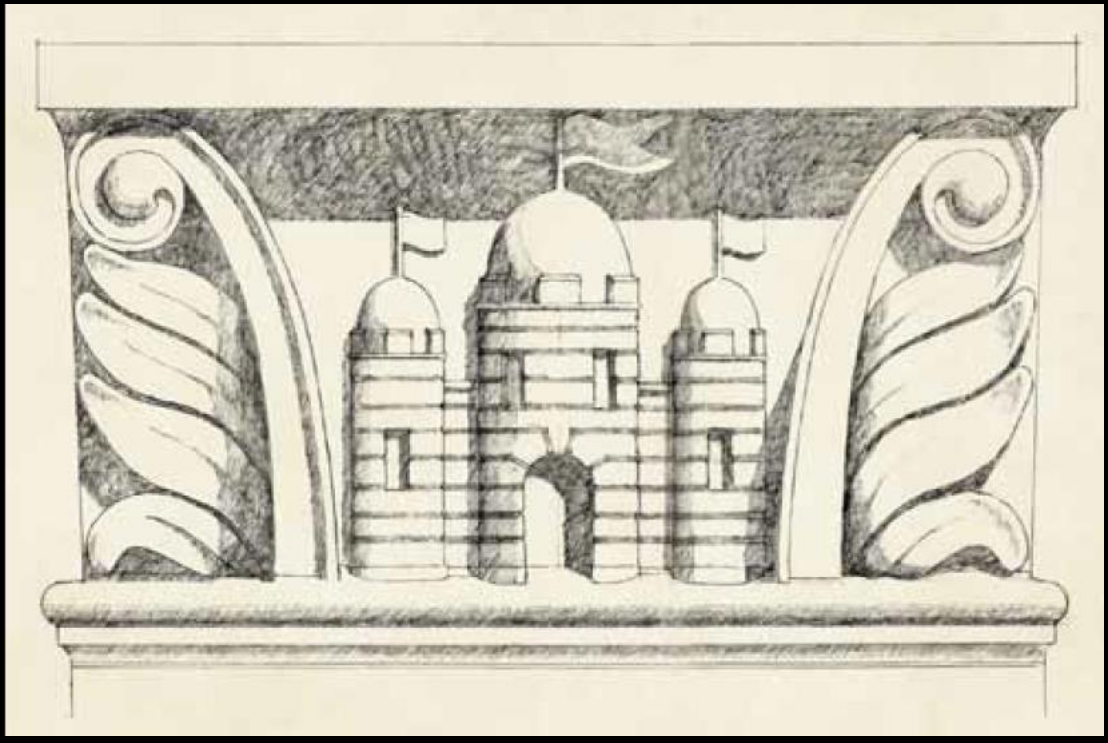


EAGLE QUARTER II
NEWBURY

DRAINAGE STATEMENT

November 2023

LOCHAILORT

Member of the Surbana Jurong Group

Eagle Quarter II

Drainage Statement

Prepared For:
Lochailort Newbury Limited

RBG Project No.:
4508

Document No.:
4508-RBG-ZZ-XX-RP-CV-00002

Revision:
P05

Status:
S3 - For Review & Comment

Date:
10 November 2023

Report Amendment Register

Revision	Section / Page No.	Revision Description	Author	Reviewer	Date
P01		For planning	Edmond Veillard	Jon Gold	08/01/2021
P02		Planning	Edmond Veillard	Jon Gold	04/02/2021
P03		Updated scheme	Natasha Brown	G Irvine	06/10/2023
P04		Draft planning	Natasha Brown	G Irvine	12/10/2023
P05		Planning	Natasha Brown	G Irvine	10/11/2023

REVISION/ISSUE AUTHOR:

.....

Natasha Brown
Signing for and on behalf of
Robert Bird & Partners Ltd
Date: 10/11/2023

REVISION CHECKER:

Digitally signed by Jonathan Gold
DN: C=GB, E=jonathan.gold@robertbird.com, O=Robert Bird Group, CN=Jonathan Gold
Reason: I have reviewed this document
Date: 2023.11.10 13:49:43Z00'00'

.....

Jon Gold
Signing for and on behalf of
Robert Bird & Partners Ltd
Date: 10/11/2023

REVIEWER/APPROVER:

.....

Glynn Irvine
Signing for and on behalf of
Robert Bird & Partners Ltd
Date: 10/11/2023

Table of Contents

1.0 Introduction

1.1. General

Robert Bird Group (RBG) have been appointed by Lochailort to undertake the below ground drainage design works for the Kennet Centre Development in Newbury (known as Eagle Quarter II).

This Drainage Statement has been produced in order to assist West Berkshire Council (WBC), as the Lead Local Flood Authority (LLFA), 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 GA Drawings by Collado Collins Architects (ref: 20011-P0-100_Rev PA, September 2023)
- Topographical Survey by Geomatic Surveyors (ref: 396KC01, October 2019)
- Thames Water Asset Location Search (ref: 1108775, May 2020)
- Ground Investigation Report by Soiltechnics (ref: STS5074-G01, September 2020)

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 (Ref: 4508-RBG-ZZ-XX-RP-CV-00002) 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 surface water drainage
- Flow rate information and required attenuation storage
- Proposed SuDS measures to achieve attenuation storage
- Maintenance requirements for the drainage systems
- Drawings of the surface water network layout
- Exceedance flow route information
- Summary of the discharge strategy for foul water

1.3. Previous Planning Application

This report was submitted previously as part of an earlier planning application (21/00379/FULMAJ). This latest version of the report has been updated to address the comments raised by the LLFA in response to the original planning application and subsequent appeal (APP/W0340/W/23/3321517). A meeting was held with the LLFA on 14th August 2023 to discuss the comments and to agree the actions required to resolve them. The LLFA comments and the agreed actions are summarised in the table below.

LLFA Objection	LLFA ref	LLFA Comment	Action
Inadequate survey information	11.3 Refusal 5 8.3 Refusal 6 8.12 Refusal 6 8.16 Refusal 6	The proposed surface water discharge rate is not accepted. The appellant has proposed to discharge runoff from the site at a rate of 144.4l/s. The appellant believes this value is representative of 50% of the existing discharge from the surface water drainage system network during a 1 in 100 year event. It is argued by the LLFA that this is not acceptable where the existing surface water drainage network has not been assessed. No proof that the network beyond the immediate pipe upstream of the connection to the Thames Water Sewer has been assessed has been provided. The LLFA maintains that the design should seek to discharge at greenfield runoff rates if the existing network is not modelled. The appellant has argued that the discharge (flow) rate used in the proposed drainage statement was agreed with the LLFA prior to the application being submitted. The appellant state no mention that a condition survey was required for this agreement to be finalised, demonstrating a lack of awareness of standard industry practice. The appellant notes that the existing connections to the public sewer have been assessed and are in good condition. The appellant refers to a CCTV report where they have verified that the actual pipes from the connection were larger than those used in their calculations. It should be noted that the CCTV survey (CD1.219) is inconclusive with most connections left unexplored. The appellant has not commented on this. Moreover, the CCTV information provided (CD1.219) shows a failure to adequately assess the system, this has not been discussed in the appellants response and no further mention of site drainage records has been provided. Please note surveys of pipes were abandoned for reasons which should have been scrutinised by the appellant (unable to lift manhole covers, blockages, siltation, etc.).	Three attempts have been made to survey the on-site drainage, but it was not possible to enter the manholes within the shopping centre due to their locations and site operation. The survey did confirm the diameter and condition of the two existing outfalls that are proposed for reuse and this information has been used along with site records to model the existing surface water drainage on site and calculate existing flow rates.
Brown roof area not clarified	8.7 Refusal 6	The appellant has also discussed brown roof elements as providing biodiversity benefits but has not made clear over what extent brown roofs will be provided or substantiated their claims with evidence.	Brown roofs will support and protect natural local species, contribute to the habitat community, and will help create a diverse and resilient ecosystem. The extent of the brown roofs is shown on the landscape plans in Appendix G of the Drainage Statement.
Blue roof and RWH omitted	8.9 Refusal 6	The appellant has attempted to justify not including blue roofs or rainwater harvesting. The appellant cites loading constraints and maintenance complications as the reasons to discount blue roofs. They have not commented on why loading for blue roofs is not viable, but adding additional floors is not? This leads one to assume that this is a matter whereby loading constraints are not an issue where profitability is concerned. Leaks are cited as a possible reason as well, but this is an issue associated with poor design, construction and/or maintenance. Rainwater harvesting has been dismissed as it is not considered to be commercially viable and would be too difficult to incorporate with the heat pump solution. Rainwater butts have been dismissed on the grounds that they don't make an impact on irrigation water demand at peak times.	Further modelling has been carried out with the inclusion of blue roofs incorporated across non-residential areas. The extent of the blue roofs is shown on the drawing in Appendix E of the Drainage Statement. Rainwater butts have now been included within the landscaping proposals.

Existing network model	8.16 Refusal 6	The appellant has used the modified rational method to determine the existing discharge rates and has not modelled the existing surface water drainage network as is best practice. The appellant has suggested in the LLFA response matrix (CD1.219) that a condition survey was not required, but this demonstrates lack of awareness of standard industry practices.	Existing drainage on site has been modelled based on survey information and site records.
Greenfield and Microdrainage calculations not correct	8.18 Refusal 6 8.25 Refusal 6	The appellant has not shown their calculations for the existing discharge rate, only the results and a statement regarding the methodology. Also, the greenfield runoff calculations should have been carried out for soil type 5 or equivalent lowest type permeability soil type (section 24.5 of CIRIA The SuDS Manual). The calculations in the Drainage Statement are not acceptable. Some amendments to address the points below will increase the storage requirements and put further pressure on what can be achieved on site: · The calculations cannot be cross referenced with the layout or the schematic as the pipe numbering/chamber references are illegible. · CV values have been left as default. Only impermeable areas have been considered in the calculation and losses will be minimal. · The MADD factor should be set to 0. · No associated catchment area information has been provided. · The exceedance route plan should also show how water is routed if the 80m3 of above ground storage in depressions is overwhelmed.	Microdrainage coefficients have been updated to reflect comments. A catchment plan and updated exceedance route plan are provided in Appendix E and F of the Drainage Statement.
Thames Water approval See appendix 6	8.20 Refusal 6 8.16 Refusal 6	For clarity, the preferred position should be to aspire to meet greenfield runoff rates and volumes, and any relaxation of this should be subject to an assessment of the current and future capacity of the receiving sewer and relevant sewerage company. Thames Water have expressed concern regarding the volume of water and rate proposed to discharge into their system in correspondence (see Appendix 6). The appellant does not appear to have reached out to Thames Water to understand the capacity of their sewers which is unacceptable. The appellant has not considered a single point of discharge, instead opting to use two discharge locations. The appellant plans to use an abandoned sewer branch as shown in Thames Water plans, but do not appear to have considered the impact this may have on the receiving system. It is not clear based on the Thames Water Plans provided in the drainage statement and the CCTV information if the receiving sewer has the capacity to accommodate the proposed surface water discharge at this location.	Foul water flow rates have been confirmed as acceptable by Thames Water and provide a reduction from existing. The existing site modelling has further verified that the proposed surface water flows are a reduction on existing as per Thames Water requirements in correspondence dated 07/05/21. The sewer survey confirmed Cheap Street 675mm connection is live, it is assumed that this is no longer a Thames Water sewer.
Drainage layout issued 08.01.21 not updated to reflect latest LA plans.	8.24 Refusal 6	The drainage design layout submitted as part of the drainage statement is not a detailed drainage design and does not reflect the latest proposals as shown in landscape plans (CD1.200 and CD1.201). Note potential clashes with tree pits, landscaping features and geocellular storage (this was a concern of the LLFA as noted previously). It is possible these features will be sacrificed for storage reducing the variety of green features on site as part of detailed design (which should have already been carried out). The layout does not adhere to basic standards expected from a full application (cover levels, invert levels, pipe sizes, gradients, etc.) and does not show all SuDS features. We do welcome the implementation of landscape features and green roofs. If a compliant detailed design can be developed with these SuDS features we would consider the variety of SuDS implemented on site acceptable, however we have reservations that this is achievable.	The drainage design layout has been updated with latest landscaping plan and includes CL's, IL's, pipe diameters and gradients. Drainage design layout is for ground floor only, further SuDS features are shown on the landscaping plans.

Table 1.1: LLFA comments and agreed actions

2.0 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.

2.2. Proposed Development

The existing buildings on the site are to be demolished except for the car park and cinema. The proposed redevelopment will be a mixed-use development, comprising residential and commercial premises and associated public realm improvements. The latest Architects General Arrangement Plan for the Ground Floor can be found in Appendix A.

2.3. Site Description

2.3.1 Topography

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-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.

Please see 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 (~25m deep).

Groundwater was encountered during the site investigation at depths of between 2.53m 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 Site Investigation. This was encountered within the made ground and alluvium deposits.

Aquifer designation mapping provided by DEFRA indicates the site lies in 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 Risk’, therefore any contamination entering the ground has a risk of contaminating groundwater 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 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 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 225mm diameter foul sewers in Market Place and Cheap Street.

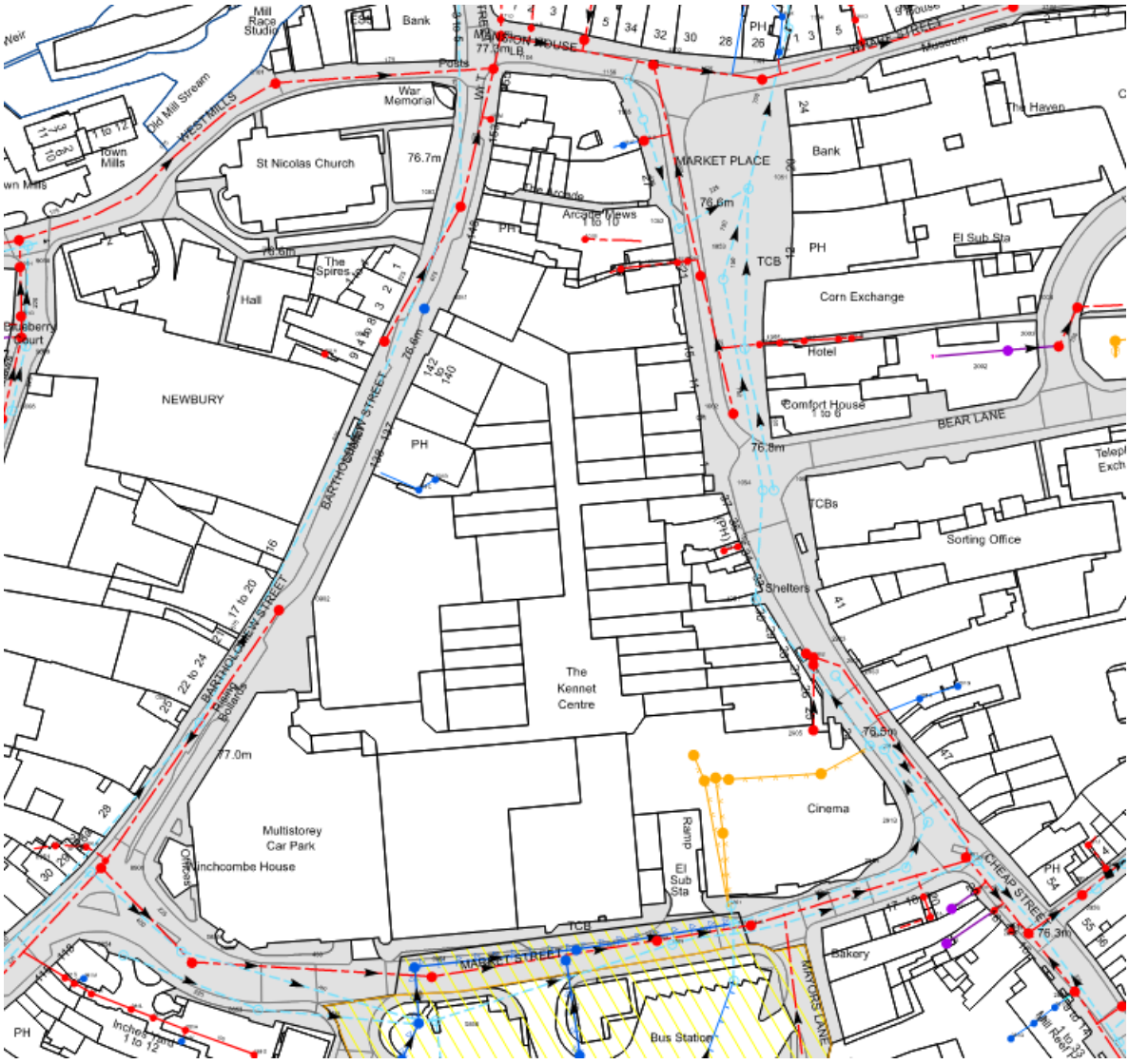


Figure 2.1: Thames Water Sewer Asset Map (extracted from Asset Location Search)

2.3.5 Flood Risk

Please refer to the site specific FRA (Ref: 4508-RBG-ZZ-XX-RP-CV-00002) for further information on flood risk and proposed site levels.

3.0 Surface Water Drainage

3.1. Surface Water Management Strategy

3.1.1 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 is not feasible for the development. Green roofs and blue roofs are proposed in the development and water butts will be provided for local storage of rainwater.
	Use infiltration techniques, such as porous surfaces in non-clay areas	✗	Infiltration is not feasible due to the underlying ground strata and shallow ground water table.
	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	✓	Potential on site for sealed water storage features
	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 / Bartholomew Street.
Least sustainable	Discharge rainwater to the combined sewer.	✗	Not required due to presence of surface water sewers

Table 3.1: Sustainable Drainage Hierarchy

The feasibility of blue roofs and rainwater harvesting has been assessed during the concept design phase. Blue roofs have been included. Rainwater harvesting at roof level is not commercially viable for the development. There are a number of biodiverse / green roofs on the site, refer to the landscape plans in Appendix G.

There is the opportunity to place SuDS features within the public realm elements of the site. Permeable paving, tree pits and planters are to be considered wherever possible.

3.1.2 Catchment Analysis

An analysis of the existing and proposed catchment areas for the site has been undertaken. The total site area of the buildings to be redeveloped is approximately 1.631ha, with this entire area currently being impermeable brownfield land. The catchment analysis has exclusion zones, which the existing drainage is assumed to remain the same.

A proportion of the roof area of the building is to be constructed using green and blue roof methods. The sizing and location of the green roof is to be confirmed at the next design stage. The location and sizing of the blue roofs is shown on drawing 4508-RBG-PR-0G-DR-C-52-86001.

3.1.3 Climate Change

WBC as the LLFA have advised that when assessing for the effects of climate change of rainfall intensity a climate change factor of 40% is to be applied to the 1 in 100-year event.

3.1.4 Design Strategy

Surface water will be collected from roof areas via downpipes and external hardstanding 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 D.

Due to the highly constrained nature of the site, it will not be possible to reduce surface water discharge from the site to greenfield runoff rates. WBC as the LLFA were consulted during a pre-application meeting and confirmed that a 50% reduction in discharge rates from the existing case should be achieved during the design. Minutes from the Pre-Application meeting can be found in Appendix C.

	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)	44.5	84
1 in 30 year	618.4	18.7	120.4	81
1 in 100 year	807.5	26.3	185.2	77

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 3.4 below.

SuDS Technique	Plan Area (m^2)	Storage Volume (m^3)	Notes
Permeable Paving	1900	285	Volume based on 500mm subbase with 30% porosity
Attenuation Tank	920	581.6	Cellular Storage tank 800mm and 400mm deep with 95% porosity
Green roofs	1468.3		Green roofs to be provided
Blue roofs	423.6	34.2	Blue roofs are 85mm deep, with 70% of area being used
	Total Storage Volume	900.8 m^3	

Table 3.3: Storage Volumes on site

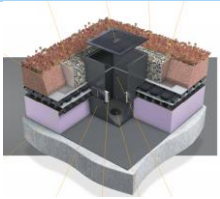
The attenuation volumes have been set to prevent any flooding on site during the 1 in 100 year storm with 40% increase to allow for climate change, and restrict on site flooding to areas away from buildings for storm events exceeding the 1 in 100 year.

At this stage no allowance in the design has been made for the attenuation effects of the green roof as the coverage and build up of the green roof is to be determined at the next design stage.

Refer to appendix D for the drainage calculations and appendix E for a general arrangement plan for the proposed drainage.

3.2. SuDS Measures

The following SuDS measures are proposed for the site:

Technique	Image	Description	Advantages	Disadvantages
Green/Brown roof		Multi-layered system that covers the roof of a building with vegetation cover/landscaping over a drainage layer. Designed to intercept and retain precipitation, reducing the volume of runoff and attenuating peak flows.	Mimics greenfield state of building footprint for high density developments, good removal of pollutants, ecological benefits, insulates buildings, sound absorption.	Additional weight, not appropriate for steep roofs, maintenance of roof vegetation.
Porous Paving/ Porous Asphalt		Surfacing that allows rainwater to infiltrate through the surface and into the underlying layers. The water is temporarily stored before infiltrating the ground or discharging to the sewerage system.	Provides source attenuation and low-level treatment of highway runoff. Reduction in runoff volume via potential infiltration.	Often requires increased construction depth and may not be applicable to heavy traffic loadings.
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 landscaped areas.	No water quality treatment.
Rainwater butts		A large container collecting rainwater to be reused or to be retained	Reuse the rainwater and possible reduction of surface water run off. Can reduce the amount of demand on the mains.	Installed above ground which can be unsightly.
Blue Roofs		Blue roofs are 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 outlets. Reduces the demand on provision of below ground attenuation, reduces the dischrage 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

3.3. 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:	Geocellular boxes, oversized pipes and tanks	
Maintenance	**Action**	**Frequency**
Regular maintenance	- check inlets, outlets, control structures, catchpits and overflows	Monthly or annually or after a large storm
Occasional tasks	- jetting and suction where silt has settled	As required
Remedial work	- reinstate	As required

Suds component:	Permeable pavements	
Maintenance	**Action**	**Frequency**
Regular maintenance	- swept clean with a stiff broom and hose with clean water	Monthly
	- mow grass edges to paving at 35-50mm and Remove weeds and leaves	As required
	- check outlets and control structures	Monthly depending on detail
Occasional tasks	- jetting to remove dirt, grime and moss.	As required
Remedial work	- small areas of damage can be repaired using the same blend as the surrounding surface.	As required

Suds component:	Green roof	
Maintenance	**Action**	**Frequency**
Regular maintenance	- mow grasses (if appropriate) as required	As required
	- inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system	Anually
	- inspect underside of roof for evidence of leakage	Anually
Occasional tasks	- removal of litter and debris to prevent clogging of inlet drains and interference with plant growth	Six monthly / annually or as required
Remedial work	- if erosion channels are evident, these should be stabilised with additional soil substrate similar to the original material. Sources of erosion damage must be identified and controlled.	As required

Suds component:	Rain Gardens	
Maintenance	**Action**	**Frequency**
Regular maintenance	- cut grasses/planting as required	As required
	- inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system	Anually
Occasional tasks	- removal of litter and debris to prevent clogging of drains and interference with plant growth	Six monthly / annually or as required

Suds component:	Rain Gardens	
Remedial work	- rehabilitation of drainage layers or geotextiles if they become clogged	As required

3.4. Exceedance Routes

During extreme rainfall events, larger than 1 in 100 year storm events, surface water runoff 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 F for a plan showing proposed exceedance flow routes.

3.5. Thames Water Consultation

A pre-planning enquiry has been submitted to Thames Water to determine the capacity of the local sewer network. Thames water have confirmed that if the existing flows can be verified to confirm that the proposed flows are a reduction, then the surface water can discharge into the existing sewer. It is proposed to connect to the 750mm Thames Water sewer in Cheap Street via the existing surface water connections from the existing buildings on the site. The foul water sewerage network has no objections.

4.0 Foul Water Drainage

4.1. Foul Water Management Strategy

Foul water will be collected from buildings via soil vent pipes, gullies and substacks. A pipe system will then convey the foul water to the public sewer. It is intended that all foul water is to discharge 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:

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

4.2. Thames Water Consultation

A pre-planning enquiry has been submitted to Thames Water to determine the capacity of the local sewer network. Thames water have confirmed that there is sufficient capacity in the existing sewers to accept the proposed flows. It is proposed to reuse the connections listed above. This will be confirmed at the next design stage when the existing connections are surveyed.

5.0 Conclusion

This Drainage Statement has been developed in line with the requirements of national and local planning policy. It has set out how 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
  - Green Roof
  - Permeable Paving
  - Below Ground Attenuation Tanks
  - Blue Roofs
  - Rainwater Butts
- Surface water will be attenuated on site to reduce the discharge for the 1 in 100 years storm (including Climate Change Allowance) to 77% of the existing flow rate. This exceeds the minimum reduction of 50% agreed previously with the LLFA.
- 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 buildings 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.
- Thames Water have confirmed that there is sufficient capacity within the existing public sewer network for the proposed flows from the development.

Please refer to the Flood Risk Assessment RBG Document Reference 4508-REP-ZZ-XX-RP-CV-00001 for details of the flood risk and mitigation strategy for the development.

Appendix A

Architectural Ground Floor Site Plan

NOTES

CONSULTANTS
- Refer to highways consultant's drawings for details
- Refer to landscape consultant's drawings for details

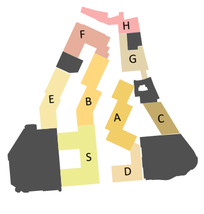
AREAS
- Refer to area schedule

N

Rev	Notes	Date	By	Auth
P.A	PLANNING SUBMISSION	06/09/2023	MM	RC

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

VISUAL SCALE 1:500 @ A1



ColladoCollins Architects

17-19 Foley Street
London W1W 6DW
T 020 7580 3490
F 020 7580 2917
info@colladocollins.com
www.colladocollins.com

Date: 29/01/2021
Drawn By: LK
Checked by: RC
Scale @ A1: As indicated
Scale @ A3: 1 : 1000
CAD File No:

LOCHAILORT

Eagle Quarter, Newbury
Proposed Site Plan - Ground Floor

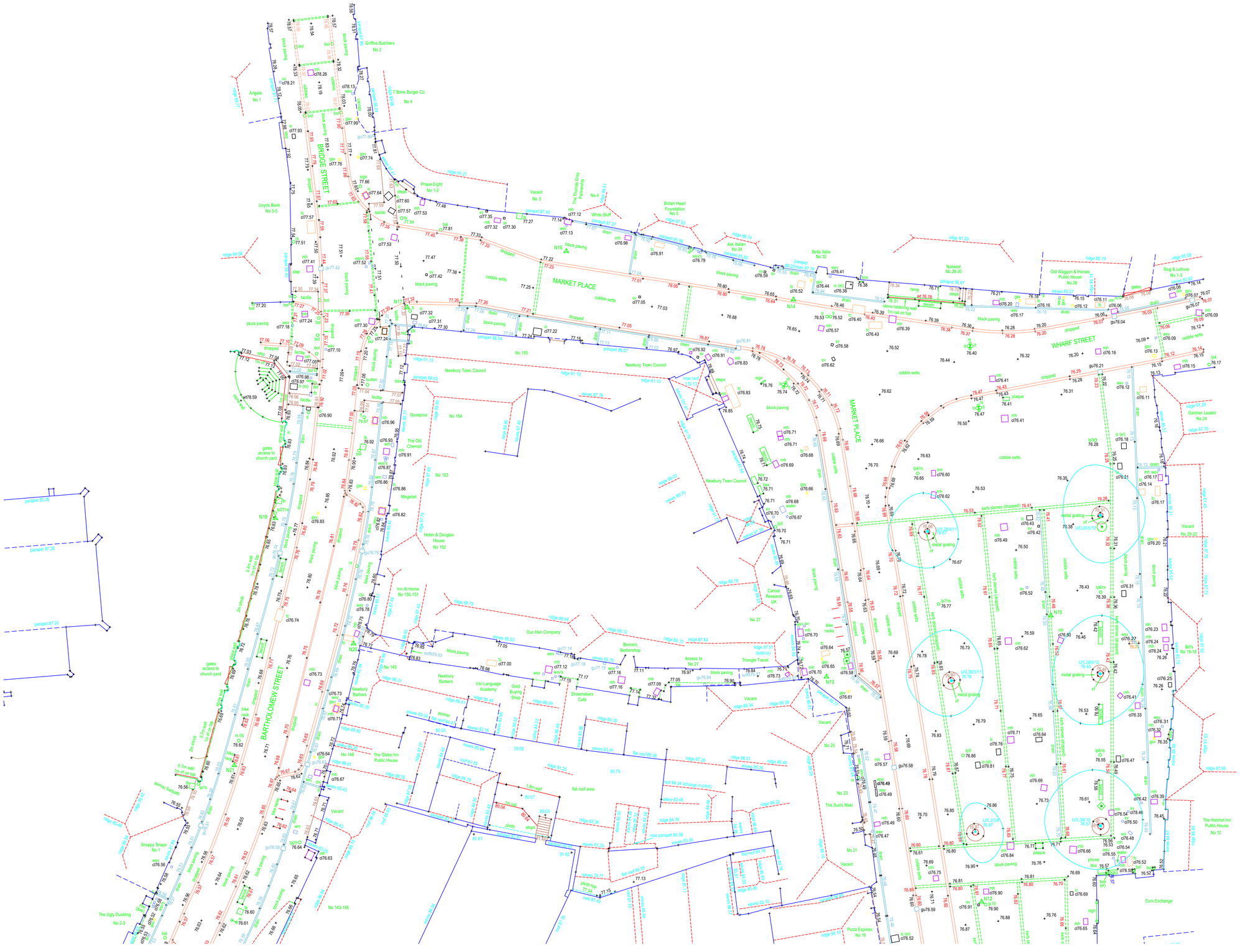
PLANNING

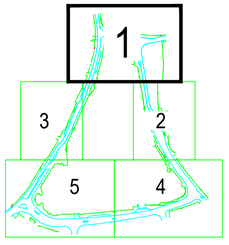
20011 P0-100

PA Revisio n

Appendix B

Topographical Survey





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.

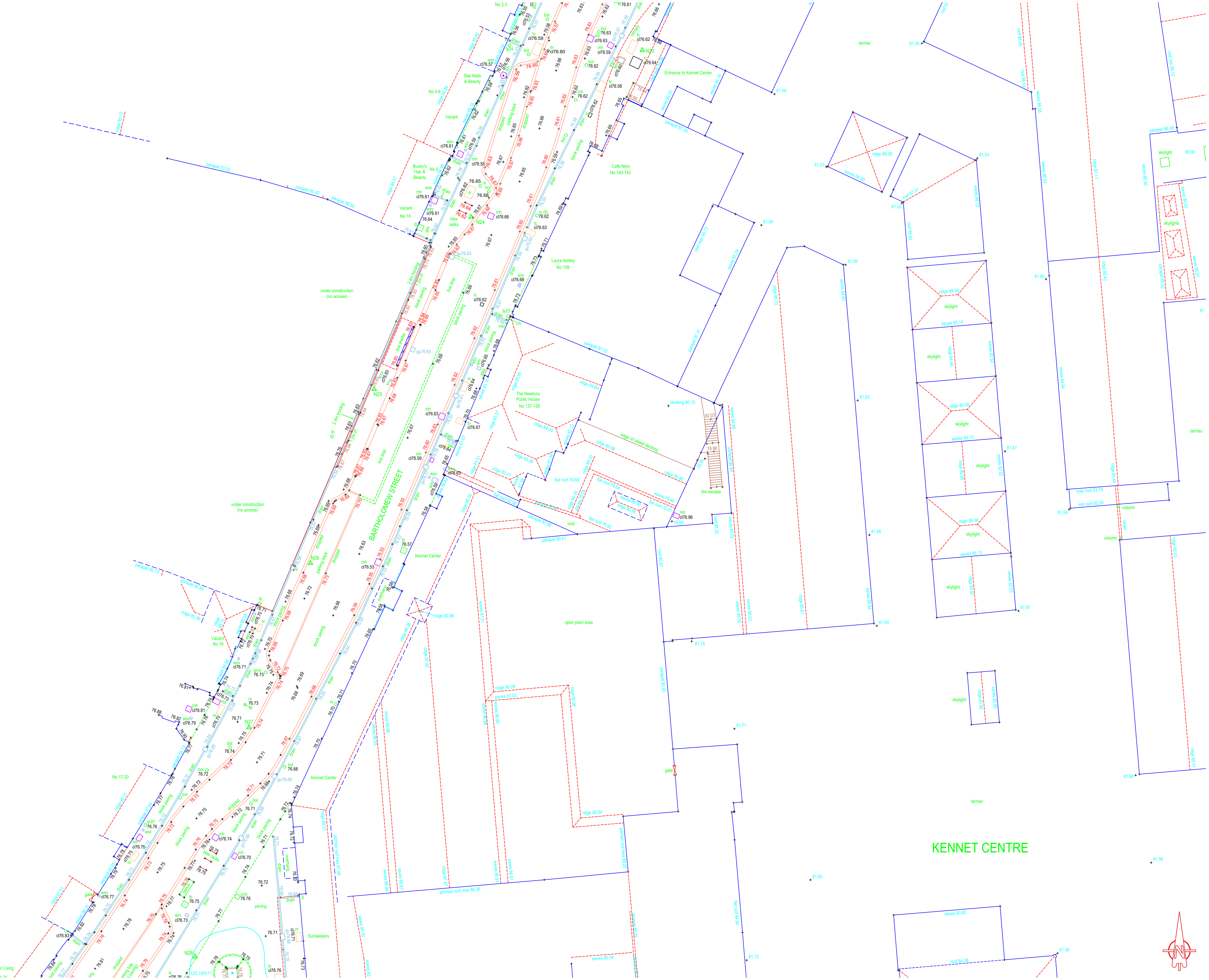
Geomatic Surveyors

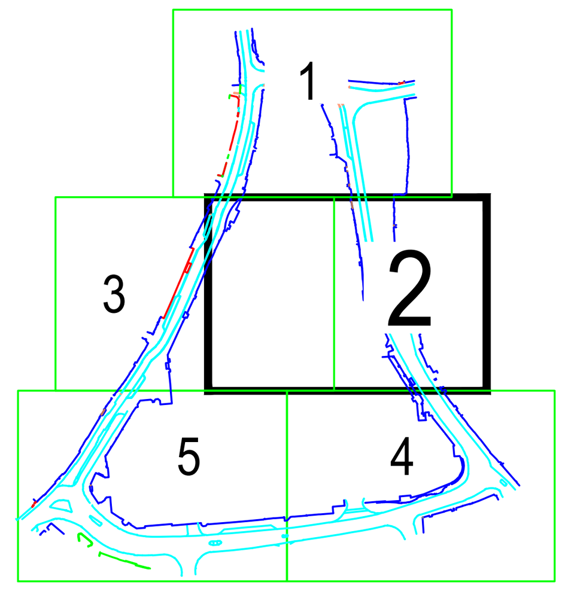
siteline

Unit E, Woodside
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)





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
G	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
CP	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

Unit E, Woodside
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 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
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

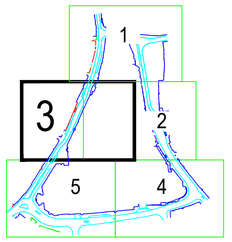
Species / Dia / Spread (max) / Ht
e.g. OK / 0.6 / 8 / 15

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
G	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.

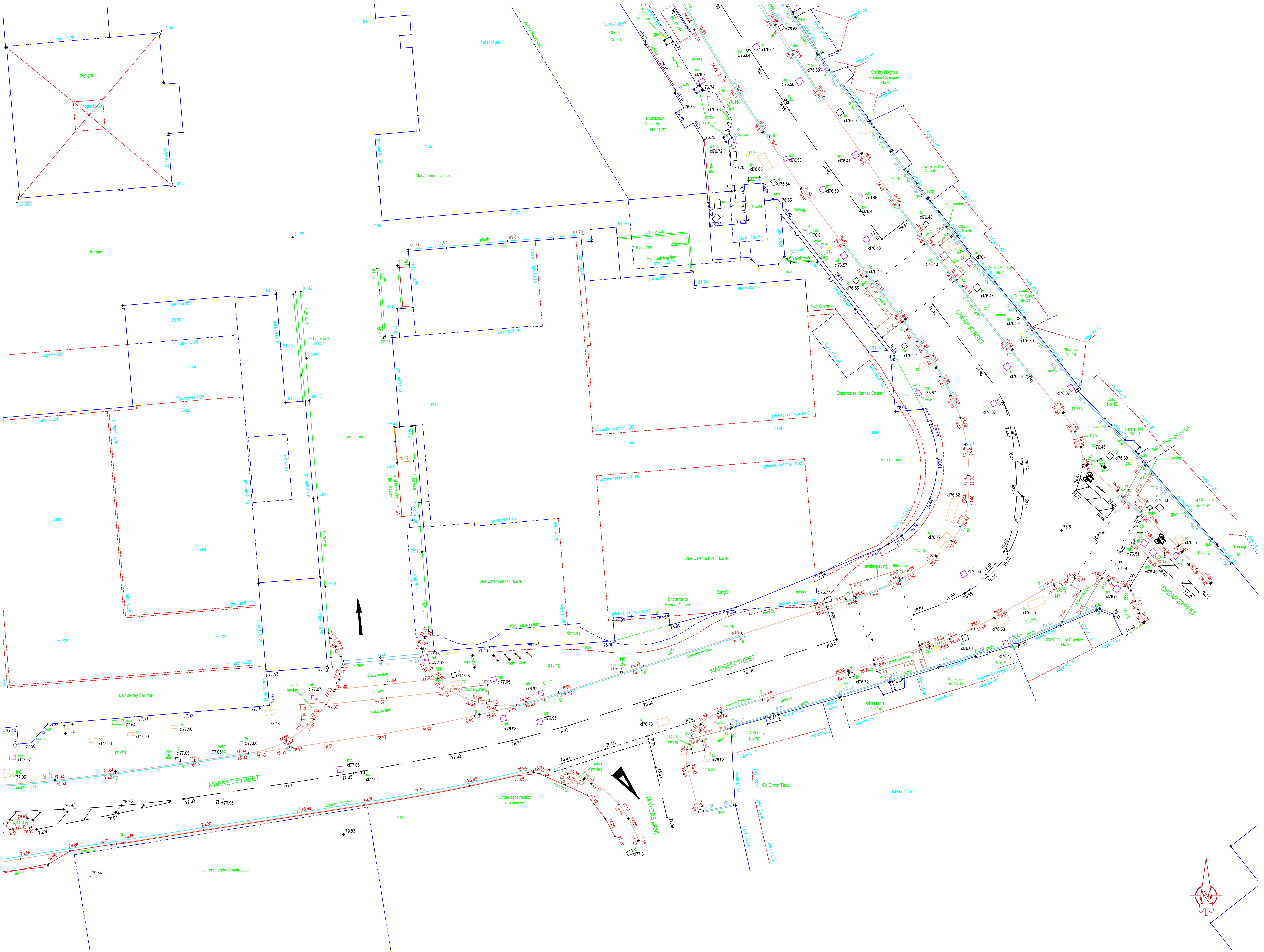
Geomatic Surveyors

siteline

Unit E, Woodside
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 3	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
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

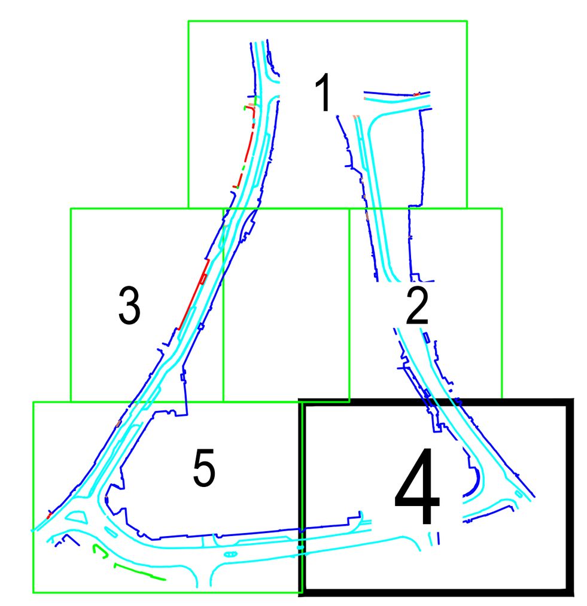
Species / Dia / Spread (max) / Ht
e.g. OK / 0.6 / 8 / 15

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
G 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
CP 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

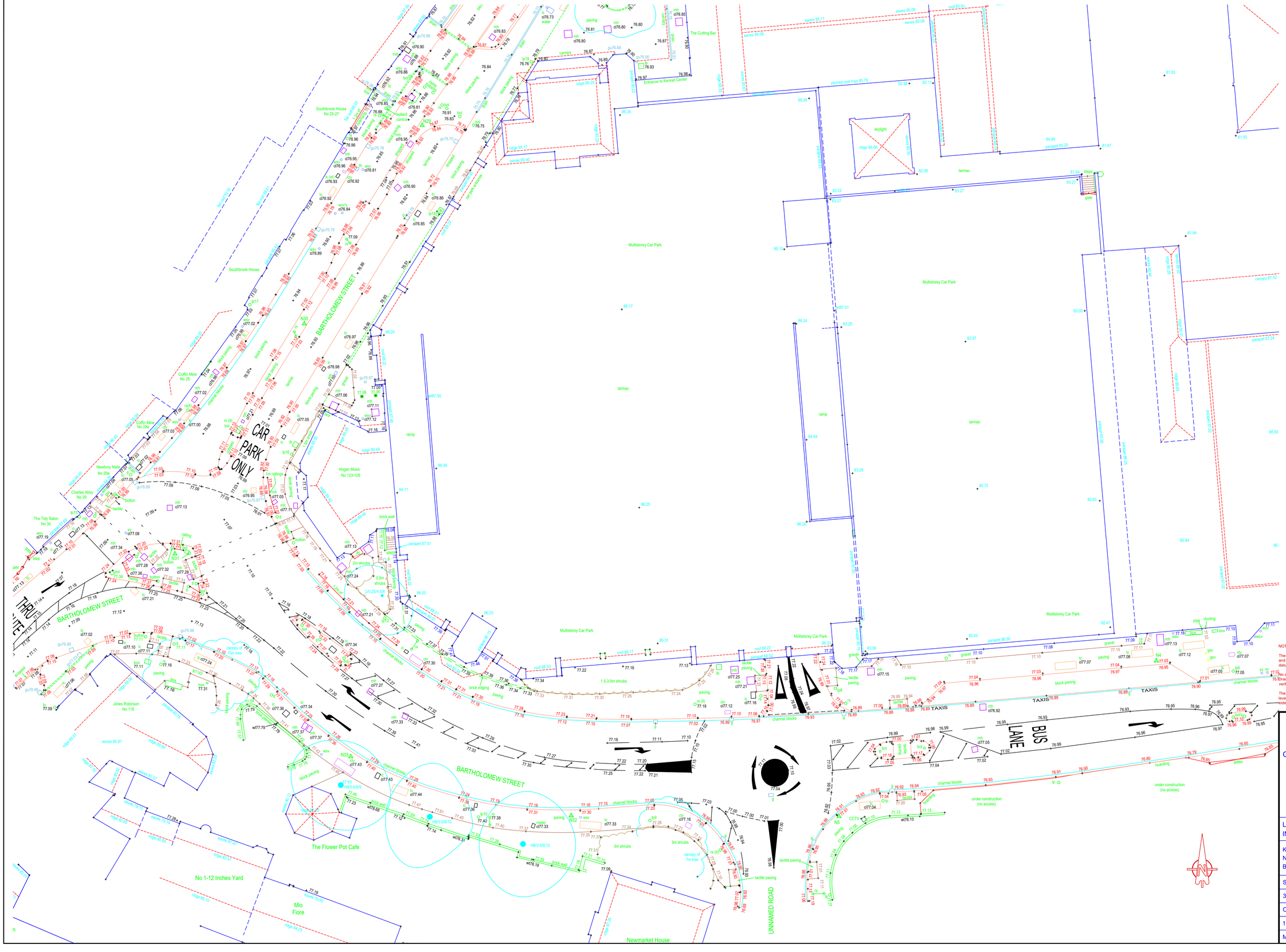
The survey grid has been related to OS National Grid using a flat earth projection and metric scale factor of 1, centred on Station RF1. Levels are related to OS datum determined from the National GPS Network using OSGM15.

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
Unit E, Woodside
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 4	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
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

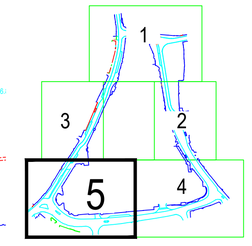
Species / Dia / Spread (max) / Ht
e.g. OK / 0.6 / 8 / 15

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
CP	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

Unit E, Woodside
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 5	Drawing Number
OCTOBER 2019	Date
1:200 (at A1)	Scale
MJR ST	Surveyor(s)

Appendix C
WBC Consultation

Meeting Minutes

Robert Bird Group
Member of the Surbana Jurong Group

West Berkshire LLFA Meeting: 4508 Kennet Centre

Date:	12th August 2020	
Time:	14:00	
Location:	MS Teams	
Attendees:	Jon Bowden (WBC)	JB
	Stuart Clark (WBC)	SC
	Ciaran Morrissey (RBG)	CM
	Edmond Veillard (RBG)	EV
	Hugo Bianchi (RBG)	HB
	James Croucher (LI)	JC
Apologies:	Hugo Haig (LI)	HH
	Cormac Ennis (RBG)	CE
Minutes:	EV / CM	
Distribution:	As above	
Next Meeting:	N/A	

Agenda

1. Site Description, Location, Development Type

2. Planning Documentation Review - Flood Risk Assessment, Drainage Statement (inc. SuDS Strategy)

3. Flood Risk
    a. Flood Zone requirements
    b. Flood Levels – mitigation measures

4. Drainage Strategy
    a. Drainage Hierarchy
    b. Discharge
    c. Proposed SuDS Measures

5. AOB and Next steps

		ITEM / ACTION	ACTION	DATE
1.0		**Site Description, Location, Development Type**		
	1.1	LI note entire site to be redeveloped with exception of cinema and MSCP which are to be retained with modifications. No basements proposed on the site.	-	
	1.2	Creation of open air public realm through centre of site. Public realm to be entirely pedestrianised (except in cases of emergency)	-	
	1.3	RBG note existing site is entirely brownfield	-	
2.0		**Planning Documentation Review**		
	2.1	WBC confirm that Flood Risk Assessment and Drainage Strategy to be two separate documents for planning submission	-	
	2.2	WBC confirm there is no specific SuDS Proforma for surface water drainage rates and attenuation volumes. RBG to set out in Drainage Strategy	-	
3.0		**Flood Risk**		
	3.1	RBG note that the site lies in Flood Zone 2 and the usage classes of the development are compatible with planning requirements	-	
	3.2	WBC confirm that threshold levels should be set in accordance with EA guidance and BS 8533 where practicable. Noted that this is difficult to achieve where existing highway levels do not meet these criteria. Post meeting note: EA modelled flood level for 1 in 100 year event +70% CC = 76.74m, 300mm freeboard to be provided where practicable	-	
	3.3	Requirement for sequential and exception test to be determined by planners, WBC note that exception test is considered unlikely	-	
	3.4	WBC note there is specific risk from groundwater flooding due to shallow groundwater table	-	
	3.5	WBC note historical flooding has occurred to Market Street during heavy rainfall	-	
4.0		**Drainage Strategy**		
	4.1	WBC confirm discharge strategy to sewers is acceptable, high ground water table precludes infiltration.	-	
	4.2	RBG note that it will be challenging to reduce discharge from site to greenfield runoff rates due to constrained city centre location of site. WBC confirm that a 50% reduction from existing is a suitable for preliminary design. RBG to provide initial assessment of attenuation volumes and discharge rates once design is progressed to determine final rate.	RBG	
	4.3	RBG note that as cinema and car park structures are to be retained, it is preferential to retain existing drainage strategy and remove the building footprints from rainfall area calculations. WBC note that the option to drain these area to the new development storage should be considered. RBG to explore rerouting these areas.	RBG	
	4.4	WBC to confirm FEH or FSR Rainfall method	WB	
	4.5	WBC confirm that a climate change allowance of 40% to be applied to rainfall	-	
	4.6	LI note potential for blue / green roofs extremely limited. WBC note small planters and areas soft landscaping on roofs would be welcomed.	RBG/LI	
	4.7	LI to consider rainwater harvesting	LI	
	4.8	WBC note that permeable paving is not aesthetically ideal. RBG to consider methods to make more appealing with Landscape Architect. Comparison to be made with Parkway Shopping Centre paving	RBG	
	4.9	WBC note use of rills, tree pits and soft landscaping in public realm will be welcomed	-	
	4.10	WBC note to reuse existing connection to brick sewer along Bartholomew St.	-	
5.0		**AOB**		

	5.1	LI to liaise with architects / landscape architects over use of green walls	LI	
	5.2	WB and LI to liaise regarding upgrading streetscape features on Bartholomew St and area's surrounding Kennet Centre	WBC/LI	
	5.3.	LI seeking to abstract groundwater via boreholes. WBC note this should be organised directly with the EA Post meeting note: RBG to set up meeting with EA	RBG	

Appendix D

Drainage Calculations

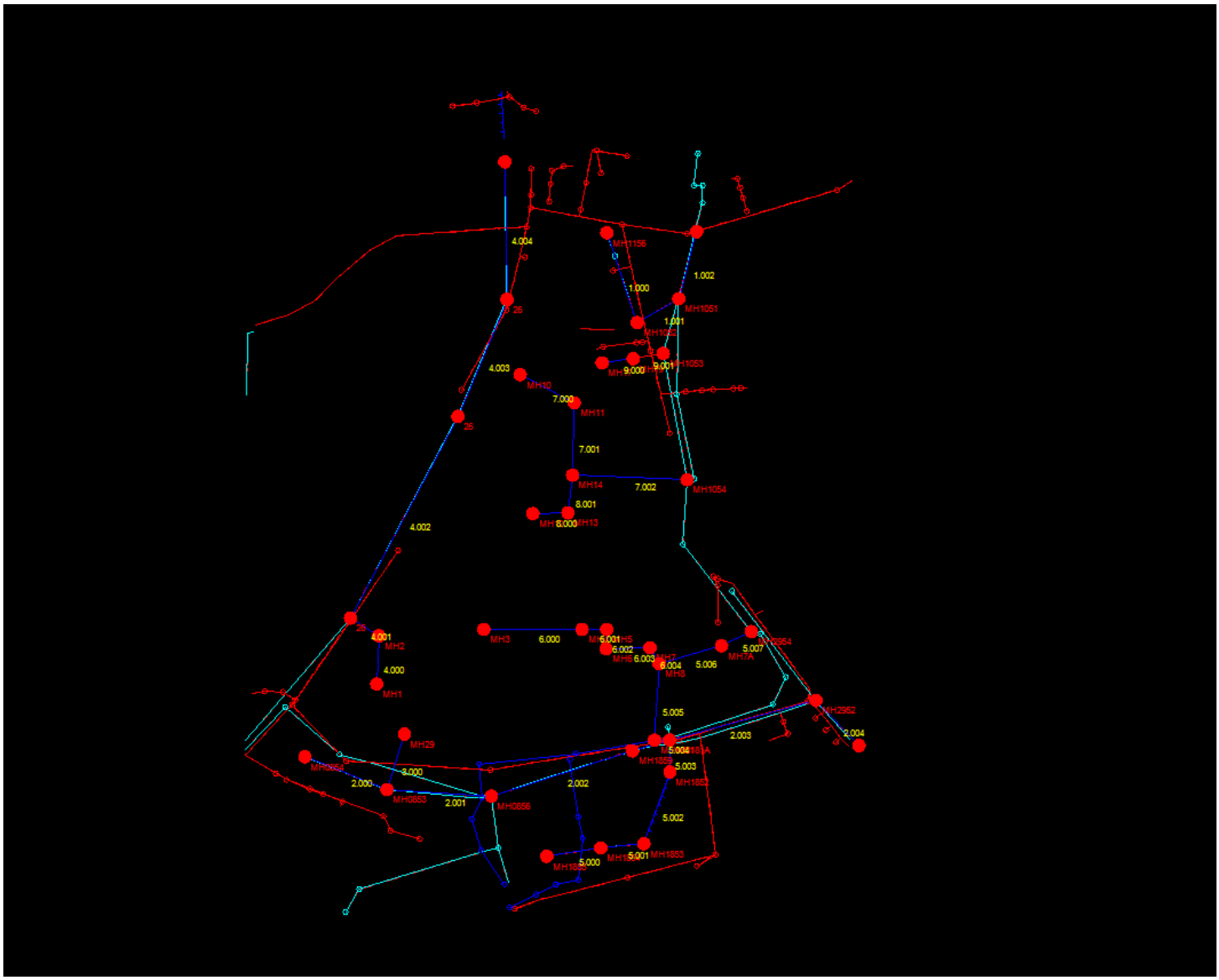
ICP SUDS Mean Annual Flood

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

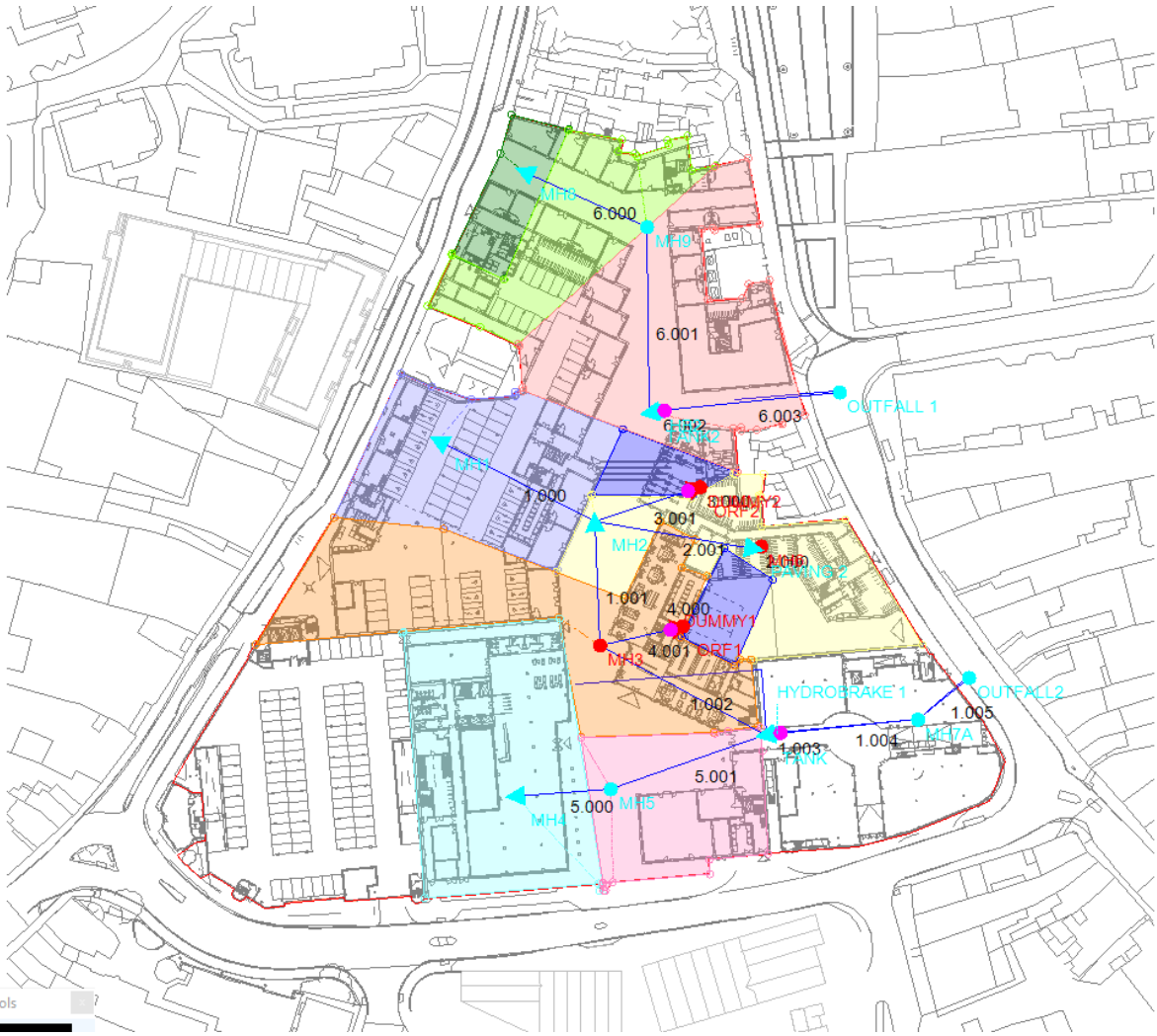
OUTFALL 1

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	


MH8
6.000
MH9
6.001
6.002
6.003
OUTFALL 1
MH1
1.000
3.001
MH2
2.001
2.000
1.001
4.000
4.001
MH3
1.002
HYDROBRAKE 1
OUTFALL2
1.005
1.004
MH7A
1.003
5.001
5.000
MH5
MH4
Video Controls

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 OUTFALL2 (pipe 1.005)

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.598	4-8	0.564

Total Area Contributing (ha) = 1.162

Total Pipe Volume (m³) = 93.650

Time Area Diagram at outfall OUTFALL 1 (pipe 6.003)

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.338	4-8	0.131

Total Area Contributing (ha) = 0.469

Total Pipe Volume (m³) = 13.782

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

Network Design Table for Storm

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	42.907	0.064	675.0	0.202	5.00	0.0	0.600	o	675	Pipe/Conduit	
2.000	1.726	1.000	1.7	0.000	5.00	0.0	0.600	o	150	Pipe/Conduit	
2.001	39.460	0.100	394.6	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
3.000	0.606	0.100	6.1	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	
3.001	26.384	24.000	1.1	0.033	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	30.194	0.045	675.0	0.180	0.00	0.0	0.600	o	675	Pipe/Conduit	
4.000	0.567	0.100	5.7	0.000	5.00	0.0	0.600	o	100	Pipe/Conduit	
4.001	20.066	24.000	0.8	0.033	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	45.611	0.068	675.0	0.302	0.00	0.0	0.600	o	675	Pipe/Conduit	
5.000	23.434	0.035	675.0	0.269	5.00	0.0	0.600	o	675	Pipe/Conduit	
5.001	39.735	0.059	675.0	0.142	0.00	0.0	0.600	o	675	Pipe/Conduit	
1.003	2.982	0.006	524.5	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
1.004	34.487	0.063	547.4	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
1.005	16.078	0.151	106.5	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)
1.000	-10.50	5.71	75.697	0.202	0.0	0.0	0.0	1.00	358.3	0.0
2.000	-11.99	5.00	77.000	0.000	0.0	0.0	0.0	7.73	136.7	0.0
2.001	-10.73	5.59	76.000	0.000	0.0	0.0	0.0	1.12	242.8	0.0
3.000	-11.99	5.00	100.100	0.000	0.0	0.0	0.0	3.16	24.8	0.0
3.001	-11.88	5.05	100.000	0.033	0.0	0.0	0.0	9.69	171.3	0.0
1.001	-9.65	6.22	75.633	0.416	0.0	0.0	0.0	1.00	358.3	0.0
4.000	-11.99	5.00	100.000	0.000	0.0	0.0	0.0	3.27	25.7	0.0
4.001	-11.92	5.03	100.000	0.033	0.0	0.0	0.0	11.12	196.4	0.0
1.002	-8.60	6.98	75.588	0.751	0.0	0.0	0.0	1.00	358.3	0.0
5.000	-11.13	5.39	75.614	0.269	0.0	0.0	0.0	1.00	358.3	0.0
5.001	-9.91	6.05	75.579	0.411	0.0	0.0	0.0	1.00	358.3	0.0
1.003	-8.55	7.02	75.580	1.162	0.0	0.0	0.0	1.14	407.0	0.0
1.004	-7.96	7.54	75.574	1.162	0.0	0.0	0.0	1.11	398.3	0.0
1.005	-7.85	7.64	75.511	1.162	0.0	0.0	0.0	2.54	908.8	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
6.000	32.841	0.146	224.9	0.052	5.00	0.0	0.600	o	375	Pipe/Conduit	
6.001	45.272	0.150	301.8	0.143	0.00	0.0	0.600	o	375	Pipe/Conduit	
6.002	3.110	0.011	277.8	0.274	0.00	0.0	0.600	o	375	Pipe/Conduit	
6.003	43.563	0.157	277.8	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	

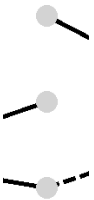
Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
6.000	-11.00	5.45	76.000	0.052	0.0	0.0	0.0	1.20	133.0	0.0
6.001	-9.71	6.18	75.854	0.195	0.0	0.0	0.0	1.04	114.6	0.0
6.002	-9.63	6.23	75.704	0.469	0.0	0.0	0.0	1.08	119.5	0.0
6.003	-8.69	6.90	75.693	0.469	0.0	0.0	0.0	1.08	119.5	0.0

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Bac
MH1	76.920	1.223	Open Manhole	1500	1.000	75.697	675				
MH6	101.000	24.000	Open Manhole	1200	2.000	77.000	150				
PAVING 2	76.800	0.800	Open Manhole	1500	2.001	76.000	525	2.000	76.000	150	
DUMMY2	101.000	0.900	Open Manhole	100	3.000	100.100	100				
ORF2	101.000	1.000	Open Manhole	1200	3.001	100.000	150	3.000	100.000	100	
MH2	76.920	1.287	Open Manhole	1500	1.001	75.633	675	1.000	75.633	675	
								2.001	75.900	525	
								3.001	76.000	150	
DUMMY1	101.000	1.000	Open Manhole	100	4.000	100.000	100				
ORF1	101.000	1.100	Open Manhole	1200	4.001	100.000	150	4.000	99.900	100	
MH3	101.000	25.412	Open Manhole	1500	1.002	75.588	675	1.001	75.588	675	
								4.001	76.000	150	
MH4	76.920	1.306	Open Manhole	1500	5.000	75.614	675				
MH5	76.920	1.341	Open Manhole	1500	5.001	75.579	675	5.000	75.579	675	
TANK	76.920	1.400	Open Manhole	1500	1.003	75.580	675	1.002	75.520	675	
								5.001	75.520	675	
HYDROBRAKE 1	76.920	1.346	Open Manhole	1800	1.004	75.574	675	1.003	75.574	675	
MH7A	76.620	1.109	Open Manhole	1500	1.005	75.511	675	1.004	75.511	675	
OUTFALL2	76.620	1.260	Open Manhole	0		OUTFALL		1.005	75.360	675	
MH8	76.920	0.920	Open Manhole	1350	6.000	76.000	375				
MH9	76.920	1.066	Open Manhole	1350	6.001	75.854	375	6.000	75.854	375	
TANK2	76.920	1.216	Open Manhole	1350	6.002	75.704	375	6.001	75.704	375	
HB2	76.620	0.927	Open Manhole	1350	6.003	75.693	375	6.002	75.693	375	
OUTFALL 1	76.620	1.084	Open Manhole	0		OUTFALL		6.003	75.536	375	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
MH1	381.565	101.586	381.565	101.586	Required	
MH6	460.201	75.802	460.201	75.802	Required	
PAVING 2	458.570	75.237	458.570	75.237	Required	



Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
DUMMY2	445.316	90.261	445.316	90.261	Required	
ORF2	444.720	90.149	444.720	90.149	Required	
MH2	419.671	81.864	419.671	81.864	Required	
DUMMY1	441.082	56.350	441.082	56.350	Required	
ORF1	440.571	56.103	440.571	56.103	Required	
MH3	420.995	51.699	420.995	51.699	Required	
MH4	400.201	14.975	400.201	14.975	Required	
MH5	423.571	16.706	423.571	16.706	Required	
TANK	461.055	29.892	461.055	29.892	Required	
HYDROBRAKE 1	464.002	30.348	464.002	30.348	Required	
MH7A	498.331	33.646	498.331	33.646	Required	
OUTFALL2	510.781	43.819			No Entry	
MH8	402.471	167.130	402.471	167.130	Required	
MH9	432.402	153.613	432.402	153.613	Required	
TANK2	432.896	108.344	432.896	108.344	Required	

Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
HB2	435.968	108.829	435.968	108.829	Required	
OUTFALL 1	479.297	113.339			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	0.202	0.202	0.202
2.000	-	-	100	0.000	0.000	0.000
2.001	-	-	100	0.000	0.000	0.000
3.000	-	-	100	0.000	0.000	0.000
3.001	-	-	100	0.033	0.033	0.033
1.001	User	-	100	0.180	0.180	0.180
4.000	-	-	100	0.000	0.000	0.000
4.001	-	-	100	0.033	0.033	0.033
1.002	User	-	100	0.302	0.302	0.302
5.000	User	-	100	0.269	0.269	0.269
5.001	User	-	100	0.141	0.141	0.141
	User	-	100	0.000	0.000	0.142
1.003	-	-	100	0.000	0.000	0.000
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
6.000	User	-	100	0.052	0.052	0.052
6.001	User	-	100	0.143	0.143	0.143
6.002	User	-	100	0.274	0.274	0.274
6.003	-	-	100	0.000	0.000	0.000
				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)
1.005	OUTFALL2	76.620	75.360	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)
6.003	OUTFALL 1	76.620	75.536	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 Storage Structures	9
Number of Online Controls	4	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

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	No
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Storm Duration (mins)	30

Online Controls for Storm

Orifice Manhole: ORF2, DS/PN: 3.001, Volume (m³): 1.1

Diameter (m) 0.150 Discharge Coefficient 0.600 Invert Level (m) 100.000

Orifice Manhole: ORF1, DS/PN: 4.001, Volume (m³): 1.1

Diameter (m) 0.100 Discharge Coefficient 0.600 Invert Level (m) 100.000

Hydro-Brake® Optimum Manhole: HYDROBRAKE 1, DS/PN: 1.004, Volume (m³): 3.9

Unit Reference	MD-SHE-0474-1530-0900-1530
Design Head (m)	0.900
Design Flow (l/s)	153.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	474
Invert Level (m)	75.574
Minimum Outlet Pipe Diameter (mm)	500
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.900	152.9
Flush-Flo™	0.616	152.8
Kick-Flo®	0.828	146.9
Mean Flow over Head Range	-	107.1

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	12.2	1.200	176.0	3.000	275.5	7.000	417.9
0.200	44.7	1.400	189.7	3.500	297.2	7.500	432.3
0.300	89.7	1.600	202.5	4.000	317.3	8.000	446.3
0.400	136.9	1.800	214.5	4.500	336.2	8.500	459.8
0.500	150.7	2.000	225.9	5.000	354.1	9.000	473.0
0.600	152.8	2.200	236.6	5.500	371.1	9.500	479.9
0.800	148.4	2.400	247.0	6.000	387.3		
1.000	161.0	2.600	256.8	6.500	402.9		

Hydro-Brake® Optimum Manhole: HB2, DS/PN: 6.003, Volume (m³): 1.5

Unit Reference	MD-SHE-0321-6000-0800-6000
Design Head (m)	0.800
Design Flow (l/s)	60.0

Hydro-Brake® Optimum Manhole: HB2, DS/PN: 6.003, Volume (m³): 1.5

Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	321
Invert Level (m)	75.693
Minimum Outlet Pipe Diameter (mm)	375
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	60.0
Flush-Flo™	0.447	60.0
Kick-Flo®	0.682	55.6
Mean Flow over Head Range	-	45.4

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)
0.100	9.6	1.200	73.0	3.000	113.9	7.000	172.4
0.200	32.8	1.400	78.6	3.500	122.8	7.500	178.4
0.300	57.7	1.600	83.9	4.000	131.1	8.000	184.1
0.400	59.8	1.800	88.9	4.500	138.9	8.500	188.0
0.500	59.7	2.000	93.5	5.000	146.2	9.000	193.5
0.600	58.2	2.200	98.0	5.500	153.2	9.500	198.9
0.800	60.0	2.400	102.2	6.000	159.9		
1.000	66.8	2.600	106.3	6.500	166.3		

Storage Structures for Storm

Porous Car Park Manhole: MH1, DS/PN: 1.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	20.0
Max Percolation (l/s)	55.6	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	76.200	Membrane Depth (mm)	100

Porous Car Park Manhole: PAVING 2, DS/PN: 2.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	20.0
Max Percolation (l/s)	55.6	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	76.200	Membrane Depth (mm)	100

Cellular Storage Manhole: ORF2, DS/PN: 3.001

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	191.5	0.0	0.086	0.0	0.0
0.085	191.5	0.0			

Porous Car Park Manhole: MH2, DS/PN: 1.001

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	10.0
Max Percolation (l/s)	27.8	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	76.200	Membrane Depth (mm)	100

Cellular Storage Manhole: ORF1, DS/PN: 4.001

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	232.1	0.0	0.086	0.0	0.0
0.085	232.1	0.0			

Porous Car Park Manhole: MH4, DS/PN: 5.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	10.0
Max Percolation (l/s)	27.8	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	76.200	Membrane Depth (mm)	100

Complex Manhole: TANK, DS/PN: 1.003

Cellular Storage

Invert Level (m)	75.435	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	610.0	0.0	0.801	0.0	0.0
0.800	610.0	0.0			

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	20.0
Membrane Percolation (mm/hr)	1000	Length (m)	25.0
Max Percolation (l/s)	138.9	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	75.955	Membrane Depth (mm)	100

Porous Car Park Manhole: MH8, DS/PN: 6.000

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	10.0
Membrane Percolation (mm/hr)	1000	Length (m)	10.0
Max Percolation (l/s)	27.8	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	76.020	Membrane Depth (mm)	100

Complex Manhole: TANK2, DS/PN: 6.002

Cellular Storage

Invert Level (m)	75.704	Safety Factor	2.0
Infiltration Coefficient Base (m/hr)	0.00000	Porosity	0.95
Infiltration Coefficient Side (m/hr)	0.00000		

Cellular Storage

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	310.0	0.0	0.401	0.0	0.0
0.400	310.0	0.0			

Porous Car Park

Infiltration Coefficient Base (m/hr)	0.00000	Width (m)	20.0
Membrane Percolation (mm/hr)	1000	Length (m)	35.0
Max Percolation (l/s)	194.4	Slope (1:X)	0.0
Safety Factor	2.0	Depression Storage (mm)	5
Porosity	0.30	Evaporation (mm/day)	3
Invert Level (m)	76.020	Membrane Depth (mm)	100

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	9
Number of Online Controls	4	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)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
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.
1.000	MH1	30 Summer	2	+0%	100/30 Winter			
2.000	MH6	30 Summer	2	+0%				
2.001	PAVING 2	30 Summer	2	+0%				
3.000	DUMMY2	30 Summer	2	+0%				
3.001	ORF2	360 Summer	2	+0%				
1.001	MH2	30 Summer	2	+0%	100/30 Summer			
4.000	DUMMY1	480 Summer	2	+0%				
4.001	ORF1	480 Summer	2	+0%				
1.002	MH3	30 Summer	2	+0%	100/30 Summer			
5.000	MH4	30 Summer	2	+0%				
5.001	MH5	30 Summer	2	+0%				
1.003	TANK	360 Summer	2	+0%				
1.004	HYDROBRAKE 1	360 Summer	2	+0%				
1.005	MH7A	360 Summer	2	+0%				
6.000	MH8	30 Summer	2	+0%				

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	MH1	75.927	-0.445	0.000	0.11		8	34.2	OK
2.000	MH6	77.000	-0.150	0.000	0.00			0.0	OK
2.001	PAVING 2	76.000	-0.525	0.000	0.00			0.0	OK
3.000	DUMMY2	100.100	-0.100	0.000	0.00			0.0	OK
3.001	ORF2	100.031	-0.119	0.000	0.00		228	0.6	OK
1.001	MH2	75.899	-0.409	0.000	0.22		6	58.1	OK
4.000	DUMMY1	100.028	-0.072	0.000	0.00			0.0	OK
4.001	ORF1	100.029	-0.121	0.000	0.00		370	0.4	OK
1.002	MH3	75.855	-0.408	0.000	0.33			99.9	OK
5.000	MH4	75.848	-0.441	0.000	0.21		8	47.0	OK
5.001	MH5	75.798	-0.456	0.000	0.23			68.3	OK
1.003	TANK	75.747	-0.508	0.000	0.08			23.7	OK
1.004	HYDROBRAKE 1	75.743	-0.506	0.000	0.07			23.6	OK
1.005	MH7A	75.605	-0.581	0.000	0.05			23.6	OK
6.000	MH8	76.062	-0.313	0.000	0.06		7	7.5	OK

PN	US/MH Name	Level Exceeded
1.000	MH1	
2.000	MH6	
2.001	PAVING 2	
3.000	DUMMY2	
3.001	ORF2	
1.001	MH2	
4.000	DUMMY1	
4.001	ORF1	
1.002	MH3	
5.000	MH4	
5.001	MH5	
1.003	TANK	
1.004	HYDROBRAKE 1	
1.005	MH7A	
6.000	MH8	

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)
6.001	MH9	30 Summer	2	+0%	100/30 Summer				75.986
6.002	TANK2	120 Summer	2	+0%	100/30 Summer				75.852
6.003	HB2	120 Summer	2	+0%	100/30 Summer				75.846

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
6.001	MH9	-0.243	0.000	0.26			27.5	OK	
6.002	TANK2	-0.227	0.000	0.25		59	21.0	OK	
6.003	HB2	-0.221	0.000	0.19			20.9	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 Storage Structures	9
Number of Online Controls	4	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)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
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.
1.000	MH1	30 Summer	30	+0%	100/30 Winter			
2.000	MH6	30 Summer	30	+0%				
2.001	PAVING 2	30 Summer	30	+0%				
3.000	DUMMY2	30 Summer	30	+0%				
3.001	ORF2	180 Summer	30	+0%				
1.001	MH2	30 Summer	30	+0%	100/30 Summer			
4.000	DUMMY1	240 Summer	30	+0%				
4.001	ORF1	240 Summer	30	+0%				
1.002	MH3	30 Summer	30	+0%	100/30 Summer			
5.000	MH4	30 Summer	30	+0%				
5.001	MH5	180 Summer	30	+0%				
1.003	TANK	180 Summer	30	+0%				
1.004	HYDROBRAKE 1	180 Summer	30	+0%				
1.005	MH7A	180 Summer	30	+0%				
6.000	MH8	30 Summer	30	+0%				

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	MH1	76.161	-0.211	0.000	0.27		8	82.7	OK
2.000	MH6	77.000	-0.150	0.000	0.00			0.0	OK
2.001	PAVING 2	76.116	-0.409	0.000	0.00		4	0.9	OK
3.000	DUMMY2	100.100	-0.100	0.000	0.00			0.0	OK
3.001	ORF2	100.054	-0.096	0.000	0.01		134	1.7	OK
1.001	MH2	76.116	-0.192	0.000	0.56		6	150.7	OK
4.000	DUMMY1	100.049	-0.051	0.000	0.00			0.0	OK
4.001	ORF1	100.049	-0.101	0.000	0.01		213	1.1	OK
1.002	MH3	76.076	-0.187	0.000	0.83			254.2	OK
5.000	MH4	76.004	-0.285	0.000	0.51		29	114.5	OK
5.001	MH5	75.953	-0.301	0.000	0.22			65.1	OK
1.003	TANK	75.924	-0.331	0.000	0.22		136	65.2	OK
1.004	HYDROBRAKE 1	75.932	-0.317	0.000	0.20			65.0	OK
1.005	MH7A	75.673	-0.513	0.000	0.13			65.0	OK
6.000	MH8	76.129	-0.246	0.000	0.18		7	21.9	OK

PN	US/MH Name	Level Exceeded
1.000	MH1	
2.000	MH6	
2.001	PAVING 2	
3.000	DUMMY2	
3.001	ORF2	
1.001	MH2	
4.000	DUMMY1	
4.001	ORF1	
1.002	MH3	
5.000	MH4	
5.001	MH5	
1.003	TANK	
1.004	HYDROBRAKE 1	
1.005	MH7A	
6.000	MH8	

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)
6.001	MH9	30 Summer	30	+0%	100/30 Summer				76.097
6.002	TANK2	60 Summer	30	+0%	100/30 Summer				75.993
6.003	HB2	60 Summer	30	+0%	100/30 Summer				75.983

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
6.001	MH9	-0.132	0.000	0.72			75.7	OK	
6.002	TANK2	-0.086	0.000	0.67		38	55.7	OK	
6.003	HB2	-0.084	0.000	0.51			55.6	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 Storage Structures	9
Number of Online Controls	4	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)	30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880
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.
1.000	MH1	30 Winter	100	+40%	100/30 Winter			
2.000	MH6	30 Summer	100	+40%				
2.001	PAVING 2	30 Summer	100	+40%				
3.000	DUMMY2	30 Summer	100	+40%				
3.001	ORF2	120 Summer	100	+40%				
1.001	MH2	30 Summer	100	+40%	100/30 Summer			
4.000	DUMMY1	180 Summer	100	+40%				
4.001	ORF1	180 Summer	100	+40%				
1.002	MH3	30 Summer	100	+40%	100/30 Summer			
5.000	MH4	120 Summer	100	+40%				
5.001	MH5	120 Summer	100	+40%				
1.003	TANK	120 Summer	100	+40%				
1.004	HYDROBRAKE 1	60 Winter	100	+40%				
1.005	MH7A	120 Summer	100	+40%				
6.000	MH8	30 Summer	100	+40%				

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
1.000	MH1	76.372	0.000	0.000	0.36		10	109.1	SURCHARGED
2.000	MH6	77.000	-0.150	0.000	0.00			0.0	OK
2.001	PAVING 2	76.308	-0.217	0.000	0.17		4	36.2	OK
3.000	DUMMY2	100.100	-0.100	0.000	0.00			0.0	OK
3.001	ORF2	100.085	-0.065	0.000	0.03		88	4.2	OK
1.001	MH2	76.335	0.027	0.000	0.86		21	230.5	SURCHARGED
4.000	DUMMY1	100.079	-0.021	0.000	0.00			0.0	OK
4.001	ORF1	100.079	-0.071	0.000	0.01		140	2.5	OK
1.002	MH3	76.297	0.034	0.000	1.32			401.0	SURCHARGED
5.000	MH4	76.281	-0.008	0.000	0.45		12	102.0	OK
5.001	MH5	76.217	-0.037	0.000	0.50			149.9	OK
1.003	TANK	76.131	-0.124	0.000	0.43		107	126.2	OK
1.004	HYDROBRAKE 1	76.140	-0.109	0.000	0.38			122.7	OK
1.005	MH7A	75.741	-0.445	0.000	0.25			125.5	OK
6.000	MH8	76.325	-0.050	0.000	0.31		17	36.5	OK

OUTFALL 1

PN	US/MH Name	Level Exceeded
1.000	MH1	
2.000	MH6	
2.001	PAVING 2	
3.000	DUMMY2	
3.001	ORF2	
1.001	MH2	
4.000	DUMMY1	
4.001	ORF1	
1.002	MH3	
5.000	MH4	
5.001	MH5	
1.003	TANK	
1.004	HYDROBRAKE 1	
1.005	MH7A	
6.000	MH8	

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)
6.001	MH9	60 Summer	100	+40%	100/30 Summer				76.316
6.002	TANK2	60 Summer	100	+40%	100/30 Summer				76.228
6.003	HB2	60 Summer	100	+40%	100/30 Summer				76.288

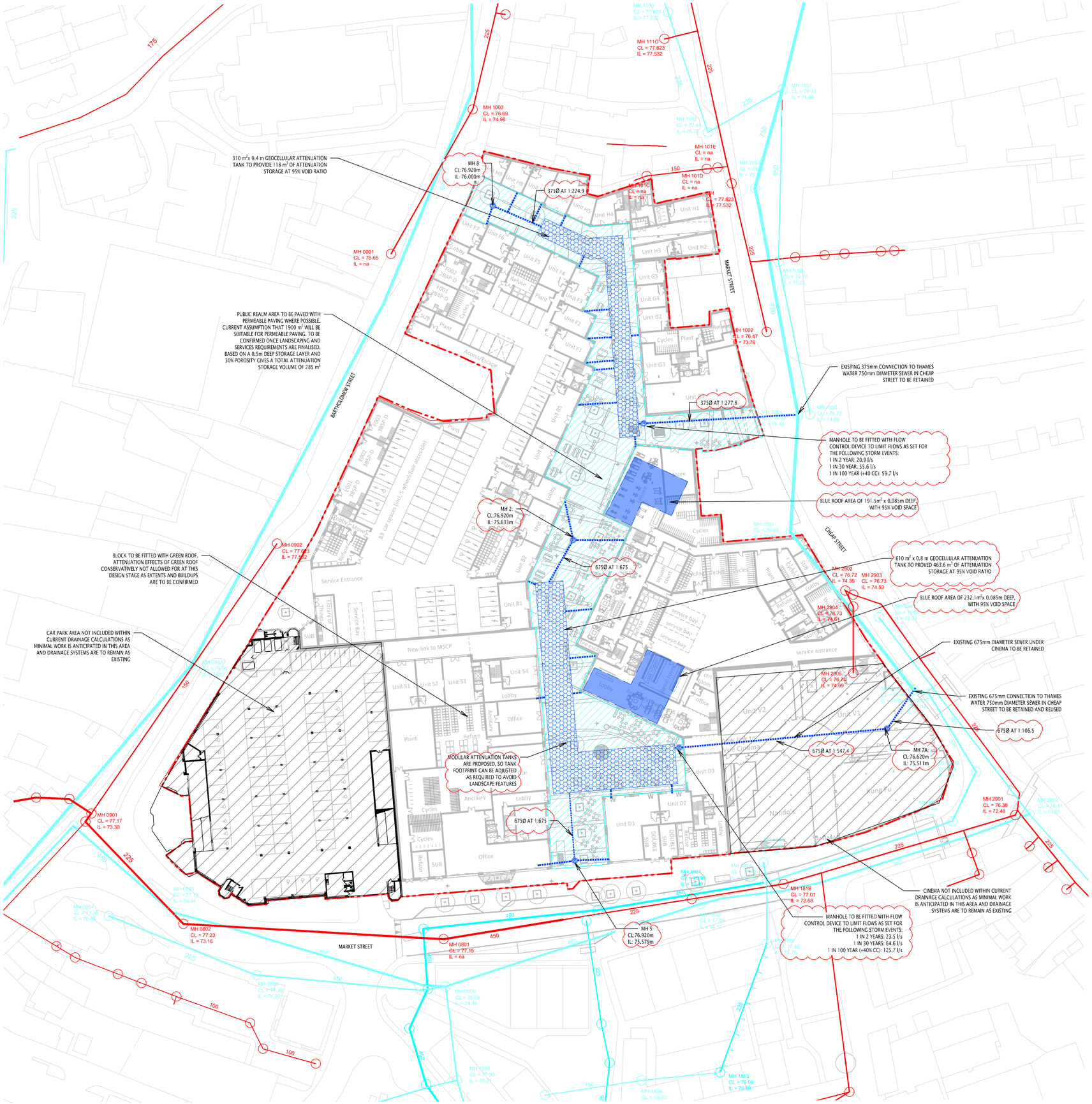
PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
6.001	MH9	0.087	0.000	0.93			97.6	SURCHARGED	
6.002	TANK2	0.149	0.000	0.80		64	66.0	SURCHARGED	
6.003	HB2	0.220	0.000	0.55			59.7	SURCHARGED	

OUTFALL 2

ALL AREAS DRAINED TO THE SAME SEWER AS EXISTING

Appendix E

Drainage General Arrangement Plan and Catchment Plans



NOTES:

1. DO NOT SCALE FROM THIS DRAWING
2. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE BUILDING REGULATIONS, LOCAL AUTHORITY REQUIREMENTS, BS EN752, BS EN 12056 AND BS8000 PART 14.
3. ALL PIPE WORK EXTERNAL TO THE BUILDING IS TO BE PLASTIC TO BS EN 1401 EXCEPT FOR CONNECTIONS TO EXISTING SEWERS. ALL PIPE WORK CAST THROUGH FOUNDATIONS TO BE CAST IRON TO BS EN 877.
4. ARCHITECT LAYOUT IS BASED ON 20011_NEWBURY_EAGLE QARTER_P0-100_PA_PROPOSED SITE PLAN- GROUND FLOOR RECEIVED 06.09.23 FROM LOCHAILORT
5. THAMES WATER SEWERS TAKEN FROM THE ASSET LOCATION SEWER RECORD DRAWINGS, ACCESSED MAY 2020.
6. EXISTING SITE SEWER INFORMATION AND CONNECTION LOCATIONS ARE BASED ON 1980s RECORD DRAWINGS.
7. DRAINAGE STRATEGY AND SURFACE WATER DISCHARGE RATES ARE SUBJECT TO AGREEMENT WITH THE LLFA AND THAMES WATER.
8. SURFACE WATER IS TO BE DISCHARGED TO THE EXISTING SEWER NETWORK. THE EXISTING NETWORK HAS BEEN MODELLED BASED ON RECORD DRAWINGS AND DRAINAGE SURVEY (396KC503, SEPTEMBER 2023)
9. THE SURFACE WATER DRAINAGE NETWORK IS 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.
10. HARDSTANDING AREAS WITHIN THE PUBLIC REALM ARE TO BE PAVED WITH PERMEABLE PAVING WHERE POSSIBLE. TREES AND PLANTERS WITHIN THE PUBLIC REALM WILL BE INCORPORATED INTO THE SURFACE WATER DRAINAGE NETWORK AS SUDS FEATURES TO ATTENUATE RAIN WATER.
11. LANDSCAPE BASED ON DRAWING D2918-FAB-01-00-DR-L-1200-P03 RECEIVED 23.09.18 FROM FABRIK

KEY TO HEALTH AND SAFETY SYMBOLS

- INDICATES A RESIDUAL RISK REQUIRING A COMPULSORY ACTION
- INDICATES A RESIDUAL RISK FOR INFORMATION
- INDICATES A RESIDUAL RISK REQUIRING A PROHIBITIVE ACTION
- INDICATES A RESIDUAL RISK AS A WARNING

LEGEND:

- SITE BOUNDARY
- ATTENUATION STORAGE
- PROPOSED SURFACE WATER PIPE
- PROPOSED SURFACE WATER MANHOLE
- AREA SUITABLE FOR PERMEABLE PAVING
- EXISTING TW SURFACE WATER SEWER
- EXISTING TW FOUL WATER SEWER
- SWMH-01 EXISTING TW SW MANHOLE
- FWMH-01 EXISTING TW FW MANHOLE

Rev	Revision Description	By	App	Date
P03	UPDATED AS PER ARCHITECT LAYOUT	BS	GI	12.10.23
P02	UPDATED AS PER ARCHITECT LAYOUT	NB	GI	03.10.23
P01	FOR INFORMATION	CM	EV	08.01.21

Scale: 1 2 3 4 5 6 7 8

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

Structural, Civil & Construction Engineering Consultant

RobertBirdGroup
Member of the Surbana Jurong Group

LONDON OFFICE
Robert Bird & Partners Limited
Level 2, 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

Client

LOCHAILORT
NEWBURY LIMITED

Project

EAGLE QUARTER II

Title

SURFACE WATER DRAINAGE
GENERAL ARRANGEMENT PLAN

Date	Drawn
DEC/2020	J.BELL
Scale at A1	Designer
1:500	C.MORRISSEY
Suitability Code	Design Checker
S2	E.VEILLARD
Job Number	Approved
4508	J.GOLD

FOR INFORMATION

Drawing Number	Revision
4508-RBG-PR-0G-DR-C-52-86001	P03

LEGEND:

BLUE ROOF

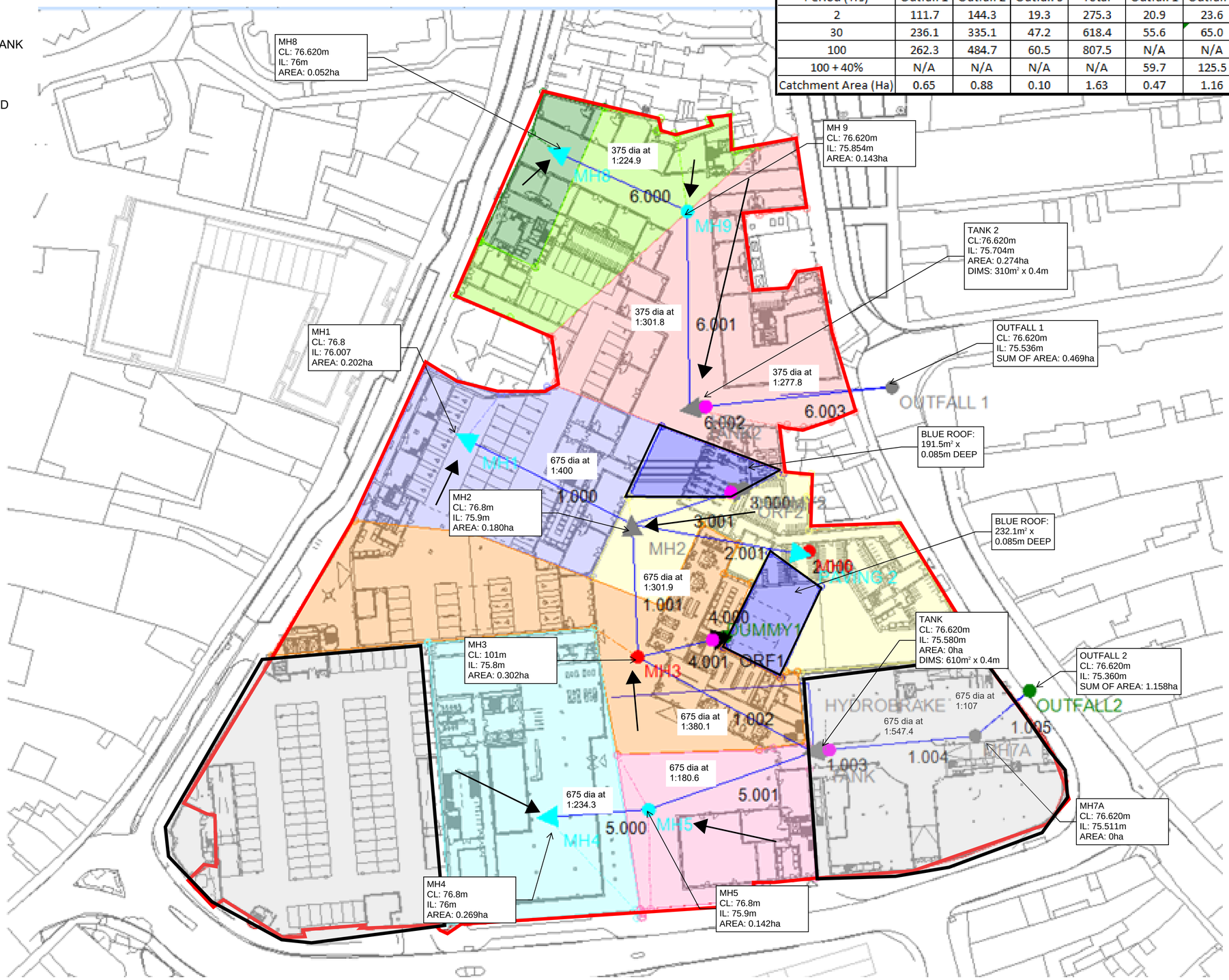
PERMEABLE PAVING/TANK

AREAS NOT INCLUDED

SITE BOUNDARY

Catchment Areas and Discharge Rates

Storm Return Period (Yrs)	Existing Discharge (l/s)				Proposed Discharge (l/s)			Percentage Reduction
	Outfall 1	Outfall 2	Outfall 3	Total	Outfall 1	Outfall 2	Total	
2	111.7	144.3	19.3	275.3	20.9	23.6	44.5	84%
30	236.1	335.1	47.2	618.4	55.6	65.0	120.8	80%
100	262.3	484.7	60.5	807.5	N/A	N/A	N/A	N/A
100 + 40%	N/A	N/A	N/A	N/A	59.7	125.5	185.2	77%
Catchment Area (Ha)	0.65	0.88	0.10	1.63	0.47	1.16	1.63	



NOTES:
1. DO NOT SCALE THIS DRAWING
2. THIS SKETCH WAS PRODUCED USING MICRODRAINAGE
3. THIS SKETCH IS BASED ON:
- ARCHITECT LAYOUT: REV K PRELIMINARY GENERAL ARRANGEMENT LAYOUTS, RECEIVED 25.11.2020 BY COLLADO COLLINS
- THAMES WATER ASSET RECORDS: 1108775-Asset Location Search-1138331, RECEIVED 18.05.23 FROM THAMES WATER
- SITE SURVEY
4. PIPE 1.005 TO BE RETAINED AS EXISTING
5. OUTFALLS TO CONNECT TO EXISTING NETWORK [THAMES WATER]
6. BLUE ROOFS MODELLED WITH VOID SPACE OF 95%

Structural, Civil & Construction Engineering Consultant
RobertBirdGroup
Member of the Surbana Jurong Group
LONDON OFFICE
Robert Bird & Partners Ltd
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	CATCHMENTS FOR PROSED NETWORK	GI	03.10.23

Client: LOCHAILORT NEWBURY LIMITED
Project: EAGLE QUARTER II
Title: CATCHMENT PLAN OF PROPOSED NETWORK

Designer: N.BROWN
Drawn: N.BROWN
Scale at A1: NTS

Design Checker: J.GOLD
Approved: G.IRVINE
Date: 03/10/2023

FOR INFORMATION

Job No: 4508
Sheet No: 4508-RBG-XX-XX-DR-C-52-87401
Rev: P01

LEGEND:

SURFACE WATER MANHOLES MODELLED IN MICRODRAINAGE

AREAS NOT INCLUDED

SITE BOUNDARY

225 ADOPTED FOUL SEWERS

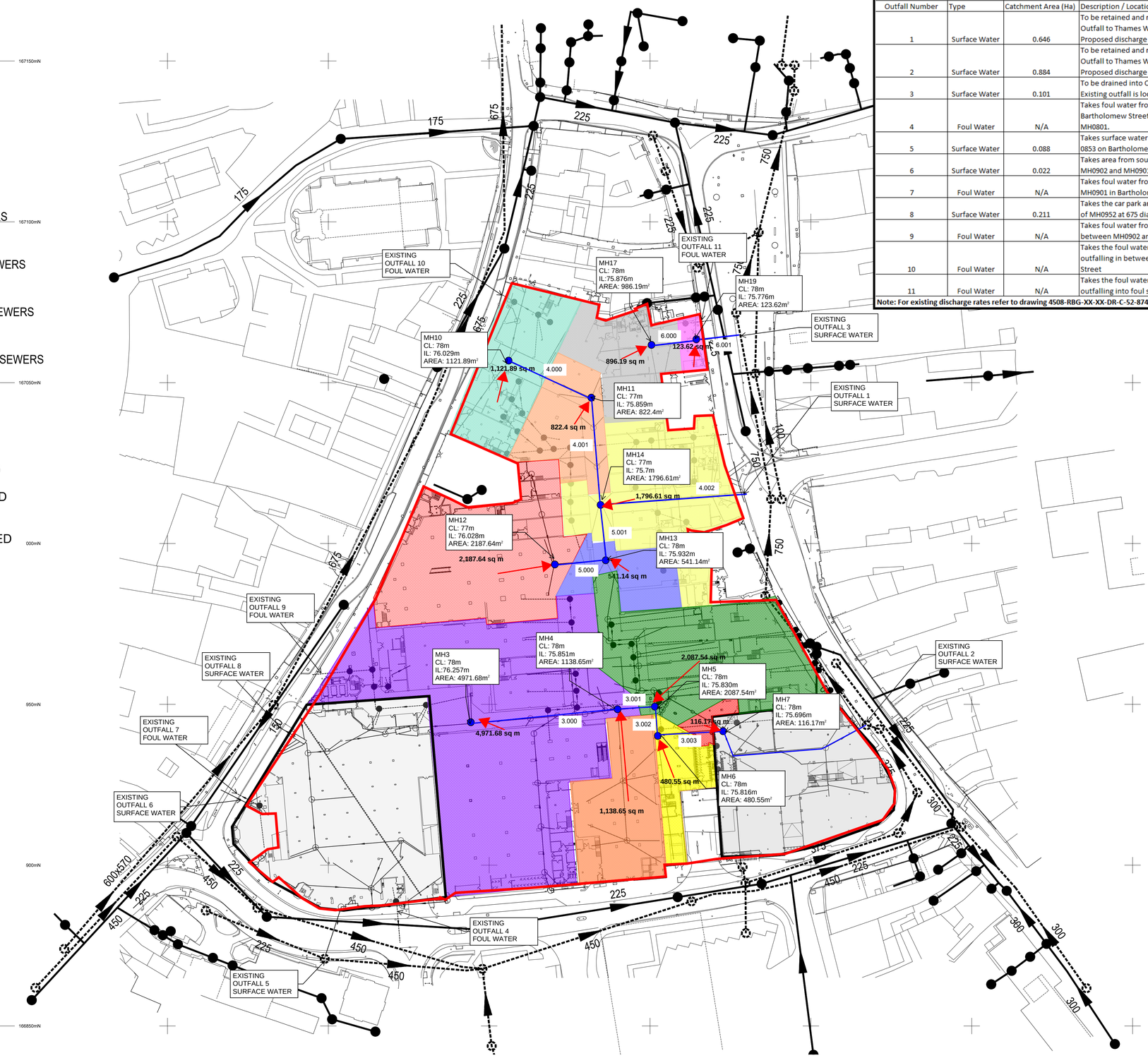
675 ADOPTED STORM SEWERS

150 ADOPTED COMBINED SEWERS

150 KENNET CENTRE FOUL SEWERS

150 KENNET CENTRE STORM SEWERS

NOTES:
1. DO NOT SCALE THIS DRAWING
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 HAVE BEEN INTERPOLATED OR ASSUMED WHERE NO DATA WAS AVAILABLE



Catchment Areas and Outfalls

Outfall Number	Type	Catchment Area (Ha)	Description / Location	Invert Level (mOD)
1	Surface Water	0.646	To be retained and re-used within the proposed network. Outfall to Thames Water SW sewer in Market Street. Proposed discharge rate to be restricted to 50% of existing.	75.700
2	Surface Water	0.884	To be retained and re-used within the proposed network. Outfall to Thames Water SW sewer in Cheap Street. Proposed discharge rate to be restricted to 50% of existing.	74.469
3	Surface Water	0.101	To be drained into Outfall 1 within the proposed network. Existing outfall is located on Market Street	75.049
4	Foul Water	N/A	Takes foul water from south part of car park area into Bartholomew Street in between Thames Water MH0802 and MH0801.	N/A
5	Surface Water	0.088	Takes surface water from south part of car park area into MH 0853 on Bartholomew Street.	76.530
6	Surface Water	0.022	Takes area from south-west, next to car park in between MH0902 and MH0901 on Bartholomew Street.	N/A
7	Foul Water	N/A	Takes foul water from the car park in between MH0902 and MH0901 in Bartholomew Street	74.319
8	Surface Water	0.211	Takes the car park area into Bartholomew Street to the left of MH0952 at 675 diameter.	N/A
9	Foul Water	N/A	Takes foul water from western part of site, outfalling in between MH0902 and MH 0901 on Bartholomew Street	76.295
10	Foul Water	N/A	Takes the foul water from the north-west corner of the site outfalling in between MH0001 and MH 1003 in Bartholomew Street	N/A
11	Foul Water	N/A	Takes the foul water from the north-west corner of the site outfalling into foul sewer in Bartholomew Street	75.630

Note: For existing discharge rates refer to drawing 4508-RBG-XX-XX-DR-C-52-87401

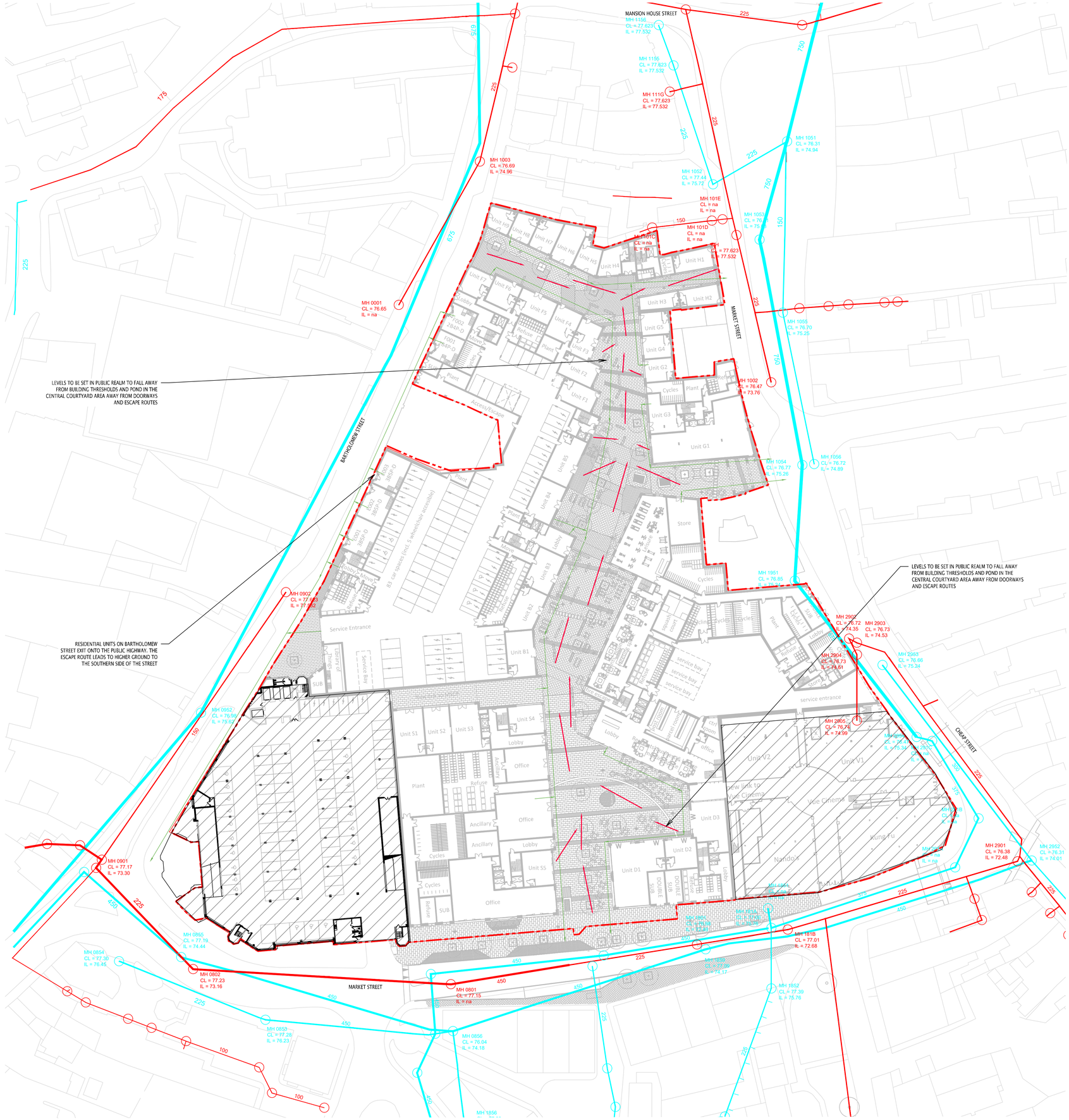
Structural, Civil & Construction Engineering Consultant
RobertBirdGroup
Member of the Surbana Jurong Group
LONDON OFFICE
Robert Bird & Partners Ltd
Harling House
47-51 Great Suffolk Street
Southwark
London SE1 0BS, ENGLAND
Ph: +44 (0) 20 7633 2880
Email: enquiries@robertbird.com.au
Web: www.robertbird.com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

Rev.	Revision Description	App	Date
P01	CATCHMENTS FOR EXISTING NETWORK	GI	03.10.23

Client: LOCHAILORT NEWBURY LIMITED	Designer: N.BROWN	Design Checker: J.GOLD	FOR INFORMATION
Project: EAGLE QUARTER II	Drawn: N.BROWN	Approved: G.IRVINE	Job No: 4508
Title: CATCHMENT PLAN OF EXISTING NETWORK	Scale at A1: NTS	Date: 03/10/2023	Sheet No: 4508-RBG-XX-XX-DR-C-52-87402
			Rev: P01

Appendix F

Exceedance Flow Routes



NOTES:

1. SITE LIES IN FLOOD ZONE 2 - LOW PROBABILITY OF FLOODING FROM RIVERS OR THE SEA. THE ENVIRONMENT AGENCY HAS BEEN CONSULTED ON LIKELY FLOOD LEVELS. SITE LEVELS ARE TO BE MAINTAINED ABOVE 76.62mAOD WHEREVER POSSIBLE TO PROVIDE SAFE EGRESS IN THE 1 IN 100 YEAR STORM EVENT WITH 35%CC FACTOR. IT IS NOTED THAT THIS IS NOT ACHIEVABLE FOR UNITS ALONG BARTHOLOMEW STREET WHERE IN LOCATIONS LEVELS ARE SLIGHTLY LOWER TO TIE INTO EXISTING LEVELS AT THE HIGHWAY BOUNDARY.
2. FOR UNITS WITH THRESHOLD LEVELS SET ABOVE 76.62mAOD ESCAPE ROUTES ARE CONSIDERED FOR SURFACE WATER FLOODING AND EXCEEDANCE FLOW ROUTES IN EXTREME RAINFALL EVENTS (BEYOND 1 IN 100 YEAR ANNUAL PROBABILITY WITH CLIMATE CHANGE)
3. ALL RESIDENTIAL PROPERTIES WITHIN THE DEVELOPMENT ARE AT FIRST FLOOR LEVEL (EXCEPT THE PROPERTIES ON BARTHOLOMEW STREET) AND WILL NOT REQUIRE IMMEDIATE EVACUATION IN THE EVENT OF SURFACE WATER FLOODING.
4. IN THE EVENT OF SURFACE WATER FLOODING IT IS INTENDED THAT COMMERCIAL UNITS ARE EVACUATED TO HIGHER GROUND TO THE SOUTH OF THE SITE ALONG MARKET STREET. THE LOCATION OF AN ASSEMBLY SPACE IS TO BE DETERMINED BY THE OPERATOR AND COMMUNICATED TO THE OCCUPANTS ONCE CONFIRMED.
5. THE ESCAPE ROUTE IDENTIFIED FROM THE COMMERCIAL UNITS TO THE PUBLIC HIGHWAY IS ROUTED ALONG LEVEL SURFACES THAT SHOULD NOT IMPEDE THE MOBILITY IMPAIRED.
6. LEVELS ALONG THE ESCAPE ROUTE ARE TO BE SET HIGHER THAN THE SURROUNDING GROUND TO ENSURE THAT THEY REMAIN DRY AS LONG AS POSSIBLE DURING AN EXTREME STORM EVENT.
7. EXTERNAL AREAS OF THE SITE ARE TO BE LIT AT NIGHT. ALL ESCAPE ROUTE LIGHTING WILL ALSO BE EMERGENCY LIGHTING.
8. LANDSCAPING LAYOUT BASED ON D2918-FAB-01-00-DR-L-1200-P03, RECEIVED 18.09.23 FROM FABRIK
9. ARCHITECT LAYOUT IS BASED ON 20011_NEWBURY_EAGLE QARTER_P0-100_PA_PROPOSED SITE PLAN- GROUND FLOOR RECEIVED 06.09.23 FROM LOCHAILORT

KEY TO HEALTH AND SAFETY SYMBOLS

- INDICATES A RESIDUAL RISK REQUIRING A COMPULSORY ACTION
- INDICATES A RESIDUAL RISK FOR INFORMATION
- INDICATES A RESIDUAL RISK REQUIRING A PROHIBITIVE ACTION
- INDICATES A RESIDUAL RISK AS A WARNING

LEGEND:

- SITE BOUNDARY
- EXCEEDANCE STORAGE
- ESCAPE ROUTE
- OVERLAND EXCEEDANCE FLOW/FLOODING ROUTE
- SWMH-01 EXISTING TW SW MANHOLE
- FWMH-01 EXISTING TW FW MANHOLE

Rev	Revision Description	By	App	Date
P03	UPDATED AS PER ARCHITECT LAYOUT	BS	GI	12.10.23
P02	UPDATED AS PER ARCHITECT LAYOUT	NB	GI	03.10.23
P01	FOR INFORMATION	CM	EV	08.01.21

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

Structural, Civil & Construction
Engineering Consultant

RobertBirdGroup
Member of the Surbana Jurong Group

LONDON OFFICE
Robert Bird & Partners Limited
Level 2, 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

Client

LOCHAILORT
NEWBURY LIMITED

Project

EAGLE QUARTER II

Title

SURFACE WATER DRAINAGE
EXCEEDANCE FLOW ROUTES

Date	Drawn
DEC/2020	J.BELL
Scale at A1	Designer
1:500	C.MORRISSEY
Suitability Code	Design Checker
S2	E.VEILLARD
Job Number	Approved
4508	J.GOLD

FOR INFORMATION

Drawing Number	Revision
4508-RBG-PR-0G-DR-C-52-86010	P03

Appendix G
Landscape Plans

A0 File Reference D2918 -FAB-01-00-DR-L-1200.dwg Plot Date 29-Jul-22

LEGEND

Paving Types

- PT1A — Paving Type 1 - Vehicular Asphalt
  To Engineer's specification
- PT2 — Paving Type 2 - Natural Granite Paving
  Colour/Finish: Mixed color range / flamed
  Size: 200x100, suitable for vehicular traffic
  Bond: Stretcher Bond
- PT2A — Paving Type 2A - Natural Granite Cobbles
  Colour/Finish: Light grey & Dark grey / flamed
  Size: 200x200, suitable for vehicular traffic
  Bond: Stack Bond
- PT3 — Paving Type 3 - Precast Concrete Blocks
  Colour: Mixed light, warm tones; Finish: Flamed
  Size: 300x150, suitable for vehicular traffic
  Bond: Stretcher
- PT3A — Paving Type 3A - Precast Concrete Blocks
  Colour: Mixed dark & light gray, blue tones;
  Finish: Flamed
  Size:200x200, suitable for vehicular traffic
  Bond: Paving pattern to be developed
- PT3B — Paving Type 3B - Precast Concrete Blocks
  Colour / Finish: Mid & Dark Mixed
  Size: 200x100, suitable for vehicular traffic
  Bond: Herringbone
- PT3C — Paving Type 3C - Precast Concrete Blocks
  Colour / Finish: Mid & Dark Mixed
  Size: 300x100+100x100, suitable for vehicular traffic
  Bond: Stacked Bond, pattern to be developed
- PT4 — Paving Type 4 - Natural Granite Sett Paving
  Colour / Finish: Mid & Dark Mixed
  Size: 100x100, suitable for vehicular traffic
  Bond: Stacked Bond
- PT5 — Paving Type 5 - Vehicular Precast Concrete Block Paving
  Color / Finish: Light gray
  Size: 200x200
  Bond: Stretcher Bond
- PT5A — Paving Type 5A - Vehicular Precast Concrete Block Paving
  Color / Finish: Dark gray
  Size: 300x300
  Bond: Stretcher Bond
- PT5B — Paving Type 5B - Vehicular Precast Concrete Block Paving
  Color / Finish: Mid gray
  Size: 200x100
  Bond: Stretcher Bond
- PT5C — Paving Type 5C- Vehicular Precast Concrete Block Paving
  Color / Finish: Mixed color range
  Size: 600x300
  Bond: Stretcher Bond
- PT5D — Paving Type 5D - Vehicular Precast Concrete Block Paving
  Color / Finish: Mixed color range
  Size: 300x200
  Bond: Stretcher Bond
- PT6 — Paving Type 6 - Porcelain Paving on Pedestals
  Bond: Stacked Bond
- PT6A — Paving Type 6A - Porcelain Paving on Pedestals
- PT7 — Paving Type 7 - Porcelain Paving on Pedestals
  Bond: Stretcher Bond
- PT8 — Paving Type 8 - Porcelain Paving on Pedestals for Private Amenity
- PT8 — Paving Type 8 - Porcelain Paving on Pedestals
- PT10 — Paving Type 10 - Resin Bound Surface
- PT11 — Paving Type 11 - Gravel Strip

Edge Types

1. Edge Type 1 - Raised Granite Kerb
   Colour / finish: Silver grey / bush hammered
   Size: 150-200mm width / 100mm upstand
2. Edge Type 2 - Flush Granite Band
   Colour / finish: Silver grey / bush hammered
   Size: 150- 300mm width / flush
3. Edge Type 3 - Flush Metal Edge
   Colour / finish: Weathered steel
   Size: Flush
4. Edge Type 4 - Raised Planter Edge
   Colour / finish: Silver grey / bush hammered
   Size: 200-400mm width / 450mm upstand

Proposed Channel Drain

Site Furniture Types

- FT1 — Furniture Type 1 - Integrated Planter Bench
  Material / finish: Timber fitted to ET4
  Size: 450mm height, plan size varies
- FT2 — Furniture Type 2 - Freestanding Bench
  Material / finish: Timber and steel
  Size: 450mm height, arm and backrests included as required
- FT3 — Furniture Type 3 - Moveable Planter - Rectangular
  Material / finish: Steel
  Size: 2400mm x 500mm
- FT3A — Furniture Type 3A - Moveable Planter - Circular
  Material / finish: Concrete
  Size: 1300mm diameter
- FT4 — Furniture Type 4 - Timber Bridge
  Material / finish: Timber and steel
  Size: arched, size as shown
- FT5 — Furniture Type 5 - Tree Grille
  Material / finish: Steel, flush with paving
  Size: 2050mm x 2050mm
- FT6 — Raised Planter with Metal Edge to suit required soil depth
- FT7 — Furniture Type 7 - Outdoor Timber Seating
- FT8 — Furniture Type 8 - Outdoor Timber Seating
- FT9 — Furniture Type 9 - Timber Play Balance Beams
- FT10 — Furniture Type 10 - Play Boulders
- FT11 — Furniture Type 11 - Balance Disc
- FT12 — Furniture Type 12 - Outdoor Gym Equipment
- FT13 — Furniture Type 13 - Outdoor Gym Equipment
- FT14 — Furniture Type 14 - Outdoor Gym Equipment
- FT15 — Furniture Type 15 - Outdoor Gym Equipment
- FT16 — Furniture Type 16 - Lightweight Metal Pergola Structure
- FT17 — Furniture Type 17 - Timber Reclined Seating
- FT18 — Furniture Type 18 - Circular Timber Seating
- FT19 — Furniture Type 19 - Bandstand

External Lighting

- L1 — Lighting Type 1 - 3.0m Ht Lighting pole
- L2 — Lighting Type 2 - 890mm Ht Lighting bollard
- L3 — Lighting Type 3 - Tree uplighter
- L4 — Lighting Type 4 - Integrated LED strip in the furniture / paving

Notes:
- Lighting proposals and locations shown on this drawing are indicative;
- External lighting detailed design to be developed by Project Lighting Consultant / Specialist Contractor.

Soft Landscape

- Proposed Tree Planting
  Refer to indicative planting strategy
- Proposed Multi-stemmed Tree
- Proposed Feature Shrub
- Proposed Mixed Shrubs, Herbaceous and Bulb Planting
- Proposed Hedge Planting
- Proposed Lawn

Revision	Date	Reason	Drawn	Checked
P03	20.06.2022	Issued for planning approval	MG	PB
P02	11.02.2021	Issued for planning approval	SM	PB
P01	04.02.2021	Issued for Information	DB	PB

Disclaimer:
1. This drawing is copyright of fabrik ltd. It must not be copied or reproduced without written consent from the owner.
2. All contractors must visit site and be responsible for taking and checking all dimensions related to the works shown on the drawing prior to fabrication or setting out.
3. This drawing uses coloured lines. Please do not rely on a monochrome copy.

External References:
- D2918 _FAB_01_00_M2_L_1200_Ground Floor

0 1 2.5 5 7.5 10 15 20 25m
1:250

fabrik landscape architects
Lenten House | 16 Lenten Street | Alton | Hampshire | GU34 1HG
T : 01420 593250 | E : alton@fabrikuk.com | W : www.fabrikuk.com

Project: EAGLE QUARTER
Client: LOCHAILORT NEWBURY LTD
Drawing Title: LANDSCAPE GENERAL ARRANGEMENT PLAN - GROUND FLOOR

Purpose of Issue	Drawn By	Checked By	Drawn Scale	Date of First Issue
ISSUED FOR PLANNING APPROVAL	SM	PB	1:250 @ A0	FEB | 2021

Project Number	Origin	Zone	Level	File Type	Role	Number	Revision
D2918	FAB	01	00	DR	L	1200	P03

LEGEND

Paving Types

- Paving Type 1 - Vehicular Asphalt
  To Engineer's specification
- Paving Type 2 - Natural Granite Paving
  Colour/Finish: Mixed color range / flamed
  Size: 200x100, suitable for vehicular traffic
  Bond: Stretcher Bond
- Paving Type 2A - Natural Granite Cobbles
  Colour/Finish: Light grey & Dark grey / flamed
  Size: 200x200, suitable for vehicular traffic
  Bond: Stack Bond
- Paving Type 3 - Precast Concrete Blocks
  Colour: Mixed light, warm tones; Finish: Flamed
  Size: 300x150, suitable for vehicular traffic
  Bond: Stretcher
- Paving Type 3A - Precast Concrete Blocks
  Colour: Mixed dark & light gray, blue tones;
  Finish: Flamed
  Size:200x200, suitable for vehicular traffic
  Bond: Paving pattern to be developed
- PT3B — Paving Type 3B - Precast Concrete Blocks
  Colour / Finish: Mid & Dark Mixed
  Size: 200x100, suitable for vehicular traffic
  Bond: Herringbone
- PT3C — Paving Type 3C - Precast Concrete Blocks
  Colour / Finish: Mid & Dark Mixed
  Size: 300x100+100x100, suitable for vehicular traffic
  Bond: Stacked Bond, pattern to be developed
- Paving Type 4 - Natural Granite Sett Paving
  Colour / Finish: Mid & Dark Mixed
  Size: 100x100, suitable for vehicular traffic
  Bond: Stacked Bond
- Paving Type 5 - Vehicular Precast Concrete Block Paving
  Color / Finish: Light gray
  Size: 200x200
  Bond: Stretcher Bond
- PT5A — Paving Type 5A - Vehicular Precast Concrete Block Paving
  Color / Finish: Dark gray
  Size: 300x300
  Bond: Stretcher Bond
- PT5B — Paving Type 5B - Vehicular Precast Concrete Block Paving
  Color / Finish: Mid gray
  Size: 200x100
  Bond: Stretcher Bond
- PT5C — Paving Type 5C- Vehicular Precast Concrete Block Paving
  Color / Finish: Mixed color range
  Size: 600x300
  Bond: Stretcher Bond
- PT5D — Paving Type 5D - Vehicular Precast Concrete Block Paving
  Color / Finish: Mixed color range
  Size: 300x200
  Bond: Stretcher Bond
- Paving Type 6 - Porcelain Paving on Pedestals
  Bond: Stacked Bond
- Paving Type 6A - Porcelain Paving on Pedestals
- Paving Type 7 - Porcelain Paving on Pedestals
  Bond: Stretcher Bond
- Paving Type 8 - Porcelain Paving on Pedestals for Private Amenity
- Paving Type 8 - Porcelain Paving on Pedestals
- Paving Type 10 - Resin Bound Surface
- Paving Type 11 - Gravel Strip

Edge Types

1. Edge Type 1 - Raised Granite Kerb
   Colour / finish: Silver grey / bush hammered
   Size: 150-200mm width / 100mm upstand
2. Edge Type 2 - Flush Granite Band
   Colour / finish: Silver grey / bush hammered
   Size: 150- 300mm width / flush
3. Edge Type 3 - Flush Metal Edge
   Colour / finish: Weathered steel
   Size: Flush
4. Edge Type 4 - Raised Planter Edge
   Colour / finish: Silver grey / bush hammered
   Size: 200-400mm width / 450mm upstand

- Proposed Channel Drain

Site Furniture Types

- FT1 — Furniture Type 1 - Integrated Planter Bench
  Material / finish: Timber fitted to ET4
  Size: 450mm height, plan size varies
- FT2 — Furniture Type 2 - Freestanding Bench
  Material / finish: Timber and steel
  Size: 450mm height, arm and backrests included as required
- FT3 — Furniture Type 3 - Moveable Planter - Rectangular
  Material / finish: Steel
  Size: 2400mm x 500mm
- FT3A — Furniture Type 3A - Moveable Planter - Circular
  Material / finish: Concrete
  Size: 1300mm diameter
- FT4 — Furniture Type 4 - Timber Bridge
  Material / finish: Timber and steel
  Size: arched, size as shown
- FT5 — Furniture Type 5 - Tree Grille
  Material / finish: Steel, flush with paving
  Size: 2050mm x 2050mm
- FT6 — Raised Planter with Metal Edge to suit required soil depth
- FT7 — Furniture Type 7 - Outdoor Timber Seating
- FT8 — Furniture Type 8 - Outdoor Timber Seating
- FT9 — Furniture Type 9 - Timber Play Balance Beams
- FT10 — Furniture Type 10 - Play Boulders
- FT11 — Furniture Type 11 - Balance Disc
- FT12 — Furniture Type 12 - Outdoor Gym Equipment
- FT13 — Furniture Type 13 - Outdoor Gym Equipment
- FT14 — Furniture Type 14 - Outdoor Gym Equipment
- FT15 — Furniture Type 15 - Outdoor Gym Equipment
- FT16 — Furniture Type 16 - Lightweight Metal Pergola Structure
- FT17 — Furniture Type 17 - Timber Reclined Seating
- FT18 — Furniture Type 18 - Circular Timber Seating
- FT19 — Furniture Type 19 - Bandstand

External Lighting

- L1 — Lighting Type 1 - 3.0m Ht Lighting pole
- L2 — Lighting Type 2 - 890mm Ht Lighting bollard
- L3 — Lighting Type 3 - Tree uplighter
- L4 — Lighting Type 4 - Integrated LED strip in the furniture / paving

Notes:
- Lighting proposals and locations shown on this drawing are indicative;
- External lighting detailed design to be developed by Project Lighting Consultant / Specialist Contractor.

Soft Landscape

- Proposed Tree Planting
  Refer to indicative planting strategy
- Proposed Multi-stemmed Tree
- Proposed Feature Shrub
- Proposed Mixed Shrubs, Herbaceous and Bulb Planting
- Proposed Hedge Planting
- Proposed Lawn

0 1 2.5 5 7.5 10 15 20 25m
1:250

Revision	Date	Reason	Drawn	Checked
P03	20.06.2022	Issued for planning approval	HG	PB
P02	11.02.2021	Issued for planning approval	SM	PB
P01	04.02.2021	Issued for information	DB	PB

External References:
- D2918_FAB_01_00_M2_L_1200_Ground Floor
- D2918_FAB_01_01_M2_L_1201_Level 1

fabrik landscape architects
Lenten House | 16 Lenten Street | Alton | Hampshire | GU34 1HG
T : 01420 593250 | E : alton@fabrikuk.com | W : www.fabrikuk.com

Project: EAGLE QUARTER
Client: LOCHAILORT NEWBURY LTD
Drawing Title: LANDSCAPE GENERAL ARRANGEMENT PLAN - LEVEL 01

Purpose of Issue	Drawn By	Checked By	Drawn Scale	Date of First Issue
ISSUED FOR PLANNING APPROVAL	SM	PB	1:250 @ A0	FEB | 2021

Project Number	Origin	Zone	Level	File Type	Role	Number	Revision
D2918	FAB	01	01	DR	L	1201	P03

A0 File Reference D2918 -FAB-01-02-DR-L-1202.dwg Plot Date 21-Jul-22

LEGEND

Paving Types

- Paving Type 1 - Vehicular Asphalt
  To Engineer's specification
- Paving Type 2 - Natural Granite Paving
  Colour/Finish: Mixed color range / flamed
  Size: 200x100, suitable for vehicular traffic
  Bond: Stretcher Bond
- Paving Type 2A - Natural Granite Cobbles
  Colour/Finish: Light grey & Dark grey / flamed
  Size: 200x200, suitable for vehicular traffic
  Bond: Stack Bond
- Paving Type 3 - Precast Concrete Blocks
  Colour: Mixed light, warm tones; Finish: Flamed
  Size: 300x150, suitable for vehicular traffic
  Bond: Stretcher
- Paving Type 3A - Precast Concrete Blocks
  Colour: Mixed dark & light gray, blue tones;
  Finish: Flamed
  Size:200x200, suitable for vehicular traffic
  Bond: Paving pattern to be developed
- PT3B Paving Type 3B - Precast Concrete Blocks
  Colour / Finish: Mid & Dark Mixed
  Size: 200x100, suitable for vehicular traffic
  Bond: Herringbone
- PT3C Paving Type 3C - Precast Concrete Blocks
  Colour / Finish: Mid & Dark Mixed
  Size: 300x100+100x100, suitable for vehicular traffic
  Bond: Stacked Bond, pattern to be developed
- Paving Type 4 - Natural Granite Sett Paving
  Colour / Finish: Mid & Dark Mixed
  Size: 100x100, suitable for vehicular traffic
  Bond: Stacked Bond
- Paving Type 5 - Vehicular Precast Concrete Block Paving
  Color / Finish: Light gray
  Size: 200x200
  Bond: Stretcher Bond
- PT5A Paving Type 5A - Vehicular Precast Concrete Block Paving
  Color / Finish: Dark gray
  Size: 300x300
  Bond: Stretcher Bond
- PT5B Paving Type 5B - Vehicular Precast Concrete Block Paving
  Color / Finish: Mid gray
  Size: 200x100
  Bond: Stretcher Bond
- PT5C Paving Type 5C- Vehicular Precast Concrete Block Paving
  Color / Finish: Mixed color range
  Size: 600x300
  Bond: Stretcher Bond
- PT5D Paving Type 5D - Vehicular Precast Concrete Block Paving
  Color / Finish: Mixed color range
  Size: 300x200
  Bond: Stretcher Bond
- Paving Type 6 - Porcelain Paving on Pedestals
  Bond: Stacked Bond
- Paving Type 6A - Porcelain Paving on Pedestals
- Paving Type 7 - Porcelain Paving on Pedestals
  Bond: Stretcher Bond
- Paving Type 8 - Porcelain Paving on Pedestals for Private Amenity
- Paving Type 8 - Porcelain Paving on Pedestals
- Paving Type 10 - Resin Bound Surface
- Paving Type 11 - Gravel Strip

Edge Types

- 1 Edge Type 1 - Raised Granite Kerb
  Colour / finish: Silver grey / bush hammered
  Size: 150-200mm width / 100mm upstand
- 2 Edge Type 2 - Flush Granite Band
  Colour / finish: Silver grey / bush hammered
  Size: 150- 300mm width / flush
- 3 Edge Type 3 - Flush Metal Edge
  Colour / finish: Weathered steel
  Size: Flush
- 4 Edge Type 4 - Raised Planter Edge
  Colour / finish: Silver grey / bush hammered
  Size: 200-400mm width / 450mm upstand
- Proposed Channel Drain

Site Furniture Types

- FT1 Furniture Type 1 - Integrated Planter Bench
  Material / finish: Timber fitted to ET4
  Size: 450mm height, plan size varies
- FT2 Furniture Type 2 - Freestanding Bench
  Material / finish: Timber and steel
  Size: 450mm height, arm and backrests included as required
- FT3 Furniture Type 3 - Moveable Planter - Rectangular
  Material / finish: Steel
  Size: 2400mm x 500mm
- FT3A Furniture Type 3A - Moveable Planter - Circular
  Material / finish: Concrete
  Size: 1300mm diameter
- FT4 Furniture Type 4 - Timber Bridge
  Material / finish: Timber and steel
  Size: arched, size as shown
- FT5 Furniture Type 5 - Tree Grille
  Material / finish: Steel, flush with paving
  Size: 2050mm x 2050mm
- FT6 Raised Planter with Metal Edge to suit required soil depth
- FT7 Furniture Type 7 - Outdoor Timber Seating
- FT8 Furniture Type 8 - Outdoor Timber Seating
- FT9 Furniture Type 9 - Timber Play Balance Beams
- FT10 Furniture Type 10 - Play Boulders
- FT11 Furniture Type 11 - Balance Disc
- FT12 Furniture Type 12 - Outdoor Gym Equipment
- FT13 Furniture Type 13 - Outdoor Gym Equipment
- FT14 Furniture Type 14 - Outdoor Gym Equipment
- FT15 Furniture Type 15 - Outdoor Gym Equipment
- FT16 Furniture Type 16 - Lightweight Metal Pergola Structure
- FT17 Furniture Type 17 - Timber Reclined Seating
- FT18 Furniture Type 18 - Circular Timber Seating
- FT19 Furniture Type 19 - Bandstand

External Lighting

- L1 Lighting Type 1 - 3.0m Ht Lighting pole
- L2 Lighting Type 2 - 890mm Ht Lighting bollard
- L3 Lighting Type 3 - Tree uplighter
- L4 Lighting Type 4 - Integrated LED strip in the furniture / paving

Notes:
- Lighting proposals and locations shown on this drawing are indicative;
- External lighting detailed design to be developed by Project Lighting Consultant / Specialist Contractor.

Soft Landscape

- Proposed Tree Planting
  Refer to indicative planting strategy
- Proposed Multi-stemmed Tree
- Proposed Feature Shrub
- Proposed Mixed Shrubs, Herbaceous and Bulb Planting
- Proposed Hedge Planting
- Proposed Lawn

0 1 2.5 5 7.5 10 15 20 25m
1:250

Revision	Date	Reason	Drawn	Checked
P03	20.06.2022	Issued for planning approval	HG	PB
P02	11.02.2021	Issued for planning approval	SM	PB
P01	04.02.2021	Issued for Information	DB	PB

Disclaimer:
1. This drawing is copyright of fabrik ltd. It must not be copied or reproduced without written consent from the owner.
2. All contractors must visit site and be responsible for taking and checking all dimensions related to the works shown on the drawing prior to fabrication or setting out.
3. This drawing uses coloured lines. Please do not rely on a monochrome copy.

External References:
- D2918_FAB_01_00_M2_L_1200_Ground Floor
- D2918_FAB_01_02_M2_L_1202_Level 2

fabrik landscape architects
Lenten House | 16 Lenten Street | Alton | Hampshire | GU34 1HG
T : 01420 593250 | E : alton@fabrikuk.com | W : www.fabrikuk.com

Project: EAGLE QUARTER
Client: LOCHAILORT NEWBURY LTD
Drawing Title: LANDSCAPE GENERAL ARRANGEMENT PLAN - LEVEL 02

Purpose of Issue	Drawn By	Checked By	Drawn Scale	Date of First Issue
ISSUED FOR PLANNING APPROVAL	SM	PB	1:250 @ A0	FEB | 2021

Project Number	Origin	Zone	Level	File Type	Role	Number	Revison
D2918	FAB	01	02	DR	L	1202	P03

A0 File Reference D2918 -FAB-01-03-DR-L-1203.dwg Plot Date 21-Jul-22

LEGEND

Paving Types

- Paving Type 1 - Vehicular Asphalt
  To Engineer's specification
- Paving Type 2 - Natural Granite Paving
  Colour/Finish: Mixed color range / flamed
  Size: 200x100, suitable for vehicular traffic
  Bond: Stretcher Bond
- Paving Type 2A - Natural Granite Cobbles
  Colour/Finish: Light grey & Dark grey / flamed
  Size: 200x200, suitable for vehicular traffic
  Bond: Stack Bond
- Paving Type 3 - Precast Concrete Blocks
  Colour: Mixed light, warm tones; Finish: Flamed
  Size: 300x150, suitable for vehicular traffic
  Bond: Stretcher
- Paving Type 3A - Precast Concrete Blocks
  Colour: Mixed dark & light gray, blue tones;
  Finish: Flamed
  Size:200x200, suitable for vehicular traffic
  Bond: Paving pattern to be developed
- PT3B Paving Type 3B - Precast Concrete Blocks
  Colour / Finish: Mid & Dark Mixed
  Size: 200x100, suitable for vehicular traffic
  Bond: Herringbone
- PT3C Paving Type 3C - Precast Concrete Blocks
  Colour / Finish: Mid & Dark Mixed
  Size: 300x100+100x100, suitable for vehicular traffic
  Bond: Stacked Bond, pattern to be developed
- Paving Type 4 - Natural Granite Sett Paving
  Colour / Finish: Mid & Dark Mixed
  Size: 100x100, suitable for vehicular traffic
  Bond: Stacked Bond
- Paving Type 5 - Vehicular Precast Concrete Block Paving
  Color / Finish: Light gray
  Size: 200x200
  Bond: Stretcher Bond
- PT5A Paving Type 5A - Vehicular Precast Concrete Block Paving
  Color / Finish: Dark gray
  Size: 300x300
  Bond: Stretcher Bond
- PT5B Paving Type 5B - Vehicular Precast Concrete Block Paving
  Color / Finish: Mid gray
  Size: 200x100
  Bond: Stretcher Bond
- PT5C Paving Type 5C- Vehicular Precast Concrete Block Paving
  Color / Finish: Mixed color range
  Size: 600x300
  Bond: Stretcher Bond
- PT5D Paving Type 5D - Vehicular Precast Concrete Block Paving
  Color / Finish: Mixed color range
  Size: 300x200
  Bond: Stretcher Bond
- Paving Type 6 - Porcelain Paving on Pedestals
  Bond: Stacked Bond
- Paving Type 6A - Porcelain Paving on Pedestals
- Paving Type 7 - Porcelain Paving on Pedestals
  Bond: Stretcher Bond
- Paving Type 8 - Porcelain Paving on Pedestals for Private Amenity
- Paving Type 8 - Porcelain Paving on Pedestals
- Paving Type 10 - Resin Bound Surface
- Paving Type 11 - Gravel Strip

Edge Types

- 1 Edge Type 1 - Raised Granite Kerb
  Colour / finish: Silver grey / bush hammered
  Size: 150-200mm width / 100mm upstand
- 2 Edge Type 2 - Flush Granite Band
  Colour / finish: Silver grey / bush hammered
  Size: 150- 300mm width / flush
- 3 Edge Type 3 - Flush Metal Edge
  Colour / finish: Weathered steel
  Size: Flush
- 4 Edge Type 4 - Raised Planter Edge
  Colour / finish: Silver grey / bush hammered
  Size: 200-400mm width / 450mm upstand
- Proposed Channel Drain

Site Furniture Types

- FT1 Furniture Type 1 - Integrated Planter Bench
  Material / finish: Timber fitted to ET4
  Size: 450mm height, plan size varies
- FT2 Furniture Type 2 - Freestanding Bench
  Material / finish: Timber and steel
  Size: 450mm height, arm and backrests included as required
- FT3 Furniture Type 3 - Moveable Planter - Rectangular
  Material / finish: Steel
  Size: 2400mm x 500mm
- FT3A Furniture Type 3A - Moveable Planter - Circular
  Material / finish: Concrete
  Size: 1300mm diameter
- FT4 Furniture Type 4 - Timber Bridge
  Material / finish: Timber and steel
  Size: arched, size as shown
- FT5 Furniture Type 5 - Tree Grille
  Material / finish: Steel, flush with paving
  Size: 2050mm x 2050mm
- FT6 Raised Planter with Metal Edge to suit required soil depth
- FT7 Furniture Type 7 - Outdoor Timber Seating
- FT8 Furniture Type 8 - Outdoor Timber Seating
- FT9 Furniture Type 9 - Timber Play Balance Beams
- FT10 Furniture Type 10 - Play Boulders
- FT11 Furniture Type 11 - Balance Disc
- FT12 Furniture Type 12 - Outdoor Gym Equipment
- FT13 Furniture Type 13 - Outdoor Gym Equipment
- FT14 Furniture Type 14 - Outdoor Gym Equipment
- FT15 Furniture Type 15 - Outdoor Gym Equipment
- FT16 Furniture Type 16 - Lightweight Metal Pergola Structure
- FT17 Furniture Type 17 - Timber Reclined Seating
- FT18 Furniture Type 18 - Circular Timber Seating
- FT19 Furniture Type 19 - Bandstand

External Lighting

- L1 Lighting Type 1 - 3.0m Ht Lighting pole
- L2 Lighting Type 2 - 890mm Ht Lighting bollard
- L3 Lighting Type 3 - Tree uplighter
- L4 Lighting Type 4 - Integrated LED strip in the furniture / paving

Notes:
- Lighting proposals and locations shown on this drawing are indicative;
- External lighting detailed design to be developed by Project Lighting Consultant / Specialist Contractor.

Soft Landscape

- Proposed Tree Planting
  Refer to indicative planting strategy
- Proposed Multi-stemmed Tree
- Proposed Feature Shrub
- Proposed Mixed Shrubs, Herbaceous and Bulb Planting
- Proposed Hedge Planting
- Proposed Lawn

0 1 2.5 5 7.5 10 15 20 25m
1:250

Revision	Date	Reason	Drawn	Checked
P04	20.06.2022	Issued for planning approval	HG	PB
P03	13.08.2021	Issued for planning approval	HG	PB
P02	11.02.2021	Issued for planning approval	SM	PB
P01	04.02.2021	Issued for Information	DB	PB

Disclaimer:
1. This drawing is copyright of fabrik ltd. It must not be copied or reproduced without written consent from the owner.
2. All contractors must visit site and be responsible for taking and checking all dimensions related to the works shown on the drawing prior to fabrication or setting out.
3. This drawing uses coloured lines. Please do not rely on a monochrome copy.

External References:
- D2918_FAB_01_00_M2_L_1200_Ground Floor
- D2918_FAB_01_03_M2_L_1203_Level 3

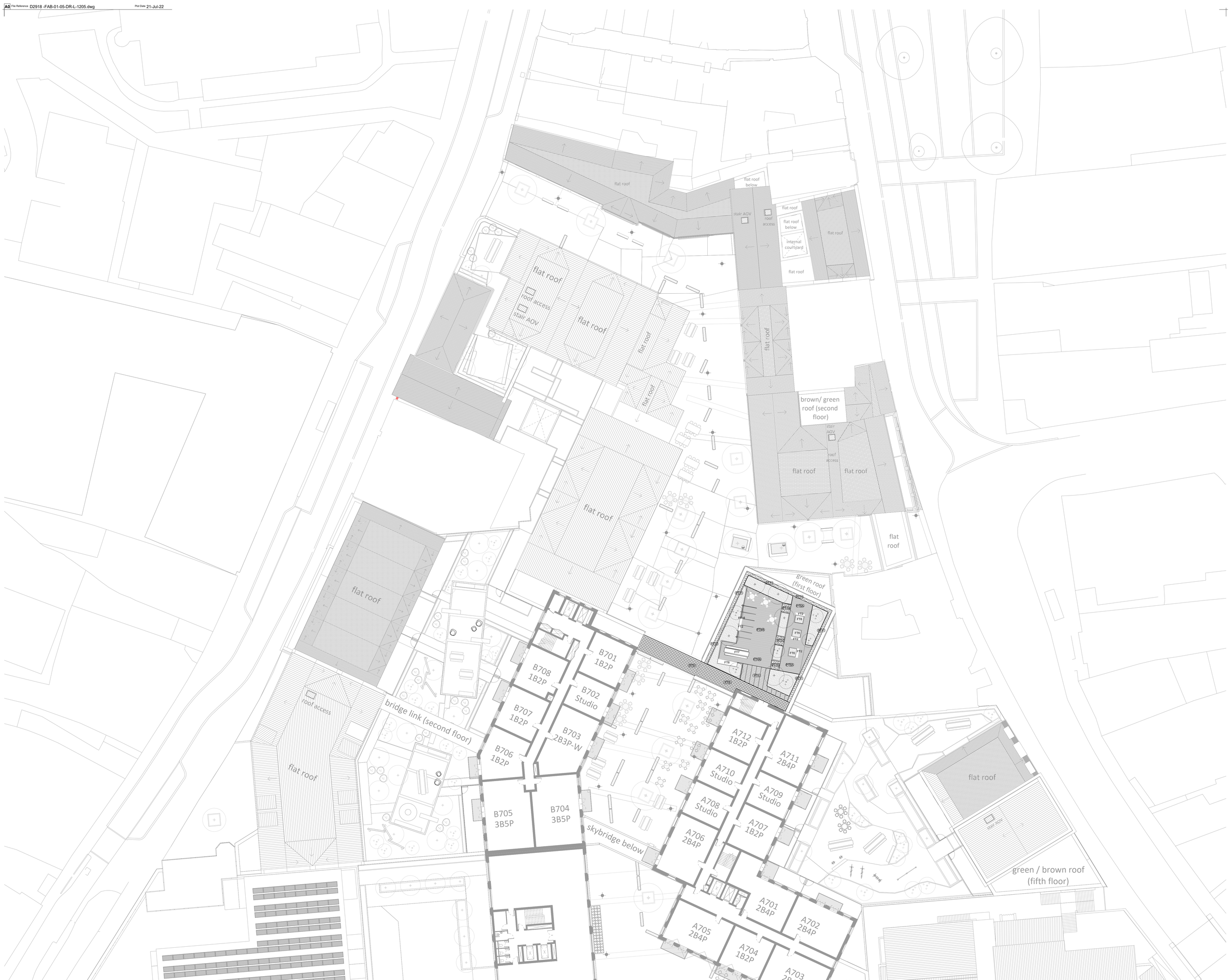
fabrik landscape architects
Lenten House | 16 Lenten Street | Alton | Hampshire | GU34 1HG
T : 01420 593250 | E : alton@fabrikuk.com | W : www.fabrikuk.com

Project: EAGLE QUARTER
Client: LOCHAILORT NEWBURY LTD
Drawing Title: LANDSCAPE GENERAL ARRANGEMENT PLAN - LEVEL 03

Purpose of Issue	Drawn By	Checked By	Drawn Scale	Date of First Issue
ISSUED FOR PLANNING APPROVAL	SM	PB	1:250 @ A0	FEB | 2021

Project Number	Origin	Zone	Level	File Type	Role	Number	Revison
D2918	FAB	01	03	DR	L	1203	P04

A0 File Reference D2918 -FAB-01-05-DR-L-1205.dwg Plot Date 21-Jul-22



LEGEND

Paving Types

- Paving Type 1 - Vehicular Asphalt
  To Engineer's specification
- Paving Type 2 - Natural Granite Paving
  Colour/Finish: Mixed color range / flamed
  Size: 200x100, suitable for vehicular traffic
  Bond: Stretcher Bond
- Paving Type 2A - Natural Granite Cobbles
  Colour/Finish: Light grey & Dark grey / flamed
  Size: 200x200, suitable for vehicular traffic
  Bond: Stack Bond
- Paving Type 3 - Precast Concrete Blocks
  Colour: Mixed light, warm tones; Finish: Flamed
  Size: 300x150, suitable for vehicular traffic
  Bond: Stretcher
- Paving Type 3A - Precast Concrete Blocks
  Colour: Mixed dark & light gray, blue tones;
  Finish: Flamed
  Size:200x200, suitable for vehicular traffic
  Bond: Paving pattern to be developed
- PT3B Paving Type 3B - Precast Concrete Blocks
  Colour / Finish: Mid & Dark Mixed
  Size: 200x100, suitable for vehicular traffic
  Bond: Herringbone
- PT3C Paving Type 3C - Precast Concrete Blocks
  Colour / Finish: Mid & Dark Mixed
  Size: 300x100+100x100, suitable for vehicular traffic
  Bond: Stacked Bond, pattern to be developed
- Paving Type 4 - Natural Granite Sett Paving
  Colour / Finish: Mid & Dark Mixed
  Size: 100x100, suitable for vehicular traffic
  Bond: Stacked Bond
- Paving Type 5 - Vehicular Precast Concrete Block Paving
  Color / Finish: Light gray
  Size: 200x200
  Bond: Stretcher Bond
- PT5A Paving Type 5A - Vehicular Precast Concrete Block Paving
  Color / Finish: Dark gray
  Size: 300x300
  Bond: Stretcher Bond
- PT5B Paving Type 5B - Vehicular Precast Concrete Block Paving
  Color / Finish: Mid gray
  Size: 200x100
  Bond: Stretcher Bond
- PT5C Paving Type 5C- Vehicular Precast Concrete Block Paving
  Color / Finish: Mixed color range
  Size: 600x300
  Bond: Stretcher Bond
- PT5D Paving Type 5D - Vehicular Precast Concrete Block Paving
  Color / Finish: Mixed color range
  Size: 300x200
  Bond: Stretcher Bond
- Paving Type 6 - Porcelain Paving on Pedestals
  Bond: Stacked Bond
- Paving Type 6A - Porcelain Paving on Pedestals
- Paving Type 7 - Porcelain Paving on Pedestals
  Bond: Stretcher Bond
- Paving Type 8 - Porcelain Paving on Pedestals for Private Amenity
- Paving Type 8 - Porcelain Paving on Pedestals
- Paving Type 10 - Resin Bound Surface
- Paving Type 11 - Gravel Strip

Edge Types

- 1 Edge Type 1 - Raised Granite Kerb
  Colour / finish: Silver grey / bush hammered
  Size: 150-200mm width / 100mm upstand
- 2 Edge Type 2 - Flush Granite Band
  Colour / finish: Silver grey / bush hammered
  Size: 150- 300mm width / flush
- 3 Edge Type 3 - Flush Metal Edge
  Colour / finish: Weathered steel
  Size: Flush
- 4 Edge Type 4 - Raised Planter Edge
  Colour / finish: Silver grey / bush hammered
  Size: 200-400mm width / 450mm upstand
- Proposed Channel Drain

Site Furniture Types

- FT1 Furniture Type 1 - Integrated Planter Bench
  Material / finish: Timber fitted to ET4
  Size: 450mm height, plan size varies
- FT2 Furniture Type 2 - Freestanding Bench
  Material / finish: Timber and steel
  Size: 450mm height, arm and backrests included as required
- FT3 Furniture Type 3 - Moveable Planter - Rectangular
  Material / finish: Steel
  Size: 2400mm x 500mm
- FT3A Furniture Type 3A - Moveable Planter - Circular
  Material / finish: Concrete
  Size: 1300mm diameter
- FT4 Furniture Type 4 - Timber Bridge
  Material / finish: Timber and steel
  Size: arched, size as shown
- FT5 Furniture Type 5 - Tree Grille
  Material / finish: Steel, flush with paving
  Size: 2050mm x 2050mm
- FT6 Raised Planter with Metal Edge to suit required soil depth
- FT7 Furniture Type 7 - Outdoor Timber Seating
- FT8 Furniture Type 8 - Outdoor Timber Seating
- FT9 Furniture Type 9 - Timber Play Balance Beams
- FT10 Furniture Type 10 - Play Boulders
- FT11 Furniture Type 11 - Balance Disc
- FT12 Furniture Type 12 - Outdoor Gym Equipment
- FT13 Furniture Type 13 - Outdoor Gym Equipment
- FT14 Furniture Type 14 - Outdoor Gym Equipment
- FT15 Furniture Type 15 - Outdoor Gym Equipment
- FT16 Furniture Type 16 - Lightweight Metal Pergola Structure
- FT17 Furniture Type 17 - Timber Reclined Seating
- FT18 Furniture Type 18 - Circular Timber Seating
- FT19 Furniture Type 19 - Bandstand

External Lighting

- L1 Lighting Type 1 - 3.0m Ht Lighting pole
- L2 Lighting Type 2 - 890mm Ht Lighting bollard
- L3 Lighting Type 3 - Tree uplighter
- L4 Lighting Type 4 - Integrated LED strip in the furniture / paving

Notes:
- Lighting proposals and locations shown on this drawing are indicative;
- External lighting detailed design to be developed by Project Lighting Consultant / Specialist Contractor.

Soft Landscape

- Proposed Tree Planting
  Refer to indicative planting strategy
- Proposed Multi-stemmed Tree
- Proposed Feature Shrub
- Proposed Mixed Shrubs, Herbaceous and Bulb Planting
- Proposed Hedge Planting
- Proposed Lawn

0 1 2.5 5 7.5 10 15 20 25m
1:250

Revision	Date	Reason	Drawn	Checked
P03	20.06.2022	Issued for planning approval	HG	PB
P02	11.02.2021	Issued for planning approval	SM	PB
P01	04.02.2021	Issued for Information	DB	PB

External References:
- D2918_FAB_01_00_M2_L_1200_Ground Floor
- D2918_FAB_01_05_M2_L_1205_Level 5

fabrik landscape architects
Lenten House | 16 Lenten Street | Alton | Hampshire | GU34 1HG
T : 01420 593250 | E : alton@fabrikuk.com | W : www.fabrikuk.com

Project: EAGLE QUARTER
Client: LOCHAILORT NEWBURY LTD
Drawing Title: LANDSCAPE GENERAL ARRANGEMENT PLAN - LEVEL 07/ 05 Office

Purpose of Issue	Drawn By	Checked By	Drawn Scale	Date of First Issue
ISSUED FOR PLANNING APPROVAL	SM	PB	1:250 @ A0	FEB | 2021

Project Number	Origin	Zone	Level	File Type	Role	Number	Revison
D2918	FAB	01	05	DR	L	1205	P03

A0 File Reference D2918 -FAB-01-08-DR-L-1206.dwg Plot Date 21-Jul-22

flat roof
flat roof below
stair AOV
roof access
flat roof
flat roof below
internal courtyard
flat roof
flat roof
flat roof
roof access
stair AOV
flat roof
flat roof
brown/ green roof (second floor)
stair AOV
roof access
flat roof
flat roof
flat roof
flat roof
green roof (first floor)
skybridge
B801 2B3P-M
B808 2B3P-M
B802 1B2P-M
B807 2B3P-M
B803 3B5P-M
B806 2B3P-M
B805 3B5P-M
B804 3B5P-M
skybridge below
A807 2B3P-M
A806 2B4P-M
A805 1B2P-M
A804 1B2P-M
A803 1B2P-M
A802 3B5P-M
A801 2B4P-M
private gardens (first floor)
flat roof
roof access
bridge link (second floor)
flat roof
green / brown roof (fifth floor)
green roof
flat roof
roof access
stair AOV
BUS SHELTER
BUS STOP
TAXI RANK
REFUGE COLLECTION LAYBY
BUS STOP
BUS SHELTER

LEGEND

Paving Types

- Paving Type 1 - Vehicular Asphalt
  To Engineer's specification
- Paving Type 2 - Natural Granite Paving
  Colour/Finish: Mixed color range / flamed
  Size: 200x100, suitable for vehicular traffic
  Bond: Stretcher Bond
- Paving Type 2A - Natural Granite Cobbles
  Colour/Finish: Light grey & Dark grey / flamed
  Size: 200x200, suitable for vehicular traffic
  Bond: Stack Bond
- Paving Type 3 - Precast Concrete Blocks
  Colour: Mixed light, warm tones; Finish: Flamed
  Size: 300x150, suitable for vehicular traffic
  Bond: Stretcher
- Paving Type 3A - Precast Concrete Blocks
  Colour: Mixed dark & light gray, blue tones;
  Finish: Flamed
  Size:200x200, suitable for vehicular traffic
  Bond: Paving pattern to be developed
- PT3B Paving Type 3B - Precast Concrete Blocks
  Colour / Finish: Mid & Dark Mixed
  Size: 200x100, suitable for vehicular traffic
  Bond: Herringbone
- PT3C Paving Type 3C - Precast Concrete Blocks
  Colour / Finish: Mid & Dark Mixed
  Size: 300x100+100x100, suitable for vehicular traffic
  Bond: Stacked Bond, pattern to be developed
- Paving Type 4 - Natural Granite Sett Paving
  Colour / Finish: Mid & Dark Mixed
  Size: 100x100, suitable for vehicular traffic
  Bond: Stacked Bond
- Paving Type 5 - Vehicular Precast Concrete Block Paving
  Color / Finish: Light gray
  Size: 200x200
  Bond: Stretcher Bond
- PT5A Paving Type 5A - Vehicular Precast Concrete Block Paving
  Color / Finish: Dark gray
  Size: 300x300
  Bond: Stretcher Bond
- PT5B Paving Type 5B - Vehicular Precast Concrete Block Paving
  Color / Finish: Mid gray
  Size: 200x100
  Bond: Stretcher Bond
- PT5C Paving Type 5C- Vehicular Precast Concrete Block Paving
  Color / Finish: Mixed color range
  Size: 600x300
  Bond: Stretcher Bond
- PT5D Paving Type 5D - Vehicular Precast Concrete Block Paving
  Color / Finish: Mixed color range
  Size: 300x200
  Bond: Stretcher Bond
- Paving Type 6 - Porcelain Paving on Pedestals
  Bond: Stacked Bond
- Paving Type 6A - Porcelain Paving on Pedestals
- Paving Type 7 - Porcelain Paving on Pedestals
  Bond: Stretcher Bond
- Paving Type 8 - Porcelain Paving on Pedestals for Private Amenity
- Paving Type 8 - Porcelain Paving on Pedestals
- Paving Type 10 - Resin Bound Surface
- Paving Type 11 - Gravel Strip

Edge Types

- 1 Edge Type 1 - Raised Granite Kerb
  Colour / finish: Silver grey / bush hammered
  Size: 150-200mm width / 100mm upstand
- 2 Edge Type 2 - Flush Granite Band
  Colour / finish: Silver grey / bush hammered
  Size: 150- 300mm width / flush
- 3 Edge Type 3 - Flush Metal Edge
  Colour / finish: Weathered steel
  Size: Flush
- 4 Edge Type 4 - Raised Planter Edge
  Colour / finish: Silver grey / bush hammered
  Size: 200-400mm width / 450mm upstand
- Proposed Channel Drain

Site Furniture Types

- FT1 Furniture Type 1 - Integrated Planter Bench
  Material / finish: Timber fitted to ET4
  Size: 450mm height, plan size varies
- FT2 Furniture Type 2 - Freestanding Bench
  Material / finish: Timber and steel
  Size: 450mm height, arm and backrests included as required
- FT3 Furniture Type 3 - Moveable Planter - Rectangular
  Material / finish: Steel
  Size: 2400mm x 500mm
- FT3A Furniture Type 3A - Moveable Planter - Circular
  Material / finish: Concrete
  Size: 1300mm diameter
- FT4 Furniture Type 4 - Timber Bridge
  Material / finish: Timber and steel
  Size: arched, size as shown
- FT5 Furniture Type 5 - Tree Grille
  Material / finish: Steel, flush with paving
  Size: 2050mm x 2050mm
- FT6 Raised Planter with Metal Edge to suit required soil depth
- FT7 Furniture Type 7 - Outdoor Timber Seating
- FT8 Furniture Type 8 - Outdoor Timber Seating
- FT9 Furniture Type 9 - Timber Play Balance Beams
- FT10 Furniture Type 10 - Play Boulders
- FT11 Furniture Type 11 - Balance Disc
- FT12 Furniture Type 12 - Outdoor Gym Equipment
- FT13 Furniture Type 13 - Outdoor Gym Equipment
- FT14 Furniture Type 14 - Outdoor Gym Equipment
- FT15 Furniture Type 15 - Outdoor Gym Equipment
- FT16 Furniture Type 16 - Lightweight Metal Pergola Structure
- FT17 Furniture Type 17 - Timber Reclined Seating
- FT18 Furniture Type 18 - Circular Timber Seating
- FT19 Furniture Type 19 - Bandstand

External Lighting

- L1 Lighting Type 1 - 3.0m Ht Lighting pole
- L2 Lighting Type 2 - 890mm Ht Lighting bollard
- L3 Lighting Type 3 - Tree uplighter
- L4 Lighting Type 4 - Integrated LED strip in the furniture / paving

Notes:
- Lighting proposals and locations shown on this drawing are indicative;
- External lighting detailed design to be developed by Project Lighting Consultant / Specialist Contractor.

Soft Landscape

- Proposed Tree Planting
  Refer to indicative planting strategy
- Proposed Multi-stemmed Tree
- Proposed Feature Shrub
- Proposed Mixed Shrubs, Herbaceous and Bulb Planting
- Proposed Hedge Planting
- Proposed Lawn

0 1 2.5 5 7.5 10 15 20 25m
1:250

Revision	Date	Reason	Drawn	Checked
P04	20.06.2022	Issued for planning approval	HG	PB
P03	13.08.2021	Issued for planning approval	HG	PB
P02	11.02.2021	Issued for planning approval	SM	PB
P01	04.02.2021	Issued for information	DB	PB

External References:
- D2918_FAB_01_00_M2_L_1200_Ground Floor
- D2918_FAB_01_08_M2_L_1206_Level 8

fabrik landscape architects
Lenten House | 16 Lenten Street | Alton | Hampshire | GU34 1HG
T : 01420 593250 | E : alton@fabrikuk.com | W : www.fabrikuk.com

Project: EAGLE QUARTER
Client: LOCHAILORT NEWBURY LTD
Drawing Title: LANDSCAPE GENERAL ARRANGEMENT PLAN - LEVEL 08

Purpose of Issue	Drawn By	Checked By	Drawn Scale	Date of First Issue
DESIGN INFORMATION ONLY	SM	PB	1:250 @ A0	FEB | 2021

Project Number	Origin	Zone	Level	File Type	Role	Number	Revison
D2918	FAB	01	08	DR	L	1206	P04

A0 File Reference D2918 -FAB-01-ZZ-DR-L-1208.dwg Plot Date 21-Jul-22

flat roof
flat roof below
stair AOV
roof access
flat roof
flat roof below
internal courtyard
flat roof
flat roof
roof access
stair AOV
flat roof
communal roof terrace (third floor)
private podium terraces (first floor)
flat roof
flat roof
flat roof
brown/ green roof (second floor)
PV11
stair AOV
roof access
flat roof
flat roof
flat roof
flat roof
flat roof
green roof (first floor)
communal podium gardens (first floor)
roof access
skybridge (seventh floor)
roof terrace (seventh floor)
stair AOV
private gardens (first floor)
roof access
bridge link (second floor)
flat roof
flat roof
communal podium gardens (first floor)
flat roof
skybridge (second floor)
stair AOV
private/ communal terraces and communal podium (second floor)
flat roof
stair AOV
green / brown roof (fifth floor)
PV11
roof terrace (eighth floor)
PV11
green roof
PV11
PV11
PV11
PV11
flat roof
roof access
stair AOV
BUS SHELTER
BUS STOP
TAXI RANK
REFUGE COLLECTION LAYBY
BUS STOP
BUS SHELTER

Soft Landscape

Biodiverse Roof Planting Mix

Paving Type 11 - Gravel Strip

0 1 2.5 5 7.5 10 15 20 25m
1:250

Revision	Date	Reason	Drawn	Checked
P02	20.06.2022	Issued for planning approval	HG	PB
P01	12.02.2021	Issued for planning approval	SM	PB

External References:
D2918 _FAB_01_ZZ_M2_L_1208_Biodiverse Roofs

fabrik landscape architects
Lenten House | 16 Lenten Street | Alton | Hampshire | GU34 1HG
T : 01420 592292 | E : alton@fabrikuk.com | W : www.fabrikuk.com

Project: EAGLE QUARTER
Client: LOCHAILORT NEWBURY LTD
Drawing Title: LANDSCAPE GENERAL ARRANGEMENT PLAN - BIODIVERSITY ROOFS

Purpose of Issue	Drawn By	Checked By	Drawn Scale	Date of First Issue
ISSUED FOR PLANNING APPROVAL	SM	PB	1:250 @ A0	FEB | 2021

Project Number	Origin	Zone	Level	File Type	Role	Number	Revison
D2918	FAB	01	ZZ	DR	L	1208	P02

FS 538679

Robert Bird & Partners Limited
Registered in the UK. Company No. 4472743

Level 1
Harling House
47-51 Great Suffolk Street
Southwark, SE1 0BS
United Kingdom

P: +44 (0) 20 7633 2880
F: +44 (0) 20 7928 4477

www.robertbird.com

Robert Bird Group
Member of the Surbana Jurong Group