFALL 9 FOUL WATER
EXISTING OUTFALL 8 SURFACE WATER
EXISTING OUTFALL 7 FOUL WATER
EXISTING OUTFALL 6 SURFACE WATER
EXISTING OUTFALL 5 SURFACE WATER
EXISTING OUTFALL 4 FOUL WATER
EXISTING OUTFALL 2 SURFACE WATER AREA: 4971.68m²

MH10 CL: 78m IL: 76.029m AREA: 1121.89m²
MH17 CL: 78m IL:75.876m AREA: 986.19m²
MH19 CL: 78m IL: 75.776m AREA: 123.62m²
MH11 CL: 77m IL: 75.859m AREA: 822.4m²
MH14 CL: 77m IL: 75.7m AREA: 1796.61m²
MH12 CL: 77m IL: 76.028m AREA: 2187.64m²
MH13 CL: 78m IL: 75.932m AREA: 541.14m²
MH4 CL: 78m IL: 75.851m AREA: 1138.65m²
MH3 CL: 78m IL:76.257m AREA: 4971.68m²
MH5 CL: 78m IL: 75.830m AREA: 2087.54m²
MH7 CL: 78m IL: 75.696m AREA: 116.17m²
MH6 CL: 78m IL: 75.816m AREA: 480.55m²

1,121.89 sq m
896.19 sq m
123.62 sq m
822.4 sq m
1,796.61 sq m
2,187.64 sq m
541.14 sq m
2,087.54 sq m
4,971.68 sq m
116.17 sq m
480.55 sq m
1,138.65 sq m

4.000 6.000 6.001 4.001 4.002 5.001 5.000 3.001 3.000 3.002 3.003

Outfall	Type of outfall	Area (m²)	Description/Location	Invert level (m)
1	Surface water *Flow: 262.3l/s at 1:100*	6345.65	Outfall 1 to be retained and reused with the proposed network. Outfall to Market Street where the Thames water surfacewater sewerage is located. 50% of current flow is required for the proposed network.	75.7
2	Surface water *Flow: 484.7l/s at 1:100 years*	11193.5	Outfall 2 to be retained and reused for southern part of site. 2064.46m² of the area is taken from Vue cinema (located in excludence zone). The outfall is located in Cheap Street where thames water surface water network is located. 50% of current flow is required for the proposed network.	74.469
3	Surface water *Flow: 60.5 l/s at 1:100 years*	930.89	To be drained into Outfall 1 with the proposed network. Current outfall is located on Market Street.	75.049
4	Foul water	N/A	Taking the foul water from south of carpark area into Bartholowmew Street, inbetween MH0802 and MH0801 of the Thames water network.	N/A
5	Surface water	884.34	Taking the south part of the car park area into MH0853 on Bartholomew Street.	76.53
6	Surface water	220.75	Taking area from the South-west, next to the carpark inbetween MH0902 and MH0901 on Bartholomew Street.	N/A
7	Foul water	N/A	Taking the foul water from the carpark to inbetween MH0902 and MH0901 in Batholomew Street	74.319
8	Surface water	2105	Taking the carpark area into Bartholomew Street, to the left of MH0952 at 675 diameter	N/A
9	FOUL WATER	N/A	Taken the foul water from the western part of the site, outfalling inbetween MH0902 and MH0901 on Bartholomew Street	76.295
10	FOUL WATER	N/A	Taking the foul water from the North-west corner of site, outfalling inbetween MH0001 and MH1003 in Bartholomew Street.	N/A
11	FOUL WATER	N/A	Taking the foul water from the North-west corner of site, outfalling into MH	75.63

0m 10m 20m 30m 40m 50m

NOTES
Drainage routes have been taken from Thames Water drainage records, as well as various historic drawings within the Kennet Centre. All drawings used are subject to base mapping errors and distortion, and the routes shown should be treated as approximate and for guidance only.

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LOCHAILORT INVESTMENTS LTD — Client
COMPOSITE DRAINAGE PLAN KENNET CENTRE NEWBURY — Contract

Structural, Civil & Construction Engineering Consultant
RobertBirdGroup
Member of the Surbana Jurong Group
LONDON OFFICE
Robert Bird & Partners Limited
Harling House
47-51 Great Suffolk Street
Southwark
London SE1 0BS, ENGLAND
Ph: +44 (0) 20 7633 2880
Email: enquiries@robertbird.com.au
Web: www.robertbird.com
UK Co: #447 2743

Rev.	Revision Description	App	Date
P01	CATCHMENT PLAN OF EXISTING	GI	XX/09/23

Client: LOCHAILORT NEWBURY LIMITED
Project: KENNET CENTRE
Title: CATCHMENT PLAN OF THE EXISTING NETWORK

Designer:	Design Checker:	FOR INFORMATION		
N.BROWN	J.GOLD			
Drawn: N.BROWN	Approved: G.IRVINE	Job No: 4508	Sheet No: 4508-RBG-XX-XX-SK-C-0003	Rev: P01
Scale at A3: 1:500	Date: DD/09/2023			

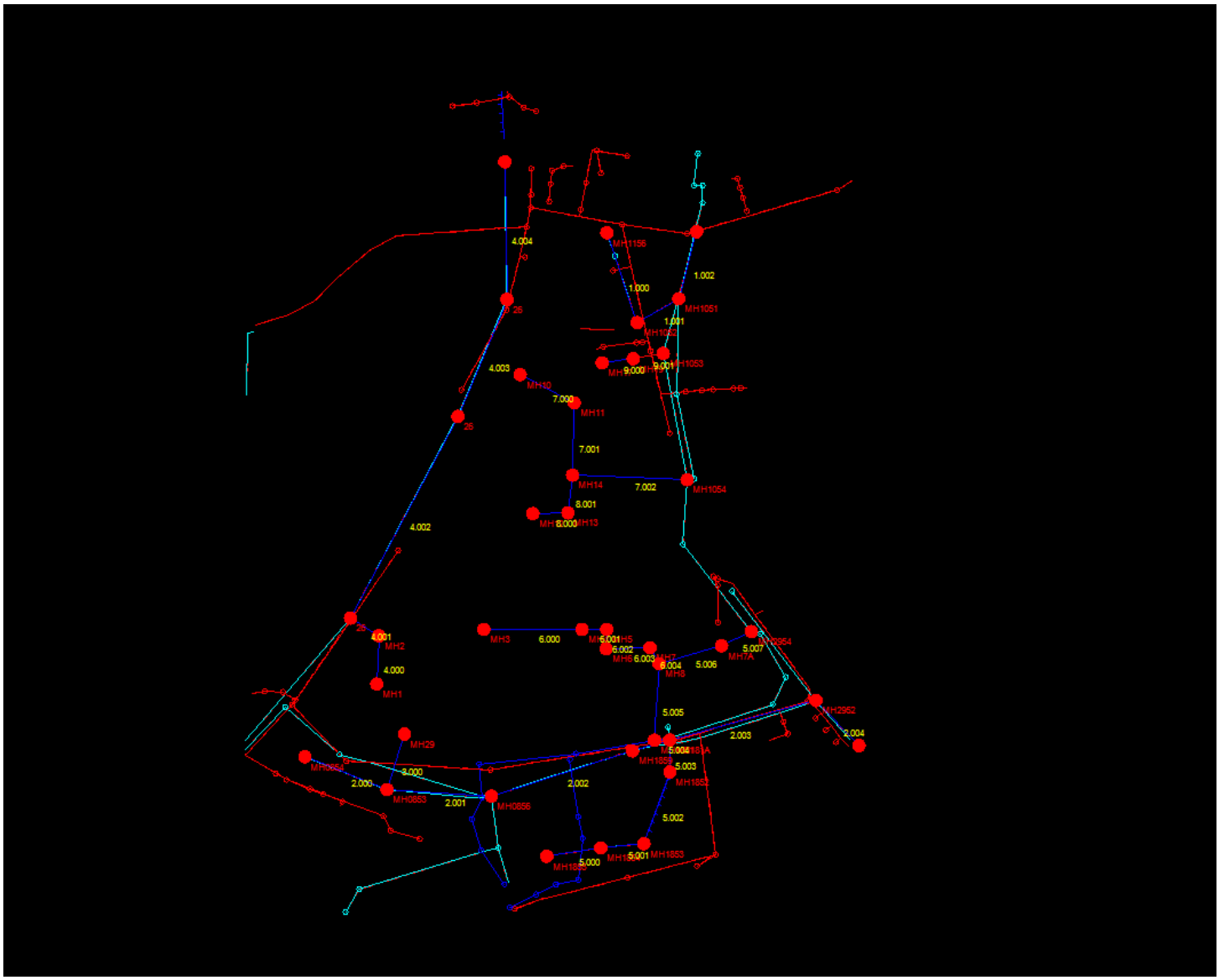
ICP SUDS Mean Annual Flood

Input

Return Period (years)	2	Soil	0.450
Area (ha)	1.633	Urban	0.000
SAAR (mm)	789	Region Number	Region 6

Results l/s

QBAR Rural	8.3
QBAR Urban	8.3
Q2 years	7.3
Q1 year	7.0
Q30 years	18.7
Q100 years	26.3


4.004
MH1156
1.000
1.002
MH1051
1.001
MH1052
9.000
9.001
MH1053
4.003
MH10
7.000
MH11
7.001
MH14
7.002
MH1054
8.001
MH13
4.002
MH3
6.000
6.001
MH5
6.002
MH6
6.003
MH7
6.004
MH8
5.006
MH7A
5.007
MH2952
2.004
5.005
2.003
MH1855
5.004
MH1855A
5.003
MH1852
2.002
5.002
MH1851
5.001
MH1853
5.000
MH1854
4.001
MH2
4.000
MH1
MH29
MH0854
8.000
2.000
MH0853
2.001
MH0856

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	30
FEH Rainfall Version	2013
Site Location	GB 447129 166981 SU 47129 66981
Data Type	Point
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	1.000
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

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	Auto Design
1.000	43.698	1.812	24.1	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	22.091	0.780	28.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	31.974	0.537	59.6	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
2.000	40.765	0.220	185.3	0.000	5.00	0.0	0.600	o	225	Pipe/Conduit	
3.000	26.882	0.179	150.0	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	
2.001	48.307	2.050	23.6	0.000	0.00	0.0	0.600	o	450	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	5.27	77.532	0.000	0.0	0.0	0.0	2.68	106.4	0.0
1.001	50.00	5.42	75.720	0.000	0.0	0.0	0.0	2.47	98.1	0.0
1.002	50.00	5.74	74.940	0.000	0.0	0.0	0.0	1.70	67.5	0.0
2.000	50.00	5.71	76.450	0.000	0.0	0.0	0.0	0.96	38.1	0.0
3.000	50.00	5.72	76.629	0.000	0.0	0.0	0.0	0.63	4.9	0.0
2.001	50.00	5.91	76.230	0.000	0.0	0.0	0.0	4.20	668.3	0.0

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	Auto Design
2.002	68.332	0.010	6833.2	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
2.003	87.799	0.160	548.7	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
2.004	28.814	0.511	56.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
4.000	22.253	0.222	100.2	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
4.001	15.381	0.154	99.9	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
4.002	105.381	0.156	675.0	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
4.003	58.532	0.087	675.0	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
4.004	63.569	0.094	675.0	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
5.000	25.181	0.230	109.5	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
5.001	19.997	0.250	80.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
5.002	35.277	1.040	33.9	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.003	14.721	0.035	424.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.004	6.911	0.016	424.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
5.005	35.348	0.100	353.5	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
6.000	45.295	0.406	111.6	0.497	5.00	0.0	0.600	o	610	Pipe/Conduit	
6.001	11.375	0.021	541.7	0.114	0.00	0.0	0.600	o	610	Pipe/Conduit	
6.002	8.926	0.014	637.5	0.209	0.00	0.0	0.600	o	610	Pipe/Conduit	
6.003	20.278	0.120	168.4	0.048	0.00	0.0	0.600	o	610	Pipe/Conduit	
6.004	8.496	0.087	97.7	0.016	0.00	0.0	0.600	o	610	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)
2.002	50.00	10.73	74.180	0.000	0.0	0.0	0.0	0.24	37.6	0.0
2.003	50.00	12.43	74.170	0.000	0.0	0.0	0.0	0.86	136.9	0.0
2.004	50.00	12.60	74.010	0.000	0.0	0.0	0.0	2.71	431.5	0.0
4.000	50.00	5.37	76.572	0.000	0.0	0.0	0.0	1.00	17.7	0.0
4.001	50.00	5.62	76.350	0.000	0.0	0.0	0.0	1.01	17.8	0.0
4.002	50.00	7.38	75.620	0.000	0.0	0.0	0.0	1.00	358.3	0.0
4.003	50.00	8.35	75.464	0.000	0.0	0.0	0.0	1.00	358.3	0.0
4.004	50.00	9.41	75.377	0.000	0.0	0.0	0.0	1.00	358.3	0.0
5.000	50.00	5.44	77.280	0.000	0.0	0.0	0.0	0.96	17.0	0.0
5.001	50.00	5.73	77.050	0.000	0.0	0.0	0.0	1.12	19.9	0.0
5.002	50.00	5.99	76.800	0.000	0.0	0.0	0.0	2.25	89.6	0.0
5.003	50.00	6.38	75.760	0.000	0.0	0.0	0.0	0.63	25.0	0.0
5.004	50.00	6.57	75.725	0.000	0.0	0.0	0.0	0.63	25.0	0.0
5.005	50.00	7.42	75.709	0.000	0.0	0.0	0.0	0.69	27.4	0.0
6.000	50.00	5.32	76.257	0.497	0.0	0.0	0.0	2.33	680.6	89.7
6.001	50.00	5.50	75.851	0.611	0.0	0.0	0.0	1.05	306.9	110.3
6.002	50.00	5.66	75.830	0.820	0.0	0.0	0.0	0.97	282.6	148.1
6.003	50.00	5.84	75.816	0.868	0.0	0.0	0.0	1.89	553.4	156.7
6.004	50.00	5.89	75.696	0.884	0.0	0.0	0.0	2.49	727.7	159.6

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	Auto Design
5.006	29.988	0.098	306.0	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	🔒
5.007	15.235	0.042	362.7	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	🔒
7.000	28.146	0.170	165.6	0.112	5.00	0.0	0.600	o	225	Pipe/Conduit	🔒
7.001	33.420	0.159	210.2	0.082	0.00	0.0	0.600	o	300	Pipe/Conduit	🔒
8.000	16.233	0.096	169.1	0.219	5.00	0.0	0.600	o	225	Pipe/Conduit	🔒
8.001	17.463	0.232	75.3	0.054	0.00	0.0	0.600	o	225	Pipe/Conduit	🔒
7.002	52.868	0.440	120.2	0.179	0.00	0.0	0.600	o	375	Pipe/Conduit	🔒
9.000	14.479	0.100	144.8	0.089	5.00	0.0	0.600	o	225	Pipe/Conduit	🔓
9.001	14.086	0.187	75.3	0.012	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)
5.006	50.00	7.76	75.609	0.884	0.0	0.0	0.0	1.49	534.2	159.6
5.007	50.00	7.94	75.511	0.884	0.0	0.0	0.0	1.37	490.3	159.6
7.000	50.00	5.46	76.029	0.112	0.0	0.0	0.0	1.01	40.3	20.2
7.001	50.00	5.98	75.859	0.194	0.0	0.0	0.0	1.08	76.4	35.0
8.000	50.00	5.27	76.028	0.219	0.0	0.0	0.0	1.00	39.9	39.5
8.001	50.00	5.46	75.932	0.273	0.0	0.0	0.0	1.51	60.0	49.3
7.002	50.00	6.51	75.700	0.646	0.0	0.0	0.0	1.65	182.4	116.6
9.000	50.00	5.22	75.876	0.089	0.0	0.0	0.0	1.08	43.1	16.1
9.001	50.00	5.38	75.776	0.101	0.0	0.0	0.0	1.51	60.0	18.2

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)
MH1156	78.000	0.468	Open Manhole	1200	1.000	77.532	225				
MH1052	77.440	1.720	Open Manhole	1200	1.001	75.720	225	1.000	75.720	225	
MH1051	76.310	1.370	Open Manhole	1200	1.002	74.940	225	1.001	74.940	225	
	76.000	1.597	Open Manhole	0		OUTFALL		1.002	74.403	225	
MH0854	77.300	0.850	Open Manhole	1200	2.000	76.450	225				
MH29	78.000	1.371	Open Manhole	1200	3.000	76.629	100				
MH0853	77.280	1.050	Open Manhole	1350	2.001	76.230	450	2.000	76.230	225	
								3.000	76.450	100	
MH0856	76.040	1.860	Open Manhole	1350	2.002	74.180	450	2.001	74.180	450	
MH1859	77.090	2.920	Open Manhole	1350	2.003	74.170	450	2.002	74.170	450	
MH2952	76.310	2.300	Open Manhole	1350	2.004	74.010	450	2.003	74.010	450	
	77.000	3.501	Open Manhole	0		OUTFALL		2.004	73.499	450	
MH1	78.000	1.428	Open Manhole	1200	4.000	76.572	150				
MH2	78.000	1.650	Open Manhole	1200	4.001	76.350	150	4.000	76.350	150	
26	78.000	2.380	Open Manhole	1500	4.002	75.620	675	4.001	76.196	150	51
26	76.660	1.196	Open Manhole	1500	4.003	75.464	675	4.002	75.464	675	
26	76.750	1.373	Open Manhole	1500	4.004	75.377	675	4.003	75.377	675	
	78.260	2.977	Open Manhole	0		OUTFALL		4.004	75.283	675	
MH1855	78.160	0.880	Open Manhole	1200	5.000	77.280	150				
MH1854	78.330	1.280	Open Manhole	1200	5.001	77.050	150	5.000	77.050	150	
MH1853	78.050	1.250	Open Manhole	1200	5.002	76.800	225	5.001	76.800	150	
MH1852	77.390	1.630	Open Manhole	1200	5.003	75.760	225	5.002	75.760	225	
MH181A	77.000	1.275	Open Manhole	1200	5.004	75.725	225	5.003	75.725	225	
MH1851	77.000	1.291	Open Manhole	1200	5.005	75.709	225	5.004	75.709	225	
MH3	78.000	1.743	Open Manhole	1500	6.000	76.257	610				
MH4	78.000	2.149	Open Manhole	1500	6.001	75.851	610	6.000	75.851	610	
MH5	78.000	2.170	Open Manhole	1500	6.002	75.830	610	6.001	75.830	610	
MH6	78.000	2.184	Open Manhole	1500	6.003	75.816	610	6.002	75.816	610	
MH7	78.000	2.304	Open Manhole	1500	6.004	75.696	610	6.003	75.696	610	
MH8	77.000	1.391	Open Manhole	1500	5.006	75.609	675	5.005	75.609	225	
								6.004	75.609	610	
MH7A	77.000	1.489	Open Manhole	1500	5.007	75.511	675	5.006	75.511	675	
MH2954	78.000	2.531	Open Manhole	1500		OUTFALL		5.007	75.469	675	
MH10	78.000	1.971	Open Manhole	1200	7.000	76.029	225				
MH11	77.000	1.141	Open Manhole	1200	7.001	75.859	300	7.000	75.859	225	
MH12	77.000	0.972	Open Manhole	1200	8.000	76.028	225				
MH13	78.000	2.068	Open Manhole	1200	8.001	75.932	225	8.000	75.932	225	
MH14	77.000	1.300	Open Manhole	1350	7.002	75.700	375	7.001	75.700	300	

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)
								8.001	75.700	225	
MH1054	76.770	1.510	Open Manhole	1800		OUTFALL		7.002	75.260	375	
MH17	78.000	2.124	Open Manhole	1200	9.000	75.876	225				
MH19	78.000	2.224	Open Manhole	1200	9.001	75.776	225	9.000	75.776	225	
MH1053	76.700	1.111	Open Manhole	1800		OUTFALL		9.001	75.589	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
MH1156	447150.331	167126.951	447150.331	167126.951	Required	
MH1052	447164.399	167085.580	447164.399	167085.580	Required	
MH1051	447183.540	167096.610	447183.540	167096.610	Required	
	447191.824	167127.492			No Entry	
MH0854	447011.060	166885.139	447011.060	166885.139	Required	
MH29	447057.009	166895.630	447057.009	166895.630	Required	
MH0853	447048.909	166869.997	447048.909	166869.997	Required	
MH0856	447097.122	166866.995	447097.122	166866.995	Required	
MH1859	447162.197	166887.842	447162.197	166887.842	Required	
MH2952	447246.844	166911.154	447246.844	166911.154	Required	
	447266.771	166890.342			No Entry	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
MH1	447044.189	166918.722	447044.189	166918.722	Required	
MH2	447045.165	166940.954	447045.165	166940.954	Required	
26	447032.168	166949.179	447032.168	166949.179	Required	
26	447081.626	167042.234	447081.626	167042.234	Required	
26	447104.318	167096.188	447104.318	167096.188	Required	
	447103.262	167159.748			No Entry	
MH1855	447122.696	166839.213	447122.696	166839.213	Required	
MH1854	447147.575	166843.104	447147.575	166843.104	Required	
MH1853	447167.484	166844.979	447167.484	166844.979	Required	
MH1852	447179.493	166878.148	447179.493	166878.148	Required	
MH181A	447179.301	166892.868	447179.301	166892.868	Required	
MH1851	447172.390	166892.797	447172.390	166892.797	Required	
MH3	447093.603	166943.927	447093.603	166943.927	Required	
MH4	447138.898	166943.922	447138.898	166943.922	Required	
MH5	447150.273	166943.940	447150.273	166943.940	Required	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
MH6	447150.045	166935.017	447150.045	166935.017	Required	
MH7	447170.318	166935.470	447170.318	166935.470	Required	
MH8	447174.513	166928.081	447174.513	166928.081	Required	
MH7A	447203.330	166936.380	447203.330	166936.380	Required	
MH2954	447217.085	166942.931			No Entry	
MH10	447110.391	167061.526	447110.391	167061.526	Required	
MH11	447135.348	167048.512	447135.348	167048.512	Required	
MH12	447116.232	166997.381	447116.232	166997.381	Required	
MH13	447132.461	166997.766	447132.461	166997.766	Required	
MH14	447134.568	167015.101	447134.568	167015.101	Required	
MH1054	447187.394	167012.986			No Entry	
MH17	447148.189	167066.954	447148.189	167066.954	Required	
MH19	447162.544	167068.838	447162.544	167068.838	Required	
MH1053	447176.412	167071.308			No Entry	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.000	0.000	0.000
1.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.000	0.000	0.000
3.000	-	-	100	0.000	0.000	0.000
2.001	-	-	100	0.000	0.000	0.000
2.002	-	-	100	0.000	0.000	0.000
2.003	-	-	100	0.000	0.000	0.000
2.004	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.000	0.000	0.000
4.001	-	-	100	0.000	0.000	0.000
4.002	-	-	100	0.000	0.000	0.000
4.003	-	-	100	0.000	0.000	0.000
4.004	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.000	0.000	0.000
5.001	-	-	100	0.000	0.000	0.000
5.002	-	-	100	0.000	0.000	0.000
5.003	-	-	100	0.000	0.000	0.000
5.004	-	-	100	0.000	0.000	0.000
5.005	-	-	100	0.000	0.000	0.000
6.000	-	-	100	0.497	0.497	0.497
6.001	-	-	100	0.114	0.114	0.114
6.002	-	-	100	0.209	0.209	0.209
6.003	-	-	100	0.048	0.048	0.048
6.004	-	-	100	0.016	0.016	0.016
5.006	-	-	100	0.000	0.000	0.000
5.007	-	-	100	0.000	0.000	0.000
7.000	-	-	100	0.112	0.112	0.112
7.001	-	-	100	0.082	0.082	0.082
8.000	-	-	100	0.219	0.219	0.219
8.001	-	-	100	0.054	0.054	0.054
7.002	-	-	100	0.179	0.179	0.179
9.000	-	-	100	0.089	0.089	0.089
9.001	-	-	100	0.012	0.012	0.012
				Total	Total	Total
				1.631	1.631	1.631

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)
1.002		76.000	74.403	0.000	0	0

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)
2.004		77.000	73.499	0.000	0	0

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)
4.004		78.260	75.283	0.000	0	0

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)
5.007	MH2954	78.000	75.469	0.000	1500	0

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)
7.002	MH1054	76.770	75.260	0.000	1800	0

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)
9.001	MH1053	76.700	75.589	0.000	1800	0

Simulation Criteria for Storm

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

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

Simulation Criteria for Storm

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 447129 166981 SU 47129 66981
Data Type	Point
Summer Storms	Yes
Winter Storms	No
Cv (Summer)	1.000
Cv (Winter)	1.000
Storm Duration (mins)	30

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 447129 166981 SU 47129 66981
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	MH1156	15 Summer	2	+0%					77.532
1.001	MH1052	15 Summer	2	+0%					75.720
1.002	MH1051	15 Summer	2	+0%					74.940
2.000	MH0854	15 Summer	2	+0%					76.450
3.000	MH29	15 Summer	2	+0%					76.629
2.001	MH0853	15 Summer	2	+0%					76.230
2.002	MH0856	15 Summer	2	+0%					74.180
2.003	MH1859	15 Summer	2	+0%					74.170
2.004	MH2952	15 Summer	2	+0%					74.010
4.000	MH1	15 Summer	2	+0%					76.572
4.001	MH2	15 Summer	2	+0%					76.350
4.002	26	15 Summer	2	+0%					75.620
4.003	26	15 Summer	2	+0%					75.464
4.004	26	15 Summer	2	+0%					75.377
5.000	MH1855	15 Summer	2	+0%					77.280
5.001	MH1854	15 Summer	2	+0%					77.050

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	MH1156	-0.225	0.000	0.00			0.0	OK	
1.001	MH1052	-0.225	0.000	0.00			0.0	OK	
1.002	MH1051	-0.225	0.000	0.00			0.0	OK	
2.000	MH0854	-0.225	0.000	0.00			0.0	OK	
3.000	MH29	-0.100	0.000	0.00			0.0	OK	
2.001	MH0853	-0.450	0.000	0.00			0.0	OK	
2.002	MH0856	-0.450	0.000	0.00			0.0	OK	
2.003	MH1859	-0.450	0.000	0.00			0.0	OK	
2.004	MH2952	-0.450	0.000	0.00			0.0	OK	
4.000	MH1	-0.150	0.000	0.00			0.0	OK	
4.001	MH2	-0.150	0.000	0.00			0.0	OK	
4.002	26	-0.675	0.000	0.00			0.0	OK	
4.003	26	-0.675	0.000	0.00			0.0	OK	
4.004	26	-0.675	0.000	0.00			0.0	OK	
5.000	MH1855	-0.150	0.000	0.00			0.0	OK	
5.001	MH1854	-0.150	0.000	0.00			0.0	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
5.002	MH1853	15 Summer	2	+0%				
5.003	MH1852	30 Summer	2	+0%	30/15 Summer			
5.004	MH181A	15 Summer	2	+0%	30/15 Summer			
5.005	MH1851	15 Summer	2	+0%	30/15 Summer			
6.000	MH3	15 Summer	2	+0%	100/15 Summer			
6.001	MH4	15 Summer	2	+0%	30/15 Summer			
6.002	MH5	15 Summer	2	+0%	30/15 Summer			
6.003	MH6	15 Summer	2	+0%	30/15 Summer			
6.004	MH7	15 Summer	2	+0%	30/15 Summer			
5.006	MH8	15 Summer	2	+0%	100/15 Summer			
5.007	MH7A	15 Summer	2	+0%	100/15 Summer			
7.000	MH10	15 Summer	2	+0%	30/15 Summer			
7.001	MH11	15 Summer	2	+0%	30/15 Summer	100/15 Summer		
8.000	MH12	15 Summer	2	+0%	2/15 Summer	30/15 Summer		
8.001	MH13	15 Summer	2	+0%	30/15 Summer			
7.002	MH14	15 Summer	2	+0%	30/15 Summer			
9.000	MH17	15 Summer	2	+0%	30/15 Summer			
9.001	MH19	15 Summer	2	+0%	100/15 Summer			

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
5.002	MH1853	76.800	-0.225	0.000	0.00			0.0	OK
5.003	MH1852	75.874	-0.111	0.000	0.03			0.6	OK
5.004	MH181A	75.875	-0.075	0.000	0.13			2.5	OK
5.005	MH1851	75.887	-0.047	0.000	0.13			3.4	OK
6.000	MH3	76.424	-0.443	0.000	0.16			96.5	OK
6.001	MH4	76.286	-0.175	0.000	0.74			110.6	OK
6.002	MH5	76.258	-0.182	0.000	0.85			141.7	OK
6.003	MH6	76.091	-0.335	0.000	0.41			149.5	OK
6.004	MH7	75.972	-0.334	0.000	0.42			152.7	OK
5.006	MH8	75.909	-0.375	0.000	0.34			145.9	OK
5.007	MH7A	75.837	-0.349	0.000	0.47			144.3	OK
7.000	MH10	76.154	-0.100	0.000	0.58			21.6	OK
7.001	MH11	76.010	-0.149	0.000	0.50			34.7	OK
8.000	MH12	76.291	0.038	0.000	1.20			42.4	SURCHARGED
8.001	MH13	76.134	-0.023	0.000	0.95			50.9	OK
7.002	MH14	75.926	-0.149	0.000	0.66			111.7	OK
9.000	MH17	75.984	-0.117	0.000	0.46			17.5	OK
9.001	MH19	75.871	-0.130	0.000	0.37			19.3	OK

OUTFALL 2

OUTFALL 1

OUTFALL 3

PN	US/MH Name	Level Exceeded
5.002	MH1853	

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

PN	US/MH Name	Level Exceeded
5.003	MH1852	
5.004	MH181A	
5.005	MH1851	
6.000	MH3	
6.001	MH4	
6.002	MH5	
6.003	MH6	
6.004	MH7	
5.006	MH8	
5.007	MH7A	
7.000	MH10	
7.001	MH11	3
8.000	MH12	9
8.001	MH13	
7.002	MH14	
9.000	MH17	
9.001	MH19	

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 447129 166981 SU 47129 66981
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	MH1156	15 Summer	30	+0%					77.532
1.001	MH1052	15 Summer	30	+0%					75.720
1.002	MH1051	15 Summer	30	+0%					74.940
2.000	MH0854	15 Summer	30	+0%					76.450
3.000	MH29	15 Summer	30	+0%					76.629
2.001	MH0853	15 Summer	30	+0%					76.230
2.002	MH0856	15 Summer	30	+0%					74.180
2.003	MH1859	15 Summer	30	+0%					74.170
2.004	MH2952	15 Summer	30	+0%					74.010
4.000	MH1	15 Summer	30	+0%					76.572
4.001	MH2	15 Summer	30	+0%					76.350
4.002	26	15 Summer	30	+0%					75.620
4.003	26	15 Summer	30	+0%					75.464
4.004	26	15 Summer	30	+0%					75.377
5.000	MH1855	15 Summer	30	+0%					77.280
5.001	MH1854	15 Summer	30	+0%					77.050

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	MH1156	-0.225	0.000	0.00			0.0	OK	
1.001	MH1052	-0.225	0.000	0.00			0.0	OK	
1.002	MH1051	-0.225	0.000	0.00			0.0	OK	
2.000	MH0854	-0.225	0.000	0.00			0.0	OK	
3.000	MH29	-0.100	0.000	0.00			0.0	OK	
2.001	MH0853	-0.450	0.000	0.00			0.0	OK	
2.002	MH0856	-0.450	0.000	0.00			0.0	OK	
2.003	MH1859	-0.450	0.000	0.00			0.0	OK	
2.004	MH2952	-0.450	0.000	0.00			0.0	OK	
4.000	MH1	-0.150	0.000	0.00			0.0	OK	
4.001	MH2	-0.150	0.000	0.00			0.0	OK	
4.002	26	-0.675	0.000	0.00			0.0	OK	
4.003	26	-0.675	0.000	0.00			0.0	OK	
4.004	26	-0.675	0.000	0.00			0.0	OK	
5.000	MH1855	-0.150	0.000	0.00			0.0	OK	
5.001	MH1854	-0.150	0.000	0.00			0.0	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
5.002	MH1853	15 Summer	30	+0%				
5.003	MH1852	15 Summer	30	+0%	30/15 Summer			
5.004	MH181A	15 Summer	30	+0%	30/15 Summer			
5.005	MH1851	15 Summer	30	+0%	30/15 Summer			
6.000	MH3	15 Summer	30	+0%	100/15 Summer			
6.001	MH4	15 Summer	30	+0%	30/15 Summer			
6.002	MH5	15 Summer	30	+0%	30/15 Summer			
6.003	MH6	15 Summer	30	+0%	30/15 Summer			
6.004	MH7	15 Summer	30	+0%	30/15 Summer			
5.006	MH8	15 Summer	30	+0%	100/15 Summer			
5.007	MH7A	30 Summer	30	+0%	100/15 Summer			
7.000	MH10	15 Summer	30	+0%	30/15 Summer			
7.001	MH11	15 Summer	30	+0%	30/15 Summer	100/15 Summer		
8.000	MH12	15 Summer	30	+0%	2/15 Summer	30/15 Summer		
8.001	MH13	15 Summer	30	+0%	30/15 Summer			
7.002	MH14	15 Summer	30	+0%	30/15 Summer			
9.000	MH17	15 Summer	30	+0%	30/15 Summer			
9.001	MH19	15 Summer	30	+0%	100/15 Summer			

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
5.002	MH1853	76.800	-0.225	0.000	0.00			0.0	OK
5.003	MH1852	76.275	0.290	0.000	0.27			5.2	SURCHARGED
5.004	MH181A	76.277	0.327	0.000	0.38			7.7	SURCHARGED
5.005	MH1851	76.278	0.344	0.000	0.31			8.0	SURCHARGED
6.000	MH3	76.762	-0.105	0.000	0.38			225.7	OK
6.001	MH4	76.646	0.185	0.000	1.85			275.0	SURCHARGED
6.002	MH5	76.616	0.176	0.000	2.20			369.0	SURCHARGED
6.003	MH6	76.534	0.108	0.000	1.08			389.6	SURCHARGED
6.004	MH7	76.409	0.103	0.000	1.08			391.8	SURCHARGED
5.006	MH8	76.284	0.000	0.000	0.86			363.6	OK
5.007	MH7A	76.186	0.000	0.000	1.10			335.1	OK
7.000	MH10	77.085	0.831	0.000	1.37			51.5	SURCHARGED
7.001	MH11	76.784	0.625	0.000	1.24			86.5	FLOOD RISK
8.000	MH12	77.011	0.758	11.049	2.03			71.6	FLOOD
8.001	MH13	76.891	0.734	0.000	1.49			79.9	SURCHARGED
7.002	MH14	76.529	0.454	0.000	1.39			236.1	SURCHARGED
9.000	MH17	76.114	0.013	0.000	1.10			41.6	SURCHARGED
9.001	MH19	75.946	-0.055	0.000	0.90			47.2	OK

OUTFALL 2

OUTFALL 1

OUTFALL 3

PN	US/MH Name	Level Exceeded
5.002	MH1853	

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

PN	US/MH Name	Level Exceeded
5.003	MH1852	
5.004	MH181A	
5.005	MH1851	
6.000	MH3	
6.001	MH4	
6.002	MH5	
6.003	MH6	
6.004	MH7	
5.006	MH8	
5.007	MH7A	
7.000	MH10	
7.001	MH11	3
8.000	MH12	9
8.001	MH13	
7.002	MH14	
9.000	MH17	
9.001	MH19	

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

Simulation Criteria

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

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

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 447129 166981 SU 47129 66981
Data Type	Point
Cv (Summer)	1.000
Cv (Winter)	1.000

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

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	MH1156	15 Summer	100	+0%					77.532
1.001	MH1052	15 Summer	100	+0%					75.720
1.002	MH1051	15 Summer	100	+0%					74.940
2.000	MH0854	15 Summer	100	+0%					76.450
3.000	MH29	15 Summer	100	+0%					76.629
2.001	MH0853	15 Summer	100	+0%					76.230
2.002	MH0856	15 Summer	100	+0%					74.180
2.003	MH1859	15 Summer	100	+0%					74.170
2.004	MH2952	15 Summer	100	+0%					74.010
4.000	MH1	15 Summer	100	+0%					76.572
4.001	MH2	15 Summer	100	+0%					76.350
4.002	26	15 Summer	100	+0%					75.620
4.003	26	15 Summer	100	+0%					75.464
4.004	26	15 Summer	100	+0%					75.377
5.000	MH1855	15 Summer	100	+0%					77.280
5.001	MH1854	15 Summer	100	+0%					77.050

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

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	MH1156	-0.225	0.000	0.00			0.0	OK	
1.001	MH1052	-0.225	0.000	0.00			0.0	OK	
1.002	MH1051	-0.225	0.000	0.00			0.0	OK	
2.000	MH0854	-0.225	0.000	0.00			0.0	OK	
3.000	MH29	-0.100	0.000	0.00			0.0	OK	
2.001	MH0853	-0.450	0.000	0.00			0.0	OK	
2.002	MH0856	-0.450	0.000	0.00			0.0	OK	
2.003	MH1859	-0.450	0.000	0.00			0.0	OK	
2.004	MH2952	-0.450	0.000	0.00			0.0	OK	
4.000	MH1	-0.150	0.000	0.00			0.0	OK	
4.001	MH2	-0.150	0.000	0.00			0.0	OK	
4.002	26	-0.675	0.000	0.00			0.0	OK	
4.003	26	-0.675	0.000	0.00			0.0	OK	
4.004	26	-0.675	0.000	0.00			0.0	OK	
5.000	MH1855	-0.150	0.000	0.00			0.0	OK	
5.001	MH1854	-0.150	0.000	0.00			0.0	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.
5.002	MH1853	15 Summer	100	+0%				
5.003	MH1852	15 Summer	100	+0%	30/15 Summer			
5.004	MH181A	15 Summer	100	+0%	30/15 Summer			
5.005	MH1851	15 Summer	100	+0%	30/15 Summer			
6.000	MH3	15 Summer	100	+0%	100/15 Summer			
6.001	MH4	15 Summer	100	+0%	30/15 Summer			
6.002	MH5	15 Summer	100	+0%	30/15 Summer			
6.003	MH6	15 Summer	100	+0%	30/15 Summer			
6.004	MH7	15 Summer	100	+0%	30/15 Summer			
5.006	MH8	15 Summer	100	+0%	100/15 Summer			
5.007	MH7A	15 Summer	100	+0%	100/15 Summer			
7.000	MH10	15 Summer	100	+0%	30/15 Summer			
7.001	MH11	15 Summer	100	+0%	30/15 Summer	100/15 Summer		
8.000	MH12	15 Summer	100	+0%	2/15 Summer	30/15 Summer		
8.001	MH13	15 Summer	100	+0%	30/15 Summer			
7.002	MH14	15 Summer	100	+0%	30/15 Summer			
9.000	MH17	15 Summer	100	+0%	30/15 Summer			
9.001	MH19	15 Summer	100	+0%	100/15 Summer			

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
5.002	MH1853	76.800	-0.225	0.000	0.00			0.0	OK
5.003	MH1852	76.353	0.368	0.000	0.26			5.0	SURCHARGED
5.004	MH181A	76.359	0.409	0.000	0.37			7.5	SURCHARGED
5.005	MH1851	76.370	0.436	0.000	0.37			9.5	SURCHARGED
6.000	MH3	77.348	0.481	0.000	0.49			287.8	SURCHARGED
6.001	MH4	77.159	0.698	0.000	2.38			352.7	SURCHARGED
6.002	MH5	77.093	0.653	0.000	2.82			472.5	SURCHARGED
6.003	MH6	76.871	0.445	0.000	1.39			501.1	SURCHARGED
6.004	MH7	76.641	0.335	0.000	1.41			509.5	SURCHARGED
5.006	MH8	76.408	0.124	0.000	1.14			481.5	SURCHARGED
5.007	MH7A	76.259	0.073	0.000	1.58			484.7	SURCHARGED
7.000	MH10	77.550	1.296	0.000	1.75			65.4	SURCHARGED
7.001	MH11	77.002	0.843	1.696	1.62			113.4	FLOOD
8.000	MH12	77.024	0.771	24.159	2.00			70.8	FLOOD
8.001	MH13	76.977	0.820	0.000	1.50			80.2	SURCHARGED
7.002	MH14	76.722	0.647	0.000	1.55			262.3	FLOOD RISK
9.000	MH17	76.264	0.163	0.000	1.39			52.5	SURCHARGED
9.001	MH19	76.061	0.060	0.000	1.16			60.5	SURCHARGED

OUTFALL 2

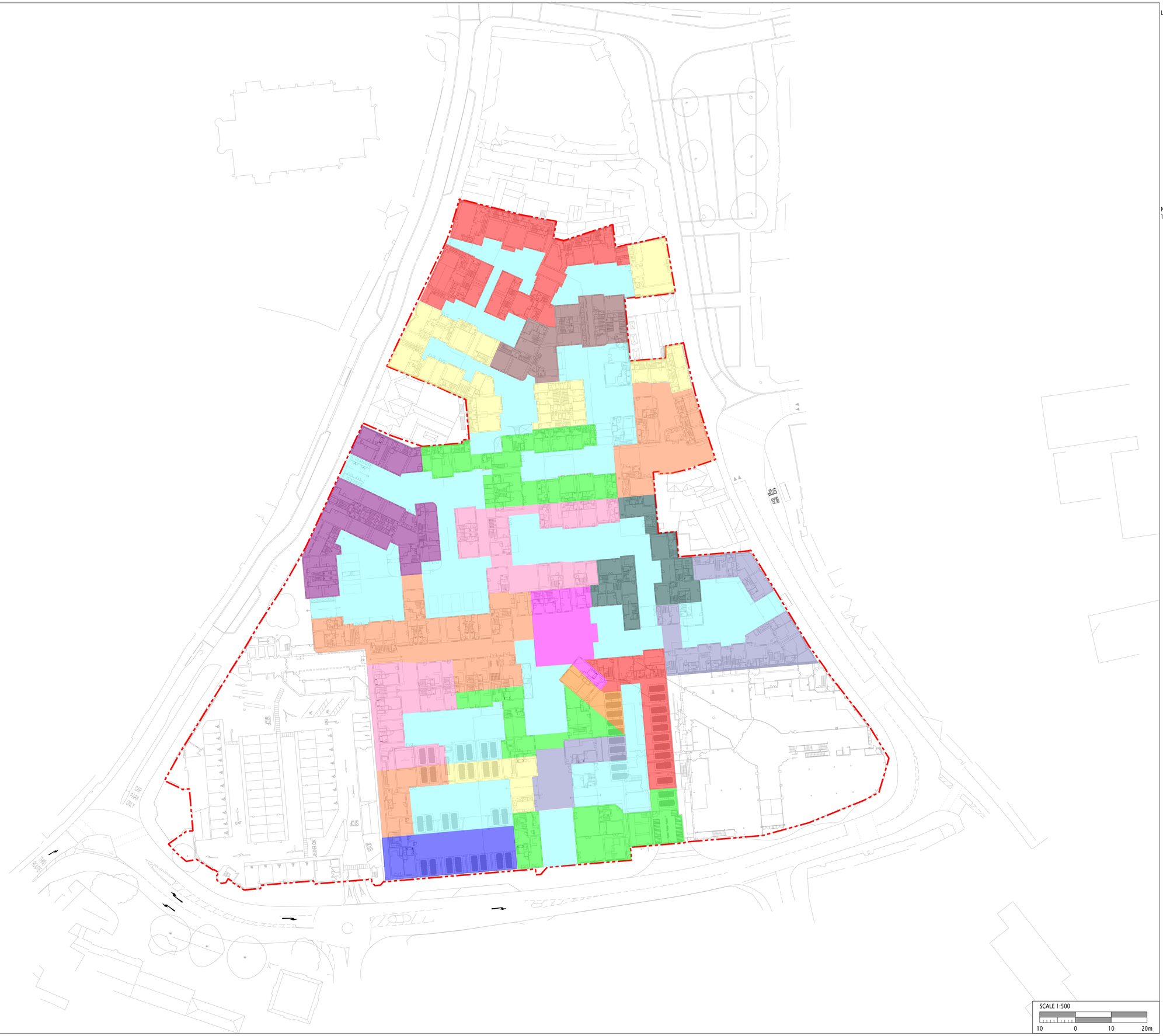
OUTFALL 1

OUTFALL 3

PN	US/MH Name	Level Exceeded
5.002	MH1853	

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

PN	US/MH Name	Level Exceeded
5.003	MH1852	
5.004	MH181A	
5.005	MH1851	
6.000	MH3	
6.001	MH4	
6.002	MH5	
6.003	MH6	
6.004	MH7	
5.006	MH8	
5.007	MH7A	
7.000	MH10	
7.001	MH11	3
8.000	MH12	9
8.001	MH13	
7.002	MH14	
9.000	MH17	
9.001	MH19	



LEGENDS:

NOTES:
1.

17/05/24

Rev	Revision Description	By	App	Date

DO NOT SCALE DRAWINGS, USE FIGURED DIMENSIONS
REFER TO GENERAL NOTES UNLESS NOTED OTHERWISE

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Client
LOCHAILORT NEWBURY LIMITED

Project
OLD TOWN

Title
PROPOSED CATCHMENT PLAN

Date 17/05/24	**Drawn** K. Hannon
Scale at A1 1:500	**Designer** N. Brown
Suitability Code S2	**Design Checker** J. Gold
Job Number 4508	**Approved** G. Irvine

For Information

Drawing Number 4508-RBG-XX-XX-DR-CV-87004

Revision

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 447129 166981 SU 47129 66981
Data Type	Point
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	1.000
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Inverts

Time Area Diagram for Storm at outfall OF1 (pipe 1.004)

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.297	4-8	0.257	8-12	0.066	12-16	0.066	16-20	0.022

Total Area Contributing (ha) = 0.710

Total Pipe Volume (m^3) = 18.276

Time Area Diagram at outfall OF2 (pipe 7.006)

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.327	4-8	0.429	8-12	0.050	12-16	0.050	16-20	0.022

Total Area Contributing (ha) = 0.878

Total Pipe Volume (m^3) = 48.457

Network Design Table for Storm

« - Indicates pipe capacity < flow

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

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)

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	Auto Design
1.000	1.803	0.006	300.0	0.023	15.00	0.0	0.600	o	300	Pipe/Conduit	🔒
1.001	14.254	0.038	375.5	0.071	0.00	0.0	0.600	o	300	Pipe/Conduit	🔒
2.000	15.008	0.051	292.0	0.050	15.00	0.0	0.600	o	150	Pipe/Conduit	🔒
2.001	12.998	0.068	191.9	0.010	0.00	0.0	0.600	o	150	Pipe/Conduit	🔒
2.002	26.765	0.089	300.0	0.051	0.00	0.0	0.600	o	300	Pipe/Conduit	🔒
1.002	33.309	0.111	300.0	0.052	0.00	0.0	0.600	o	300	Pipe/Conduit	🔒
1.003	8.397	0.028	296.0	0.014	0.00	0.0	0.600	o	300	Pipe/Conduit	🔒
3.000	17.987	0.058	310.1	0.094	15.00	0.0	0.600	o	300	Pipe/Conduit	🔒
4.000	1.425	0.010	150.0	0.033	15.00	0.0	0.600	o	150	Pipe/Conduit	🔓
3.001	26.569	0.090	295.2	0.046	0.00	0.0	0.600	o	300	Pipe/Conduit	🔒
5.000	15.892	0.110	144.5	0.019	15.00	0.0	0.600	o	150	Pipe/Conduit	🔓
3.002	7.824	0.007	1117.8	0.036	0.00	0.0	0.600	o	300	Pipe/Conduit	🔒
6.000	5.808	0.009	622.3	0.030	15.00	0.0	0.600	o	150	Pipe/Conduit	🔓
6.001	17.254	0.115	150.0	0.068	0.00	0.0	0.600	o	225	Pipe/Conduit	🔒
3.003	23.644	0.064	371.8	0.058	0.00	0.0	0.600	o	300	Pipe/Conduit	🔒
1.004	48.326	0.129	375.9	0.054	0.00	0.0	0.600	o	375	Pipe/Conduit	🔒
7.000	12.954	0.086	150.0	0.025	15.00	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	34.30	15.03	76.044	0.023	0.0	0.0	0.0	0.90	63.8	2.8
1.001	33.83	15.33	76.038	0.094	0.0	0.0	0.0	0.81	56.9	11.4
2.000	33.68	15.43	76.445	0.050	0.0	0.0	0.0	0.58	10.3	6.1
2.001	33.24	15.73	76.394	0.060	0.0	0.0	0.0	0.72	12.8	7.3
2.002	32.56	16.22	76.089	0.111	0.0	0.0	0.0	0.90	63.8	13.1
1.002	31.79	16.84	76.000	0.257	0.0	0.0	0.0	0.90	63.8	29.5
1.003	31.60	16.99	75.693	0.271	0.0	0.0	0.0	0.90	63.9	30.9
3.000	33.81	15.34	76.088	0.094	0.0	0.0	0.0	0.89	62.7	11.5
4.000	34.31	15.03	76.040	0.033	0.0	0.0	0.0	0.82	14.5	4.0
3.001	33.10	15.82	76.030	0.172	0.0	0.0	0.0	0.91	64.3	20.6
5.000	33.85	15.32	76.050	0.019	0.0	0.0	0.0	0.83	14.7	2.4
3.002	32.72	16.11	75.940	0.228	0.0	0.0	0.0	0.46	32.7	26.9
6.000	33.96	15.24	76.064	0.030	0.0	0.0	0.0	0.40	7.0	3.7
6.001	33.55	15.51	76.055	0.098	0.0	0.0	0.0	1.07	42.4	11.9
3.003	32.09	16.59	75.854	0.384	0.0	0.0	0.0	0.81	57.2	44.5
1.004	30.62	17.86	75.665	0.710	0.0	0.0	0.0	0.93	102.6	78.5
7.000	33.93	15.26	76.547	0.025	0.0	0.0	0.0	0.82	14.5	3.0

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	Auto Design
7.001	14.654	0.017	846.3	0.029	0.00	0.0	0.600	o	150	Pipe/Conduit	
7.002	12.223	0.041	300.0	0.019	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.000	2.799	0.018	157.8	0.029	15.00	0.0	0.600	o	150	Pipe/Conduit	
8.001	11.796	0.039	300.0	0.072	0.00	0.0	0.600	o	300	Pipe/Conduit	
9.000	3.587	0.024	150.0	0.065	15.00	0.0	0.600	o	150	Pipe/Conduit	
9.001	2.634	0.018	150.0	0.035	0.00	0.0	0.600	o	150	Pipe/Conduit	
9.002	14.668	0.024	600.0	0.058	0.00	0.0	0.600	o	300	Pipe/Conduit	
9.003	14.668	0.024	600.0	0.014	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.002	15.782	0.053	300.0	0.035	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.003	15.782	0.053	300.0	0.021	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.004	15.617	0.052	300.0	0.145	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.005	4.095	0.013	315.0	0.022	0.00	0.0	0.600	o	300	Pipe/Conduit	
10.000	1.744	0.012	150.0	0.053	15.00	0.0	0.600	o	150	Pipe/Conduit	
10.001	18.880	0.063	300.0	0.029	0.00	0.0	0.600	o	300	Pipe/Conduit	
8.006	16.859	0.056	300.0	0.034	0.00	0.0	0.600	o	300	Pipe/Conduit	
11.000	6.816	0.046	148.5	0.016	15.00	0.0	0.600	o	150	Pipe/Conduit	
11.001	7.134	0.024	300.0	0.060	0.00	0.0	0.600	o	300	Pipe/Conduit	
12.000	2.442	1.000	2.4	0.000	15.00	0.0	0.600	o	100	Pipe/Conduit	
12.001	1.310	1.000	1.3	0.051	0.00	0.0	0.600	o	100	Pipe/Conduit	
12.002	28.717	23.000	1.2	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)
7.001	32.88	15.99	75.961	0.053	0.0	0.0	0.0	0.34	6.0«	6.3
7.002	32.58	16.21	75.944	0.073	0.0	0.0	0.0	0.90	63.8	8.5
8.000	34.26	15.06	76.128	0.029	0.0	0.0	0.0	0.80	14.1	3.6
8.001	33.91	15.28	76.107	0.101	0.0	0.0	0.0	0.90	63.8	12.3
9.000	34.24	15.07	76.358	0.065	0.0	0.0	0.0	0.82	14.5	8.0
9.001	34.15	15.13	76.184	0.100	0.0	0.0	0.0	0.82	14.5	12.3
9.002	33.55	15.51	76.166	0.157	0.0	0.0	0.0	0.63	44.9	19.1
9.003	33.00	15.90	76.142	0.171	0.0	0.0	0.0	0.63	44.9	20.4
8.002	32.61	16.19	76.068	0.307	0.0	0.0	0.0	0.90	63.8	36.1
8.003	32.23	16.48	76.015	0.328	0.0	0.0	0.0	0.90	63.8	38.1
8.004	31.88	16.77	75.963	0.473	0.0	0.0	0.0	0.90	63.8	54.4
8.005	31.78	16.85	75.724	0.495	0.0	0.0	0.0	0.88	62.2	56.8
10.000	34.30	15.04	76.068	0.053	0.0	0.0	0.0	0.82	14.5	6.6
10.001	33.74	15.38	75.785	0.082	0.0	0.0	0.0	0.90	63.8	10.0
8.006	31.41	17.16	75.711	0.611	0.0	0.0	0.0	0.90	63.8«	69.3
11.000	34.13	15.14	75.992	0.016	0.0	0.0	0.0	0.82	14.5	2.0
11.001	33.92	15.27	75.946	0.076	0.0	0.0	0.0	0.90	63.8	9.3
12.000	34.35	15.01	101.000	0.000	0.0	0.0	0.0	4.99	39.2	0.0
12.001	34.34	15.01	100.000	0.051	0.0	0.0	0.0	6.82	53.5	6.3
12.002	34.25	15.06	99.000	0.051	0.0	0.0	0.0	9.09	160.7	6.3

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	Auto Design
7.003	17.792	0.059	300.0	0.027	0.00	0.0	0.600	o	300	Pipe/Conduit	
7.004	23.544	0.035	675.0	0.041	0.00	0.0	0.600	o	900	Pipe/Conduit	
7.005	33.591	0.050	671.8	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
7.006	23.582	0.151	156.2	0.000	0.00	0.0	0.600	o	675	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)
7.003	31.04	17.49	75.655	0.838	0.0	0.0	0.0	0.90	63.8«	93.9
7.004	30.68	17.81	75.596	0.878	0.0	0.0	0.0	1.20	762.4	97.3
7.005	30.09	18.37	75.561	0.878	0.0	0.0	0.0	1.00	359.1	97.3
7.006	29.90	18.56	75.511	0.878	0.0	0.0	0.0	2.09	749.6	97.3

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)
CR9	76.620	0.576	Open Manhole	1200	1.000	76.044	300				
MH14	76.620	0.582	Open Manhole	1800	1.001	76.038	300	1.000	76.038	300	
CR3	76.920	0.475	Open Manhole	1200	2.000	76.445	150				
MH15	76.920	0.526	Open Manhole	1200	2.001	76.394	150	2.000	76.394	150	
CR4	76.920	0.831	Open Manhole	1200	2.002	76.089	300	2.001	76.326	150	87
MH13	76.620	0.620	Open Manhole	1800	1.002	76.000	300	1.001	76.000	300	
								2.002	76.000	300	
CR15	76.620	0.927	Open Manhole	1200	1.003	75.693	300	1.002	75.889	300	196
MH18	76.920	0.832	Open Manhole	1800	3.000	76.088	300				
CR6	76.920	0.880	Open Manhole	1200	4.000	76.040	150				
MH19	76.920	0.890	Open Manhole	1800	3.001	76.030	300	3.000	76.030	300	
								4.000	76.030	150	
CR10	76.620	0.570	Open Manhole	1200	5.000	76.050	150				
MH17	76.920	0.980	Open Manhole	1800	3.002	75.940	300	3.001	75.940	300	
								5.000	75.940	150	
CR12	76.620	0.556	Open Manhole	1200	6.000	76.064	150				
MH16	76.620	0.565	Open Manhole	1800	6.001	76.055	225	6.000	76.055	150	
CR17	76.920	1.066	Open Manhole	1200	3.003	75.854	300	3.002	75.933	300	79
								6.001	75.940	225	11
MH12	76.620	0.955	Open Manhole	1800	1.004	75.665	375	1.003	75.665	300	
								3.003	75.790	300	50
OF1	76.620	1.084	Open Manhole	0		OUTFALL		1.004	75.536	375	
MH1	76.920	0.373	Open Manhole	1200	7.000	76.547	150				
CR1	76.920	0.959	Open Manhole	1200	7.001	75.961	150	7.000	76.461	150	500
MH2	76.620	0.676	Open Manhole	1200	7.002	75.944	300	7.001	75.944	150	
CR14	76.728	0.600	Open Manhole	1200	8.000	76.128	150				
MH8	76.620	0.513	Open Manhole	1800	8.001	76.107	300	8.000	76.110	150	
MH11	76.920	0.562	Open Manhole	1200	9.000	76.358	150				
CR5	76.920	0.736	Open Manhole	1200	9.001	76.184	150	9.000	76.334	150	150
MH10	76.620	0.454	Open Manhole	1800	9.002	76.166	300	9.001	76.166	150	
CR18	76.620	0.478	Open Manhole	1200	9.003	76.142	300	9.002	76.142	300	
MH7	76.620	0.552	Open Manhole	1800	8.002	76.068	300	8.001	76.068	300	
								9.003	76.117	300	49
CR16	76.620	0.605	Open Manhole	1200	8.003	76.015	300	8.002	76.015	300	
MH6	76.620	0.657	Open Manhole	1200	8.004	75.963	300	8.003	75.963	300	
cr13	76.620	0.896	Open Manhole	1200	8.005	75.724	300	8.004	75.911	300	187
MH4	76.620	0.552	Open Manhole	1200	10.000	76.068	150				
CR2	76.620	0.835	Open Manhole	1200	10.001	75.785	300	10.000	76.056	150	121
MH5	76.620	0.909	Open Manhole	1800	8.006	75.711	300	8.005	75.711	300	
								10.001	75.722	300	11
CR8	76.620	0.628	Open Manhole	1200	11.000	75.992	150				
MH4	76.620	0.674	Open Manhole	1200	11.001	75.946	300	11.000	75.946	150	
35	102.000	1.000	Junction		12.000	101.000	100				
BR1	102.000	2.000	Open Manhole	1200	12.001	100.000	100	12.000	100.000	100	
ORF1	102.000	3.000	Open Manhole	1200	12.002	99.000	150	12.001	99.000	100	

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)
MH3	76.620	0.965	Open Manhole	1800	7.003	75.655	300	7.002	75.903	300	248
								8.006	75.655	300	
								11.001	75.922	300	267
								12.002	76.000	150	195
CR7	76.920	1.324	Open Manhole	1800	7.004	75.596	900	7.003	75.596	300	
13	76.620	1.059	Open Manhole	1800	7.005	75.561	675	7.004	75.561	900	
MH7A	76.620	1.109	Open Manhole	1500	7.006	75.511	675	7.005	75.511	675	
OF2	76.620	1.260	Open Manhole	0		OUTFALL		7.006	75.360	675	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
CR9	447091.214	166998.313	447091.214	166998.313	Required	
MH14	447092.862	166997.583	447092.862	166997.583	Required	
CR3	447077.559	166972.287	447077.559	166972.287	Required	
MH15	447092.523	166973.437	447092.523	166973.437	Required	
CR4	447105.313	166975.753	447105.313	166975.753	Required	
MH13	447106.240	167002.502	447106.240	167002.502	Required	
CR15	447139.305	167006.523	447139.305	167006.523	Required	
MH18	447125.164	167062.621	447125.164	167062.621	Required	
CR6	447118.846	167045.531	447118.846	167045.531	Required	
MH19	447120.255	167045.317	447120.255	167045.317	Required	
CR10	447139.717	167052.837	447139.717	167052.837	Required	
MH17	447145.847	167038.175	447145.847	167038.175	Required	
CR12	447120.855	167028.509	447120.855	167028.509	Required	
MH16	447126.616	167029.244	447126.616	167029.244	Required	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
CR17	447143.815	167030.618	447143.815	167030.618	Required	
MH12	447147.667	167007.291	447147.667	167007.291	Required	
OF1	447194.550	167019.012			No Entry	
MH1	447095.000	166911.595	447095.000	166911.595	Required	
CR1	447107.855	166913.198	447107.855	166913.198	Required	
MH2	447122.323	166915.530	447122.323	166915.530	Required	
CR14	447175.751	166958.424	447175.751	166958.424	Required	
MH8	447172.964	166958.155	447172.964	166958.155	Required	
MH11	447151.483	166985.770	447151.483	166985.770	Required	
CR5	447155.061	166986.023	447155.061	166986.023	Required	
MH10	447157.694	166986.038	447157.694	166986.038	Required	
CR18	447159.464	166971.477	447159.464	166971.477	Required	
MH7	447161.234	166956.916	447161.234	166956.916	Required	
CR16	447145.514	166955.508	447145.514	166955.508	Required	
MH6	447129.795	166954.100	447129.795	166954.100	Required	
cr13	447131.793	166938.612	447131.793	166938.612	Required	
MH4	447111.708	166933.367	447111.708	166933.367	Required	
CR2	447113.450	166933.454	447113.450	166933.454	Required	
MH5	447132.298	166934.549	447132.298	166934.549	Required	
CR8	447135.708	166903.931	447135.708	166903.931	Required	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
MH4	447135.022	166910.712	447135.022	166910.712	Required	
35	447108.118	166898.807			No Entry	
BR1	447109.859	166900.520	447109.859	166900.520	Required	
ORF1	447110.656	166901.560	447110.656	166901.560	Required	
MH3	447134.331	166917.812	447134.331	166917.812	Required	
CR7	447152.084	166918.986	447152.084	166918.986	Required	
13	447170.540	166933.604	447170.540	166933.604	Required	
MH7A	447203.778	166938.459	447203.778	166938.459	Required	
OF2	447224.581	166949.564			No Entry	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.023	0.023	0.023
1.001	User	-	100	0.019	0.019	0.019
	User	-	100	0.042	0.042	0.061
	User	-	100	0.010	0.010	0.071
2.000	User	-	100	0.050	0.050	0.050
2.001	User	-	100	0.010	0.010	0.010
2.002	User	-	100	0.051	0.051	0.051
1.002	User	-	100	0.052	0.052	0.052
1.003	User	-	100	0.014	0.014	0.014
3.000	User	-	100	0.024	0.024	0.024
	User	-	100	0.013	0.013	0.037
	User	-	100	0.054	0.054	0.091
	User	-	100	0.003	0.003	0.094
4.000	User	-	100	0.033	0.033	0.033
3.001	User	-	100	0.035	0.035	0.035
	User	-	100	0.011	0.011	0.046
5.000	User	-	100	0.019	0.019	0.019
3.002	User	-	100	0.018	0.018	0.018
	User	-	100	0.019	0.019	0.036
6.000	User	-	100	0.030	0.030	0.030
6.001	User	-	100	0.016	0.016	0.016
	User	-	100	0.052	0.052	0.068
3.003	User	-	100	0.058	0.058	0.058
1.004	User	-	100	0.054	0.054	0.054
7.000	User	-	100	0.025	0.025	0.025
7.001	User	-	100	0.029	0.029	0.029
7.002	User	-	100	0.019	0.019	0.019
8.000	User	-	100	0.020	0.020	0.020
	User	-	100	0.009	0.009	0.029
8.001	User	-	100	0.016	0.016	0.016
	User	-	100	0.055	0.055	0.072
9.000	User	-	100	0.065	0.065	0.065
9.001	User	-	100	0.035	0.035	0.035
9.002	User	-	100	0.019	0.019	0.019
	User	-	100	0.024	0.024	0.043
	User	-	100	0.015	0.015	0.058
9.003	User	-	100	0.014	0.014	0.014
8.002	User	-	100	0.035	0.035	0.035
8.003	User	-	100	0.021	0.021	0.021
8.004	User	-	100	0.103	0.103	0.103
	User	-	100	0.012	0.012	0.115
	User	-	100	0.030	0.030	0.145
8.005	User	-	100	0.022	0.022	0.022
10.000	User	-	100	0.053	0.053	0.053
10.001	User	-	100	0.029	0.029	0.029
8.006	User	-	100	0.034	0.034	0.034
11.000	User	-	100	0.016	0.016	0.016
11.001	User	-	100	0.012	0.012	0.012
	User	-	100	0.048	0.048	0.060
12.000	-	-	100	0.000	0.000	0.000
12.001	-	-	100	0.051	0.051	0.051
12.002	-	-	100	0.000	0.000	0.000
7.003	User	-	100	0.027	0.027	0.027
7.004	User	-	100	0.041	0.041	0.041
7.005	-	-	100	0.000	0.000	0.000
7.006	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				1.588	1.588	1.588

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)
1.004	OF1	76.620	75.536	0.000	0	0

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)
7.006	OF2	76.620	75.360	0.000	0	0

Simulation Criteria for Storm

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

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	3	Number of Storage Structures	18	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	No
Return Period (years)	2	Winter Storms	Yes
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 447129 166981 SU 47129 66981	Cv (Winter)	1.000
Data Type	Point	Storm Duration (mins)	30

Online Controls for Storm

Hydro-Brake® Optimum Manhole: MH12, DS/PN: 1.004, Volume (m³): 4.5

Unit Reference	MD-SCL-0357-9830-1000-9830
Design Head (m)	1.000
Design Flow (l/s)	98.3
Flush-Flo™	Calculated
Objective	Minimise blockage risk
Application	Surface
Sump Available	Yes
Diameter (mm)	357
Invert Level (m)	75.665
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	2100

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	98.2	Kick-Flo®	0.758	85.9
Flush-Flo™	0.435	98.1	Mean Flow over Head Range	-	73.4

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	11.3	0.800	88.2	2.000	137.5	4.000	192.9	7.000	253.7
0.200	39.6	1.000	98.2	2.200	144.1	4.500	204.3	7.500	262.4
0.300	73.5	1.200	107.3	2.400	150.3	5.000	215.1	8.000	270.9
0.400	97.9	1.400	115.7	2.600	156.3	5.500	225.4	8.500	279.1
0.500	97.5	1.600	123.4	3.000	167.6	6.000	235.2	9.000	287.0
0.600	94.7	1.800	130.7	3.500	180.7	6.500	244.6	9.500	294.7

Orifice Manhole: ORF1, DS/PN: 12.002, Volume (m³): 3.4

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 99.000

Hydro-Brake® Optimum Manhole: 13, DS/PN: 7.005, Volume (m³): 16.5

Unit Reference	MD-SHE-0309-5610-1000-5610
Design Head (m)	1.000
Design Flow (l/s)	56.1
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	309
Invert Level (m)	75.561
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	56.1	Kick-Flo®	0.792	50.2
Flush-Flo™	0.460	56.1	Mean Flow over Head Range	-	44.7

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

Hydro-Brake® Optimum Manhole: 13, DS/PN: 7.005, Volume (m³): 16.5

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	9.4	0.800	50.4	2.000	78.4	4.000	109.9	7.000	144.5
0.200	31.7	1.000	56.1	2.200	82.2	4.500	116.4	7.500	149.4
0.300	54.0	1.200	61.3	2.400	85.7	5.000	122.5	8.000	154.2
0.400	55.8	1.400	66.0	2.600	89.1	5.500	128.4	8.500	158.9
0.500	56.0	1.600	70.4	3.000	95.5	6.000	134.0	9.000	163.4
0.600	55.1	1.800	74.5	3.500	103.0	6.500	139.3	9.500	167.8

Storage Structures for Storm

Cellular Storage Manhole: CR9, DS/PN: 1.000

Invert Level (m) 76.044 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	107.0	0.0	0.300	107.0	0.0	0.301	0.0	0.0

Cellular Storage Manhole: CR3, DS/PN: 2.000

Invert Level (m) 76.445 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	260.9	0.0	0.150	260.9	0.0	0.151	0.0	0.0

Cellular Storage Manhole: CR4, DS/PN: 2.002

Invert Level (m) 76.089 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	314.8	0.0	0.300	314.8	0.0	0.301	0.0	0.0

Cellular Storage Manhole: CR15, DS/PN: 1.003

Invert Level (m) 75.693 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	69.4	0.0	0.600	69.4	0.0	0.601	0.0	0.0

Cellular Storage Manhole: CR6, DS/PN: 4.000

Invert Level (m) 76.040 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	134.8	0.0	0.450	134.8	0.0	0.451	0.0	0.0

Cellular Storage Manhole: CR10, DS/PN: 5.000

Invert Level (m) 76.050 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Cellular Storage Manhole: CR10, DS/PN: 5.000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	85.7	0.0	0.300	85.7	0.0	0.301	0.0	0.0

Cellular Storage Manhole: CR12, DS/PN: 6.000

Invert Level (m) 76.064 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	131.1	0.0	0.150	131.1	0.0	0.151	0.0	0.0

Cellular Storage Manhole: CR17, DS/PN: 3.003

Invert Level (m) 75.854 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	162.5	0.0	0.300	162.5	0.0	0.301	0.0	0.0

Cellular Storage Manhole: CR1, DS/PN: 7.001

Invert Level (m) 75.961 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	180.9	0.0	0.300	180.9	0.0	0.301	0.0	0.0

Cellular Storage Manhole: CR14, DS/PN: 8.000

Invert Level (m) 76.128 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	209.4	0.0	0.150	209.4	0.0	0.151	0.0	0.0

Cellular Storage Manhole: CR5, DS/PN: 9.001

Invert Level (m) 76.184 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	238.9	0.0	0.300	238.9	0.0	0.301	0.0	0.0

Cellular Storage Manhole: CR18, DS/PN: 9.003

Invert Level (m) 76.142 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	54.6	0.0	0.150	54.6	0.0	0.151	0.0	0.0

Cellular Storage Manhole: CR16, DS/PN: 8.003

Invert Level (m) 76.015 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	178.7	0.0	0.300	178.7	0.0	0.301	0.0	0.0

Cellular Storage Manhole: cr13, DS/PN: 8.005

Invert Level (m) 75.724 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	135.4	0.0	0.600	135.4	0.0	0.601	0.0	0.0

Cellular Storage Manhole: CR2, DS/PN: 10.001

Invert Level (m) 75.785 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	170.9	0.0	0.300	170.9	0.0	0.301	0.0	0.0

Cellular Storage Manhole: CR8, DS/PN: 11.000

Invert Level (m) 75.992 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	96.7	0.0	0.300	96.7	0.0	0.301	0.0	0.0

Cellular Storage Manhole: BR1, DS/PN: 12.001

Invert Level (m) 100.000 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	336.0	0.0	0.085	336.0	0.0

Cellular Storage Manhole: CR7, DS/PN: 7.004

Invert Level (m) 76.040 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	134.8	0.0	0.450	134.8	0.0	0.451	0.0	0.0

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	3	Number of Storage Structures	18	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Point
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 447129 166981 SU 47129 66981	Cv (Winter)	1.000

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

Profile(s)	Summer and Winter
Duration(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	CR9	240 Summer	2	+0%					76.094	-0.250
1.001	MH14	30 Summer	2	+0%					76.138	-0.200
2.000	CR3	360 Summer	2	+0%					76.477	-0.118
2.001	MH15	30 Summer	2	+0%					76.431	-0.113
2.002	CR4	360 Summer	2	+0%					76.124	-0.265
1.002	MH13	30 Summer	2	+0%					76.107	-0.193
1.003	CR15	120 Summer	2	+0%	30/60 Summer				75.842	-0.151
3.000	MH18	30 Summer	2	+0%	100/30 Summer				76.179	-0.209
4.000	CR6	240 Summer	2	+0%	100/30 Summer				76.094	-0.096
3.001	MH19	30 Summer	2	+0%	100/30 Summer				76.137	-0.193
5.000	CR10	120 Summer	2	+0%	100/30 Summer				76.076	-0.124
3.002	MH17	30 Summer	2	+0%	100/30 Summer				76.090	-0.150
6.000	CR12	240 Summer	2	+0%	100/60 Summer				76.106	-0.108
6.001	MH16	30 Summer	2	+0%	100/30 Summer				76.132	-0.148
3.003	CR17	120 Summer	2	+0%	100/30 Summer				75.980	-0.174
1.004	MH12	120 Summer	2	+0%	100/30 Summer				75.837	-0.203
7.000	MH1	30 Summer	2	+0%					76.590	-0.107
7.001	CR1	240 Summer	2	+0%	100/30 Summer				76.011	-0.100
7.002	MH2	30 Summer	2	+0%					75.989	-0.255
8.000	CR14	360 Summer	2	+0%	100/30 Summer				76.159	-0.119
8.001	MH8	30 Summer	2	+0%	100/30 Summer				76.206	-0.201
9.000	MH11	30 Summer	2	+0%	30/30 Summer				76.441	-0.067
9.001	CR5	240 Summer	2	+0%	100/30 Summer				76.260	-0.074
9.002	MH10	30 Summer	2	+0%	100/30 Summer				76.276	-0.190
9.003	CR18	60 Summer	2	+0%	100/30 Summer				76.225	-0.217
8.002	MH7	30 Summer	2	+0%	100/30 Summer				76.180	-0.188
8.003	CR16	120 Summer	2	+0%	100/30 Summer				76.111	-0.204
8.004	MH6	30 Summer	2	+0%	30/30 Summer				76.093	-0.170
8.005	cr13	180 Summer	2	+0%	30/30 Summer				75.865	-0.159
10.000	MH4	30 Summer	2	+0%	30/30 Summer				76.141	-0.077
10.001	CR2	180 Summer	2	+0%	100/30 Summer				75.862	-0.223
8.006	MH5	180 Summer	2	+0%	30/30 Summer				75.858	-0.153
11.000	CR8	180 Summer	2	+0%	100/60 Summer				76.014	-0.128

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

PN	US/MH Name	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	CR9	0.000	0.02		90	1.2	OK	
1.001	MH14	0.000	0.20			8.3	OK	
2.000	CR3	0.000	0.10		203	1.0	OK	
2.001	MH15	0.000	0.14			1.6	OK	
2.002	CR4	0.000	0.03		216	1.9	OK	
1.002	MH13	0.000	0.27			16.1	OK	
1.003	CR15	0.000	0.18		56	8.8	OK	
3.000	MH18	0.000	0.17			9.4	OK	
4.000	CR6	0.000	0.18		66	1.9	OK	
3.001	MH19	0.000	0.23			13.4	OK	
5.000	CR10	0.000	0.07		63	1.0	OK	
3.002	MH17	0.000	0.50			18.0	OK	
6.000	CR12	0.000	0.13		113	1.2	OK	
6.001	MH16	0.000	0.26			9.7	OK	
3.003	CR17	0.000	0.37		59	18.8	OK	
1.004	MH12	0.000	0.32			30.3	OK	
7.000	MH1	0.000	0.18			2.4	OK	
7.001	CR1	0.000	0.24		170	1.2	OK	
7.002	MH2	0.000	0.05			2.8	OK	
8.000	CR14	0.000	0.07		156	0.8	OK	
8.001	MH8	0.000	0.19			9.9	OK	
9.000	MH11	0.000	0.59			6.4	OK	
9.001	CR5	0.000	0.28		114	3.1	OK	
9.002	MH10	0.000	0.29			7.6	OK	
9.003	CR18	0.000	0.17			4.6	OK	
8.002	MH7	0.000	0.30			16.2	OK	
8.003	CR16	0.000	0.19		88	10.2	OK	
8.004	MH6	0.000	0.39			20.8	OK	
8.005	cr13	0.000	0.33		90	15.9	OK	
10.000	MH4	0.000	0.48			5.2	OK	
10.001	CR2	0.000	0.06		73	3.1	OK	
8.006	MH5	0.000	0.33			18.2	OK	
11.000	CR8	0.000	0.05		92	0.7	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
11.001	MH4	30 Summer	2	+0%					76.035	-0.211
12.000	35	30 Summer	2	+0%					101.000	-0.100
12.001	BR1	180 Summer	2	+0%					100.018	-0.082
12.002	ORF1	180 Summer	2	+0%	2/30 Summer				99.859	0.709
7.003	MH3	180 Summer	2	+0%	30/30 Summer				75.832	-0.123
7.004	CR7	180 Summer	2	+0%					75.804	-0.692
7.005	13	180 Summer	2	+0%					75.786	-0.450
7.006	MH7A	180 Summer	2	+0%					75.610	-0.576

PN	US/MH Name	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
11.001	MH4	0.000	0.19			8.9	OK	
12.000	35	0.000	0.00			0.0	OK*	
12.001	BR1	0.000	0.07		88	2.0	OK	
12.002	ORF1	0.000	0.01			1.7	SURCHARGED	
7.003	MH3	0.000	0.45			24.7	OK	
7.004	CR7	0.000	0.06		75	26.1	OK	
7.005	13	0.000	0.09			26.0	OK	
7.006	MH7A	0.000	0.05			26.0	OK	

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	3	Number of Storage Structures	18	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Point
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 447129 166981 SU 47129 66981	Cv (Winter)	1.000

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

Profile(s)	Summer and Winter
Duration(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

WARNING: Half Drain Time has not been calculated as the structure is too full.

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	CR9	120 Summer	30	+0%					76.141	-0.203
1.001	MH14	30 Summer	30	+0%					76.216	-0.122
2.000	CR3	180 Summer	30	+0%					76.501	-0.094
2.001	MH15	30 Summer	30	+0%					76.461	-0.083
2.002	CR4	180 Summer	30	+0%					76.154	-0.235
1.002	MH13	30 Summer	30	+0%					76.188	-0.112
1.003	CR15	60 Summer	30	+0%	30/60 Summer				75.995	0.002
3.000	MH18	30 Summer	30	+0%	100/30 Summer				76.270	-0.118
4.000	CR6	60 Summer	30	+0%	100/30 Summer				76.147	-0.043
3.001	MH19	30 Summer	30	+0%	100/30 Summer				76.248	-0.082
5.000	CR10	60 Summer	30	+0%	100/30 Summer				76.123	-0.077
3.002	MH17	30 Summer	30	+0%	100/30 Summer				76.211	-0.029
6.000	CR12	120 Summer	30	+0%	100/60 Summer				76.137	-0.077
6.001	MH16	30 Summer	30	+0%	100/30 Summer				76.206	-0.074
3.003	CR17	60 Summer	30	+0%	100/30 Summer				76.081	-0.073
1.004	MH12	60 Summer	30	+0%	100/30 Summer				75.980	-0.060
7.000	MH1	30 Summer	30	+0%					76.617	-0.080
7.001	CR1	120 Summer	30	+0%	100/30 Summer				76.049	-0.062
7.002	MH2	30 Summer	30	+0%					76.027	-0.217
8.000	CR14	240 Summer	30	+0%	100/30 Summer				76.194	-0.084
8.001	MH8	30 Summer	30	+0%	100/30 Summer				76.314	-0.093
9.000	MH11	30 Summer	30	+0%	30/30 Summer				76.539	0.031
9.001	CR5	180 Summer	30	+0%	100/30 Summer				76.322	-0.012
9.002	MH10	30 Summer	30	+0%	100/30 Summer				76.371	-0.095
9.003	CR18	30 Summer	30	+0%	100/30 Summer				76.344	-0.097
8.002	MH7	30 Summer	30	+0%	100/30 Summer				76.297	-0.071
8.003	CR16	60 Summer	30	+0%	100/30 Summer				76.212	-0.104
8.004	MH6	30 Summer	30	+0%	30/30 Summer				76.264	0.001
8.005	cr13	120 Summer	30	+0%	30/30 Summer				76.095	0.071
10.000	MH4	30 Summer	30	+0%	30/30 Summer				76.240	0.022

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

PN	US/MH Name	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	CR9	0.000	0.08		53	4.2	OK	
1.001	MH14	0.000	0.50			21.1	OK	
2.000	CR3	0.000	0.30		116	2.8	OK	
2.001	MH15	0.000	0.40			4.7	OK	
2.002	CR4	0.000	0.10		126	5.7	OK	
1.002	MH13	0.000	0.70			41.2	OK	
1.003	CR15	0.000	0.49		35	23.9	SURCHARGED	
3.000	MH18	0.000	0.42			22.9	OK	
4.000	CR6	0.000	0.55		31	6.0	OK	
3.001	MH19	0.000	0.46			26.4	OK	
5.000	CR10	0.000	0.31		25	4.2	OK	
3.002	MH17	0.000	1.00			36.3	OK	
6.000	CR12	0.000	0.42		60	3.6	OK	
6.001	MH16	0.000	0.77			29.0	OK	
3.003	CR17	0.000	0.93		37	47.1	OK	
1.004	MH12	0.000	0.81			77.0	OK	
7.000	MH1	0.000	0.45			5.9	OK	
7.001	CR1	0.000	0.64		99	3.1	OK	
7.002	MH2	0.000	0.16			8.1	OK	
8.000	CR14	0.000	0.22		89	2.3	OK	
8.001	MH8	0.000	0.54			27.8	OK	
9.000	MH11	0.000	1.44			15.6	SURCHARGED	
9.001	CR5	0.000	0.71		83	7.7	OK	
9.002	MH10	0.000	0.73			19.3	FLOOD RISK	
9.003	CR18	0.000	0.73			19.4	FLOOD RISK	
8.002	MH7	0.000	0.93			49.9	OK	
8.003	CR16	0.000	0.57		46	31.0	OK	
8.004	MH6	0.000	1.02			54.7	SURCHARGED	
8.005	cr13	0.000	0.77		68	37.0	SURCHARGED	
10.000	MH4	0.000	1.17			12.7	SURCHARGED	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
10.001	CR2	180 Summer	30	+0%	100/30 Summer				76.040	-0.045
8.006	MH5	120 Summer	30	+0%	30/30 Summer				76.077	0.066
11.000	CR8	120 Summer	30	+0%	100/60 Summer				76.038	-0.104
11.001	MH4	30 Summer	30	+0%					76.108	-0.138
12.000	35	30 Summer	30	+0%					101.000	-0.100
12.001	BR1	120 Summer	30	+0%					100.041	-0.059
12.002	ORF1	30 Summer	30	+0%	2/30 Summer				100.043	0.893
7.003	MH3	30 Summer	30	+0%	30/30 Summer				76.009	0.054
7.004	CR7	30 Summer	30	+0%					75.938	-0.558
7.005	13	30 Summer	30	+0%					75.929	-0.307
7.006	MH7A	30 Summer	30	+0%					75.652	-0.534

PN	US/MH Name	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
10.001	CR2	0.000	0.46		72	25.5	OK	
8.006	MH5	0.000	0.85			46.4	SURCHARGED	
11.000	CR8	0.000	0.18		50	2.2	OK	
11.001	MH4	0.000	0.56			26.0	OK	
12.000	35	0.000	0.00			0.0	OK*	
12.001	BR1	0.000	0.16		83	4.4	OK	
12.002	ORF1	0.000	0.01			1.9	SURCHARGED	
7.003	MH3	0.000	0.75			41.2	SURCHARGED	
7.004	CR7	0.000	0.13			55.9	OK	
7.005	13	0.000	0.17			48.4	OK	
7.006	MH7A	0.000	0.10			47.8	OK	

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

Simulation Criteria

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

Number of Input Hydrographs	0	Number of Offline Controls	0	Number of Time/Area Diagrams	0
Number of Online Controls	3	Number of Storage Structures	18	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Data Type	Point
FEH Rainfall Version	2013	Cv (Summer)	1.000
Site Location	GB 447129 166981 SU 47129 66981	Cv (Winter)	1.000

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

Profile(s)	Summer and Winter
Duration(s) (mins)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
1.000	CR9	60 Summer	100	+40%					76.249	-0.095
1.001	MH14	30 Summer	100	+40%					76.338	0.000
2.000	CR3	120 Summer	100	+40%					76.535	-0.060
2.001	MH15	30 Summer	100	+40%					76.489	-0.055
2.002	CR4	60 Summer	100	+40%					76.231	-0.158
1.002	MH13	30 Summer	100	+40%					76.290	-0.010
1.003	CR15	60 Summer	100	+40%	30/60 Summer				76.222	0.229
3.000	MH18	30 Summer	100	+40%	100/30 Summer				76.489	0.101
4.000	CR6	60 Summer	100	+40%	100/30 Summer				76.317	0.127
3.001	MH19	30 Summer	100	+40%	100/30 Summer				76.436	0.106
5.000	CR10	60 Summer	100	+40%	100/30 Summer				76.253	0.053
3.002	MH17	30 Summer	100	+40%	100/30 Summer				76.412	0.172
6.000	CR12	60 Summer	100	+40%	100/60 Summer				76.338	0.124
6.001	MH16	30 Summer	100	+40%	100/30 Summer				76.413	0.133
3.003	CR17	30 Winter	100	+40%	100/30 Summer				76.316	0.162
1.004	MH12	60 Summer	100	+40%	100/30 Summer				76.192	0.152
7.000	MH1	30 Summer	100	+40%					76.650	-0.047
7.001	CR1	120 Summer	100	+40%	100/30 Summer				76.197	0.086
7.002	MH2	120 Summer	100	+40%					76.206	-0.038
8.000	CR14	120 Summer	100	+40%	100/30 Summer				76.514	0.236
8.001	MH8	30 Summer	100	+40%	100/30 Summer				76.505	0.098
9.000	MH11	30 Summer	100	+40%	30/30 Summer				76.680	0.172
9.001	CR5	120 Summer	100	+40%	100/30 Summer				76.484	0.150
9.002	MH10	30 Summer	100	+40%	100/30 Summer				76.504	0.038
9.003	CR18	60 Summer	100	+40%	100/30 Summer				76.501	0.060
8.002	MH7	60 Summer	100	+40%	100/30 Summer				76.495	0.127
8.003	CR16	60 Summer	100	+40%	100/30 Summer				76.452	0.137
8.004	MH6	120 Summer	100	+40%	30/30 Summer				76.390	0.127
8.005	cr13	120 Summer	100	+40%	30/30 Summer				76.317	0.293
10.000	MH4	60 Summer	100	+40%	30/30 Summer				76.446	0.228
10.001	CR2	60 Summer	100	+40%	100/30 Summer				76.336	0.251
8.006	MH5	120 Summer	100	+40%	30/30 Summer				76.286	0.275
11.000	CR8	120 Summer	100	+40%	100/60 Summer				76.198	0.056

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

PN	US/MH Name	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	CR9	0.000	0.20		30	10.8	OK	
1.001	MH14	0.000	0.77			32.7	FLOOD RISK	
2.000	CR3	0.000	0.67		77	6.4	OK	
2.001	MH15	0.000	0.70			8.2	OK	
2.002	CR4	0.000	0.30		49	17.4	OK	
1.002	MH13	0.000	1.00			58.3	OK	
1.003	CR15	0.000	0.79		51	38.3	SURCHARGED	
3.000	MH18	0.000	0.81			43.9	SURCHARGED	
4.000	CR6	0.000	1.34		31	14.6	SURCHARGED	
3.001	MH19	0.000	0.77			44.3	SURCHARGED	
5.000	CR10	0.000	0.58		25	8.0	SURCHARGED	
3.002	MH17	0.000	1.70			61.6	SURCHARGED	
6.000	CR12	0.000	1.35		37	11.6	FLOOD RISK	
6.001	MH16	0.000	1.09			41.4	FLOOD RISK	
3.003	CR17	0.000	1.43			72.8	SURCHARGED	
1.004	MH12	0.000	1.03			97.3	SURCHARGED	
7.000	MH1	0.000	0.81			10.7	FLOOD RISK	
7.001	CR1	0.000	2.18		67	10.4	SURCHARGED	
7.002	MH2	0.000	0.20			10.6	OK	
8.000	CR14	0.000	0.76		111	8.2	FLOOD RISK	
8.001	MH8	0.000	0.66			33.8	FLOOD RISK	
9.000	MH11	0.000	2.61			28.3	FLOOD RISK	
9.001	CR5	0.000	1.24		70	13.5	SURCHARGED	
9.002	MH10	0.000	0.85			22.5	FLOOD RISK	
9.003	CR18	0.000	0.88			23.4	FLOOD RISK	
8.002	MH7	0.000	1.20			64.5	FLOOD RISK	
8.003	CR16	0.000	0.61			32.9	FLOOD RISK	
8.004	MH6	0.000	1.28			69.1	FLOOD RISK	
8.005	cr13	0.000	1.11		110	53.8	SURCHARGED	
10.000	MH4	0.000	2.05			22.2	FLOOD RISK	
10.001	CR2	0.000	0.49			27.3	FLOOD RISK	
8.006	MH5	0.000	1.19			64.8	SURCHARGED	
11.000	CR8	0.000	0.90		42	11.1	SURCHARGED	

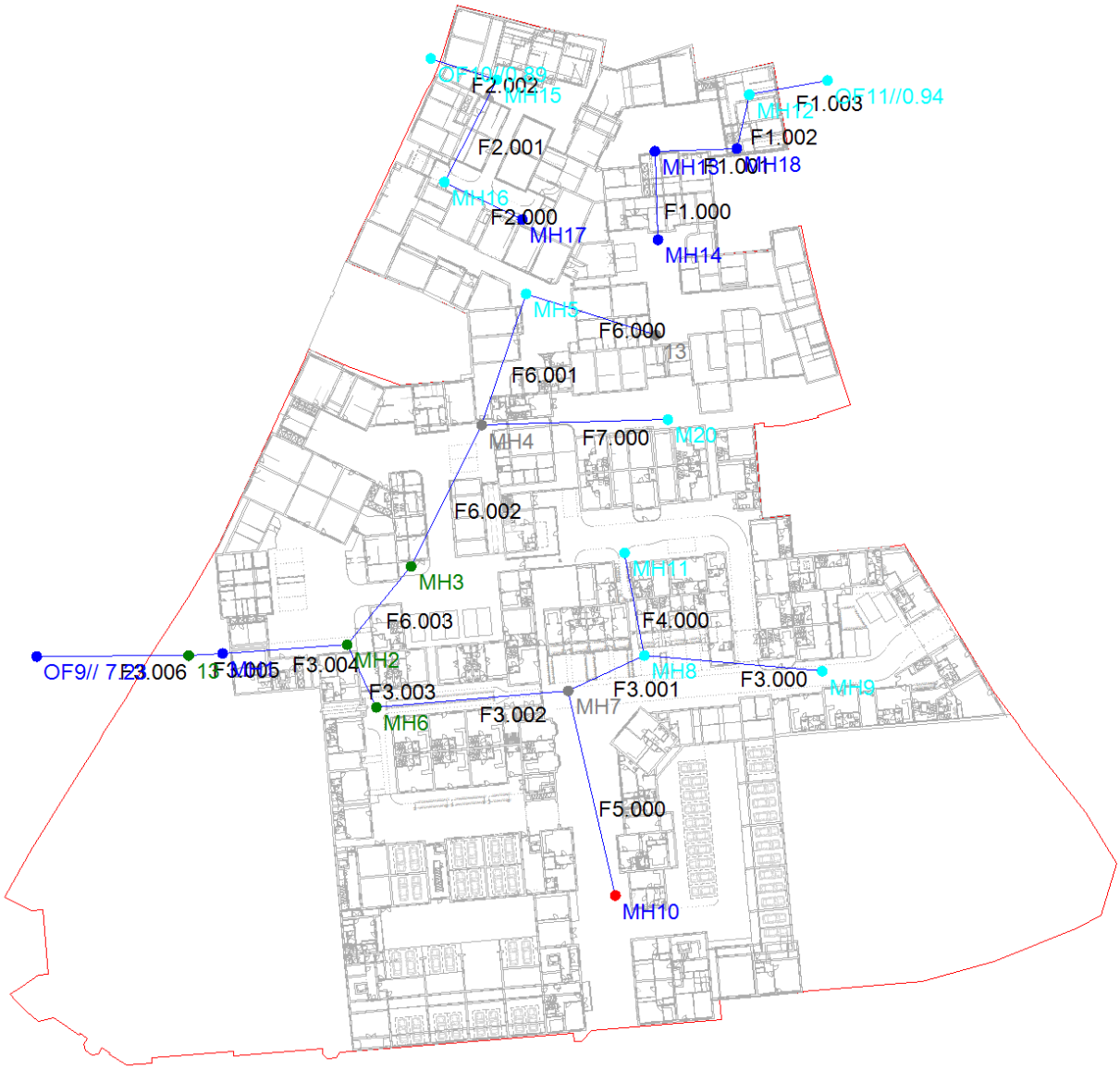
100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)
11.001	MH4	120 Summer	100	+40%					76.211	-0.035
12.000	35	30 Summer	100	+40%					101.000	-0.100
12.001	BR1	120 Winter	100	+40%					100.084	-0.016
12.002	ORF1	30 Summer	100	+40%	2/30 Summer				100.081	0.931
7.003	MH3	120 Summer	100	+40%	30/30 Summer				76.212	0.257
7.004	CR7	120 Summer	100	+40%					76.138	-0.358
7.005	13	120 Summer	100	+40%					76.124	-0.112
7.006	MH7A	120 Summer	100	+40%					75.661	-0.525

PN	US/MH Name	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
11.001	MH4	0.000	0.47			21.6	OK	
12.000	35	0.000	0.00			0.0	OK*	
12.001	BR1	0.000	0.14		123	3.8	OK	
12.002	ORF1	0.000	0.01			1.9	SURCHARGED	
7.003	MH3	0.000	1.31			72.0	SURCHARGED	
7.004	CR7	0.000	0.15		29	65.9	OK	
7.005	13	0.000	0.19			55.8	OK	
7.006	MH7A	0.000	0.11			55.8	OK	

Robert Bird & Partners Ltd		Page 1
Level 1, Harling House 47-51 Great Suffolk Street London, SE1 0BS	KENNET CENTRE FOUL WATER	
Date 28/03/2024 File Kennet Old Town scheme.MDX	Designed by N.BROWN Checked by J.GOLD	
Innovyze	Network 2020.1.3	

FOUL SEWERAGE DESIGN



FOUL SEWERAGE DESIGN

Design Criteria for Foul

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.00	Add Flow / Climate Change (%)	0
Industrial Peak Flow Factor	5.00	Minimum Backdrop Height (m)	0.200
Calculation Method	EN 752	Maximum Backdrop Height (m)	1.500
Frequency Factor	0.50	Min Design Depth for Optimisation (m)	1.200
Domestic (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	0.75
Domestic Peak Flow Factor	6.00	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Foul

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F1.000	16.142	0.179	90.2	0.000	0.0	1.0	1.500	o	100	Pipe/Conduit	
F1.001	14.941	0.149	100.3	0.000	0.0	0.0	1.500	o	100	Pipe/Conduit	
F1.002	10.118	0.094	107.6	0.000	0.0	0.0	1.500	o	100	Pipe/Conduit	
F1.003	14.470	0.116	124.7	0.000	0.0	0.0	1.500	o	100	Pipe/Conduit	
F2.000	15.779	0.264	59.8	0.000	0.0	1.0	1.500	o	100	Pipe/Conduit	
F2.001	20.977	0.229	91.6	0.000	0.0	0.0	1.500	o	100	Pipe/Conduit	
F2.002	12.653	0.207	61.1	0.000	0.0	0.0	1.500	o	100	Pipe/Conduit	
F3.000	32.501	0.217	150.0	0.000	0.0	7.2	1.500	o	150	Pipe/Conduit	
F4.000	19.052	0.129	147.7	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
F3.001	15.300	0.108	141.7	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
F5.000	38.259	0.478	80.0	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
F3.002	35.068	0.260	134.9	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F1.000	76.372	0.000	1.0	0.0	0.0	29	0.53	0.70	5.5	1.0
F1.001	76.193	0.000	1.0	0.0	0.0	30	0.51	0.67	5.2	1.0
F1.002	76.044	0.000	1.0	0.0	0.0	30	0.50	0.64	5.0	1.0
F1.003	75.950	0.000	1.0	0.0	0.0	32	0.47	0.59	4.7	1.0
F2.000	76.527	0.000	1.0	0.0	0.0	26	0.61	0.86	6.8	1.0
F2.001	76.263	0.000	1.0	0.0	0.0	29	0.52	0.69	5.5	1.0
F2.002	76.034	0.000	1.0	0.0	0.0	26	0.61	0.85	6.7	1.0
F3.000	75.949	0.000	7.2	0.0	0.0	81	0.74	0.71	12.6	7.2
F4.000	75.861	0.000	0.0	0.0	0.0	0	0.00	0.72	12.7	0.0
F3.001	75.732	0.000	7.2	0.0	0.0	80	0.75	0.74	13.0	7.2
F5.000	76.102	0.000	0.0	0.0	0.0	0	0.00	0.98	17.3	0.0
F3.002	75.624	0.000	7.2	0.0	0.0	79	0.77	0.75	13.3	7.2

Network Design Table for Foul

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
F3.003	12.583	0.094	133.9	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
F6.000	24.847	0.172	144.5	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
F6.001	25.238	0.163	154.8	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
F7.000	33.917	0.227	149.4	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
F6.002	28.815	0.197	146.3	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
F6.003	18.404	0.120	153.4	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
F3.004	22.732	0.138	164.7	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
F3.005	6.206	0.117	53.0	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	
F3.006	27.684	0.192	144.2	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	

Network Results Table

PN	US/IL (m)	Σ Area (ha)	Σ Base Flow (l/s)	Σ Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
F3.003	75.364	0.000	7.2	0.0	0.0	78	0.77	0.76	13.4	7.2
F6.000	75.927	0.000	0.0	0.0	0.0	0	0.00	0.73	12.9	0.0
F6.001	75.755	0.000	0.0	0.0	0.0	0	0.00	0.70	12.4	0.0
F7.000	75.821	0.000	0.0	0.0	0.0	0	0.00	0.72	12.6	0.0
F6.002	75.597	0.000	0.0	0.0	0.0	0	0.00	0.72	12.8	0.0
F6.003	75.400	0.000	0.0	0.0	0.0	0	0.00	0.71	12.5	0.0
F3.004	75.270	0.000	7.2	0.0	0.0	84	0.71	0.68	12.0	7.2
F3.005	75.132	0.000	7.2	0.0	0.0	60	1.09	1.20	21.3	7.2
F3.006	75.015	0.000	7.2	0.0	0.0	80	0.75	0.73	12.9	7.2

Manhole Schedules for Foul

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
MH14	76.920	0.548	Open Manhole	1200	F1.000	76.372	100				
MH13	76.620	0.427	Open Manhole	1200	F1.001	76.193	100	F1.000	76.193	100	
MH18	76.620	0.576	Open Manhole	1200	F1.002	76.044	100	F1.001	76.044	100	
MH12	76.620	0.670	Open Manhole	1200	F1.003	75.950	100	F1.002	75.950	100	
OF11//0.94	76.620	0.786	Open Manhole	0		OUTFALL		F1.003	75.834	100	
MH17	76.920	0.393	Open Manhole	1200	F2.000	76.527	100				
MH16	76.920	0.657	Open Manhole	450	F2.001	76.263	100	F2.000	76.263	100	
MH15	76.920	0.886	Open Manhole	1200	F2.002	76.034	100	F2.001	76.034	100	
OF10//0.89	76.620	0.793	Open Manhole	0		OUTFALL		F2.002	75.827	100	
MH9	76.620	0.671	Open Manhole	1200	F3.000	75.949	150				
MH11	76.620	0.759	Open Manhole	1200	F4.000	75.861	150				
MH8	76.620	0.888	Open Manhole	1200	F3.001	75.732	150	F3.000	75.732	150	
								F4.000	75.732	150	
MH10	76.620	0.518	Open Manhole	1200	F5.000	76.102	150				
MH7	76.620	0.996	Open Manhole	1200	F3.002	75.624	150	F3.001	75.624	150	
								F5.000	75.624	150	
MH6	76.620	1.256	Open Manhole	1200	F3.003	75.364	150	F3.002	75.364	150	
13	76.920	0.993	Open Manhole	1200	F6.000	75.927	150				
MH5	76.620	0.865	Open Manhole	1200	F6.001	75.755	150	F6.000	75.755	150	
M20	76.620	0.799	Open Manhole	1200	F7.000	75.821	150				
MH4	76.620	1.028	Open Manhole	1200	F6.002	75.597	150	F6.001	75.592	150	
								F7.000	75.594	150	
MH3	76.620	1.220	Open Manhole	1200	F6.003	75.400	150	F6.002	75.400	150	
MH2	76.620	1.350	Open Manhole	1200	F3.004	75.270	150	F3.003	75.270	150	
								F6.003	75.280	150	10
MH1	0.000		Open Manhole	1200	F3.005	75.132	150	F3.004	75.132	150	
13	76.620	1.605	Open Manhole	1200	F3.006	75.015	150	F3.005	75.015	150	
OF9// 7.23	0.000		Open Manhole	0		OUTFALL		F3.006	74.823	150	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
MH14	447143.682	167038.146	447143.682	167038.146	Required	
MH13	447143.114	167054.277	447143.114	167054.277	Required	
MH18	447158.047	167054.745	447158.047	167054.745	Required	
MH12	447160.307	167064.608	447160.307	167064.608	Required	
OF11//0.94	447174.545	167067.186			No Entry	

Manhole Schedules for Foul

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
MH17	447118.986	167041.836	447118.986	167041.836	Required	
MH16	447104.757	167048.657	447104.757	167048.657	Required	
MH15	447114.348	167067.313	447114.348	167067.313	Required	
OF10//0.89	447102.302	167071.185			No Entry	
MH9	447173.575	166959.512	447173.575	166959.512	Required	
MH11	447137.607	166981.074	447137.607	166981.074	Required	
MH8	447141.200	166962.364	447141.200	166962.364	Required	
MH10	447135.912	166918.639	447135.912	166918.639	Required	
MH7	447127.322	166955.921	447127.322	166955.921	Required	
MH6	447092.381	166952.948	447092.381	166952.948	Required	
13	447143.329	167020.746	447143.329	167020.746	Required	
MH5	447119.652	167028.283	447119.652	167028.283	Required	
M20	447145.488	167005.382	447145.488	167005.382	Required	
MH4	447111.586	167004.369	447111.586	167004.369	Required	
MH3	447098.700	166978.596	447098.700	166978.596	Required	
MH2	447087.053	166964.347	447087.053	166964.347	Required	
MH1	447064.378	166962.736	447064.378	166962.736	Required	
13	447058.182	166962.364	447058.182	166962.364	Required	
OF9// 7.23	447030.499	166962.188			No Entry	

Free Flowing Outfall Details for Foul

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
F1.003	OF11//0.94	76.620	75.834	0.000	0	0

Free Flowing Outfall Details for Foul

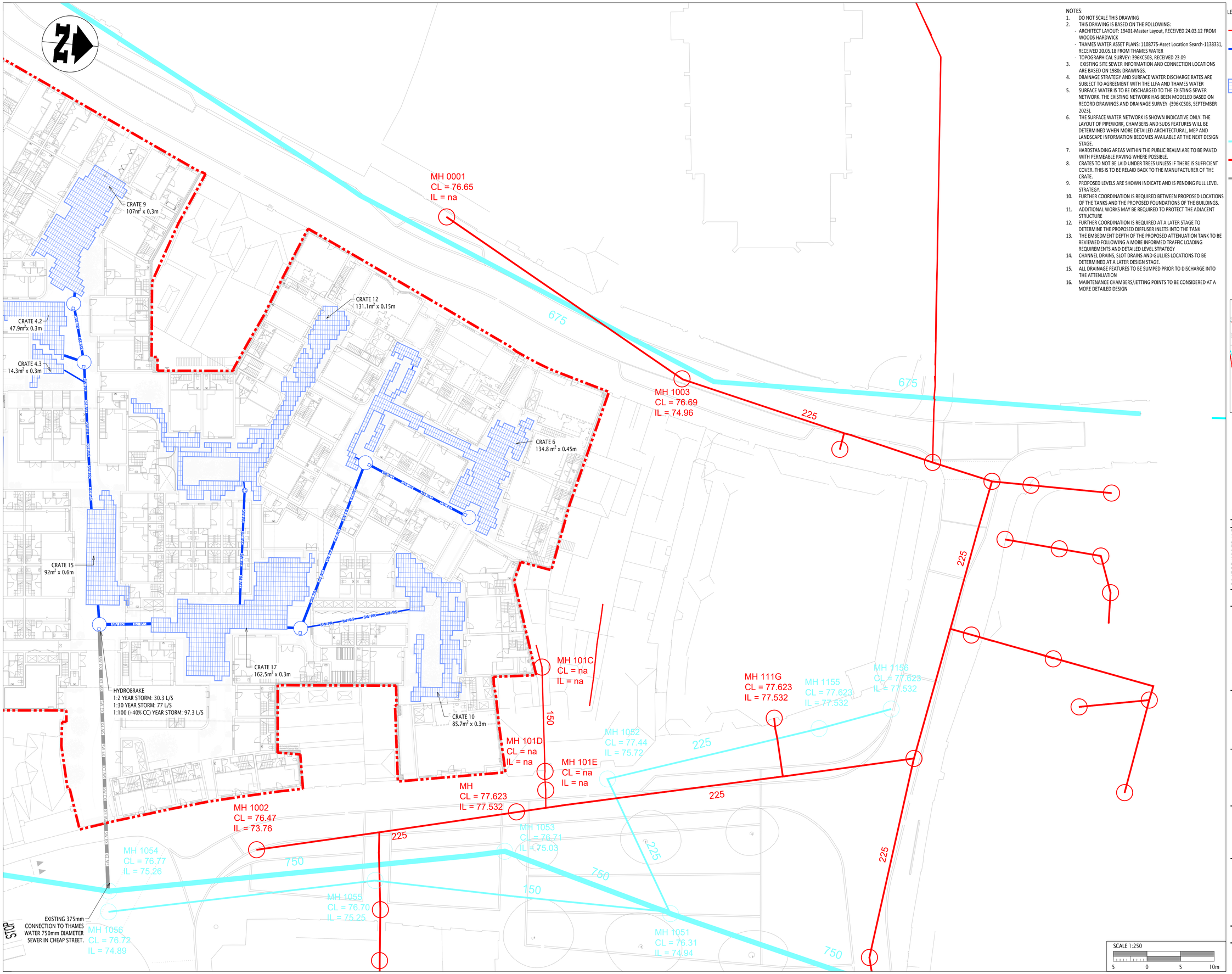
Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
F2.002	OF10//0.89	76.620	75.827	0.000	0	0

Free Flowing Outfall Details for Foul

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
F3.006	OF9// 7.23	0.000	74.823	0.000	0	0

Appendix D Drainage General Arrangement Plan & Catchment Plans

Old Town, Newbury



NOTES:

1. DO NOT SCALE THIS DRAWING
2. THIS DRAWING IS BASED ON THE FOLLOWING:
   - ARCHITECT LAYOUT: 19401-Master Layout, RECEIVED 24.03.12 FROM WOODS HARDWICK
   - THAMES WATER ASSET PLANS: 1108775-Asset Location Search-1138331, RECEIVED 20.05.18 FROM THAMES WATER
   - TOPOGRAPHICAL SURVEY: 396KCS03, RECEIVED 23.09
3. EXISTING SITE SEWER INFORMATION AND CONNECTION LOCATIONS ARE BASED ON 1990s DRAWINGS.
4. DRAINAGE STRATEGY AND SURFACE WATER DISCHARGE RATES ARE SUBJECT TO AGREEMENT WITH THE LLFA AND THAMES WATER
5. SURFACE WATER IS TO BE DISCHARGED TO THE EXISTING SEWER NETWORK. THE EXISTING NETWORK HAS BEEN MODELED BASED ON RECORD DRAWINGS AND DRAINAGE SURVEY (396KCS03, SEPTEMBER 2023).
6. THE SURFACE WATER NETWORK IS SHOWN INDICATIVE ONLY. THE LAYOUT OF PIPEWORK, CHAMBERS AND SUDS FEATURES WILL BE DETERMINED WHEN MORE DETAILED ARCHITECTURAL, MEP AND LANDSCAPE INFORMATION BECOMES AVAILABLE AT THE NEXT DESIGN STAGE.
7. HARDSTANDING AREAS WITHIN THE PUBLIC REALM ARE TO BE PAVED WITH PERMEABLE PAVING WHERE POSSIBLE.
8. CRATES TO NOT BE LAID UNDER TREES UNLESS IF THERE IS SUFFICIENT COVER. THIS IS TO BE RELAID BACK TO THE MANUFACTURER OF THE CRATE.
9. PROPOSED LEVELS ARE SHOWN INDICATE AND IS PENDING FULL LEVEL STRATEGY.
10. FURTHER COORDINATION IS REQUIRED BETWEEN PROPOSED LOCATIONS OF THE TANKS AND THE PROPOSED FOUNDATIONS OF THE BUILDINGS.
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12. FURTHER COORDINATION IS REQUIRED AT A LATER STAGE TO DETERMINE THE PROPOSED DIFFUSER INLETS INTO THE TANK
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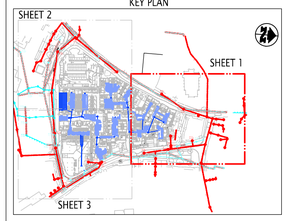
16. MAINTENANCE CHAMBERS/JETTING POINTS TO BE CONSIDERED AT A MORE DETAILED DESIGN

LEGENDS:

- SITE BOUNDARY
- SW PR — PROPOSED SURFACE WATER PIPE
- PROPOSED SURFACE WATER MANHOLE / INSPECTION CHAMBER
- PERMEAVOID CRATES
- EXISTING SURFACE WATER MANHOLE
- EXISTING FOUL WATER MANHOLE
- EXISTING TW SURFACE WATER SEWER
- EXISTING TW FOUL WATER SEWER
- SW EX — EXISTING SURFACE WATER PIPE
- EXISTING SURFACE WATER MANHOLE / INSPECTION CHAMBER

KEY PLAN



Rev	Revision Description	By	App	Date
P02	FOR PLANNING	KH	JG	17/05/24
P01	FOR INFORMATION	KH	JG	28/03/24

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Client
LOCHAILORT NEWBURY LIMITED

Project
KENNET OLD TOWN

Title
PROPOSED SURFACE WATER DRAINAGE LAYOUT SHEET 1

Date	Drawn
28/03/24	K. Hannon
Scale at A1	Designer
1:250	N. Brown
Suitability Code	Design Checker
S2	J. Gold
Job Number	Approved
4508	G. Irvine

For Information

Drawing Number	Revision
4508-RBG-XX-XX-DR-CV-87001	P02

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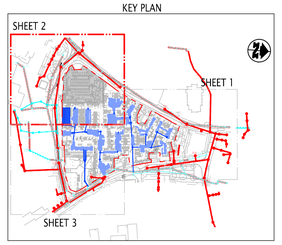
LEGENDS:

- SITE BOUNDARY
- PROPOSED SURFACE WATER PIPE
- PROPOSED SURFACE WATER MANHOLE / INSPECTION CHAMBER
- PERMEAVOID CRATES
- EXISTING SURFACE WATER MANHOLE
- EXISTING FOUL WATER MANHOLE
- EXISTING TW SURFACE WATER SEWER
- EXISTING TW FOUL WATER SEWER
- EXISTING SURFACE WATER PIPE
- EXISTING SURFACE WATER MANHOLE / INSPECTION CHAMBER

KEY PLAN



MH 0852
CL = 77.78
IL = 77.05

MH 0851
CL = 77.73
IL = 76.87

MH 0854
CL = 77.30
IL = 76.45

MH 0901
CL = 77.17
IL = 73.30

MH 0855
CL = 77.19
IL = 74.44

MH 0802
CL = 77.23
IL = 73.16

MH 0853
CL = 77.28
IL = 76.23

MH 0952
CL = 76.98
IL = 75.62

MH 0902
CL = 77.623
IL = 77.532

MH 1856
CL = 77.90
IL = 76.21

MH 0856
CL = 76.04
IL = 74.18

MH 0801
CL = 77.15
IL = na

MH 1855
CL = 78.16
IL = 77.28

CAR PARK NOT INCLUDED WITHIN CURRENT DRAINAGE CALCULATIONS AS MINIMAL WORK IS ANTICIPATED IN THIS AREA AND DRAINAGE SYSTEMS ARE TO REMAIN AS EXISTING

EXISTING SURFACE WATER OUTFALLS IN MARTHOLOMEW STREET TO BE RETAINED AS TAKING IN AREAS FROM CAR PARK.

BLUE ROOF 1:
336m² x 0.085m DEEP BLUE ROOF

DETAILS OF THE BLUE ROOF FEATURING AS SUDS SHOULD BE CONSIDERED AT A MORE DETAILED DESIGN STAGE & COORDINATION WITH OTHER SERVICES.

CRATE 1:
180.9m² x 0.3m

CRATE 2
170.9m² x 0.3m

CRATE 3
260.9m² x 0.15m

CRATE 4.1
252.6m² x 0.3m

SCALE 1:250
5 0 5 10m

Rev	Revision Description	By	App	Date
P02	FOR PLANNING	KH	JG	17/05/24
P01	FOR INFORMATION	KH	JG	28/03/24

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UK Co. 8447 2743

Client
LOCHAILORT NEWBURY LIMITED

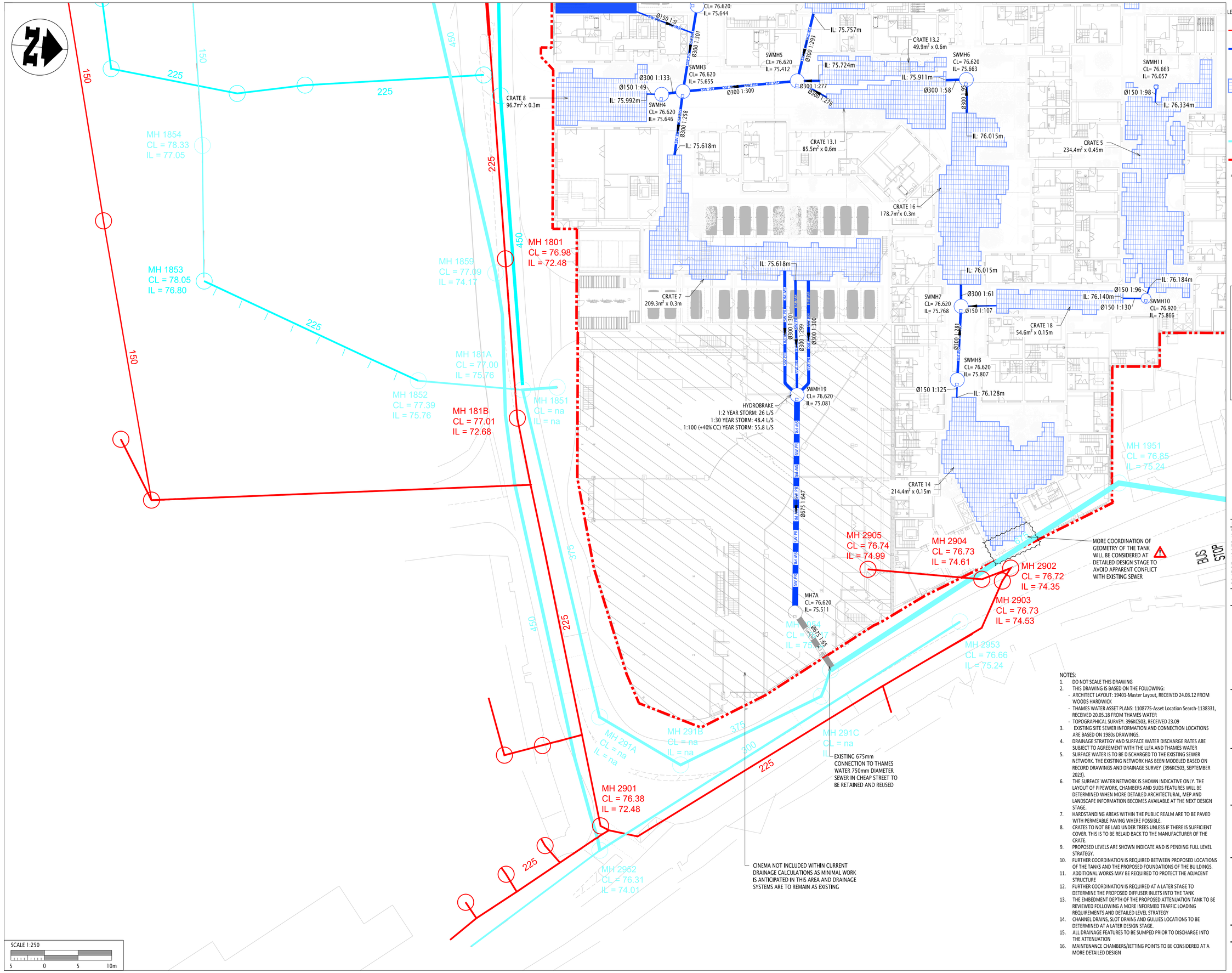
Project
OLD TOWN

Title
PROPOSED SURFACE WATER DRAINAGE LAYOUT SHEET 2

Date	Drawn
28/03/24	K. Hannon
Scale at A1	Designer
1:250	N. Brown
Suitability Code	Design Checker
S2	J. Gold
Job Number	Approved
4508	G. Irvine

For Information

Drawing Number	Revision
4508-RBG-XX-XX-DR-CV-87002	P02



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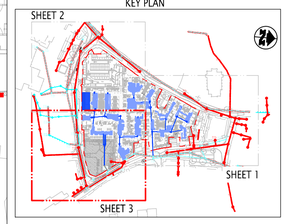

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SCALE 1:250

5 0 5 10m

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P02	FOR PLANNING	KH	JG	17/05/24
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UK Co. 8447 2743

Client
LOCHAILORT NEWBURY LIMITED

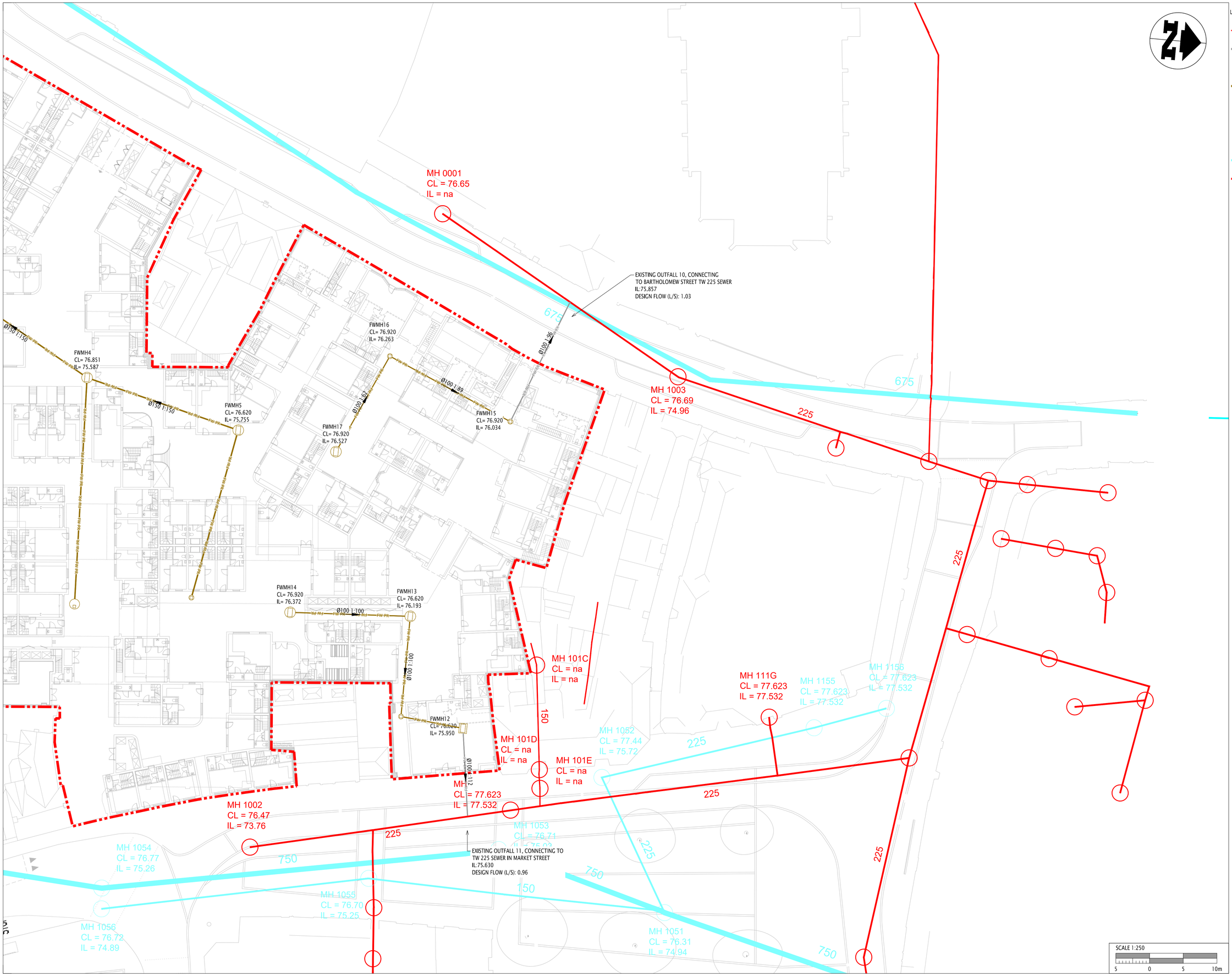
Project
OLD TOWN

Title
PROPOSED SURFACE WATER DRAINAGE LAYOUT SHEET 3

Date	28/03/24
Scale at A1	1:250
Suitability Code	S2
Job Number	4508
Drawn	K. Hannon
Designer	N. Brown
Design Checker	J. Gold
Approved	G. Irvine

For Information

Drawing Number	Revision
4508-RBG-XX-XX-DR-CV-87003	P02



LEGENDS:

- SITE BOUNDARY
- EXISTING FOUL WATER PIPE
- EXISTING FOUL WATER MANHOLE / INSPECTION CHAMBER
- PROPOSED FOUL WATER PIPE
- PROPOSED FOUL WATER MANHOLE / INSPECTION CHAMBER
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- EXISTING FOUL WATER MANHOLE
- EXISTING TW SURFACE WATER SEWER
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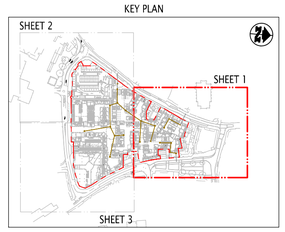
3. EXISTING SITE SEWER INFORMATION AND CONNECTION LOCATIONS ARE BASED ON 1980s DRAWINGS.
4. FOUL WATER DRAINAGE RATES CALCULATED USING THE POPULATION METHOD AND ACCOMMODATION SCHEDULES-19401-Newbury SoA (Sheet1&2) RECEIVED 24.03.06 FROM LOCHAILORT
5. FOUL WATER IS TO BE DISCHARGED TO THE EXISTING SEWER NETWORK. THE EXISTING NET WORK HAS BEEN MODELLED BASED ON RECORD DRAWINGS AND DRAINAGE SURVEY (396KC503, SEPTEMBER 2023).
6. THE FOULWATER NETWORK IS SHOWN INDICATIVE ONLY. THE LAYOUT OF PIPEWORK, CHAMBERS WILL BE DETERMINED WHEN MORE DETAILED ARCHITECTURAL, MEP AND LANDSCAPE INFORMATION BECOMES AVAILABLE AT THE NEXT DESIGN STAGE.

KEY PLAN



Rev	Revision Description	By	App	Date
P02	FOR PLANNING	KH	JG	17/05/24
P01	FOR INFORMATION	KH	JG	28/03/24

DO NOT SCALE DRAWINGS, USE FIGURED DIMENSIONS REFER TO GENERAL NOTES UNLESS NOTED OTHERWISE

Structural, Civil & Construction Engineering Consultant

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Web: www.robertbird.com
UK Co. #447 2743

Client
LOCHAILORT NEWBURY LIMITED

Project
OLD TOWN

Title
PROPOSED FOUL DRAINAGE
GENERAL ARRANGEMENT
SHEET 1

Date	Drawn
28/03/24	K. Hannon
Scale at A1	Designer
1:250	N. Brown
Suitability Code	Design Checker
S2	J. Gold
Job Number	Approved
4508	G. Irvine

For Information

Drawing Number	Revision
4508-RBG-XX-XX-DR-CV-88001	P02

SCALE 1:250
5 0 5 10m

SCALE 1:250

5 0 5 10m

MH 0852
CL = 77.78
IL = 77.05

MH 0851
CL = 77.73
IL = 76.87

MH 0854
CL = 77.30
IL = 76.45

MH 0853
CL = 77.28
IL = 76.23

MH 1856
CL = 77.90
IL = 76.21

MH 0856
CL = 76.04
IL = 74.18

MH 1855
CL = 78.16
IL = 77.28

MH 0855
CL = 77.19
IL = 74.44

MH 0802
CL = 77.23
IL = 73.16

MH 0901
CL = 77.17
IL = 73.30

MH 0801
CL = 77.15
IL = na

MH 0952
CL = 76.98
IL = 75.62

MH 0902
CL = 77.623
IL = 77.532

EXFWMH1
CL= 76.395
IL= 74.895

EXFWMH2
CL= 76.620
IL= 75.132

FWMH2
CL= 76.620
IL= 75.270

FWMH6
CL= 76.620
IL= 75,352

FWMH3
CL= 76.620
IL= 75.415

CAR PARK NOT INCLUDED WITHIN CURRENT DRAINAGE CALCULATIONS AS MINIMAL WORK IS ANTICIPATED IN THIS AREA AND DRAINAGE SYSTEMS ARE TO REMAIN AS EXISTING

EXISTING OUTFALL 9, CONNECTING TO BARTHOLOMEW STREET TW SEWER
IL 74.067
DESIGN FLOW (L/S): 7.23

100 100 300 450 450 450 450 450 450 450 225 225 150 Ø150 1:83 Ø150 1:71 Ø150 1:150 Ø150 1:149 Ø150 1:150 Ø150 1:83 Ø150 1:150

LEGENDS:

- SITE BOUNDARY
- EXISTING FOUL WATER PIPE
- EXISTING FOUL WATER MANHOLE / INSPECTION CHAMBER
- PROPOSED FOUL WATER PIPE
- PROPOSED FOUL WATER MANHOLE / INSPECTION CHAMBER
- EXISTING SURFACE WATER MANHOLE
- EXISTING FOUL WATER MANHOLE
- EXISTING TW SURFACE WATER SEWER
- EXISTING TW FOUL WATER SEWER

NOTES:
1. DO NOT SCALE THIS DRAWING
2. THIS DRAWING IS BASED ON THE FOLLOWING:
   - ARCHITECT LAYOUT: 19401-Master Layout, RECEIVED 24.03.12 FROM WOODS HARDWICK
   - THAMES WATER ASSET PLANS: 1108775-Asset Location Search-1138331, RECEIVED 20.05.18 FROM THAMES WATER-TOPOGRAPHICAL SURVEY: 396KCS03, SEPT 2023
3. EXISTING SITE SEWER INFORMATION AND CONNECTION LOCATIONS ARE BASED ON 1980s DRAWINGS.
4. FOUL WATER DRAINAGE RATES CALCULATED USING THE POPULATION METHOD AND ACCOMMODATION SCHEDULES-19401-Newbury SoA (Sheet1&2) RECEIVED 24.03.06 FROM LOCHAILORT
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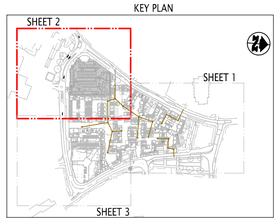
KEY PLAN



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P02	FOR PLANNING	KH	JG	17/05/24
P01	FOR INFORMATION	KH	JG	28/03/24

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UK Co. #447 2743

Client
LOCHAILORT NEWBURY LIMITED

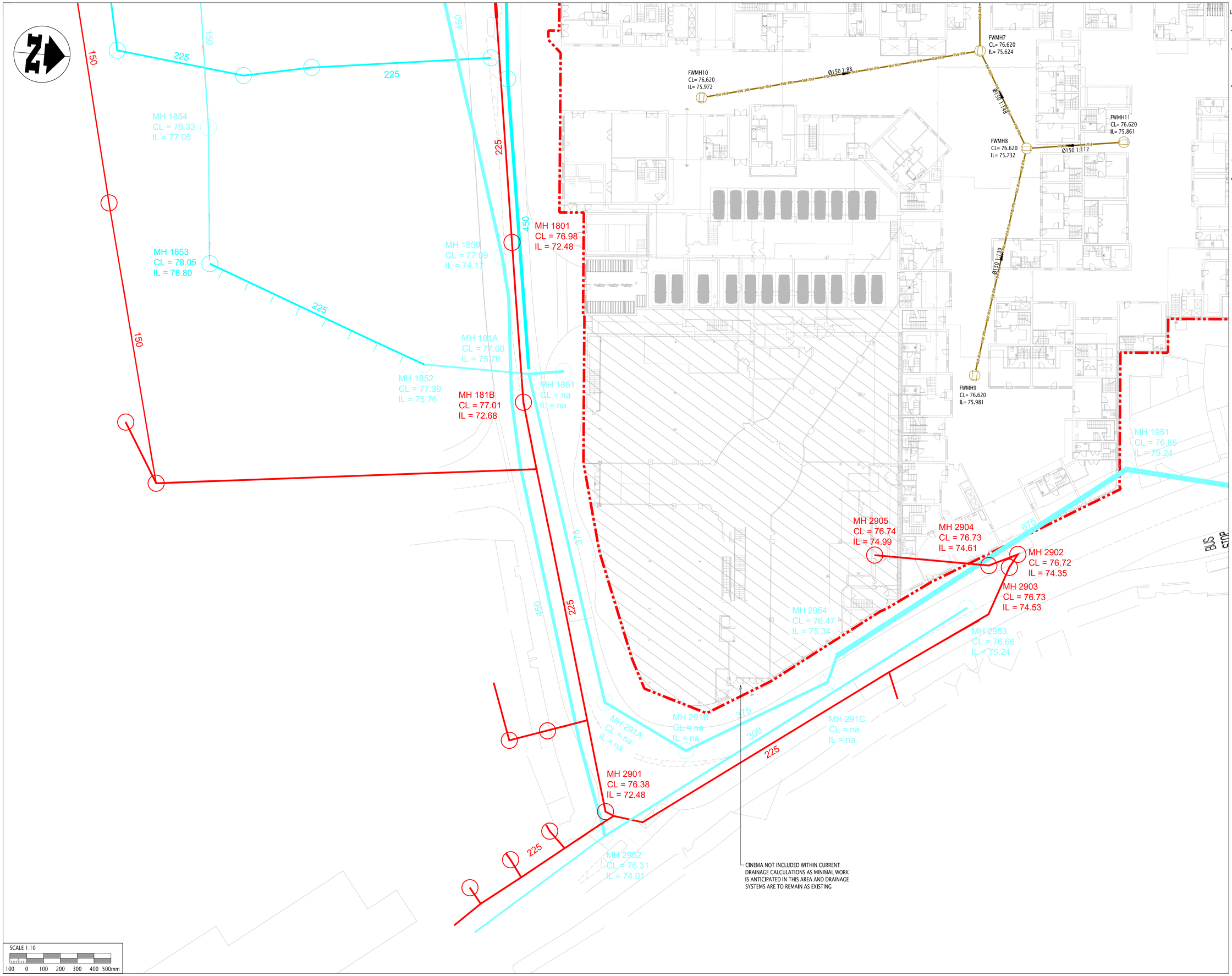
Project
OLD TOWN

Title
PROPOSED FOUL DRAINAGE GENERAL ARRANGEMENT SHEET 2

Date	Drawn
28/03/24	K. Hannon
Scale at A1	Designer
1:250	N. Brown
Suitability Code	Design Checker
S2	J. Gold
Job Number	Approved
4508	G. Irvine

For Information

Drawing Number	Revision
4508-RBG-XX-XX-DR-CV-88002	P02



LEGENDS:

- SITE BOUNDARY
- EXISTING FOUL WATER PIPE
- EXISTING FOUL WATER MANHOLE / INSPECTION CHAMBER
- PROPOSED FOUL WATER PIPE
- PROPOSED FOUL WATER MANHOLE / INSPECTION CHAMBER
- EXISTING SURFACE WATER MANHOLE
- EXISTING FOUL WATER MANHOLE
- EXISTING TW SURFACE WATER SEWER
- EXISTING TW FOUL WATER SEWER

NOTES:

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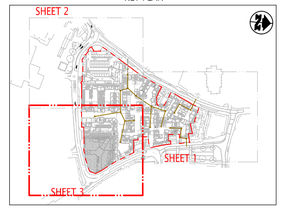

Rev	Revision Description	By	App	Date
P02	FOR PLANNING	KH	JG	17/05/24
P01	FOR INFORMATION	KH	JG	28/03/24

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UK Co. 8467 2743

Client
LOCHAILORT NEWBURY LIMITED

Project
OLD TOWN

Title
PROPOSED FOUL DRAINAGE GENERAL ARRANGEMENT SHEET 3

Date	Drawn
28/03/24	K. Hannon
Scale at A1	Designer
1:250	N. Brown
Suitability Code	Design Checker
S2	J. Gold
Job Number	Approved
4508	G. Irvine

For Information

Drawing Number	Revision
4508-RBG-XX-XX-DR-CV-88003	P02

Appendix E
Exceedance Flow Routes

Old Town, Newbury

RESIDENTIAL UNITS ON BARTHOLOMEW SDTREET EXIT ONTO THE PUBLIC HIGHWAY. THE ESCAPE ROUT LEADS TO HIGHER GROUNF TO THE SOUTHERN SIDE OF THE SITE

ESCAPE ROUTE TO BATHOLOMEW STREET

MH 0001
CL = 76.65
IL = na

675

ESCAPE ROUTE TO BATHOLOMEW STREET

MH 1003
CL = 76.69
IL = 74.96

225

675

225

MH 101C
CL = na
IL = na

150

MH 111G
CL = 77.623
IL = 77.532

MH 1155
CL = 77.623
IL = 77.532

MH 1156
CL = 77.623
IL = 77.532

MH 1052
CL = 77.44
IL = 75.72

225

MH 101D
CL = na
IL = na

MH 101E
CL = na
IL = na

MH
CL = 77.623
IL = 77.532

225

MH 1002
CL = 76.47
IL = 73.76

225

MH 1053
CL = 76.71
IL = 75.03

225

225

ESCAPE ROUTE VIA CHEAP STREET

MH 1054
CL = 76.77
IL = 75.26

750

750

150

MH 1055
CL = 76.70
IL = 75.25

MH 1056
CL = 76.72
IL = 74.89

STOP

MH 1051
CL = 76.31
IL = 74.94

750

SCALE 1:250
5 0 5 10m

LEGENDS:

- SITE BOUNDARY
- EXCEEDENCE FLOW
- SURFACE WATER OVERLAND FLOW
- ESCAPE ROUTE
- EXISTING SURFACE WATER MANHOLE
- EXISTING FOUL WATER MANHOLE
- EXISTING TW SURFACE WATER SEWER
- EXISTING TW FOUL WATER SEWER

NOTES:
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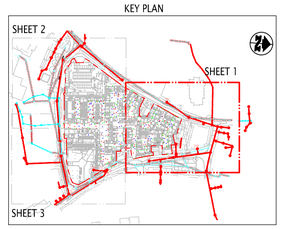
2. THIS DRAWING IS BASED ON:
   - ARCHITECT LAYOUT: 1904-Master layout, RECEIVED 24.05.02 FROM WOODS HARDWICK
   - THAMES WATER ASSET PLANS: 1108775-Asset Location Search-1138331, RECEIVED 20.05.18 FROM THAMES WATER
   - TOPOGRAPHICAL SURVEY: 396KC503, RECEIVED 23.09
3. LEVELS TO BE SET IN PUBLIC REALM TO FALL AWAY FROM BUILDING THRESHOLDS
4. EXTERNAL AREAS OF THE SITE ARE TO BE LIT AT NIGHT. ALL ESCAPE ROUTE LIGHTING WILL ALSO BE EMERGENCY LIGHTING.
5. SIMULATION AT 1 IN 100 YEAR PLUS 40% CLIMATE CHANGE DOES NOT SUGGEST THAT ANY MANHOLE IS FLOODING
6. FLOOD EXCEEDANCE ROUTING IF REQUIRED TO BE DETERMINED POST DEVELOPMENT OF PROPOSED SITE LEVEL STRATEGY

KEY PLAN



Rev	Revision Description	By	App	Date
P02	FOR PLANNING	KH	JG	17/05/24
P01	FOR INFORMATION	KH	JG	28/03/24

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UK Co. #447 2743

Client
LOCHAILORT NEWBURY LIMITED

Project
OLD TOWN

Title
SURFACE WATER
OVERLAND & EXCEEDENCE FLOWS
SHEET 1

Date	Drawn
28/03/24	K. Hannon
Scale at A1	Designer
1:250	N. Brown
Suitability Code	Design Checker
S2	J. Gold
Job Number	Approved
4508	G. Irvine

For Information

Drawing Number	Revision
4508-RBG-XX-XX-DR-CV-86010	P02

SCALE 1:250

5 0 5 10m

MH 0852
CL = 77.78
IL = 77.05

MH 0851
CL = 77.73
IL = 76.87

MH 0854
CL = 77.30
IL = 76.45

MH 0901
CL = 77.17
IL = 73.30

MH 0855
CL = 77.19
IL = 74.44

MH 0802
CL = 77.23
IL = 73.16

MH 0853
CL = 77.28
IL = 76.23

MH 0856
CL = 76.04
IL = 74.18

MH 1856
CL = 77.90
IL = 76.21

MH 0801
CL = 77.15
IL = na

MH 1855
CL = 78.16
IL = 77.28

MH 0952
CL = 76.98
IL = 75.62

MH 0902
CL = 77.623
IL = 77.532

CAR PARK NOT INCLUDED WITHIN CURRENT DRAINAGE CALCULATIONS AS MINIMAL WORK IS ANTICIPATED IN THIS AREA AND DRAINAGE SYSTEMS ARE TO REMAIN AS EXISTING

ESCAPE ROUTE TO BATHOLOMEW STREET

CAR PARK ONLY

100 225 450 150 300

LEGENDS:

- SITE BOUNDARY
- EXCEEDENCE FLOW
- SURFACE WATER OVERLAND FLOW
- ESCAPE ROUTE
- EXISTING SURFACE WATER MANHOLE
- EXISTING FOUL WATER MANHOLE
- EXISTING TW SURFACE WATER SEWER
- EXISTING TW FOUL WATER SEWER

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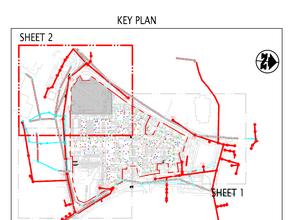
   - THAMES WATER ASSET PLANS: 110877S-Asset Location Search-1138331, RECEIVED 20.05.18 FROM THAMES WATER
   - TOPOGRAPHICAL SURVEY: 396KC503, RECEIVED 23.09
3. LEVELS TO BE SET IN PUBLIC REALM TO FALL AWAY FROM BUILDING THRESHOLDS
4. EXTERNAL AREAS OF THE SITE ARE TO BE LIT AT NIGHT. ALL ESCAPE ROUTE LIGHTING WILL ALSO BE EMERGENCY LIGHTING.
5. SIMULATION AT 1 IN 100 YEAR PLUS 40% CLIMATE CHANGE DOES NOT SUGGEST THAT ANY MANHOLE IS FLOODING
6. FLOOD EXCEEDANCE ROUTING IF REQUIRED TO BE DETERMINED POST DEVELOPMENT OF PROPOSED SITE LEVEL STRATEGY

KEY PLAN



Rev	Revision Description	By	App	Date
P02	FOR PLANNING	KH	JG	17/05/24
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Web: www.robertbird.com
UK Co #447 2743

Client
LOCHAILORT NEWBURY LIMITED

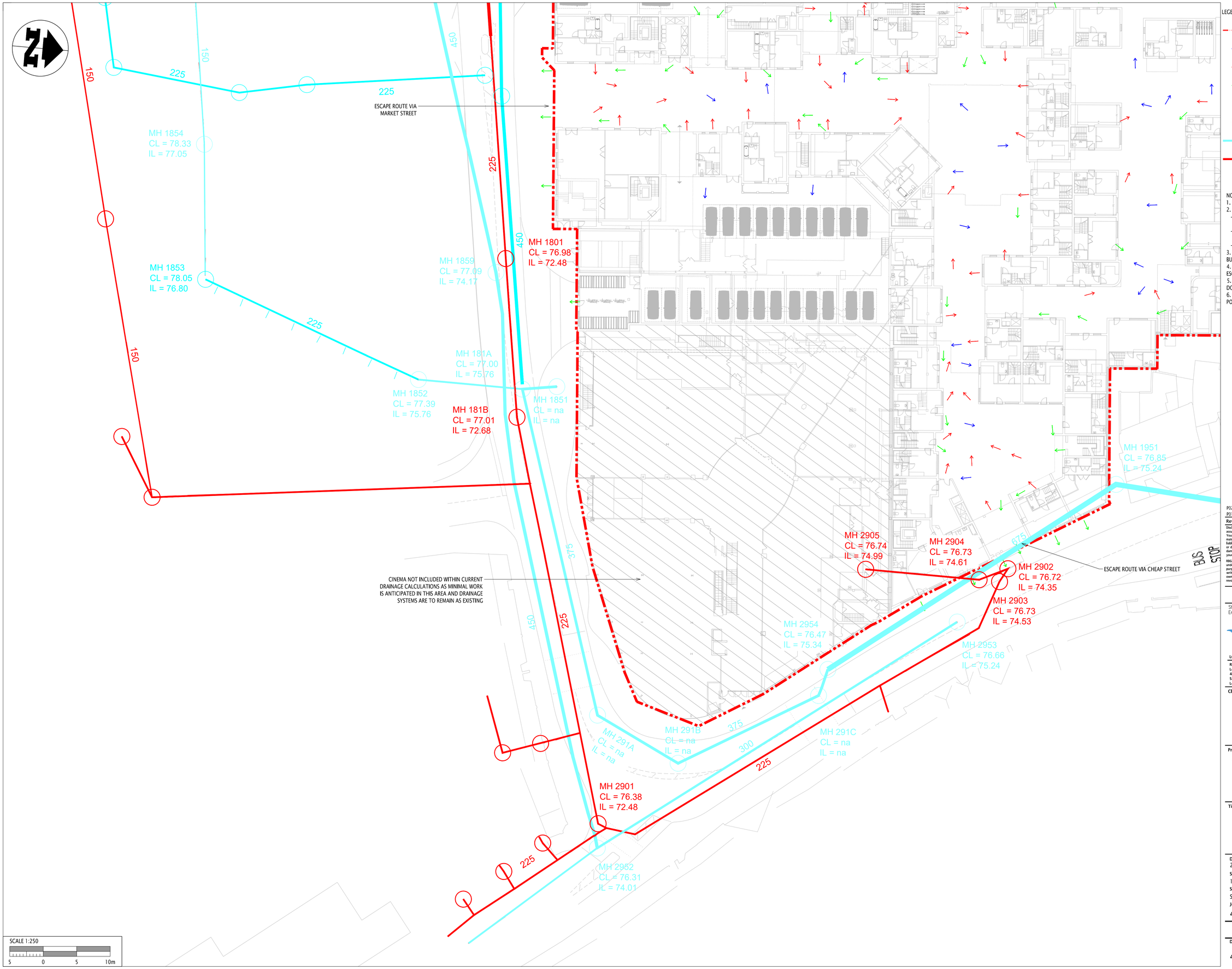
Project
OLD TOWN

Title
SURFACE WATER
OVERLAND & EXCEEDENCE FLOWS
SHEET 2

Date	Drawn
28/03/24	K. Hannon
Scale at A1	Designer
1:250	N. Brown
Suitability Code	Design Checker
S2	J. Gold
Job Number	Approved
4508	G. Irvine

For Information

Drawing Number	Revision
4508-RBG-XX-XX-DR-CV-86011	P02



LEGENDS:

- SITE BOUNDARY
- EXCEEDENCE FLOW
- SURFACE WATER OVERLAND FLOW
- ESCAPE ROUTE
- EXISTING SURFACE WATER MANHOLE
- EXISTING FOUL WATER MANHOLE
- EXISTING TW SURFACE WATER SEWER
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   - TOPOGRAPHICAL SURVEY: 396KC503, RECEIVED 23.09
3. LEVELS TO BE SET IN PUBLIC REALM TO FALL AWAY FROM BUILDING THRESHOLDS
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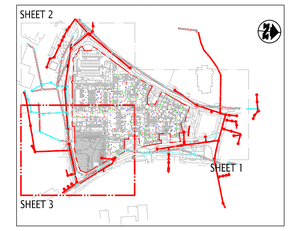
5. SIMULATION AT 1 IN 100 YEAR PLUS 40% CLIMATE CHANGE DOES NOT SUGGEST THAT ANY MANHOLE IS FLOODING
6. FLOOD EXCEEDANCE ROUTING IF REQUIRED TO BE DETERMINED POST DEVELOPMENT OF PROPOSED SITE LEVEL STRATEGY

KEY PLAN



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P02	FOR PLANNING	KH	JG	17/05/24
P01	FOR INFORMATION	KH	JG	28/03/24

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Client
LOCHAILORT NEWBURY LIMITED

Project
OLD TOWN

Title
SURFACE WATER
OVERLAND & EXCEEDENCE FLOWS
SHEET 3

Date	Drawn
28/03/24	K. Hannon
Scale at A1	Designer
1:250	N. Brown
Suitability Code	Design Checker
S2	J. Gold
Job Number	Approved
4508	G. Irvine

For Information

Drawing Number	Revision
4508-RBG-XX-XX-DR-CV-86012	P02

Contact Details

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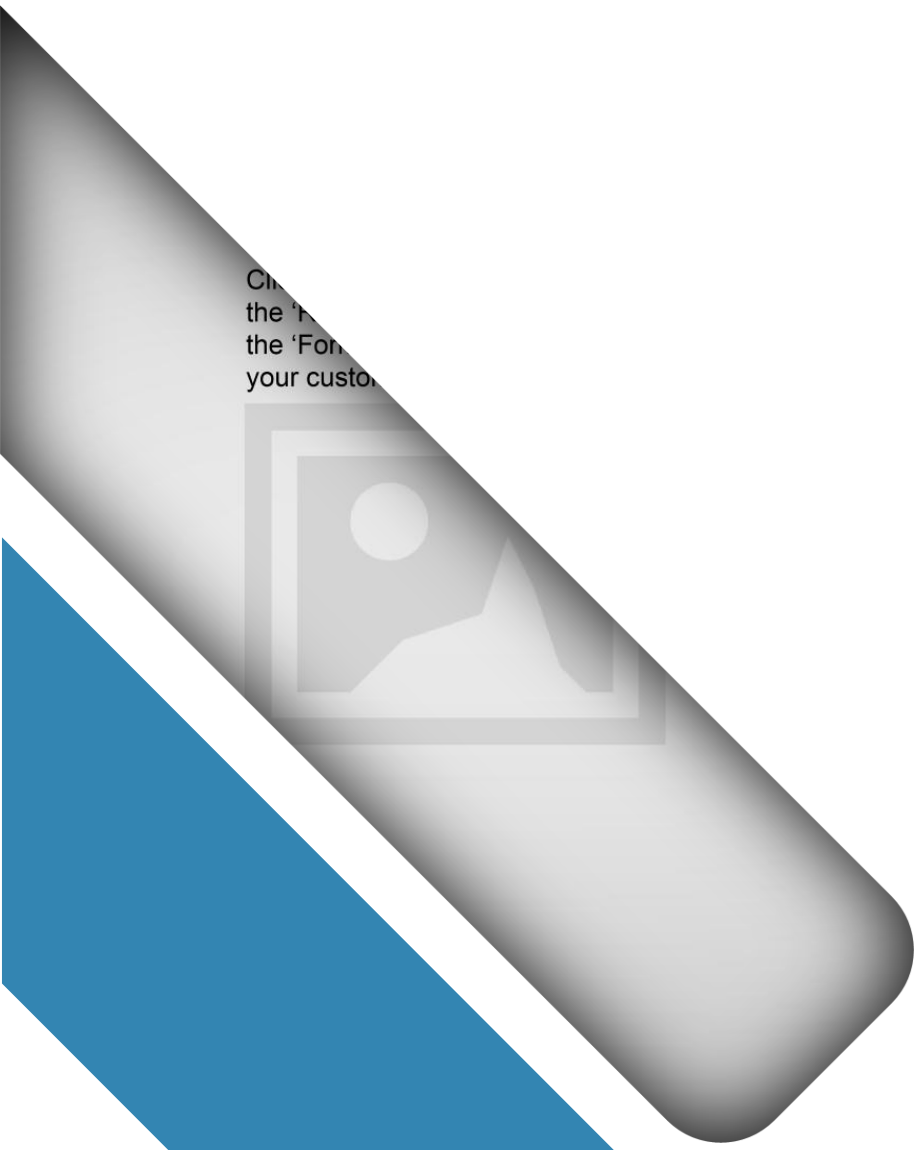

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