NEWLANDS DEVELOPMENTS – HOYLAND COMMON, BARNSLEY

Plot 1 - Hermes.

Drainage Design Philosophy
HOYLA-RPS-SI-XX-RP-D-1030

NK020040
HOYLA-RPS-SI-XX-RP-C-1030
Plot 1 Hoyland Common
P03
18 May 2020

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Document status

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Approval for issue

Mark Harris 27 July 2020

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1 INTRODUCTION

1.1 This report has been prepared on behalf of Newlands Developments (hereafter referred to as the Applicant) to support their planning application for the development of Hoyland Common, Barnsley. It forms one of a suite of technical reports for a 'Hybrid planning application for a development of employment uses (B1, B2 and B8), new link road, associated works including provision of internal access roads, drainage and landscaping and detailed planning application for plot 1.

1.2 The overall development proposals are outlined on the Architects masterplan 4400-001 (refer to **Appendix A**)

1.3 This report details the proposed surface and foul water drainage strategy specifically for Plot 1 only. The proposals including boundaries and areas are outlined on the Architects Site plan 4400-101 (refer to **Appendix B**).

1.4 This Drainage Strategy supplements a separate Flood Risk Assessment 'RCEF76268' and Development Drainage Strategy 'HOYLA-RPS-SI-XX-RP-D-DS01' both by RPS which set out the requirements for the overall development.

1.5 The plot 1 site occupies 22ha of undeveloped land which comprises a series of fields some of which are ploughed or used for grazing animals.

1.6 The site is located on the outskirts of Hoyland common close to the M1 motorway and junction 36 at National Grid Reference (NGR) [tbc]. The site is bounded by Tankersley Road to the North, beyond which is agricultural land designated for further development and The Rockingham Centre and sports field. The residential area of Hoyland common and Sheffield road A6135 is immediately to the East. Agricultural land to the South which is also designated for development and the M1 motorway and junction 36 slip road forms the Western boundary.

1.7 The site lies within an area administered by Barnsley Metropolitan Borough Council (BMBC).

1.8 The report has been written in accordance with the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government, 2019), CIRIA C753 'The SuDS Manual' (CIRIA, 2015) and the requirements of BMBC as the Lead Local Flood Authority (LLFA).

1.9 The contents of this report are to be read in conjunction with all supporting drawings and/or documents referenced herein, appended to this report or submitted in support of the planning application for this development.

2 BASELINE CONDITIONS

Ground Conditions

2.1 A phase 1 desk study and Preliminary/Phase 1 coal Mining Risk Assessment were carried out for the site by Applied Geology in January 2020. More recently Applied Geology have carried out further intrusive ground investigation report and geotechnical design report (ref: AG3080-19-AK21 and AG3080-19-AK36) and the information below is summarised based on these reports.

Geology

2.2 The geology encounted beneath the main site area, consists of a layer of Topsoil and Topsoil/Made Ground averaging around 300mm depth at the surface.

2.3 The underlying Made Ground varies in depth and typically consists of Opencast Backfill, reworked natural materials of the Pennine Middle Coal Measures Formation. Natural soils consisted of the Pennine Middle Coal Measures Formation, a weathered clay horizon was encountered where natural materials were present at shallow depths, increasing to rock strength with depth, and directly below the Opencast Backfill. Shallow coal seams were encountered in some areas.

Ground contamination

2.4 Based on the nature of the development proposals the results of the ground investigation indicated that remedial measures were not considered necessary to minimise risk to Human Health or Controlled Waters.

Groundwater

2.5 Based on the current level of geotechnical information available, it is anticipated that the site is unlikely to promote infiltration rates adequate for the use of soakaways. Therefore, at this stage the proposals set out within the overall development drainage strategy (referred to in paragraph 1.4) is based upon the assumption that there will be no infiltration SuDs features.

2.6 There are no groundwater abstractions within 500m of the site and the site is not located within a groundwater Source Protection Zone (SPZ).

Flood risk

2.7 The Environment Agency's 'Flood Map for Planning' indicates that the site is located within Flood Zone 1, whereby the annual probability of flooding from fluvial or tidal sources is classified as less than 1 in 1,000. The site is considered to be of 'low' risk from surface water flooding. Further information on flooding is provided in the RPS Flood Risk Assessment (referred to in paragraph 1.4).

Existing Surface and Foul Water Drainage

2.8 The site is higher than the M1 motorway to the West but is relatively flat in topography to the North ranging between 143m and 147m AOD. Levels peak in the centre of the site to around 150m AOD and drop off to the east to approximately 140m AOD and more significantly to the South ranging between 138m and 131m AOD.

2.9 As the proposed site is currently undeveloped no surface water is known to have previously discharged to the public sewer network. A new surface water network is proposed as part of the site wide development and infrastructure.

2.10 It is believed that the current site surface water runoff is split into two catchments. An area to the north east is drained to towards the M1 motorway into a Highways England drain. The remainder of the site appears to be drained to a series of ditches which eventually outfall into the Harley Dyke approximately 1Km to the South. An annotated Topographical Survey is included within A**ppendix C** which shows the current site topography and existing drainage assumptions.

2.11 There are no existing public foul sewers on the site. A Pre-development enquiry with Yorkshire water has identified a suitable connection location at the junction of Allott street and Fitzwilliam Street for the discharge of foul water.

3 PROPOSED SURFACE WATER DRAINAGE

3.1 The proposed development seeks planning consent for a parcel distribution hub with integral offices and separate vehicle maintenance unit. Externally there is a service yard to the perimeter of the warehouse, lorry and trailer parking area's, car park provision, a vehicle wash and re-fuelling area.

3.2 The development drainage strategy HOYLA-RPS-SI-XX-RP-D-DS01 sets out the strategy and SUDs requirements for the overall development. An infrastructure surface water drain running below the proposed link road will serve plot 1 at the HGV entrance and unrestricted flows will be conveyed South into an attenuation pond which serves the Southern catchment of the development. It is proposed that flows within the pond are to be attenuated to a greenfield runoff rate before discharging into the Harley Dyke approximately 1Km to the South.

3.3 The proposed surface water drainage for plot 1 is shown on RPS drawing 'Surface and Foul Water Drainage Layout' HOYLA-RPS-SI-XX-DR-D-1300 (refer to **Appendix E**).

3.4 Each building and the associated impermeable external surfaces will be collected within a private below ground drainage system before connection into the infrastructure outfall manhole C1.6 at the HGV entrance.

3.5 The warehouse and office roof drainage will comprise of siphonic drainage with primary and secondary systems. The primary siphonic roof drainage from the warehouse will be collected into a separate network of receiving below ground drainage and will flow under gravity through a sediment sump/catch pit to the outfall.

3.6 The secondary siphonic roof drainage which will activate during extreme events will be allowed to discharge directly on to the positively drained surrounding hardstanding areas of the service yard. The drainage in these areas will be designed to cater for these additional flows.

3.7 The Vehicle Maintenance Unit (VMU) roof drainage will comprise a tradition gravity drainage system with roof gutters and external downpipes The rainwater downpipes will be connected directly to a below ground drainage network, where flows will be conveyed under gravity through a sediment sump/catch pit to the outfall.

3.8 The service yard comprises predominantly loading docks to both the east and west elevations and level access loading aprons are proposed along the Northern elevation. A single row of HGV parking is provided to the perimeter of the west and northern service yard areas and to the east there is a large parking area with provision for multiple rows of HGV parking. These area's will have falls to a series of channel drains located at the low points of the yard. The channel drains within the service yard apron will convey the run-off to the receiving below ground drainage system which flows under gravity through a sediment sump/catch pit and class 1 full retention separator with alarm before discharge to the outfall.

3.9 Trailer parking is proposed to the south up to a kerbed island which separates the main HGV access route from the entrance. This hardstanding area will have falls to a series of channel drains located at the low point of the yard. The channel drains will convey the run-off to the receiving below ground drainage system which flows under gravity through a sediment sump/catch pit and by-pass separator with alarm before discharge to the outfall.

3.10 Car parking spaces will be constructed of bituminous construction. Levels will be designed to ensure surface water run-off is collected within linear drains or gullies located at the lowest point. These drains will convey the run-off to the receiving below ground drainage into a by-pass separator with alarm before discharge to the outfall.

3.11 The HGV access road will be constructed of bituminous construction. Levels will be designed to ensure surface water run-off is collected within linear drains or gullies located at the lowest point. These drains will convey the run-off to the receiving below ground drainage before discharge to the outfall. However due to the potential for waiting vehicles the inbound lane catchment will be drained to the outfall via a full retention separator with alarm.

3.12 It is proposed that surface water flows from the vehicle wash area will be contained by kerbs and a channel drain at the low points and flows will pass through an oil separator before discharge to the foul drainage system **or** to a water recovery unit for washing vehicles. The receiving below ground drainage system will flow under gravity through a sediment sump/catch pit and separator before discharge to the outfall subject to the necessary consents with Yorkshire Water.

3.13 It is proposed that surface water flows from the re-fuelling area will be contained by kerbs and a channel drain at the low point. The channel drain will convey the run-off to the receiving below ground drainage system which flows under gravity through a sediment sump/catch pit and Forecourt separator with alarm before discharge to the outfall.

3.14 Rainwater harvesting is included within the developer specification for the project together with dual flush toilets as water saving measures.

3.15 Hydraulic calculations for the proposed surface water drainage layout have been produced in MicroDrainage©. (refer to **Appendix H** RPS MicroDrainage© Calculations).

4 SUSTAINABLE DRANAGE SYSTEMS

Strategy

4.1 The development drainage strategy 'HOYLA-RPS-SI-XX-RP-D-DS01' sets out the overall SUDS proposals for the development in accordance with CIRIA C753 'The SuDS Manual' (CIRIA, 2015) to reduce the impact on the receiving water body.

4.2 Large areas of Landscaping are proposed to the perimeter of plot 1 providing amenity and bio-diversity value. It is proposed that generally these areas will drain naturally into the ground but at low points filter drains will be provided to prevent surface water runoff onto adjacent land.

Discharge Rates

4.3 As defined in section 3.2 the infrastructure drainage will be designed to allow unrestricted flows from plot 1 before discharge into a development attenuation pond where flows will be restricted to a greenfield runoff rate before discharging into the Harley Dyke approximately 1Km to the South. Reference should be made to the development drainage strategy HOYLA-RPS-SI-XX-RP-D-DS01 for more detailed information.

Outfall

4.4 The plot 1 surface water will outfall into the proposed infrastructure manhole ref: C1.6 situated at the HGV entrance

Water Quantity and Water Quality / Pollution Control

4.5 The Greenfield discharge restriction proposed satisfies the requirements of C753, cl 24.10 Designing for Long Term Storage (CIRIA, 2015). Flows will be restricted at the development attenuation pond by the provision of a Hydro-Brake® vortex flow control device.

4.6 An isolation valve/penstocks will be provided to the drainage system upstream of the infrastructure outfall manhole C1.6 to allow the system to be shut down in the event of an oil spillage or emergency.

Designing for Exceedance

4.7 The surface water drainage network has been designed to accommodate run-off from all storms up to and including the 100-year return period with an additional 30% for future climate change with and any localised flooding contained on site.

General Construction Phase Pollution Prevention Measures

4.8 In order to protect the surface water interests surrounding the site, the following mitigation measures shall be adopted by the Principal Contractor during the construction process.

1. Pollution prevention equipment will be kept in the main compound at all times and procedures for use put in place.
2. The Principal Contractor will be required to keep spill kits on site at all times and ensure that staff are trained to use them
3. Construction vehicles will be regularly maintained to reduce the risk of leakage or spillage. Maintenance work will be carried out off-site or on impervious drip trays of sufficient capacity to prevent spillage of fuel and oil.

4. Immobile plant, fuels, oils and chemicals will be stood on impervious drip trays or be secured/locked in appropriately bunded areas (at 110% of volume). Refuelling operations will be carried out within a designated construction site compound remote from surface drainage systems. Empty drums will be disposed of appropriately.
5. The washing out of any Ready-Mix Lorries shall be strictly controlled. The effluent from such cleaning shall be disposed of appropriately.
6. Any temporary foul drainage to serve welfare facilities will be provided at the start of works on site. Foul water will be disposed of appropriately.

4.9 All works on site will follow the best practice guidelines outlined in section 5 and 6 of CIRIA C532-Control of Water Pollution from Construction Sites (CIRIA, 2001).

Surface Water Design Criteria

4.10 The new surface water drainage system will be designed to satisfy the following design criteria:

1. Surface water run-off derived from the most onerous 1 in 2 year return period storm will flow unimpeded through the drainage network where practically possible.
2. Surface water run-off derived from the most onerous 1 in 30 year return period storm will be accommodated within the drainage system.
3. Surface water run-off derived from the most onerous 1 in 100 + 30% year return period storm shall be allowed to flood to the following flood depths:
   - Service Yard Dock aprons – 300mm
   - Car parking and general yard areas – 125mm
4. Surface water run-off shall not cross any site boundary or enter any of the proposed buildings.

4.11 The drainage calculations have been completed using industry standard MicroDrainage© software, by Innovyze

Surface Water Hydraulic Design Parameters

Global variables for 'Flood Studies Report' (FSR) rainfall data:

Rainfall:	Storm intensities are based upon the Flood Studies Report approach.
Design Return Period:	2, 30 and 100 years.
Climate change:	Rainfall profiles increased by 30% during the 1 in 100 year event.
M5-60:	19.0
Ratio 'r':	0.36
Volumetric Run-off coefficient:	0.755 (summer); 0.822 (winter)
Global time of entry:	4 minutes.
Infiltration:	Ignore for peak flow design.
Backdrops:	Allow in design; maximum depth of 1.5m.
Depth:	0.600m / 0.900m / 1.200m minimum cover (Landscaping / service yard / highway; typically)
Surcharge:	No surcharging of pipes during 1:2 year event, where practicably possible.

5 FOUL WATER DRAINAGE

5.1 The development drainage strategy HOYLA-RPS-SI-XX-RP-D-DS01 sets out the strategy for the overall development. An infrastructure foul water drain running below the proposed link road will serve plot 1 at the HGV entrance Foul water for the development site is proposed to be collected into a gravity drainage network, that will be offered for adoption to Yorkshire water. The network located in the proposed new road to convey foul water to a new Adopted pumping station located by the Sheffield road roundabout and the Plot 2 entrance.

5.2 A Pre-development enquiry with Yorkshire water has provided a suitable location (MH6003) at the junction of Allott and Fitzwilliam Street for the discharge of foul water from the new site pumping station.

5.3 The proposed foul water drainage for plot 1 is shown on RPS drawing 'Surface and Foul Water Drainage Layout' HOYLA-RPS-SI-XX-DR-D-1300 (refer to **Appendix E**).

5.4 Domestic foul drainage from the development shall enter into a private below ground drainage system which will flow through gravity to the infrastructure outfall manhole FC8 at the HGV entrance.

5.5 At this stage of the proposed scheme detailed layouts and schedules of sanitary ware units are not finalised. All commercial development plots will be supplied with a connection point to take flow from each unit to the sewer and has been designed on the conservative rate of 0.6l/s per hectare of developable land in accordance with Sewers for Adoption 7th Edition Clause B5.1 sub-item 2a:

Unit 1 = 22 Ha

Foul flow = 13.2 litres per second.

5.6 Based on the preliminary assessments above, it is anticipated that peak foul flows from the proposed development will not exceed **13.2 l/s**.

5.7 The foul water pipes within the on-plot drainage scheme have been designed to a minimum 150mm diameter pipework laid to a minimum fall of 1:150. This satisfies the local peak flow rate as well as the minimum flow velocity to satisfy the self-cleansing requirements, in accordance with clause B4 9a '*Sewers for Adoption 7th Edition*'.

6 MAINTENANCE REGIME

6.1 On site drainage systems and SuDS features would remain under private ownership and would be maintained by an Estates management company or the owner/occupier in accordance with the following guidance:

Main Drainage System

6.2 Gutters, rainwater pipes, outlets, gullies and drainage channels would be inspected and thoroughly cleaned once a year.

6.3 All manholes would be inspected once a year and where necessary cleaned out at the same time. Any defects to the brickwork, benching cover or frame would be made good. Attention would be made to the Confined Spaces Regulations 1997 and the provisions contained therein for access to confined spaces. Details for entrance to manholes and separator tanks are contained in the above legislation.

Cleaning of the Drainage System

6.4 The following operations would be carried out during the periodic cleaning of the drainage system:

1. Covers of inspection chambers and manholes would be removed and the sides, benching and channels cleaned.
2. Intercepting traps, if fitted, would be plunged and flushed with clean water. Care would be taken to see that the stopper in the rodding eye is securely replaced.
3. Main and branch drains should be cleaned and afterwards would be flushed with clean water. Any obstructions found would be removed and not flushed into the system.
4. Periodically, accumulated deposits in gullies would be removed. The traps would then be plunged and thoroughly flushed out with clean water.
5. Covers of inspection chambers and gullies would be replaced, bedded unsuitable grease or other sealing material and/or bolted down as appropriate to the type. Missing bolts and broken items would be renewed.

Methods of Cleaning

6.5 The drainage system would be cleaned, as appropriate, using one or more of the following methods:

a. Rodding.

Appropriate cleaning tools and techniques should be chosen to avoid damage to the pipework to be cleaned. A set of rods with appropriate ends is basic useful equipment. It is important that correctly designed proprietary ends are used on the rods. Makeshift devices attached to the ends of rods should be avoided as they are not as effective as the correctly designed article and could become detached and create a blockage which would be difficult to remove. Furthermore, it is possible that such devices could cause damage to the pipeline. If the rods have brass ferrules, they should be checked to ensure that their fastenings are secure and that there are no protruding shoulders or fastenings as these can cause damage to drain lines, especially when entering through rodding eyes.

b. Jetting.

High pressure jetting techniques are suitable for use with all currently available pipe materials and should also be considered.

c. Hydraulic rams compressed air or other gases.

Equipment is available for use with all sizes of drain likely to be encountered in building drainage and is suitable for use with all currently available pipe materials. The principle of operation is that a shock wave is induced and is transmitted by water to the point of blockage, and the technique is effective where the pipe is surcharged or can be filled with water from the blockage to a point where the equipment can be used.

Penstocks

6.6 Penstocks to be checked and maintained in accordance with the manufacturer's recommendations. But in general penstock manholes should be inspected every 3 months to clean out any debris and silt, to check condition of the system (including fixing bolts), to operate the system through a full cycle and ensure all moving parts are sufficiently oiled/greased.

SuDS Drainage

Proprietary Treatment Systems

6.7 Treatment systems such as oil separators and silt traps require regular maintenance. Routine inspections would be undertaken at least every six months and a log maintained of inspection date, depth of oil / silt and any cleaning that is undertaken. All systems on the site would be accessible for cleaning purposes. Proprietary treatment devices would have different operation and maintenance requirements and specific reference would be made to the manufacturer's guidelines. However, for generic guidance reference can be made to the guidance set out within the CIRIA Guide C753 SUDS Manual section 14.12.1 and table 14.1 for operation and maintenance (extract show below).

TABLE 14.2 An example of operation and maintenance requirements for a proprietary treatment system

Maintenance schedule	Required action	Typical frequency
Routine maintenance	Remove litter and debris and inspect for sediment, oil and grease accumulation	Six monthly
	Change the filter media	As recommended by manufacturer
	Remove sediment, oil, grease and floatables	As necessary – indicated by system inspections or immediately following significant spill
Remedial actions	Replace malfunctioning parts or structures	As required
Monitoring	Inspect for evidence of poor operation	Six monthly
	Inspect filter media and establish appropriate replacement frequencies	Six monthly
	Inspect sediment accumulation rates and establish appropriate removal frequencies	Monthly during first half year of operation, then every six months

7 REFERENCES

RCEF76268 - RPS Flood Risk Assessment

HOYLA-RPS-SI-XX-RP-D-DS01 - RPS Development Drainage Strategy

HOYLA-RPS-SI-XX-DR-D-0300, 0301, 0302 Infrastructure Drainage Layouts

AG3080-19-AK21 - Applied Geology Ground Investigation Report

Greenhatch Topographical Survey with Existing Drainage Assumptions Annotated

CIRIA, 2001. Control of Water Pollution from Construction Sites C532

CIRIA, 2015. SuDS Manual C753

Ministry of Housing, Communities and Local Government, 2019. National Planning Policy Framework.

WRC Sewers For Adoption 7th Edition

Appendix A

‘HOY-PHP-1A-00-DR-A-4400-001 – Masterplan’

Areas Schedule

Plot No.	Warehouse GIA sqft	Warehouse GIA sqm	Offices GIA sqft	Offices GIA sqm	**Total GIA sqft**	Total GIA sqm	Cars Parking	HGV Parking	Docks
1	298700	27750	40594	3771	**339821**	31571	650	595	163
2	480000	44593	44800	4162	**524800**	48755	380	133	64
Total	778700	72343	85394	7933	**864621**	80326	1030	728	227

Note: total Area figure for plot 1 includes VMU / gatehouse areas (as area schedule on Site Plan)

net site area
4.92ha

net site area
18.00ha

net site area
10.47ha

APPLICATION RED LINE AREA

Overhead Electricity Cables
No Building Zone hatched Blue

Revision:

P1	first issue	29mar2019 PL
P2	Unit 2 scheme added	09dec2019 PL
P3	Unit 2 layout updated	10dec2019 PL
P4	layout updated	16dec2019 PL
P5	new road design, redline adjusted	29jan2020 PL
P6	residential site access proposal indicated	29jan2020 PL
P7	small commercial site layouts added	31jan2020 PL
P8	areas table corrected	03feb2020 PL
P9	updated following comments	03feb2020 PL
P10	net site areas noted	03feb2020 PL
P11	plot 2 changed to 2 units	12feb2020 RM
P12	road updated, ponds added	24feb2020 PL
P13	plot 2 amended to single unit	25mar2020 RM
P14	new RPS road design update	13apr2020 PL
P15	balancing pond, road and red line amended	15apr2020 RM
P16	Minor update to road	20apr2020 JM
P17	roundabout and Plot 2 access update	28apr2020 PL
P18	net site plot areas adjusted and shown	07may2020 PL
P19	plateau contours updated	19may2020 PL
P20	further earthworks update	20may2020 PL
P21	redline and road update	21may2020 PL
P22	acoustic fence, generator added, areas update	29may2020 PL
P23	acoustic barrier extent updated	04jun2020 PL
P24	Area Table corrected	10jun2020 PL

0 50m 100m SCALE 1:2500

N

Hoyland Common
Barnsley M1, J36

newlands developments

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Masterplan

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Project No:	Drawing No:	Rev:
4400	001	P24

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Appendix B

‘HOY-PHP-1A-00-DR-A-4400-101 – Hermes Plot 1 Site Plan’

SCHEDULE OF ACCOMODATION GIA

	m²	ft²
Warehouse	27,750	298,700
Office (ground)	1,164	12,529
Office (first)	1,164	12,529
Office (2nd fl, viewing etc)	465	5,000
Toilets/Comms (north end)	80	861
VMU	703	7,565
Gatehouse Type A	147	1,582
Gatehouse Type B x4	98	1054
TOTAL	31,571	339,821

Car Parking total including; 650 spaces
- 42 accessible spaces
- 73 car share spaces
- 13 additional enlarged spaces
- 34 Electric Vehicle charging spaces
- ducting for future potential 130 ev

HGV Parking (excl doors) 595 spaces
Tractor Parking 150 spaces
(inc Rigid Lorry 7.5t Parking, Shunter Parking, Recycle, Collection Trailers)

Motorcycle Parking 30 spaces
Bicycle Parking 60 spaces

Haunch Height 12.5 m

Dock Levellers 163 No.
Compactors 3 No.
Level Access Doors (Unit) 4 No.
Level Access (VMU) 4 No.

Revision:

P1	first issue	30mar2020	PL
P2	Red line and road updated	16Apr2020	JM
P3	Minor update to road	20Apr2020	JM
P4	fence added around car park	01may2020	PL
P5	car park / biodiversity updates	04may2020	PL
P6	road and contours updated	20may2020	PL
P7	redline and acoustic barrier update	04jun2020	PL

0 25m 50m SCALE 1:1250

N

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Hermes Plot 1

Hoyland Common, Barnsley.

Site Plan

Status

Drawn PL Checked RM

Date mar2020

Project Number:

Project Code Originator Zone Level-Info Type Role Drg. No. Revision

HOY-PHP-1A-00-DR-A-4400-101-P07

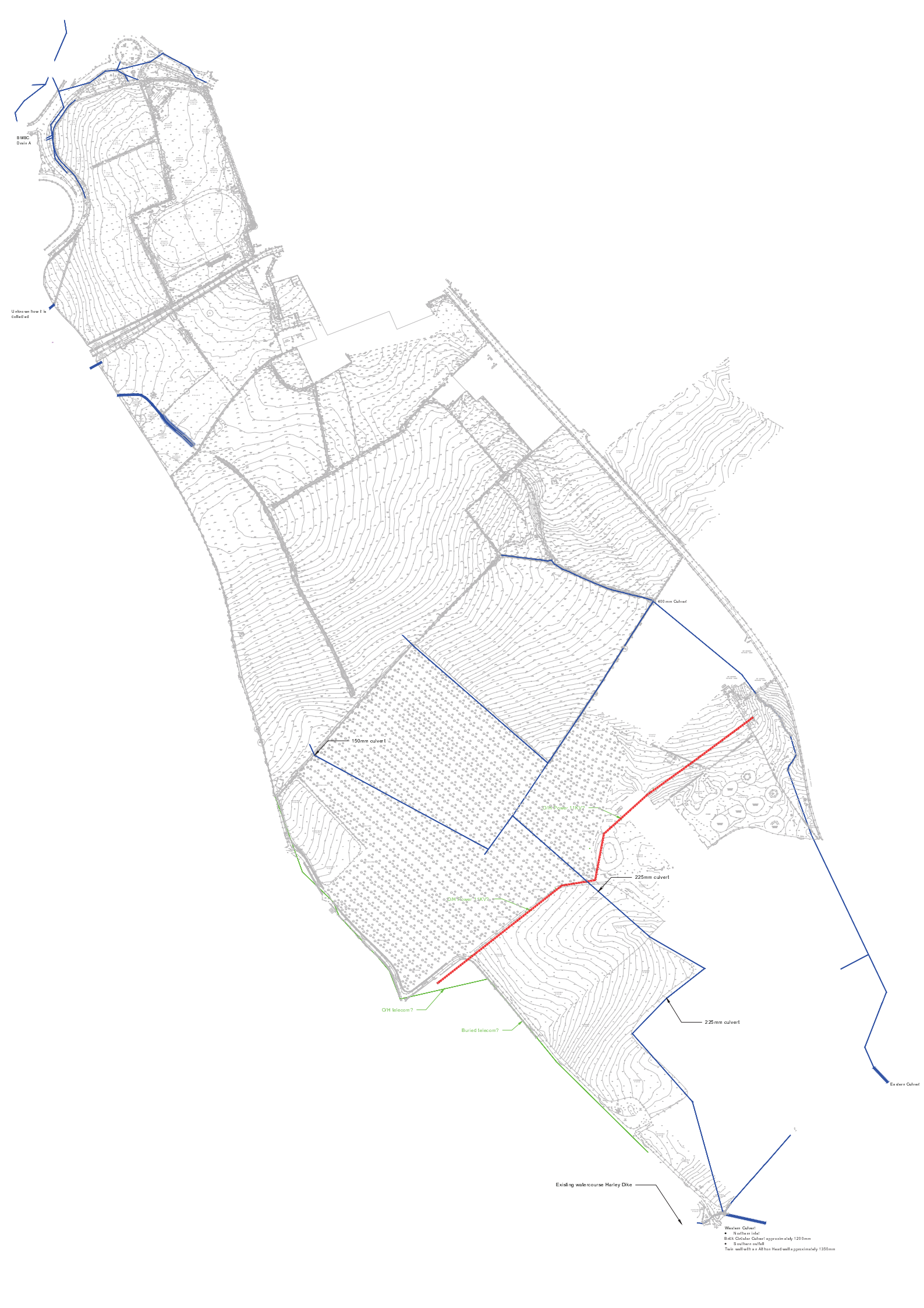
Scale@ A1
1:1250

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Issues

Appendix C

Greenhatch Topographical Survey (with existing drainage assumptions annotated)


BMBC Drain A
Unknown how it is collected
400mm Culvert
150mm culvert
O/H Power 11KV2
225mm culvert
O/H Power 11KV2a
O/H telecom?
Buried telecom?
225mm culvert
Eastern Culvert
Existing watercourse Harley Dike
Western Culvert
• Northern inlet
Brick Circular Culvert approximately 1200mm
• Southern outfall
Twin wall with an Alfton Head wall approximately 1350mm

Appendix D

‘HOYLA-RPS-SI-XX-DR-C-1600-External Levels’

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Notes

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2. If received electronically it is the recipients responsibility to print to correct scale. Only written dimensions should be used.
3. This drawing should be read in conjunction with all other relevant drawings and specifications.

Key :

134.075* : Indicates Proposed Levels
134.535^ : Indicates Existing Tie In Levels

: Indicates Retaining Wall Extents
: Indicates HB2 Kerbs
: Indicates Trief Containment Kerbs
: Indicates Drop Kerbs
: Indicates Transition Kerbs
: Indicates Kerb Drain

FFL=144.500

FFL=140.600

Extended kerbed island to be 20m from face of building.

3m kerbed island from building face to allow levels to fall away from building/access doors.

Kerb island required to retain vehicle wash & fuel pump.

10m

SCALE 1:750

P01	First issue		RB	JDC 22.05.20
Rev	Description		By	Ckd Date

RPS MAKING COMPLEX EASY
Sherwood House, Sherwood Avenue,
Newark, Nottinghamshire, NG24 1QQ
T: 01636 605 700 E: rpsnewark@rpsgroup.com

Client: newlands developments

Project: Plot 1 Hermes Hoyland Common Barnsley

Title: Proposed Levels

RPS Project Number	Scale @ A0	Date Created
NK020040	1:750	22.05.20
Task Team Manager	**Information Author**	**Task Information Manager**
MH	RB	JDC

Status: S1 (Suitable for Information)

Document Number: HOYLA-RPS-SI-XX-DR-C-1600

Revision: P01

Project Code - Originator - Zone - Level - Type - Role - Drawing Number

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Appendix E

‘HOYLA-RPS-SI-XX-DR-D-1300-Surface and Foul Water Drainage Layout’

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Notes

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2. If received electronically it is the recipients responsibility to print to correct scale. Only written dimensions should be used.
3. This drawing should be read in conjunction with all other relevant drawings and specifications.

Key:

- FW Sewer (I/D & Gradient)
- SW Drain (I/D & Gradient)
- Infrastructure Water FW Sewer
- Infrastructure Water SW Drain
- Infrastructure Water FW Manhole
- Infrastructure Water SW Manhole
- FW Manhole (manhole covers to be painted yellow)
- SW Manhole (manhole covers to be painted blue)
- Catchpit Manhole
- Penstock Isolation Valve Chamber
- Hydrobrake - Flow Control Chamber
- FW Package Pumping Station
- Foul Rising Main
- Kerb Drain
- Proposed Surface Water Slot Drain (OB= Outlet Box & AC= Access Chamber)
- CP Catchpit Manhole (Silt / debris trap)
- VC Vented Manhole cover
- IC Inspection Chamber
- PPIC Polypropylene Inspection Chamber
- PPCP Polypropylene Catch Pit
- RE Rodding Eye
- KO Kerb Outfall Unit
- RWP Rainwater Down Pipe
- SDP Syphonic Primary Discharge
- Syphonic Secondary Discharge
- SDG Sprinkler Discharge Gully
- RG Road Gully
- Filter Drain taking surface water run-off from landscape embankments
- Concrete encased pipes
- Assumed route of high level secondary syphonic drainage
- Hatch indicates 1:100 year + 30% CC ponding extent.

Above ground routing of foul drainage to be confirmed. Allowance to be made for venting head of each run through the roof.

All connections to existing infrastructure manholes FC8 and C4.6 to be checked and existing levels verified prior to construction work commencing on site

All manholes located in service yards may require minor repositioning and alteration of cover levels to suit yard joint layout

Rainwater harvesting tank location and details to be confirmed

Sprinkler test drainage requirements to be confirmed

Rev	Description	By	Ckd	Date
P04	Temporary above ground surface water storage added to plan for planning issue.	RB	JDC	10.06.20
P03	Gatic slot drain, full retention, by-pass separators and kerb sizes added. New full retention separator added.	RB	JDC	09.06.20
P02	Layout updated to suit hydraulic drainage system.	RB	JDC	05.06.20
P01	First issue	RB	JDC	22.05.20

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Sherwood House, Sherwood Avenue,
Newark, Nottinghamshire, NG24 1QQ
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Client: newlands developments

Project: Plot 1 Hermes
Hoyland Common Barnsley

Title: Proposed Surface and Foul Water Drainage Layout

RPS Project Number	Scale @ A0	Date Created
NK020040	1:750	22.05.2020
Task Team Manager	Information Author	Task Information Manager
MH	RB	JDC

Status: S1 (Suitable for Information)

Document Number: HOYLA-RPS-SI-XX-DR-D-1300

Revision: P04

Project Code - Originator - Zone - Level - Type - Role - Drawing Number

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Appendix F

‘HOYLA-RPS-SI-XX-DR-D-1305-Surface Water Catchment Plan

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Unit 1

Surface Water Catchment Key:

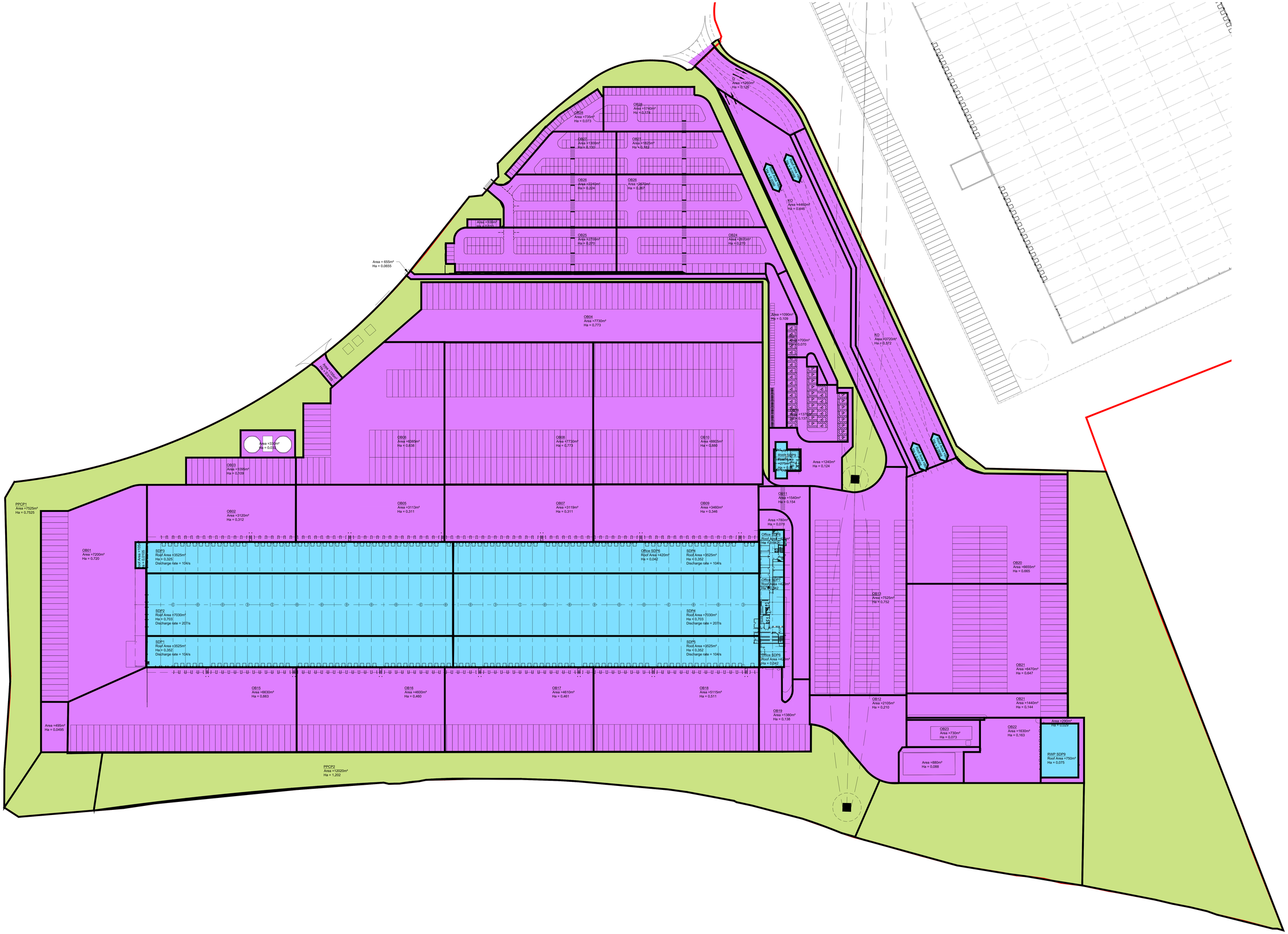
54,930m² : Soft Landscaping

Total Permeable Area = 54,930m²

31,310m² : Roof / Structure

135,582m² : Paved Areas

Total Impermeable Area = 166,892m²



10m SCALE 1:750

Rev	Description	By	Ckd	Date
P01	First issue	JTR	RB	10.06.20

Shenwood House, Sherwood Avenue,
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T: 01636 605 700 E: rpsnewark@rpsgroup.com

Client: newlands developments

Project: Plot 1 Hermes Hoyland
Common Barnsley

Title: Surface Water Catchment Plan

RPS Project Number	Scale @ A0	Date Created
NK020040	1:750	10.06.20
Task Team Manager	**Information Author**	**Task Information Manager**
MH	RB	JDC

Status: S1 (Suitable for Information)

Document Number: HOYLA-RPS-SI-XX-DR-C-1305

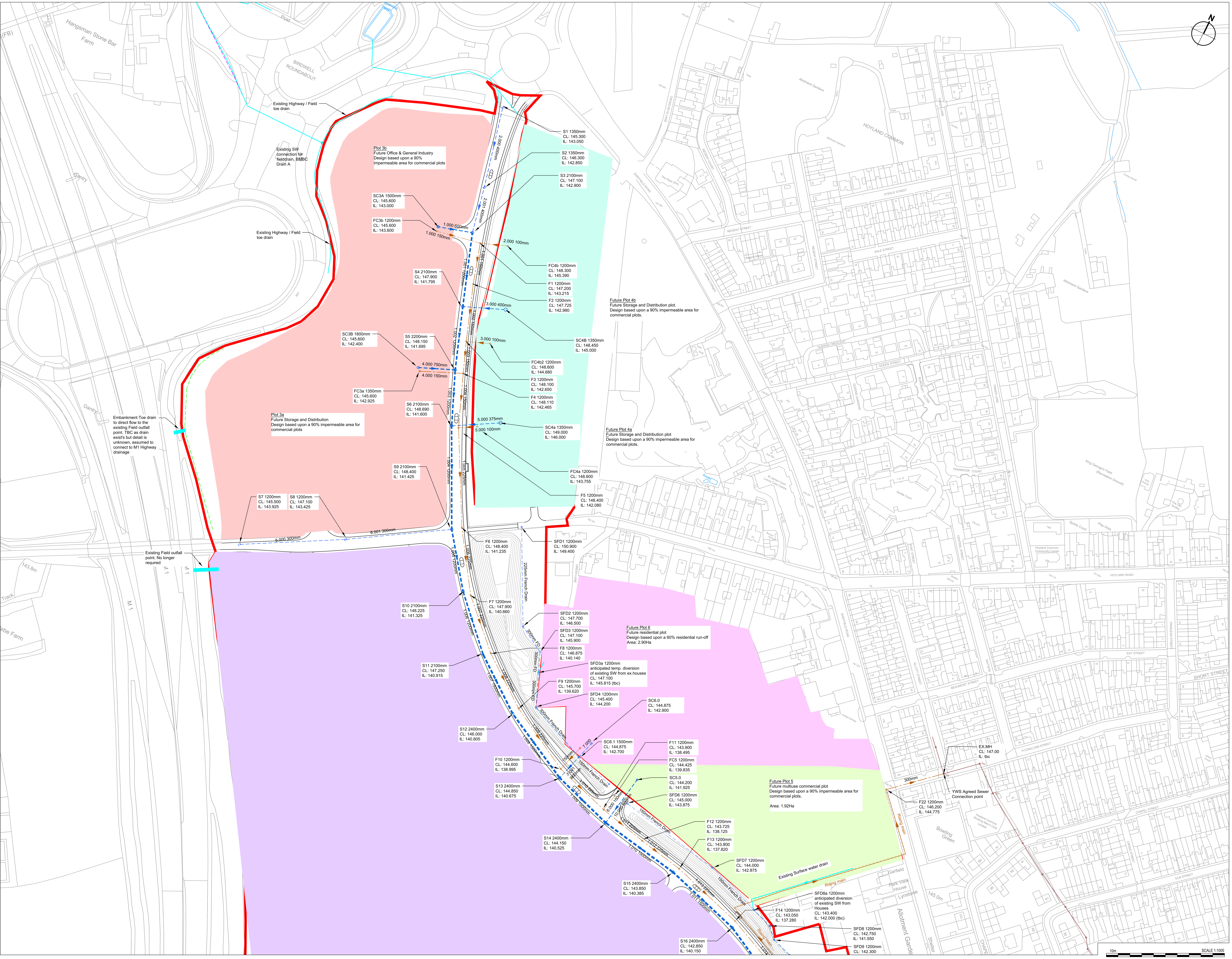
Project Code - Originator - Zone - Level - Type - Role - Drawing Number

Revision: P01

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Appendix G

‘HOYLA-RPS-SI-XX-DR-D-0300, 0301 and 0302 – Infrastructure Drainage Layouts’



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2. If received electronically it is the recipients responsibility to print to correct scale. Only written dimensions should be used.
3. This drawing should be read in conjunction with all other relevant drawings and specifications.
4. Masterplan taken from PHP drawing 4400-001 Rev P25, received 15/06/2020.
5. Drainage subject to detailed design & subsequent approval from Yorkshire Water Services and the LLFA
6. Foul water drainage is to be adopted and is subject to S104 approval agreement and approval of a S106 connection to the existing foul sewer with Yorkshire Water.
7. Surface water drainage is to be adopted and is subject to S104 approval agreement with Yorkshire Water up to the inlet to the proposed Attenuation Pond.
8. Any existing Drainage to be retained from properties on Sheffield road and Tankersley Road will be subject to S185 diversion approval with Yorkshire water where appropriate.

Key:

- Proposed Adoptable Surface Water
- Proposed Highway Drainage
- Proposed Private Surface Water
- Existing Surface water drains
- Proposed Adoptable Foul Water
- Proposed Adoptable rising Main
- Proposed Toe Drain
- Development Plot Area 1 (Hermes)
- Development Plot Area 2
- Development Plot Area 3
- Development Plot Area 4
- Development Plot Area 5
- Development Plot Area 6



Key Plan
Not to Scale

Rev	Description	By	Ckd	Date
P08	Revised For Planning	JNB	SMC	23.07.20
P07	Option for all SW to go South	JNB	SMC	13.07.20
P06	Access added	JNB	SMC	16.06.20
P05	Issued for Planning	JNB	SMC	11.06.20
P04	Issued for Draft Planning	SMC	LM	22.05.20
P03	Drainage Layout Amended	JNB	SMC	09.04.20
P02	Drainage Detail Added	SMC	SG	23.03.20
P01	First Issue	AB	SMC	09.03.20

rps MAKING COMPLEX EASY

Sherwood House, Sherwood Avenue, Newark, Nottinghamshire, NG24 1QQ
T:01636 605 700 E: rpsnewark@rpsgroup.com

Client: newlands developments

Project: Hoyland

Title: Proposed Drainage Strategy Sheet 1 of 3

RPS Project Number: NK020040
Scale @ A1: 1:1000
Date Created: 09.03.20

Task Team Manager: SG
Information Author: JNB
Task Information Manager: SMC

Status: S2

Document Number: HOYLA-RPS-SI-XX-DR-D-0300
Revision: P08

Project Code - Originator - Zone - Level - Type - Role - Drawing Number

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7. Surface water drainage is to be adopted and is subject to S104 approval agreement with Yorkshire Water up to the inlet to the proposed Attenuation Pond.
8. Any existing Drainage to be retained from properties on Sheffield road and Tankersley Road will be subject to S185 diversion approval with Yorkshire water where appropriate.

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- Proposed Highway Drainage
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- Development Plot Area 1 (Hermes)
- Development Plot Area 2
- Development Plot Area 3
- Development Plot Area 4
- Development Plot Area 5
- Development Plot Area 6

Plot 1
Future commercial distribution center SW and FW connection.
Plot to be allowed free flowing connection to surface water drainage system.
Attenuation based upon a 90% impermeable area for commercial plots.

Area: 18.2Ha

Plot 2
Future multi-use commercial SW and FW connection
Plot to be allowed free flowing connection to surface water drainage system.

Attenuation based upon a 90% impermeable area for commercial plots.

Area: 10.39Ha

S16 2400mm CL: 142.850 IL: 140.150
F14 1200mm CL: 143.050 IL: 137.280
Houses CL: 143.400 IL: 142.000 (tbc)
SFD8 1200mm CL: 142.750 IL: 141.550
SFD9 1200mm CL: 142.300 IL: 141.100
SFD10 1200mm CL: 141.100 IL: 139.900
SFD11 1200mm CL: 140.100 IL: 138.825
F15 1200mm CL: 141.100 IL: 135.340
SFD12 1350mm CL: 139.000 IL: 137.625
F16 1200mm CL: 139.550 IL: 135.075
SS17 3000mm CL: 141.100 IL: 136.270
FC1 1200mm CL: 139.500 IL: 135.500
C1.6 2400mm CL: 139.500 IL: 136.650
SS18 2700mm CL: 140.210 IL: 135.770
SFD13 1350mm CL: 138.500 IL: 137.125
F17 1200mm CL: 137.825 IL: 134.865
SFD13a 1200mm anticipated diversion of existing SW from Alotments CL: 138.500 IL: 137.200 (tbc)
SS19 2700mm CL: 137.710 IL: 134.710
F18 1200mm CL: 135.100 IL: 133.600
Toe drain incorporated into the site drainage
SS20 2700mm CL: 134.700 IL: 131.700
F19 1200mm CL: 132.150 IL: 130.650
SS21 2700mm CL: 131.525 IL: 128.525
SS22 2700mm CL: 129.890 IL: 126.890
F21 1200mm CL: 130.500 IL: 126.210
FC2 1350mm CL: 130.500 IL: 126.500
Adopted Pumping station CL 130.500 IL 126.200 SUMP IL 125.000
F20 1200mm CL: 129.890 IL: 128.390
SS23 2700mm CL: 127.850 IL: 124.850
'Sewage Sector Guidance Appendix C' has been used to calculate the peak foul flows from the residential and commercial developments.
The following breakdown applies:
- Residential - 4000 l/unit/day Peak flow
- Commercial - 0.6l/s/ha Peak flow

Foul Peak Flow
- Plot 1 18.35Ha - 11.01 l/s
- Plot 2 9.02Ha - 5.412 l/s
- Plot 3 5.09Ha - 3.054 l/s
- Plot 4 2.03Ha - 1.218 l/s
- Plot 5 1.70 ha - 1.02 l/s
- Plot 6 101 Units – 4.68 l/s

Total 26.394 l/s

Foul Storage required
Based on SSG v2 the pumping station will require an emergency storage of:
160m3 per unit for residential sites
1hr x Peak rate for commercial discharges
- 101 residential units - 101units - 16.160m³
- Commercial Development - 21.714 l/s - 78.170m³

Total = 94.33m³

SS24 2700mm CL: 126.000 IL: 123.000
SS25 2700mm CL: 124.500 IL: 121.500
SS26 2700mm CL: 123.000 IL: 120.000
SS27 2700mm CL 120.500 IL 117.500
SS28 2700mm CL: 119.000 IL: 116.000
SS29 2700mm CL: 114.750 IL: 111.750
SS30 2700mm CL: 113.600 IL: 110.600
SS31 2700mm CL: 111.500 IL: 108.500
SS32 2700mm CL: 109.900 IL: 106.900
SS33 2700 CL: 108.700 IL: 105.700
C2.3 2000mm CL: 134.750 IL: 127.100
Existing drainage Ditch outfall, for the toe drain CL 117.000 Ex.IL 116.500
Existing 150mm land drain outfall drain to wooodland, for the toe drain connection. CL: 131.00 Ex.IL 129.88
Existing Drainage in the road to be retained and gullies moved to match the new layout



Key Plan
Not to Scale

P09	Revised For Planning	JNB	SMC	23.07.20
P08	Option for all SW to go South	JNB	SMC	13.07.20
P07	Access added	JNB	SMC	16.06.20
P06	Issued for Planning	JNB	SMC	11.06.20
P05	Issued for Draft Planning	SMC	LM	22.05.20
P04	Drainage Option 1 Amended	SMC	SMC	30.04.20
P03	Drainage Layout Amended	JNB	SMC	09.04.20
P02	Drainage Detail Added	SMC	SG	23.03.20
P01	First Issue	AB	SMC	09.03.20
Rev	Description	By	Ckd	Date

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Client: newlands developments

Project: Hoyland

Title: Proposed Drainage Strategy Sheet 2 of 3

RPS Project Number	Scale @ A1	Date Created
NK020040	1:1000	09.03.20
Task Team Manager	Information Author	Task Information Manager
SG	JNB	SMC

Status: S2

Document Number: HOYLA-RPS-SI-XX-DR-D-0301 Revision: P09

Project Code - Originator - Zone - Level - Type - Role - Drawing Number

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10m SCALE 1:1000

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- Development Plot Area 1 (Hermes)
- Development Plot Area 2
- Development Plot Area 3
- Development Plot Area 4
- Development Plot Area 5
- Development Plot Area 6

SS33 2700
CL: 108.700
IL: 105.700

1600mm

SS34 2700mm
CL: 108.250
IL: 103.685

1050 1800mm

SS35 2700mm
CL: 108.250
IL: 102.085

1050 1800mm

Existing Drainage Culvert IL and size tbc likley to be 225mm with IL 104.000 so above the proposed culvert crown of 103.75

SS36 2700mm
CL: 105.250
IL: 101.455

1050 1800mm

SS37 2700mm
CL: 104.500
IL: 101.250

1050 1800mm

100m Radius from Old Hall

Proposed 43,000m³ Attenuation Pond with 1:5 embankments and 1.4 side slopes in the pond area.
TB - 104.500
BB - 99.300
NWL - 100.500
TWL - 104.200
Pond Inlet to be designed with a pre treatment forebay and 6m of placed stone erosion protection by the inlet

Proposed Pond Bund
To construct the pond requires that a bund is needed to bring the 102.00m existing ground level up to 104.50m top of bund level. This will require Geotechnical guidance on soils to calculate a safe bund construction to support retaining the potential 2.5m head of water behind it.

Hydrobrake Optimum
Restricted to 82.4l/s

1350mm

1350 400mm

SS38 1350mm
CL 104.500
IL 100.490

SS39 1350mm
CL: 101.600
IL: 100.300

Inlet Headwall with 4m of placed stone erosion protection in the Swale
CL 101.500
IL 100.030

1050 Swale

Grass Swale with bund's to dissipate flow allowing for further pollution control
750mm Base
500mm Deep
1:4 Side Slopes
CL 99.750
IL 99.250

1050 Swale

Grass Swale with bunds
750mm Base
500mm Deep
1:4 Side Slopes
CL 94.500
IL 94.000

1050 Swale

Existing Ditch

Existing Stream

Outlet to existing south western Brick culvert
IL 92.74
Invert

Outlet to existing south eastern culvert

Issues
The Old Hall Cottage
Tankersley Old Hall
The Foxwood
Old Hall Farm Cottage
Old Hall Farm
Shaft
112.8m
Subway
Track
Path (um)
113.1m
118.9m
BLACK LANE
111.1m
Pond
Pumping Station
Drain
Spreads
Issues
FB
Path (um)
Collects
Pond
Tankersley Park
Pond
Track
103.3m
Shaft
Air Shaft
Path (um)
Air Shaft
Lidgett House
101.5m
FB
LIDGETT GRANGE
A 61945
SHEFFIELD ROAD
Lidgett Garage
Shaft (disused)
114.1m
113.0m
MP
106.7m
102.6m
Sloping House
MP 167.5
SP
LB
Longley Spring
Longley Spring Cottage
Ivy Cottage
Longley Spring CG
Pear Cottage
Smithy Cottage
Harley Dike
MP 167.25
99.9m
ROAD CLOSURE
Harley Dike



Key Plan
Not to Scale

P09	Revised For Planning	JNB	SMC	23.07.20
P08	Option for all SW to go South	JNB	SMC	13.07.20
P07	Access added	JNB	SMC	16.06.20
P06	Issued for Planning	JNB	SMC	11.06.20
P05	Issued for Draft Planning	SMC	LM	22.05.20
P04	Drainage Option 1 Amended	SMC	SMC	30.04.20
P03	Drainage Layout Amended	JNB	SMC	09.04.20
P02	Drainage Detail Added	SMC	SG	23.03.20
P01	First Issue	AB	SMC	09.03.20
Rev	Description	By	Ckd	Date

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Client: newlands developments

Project: Hoyland

Title: Proposed Drainage Strategy
Sheet 3 of 3

RPS Project Number	Scale @ A1	Date Created
NK020040	1:1000	09.03.20
Task Team Manager	**Information Author**	**Task Information Manager**
SG	JNB	SMC

Status: S2

Document Number: HOYLA-RPS-SI-XX-DR-D-0302
Project Code - Originator - Zone - Level - Type - Role - Drawing Number

Revision: P09

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Appendix H

Micro-drainage Calculations

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	2	Maximum Rainfall (mm/hr)	50	Volumetric Runoff Coeff.	0.750	Minimum Backdrop Height (m)	0.200	Min Vel for Auto Design only (m/s)	1.00
M5-60 (mm)	19.000	Maximum Time of Concentration (mins)	30	PIMP (%)	100	Maximum Backdrop Height (m)	1.500	Min Slope for Optimisation (1:X)	500
Ratio R	0.360	Foul Sewage (l/s/ha)	0.000	Add Flow / Climate Change (%)	0	Min Design Depth for Optimisation (m)	1.200		

Designed with Level Soffits

Network Design Table for Storm

- Indicates pipe length does not match coordinates

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	5.000	5.000	1.0	0.352	2.00	0.0	0.600	o	300	Pipe/Conduit	
1.001	5.000	5.000	1.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.002	10.600	0.035	302.9	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.003	3.800	0.015	253.3	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.000	5.000	5.000	1.0	0.703	2.00	0.0	0.600	o	375	Pipe/Conduit	
2.001	5.000	5.000	1.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
2.002	10.800	0.050	216.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.004	43.400	0.610	71.1	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
3.000	26.200	0.085	308.2	0.614	8.00	0.0	0.600	o	375	Pipe/Conduit	
3.001	32.500	0.110	295.5	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.005	13.400	0.645	20.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
4.000	5.000	5.000	1.0	0.352	2.00	0.0	0.600	o	300	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	2.01	153.500	0.352	0.0	0.0	0.0	15.84	1119.6	47.7
1.001	50.00	2.01	148.500	0.352	0.0	0.0	0.0	15.84	1119.6	47.7
1.002	50.00	2.18	143.425	0.352	0.0	0.0	0.0	1.04	114.4	47.7
1.003	50.00	2.24	143.165	0.352	0.0	0.0	0.0	1.13	125.2	47.7
2.000	50.00	2.00	153.500	0.703	0.0	0.0	0.0	18.24	2014.2	95.2
2.001	50.00	2.01	148.500	0.703	0.0	0.0	0.0	18.24	2014.2	95.2
2.002	50.00	2.14	143.425	0.703	0.0	0.0	0.0	1.38	219.4	95.2
1.004	50.00	2.54	143.075	1.055	0.0	0.0	0.0	2.41	383.7	142.9
3.000	49.91	8.43	142.735	0.614	0.0	0.0	0.0	1.03	113.4	83.0
3.001	48.44	8.94	142.650	0.614	0.0	0.0	0.0	1.05	115.8	83.0
1.005	48.30	8.99	142.465	1.669	0.0	0.0	0.0	4.48	711.9	218.3
4.000	50.00	2.01	153.500	0.352	0.0	0.0	0.0	15.84	1119.6	47.7

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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
4.001	5.000	5.000	1.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
4.002	9.500	0.030	316.7	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
1.006	42.500	0.155	274.2	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
5.000	10.400	0.035	297.1	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	
1.007	37.500	0.125	300.0	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
6.000	10.400	0.160	65.0	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	
1.008	37.500	0.125	300.0	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
7.000	10.400	0.285	36.5	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	
1.009	42.500	0.142	300.0	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
8.000	14.400	0.427	33.7	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	
1.010	32.500	0.110	295.5	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
9.000	10.400	0.537	19.4	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	
1.011	47.500	0.158	300.0	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
10.000	18.900	0.695	27.2	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
4.001	50.00	2.01	148.500	0.352	0.0	0.0	0.0	15.84	1119.6	47.7
4.002	50.00	2.17	142.000	0.352	0.0	0.0	0.0	1.01	111.9	47.7
1.006	47.03	9.47	141.670	2.021	0.0	0.0	0.0	1.47	414.4	257.4
5.000	50.00	4.30	142.000	0.011	0.0	0.0	0.0	0.58	10.2	1.5
1.007	46.00	9.89	141.440	2.032	0.0	0.0	0.0	1.51	539.6	257.4
6.000	50.00	4.14	142.000	0.011	0.0	0.0	0.0	1.25	22.1	1.5
1.008	45.02	10.30	141.315	2.043	0.0	0.0	0.0	1.51	539.6	257.4
7.000	50.00	4.10	142.000	0.011	0.0	0.0	0.0	1.67	29.5	1.5
1.009	43.96	10.77	141.190	2.054	0.0	0.0	0.0	1.51	539.6	257.4
8.000	50.00	4.14	142.000	0.011	0.0	0.0	0.0	1.74	30.7	1.5
1.010	43.22	11.13	141.048	2.065	0.0	0.0	0.0	1.52	543.8	257.4
9.000	50.00	4.08	142.000	0.011	0.0	0.0	0.0	2.30	40.6	1.5
1.011	42.17	11.66	140.938	2.076	0.0	0.0	0.0	1.51	539.6	257.4
10.000	50.00	4.16	142.000	0.011	0.0	0.0	0.0	1.94	34.3	1.5

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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
1.012	27.500	0.090	305.6	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
11.000	10.400	0.785	13.2	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	
1.013	52.500	0.175	300.0	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
12.000	23.500	0.960	24.5	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	
1.014	22.500	0.075	300.0	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
13.000	10.400	1.035	10.0	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	
1.015	18.800	0.065	289.2	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
14.000	5.000	5.000	1.0	0.352	2.00	0.0	0.600	o	300	Pipe/Conduit	
14.001	5.000	5.000	1.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
14.002	9.900	0.100	99.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.016	3.800	0.010	380.0	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
15.000	5.000	5.000	1.0	0.703	2.00	0.0	0.600	o	300	Pipe/Conduit	
15.001	5.000	5.000	1.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
15.002	9.400	0.095	98.9	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
1.017	15.700	0.050	314.0	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)
1.012	41.59	11.96	140.780	2.087	0.0	0.0	0.0	1.49	534.6	257.4
11.000	50.00	4.06	142.000	0.011	0.0	0.0	0.0	2.78	49.2	1.5
1.013	40.54	12.54	140.690	2.098	0.0	0.0	0.0	1.51	539.6	257.4
12.000	50.00	4.19	142.000	0.011	0.0	0.0	0.0	2.04	36.1	1.5
1.014	40.11	12.79	140.515	2.109	0.0	0.0	0.0	1.51	539.6	257.4
13.000	50.00	4.05	142.000	0.011	0.0	0.0	0.0	3.20	56.5	1.5
1.015	39.76	12.99	140.440	2.120	0.0	0.0	0.0	1.54	549.6	257.4
14.000	50.00	2.01	153.500	0.352	0.0	0.0	0.0	15.84	1119.6	47.7
14.001	50.00	2.01	148.500	0.352	0.0	0.0	0.0	15.84	1119.6	47.7
14.002	50.00	2.11	142.000	0.352	0.0	0.0	0.0	1.58	111.7	47.7
1.016	39.68	13.04	140.375	2.472	0.0	0.0	0.0	1.34	479.0	265.7
15.000	50.00	2.01	153.500	0.703	0.0	0.0	0.0	15.84	1119.6	95.2
15.001	50.00	2.01	148.500	0.703	0.0	0.0	0.0	15.84	1119.6	95.2
15.002	50.00	2.09	142.000	0.703	0.0	0.0	0.0	2.04	325.1	95.2
1.017	39.39	13.22	140.365	3.175	0.0	0.0	0.0	1.47	527.3	338.7

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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
1.018	20.356	0.070	290.8	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
16.000	10.400	0.035	297.1	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	
16.001	37.500	0.125	300.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
17.000	10.400	0.160	65.0	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	
16.002	37.600	0.125	300.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
18.000	10.400	0.285	36.5	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	
16.003	37.400	0.125	300.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
19.000	10.400	0.410	25.4	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	
16.004	37.500	0.275	136.4	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
20.000	10.400	0.685	15.2	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	
16.005	37.500	0.125	300.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
21.000	10.400	0.810	12.8	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	
16.006	37.600	0.125	300.8	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
22.000	10.400	0.935	11.1	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.018	39.03	13.44	140.315	3.175	0.0	0.0	0.0	1.53	548.1	338.7
16.000	50.00	4.30	142.150	0.011	0.0	0.0	0.0	0.58	10.2	1.5
16.001	50.00	5.39	142.115	0.011	0.0	0.0	0.0	0.58	10.2	1.5
17.000	50.00	4.14	142.150	0.011	0.0	0.0	0.0	1.25	22.1	1.5
16.002	50.00	6.48	141.990	0.022	0.0	0.0	0.0	0.57	10.1	3.0
18.000	50.00	4.10	142.150	0.011	0.0	0.0	0.0	1.67	29.5	1.5
16.003	50.00	7.56	141.865	0.033	0.0	0.0	0.0	0.58	10.2	4.5
19.000	50.00	4.09	142.150	0.011	0.0	0.0	0.0	2.01	35.5	1.5
16.004	50.00	8.29	141.740	0.044	0.0	0.0	0.0	0.86	15.2	6.0
20.000	50.00	4.07	142.150	0.011	0.0	0.0	0.0	2.60	45.9	1.5
16.005	47.95	9.12	141.390	0.055	0.0	0.0	0.0	0.75	29.8	7.1
21.000	50.00	4.06	142.150	0.011	0.0	0.0	0.0	2.83	50.0	1.5
16.006	45.82	9.96	141.265	0.066	0.0	0.0	0.0	0.75	29.8	8.2
22.000	50.00	4.06	142.150	0.011	0.0	0.0	0.0	3.04	53.7	1.5

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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
16.007	37.300	0.125	298.4	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
23.000	10.400	1.060	9.8	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	
16.008	37.600	0.125	300.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
24.000	10.400	1.185	8.8	0.011	4.00	0.0	0.600	o	150	Pipe/Conduit	
16.009	22.800	0.075	304.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
25.000	5.000	5.000	1.0	0.352	2.00	0.0	0.600	o	375	Pipe/Conduit	
25.001	5.000	5.000	1.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
25.002	9.600	0.030	320.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
16.010	27.100	0.090	300.0	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
26.000	53.900	1.375	39.2	1.200	4.00	0.0	0.600	o	525	Pipe/Conduit	
16.011	23.004	0.075	306.7	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
16.012	2.800	0.010	289.7	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
27.000	8.300	0.028	300.0	0.042	2.00	0.0	0.600	o	150	Pipe/Conduit	
27.001	5.300#	0.018	300.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
27.002	4.300#	2.540	1.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
16.007	44.44	10.56	140.990	0.077	0.0	0.0	0.0	1.04	115.3	9.3
23.000	50.00	4.05	142.150	0.011	0.0	0.0	0.0	3.24	57.2	1.5
16.008	43.29	11.09	140.790	0.088	0.0	0.0	0.0	1.17	185.6	10.3
24.000	50.00	4.05	142.150	0.011	0.0	0.0	0.0	3.42	60.5	1.5
16.009	42.63	11.42	140.665	0.099	0.0	0.0	0.0	1.16	184.6	11.4
25.000	50.00	2.00	153.500	0.352	0.0	0.0	0.0	18.24	2014.2	47.7
25.001	50.00	2.01	148.500	0.352	0.0	0.0	0.0	18.24	2014.2	47.7
25.002	50.00	2.17	142.000	0.352	0.0	0.0	0.0	1.01	111.3	47.7
16.010	41.88	11.81	140.590	0.451	0.0	0.0	0.0	1.17	185.8	51.2
26.000	50.00	4.25	141.800	1.200	0.0	0.0	0.0	3.59	776.2	162.5
16.011	41.36	12.08	140.350	1.651	0.0	0.0	0.0	1.39	391.6	184.9
16.012	41.30	12.12	140.275	1.651	0.0	0.0	0.0	1.43	403.1	184.9
27.000	50.00	2.24	143.300	0.042	0.0	0.0	0.0	0.58	10.2	5.7
27.001	50.00	2.39	143.272	0.042	0.0	0.0	0.0	0.58	10.2	5.7
27.002	50.00	2.40	143.255	0.042	0.0	0.0	0.0	7.81	138.0	5.7

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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
16.013	40.148	0.145	276.9	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
28.000	9.000	0.030	300.0	0.042	2.00	0.0	0.600	o	150	Pipe/Conduit	
16.014	27.500	0.090	305.6	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
29.000	9.000	0.090	100.0	0.042	2.00	0.0	0.600	o	150	Pipe/Conduit	
16.015	23.400	0.154	151.6	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
30.000	41.000	0.135	303.7	0.720	4.00	0.0	0.600	o	525	Pipe/Conduit	
30.001	18.600	0.060	310.0	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
30.002	80.000	0.477	167.6	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
31.000	16.823	0.137	122.8	0.312	4.00	0.0	0.600	o	375	Pipe/Conduit	
32.000	19.385	0.062	311.0	0.109	4.00	0.0	0.600	o	225	Pipe/Conduit	
30.003	68.000	0.225	302.2	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
33.000	18.000	0.060	300.0	0.773	4.00	0.0	0.600	o	450	Pipe/Conduit	
33.001	35.300	0.120	294.2	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
33.002	73.900	1.172	63.1	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
30.004	21.800	0.150	145.3	0.000	0.00	0.0	0.600	o	600	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)
16.013	40.48	12.58	140.265	1.693	0.0	0.0	0.0	1.46	412.4	185.6
28.000	50.00	2.26	143.300	0.042	0.0	0.0	0.0	0.58	10.2	5.7
16.014	39.91	12.91	140.120	1.735	0.0	0.0	0.0	1.39	392.4	187.5
29.000	50.00	2.15	143.300	0.042	0.0	0.0	0.0	1.00	17.8	5.7
16.015	39.58	13.10	140.030	1.777	0.0	0.0	0.0	1.98	558.5	190.5
30.000	50.00	4.53	142.125	0.720	0.0	0.0	0.0	1.28	277.1	97.5
30.001	50.00	4.78	141.990	0.720	0.0	0.0	0.0	1.27	274.2	97.5
30.002	50.00	5.55	141.930	0.720	0.0	0.0	0.0	1.73	373.9	97.5
31.000	50.00	4.17	141.740	0.312	0.0	0.0	0.0	1.63	180.5	42.2
32.000	50.00	4.44	141.815	0.109	0.0	0.0	0.0	0.74	29.3	14.8
30.003	50.00	6.43	141.453	1.141	0.0	0.0	0.0	1.28	277.8	154.5
33.000	50.00	4.26	142.655	0.773	0.0	0.0	0.0	1.17	185.8	104.7
33.001	50.00	4.76	142.595	0.773	0.0	0.0	0.0	1.18	187.7	104.7
33.002	50.00	5.24	142.475	0.773	0.0	0.0	0.0	2.56	407.7	104.7
30.004	50.00	6.61	141.153	1.914	0.0	0.0	0.0	2.02	570.6	259.2

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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
34.000	16.800	0.362	46.4	0.311	4.00	0.0	0.600	o	225	Pipe/Conduit	
35.000	19.300	0.662	29.2	0.638	4.00	0.0	0.600	o	450	Pipe/Conduit	
30.005	90.000	0.300	300.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
36.000	16.800	0.662	25.4	0.311	4.00	0.0	0.600	o	225	Pipe/Conduit	
37.000	19.529	0.867	22.5	0.773	4.00	0.0	0.600	o	450	Pipe/Conduit	
30.006	45.300	0.150	302.0	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
30.007	54.800	0.185	296.2	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
38.000	14.172	0.253	56.0	0.346	4.00	0.0	0.600	o	375	Pipe/Conduit	
39.000	22.400	0.075	298.7	0.880	4.00	0.0	0.600	o	450	Pipe/Conduit	
30.008	9.608	0.010	960.8	0.000	0.00	0.0	0.600	o	975	Pipe/Conduit	
30.009	10.164	0.011	952.8	0.000	0.00	0.0	0.600	o	975	Pipe/Conduit	
40.000	17.200	1.628	10.6	0.010	4.00	0.0	0.600	o	150	Pipe/Conduit	
41.000	15.000	1.628	9.2	0.010	4.00	0.0	0.600	o	150	Pipe/Conduit	
30.010	7.800	0.472	16.5	0.000	0.00	0.0	0.600	o	975	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)
34.000	50.00	4.15	141.740	0.311	0.0	0.0	0.0	1.93	76.5	42.1
35.000	50.00	4.09	141.815	0.638	0.0	0.0	0.0	3.78	600.6	86.4
30.005	50.00	7.68	141.003	2.863	0.0	0.0	0.0	1.40	396.0	387.7
36.000	50.00	4.11	141.740	0.311	0.0	0.0	0.0	2.61	103.7	42.1
37.000	50.00	4.08	141.815	0.773	0.0	0.0	0.0	4.30	683.6	104.7
30.006	50.00	8.19	140.628	3.947	0.0	0.0	0.0	1.50	537.8	534.5
30.007	48.87	8.79	140.478	3.947	0.0	0.0	0.0	1.52	543.1	534.5
38.000	50.00	4.10	141.740	0.346	0.0	0.0	0.0	2.43	267.9	46.9
39.000	50.00	4.32	141.740	0.880	0.0	0.0	0.0	1.17	186.3	119.2
30.008	48.44	8.94	139.993	5.173	0.0	0.0	0.0	1.05	786.7	678.7
30.009	48.01	9.10	139.983	5.173	0.0	0.0	0.0	1.06	790.0	678.7
40.000	50.00	4.09	142.500	0.010	0.0	0.0	0.0	3.12	55.1	1.4
41.000	50.00	4.07	142.500	0.010	0.0	0.0	0.0	3.34	59.0	1.4
30.010	47.97	9.12	139.972	5.193	0.0	0.0	0.0	8.12	6061.4	678.7

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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
1.019	39.700	0.130	305.4	0.000	0.00	0.0	0.600	o	975	Pipe/Conduit	
42.000	39.500	0.130	303.8	0.210	4.00	0.0	0.600	o	300	Pipe/Conduit	
42.001	49.300	0.165	298.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
43.000	39.500	0.370	106.8	0.752	4.00	0.0	0.600	o	450	Pipe/Conduit	
42.002	56.300	0.340	165.6	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
44.000	40.900	0.190	215.3	0.070	4.00	0.0	0.600	o	150	Pipe/Conduit	
45.000	12.509	0.115	108.8	0.137	4.00	0.0	0.600	o	300	Pipe/Conduit	
44.001	43.400	0.945	45.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
46.000	19.200	0.064	300.0	0.154	4.00	0.0	0.600	o	225	Pipe/Conduit	
42.003	9.559	0.015	637.3	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
42.004	7.536	0.005	1507.2	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
42.005	13.700	0.325	42.2	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
1.020	15.800	0.147	107.5	0.000	0.00	0.0	0.600	o	1050	Pipe/Conduit	
47.000	17.500	0.060	291.7	0.663	4.00	0.0	0.600	o	525	Pipe/Conduit	
47.001	90.000	0.300	300.0	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.019	38.47	13.79	139.500	10.145	0.0	0.0	0.0	1.88	1402.6	1057.0
42.000	50.00	4.73	141.175	0.210	0.0	0.0	0.0	0.90	63.4	28.4
42.001	50.00	5.64	141.045	0.210	0.0	0.0	0.0	0.90	63.9	28.4
43.000	50.00	4.33	141.100	0.752	0.0	0.0	0.0	1.97	312.9	101.8
42.002	50.00	6.24	140.730	0.962	0.0	0.0	0.0	1.58	250.8	130.3
44.000	50.00	5.00	141.825	0.070	0.0	0.0	0.0	0.68	12.0	9.5
45.000	50.00	4.14	141.600	0.137	0.0	0.0	0.0	1.51	106.5	18.6
44.001	50.00	5.31	141.485	0.207	0.0	0.0	0.0	2.33	164.4	28.0
46.000	50.00	4.43	142.640	0.154	0.0	0.0	0.0	0.75	29.8	20.9
42.003	50.00	6.40	140.240	1.323	0.0	0.0	0.0	0.96	270.6	179.2
42.004	50.00	6.59	140.150	1.323	0.0	0.0	0.0	0.67	238.4	179.2
42.005	50.00	6.65	140.145	1.323	0.0	0.0	0.0	4.04	1447.2	179.2
1.020	38.35	13.87	139.445	11.468	0.0	0.0	0.0	3.32	2878.2	1191.1
47.000	50.00	4.22	141.740	0.663	0.0	0.0	0.0	1.31	282.8	89.8
47.001	50.00	5.39	141.680	0.663	0.0	0.0	0.0	1.29	278.8	89.8

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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
48.000	17.494	0.210	83.3	0.460	4.00	0.0	0.600	o	375	Pipe/Conduit	
47.002	90.000	0.300	300.0	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
49.000	17.489	0.510	34.3	0.461	4.00	0.0	0.600	o	375	Pipe/Conduit	
47.003	44.800	0.150	298.7	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
47.004	55.200	0.185	298.4	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
50.000	17.500	0.060	291.7	0.511	4.00	0.0	0.600	o	450	Pipe/Conduit	
51.000	8.400	0.030	280.0	0.138	4.00	0.0	0.600	o	225	Pipe/Conduit	
47.005	50.000	0.165	303.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
47.006	64.500	0.215	300.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
47.007	7.300	0.024	300.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
52.000	18.100	0.052	350.0	0.665	4.00	0.0	0.600	o	450	Pipe/Conduit	
52.001	66.300	0.234	283.8	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
53.000	18.100	0.060	301.7	0.144	4.00	0.0	0.600	o	225	Pipe/Conduit	
54.000	21.300	0.071	300.0	0.163	4.00	0.0	0.600	o	225	Pipe/Conduit	
52.002	37.800	0.108	350.0	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)
48.000	50.00	4.15	141.740	0.460	0.0	0.0	0.0	1.99	219.4	62.3
47.002	50.00	6.55	141.380	1.123	0.0	0.0	0.0	1.29	278.8	152.1
49.000	50.00	4.09	141.740	0.461	0.0	0.0	0.0	3.10	342.7	62.4
47.003	50.00	7.13	141.080	1.584	0.0	0.0	0.0	1.29	279.4	214.5
47.004	50.00	7.84	140.930	1.584	0.0	0.0	0.0	1.29	279.6	214.5
50.000	50.00	4.25	141.740	0.511	0.0	0.0	0.0	1.19	188.5	69.2
51.000	50.00	4.18	142.120	0.138	0.0	0.0	0.0	0.78	30.9	18.7
47.005	49.86	8.44	140.670	2.233	0.0	0.0	0.0	1.39	394.0	301.5
47.006	47.72	9.21	140.505	2.233	0.0	0.0	0.0	1.40	396.0	301.5
47.007	47.49	9.30	140.290	2.233	0.0	0.0	0.0	1.40	396.0	301.5
52.000	50.00	4.28	139.150	0.665	0.0	0.0	0.0	1.08	171.9	90.0
52.001	50.00	5.20	139.098	0.665	0.0	0.0	0.0	1.20	191.1	90.0
53.000	50.00	4.40	139.150	0.144	0.0	0.0	0.0	0.75	29.7	19.5
54.000	50.00	4.47	139.350	0.163	0.0	0.0	0.0	0.75	29.8	22.1
52.002	50.00	5.78	138.865	0.972	0.0	0.0	0.0	1.08	171.9	131.6

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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
47.008	11.076	0.032	350.0	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
47.009	11.690	0.136	85.9	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
55.000	44.900	0.150	299.3	0.018	4.00	0.0	0.600	o	150	Pipe/Conduit	
56.000	24.300	0.150	162.0	0.018	4.00	0.0	0.600	o	150	Pipe/Conduit	
55.001	41.800	0.141	296.5	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
57.000	7.059	0.025	282.4	0.073	4.00	0.0	0.600	o	225	Pipe/Conduit	
57.001	4.598	0.015	300.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
57.002	5.498	0.018	300.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
58.000	32.057	0.096	333.9	0.018	4.00	0.0	0.600	o	150	Pipe/Conduit	
59.000	10.979	0.096	114.4	0.018	4.00	0.0	0.600	o	150	Pipe/Conduit	
58.001	15.056	0.195	77.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
55.002	33.100	0.110	300.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
55.003	32.900	0.110	300.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
47.010	33.200	0.055	600.0	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
47.011	43.600	0.073	600.0	0.000	0.00	0.0	0.600	o	900	Pipe/Conduit	
47.012	38.000	0.063	600.0	0.000	0.00	0.0	0.600	o	900	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)
47.008	47.21	9.41	138.307	3.205	0.0	0.0	0.0	1.67	1061.8	409.7
47.009	47.06	9.46	138.275	3.205	0.0	0.0	0.0	3.38	2151.0	409.7
55.000	50.00	5.30	139.400	0.018	0.0	0.0	0.0	0.58	10.2	2.4
56.000	50.00	4.51	139.400	0.018	0.0	0.0	0.0	0.79	13.9	2.4
55.001	50.00	6.50	139.250	0.036	0.0	0.0	0.0	0.58	10.2	4.9
57.000	50.00	4.15	140.070	0.073	0.0	0.0	0.0	0.77	30.7	9.9
57.001	50.00	4.25	140.045	0.073	0.0	0.0	0.0	0.75	29.8	9.9
57.002	50.00	4.38	140.030	0.073	0.0	0.0	0.0	0.75	29.8	9.9
58.000	50.00	4.98	139.400	0.018	0.0	0.0	0.0	0.54	9.6	2.4
59.000	50.00	4.19	139.400	0.018	0.0	0.0	0.0	0.94	16.6	2.4
58.001	50.00	5.20	139.304	0.036	0.0	0.0	0.0	1.15	20.2	4.9
55.002	50.00	7.24	139.034	0.145	0.0	0.0	0.0	0.75	29.8	19.6
55.003	50.00	7.97	138.924	0.145	0.0	0.0	0.0	0.75	29.8	19.6
47.010	45.97	9.90	138.139	3.350	0.0	0.0	0.0	1.27	809.1	417.1
47.011	44.64	10.47	138.084	3.350	0.0	0.0	0.0	1.27	809.1	417.1
47.012	43.55	10.97	138.011	3.350	0.0	0.0	0.0	1.27	809.1	417.1

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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
1.021	26.000	0.043	604.7	0.000	0.00	0.0	0.600	o	1350	Pipe/Conduit	
60.000	27.300	0.091	300.0	0.001	4.00	0.0	0.600	o	150	Pipe/Conduit	
61.000	13.978	0.045	308.3	0.001	4.00	0.0	0.600	o	150	Pipe/Conduit	
1.022	80.000	0.133	600.0	0.000	0.00	0.0	0.600	o	1350	Pipe/Conduit	
62.000	7.200	1.429	5.0	0.065	4.00	0.0	0.600	o	150	Pipe/Conduit	
1.023	75.300	0.126	597.6	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
63.000	7.700	0.755	10.2	0.200	4.00	0.0	0.600	o	150	Pipe/Conduit	
1.024	44.600	0.074	602.7	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
64.000	7.699	0.404	19.1	0.126	4.00	0.0	0.600	o	150	Pipe/Conduit	
65.000	24.000	0.080	300.0	0.001	4.00	0.0	0.600	o	150	Pipe/Conduit	
1.025	35.200	0.059	596.6	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
66.000	5.870	0.020	293.5	0.047	4.00	0.0	0.600	o	150	Pipe/Conduit	
66.001	64.228	0.390	164.7	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
67.000	5.894	0.020	294.7	0.183	4.00	0.0	0.600	o	300	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)
1.021	37.95	14.14	137.498	14.818	0.0	0.0	0.0	1.63	2330.4	1522.8
60.000	50.00	4.79	141.150	0.001	0.0	0.0	0.0	0.58	10.2	0.1
61.000	50.00	4.41	141.000	0.001	0.0	0.0	0.0	0.57	10.0	0.1
1.022	36.77	14.95	137.679	14.820	0.0	0.0	0.0	1.63	2339.5	1522.8
62.000	50.00	4.03	140.100	0.065	0.0	0.0	0.0	4.52	79.9	8.8
1.023	35.80	15.67	137.321	14.885	0.0	0.0	0.0	1.75	3087.7	1522.8
63.000	50.00	4.04	139.300	0.200	0.0	0.0	0.0	3.17	56.1	27.1
1.024	35.25	16.10	137.195	15.085	0.0	0.0	0.0	1.74	3074.6	1522.8
64.000	50.00	4.06	138.800	0.126	0.0	0.0	0.0	2.32	41.0	17.1
65.000	50.00	4.70	139.550	0.001	0.0	0.0	0.0	0.58	10.2	0.1
1.025	34.83	16.44	137.046	15.212	0.0	0.0	0.0	1.75	3090.3	1522.8
66.000	50.00	4.17	140.450	0.047	0.0	0.0	0.0	0.58	10.3	6.4
66.001	50.00	5.54	140.430	0.047	0.0	0.0	0.0	0.78	13.8	6.4
67.000	50.00	4.11	139.910	0.183	0.0	0.0	0.0	0.91	64.4	24.8

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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
66.002	44.800	0.300	149.3	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
68.000	3.545	0.120	29.5	0.075	4.00	0.0	0.600	o	150	Pipe/Conduit	
66.003	90.000	0.475	189.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
69.000	4.200	0.090	46.7	0.065	4.00	0.0	0.600	o	225	Pipe/Conduit	
66.004	23.046	0.055	419.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
66.005	23.528	0.078	300.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
1.026	16.800	0.028	600.0	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
70.000	7.500	0.025	300.0	0.125	4.00	0.0	0.600	o	225	Pipe/Conduit	
1.027	8.300	0.028	296.4	0.000	0.00	0.0	0.600	o	1500	Pipe/Conduit	
71.000	14.338	0.050	286.8	0.270	4.00	0.0	0.600	o	300	Pipe/Conduit	
71.001	82.400	0.235	350.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
72.000	8.650	0.030	288.3	0.270	4.00	0.0	0.600	o	300	Pipe/Conduit	
71.002	32.000	0.105	304.8	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
73.000	8.600	0.030	286.7	0.490	4.00	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)
66.002	50.00	6.12	139.890	0.230	0.0	0.0	0.0	1.28	90.8	31.1
68.000	50.00	4.03	139.860	0.075	0.0	0.0	0.0	1.86	32.9	10.2
66.003	50.00	7.44	139.590	0.305	0.0	0.0	0.0	1.14	80.5	41.3
69.000	50.00	4.04	139.280	0.065	0.0	0.0	0.0	1.92	76.3	8.8
66.004	50.00	7.94	139.115	0.370	0.0	0.0	0.0	0.76	53.8	50.1
66.005	50.00	8.38	139.060	0.370	0.0	0.0	0.0	0.90	63.8	50.1
1.026	34.64	16.60	136.987	15.582	0.0	0.0	0.0	1.74	3081.5	1522.8
70.000	50.00	4.17	138.050	0.125	0.0	0.0	0.0	0.75	29.8	16.9
1.027	34.57	16.65	136.750	15.707	0.0	0.0	0.0	2.49	4393.6	1522.8
71.000	50.00	4.26	141.910	0.270	0.0	0.0	0.0	0.92	65.3	36.6
71.001	50.00	5.90	141.860	0.270	0.0	0.0	0.0	0.83	59.0	36.6
72.000	50.00	4.16	141.910	0.270	0.0	0.0	0.0	0.92	65.1	36.6
71.002	50.00	6.42	141.550	0.540	0.0	0.0	0.0	1.03	114.0	73.1
73.000	50.00	4.13	141.035	0.490	0.0	0.0	0.0	1.07	117.6	66.4

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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
71.003	26.000	0.085	305.9	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
74.000	8.600	0.030	286.7	0.312	4.00	0.0	0.600	o	375	Pipe/Conduit	
71.004	22.600	0.075	301.3	0.000	0.00	0.0	0.600	o	525	Pipe/Conduit	
75.000	9.000	0.030	300.0	0.247	4.00	0.0	0.600	o	375	Pipe/Conduit	
71.005	9.801	0.015	653.4	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
71.006	9.622	0.013	759.6	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
71.007	32.557	2.185	14.9	0.000	0.00	0.0	0.600	o	675	Pipe/Conduit	
1.028	14.000	0.072	194.4	0.000	0.00	0.0	0.600	o	1500	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)
71.003	50.00	6.80	140.930	1.030	0.0	0.0	0.0	1.16	184.0	139.5
74.000	50.00	4.13	140.460	0.312	0.0	0.0	0.0	1.07	117.6	42.2
71.004	50.00	7.09	140.280	1.342	0.0	0.0	0.0	1.29	278.2	181.7
75.000	50.00	4.14	139.910	0.247	0.0	0.0	0.0	1.04	115.0	33.4
71.005	50.00	7.25	139.580	1.589	0.0	0.0	0.0	1.02	364.2	215.2
71.006	50.00	7.42	139.565	1.589	0.0	0.0	0.0	0.94	337.5	215.2
71.007	50.00	7.50	139.552	1.589	0.0	0.0	0.0	6.81	2437.5	215.2
1.028	34.48	16.73	136.722	17.296	0.0	0.0	0.0	3.07	5430.1	1615.2

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)
1.028	C1.6	140.000	136.650	0.000	0	0

Simulation Criteria for Storm

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

Number of Input Hydrographs 0 Number of Online Controls 6 Number of Offline Controls 6 Number of Storage Structures 0 Number of Time/Area Diagrams 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Region England and Wales Ratio R 0.360 Cv (Summer) 0.750 Storm Duration (mins) 30
Return Period (years) 2 M5-60 (mm) 19.000 Profile Type Summer Cv (Winter) 0.840

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Online Controls for Storm

Depth/Flow Relationship Manhole: SDP1b, DS/PN: 1.001, Volume (m³): 1.4

Invert Level (m) 148.500

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	104.0000	0.400	104.0000	0.700	104.0000	1.000	104.0000	1.300	104.0000	1.600	104.0000	1.900	104.0000	2.200	104.0000	2.500	104.0000	2.800	104.0000
0.200	104.0000	0.500	104.0000	0.800	104.0000	1.100	104.0000	1.400	104.0000	1.700	104.0000	2.000	104.0000	2.300	104.0000	2.600	104.0000	2.900	104.0000
0.300	104.0000	0.600	104.0000	0.900	104.0000	1.200	104.0000	1.500	104.0000	1.800	104.0000	2.100	104.0000	2.400	104.0000	2.700	104.0000	3.000	104.0000

Depth/Flow Relationship Manhole: SDP2b, DS/PN: 2.001, Volume (m³): 1.8

Invert Level (m) 148.500

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	207.0000	0.400	207.0000	0.700	207.0000	1.000	207.0000	1.300	207.0000	1.600	207.0000	1.900	207.0000	2.200	207.0000	2.500	207.0000	2.800	207.0000
0.200	207.0000	0.500	207.0000	0.800	207.0000	1.100	207.0000	1.400	207.0000	1.700	207.0000	2.000	207.0000	2.300	207.0000	2.600	207.0000	2.900	207.0000
0.300	207.0000	0.600	207.0000	0.900	207.0000	1.200	207.0000	1.500	207.0000	1.800	207.0000	2.100	207.0000	2.400	207.0000	2.700	207.0000	3.000	207.0000

Depth/Flow Relationship Manhole: SDP3b, DS/PN: 4.001, Volume (m³): 1.4

Invert Level (m) 148.500

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	104.0000	0.400	104.0000	0.700	104.0000	1.000	104.0000	1.300	104.0000	1.600	104.0000	1.900	104.0000	2.200	104.0000	2.500	104.0000	2.800	104.0000
0.200	104.0000	0.500	104.0000	0.800	104.0000	1.100	104.0000	1.400	104.0000	1.700	104.0000	2.000	104.0000	2.300	104.0000	2.600	104.0000	2.900	104.0000
0.300	104.0000	0.600	104.0000	0.900	104.0000	1.200	104.0000	1.500	104.0000	1.800	104.0000	2.100	104.0000	2.400	104.0000	2.700	104.0000	3.000	104.0000

Depth/Flow Relationship Manhole: SDP4b, DS/PN: 14.001, Volume (m³): 1.4

Invert Level (m) 148.500

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	104.0000	0.400	104.0000	0.700	104.0000	1.000	104.0000	1.300	104.0000	1.600	104.0000	1.900	104.0000	2.200	104.0000	2.500	104.0000	2.800	104.0000
0.200	104.0000	0.500	104.0000	0.800	104.0000	1.100	104.0000	1.400	104.0000	1.700	104.0000	2.000	104.0000	2.300	104.0000	2.600	104.0000	2.900	104.0000
0.300	104.0000	0.600	104.0000	0.900	104.0000	1.200	104.0000	1.500	104.0000	1.800	104.0000	2.100	104.0000	2.400	104.0000	2.700	104.0000	3.000	104.0000

Depth/Flow Relationship Manhole: SDP5b, DS/PN: 15.001, Volume (m³): 1.4

Invert Level (m) 148.500

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	207.0000	0.400	207.0000	0.700	207.0000	1.000	207.0000	1.300	207.0000	1.600	207.0000	1.900	207.0000	2.200	207.0000	2.500	207.0000	2.800	207.0000
0.200	207.0000	0.500	207.0000	0.800	207.0000	1.100	207.0000	1.400	207.0000	1.700	207.0000	2.000	207.0000	2.300	207.0000	2.600	207.0000	2.900	207.0000
0.300	207.0000	0.600	207.0000	0.900	207.0000	1.200	207.0000	1.500	207.0000	1.800	207.0000	2.100	207.0000	2.400	207.0000	2.700	207.0000	3.000	207.0000

Depth/Flow Relationship Manhole: SDP6b, DS/PN: 25.001, Volume (m³): 1.8

Invert Level (m) 148.500

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	104.0000	0.300	104.0000	0.500	104.0000	0.700	104.0000	0.900	104.0000	1.100	104.0000	1.300	104.0000	1.500	104.0000	1.700	104.0000	1.900	104.0000
0.200	104.0000	0.400	104.0000	0.600	104.0000	0.800	104.0000	1.000	104.0000	1.200	104.0000	1.400	104.0000	1.600	104.0000	1.800	104.0000	2.000	104.0000

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Depth/Flow Relationship Manhole: SDP6b, DS/PN: 25.001, Volume (m³): 1.8

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
2.100	104.0000	2.200	104.0000	2.300	104.0000	2.400	104.0000	2.500	104.0000	2.600	104.0000	2.700	104.0000	2.800	104.0000	2.900	104.0000	3.000	104.0000

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Offline Controls for Storm

Weir Manhole: SDP1b, DS/PN: 1.001, Loop to PN: 47.000

Discharge Coef 0.544 Width (m) 1.000 Invert Level (m) 148.500

Weir Manhole: SDP2b, DS/PN: 2.001, Loop to PN: 47.000

Discharge Coef 0.544 Width (m) 1.000 Invert Level (m) 148.500

Weir Manhole: SDP3b, DS/PN: 4.001, Loop to PN: 31.000

Discharge Coef 0.544 Width (m) 1.000 Invert Level (m) 148.500

Weir Manhole: SDP4b, DS/PN: 14.001, Loop to PN: 38.000

Discharge Coef 0.544 Width (m) 1.000 Invert Level (m) 148.500

Weir Manhole: SDP5b, DS/PN: 15.001, Loop to PN: 50.000

Discharge Coef 0.544 Width (m) 1.000 Invert Level (m) 148.500

Weir Manhole: SDP6b, DS/PN: 25.001, Loop to PN: 50.000

Discharge Coef 0.544 Width (m) 1.000 Invert Level (m) 148.500

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Online Controls 6 Number of Offline Controls 6 Number of Storage Structures 0 Number of Time/Area Diagrams 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Region England and Wales M5-60 (mm) 19.000 Ratio R 0.357 Cv (Summer) 0.755 Cv (Winter) 0.822

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SDP1a	15 Summer	2	+0%					153.574	-0.226	0.000	0.14		78.5	OK	
1.001	SDP1b	15 Summer	2	+0%			2/15 Summer	54	148.563	-0.237	0.000	0.12	11.2	65.2	OK	
1.002	SDP1	15 Summer	2	+0%	30/15 Summer				143.681	-0.119	0.000	0.77		65.7	OK	
1.003	S01(V)	15 Summer	2	+0%	30/15 Summer				143.429	-0.111	0.000	0.81		65.5	OK	
2.000	SDP2a	15 Summer	2	+0%					153.606	-0.269	0.000	0.18		157.0	OK	
2.001	SDP2b	15 Summer	2	+0%	100/15 Summer		2/15 Summer	54	148.569	-0.306	0.000	0.16	13.7	141.0	OK	
2.002	SDP2	15 Summer	2	+0%	30/15 Summer				143.771	-0.104	0.000	0.91		141.7	OK	
1.004	S02(V)	15 Summer	2	+0%	100/15 Summer				143.325	-0.200	0.000	0.57		196.4	OK	
3.000	PPCP1	15 Winter	2	+0%	30/15 Summer	100/15 Winter			142.988	-0.122	0.000	0.78		77.2	OK	1
3.001	S03	15 Winter	2	+0%	30/15 Summer	100/15 Summer			142.892	-0.133	0.000	0.74		76.4	OK	6
1.005	S04	15 Summer	2	+0%	100/15 Summer				142.705	-0.210	0.000	0.56		251.2	OK	
4.000	SDP3a	15 Summer	2	+0%					153.574	-0.226	0.000	0.14		78.5	OK	
4.001	SDP3b	15 Summer	2	+0%			2/15 Summer	54	148.563	-0.237	0.000	0.12	11.4	65.0	OK	
4.002	SDP3	15 Summer	2	+0%	30/15 Summer				142.269	-0.106	0.000	0.83		65.5	OK	
1.006	S05(V)	15 Summer	2	+0%	30/15 Summer	100/15 Summer			142.097	-0.173	0.000	0.82		291.8	OK	4
5.000	RWP1	15 Summer	2	+0%	100/15 Summer				142.047	-0.103	0.000	0.21		2.0	OK	
1.007	dummy mh1	15 Summer	2	+0%	100/15 Summer	100/15 Summer			141.843	-0.272	0.000	0.64		286.5	OK	2
6.000	RWP2	15 Summer	2	+0%	100/15 Summer				142.031	-0.119	0.000	0.10		2.0	OK	
1.008	S06	15 Summer	2	+0%	100/15 Summer	100/15 Summer			141.711	-0.279	0.000	0.62		276.5	OK	1
7.000	RWP3	15 Summer	2	+0%	100/15 Summer				142.027	-0.123	0.000	0.07		2.0	OK	
1.009	dummy mh2	15 Summer	2	+0%	100/15 Summer	100/15 Summer			141.569	-0.296	0.000	0.58		262.6	OK	
8.000	RWP4	15 Summer	2	+0%	100/15 Summer				142.026	-0.124	0.000	0.07		2.0	OK	
1.010	S07	15 Winter	2	+0%	100/15 Summer				141.424	-0.299	0.000	0.59		257.0	OK	
9.000	RWP5	15 Summer	2	+0%	100/15 Winter				142.022	-0.128	0.000	0.05		2.0	OK	
1.011	dummy mh3	15 Winter	2	+0%	100/15 Summer				141.297	-0.316	0.000	0.54		249.4	OK	
10.000	RWP6	15 Summer	2	+0%	100/30 Summer				142.024	-0.126	0.000	0.06		2.0	OK	
1.012	S08	15 Winter	2	+0%	100/15 Summer				141.154	-0.301	0.000	0.58		243.9	OK	
11.000	RWP7	15 Summer	2	+0%	100/30 Winter				142.020	-0.130	0.000	0.04		2.0	OK	
1.013	dummy mh4	15 Winter	2	+0%	100/15 Summer				141.041	-0.324	0.000	0.51		239.4	OK	
12.000	RWP8	15 Summer	2	+0%	100/30 Winter				142.023	-0.127	0.000	0.06		2.0	OK	
1.014	S09	15 Winter	2	+0%	30/15 Summer				140.920	-0.270	0.000	0.56		227.2	OK	
13.000	RWP9	15 Summer	2	+0%					142.019	-0.131	0.000	0.04		2.0	OK	
1.015	dummy mh5	15 Winter	2	+0%	30/15 Summer				140.868	-0.247	0.000	0.57		224.7	OK	
14.000	SDP4a	15 Summer	2	+0%					153.574	-0.226	0.000	0.14		78.5	OK	
14.001	SDP4b	15 Summer	2	+0%			2/15 Summer	54	148.561	-0.239	0.000	0.11	15.4	63.2	OK	
14.002	SDP4	15 Summer	2	+0%	30/15 Summer				142.208	-0.092	0.000	0.80		63.4	OK	
1.016	S10(V)	15 Winter	2	+0%	30/15 Summer				140.829	-0.220	0.000	0.79		225.2	OK	
15.000	SDP5a	15 Summer	2	+0%					153.608	-0.192	0.000	0.28		157.0	OK	
15.001	SDP5b	15 Summer	2	+0%	100/15 Summer		2/15 Summer	54	148.569	-0.231	0.000	0.25	14.2	140.5	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
15.002	SDP5	15 Summer	2	+0%	30/15 Summer				142.318	-0.132	0.000	0.81		141.2	OK	
1.017	S11(V)	30 Winter	2	+0%	30/15 Summer				140.765	-0.275	0.000	0.66		238.4	OK	
1.018	S12	30 Winter	2	+0%	30/15 Winter				140.689	-0.300	0.000	0.59		238.2	OK	
16.000	RWP10	15 Summer	2	+0%	100/15 Summer				142.197	-0.103	0.000	0.21		2.0	OK	
16.001	S13	15 Summer	2	+0%	100/15 Summer				142.160	-0.105	0.000	0.19		1.8	OK	
17.000	RWP11	15 Summer	2	+0%	100/15 Summer				142.181	-0.119	0.000	0.10		2.0	OK	
16.002	dummy mh6	15 Summer	2	+0%	100/15 Summer				142.052	-0.088	0.000	0.34		3.4	OK	
18.000	RWP12	15 Summer	2	+0%	100/15 Summer				142.177	-0.123	0.000	0.07		2.0	OK	
16.003	S14	15 Winter	2	+0%	100/15 Summer				141.940	-0.075	0.000	0.48		4.7	OK	
19.000	RWP13	15 Summer	2	+0%	100/15 Summer				142.174	-0.126	0.000	0.06		2.0	OK	
16.004	dummy mh7	15 Winter	2	+0%	100/15 Summer				141.807	-0.083	0.000	0.41		6.0	OK	
20.000	RWP14	15 Summer	2	+0%	100/15 Summer				142.171	-0.129	0.000	0.05		2.0	OK	
16.005	S15	15 Winter	2	+0%	30/15 Winter				141.467	-0.148	0.000	0.25		7.1	OK	
21.000	RWP15	15 Summer	2	+0%	100/15 Summer				142.170	-0.130	0.000	0.04		2.0	OK	
16.006	dummy mh8	15 Winter	2	+0%	30/15 Summer				141.347	-0.143	0.000	0.29		8.1	OK	
22.000	RWP16	15 Summer	2	+0%	100/15 Summer				142.169	-0.131	0.000	0.04		2.0	OK	
16.007	S16	15 Winter	2	+0%	30/15 Summer				141.064	-0.301	0.000	0.09		9.0	OK	
23.000	RWP17	15 Summer	2	+0%	100/15 Summer				142.169	-0.131	0.000	0.04		2.0	OK	
16.008	dummy mh9	15 Summer	2	+0%	30/15 Summer				140.915	-0.325	0.000	0.06		10.5	OK	
24.000	RWP18	15 Summer	2	+0%	100/15 Summer				142.168	-0.132	0.000	0.04		2.0	OK	
16.009	S17	15 Summer	2	+0%	30/15 Summer				140.909	-0.206	0.000	0.17		26.5	OK	
25.000	SDP6a	15 Summer	2	+0%					153.575	-0.300	0.000	0.09		78.5	OK	
25.001	SDP6b	15 Summer	2	+0%			2/15 Summer	54	148.561	-0.314	0.000	0.07	15.4	63.2	OK	
25.002	SDP6	15 Summer	2	+0%	30/15 Summer				142.263	-0.112	0.000	0.81		63.4	OK	
16.010	S18(V)	15 Summer	2	+0%	30/15 Summer				140.902	-0.138	0.000	0.33		51.2	OK	
26.000	PPCP2	15 Summer	2	+0%	100/15 Summer	100/15 Summer			141.998	-0.327	0.000	0.30		212.0	OK	4
16.011	S19	15 Summer	2	+0%	30/15 Summer				140.856	-0.094	0.000	0.78		238.3	OK	
16.012	S20	15 Summer	2	+0%	30/15 Summer				140.802	-0.073	0.000	1.00		227.8	OK	
27.000	Office SDP7	15 Summer	2	+0%	30/15 Summer				143.446	-0.004	0.000	1.00		8.8	OK	
27.001	S21(V)	15 Summer	2	+0%	30/15 Summer				143.394	-0.029	0.000	0.96		8.6	OK	
27.002	RWHT	15 Summer	2	+0%					143.285	-0.120	0.000	0.09		8.8	OK	
16.013	S22	15 Winter	2	+0%	30/15 Summer				140.629	-0.236	0.000	0.66		232.9	OK	
28.000	Office SDP8	15 Summer	2	+0%	30/15 Summer				143.442	-0.008	0.000	1.00		8.9	OK	
16.014	S23(V)	15 Winter	2	+0%	30/15 Summer				140.508	-0.211	0.000	0.74		234.2	OK	
29.000	Office SDP9	15 Summer	2	+0%	30/15 Summer				143.384	-0.066	0.000	0.60		9.4	OK	
16.015	S24(V)	15 Winter	2	+0%	30/15 Summer				140.366	-0.264	0.000	0.60		237.2	OK	
30.000	OB01	15 Summer	2	+0%	30/15 Summer	100/15 Summer			142.396	-0.254	0.000	0.50		121.7	OK	6
30.001	S25	15 Summer	2	+0%	30/15 Summer	100/15 Summer			142.274	-0.241	0.000	0.57		120.1	OK	
30.002	S26	15 Summer	2	+0%	30/15 Summer	100/15 Winter			142.143	-0.312	0.000	0.33		114.6	OK	
31.000	OB02	15 Summer	2	+0%	30/15 Summer	100/15 Summer			141.921	-0.194	0.000	0.47		67.7	OK	7
32.000	OB03	15 Summer	2	+0%	30/15 Summer	100/15 Summer			141.958	-0.082	0.000	0.73		19.2	OK	6
30.003	S27	15 Winter	2	+0%	30/15 Summer				141.776	-0.202	0.000	0.66		169.4	OK	
33.000	OB04	15 Summer	2	+0%	30/15 Summer	100/15 Summer			142.995	-0.110	0.000	0.90		133.0	OK	5
33.001	S28	15 Summer	2	+0%	30/15 Summer				142.906	-0.139	0.000	0.80		131.2	OK	
33.002	S29	15 Summer	2	+0%	30/15 Winter				142.657	-0.268	0.000	0.33		127.7	OK	
30.004	S30	15 Winter	2	+0%	30/15 Summer				141.610	-0.143	0.000	0.75		291.6	OK	
34.000	OB05	15 Summer	2	+0%	30/15 Summer	100/15 Summer			141.895	-0.070	0.000	0.81		55.3	OK	7
35.000	OB06	15 Summer	2	+0%	30/15 Summer	100/15 Summer			141.966	-0.299	0.000	0.25		113.3	OK	6
30.005	S31	15 Winter	2	+0%	30/15 Summer				141.550	-0.052	0.000	0.99		363.0	OK	
36.000	OB07	15 Summer	2	+0%	30/15 Summer	100/15 Summer			141.866	-0.099	0.000	0.60		55.2	OK	5
37.000	OB08	15 Summer	2	+0%	100/15 Summer	100/15 Summer			141.971	-0.294	0.000	0.26		137.2	OK	4
30.006	S32	15 Winter	2	+0%	30/15 Summer				141.203	-0.100	0.000	1.00		456.4	OK	
30.007	S33	15 Winter	2	+0%	30/15 Summer				141.004	-0.149	0.000	0.96		454.5	OK	
38.000	OB09	15 Summer	2	+0%	100/15 Summer				141.902	-0.213	0.000	0.38		74.8	OK	
39.000	OB10	15 Summer	2	+0%	30/15 Summer				142.106	-0.084	0.000	0.99		151.4	OK	
30.008	S34(BD)	15 Winter	2	+0%	30/15 Summer				140.798	-0.169	0.000	1.26		560.6	OK	
30.009	FRS	15 Winter	2	+0%	30/15 Summer				140.767	-0.191	0.000	1.30		559.1	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
40.000	RWP19	15 Summer	2	+0%					142.518	-0.132	0.000	0.03		1.8	OK	
41.000	RWP20	15 Summer	2	+0%					142.518	-0.132	0.000	0.03		1.8	OK	
30.010	S35	15 Winter	2	+0%	30/15 Summer				140.342	-0.605	0.000	0.31		560.5	OK	
1.019	S36	15 Winter	2	+0%	30/15 Summer				140.270	-0.205	0.000	0.88		948.3	OK	
42.000	OB12	15 Summer	2	+0%	30/15 Summer	100/15 Summer			141.348	-0.127	0.000	0.59		35.0	OK	4
42.001	S37	15 Summer	2	+0%	30/15 Summer				141.208	-0.137	0.000	0.55		33.0	OK	
43.000	OB13	15 Summer	2	+0%	100/15 Summer	100/15 Summer			141.319	-0.231	0.000	0.48		132.0	OK	4
42.002	S38	15 Summer	2	+0%	30/15 Summer				141.005	-0.175	0.000	0.66		152.9	OK	
44.000	KO1	15 Summer	2	+0%	30/15 Summer	100/15 Summer			141.973	-0.002	0.000	1.00		11.7	OK	2
45.000	OB14	15 Summer	2	+0%					141.709	-0.191	0.000	0.29		24.3	OK	
44.001	S39	15 Summer	2	+0%	100/15 Summer				141.583	-0.202	0.000	0.23		35.1	OK	
46.000	OB11	15 Summer	2	+0%	30/15 Summer				142.826	-0.039	0.000	1.00		26.8	OK	
42.003	S40(BD)	15 Winter	2	+0%	30/15 Summer				140.840	0.000	0.000	1.31		200.9	OK	
42.004	By-Pass Separator	15 Winter	2	+0%	30/15 Winter				140.599	-0.226	0.000	0.85		198.3	OK	
42.005	S41	15 Winter	2	+0%	30/15 Winter				140.386	-0.434	0.000	0.27		194.2	OK	
1.020	S42	15 Winter	2	+0%	30/15 Summer				140.163	-0.332	0.000	0.81		1133.6	OK	
47.000	OB15	15 Summer	2	+0%	30/15 Summer	100/15 Summer			142.051	-0.214	0.000	0.66		141.1	OK	6
47.001	S43	15 Summer	2	+0%	30/15 Summer				141.957	-0.248	0.000	0.47		123.8	OK	
48.000	OB16	15 Summer	2	+0%	30/15 Summer	100/15 Summer			141.918	-0.197	0.000	0.46		81.7	OK	6
47.002	S44	15 Summer	2	+0%	30/15 Summer				141.712	-0.193	0.000	0.66		172.3	OK	
49.000	OB17	15 Summer	2	+0%	30/15 Summer	100/15 Summer			141.878	-0.237	0.000	0.29		81.8	OK	5
47.003	S45	15 Winter	2	+0%	30/15 Summer				141.467	-0.138	0.000	0.88		217.3	OK	
47.004	S46	15 Winter	2	+0%	30/15 Summer				141.305	-0.150	0.000	0.84		210.7	OK	
50.000	OB18	15 Summer	2	+0%	30/15 Summer	100/15 Summer			142.046	-0.144	0.000	0.80		119.2	OK	3
51.000	OB19	15 Summer	2	+0%	30/15 Summer				142.297	-0.048	0.000	0.98		24.5	OK	
47.005	S47(BD)	15 Winter	2	+0%	30/15 Summer				141.068	-0.202	0.000	0.77		265.6	OK	
47.006	S48	15 Winter	2	+0%	30/15 Summer				140.967	-0.138	0.000	0.71		251.5	OK	
47.007	S49	15 Winter	2	+0%	30/15 Summer				140.884	-0.006	0.000	1.00		225.1	OK	
52.000	OB20	15 Summer	2	+0%	30/15 Summer	100/15 Summer			139.472	-0.128	0.000	0.84		114.4	OK	6
52.001	S50	15 Summer	2	+0%	30/15 Summer				139.364	-0.184	0.000	0.60		106.5	OK	
53.000	OB21	15 Summer	2	+0%	30/15 Summer	100/15 Summer			139.324	-0.051	0.000	0.94		25.2	OK	5
54.000	OB22	15 Summer	2	+0%	30/15 Summer	100/15 Winter			139.566	-0.009	0.000	1.00		27.1	OK	3
52.002	S51	15 Winter	2	+0%	30/15 Summer				139.219	-0.096	0.000	0.97		147.1	OK	
47.008	S52	15 Winter	2	+0%	30/15 Summer				138.846	-0.361	0.000	0.66		358.6	OK	
47.009	FRS	15 Winter	2	+0%	30/15 Summer				138.781	-0.394	0.000	0.37		351.6	OK	
55.000	RWP21	15 Summer	2	+0%	100/15 Summer				139.458	-0.092	0.000	0.30		3.0	OK	
56.000	RWP22	15 Summer	2	+0%	100/15 Summer				139.450	-0.100	0.000	0.24		3.1	OK	
55.001	S53	15 Summer	2	+0%	30/15 Summer				139.333	-0.067	0.000	0.57		5.6	OK	
57.000	OB23	15 Summer	2	+0%	100/15 Summer				140.188	-0.107	0.000	0.54		13.0	OK	
57.001	S54	15 Summer	2	+0%	100/15 Summer				140.164	-0.106	0.000	0.53		12.8	OK	
57.002	Forecourt Separator	15 Summer	2	+0%	100/15 Summer				140.150	-0.105	0.000	0.54		12.6	OK	
58.000	RWP23	15 Summer	2	+0%	100/15 Summer				139.461	-0.089	0.000	0.33		3.0	OK	
59.000	RWP24	15 Summer	2	+0%	100/15 Summer				139.447	-0.103	0.000	0.21		3.2	OK	
58.001	dummy mh	15 Summer	2	+0%	100/15 Summer				139.364	-0.090	0.000	0.33		6.1	OK	
55.002	S55	15 Summer	2	+0%	30/15 Summer				139.194	-0.065	0.000	0.82		23.1	OK	
55.003	S56	15 Summer	2	+0%	30/15 Summer				139.078	-0.071	0.000	0.80		22.5	OK	
47.010	S57	15 Winter	2	+0%	30/15 Summer				138.763	-0.276	0.000	0.59		360.0	OK	
47.011	S58	15 Winter	2	+0%	30/15 Summer				138.712	-0.271	0.000	0.53		341.6	OK	
47.012	S59	15 Winter	2	+0%	30/15 Summer				138.655	-0.256	0.000	0.55		343.3	OK	
1.021	S60(BD)(P)	15 Winter	2	+0%	30/15 Summer				138.604	-0.244	0.000	1.03		1379.6	OK	
60.000	RWP25	15 Summer	2	+0%					141.162	-0.138	0.000	0.02		0.2	OK	
61.000	RWP26	15 Summer	2	+0%					141.013	-0.137	0.000	0.02		0.2	OK	
1.022	S61	15 Winter	2	+0%	100/15 Summer				138.533	-0.496	0.000	0.71		1355.7	OK	
62.000	KO2	15 Summer	2	+0%					140.141	-0.109	0.000	0.17		11.5	OK	
1.023	S62	30 Winter	2	+0%	100/15 Summer				138.268	-0.553	0.000	0.54		1306.0	OK	
63.000	K03	15 Summer	2	+0%	30/15 Summer	100/15 Summer			139.396	-0.054	0.000	0.73		35.5	OK	3
1.024	S63	30 Winter	2	+0%	100/15 Summer				138.169	-0.526	0.000	0.60		1276.4	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
64.000	KO4	15 Summer	2	+0%	30/15 Summer				138.887	-0.063	0.000	0.63		22.4	OK	
65.000	RWP28	15 Summer	2	+0%					139.563	-0.137	0.000	0.02		0.2	OK	
1.025	S64	30 Winter	2	+0%	30/30 Winter				138.077	-0.469	0.000	0.63		1266.7	OK	
66.000	KO5	15 Summer	2	+0%	30/15 Summer				140.568	-0.032	0.000	0.97		8.3	OK	
66.001	S65	15 Summer	2	+0%	30/15 Summer				140.515	-0.065	0.000	0.61		8.2	OK	
67.000	K06	15 Summer	2	+0%	30/15 Summer				140.101	-0.109	0.000	0.73		32.5	OK	
66.002	S66	15 Summer	2	+0%	100/15 Summer	100/15 Summer			140.034	-0.156	0.000	0.45		38.4	OK	2
68.000	KO7	15 Summer	2	+0%	30/15 Summer				139.945	-0.065	0.000	0.61		13.3	OK	
66.003	S67	15 Summer	2	+0%	30/15 Summer				139.765	-0.125	0.000	0.58		45.5	OK	
69.000	KO8	15 Winter	2	+0%	30/15 Summer				139.394	-0.111	0.000	0.27		11.2	OK	
66.004	S68	15 Winter	2	+0%	30/15 Summer				139.390	-0.025	0.000	1.00		47.7	OK	
66.005	FRS	15 Winter	2	+0%	30/15 Summer				139.272	-0.088	0.000	0.84		47.7	OK	
1.026	S69	30 Winter	2	+0%	100/15 Winter				138.009	-0.478	0.000	1.08		1276.8	OK	
70.000	G1	15 Summer	2	+0%	30/15 Summer				138.222	-0.053	0.000	0.94		22.2	OK	
1.027	dummy mh	30 Winter	2	+0%	100/15 Summer				137.730	-0.520	0.000	0.76		1282.1	OK	
71.000	OB24	15 Summer	2	+0%	30/15 Summer	100/15 Summer			142.128	-0.082	0.000	0.87		47.3	OK	3
71.001	S70	15 Summer	2	+0%	30/15 Summer	100/15 Summer			142.071	-0.089	0.000	0.71		40.2	OK	3
72.000	OB25	15 Summer	2	+0%	30/15 Summer				142.144	-0.066	0.000	0.97		47.7	OK	
71.002	S71	15 Summer	2	+0%	30/15 Summer				141.806	-0.119	0.000	0.80		81.6	OK	
73.000	OB26	15 Summer	2	+0%	30/15 Summer	100/15 Summer			141.362	-0.048	0.000	1.00		83.4	OK	1
71.003	S72	15 Summer	2	+0%	30/15 Summer				141.305	-0.075	0.000	0.99		153.6	OK	
74.000	OB27	15 Summer	2	+0%	30/15 Summer				140.693	-0.142	0.000	0.65		54.3	OK	
71.004	S73	15 Winter	2	+0%	30/15 Summer				140.670	-0.135	0.000	0.90		200.4	OK	
75.000	OB28	15 Winter	2	+0%	30/15 Summer				140.170	-0.115	0.000	0.48		39.2	OK	
71.005	S74	15 Winter	2	+0%	30/15 Summer				140.153	-0.102	0.000	1.18		232.7	OK	
71.006	By-Pass Separator	15 Summer	2	+0%	30/15 Summer				140.116	-0.124	0.000	1.17		232.3	OK	
71.007	S75(P)	15 Summer	2	+0%					139.710	-0.518	0.000	0.12		233.1	OK	
1.028	S76	30 Winter	2	+0%	100/30 Summer				137.483	-0.739	0.000	0.51		1327.1	OK	

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Online Controls 6 Number of Offline Controls 6 Number of Storage Structures 0 Number of Time/Area Diagrams 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Region England and Wales M5-60 (mm) 19.000 Ratio R 0.357 Cv (Summer) 0.755 Cv (Winter) 0.822

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SDP1a	15 Summer	30	+0%					153.605	-0.195	0.000	0.27		148.6	OK	
1.001	SDP1b	15 Summer	30	+0%			2/15 Summer	54	148.607	-0.193	0.000	0.18	38.8	103.1	OK	
1.002	SDP1	15 Summer	30	+0%	30/15 Summer				143.827	0.027	0.000	1.22		103.6	SURCHARGED	
1.003	S01(V)	15 Summer	30	+0%	30/15 Summer				143.573	0.033	0.000	1.22		98.0	SURCHARGED	
2.000	SDP2a	15 Summer	30	+0%					153.650	-0.225	0.000	0.34		296.9	OK	
2.001	SDP2b	15 Summer	30	+0%	100/15 Summer		2/15 Summer	54	148.681	-0.194	0.000	0.24	73.5	206.5	OK	
2.002	SDP2	15 Summer	30	+0%	30/15 Summer				143.940	0.065	0.000	1.32		206.3	SURCHARGED	
1.004	S02(V)	15 Summer	30	+0%	100/15 Summer				143.411	-0.114	0.000	0.88		301.6	OK	
3.000	PPCP1	15 Winter	30	+0%	30/15 Summer	100/15 Winter			143.280	0.170	0.000	1.44		141.8	SURCHARGED	1
3.001	S03	15 Winter	30	+0%	30/15 Summer	100/15 Summer			143.104	0.079	0.000	1.37		141.0	SURCHARGED	6
1.005	S04	15 Summer	30	+0%	100/15 Summer				142.827	-0.088	0.000	0.83		378.0	OK	
4.000	SDP3a	15 Summer	30	+0%					153.605	-0.195	0.000	0.27		148.6	OK	
4.001	SDP3b	15 Summer	30	+0%			2/15 Summer	54	148.605	-0.195	0.000	0.18	40.2	102.8	OK	
4.002	SDP3	15 Summer	30	+0%	30/15 Summer				142.405	0.030	0.000	1.30		103.3	SURCHARGED	
1.006	S05(V)	15 Summer	30	+0%	30/15 Summer	100/15 Summer			142.349	0.079	0.000	1.26		448.4	SURCHARGED	4
5.000	RWP1	15 Summer	30	+0%	100/15 Summer				142.066	-0.084	0.000	0.40		3.7	OK	
1.007	dummy mh1	15 Winter	30	+0%	100/15 Summer	100/15 Summer			142.023	-0.092	0.000	1.00		444.6	OK	2
6.000	RWP2	15 Summer	30	+0%	100/15 Summer				142.044	-0.106	0.000	0.19		3.7	OK	
1.008	S06	15 Winter	30	+0%	100/15 Summer	100/15 Summer			141.858	-0.132	0.000	0.98		437.6	OK	1
7.000	RWP3	15 Summer	30	+0%	100/15 Summer				142.037	-0.113	0.000	0.14		3.7	OK	
1.009	dummy mh2	30 Winter	30	+0%	100/15 Summer	100/15 Summer			141.732	-0.133	0.000	0.83		377.8	OK	
8.000	RWP4	15 Summer	30	+0%	100/15 Summer				142.036	-0.114	0.000	0.13		3.7	OK	
1.010	S07	30 Winter	30	+0%	100/15 Summer				141.652	-0.071	0.000	0.85		371.4	OK	
9.000	RWP5	15 Summer	30	+0%	100/15 Winter				142.032	-0.118	0.000	0.10		3.7	OK	
1.011	dummy mh3	30 Winter	30	+0%	100/15 Summer				141.568	-0.045	0.000	0.79		363.7	OK	
10.000	RWP6	15 Summer	30	+0%	100/30 Summer				142.034	-0.116	0.000	0.12		3.7	OK	
1.012	S08	30 Winter	30	+0%	100/15 Summer				141.453	-0.002	0.000	0.87		364.5	OK	
11.000	RWP7	15 Summer	30	+0%	100/30 Winter				142.029	-0.121	0.000	0.08		3.7	OK	
1.013	dummy mh4	30 Winter	30	+0%	100/15 Summer				141.350	-0.015	0.000	0.78		363.0	OK	
12.000	RWP8	15 Summer	30	+0%	100/30 Winter				142.033	-0.117	0.000	0.11		3.7	OK	
1.014	S09	30 Winter	30	+0%	30/15 Summer				141.217	0.028	0.000	0.89		359.0	SURCHARGED	
13.000	RWP9	15 Summer	30	+0%					142.027	-0.123	0.000	0.07		3.7	OK	
1.015	dummy mh5	30 Winter	30	+0%	30/15 Summer				141.169	0.055	0.000	0.91		360.6	SURCHARGED	
14.000	SDP4a	15 Summer	30	+0%					153.605	-0.195	0.000	0.27		148.6	OK	
14.001	SDP4b	15 Summer	30	+0%			2/15 Summer	54	148.596	-0.204	0.000	0.18	48.7	100.0	OK	
14.002	SDP4	15 Summer	30	+0%	30/15 Summer				142.368	0.068	0.000	1.27		100.7	SURCHARGED	
1.016	S10(V)	30 Winter	30	+0%	30/15 Summer				141.122	0.072	0.000	1.33		377.7	SURCHARGED	
15.000	SDP5a	15 Summer	30	+0%					153.655	-0.145	0.000	0.53		297.0	OK	
15.001	SDP5b	15 Summer	30	+0%	100/15 Summer		2/15 Summer	54	148.677	-0.123	0.000	0.37	77.7	206.5	OK	

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
15.002	SDP5	15 Summer	30	+0%	30/15 Summer				142.470	0.020	0.000	1.19		206.4	SURCHARGED	
1.017	S11(V)	15 Summer	30	+0%	30/15 Summer				141.093	0.054	0.000	1.07		387.2	SURCHARGED	
1.018	S12	30 Winter	30	+0%	30/15 Winter				141.026	0.036	0.000	1.04		418.7	SURCHARGED	
16.000	RWP10	15 Summer	30	+0%	100/15 Summer				142.216	-0.084	0.000	0.40		3.7	OK	
16.001	S13	15 Summer	30	+0%	100/15 Summer				142.178	-0.087	0.000	0.36		3.5	OK	
17.000	RWP11	15 Summer	30	+0%	100/15 Summer				142.194	-0.106	0.000	0.19		3.7	OK	
16.002	dummy mh6	15 Summer	30	+0%	100/15 Summer				142.083	-0.057	0.000	0.66		6.5	OK	
18.000	RWP12	15 Summer	30	+0%	100/15 Summer				142.187	-0.113	0.000	0.14		3.7	OK	
16.003	S14	15 Winter	30	+0%	100/15 Summer				141.981	-0.034	0.000	0.92		9.0	OK	
19.000	RWP13	15 Summer	30	+0%	100/15 Summer				142.184	-0.116	0.000	0.12		3.7	OK	
16.004	dummy mh7	15 Winter	30	+0%	100/15 Summer				141.841	-0.049	0.000	0.77		11.3	OK	
20.000	RWP14	15 Summer	30	+0%	100/15 Summer				142.180	-0.120	0.000	0.09		3.7	OK	
16.005	S15	15 Winter	30	+0%	30/15 Winter				141.656	0.041	0.000	0.53		15.0	SURCHARGED	
21.000	RWP15	15 Summer	30	+0%	100/15 Summer				142.179	-0.121	0.000	0.08		3.7	OK	
16.006	dummy mh8	15 Winter	30	+0%	30/15 Summer				141.611	0.121	0.000	0.73		20.7	SURCHARGED	
22.000	RWP16	15 Summer	30	+0%	100/15 Summer				142.177	-0.123	0.000	0.08		3.7	OK	
16.007	S16	15 Winter	30	+0%	30/15 Summer				141.583	0.218	0.000	0.23		23.6	SURCHARGED	
23.000	RWP17	15 Summer	30	+0%	100/15 Summer				142.176	-0.124	0.000	0.07		3.7	OK	
16.008	dummy mh9	15 Winter	30	+0%	30/15 Summer				141.579	0.339	0.000	0.16		25.9	SURCHARGED	
24.000	RWP18	15 Summer	30	+0%	100/15 Summer				142.176	-0.124	0.000	0.07		3.7	OK	
16.009	S17	15 Winter	30	+0%	30/15 Summer				141.577	0.462	0.000	0.25		38.7	SURCHARGED	
25.000	SDP6a	15 Summer	30	+0%					153.603	-0.272	0.000	0.17		148.6	OK	
25.001	SDP6b	15 Summer	30	+0%			2/15 Summer	54	148.596	-0.279	0.000	0.11	48.8	99.9	OK	
25.002	SDP6	15 Summer	30	+0%	30/15 Summer				142.398	0.023	0.000	1.28		100.8	SURCHARGED	
16.010	S18(V)	15 Winter	30	+0%	30/15 Summer				141.577	0.537	0.000	0.35		54.8	SURCHARGED	
26.000	PPCP2	15 Summer	30	+0%	100/15 Summer	100/15 Summer			142.086	-0.239	0.000	0.58		401.8	OK	4
16.011	S19	15 Winter	30	+0%	30/15 Summer				141.488	0.538	0.000	1.33		403.5	SURCHARGED	
16.012	S20	15 Winter	30	+0%	30/15 Summer				141.417	0.542	0.000	1.74		395.7	SURCHARGED	
27.000	Office SDP7	15 Summer	30	+0%	30/15 Summer				143.586	0.136	0.000	1.89		16.8	SURCHARGED	
27.001	S21(V)	15 Summer	30	+0%	30/15 Summer				143.476	0.054	0.000	1.87		16.6	SURCHARGED	
27.002	RWHT	15 Summer	30	+0%					143.296	-0.108	0.000	0.17		16.9	OK	
16.013	S22	15 Winter	30	+0%	30/15 Summer				141.372	0.507	0.000	1.12		392.6	SURCHARGED	
28.000	Office SDP8	15 Summer	30	+0%	30/15 Summer				143.542	0.092	0.000	2.01		18.0	SURCHARGED	
16.014	S23(V)	15 Winter	30	+0%	30/15 Summer				141.236	0.517	0.000	1.19		374.5	SURCHARGED	
29.000	Office SDP9	15 Summer	30	+0%	30/15 Summer				143.471	0.021	0.000	1.13		17.6	SURCHARGED	
16.015	S24(V)	15 Winter	30	+0%	30/15 Summer				141.108	0.479	0.000	0.96		379.5	SURCHARGED	
30.000	OB01	15 Winter	30	+0%	30/15 Summer	100/15 Summer			143.059	0.409	0.000	0.93		225.2	SURCHARGED	6
30.001	S25	15 Winter	30	+0%	30/15 Summer	100/15 Summer			142.997	0.482	0.000	0.95		200.8	SURCHARGED	
30.002	S26	15 Winter	30	+0%	30/15 Summer	100/15 Winter			142.952	0.497	0.000	0.45		157.1	SURCHARGED	
31.000	OB02	15 Winter	30	+0%	30/15 Summer	100/15 Summer			142.924	0.809	0.000	0.87		125.8	FLOOD RISK	7
32.000	OB03	15 Winter	30	+0%	30/15 Summer	100/15 Summer			142.842	0.802	0.000	1.17		31.0	FLOOD RISK	6
30.003	S27	15 Winter	30	+0%	30/15 Summer				142.791	0.813	0.000	0.73		187.2	SURCHARGED	
33.000	OB04	15 Summer	30	+0%	30/15 Summer	100/15 Summer			143.361	0.256	0.000	1.61		238.0	SURCHARGED	5
33.001	S28	15 Summer	30	+0%	30/15 Summer				143.167	0.122	0.000	1.44		237.0	SURCHARGED	
33.002	S29	15 Winter	30	+0%	30/15 Winter				142.971	0.046	0.000	0.57		215.9	SURCHARGED	
30.004	S30	15 Winter	30	+0%	30/15 Summer				142.651	0.898	0.000	0.97		377.9	SURCHARGED	
34.000	OB05	15 Winter	30	+0%	30/15 Summer	100/15 Summer			142.749	0.784	0.000	1.14		77.7	FLOOD RISK	7
35.000	OB06	15 Winter	30	+0%	30/15 Summer	100/15 Summer			142.756	0.491	0.000	0.44		199.6	SURCHARGED	6
30.005	S31	15 Winter	30	+0%	30/15 Summer				142.522	0.919	0.000	1.35		495.7	SURCHARGED	
36.000	OB07	15 Winter	30	+0%	30/15 Summer	100/15 Summer			142.269	0.304	0.000	0.98		90.2	SURCHARGED	5
37.000	OB08	15 Winter	30	+0%	100/15 Summer	100/15 Summer			142.121	-0.144	0.000	0.48		252.5	OK	4
30.006	S32	15 Winter	30	+0%	30/15 Summer				141.975	0.672	0.000	1.48		674.2	SURCHARGED	
30.007	S33	15 Winter	30	+0%	30/15 Summer				141.673	0.521	0.000	1.40		661.0	SURCHARGED	
38.000	OB09	15 Summer	30	+0%	100/15 Summer				142.004	-0.111	0.000	0.81		158.6	OK	
39.000	OB10	15 Summer	30	+0%	30/15 Summer				142.369	0.179	0.000	1.89		289.4	SURCHARGED	
30.008	S34(BD)	15 Winter	30	+0%	30/15 Summer				141.315	0.348	0.000	2.18		972.2	SURCHARGED	
30.009	FRS	30 Summer	30	+0%	30/15 Summer				141.257	0.299	0.000	2.13		916.3	SURCHARGED	

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PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
40.000	RWP19	15 Summer	30	+0%					142.525	-0.125	0.000	0.07		3.4	OK	
41.000	RWP20	15 Summer	30	+0%					142.524	-0.126	0.000	0.06		3.4	OK	
30.010	S35	30 Summer	30	+0%	30/15 Summer				141.201	0.254	0.000	0.51		928.6	SURCHARGED	
1.019	S36	15 Winter	30	+0%	30/15 Summer				140.972	0.497	0.000	1.36		1465.8	SURCHARGED	
42.000	OB12	15 Summer	30	+0%	30/15 Summer	100/15 Summer			141.590	0.115	0.000	1.08		63.3	SURCHARGED	4
42.001	S37	15 Summer	30	+0%	30/15 Summer				141.468	0.123	0.000	0.90		54.0	SURCHARGED	
43.000	OB13	15 Winter	30	+0%	100/15 Summer	100/15 Summer			141.526	-0.024	0.000	0.82		227.1	OK	4
42.002	S38	15 Summer	30	+0%	30/15 Summer				141.329	0.149	0.000	1.08		247.6	SURCHARGED	
44.000	KO1	15 Summer	30	+0%	30/15 Summer	100/15 Summer			142.342	0.367	0.000	1.71		20.0	SURCHARGED	2
45.000	OB14	15 Summer	30	+0%					141.757	-0.143	0.000	0.54		46.0	OK	
44.001	S39	15 Summer	30	+0%	100/15 Summer				141.620	-0.165	0.000	0.40		61.9	OK	
46.000	OB11	15 Summer	30	+0%	30/15 Summer				143.023	0.158	0.000	1.85		49.9	SURCHARGED	
42.003	S40(BD)	15 Winter	30	+0%	30/15 Summer				140.928	0.088	0.000	2.23		343.8	SURCHARGED	
42.004	By-Pass Separator	15 Winter	30	+0%	30/15 Winter				140.881	0.056	0.000	1.46		342.0	SURCHARGED	
42.005	S41	15 Winter	30	+0%	30/15 Winter				140.853	0.033	0.000	0.46		332.0	SURCHARGED	
1.020	S42	15 Winter	30	+0%	30/15 Summer				140.656	0.161	0.000	1.28		1803.6	SURCHARGED	
47.000	OB15	15 Winter	30	+0%	30/15 Summer	100/15 Summer			142.631	0.366	0.000	1.31		282.3	SURCHARGED	6
47.001	S43	15 Winter	30	+0%	30/15 Summer				142.543	0.338	0.000	0.90		235.9	SURCHARGED	
48.000	OB16	15 Winter	30	+0%	30/15 Summer	100/15 Summer			142.574	0.459	0.000	0.81		145.0	SURCHARGED	6
47.002	S44	15 Winter	30	+0%	30/15 Summer				142.449	0.544	0.000	0.97		252.1	SURCHARGED	
49.000	OB17	15 Winter	30	+0%	30/15 Summer	100/15 Summer			142.341	0.226	0.000	0.54		150.6	SURCHARGED	5
47.003	S45	15 Winter	30	+0%	30/15 Summer				142.158	0.553	0.000	1.24		306.6	SURCHARGED	
47.004	S46	15 Winter	30	+0%	30/15 Summer				141.923	0.468	0.000	1.21		305.2	SURCHARGED	
50.000	OB18	15 Summer	30	+0%	30/15 Summer	100/15 Summer			142.391	0.201	0.000	2.00		297.4	SURCHARGED	3
51.000	OB19	15 Summer	30	+0%	30/15 Summer				142.417	0.072	0.000	1.87		46.8	SURCHARGED	
47.005	S47(BD)	15 Winter	30	+0%	30/15 Summer				141.670	0.400	0.000	1.33		458.5	SURCHARGED	
47.006	S48	15 Winter	30	+0%	30/15 Summer				141.381	0.276	0.000	1.23		438.7	SURCHARGED	
47.007	S49	15 Winter	30	+0%	30/15 Summer				141.035	0.145	0.000	1.96		442.2	SURCHARGED	
52.000	OB20	15 Winter	30	+0%	30/15 Summer	100/15 Summer			139.853	0.253	0.000	1.39		190.2	SURCHARGED	6
52.001	S50	15 Winter	30	+0%	30/15 Summer				139.750	0.201	0.000	0.99		175.4	SURCHARGED	
53.000	OB21	15 Winter	30	+0%	30/15 Summer	100/15 Summer			139.638	0.263	0.000	1.54		41.1	SURCHARGED	5
54.000	OB22	15 Summer	30	+0%	30/15 Summer	100/15 Winter			139.774	0.199	0.000	1.91		52.0	SURCHARGED	3
52.002	S51	30 Summer	30	+0%	30/15 Summer				139.514	0.199	0.000	1.52		230.6	SURCHARGED	
47.008	S52	30 Summer	30	+0%	30/15 Summer				139.400	0.193	0.000	1.14		620.2	SURCHARGED	
47.009	FRS	30 Summer	30	+0%	30/15 Summer				139.365	0.190	0.000	0.64		613.3	SURCHARGED	
55.000	RWP21	15 Summer	30	+0%	100/15 Summer				139.485	-0.065	0.000	0.57		5.6	OK	
56.000	RWP22	15 Winter	30	+0%	100/15 Summer				139.473	-0.077	0.000	0.44		5.8	OK	
55.001	S53	15 Winter	30	+0%	30/15 Summer				139.464	0.064	0.000	0.72		7.1	SURCHARGED	
57.000	OB23	15 Summer	30	+0%	100/15 Summer				140.267	-0.028	0.000	1.00		24.1	OK	
57.001	S54	15 Summer	30	+0%	100/15 Summer				140.241	-0.029	0.000	0.96		23.5	OK	
57.002	Forecourt Separator	15 Summer	30	+0%	100/15 Summer				140.222	-0.033	0.000	1.00		23.2	OK	
58.000	RWP23	15 Summer	30	+0%	100/15 Summer				139.488	-0.062	0.000	0.62		5.8	OK	
59.000	RWP24	15 Summer	30	+0%	100/15 Summer				139.466	-0.084	0.000	0.41		6.0	OK	
58.001	dummy mh	30 Winter	30	+0%	100/15 Summer				139.434	-0.020	0.000	0.47		8.9	OK	
55.002	S55	30 Summer	30	+0%	30/15 Summer				139.491	0.232	0.000	1.25		35.0	SURCHARGED	
55.003	S56	15 Winter	30	+0%	30/15 Summer				139.389	0.241	0.000	1.21		33.9	SURCHARGED	
47.010	S57	15 Winter	30	+0%	30/15 Summer				139.326	0.287	0.000	1.06		648.8	SURCHARGED	
47.011	S58	15 Winter	30	+0%	30/15 Summer				139.266	0.283	0.000	0.96		617.6	SURCHARGED	
47.012	S59	15 Winter	30	+0%	30/15 Summer				139.197	0.286	0.000	0.97		607.5	SURCHARGED	
1.021	S60(BD)(P)	30 Winter	30	+0%	30/15 Summer				139.140	0.292	0.000	1.72		2312.3	SURCHARGED	
60.000	RWP25	15 Summer	30	+0%					141.168	-0.132	0.000	0.03		0.3	OK	
61.000	RWP26	15 Summer	30	+0%					141.018	-0.132	0.000	0.04		0.3	OK	
1.022	S61	15 Winter	30	+0%	100/15 Summer				139.029	0.000	0.000	1.16		2204.8	OK	
62.000	KO2	15 Summer	30	+0%					140.158	-0.092	0.000	0.32		21.8	OK	
1.023	S62	30 Summer	30	+0%	100/15 Summer				138.821	0.000	0.000	0.84		2023.6	OK	
63.000	K03	15 Summer	30	+0%	30/15 Summer	100/15 Summer			139.787	0.337	0.000	1.20		58.0	SURCHARGED	3
1.024	S63	30 Winter	30	+0%	100/15 Summer				138.694	-0.001	0.000	0.98		2094.7	OK	

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64.000	KO4	15 Summer	30	+0%	30/15 Summer				139.068	0.118	0.000	1.12		39.5	SURCHARGED	
65.000	RWP28	15 Summer	30	+0%					139.568	-0.132	0.000	0.03		0.3	OK	
1.025	S64	30 Winter	30	+0%	30/30 Winter				138.552	0.006	0.000	1.04		2092.2	SURCHARGED	
66.000	KO5	15 Summer	30	+0%	30/15 Summer				140.681	0.081	0.000	1.72		14.7	SURCHARGED	
66.001	S65	15 Summer	30	+0%	30/15 Summer				140.619	0.039	0.000	1.01		13.6	SURCHARGED	
67.000	K06	15 Summer	30	+0%	30/15 Summer				140.239	0.029	0.000	1.39		62.2	SURCHARGED	
66.002	S66	15 Winter	30	+0%	100/15 Summer	100/15 Summer			140.162	-0.028	0.000	0.80		67.8	OK	2
68.000	KO7	15 Winter	30	+0%	30/15 Summer				140.086	0.076	0.000	1.08		23.5	SURCHARGED	
66.003	S67	15 Winter	30	+0%	30/15 Summer				140.013	0.123	0.000	0.95		74.2	SURCHARGED	
69.000	KO8	15 Winter	30	+0%	30/15 Summer				139.588	0.083	0.000	0.43		18.3	SURCHARGED	
66.004	S68	15 Winter	30	+0%	30/15 Summer				139.582	0.167	0.000	1.69		80.5	SURCHARGED	
66.005	FRS	15 Winter	30	+0%	30/15 Summer				139.424	0.064	0.000	1.42		80.3	SURCHARGED	
1.026	S69	60 Winter	30	+0%	100/15 Winter				138.487	0.000	0.000	1.54		1814.5	OK	
70.000	G1	15 Summer	30	+0%	30/15 Summer				138.331	0.056	0.000	1.79		42.3	SURCHARGED	
1.027	dummy mh	30 Winter	30	+0%	100/15 Summer				138.250	0.000	0.000	1.26		2136.4	OK	
71.000	OB24	15 Summer	30	+0%	30/15 Summer	100/15 Summer			142.512	0.302	0.000	1.41		76.9	SURCHARGED	3
71.001	S70	15 Summer	30	+0%	30/15 Summer	100/15 Summer			142.419	0.259	0.000	1.19		67.9	SURCHARGED	3
72.000	OB25	15 Summer	30	+0%	30/15 Summer				142.303	0.093	0.000	1.85		91.6	SURCHARGED	
71.002	S71	15 Winter	30	+0%	30/15 Summer				142.011	0.086	0.000	1.38		140.5	SURCHARGED	
73.000	OB26	15 Summer	30	+0%	30/15 Summer	100/15 Summer			141.691	0.281	0.000	1.83		153.0	SURCHARGED	1
71.003	S72	15 Winter	30	+0%	30/15 Summer				141.541	0.161	0.000	1.75		270.8	SURCHARGED	
74.000	OB27	15 Winter	30	+0%	30/15 Summer				140.972	0.137	0.000	1.18		98.4	SURCHARGED	
71.004	S73	15 Winter	30	+0%	30/15 Summer				140.924	0.119	0.000	1.60		356.4	SURCHARGED	
75.000	OB28	15 Summer	30	+0%	30/15 Summer				140.377	0.092	0.000	0.97		80.5	SURCHARGED	
71.005	S74	15 Summer	30	+0%	30/15 Summer				140.317	0.062	0.000	2.19		430.2	SURCHARGED	
71.006	By-Pass Separator	15 Winter	30	+0%	30/15 Summer				140.254	0.014	0.000	2.15		428.4	SURCHARGED	
71.007	S75(P)	15 Summer	30	+0%					139.772	-0.456	0.000	0.23		424.7	OK	
1.028	S76	30 Winter	30	+0%	100/30 Summer				137.804	-0.418	0.000	0.87		2244.7	OK	

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

Simulation Criteria

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

Number of Input Hydrographs 0 Number of Online Controls 6 Number of Offline Controls 6 Number of Storage Structures 0 Number of Time/Area Diagrams 0 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR Region England and Wales M5-60 (mm) 19.000 Ratio R 0.357 Cv (Summer) 0.755 Cv (Winter) 0.822

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

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	SDP1a	15 Summer	100	+30%					153.640	-0.160	0.000	0.45		249.9	OK	
1.001	SDP1b	15 Summer	100	+30%			2/15 Summer	54	148.736	-0.064	0.000	0.19	121.9	103.9	OK	
1.002	SDP1	30 Summer	100	+30%	30/15 Summer				144.033	0.233	0.000	1.23		104.2	SURCHARGED	
1.003	S01(V)	30 Winter	100	+30%	30/15 Summer				143.981	0.441	0.000	1.31		105.8	FLOOD RISK	
2.000	SDP2a	15 Summer	100	+30%					153.703	-0.172	0.000	0.57		499.2	OK	
2.001	SDP2b	15 Summer	100	+30%	100/15 Summer		2/15 Summer	54	148.880	0.005	0.000	0.24	241.7	206.8	SURCHARGED	
2.002	SDP2	30 Winter	100	+30%	30/15 Summer				144.004	0.129	0.000	1.33		206.8	SURCHARGED	
1.004	S02(V)	30 Winter	100	+30%	100/15 Summer				143.917	0.392	0.000	0.90		308.7	SURCHARGED	
3.000	PPCP1	15 Winter	100	+30%	30/15 Summer	100/15 Winter			143.936	0.826	0.835	2.35		232.3	FLOOD	1
3.001	S03	30 Winter	100	+30%	30/15 Summer	100/15 Summer			143.492	0.467	46.986	2.21		227.9	FLOOD	6
1.005	S04	15 Winter	100	+30%	100/15 Summer				143.614	0.699	0.000	0.93		421.7	SURCHARGED	
4.000	SDP3a	15 Summer	100	+30%					153.640	-0.160	0.000	0.45		249.9	OK	
4.001	SDP3b	15 Summer	100	+30%			2/15 Summer	54	148.732	-0.068	0.000	0.19	126.0	103.8	OK	
4.002	SDP3	15 Winter	100	+30%	30/15 Summer				143.275	0.900	0.000	1.30		103.4	SURCHARGED	
1.006	S05(V)	30 Winter	100	+30%	30/15 Summer	100/15 Summer			143.108	0.838	13.134	1.39		493.6	FLOOD	4
5.000	RWP1	30 Winter	100	+30%	100/15 Summer				142.995	0.845	0.000	1.52		13.9	FLOOD RISK	
1.007	dummy mh1	15 Winter	100	+30%	100/15 Summer	100/15 Summer			143.099	0.984	5.801	1.05		466.0	FLOOD	2
6.000	RWP2	30 Winter	100	+30%	100/15 Summer				142.890	0.740	0.000	0.45		8.9	SURCHARGED	
1.008	S06	15 Summer	100	+30%	100/15 Summer	100/15 Summer			143.097	1.107	2.639	0.95		422.3	FLOOD	1
7.000	RWP3	30 Winter	100	+30%	100/15 Summer				142.804	0.654	0.000	0.27		7.0	SURCHARGED	
1.009	dummy mh2	15 Summer	100	+30%	100/15 Summer	100/15 Summer			142.944	1.079	0.069	0.92		419.1	FLOOD	
8.000	RWP4	30 Winter	100	+30%	100/15 Summer				142.699	0.549	0.000	0.20		5.5	SURCHARGED	
1.010	S07	30 Winter	100	+30%	100/15 Summer				142.675	0.952	0.000	1.01		441.2	SURCHARGED	
9.000	RWP5	30 Winter	100	+30%	100/15 Winter				142.594	0.444	0.000	0.15		5.5	SURCHARGED	
1.011	dummy mh3	30 Winter	100	+30%	100/15 Summer				142.574	0.961	0.000	0.93		429.9	SURCHARGED	
10.000	RWP6	30 Winter	100	+30%	100/30 Summer				142.459	0.309	0.000	0.16		5.0	SURCHARGED	
1.012	S08	30 Winter	100	+30%	100/15 Summer				142.445	0.990	0.000	1.03		432.0	SURCHARGED	
11.000	RWP7	30 Winter	100	+30%	100/30 Winter				142.364	0.214	0.000	0.11		5.0	SURCHARGED	
1.013	dummy mh4	30 Winter	100	+30%	100/15 Summer				142.354	0.989	0.000	0.91		426.2	SURCHARGED	
12.000	RWP8	30 Winter	100	+30%	100/30 Winter				142.217	0.067	0.000	0.14		4.9	SURCHARGED	
1.014	S09	30 Winter	100	+30%	30/15 Summer				142.205	1.016	0.000	1.06		430.0	SURCHARGED	
13.000	RWP9	30 Winter	100	+30%					142.129	-0.021	0.000	0.09		4.6	OK	
1.015	dummy mh5	30 Winter	100	+30%	30/15 Summer				142.121	1.006	0.000	1.11		437.9	SURCHARGED	
14.000	SDP4a	15 Summer	100	+30%					153.640	-0.160	0.000	0.45		249.9	OK	
14.001	SDP4b	15 Summer	100	+30%			2/15 Summer	54	148.695	-0.105	0.000	0.19	146.2	103.8	OK	
14.002	SDP4	15 Summer	100	+30%	30/15 Summer				142.369	0.069	0.000	1.31		103.9	SURCHARGED	
1.016	S10(V)	30 Winter	100	+30%	30/15 Summer				142.045	0.996	0.000	1.69		480.8	SURCHARGED	
15.000	SDP5a	15 Summer	100	+30%					153.720	-0.080	0.000	0.89		499.4	OK	
15.001	SDP5b	15 Summer	100	+30%	100/15 Summer		2/15 Summer	54	148.873	0.073	0.000	0.37	253.6	206.9	SURCHARGED	

Flood volumes contained within service yard

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
15.002	SDP5	15 Summer	100	+30%	30/15 Summer				142.472	0.022	0.000	1.19		206.8	SURCHARGED	
1.017	S11(V)	30 Winter	100	+30%	30/15 Summer				141.999	0.960	0.000	1.57		569.5	SURCHARGED	
1.018	S12	30 Winter	100	+30%	30/15 Winter				141.833	0.843	0.000	1.42		571.6	SURCHARGED	
16.000	RWP10	30 Winter	100	+30%	100/15 Summer				142.707	0.407	0.000	0.51		4.6	SURCHARGED	
16.001	S13	30 Winter	100	+30%	100/15 Summer				142.700	0.435	0.000	0.43		4.3	SURCHARGED	
17.000	RWP11	30 Winter	100	+30%	100/15 Summer				142.705	0.405	0.000	0.23		4.6	SURCHARGED	
16.002	dummy mh6	30 Winter	100	+30%	100/15 Summer				142.695	0.555	0.000	0.88		8.7	SURCHARGED	
18.000	RWP12	30 Winter	100	+30%	100/15 Summer				142.700	0.400	0.000	0.17		4.6	SURCHARGED	
16.003	S14	30 Winter	100	+30%	100/15 Summer				142.685	0.670	0.000	1.22		12.0	SURCHARGED	
19.000	RWP13	30 Winter	100	+30%	100/15 Summer				142.705	0.405	0.000	0.14		4.4	SURCHARGED	
16.004	dummy mh7	30 Winter	100	+30%	100/15 Summer				142.695	0.805	0.000	1.05		15.5	SURCHARGED	
20.000	RWP14	30 Winter	100	+30%	100/15 Summer				142.726	0.426	0.000	0.11		4.6	SURCHARGED	
16.005	S15	30 Winter	100	+30%	30/15 Winter				142.712	1.097	0.000	0.73		20.7	SURCHARGED	
21.000	RWP15	30 Winter	100	+30%	100/15 Summer				142.725	0.425	0.000	0.11		4.9	SURCHARGED	
16.006	dummy mh8	30 Winter	100	+30%	30/15 Summer				142.710	1.220	0.000	0.85		23.8	SURCHARGED	
22.000	RWP16	30 Winter	100	+30%	100/15 Summer				142.740	0.440	0.000	0.11		5.2	SURCHARGED	
16.007	S16	30 Winter	100	+30%	30/15 Summer				142.726	1.361	0.000	0.25		26.5	SURCHARGED	
23.000	RWP17	30 Winter	100	+30%	100/15 Summer				142.747	0.447	0.000	0.10		5.3	SURCHARGED	
16.008	dummy mh9	30 Winter	100	+30%	30/15 Summer				142.732	1.492	0.000	0.19		30.5	SURCHARGED	
24.000	RWP18	30 Winter	100	+30%	100/15 Summer				142.752	0.452	0.000	0.10		5.4	SURCHARGED	
16.009	S17	30 Winter	100	+30%	30/15 Summer				142.737	1.622	0.000	0.39		59.4	SURCHARGED	
25.000	SDP6a	15 Summer	100	+30%					153.636	-0.239	0.000	0.29		249.9	OK	
25.001	SDP6b	15 Summer	100	+30%			2/15 Summer	54	148.695	-0.180	0.000	0.12	146.3	103.8	OK	
25.002	SDP6	30 Winter	100	+30%	30/15 Summer				142.769	0.394	0.000	1.29		101.7	SURCHARGED	
16.010	S18(V)	30 Winter	100	+30%	30/15 Summer				142.742	1.702	0.000	0.52		81.9	SURCHARGED	
26.000	PPCP2	15 Winter	100	+30%	100/15 Summer	100/15 Summer			143.013	0.688	13.337	0.73		506.2	FLOOD	4
16.011	S19	30 Winter	100	+30%	30/15 Summer				142.646	1.696	0.000	1.45		439.4	SURCHARGED	
16.012	S20	30 Winter	100	+30%	30/15 Summer				142.473	1.599	0.000	1.90		433.9	SURCHARGED	
27.000	Office SDP7	15 Summer	100	+30%	30/15 Summer				143.880	0.430	0.000	3.00		26.6	SURCHARGED	
27.001	S21(V)	15 Summer	100	+30%	30/15 Summer				143.595	0.173	0.000	3.04		26.9	SURCHARGED	
27.002	RWHT	15 Summer	100	+30%					143.308	-0.097	0.000	0.27		27.2	OK	
16.013	S22	30 Winter	100	+30%	30/15 Summer				142.300	1.435	0.000	1.26		444.4	SURCHARGED	
28.000	Office SDP8	15 Summer	100	+30%	30/15 Summer				143.746	0.296	0.000	3.21		28.8	SURCHARGED	
16.014	S23(V)	30 Winter	100	+30%	30/15 Summer				142.081	1.361	0.000	1.44		454.4	SURCHARGED	
29.000	Office SDP9	15 Summer	100	+30%	30/15 Summer				143.681	0.231	0.000	1.84		28.8	SURCHARGED	
16.015	S24(V)	30 Winter	100	+30%	30/15 Summer				141.880	1.251	0.000	1.18		462.7	SURCHARGED	
30.000	OB01	15 Winter	100	+30%	30/15 Summer	100/15 Summer			143.444	0.794	44.482	1.00		241.1	FLOOD	6
30.001	S25	15 Winter	100	+30%	30/15 Summer	100/15 Summer			143.413	0.898	0.167	0.89		187.9	FLOOD	
30.002	S26	30 Summer	100	+30%	30/15 Summer	100/15 Winter			143.359	0.904	0.000	0.42		145.1	FLOOD RISK	
31.000	OB02	30 Winter	100	+30%	30/15 Summer	100/15 Summer			143.118	1.003	103.195	1.26		182.3	FLOOD	7
32.000	OB03	30 Winter	100	+30%	30/15 Summer	100/15 Summer			143.114	1.074	23.908	2.61		68.9	FLOOD	6
30.003	S27	30 Summer	100	+30%	30/15 Summer				143.230	1.252	0.000	1.04		263.9	FLOOD RISK	
33.000	OB04	15 Winter	100	+30%	30/15 Summer	100/15 Summer			143.958	0.853	27.657	2.16		318.4	FLOOD	5
33.001	S28	15 Winter	100	+30%	30/15 Summer				144.082	1.037	0.000	1.71		281.1	SURCHARGED	
33.002	S29	15 Winter	100	+30%	30/15 Winter				143.794	0.869	0.000	0.62		237.3	SURCHARGED	
30.004	S30	30 Summer	100	+30%	30/15 Summer				143.230	1.477	0.000	0.91		354.4	FLOOD RISK	
34.000	OB05	30 Winter	100	+30%	30/15 Summer	100/15 Summer			143.053	1.088	37.822	1.53		104.5	FLOOD	7
35.000	OB06	15 Winter	100	+30%	30/15 Summer	100/15 Summer			143.134	0.869	43.681	0.56		255.4	FLOOD	6
30.005	S31	15 Summer	100	+30%	30/15 Summer				143.158	1.555	0.000	1.48		542.0	FLOOD RISK	
36.000	OB07	15 Winter	100	+30%	30/15 Summer	100/15 Summer			143.031	1.066	16.596	1.11		102.5	FLOOD	5
37.000	OB08	15 Winter	100	+30%	100/15 Summer	100/15 Summer			143.102	0.837	11.786	0.63		332.7	FLOOD	4
30.006	S32	15 Winter	100	+30%	30/15 Summer				142.941	1.638	0.000	1.60		728.7	SURCHARGED	
30.007	S33	15 Winter	100	+30%	30/15 Summer				142.620	1.468	0.000	1.49		706.0	SURCHARGED	
38.000	OB09	15 Summer	100	+30%	100/15 Summer				142.612	0.497	0.000	1.66		327.4	SURCHARGED	
39.000	OB10	15 Summer	100	+30%	30/15 Summer				142.850	0.660	0.000	3.05		468.1	FLOOD RISK	
30.008	S34(BD)	15 Winter	100	+30%	30/15 Summer				142.262	1.294	0.000	3.01		1343.5	SURCHARGED	
30.009	FRS	30 Winter	100	+30%	30/15 Summer				142.031	1.074	0.000	2.75		1185.7	SURCHARGED	

Flood volumes contained within service yard

Flood volumes contained within HGV parking yard

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Date 09/06/2020 15:09
File NK020040_HOYLA_MICRO DRAINAGE DESIGN SURFACE WATER.MDX

Designed by rick.brewer
Checked by

Innovyze | Network 2019.1

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded	
40.000	RWP19	15 Summer	100	+30%					142.533	-0.117	0.000	0.11		5.6	OK		
41.000	RWP20	15 Summer	100	+30%					142.532	-0.118	0.000	0.10		5.6	OK		
30.010	S35	30 Winter	100	+30%	30/15 Summer				141.898	0.951	0.000	0.65		1188.6	SURCHARGED		
1.019	S36	30 Winter	100	+30%	30/15 Summer				141.666	1.191	0.000	1.98		2133.8	SURCHARGED		
42.000	OB12	15 Winter	100	+30%	30/15 Summer	100/15 Summer			142.380	0.905	5.489	1.24		72.9	FLOOD	4	Flood volumes contained within slot drains/kerb drain
42.001	S37	15 Summer	100	+30%	30/15 Summer				142.356	1.011	0.000	1.15		69.3	SURCHARGED		
43.000	OB13	15 Winter	100	+30%	100/15 Summer	100/15 Summer			142.388	0.838	12.975	1.02		282.9	FLOOD	4	
42.002	S38	15 Summer	100	+30%	30/15 Summer				142.162	0.982	0.000	1.39		320.4	SURCHARGED		
44.000	KO1	15 Winter	100	+30%	30/15 Summer	100/15 Summer			143.025	1.050	0.212	2.51		29.3	FLOOD	2	
45.000	OB14	15 Winter	100	+30%					141.885	-0.015	0.000	0.89		75.2	OK		
44.001	S39	15 Winter	100	+30%	100/15 Summer				141.800	0.015	0.000	0.63		96.1	SURCHARGED		
46.000	OB11	15 Summer	100	+30%	30/15 Summer				143.417	0.552	0.000	3.06		82.3	SURCHARGED		
42.003	S40(BD)	15 Winter	100	+30%	30/15 Summer				141.501	0.661	0.000	3.12		480.6	SURCHARGED		
42.004	By-Pass Separator	15 Winter	100	+30%	30/15 Winter				141.283	0.458	0.000	2.04		477.7	SURCHARGED		
42.005	S41	30 Winter	100	+30%	30/15 Winter				141.197	0.377	0.000	0.62		446.9	SURCHARGED		
1.020	S42	30 Winter	100	+30%	30/15 Summer				141.005	0.510	0.000	1.83		2576.7	SURCHARGED		
47.000	OB15	15 Winter	100	+30%	30/15 Summer	100/15 Summer			143.139	0.874	123.894	1.60		344.1	FLOOD	6	
47.001	S43	15 Winter	100	+30%	30/15 Summer				143.154	0.949	0.000	0.95		246.9	FLOOD RISK		Flood volumes contained within service yard
48.000	OB16	15 Winter	100	+30%	30/15 Summer	100/15 Summer			143.055	0.940	40.049	0.99		178.1	FLOOD	6	
47.002	S44	15 Summer	100	+30%	30/15 Summer				143.099	1.194	0.000	0.91		236.2	SURCHARGED		
49.000	OB17	15 Winter	100	+30%	30/15 Summer	100/15 Summer			143.035	0.920	20.284	0.71		198.7	FLOOD	5	
47.003	S45	15 Summer	100	+30%	30/15 Summer				143.055	1.450	0.000	1.40		343.7	SURCHARGED		
47.004	S46	15 Summer	100	+30%	30/15 Summer				142.924	1.469	0.000	1.36		343.2	SURCHARGED		
50.000	OB18	15 Summer	100	+30%	30/15 Summer	100/15 Summer			143.036	0.846	20.858	3.38		503.3	FLOOD	3	
51.000	OB19	15 Winter	100	+30%	30/15 Summer				142.864	0.519	0.000	2.77		69.3	SURCHARGED		
47.005	S47(BD)	15 Summer	100	+30%	30/15 Summer				142.697	1.427	0.000	1.98		684.5	SURCHARGED		
47.006	S48	15 Summer	100	+30%	30/15 Summer				142.054	0.949	0.000	1.84		655.5	SURCHARGED		
47.007	S49	30 Summer	100	+30%	30/15 Summer				141.273	0.383	0.000	2.94		661.1	SURCHARGED		
52.000	OB20	30 Winter	100	+30%	30/15 Summer	100/15 Summer			140.406	0.806	56.304	1.55		211.6	FLOOD	6	Flood volumes contained within HGV parking yard
52.001	S50	15 Winter	100	+30%	30/15 Summer				140.424	0.876	0.000	1.27		225.1	FLOOD RISK		
53.000	OB21	30 Winter	100	+30%	30/15 Summer	100/15 Summer			140.354	0.979	4.279	1.78		47.5	FLOOD	5	
54.000	OB22	15 Winter	100	+30%	30/15 Summer	100/15 Winter			140.550	0.975	0.433	2.65		71.8	FLOOD	3	
52.002	S51	15 Winter	100	+30%	30/15 Summer				140.345	1.030	0.000	2.23		338.3	SURCHARGED		
47.008	S52	30 Winter	100	+30%	30/15 Summer				140.276	1.069	0.000	1.61		872.9	SURCHARGED		
47.009	FRS	30 Winter	100	+30%	30/15 Summer				140.232	1.057	0.000	0.90		862.4	SURCHARGED		
55.000	RWP21	30 Winter	100	+30%	100/15 Summer				140.397	0.847	0.000	0.65		6.4	FLOOD RISK		
56.000	RWP22	30 Winter	100	+30%	100/15 Summer				140.386	0.836	0.000	0.52		6.9	FLOOD RISK		
55.001	S53	30 Winter	100	+30%	30/15 Summer				140.369	0.969	0.000	1.09		10.8	SURCHARGED		
57.000	OB23	15 Summer	100	+30%	100/15 Summer				140.480	0.185	0.000	1.67		40.2	SURCHARGED		
57.001	S54	15 Summer	100	+30%	100/15 Summer				140.395	0.125	0.000	1.62		39.5	SURCHARGED		
57.002	Forecourt Separator	30 Winter	100	+30%	100/15 Summer				140.340	0.085	0.000	1.31		30.3	SURCHARGED		
58.000	RWP23	30 Winter	100	+30%	100/15 Summer				140.376	0.826	0.000	0.73		6.7	FLOOD RISK		
59.000	RWP24	30 Winter	100	+30%	100/15 Summer				140.368	0.818	0.000	0.48		7.2	FLOOD RISK		
58.001	dummy mh	30 Winter	100	+30%	100/15 Summer				140.357	0.903	0.000	0.72		13.4	SURCHARGED		
55.002	S55	30 Winter	100	+30%	30/15 Summer				140.327	1.068	0.000	1.31		36.7	SURCHARGED		
55.003	S56	30 Winter	100	+30%	30/15 Summer				140.243	1.094	0.000	1.24		34.8	SURCHARGED		
47.010	S57	30 Winter	100	+30%	30/15 Summer				140.189	1.150	0.000	1.43		875.3	SURCHARGED		
47.011	S58	30 Winter	100	+30%	30/15 Summer				140.102	1.119	0.000	1.32		853.0	SURCHARGED		
47.012	S59	30 Winter	100	+30%	30/15 Summer				139.988	1.077	0.000	1.33		834.0	SURCHARGED		
1.021	S60(BD)(P)	30 Winter	100	+30%	30/15 Summer				139.907	1.060	0.000	2.51		3366.2	SURCHARGED		
60.000	RWP25	15 Summer	100	+30%					141.173	-0.127	0.000	0.06		0.6	OK		
61.000	RWP26	15 Summer	100	+30%					141.024	-0.126	0.000	0.06		0.6	OK		
1.022	S61	30 Winter	100	+30%	100/15 Summer				139.555	0.526	0.000	1.75		3319.5	SURCHARGED		
62.000	KO2	15 Summer	100	+30%					140.178	-0.072	0.000	0.54		36.7	OK		
1.023	S62	30 Winter	100	+30%	100/15 Summer				139.187	0.366	0.000	1.34		3247.7	SURCHARGED		
63.000	K03	15 Winter	100	+30%	30/15 Summer	100/15 Summer			140.503	1.053	3.147	1.55		75.1	FLOOD	3	
1.024	S63	30 Winter	100	+30%	100/15 Summer				138.970	0.275	0.000	1.52		3257.0	SURCHARGED		

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status	Level Exceeded
64.000	KO4	15 Summer	100	+30%	30/15 Summer				139.762	0.812	0.000	1.73		61.0	FLOOD RISK	
65.000	RWP28	15 Summer	100	+30%					139.573	-0.127	0.000	0.06		0.5	OK	
1.025	S64	30 Winter	100	+30%	30/30 Winter				138.807	0.261	0.000	1.61		3244.1	SURCHARGED	
66.000	KO5	15 Winter	100	+30%	30/15 Summer				141.352	0.752	0.000	2.16		18.5	FLOOD RISK	
66.001	S65	15 Winter	100	+30%	30/15 Summer				141.278	0.698	0.000	1.14		15.5	SURCHARGED	
67.000	K06	15 Winter	100	+30%	30/15 Summer				140.867	0.657	0.000	1.97		88.1	FLOOD RISK	
66.002	S66	15 Winter	100	+30%	100/15 Summer	100/15 Summer			140.728	0.538	2.916	0.93		79.2	FLOOD	2
68.000	KO7	15 Winter	100	+30%	30/15 Summer				140.833	0.823	0.000	1.41		30.5	FLOOD RISK	
66.003	S67	15 Winter	100	+30%	30/15 Summer				140.561	0.671	0.000	1.23		95.4	SURCHARGED	
69.000	KO8	15 Winter	100	+30%	30/15 Summer				139.918	0.413	0.000	0.75		31.6	SURCHARGED	
66.004	S68	15 Winter	100	+30%	30/15 Summer				139.884	0.469	0.000	2.35		112.3	SURCHARGED	
66.005	FRS	15 Winter	100	+30%	30/15 Summer				139.572	0.212	0.000	1.97		111.6	FLOOD RISK	
1.026	S69	30 Winter	100	+30%	100/15 Winter				138.654	0.167	0.000	2.84		3348.8	SURCHARGED	
70.000	G1	30 Winter	100	+30%	30/15 Summer				138.556	0.281	0.000	2.21		52.4	SURCHARGED	
1.027	dummy mh	30 Winter	100	+30%	100/15 Summer				138.527	0.277	0.000	1.99		3364.4	SURCHARGED	
71.000	OB24	15 Winter	100	+30%	30/15 Summer	100/15 Summer			143.114	0.904	3.919	1.93		105.0	FLOOD	3
71.001	S70	15 Winter	100	+30%	30/15 Summer	100/15 Summer			142.928	0.768	3.130	1.75		99.4	FLOOD	3
72.000	OB25	15 Summer	100	+30%	30/15 Summer				142.670	0.460	0.000	2.82		139.3	SURCHARGED	
71.002	S71	15 Winter	100	+30%	30/15 Summer				142.413	0.488	0.000	2.05		207.8	SURCHARGED	
73.000	OB26	15 Winter	100	+30%	30/15 Summer	100/15 Summer			142.310	0.900	0.075	2.78		232.2	FLOOD	1
71.003	S72	15 Winter	100	+30%	30/15 Summer				141.968	0.588	0.000	2.79		432.4	FLOOD RISK	
74.000	OB27	15 Winter	100	+30%	30/15 Summer				141.410	0.575	0.000	1.87		156.4	FLOOD RISK	
71.004	S73	15 Winter	100	+30%	30/15 Summer				141.290	0.485	0.000	2.53		562.7	FLOOD RISK	
75.000	OB28	15 Winter	100	+30%	30/15 Summer				140.813	0.528	0.000	1.44		119.2	FLOOD RISK	
71.005	S74	15 Winter	100	+30%	30/15 Summer				140.746	0.491	0.000	3.36		662.0	SURCHARGED	
71.006	By-Pass Separator	15 Winter	100	+30%	30/15 Summer				140.469	0.229	0.000	3.32		662.0	SURCHARGED	
71.007	S75(P)	15 Winter	100	+30%					139.828	-0.400	0.000	0.35		660.3	OK	
1.028	S76	30 Winter	100	+30%	100/30 Summer				138.415	0.193	0.000	1.40		3643.2	SURCHARGED	

Flood volumes contained within slot drains/kerb drain

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