



**PROPOSED DEVELOPMENT OF NEW LIDL STORE
AT BANKWOOD WAY, BIRSTALL**

DRAINAGE DESIGN REPORT

CLIENT LIDL IRELAND GMBH

PROJECT NO. 24185

DOCUMENT NO. 24185-SDS-XX-RP-C-0001-00

DATE SEPTEMBER 2024

REV. 00

DOCUMENT TITLE SHEET

Client:	Lidl Great Ltd
Project Description:	Development of Lidl store and retail store with ancillary works at Bankwood Way, Birstall
Project. No.	24185

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DOCUMENT CONTROL SHEET

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1. INTRODUCTION

1.1 Instruction

In conjunction with the appointed multi-disciplinary design team, SDS (Structural Design Solutions) Ltd, Design Engineers, have been requested by Lidl Great Britain Ltd, to prepare the 'Drainage Design Report' for the proposed development on a brownfield site for a Lidl Supermarket and retail store at Bankwood, Birstall. The Drainage report is to be read in conjunction with the Flood risk assessment ref: 09-148-DOC-001C by Beam Consulting.

1.2 Local Authority

The proposed site is located within the administrative jurisdiction of Kirklees Council.

1.3 Existing Development Details

The existing site consists of previously demolished buildings with associated car parking. The site area is 15167m² (1.5167 ha) and the previous development had 11609m² impermeable hardstanding and 1713m³ roof area. The remaining 1845m² is landscaping.

1.4 Site Location and Description

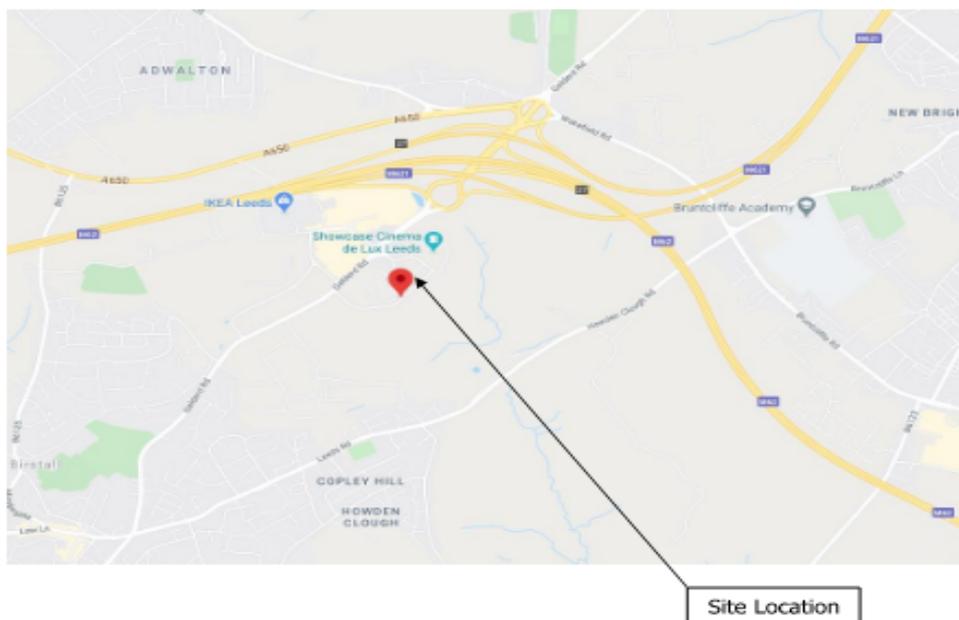


Figure 1.1 – Aerial image of the proposed development site (image courtesy of Google Maps)

1.5 Proposed Development

The proposed development will consist of the construction of a single storey, discount foodstore and retail store. Provision for car parking spaces, including electrical vehicle (EV) charging spaces and pre-wiring other spaces to accommodate future EV parking; cycle stands, trolley bay, hard and soft landscaping, and boundary treatments. Electrical substation building; site lighting; external mechanical plant area; roof mounted photovoltaic panels; all advertising at the main entrance.

Vehicular access/egress into the foodstore is from the Woodhead Road and Bankwood Way Figure 1.4 shows an extract of the proposed site layout plan for the new Lidl Store.

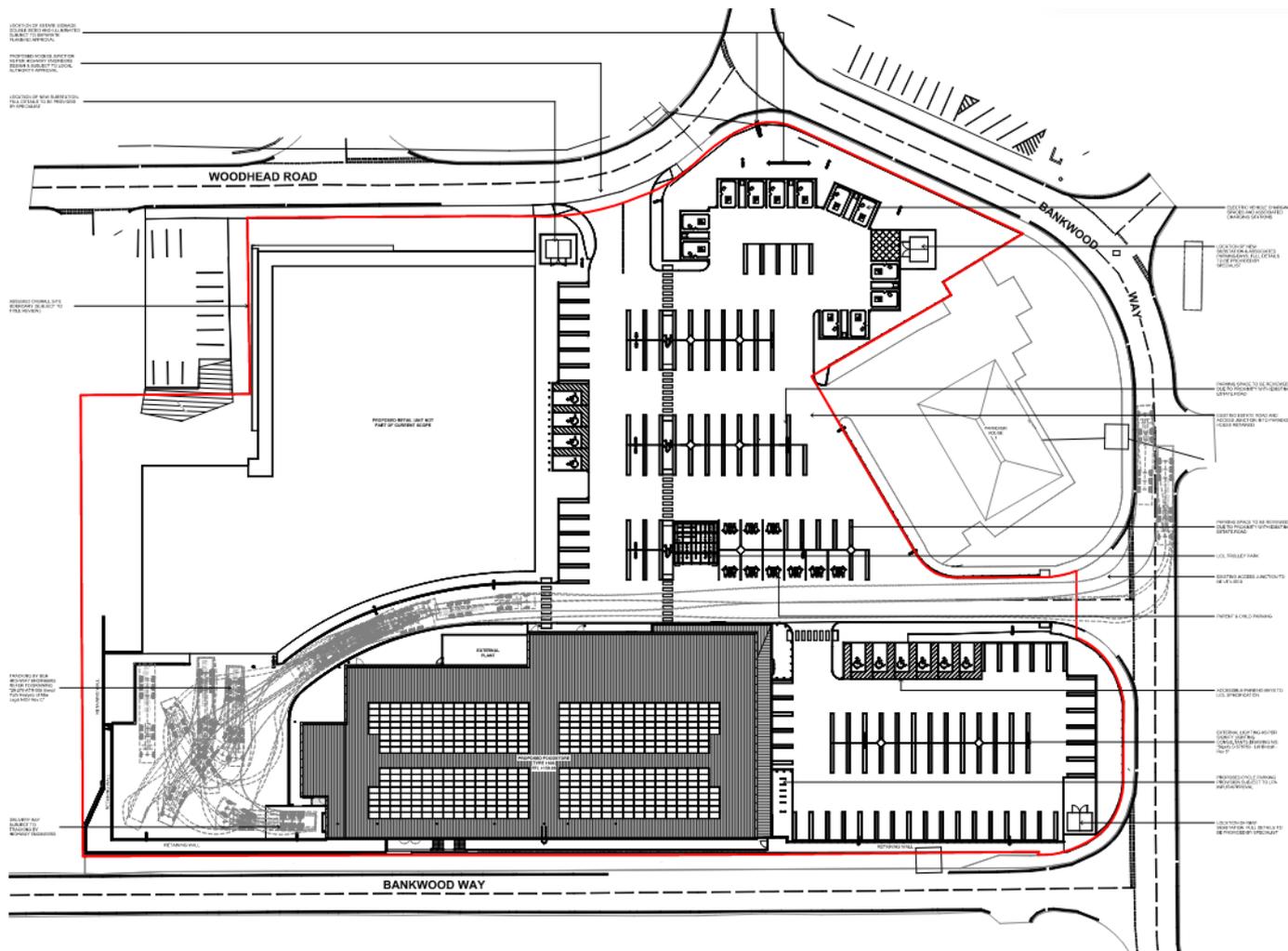


Figure 1.2 – Proposed site layout plan (Source: SMR Architects)

2.0 FLOOD RISK ASSESSMENT

Refer to Beam consulting report ref: 09-148-DOC-001C

3.0 SURFACE WATER STRATEGY

3.1 Introduction

The aim of any Sustainable urban Drainage Systems (SuDS) strategy is to ensure that a new development does not negatively affect the surrounding watercourse system, existing surface water network and groundwater system. The proposed SuDS strategy will aim to achieve this by using a variety of SuDS measures within the site. These measures include water interception, treatment, and attenuation. The proposed SuDS strategy will be established with the following steps:

1. The existing greenfield run-off of the development area will be calculated and used as the minimum benchmark for the SuDS design.
2. A host of SuDS features will be chosen based on their applicability and usage for the site.
3. A "MICRODRAINAGE" model will be created to analyse the rainfall on the site and the effectiveness of the proposed SuDS measures.
4. If effective, these SuDS measures will be implemented on the proposed site.
 - The surface water strategy for the proposed site was designed in accordance with the SUDS Manual (C754,2015), local authority guidelines and policies.

Beam consulting Engineers completed a drainage design as outlined in section 4 of the FRA ref: 09-148-DOC-001C. This was submitted in support of planning grant 2021/62/92528/E. Due to minor carpark and building alterations from the approved layout SDS Designers have completed and updated design as detailed in Appendix A.

3.2 Surface Water Network

The site formerly housed 9no office buildings and associated car parks developed in the 1990s, which have been demolished. The surface water system is understood to have comprised of underground pipes and discharged into either the public sewer on the north side of the site in Bankwood Way or the culvert that runs across the site. No evidence of attenuation has been found on site. It is proposed to discharge to the culvert crossing the site for the new development. The proposed surface water drainage system will include on site attenuation and interceptor, prior to connecting into the flow control manhole.

The total site area is 15,167m² and will comprise a total impermeable area of 12,400m². Based on the existing surface water discharge rate of 185.2 litre/sec less 30% for betterment this gives an allowable total discharge of 129.6 litre/sec, to be limited by a flow control. Based on 1 in 100 year rainfall and 30% allowance for climate change a total of 285m³ on site attenuation is required. Attenuation for the 1 in 100 year rainfall and 30% allowance for climate change can be provided using a traditional attenuation system located within the car parking/road areas of the development. The 30% climate change allowance will ensure that the proposed development drainage system can cope with future predicted rainfall increase. See Appendix B for calculations.

3.3 FOUL WATER DRAINAGE

The existing foul water system is understood to have comprised of underground pipes and discharged into the public sewer on the north side of the site in Bankwood Way. It is proposed to discharge to the same public sewers for the new development.

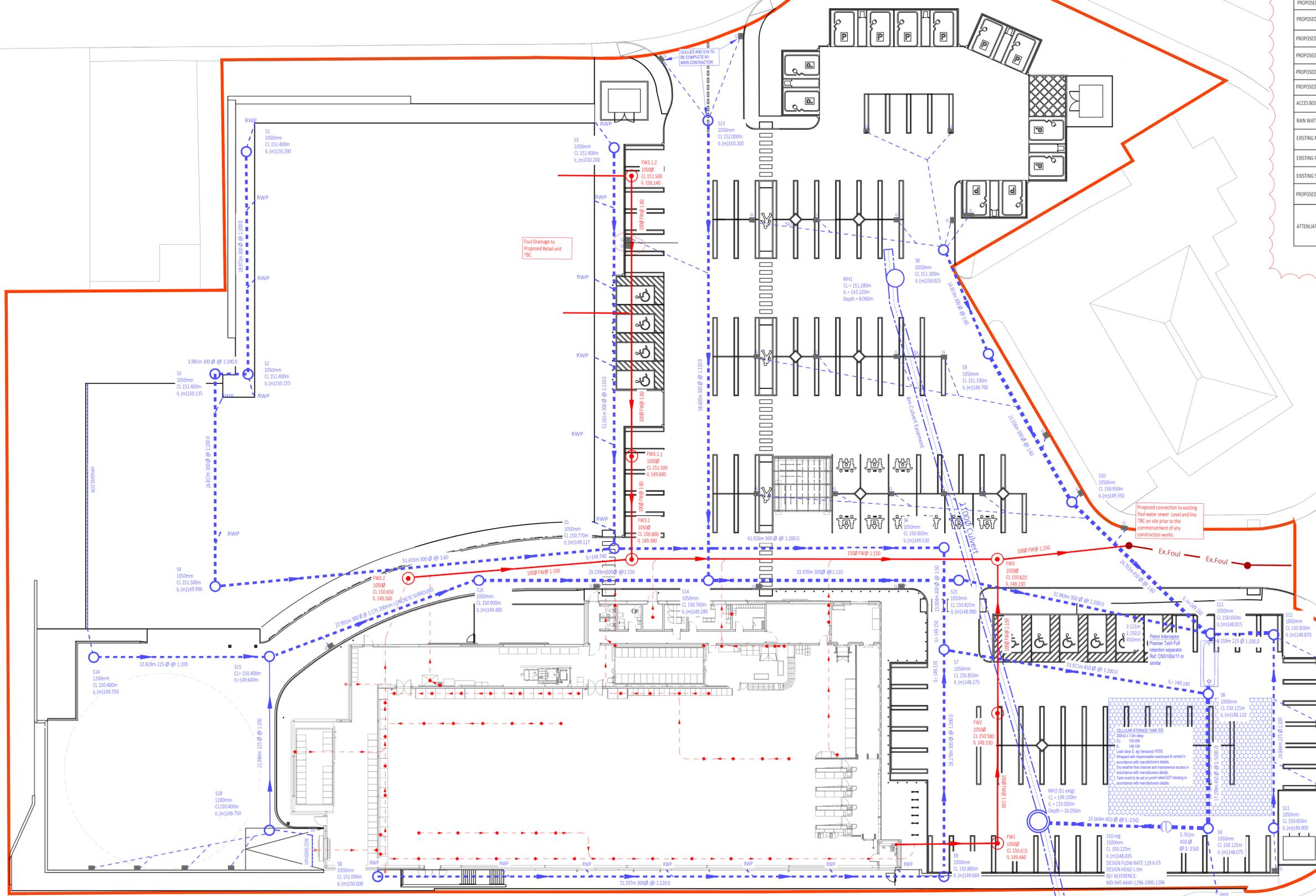
It is proposed to install a new foul water system for the proposed new Lidl store and retail store. The foul drainage will comprise underground piped drainage and will discharge into the public sewer on Bankwood Way.

The detailed drainage scheme, drawing numbers 24185-3021-T4 in Appendix A indicates the proposed layout.

APPENDIX A – DRAINAGE LAYOUT



LEGEND - PROPOSED SITE DRAINAGE	
ELEMENT	SHOWN AS
PROPOSED FOUL DRAINAGE EXTERNAL 150mm Ø	
PROPOSED SW & FW PC RING MANHOLE	
PROPOSED SW DRAIN	
PROPOSED GULLY CONNECTION 150mm DIAMETER	
PROPOSED ACO CHANNEL	
PROPOSED SLOT CHANNEL	
ACCESS BOX FOR SLOT CHANNEL	
RAIN WATER PIPE	
EXISTING MANHOLES (FOUL & SURFACE)	
EXISTING FOUL WATER	
EXISTING SURFACE WATER	
PROPOSED GULLY	
ATTENUATION TANK	



CELLULAR STORAGE TANK S15
 3000 x 3000 mm
 CL 150.000
 IL 149.100
 100mm dia
 100mm dia
 Load shall be 10kg Vertical/YES.
 1) Wrapped with impermeable membrane & vented in accordance with manufacturers details.
 2) Dry weather flow channel and maintenance access in accordance with manufacturers details.
 3) Tank needs to be set on good stable DOT bedding in accordance with manufacturers details.

PROPOSED SITE LAYOUT PLAN
 SCALE: 1:250

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DRAWING NOTES:

- This Drawing is to be read in conjunction with the relevant Specifications & other Architectural & Engineering Drawings. Engineers to be informed immediately of any discrepancies before work proceeds.
- Do Not Scale from this Drawing. -Metric Figure Dimension only are to be used.
- It is "The Contractors" responsibility to ensure that all works are carried out in accordance with the requirements of the current Building Regulations and all other statutory documents relevant to this project including the grant of planning permission, Fire Safety Certificate and Disability Access Certificate.
- SDS (Structural Design Solutions) Ltd / SDS-UK (Structural Design Solutions) Ltd. bear no liability for unilateral changes/modifications made during the course of construction based on the drawing prepared, without prior consultation and confirmation of acceptance of the revision by SDS (Structural Design Solutions) Ltd / SDS-UK (Structural Design Solutions) Ltd.

REV.	DATE	BY	DESCRIPTION
T4	02.10.2024	ALN	DRAINAGE UPDATED
T3	07.08.2024	JPM	DRAINAGE UPDATED
T2	22.07.2024	JAC	ISSUED FOR CONSTRUCTION
T1	17.07.2024	JAC	ISSUED FOR CONSTRUCTION

REV.	DATE	BY	DESCRIPTION
T4	02.10.2024	ALN	DRAINAGE UPDATED
T3	07.08.2024	JPM	DRAINAGE UPDATED
T2	22.07.2024	JAC	ISSUED FOR CONSTRUCTION
T1	17.07.2024	JAC	ISSUED FOR CONSTRUCTION

Client: **LIDL GB**

Project Title: **PROPOSED NEW LIDL BIRSTALL, BANKWOOD WAY BIRSTALL, UK**

Drawing Title: **SITE LAYOUT FOUL SEWER & SURFACE WATER LAYOUT**

Scale: 1:250

Drawn by: JAC

Date: JULY 2024

Checked: AM

Project No: 24185-SDS-00-SL-DR-C-3021

Revision: T4

Scale: 1:250

Paper Size: A1

Status: TENDER

Drawn by: JAC

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Revision: T4

APPENDIX B – DESIGN CALCULATIONS

SDS		Page 1
Structural & Civil Engineers Unit 9, N5 Business Park, Ca... Co. Mayo, Mayo, Ireland	Birstall Network Simulation 1, 30 & 100+30%CC Events	
Date 30/09/2024 22:53 File Birstall Network Model.MDX	Designed by MM Checked by JM	
Innovyze	Network 2020.1	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

« - Indicates pipe capacity < flow

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	28.972	0.135	214.6	0.134	5.00	0.0	0.003	o	300	Pipe/Conduit	
S1.001	3.985	0.020	199.3	0.000	0.00	0.0	0.003	o	300	Pipe/Conduit	
S1.002	26.817	0.139	192.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.003	51.435	0.879	58.5	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S2.000	51.561	0.460	112.1	0.134	5.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	41.926	0.210	199.6	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.005	13.004	0.255	51.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S3.000	72.297	0.331	218.4	0.254	5.00	0.0	0.600	o	300	Pipe/Conduit	
S3.001	28.278	0.136	207.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.006	33.911	0.165	205.5	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S4.000	14.653	0.251	58.4	0.277	5.00	0.0	0.600	o	300	Pipe/Conduit	
S4.001	21.556	0.369	58.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.002	24.703	0.422	58.5	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)	E I.Area (ha)	E Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.34	150.290	0.134	0.0	0.0	0.0	1.42	100.1	18.1
S1.001	50.00	5.39	150.155	0.134	0.0	0.0	0.0	1.47	104.2	18.1
S1.002	50.00	5.78	150.135	0.134	0.0	0.0	0.0	1.13	79.8	18.1
S1.003	50.00	6.20	149.996	0.134	0.0	0.0	0.0	2.06	145.6	18.1
S2.000	50.00	5.58	150.200	0.134	0.0	0.0	0.0	1.48	104.9	18.1
S1.004	50.00	6.83	149.740	0.268	0.0	0.0	0.0	1.11	78.4	36.3
S1.005	50.00	6.93	149.530	0.268	0.0	0.0	0.0	2.21	156.0	36.3
S3.000	50.00	6.14	150.000	0.254	0.0	0.0	0.0	1.06	74.9	34.4
S3.001	50.00	6.57	149.669	0.254	0.0	0.0	0.0	1.09	76.8	34.4
S1.006	50.00	7.33	148.275	0.522	0.0	0.0	0.0	1.41	224.9	70.7
S4.000	50.00	5.12	150.025	0.277	0.0	0.0	0.0	2.06	145.7	37.5
S4.001	50.00	5.29	149.760	0.277	0.0	0.0	0.0	2.06	145.7	37.5
S4.002	50.00	5.45	149.350	0.277	0.0	0.0	0.0	2.66	423.3	37.5

SDS		Page 2
Structural & Civil Engineers Unit 9, N5 Business Park, Ca... Co. Mayo, Mayo, Ireland	Birstall Network Simulation 1, 30 & 100+30%CC Events	
Date 30/09/2024 22:53 File Birstall Network Model.MDX	Designed by MM Checked by JM	
Innovyze	Network 2020.1	

STORM SEWER DESIGN by the Modified Rational Method

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S5.000	24.844	0.130	191.1	0.180	5.00	0.0	0.600	o	225	Pipe/Conduit	
S5.001	8.159	0.045	181.3	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
S6.000	58.605	0.520	112.7	0.081	5.00	0.0	0.600	o	300	Pipe/Conduit	
S7.000	22.828	0.110	207.5	0.055	5.00	0.0	0.600	o	225	Pipe/Conduit	
S8.000	21.986	0.110	199.9	0.125	5.00	0.0	0.600	o	225	Pipe/Conduit	
S7.001	27.991	0.160	174.9	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S7.002	29.239	0.200	146.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.001	32.470	0.300	108.2	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S6.002	32.969	0.165	199.8	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.003	7.409	0.200	37.0	0.000	0.00	0.0	0.600	o	375	Pipe/Conduit	
S1.007	17.299	0.035	494.3	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.008	5.762	0.040	144.1	0.000	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.009	15.564	0.105	148.2	0.000	0.00	0.0	0.003	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)
S5.000	50.00	5.44	149.000	0.180	0.0	0.0	0.0	0.94	37.5	24.4
S5.001	50.00	5.58	148.870	0.180	0.0	0.0	0.0	0.97	38.5	24.4
S6.000	50.00	5.66	150.200	0.081	0.0	0.0	0.0	1.48	104.6	11.0
S7.000	50.00	5.42	149.750	0.055	0.0	0.0	0.0	0.90	35.9	7.4
S8.000	50.00	5.40	149.750	0.125	0.0	0.0	0.0	0.92	36.6	16.9
S7.001	50.00	5.81	149.640	0.180	0.0	0.0	0.0	1.19	83.8	24.4
S7.002	50.00	6.19	149.480	0.180	0.0	0.0	0.0	1.30	91.8	24.4
S6.001	50.00	6.55	149.280	0.261	0.0	0.0	0.0	1.51	106.8	35.3
S6.002	50.00	7.04	148.980	0.261	0.0	0.0	0.0	1.11	78.4	35.3
S4.003	50.00	7.09	148.825	0.718	0.0	0.0	0.0	2.99	329.7	97.2
S1.007	50.00	7.64	148.110	1.240	0.0	0.0	0.0	0.91	144.4	167.9
S1.008	50.00	7.70	148.075	1.240	0.0	0.0	0.0	1.69	269.1	167.9
S1.009	50.00	7.82	148.035	1.240	0.0	0.0	0.0	2.25	357.7	167.9

Structual & Civil Engineers
 Unit 9, N5 Business Park, Ca...
 Co. Mayo, Mayo, Ireland

Birstall Network Simulation
 1, 30 & 100+30%CC Events



Date 30/09/2024 22:53
 File Birstall Network Model.MDX

Designed by MM
 Checked by JM

Innovyze Network 2020.1

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S1	151.400	1.110	Open Manhole	1500	S1.000	150.290	300				
S2	151.400	1.245	Open Manhole	1500	S1.001	150.155	300	S1.000	150.155	300	
S3	151.400	1.265	Open Manhole	1500	S1.002	150.135	300	S1.001	150.135	300	
S4	151.500	1.504	Open Manhole	1500	S1.003	149.996	300	S1.002	149.996	300	
S5	151.400	1.200	Open Manhole	1500	S2.000	150.200	300				
S5	150.770	1.653	Open Manhole	1500	S1.004	149.740	300	S1.003	149.117	300	
								S2.000	149.740	300	
S6	150.850	1.320	Open Manhole	1500	S1.005	149.530	300	S1.004	149.530	300	
S8	151.000	1.000	Open Manhole	1500	S3.000	150.000	300				
S9	150.880	1.211	Open Manhole	1500	S3.001	149.669	300	S3.000	149.669	300	
S7	150.850	2.575	Open Manhole	2000	S1.006	148.275	450	S1.005	149.275	300	850
								S3.001	149.533	300	1108
S8	151.300	1.275	Open Manhole	1500	S4.000	150.025	300				
S9	151.330	1.570	Open Manhole	1500	S4.001	149.760	300	S4.000	149.774	300	14
S10	150.950	1.600	Open Manhole	2000	S4.002	149.350	450	S4.001	149.391	300	
S11	150.850	1.850	Open Manhole	1500	S5.000	149.000	225				
S12	150.850	1.980	Open Manhole	1500	S5.001	148.870	225	S5.000	148.870	225	
S13	152.000	1.800	Open Manhole	1500	S6.000	150.200	300				
S14	150.400	0.650	Open Manhole	1500	S7.000	149.750	225				
S18	150.400	0.650	Open Manhole	1500	S8.000	149.750	225				
S15	150.400	0.760	Open Manhole	1500	S7.001	149.640	300	S7.000	149.640	225	
								S8.000	149.640	225	
S16	150.900	1.420	Open Manhole	1500	S7.002	149.480	300	S7.001	149.480	300	
S14	150.760	1.480	Open Manhole	1500	S6.001	149.280	300	S6.000	149.680	300	400
								S7.002	149.280	300	
S15	150.825	1.845	Open Manhole	1500	S6.002	148.980	300	S6.001	148.980	300	
S11	150.650	1.835	Open Manhole	2000	S4.003	148.825	375	S4.002	148.928	450	178
								S5.001	148.825	225	
								S6.002	148.815	300	
S8	150.125	2.015	Open Manhole	2000	S1.007	148.110	450	S1.006	148.110	450	
								S4.003	148.625	375	440
S9	150.125	2.050	Open Manhole	2000	S1.008	148.075	450	S1.007	148.075	450	
S10	150.225	2.190	Open Manhole	2000	S1.009	148.035	450	S1.008	148.035	450	
S	150.100	2.170	Open Manhole	0		OUTFALL		S1.009	147.930	450	

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Birstall Network Simulation
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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	423637.945	427421.545	423637.945	427421.545	Required	
S2	423659.436	427402.116	423659.436	427402.116	Required	
S3	423656.740	427399.181	423656.740	427399.181	Required	
S4	423676.567	427381.125	423676.567	427381.125	Required	
S5	423669.138	427456.690	423669.138	427456.690	Required	
S5	423707.489	427422.227	423707.489	427422.227	Required	
S6	423735.553	427453.376	423735.553	427453.376	Required	
S8	423717.521	427372.521	423717.521	427372.521	Required	
S9	423766.326	427425.858	423766.326	427425.858	Required	
S7	423745.233	427444.693	423745.233	427444.693	Required	
S8	423707.414	427479.076	423707.414	427479.076	Required	
S9	423721.304	427474.409	423721.304	427474.409	Required	
S10	423742.249	427469.309	423742.249	427469.309	Required	
S11	423790.636	427460.584	423790.636	427460.584	Required	
S12	423772.253	427477.296	423772.253	427477.296	Required	

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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S13	423675.059	427467.799	423675.059	427467.799	Required	
S14	423672.750	427363.573	423672.750	427363.573	Required	
S18	423704.072	427365.486	423704.072	427365.486	Required	
S15	423688.037	427380.527	423688.037	427380.527	Required	
S16	423698.321	427406.561	423698.321	427406.561	Required	
S14	423718.135	427428.062	423718.135	427428.062	Required	
S15	423740.000	427452.067	423740.000	427452.067	Required	
S11	423766.882	427471.154	423766.882	427471.154	Required	
S8	423771.872	427465.677	423771.872	427465.677	Required	
S9	423785.011	427454.425	423785.011	427454.425	Required	
S10	423780.828	427450.462	423780.828	427450.462	Required	
S	423770.021	427439.262			No Entry	

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	o	300	S1	151.400	150.290	0.810	Open Manhole	1500
S1.001	o	300	S2	151.400	150.155	0.945	Open Manhole	1500
S1.002	o	300	S3	151.400	150.135	0.965	Open Manhole	1500
S1.003	o	300	S4	151.500	149.996	1.204	Open Manhole	1500
S2.000	o	300	S5	151.400	150.200	0.900	Open Manhole	1500
S1.004	o	300	S5	150.770	149.740	0.730	Open Manhole	1500
S1.005	o	300	S6	150.850	149.530	1.020	Open Manhole	1500
S3.000	o	300	S8	151.000	150.000	0.700	Open Manhole	1500
S3.001	o	300	S9	150.880	149.669	0.911	Open Manhole	1500
S1.006	o	450	S7	150.850	148.275	2.125	Open Manhole	2000
S4.000	o	300	S8	151.300	150.025	0.975	Open Manhole	1500
S4.001	o	300	S9	151.330	149.760	1.270	Open Manhole	1500
S4.002	o	450	S10	150.950	149.350	1.150	Open Manhole	2000
S5.000	o	225	S11	150.850	149.000	1.625	Open Manhole	1500
S5.001	o	225	S12	150.850	148.870	1.755	Open Manhole	1500

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S1.000	28.972	214.6	S2	151.400	150.155	0.945	Open Manhole	1500
S1.001	3.985	199.3	S3	151.400	150.135	0.965	Open Manhole	1500
S1.002	26.817	192.9	S4	151.500	149.996	1.204	Open Manhole	1500
S1.003	51.435	58.5	S5	150.770	149.117	1.353	Open Manhole	1500
S2.000	51.561	112.1	S5	150.770	149.740	0.730	Open Manhole	1500
S1.004	41.926	199.6	S6	150.850	149.530	1.020	Open Manhole	1500
S1.005	13.004	51.0	S7	150.850	149.275	1.275	Open Manhole	2000
S3.000	72.297	218.4	S9	150.880	149.669	0.911	Open Manhole	1500
S3.001	28.278	207.9	S7	150.850	149.533	1.017	Open Manhole	2000
S1.006	33.911	205.5	S8	150.125	148.110	1.565	Open Manhole	2000
S4.000	14.653	58.4	S9	151.330	149.774	1.256	Open Manhole	1500
S4.001	21.556	58.4	S10	150.950	149.391	1.259	Open Manhole	2000
S4.002	24.703	58.5	S11	150.650	148.928	1.272	Open Manhole	2000
S5.000	24.844	191.1	S12	150.850	148.870	1.755	Open Manhole	1500
S5.001	8.159	181.3	S11	150.650	148.825	1.600	Open Manhole	2000

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S6.000	o	300	S13	152.000	150.200	1.500	Open Manhole	1500
S7.000	o	225	S14	150.400	149.750	0.425	Open Manhole	1500
S8.000	o	225	S18	150.400	149.750	0.425	Open Manhole	1500
S7.001	o	300	S15	150.400	149.640	0.460	Open Manhole	1500
S7.002	o	300	S16	150.900	149.480	1.120	Open Manhole	1500
S6.001	o	300	S14	150.760	149.280	1.180	Open Manhole	1500
S6.002	o	300	S15	150.825	148.980	1.545	Open Manhole	1500
S4.003	o	375	S11	150.650	148.825	1.450	Open Manhole	2000
S1.007	o	450	S8	150.125	148.110	1.565	Open Manhole	2000
S1.008	o	450	S9	150.125	148.075	1.600	Open Manhole	2000
S1.009	o	450	S10	150.225	148.035	1.740	Open Manhole	2000

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
S6.000	58.605	112.7	S14	150.760	149.680	0.780	Open Manhole	1500
S7.000	22.828	207.5	S15	150.400	149.640	0.535	Open Manhole	1500
S8.000	21.986	199.9	S15	150.400	149.640	0.535	Open Manhole	1500
S7.001	27.991	174.9	S16	150.900	149.480	1.120	Open Manhole	1500
S7.002	29.239	146.2	S14	150.760	149.280	1.180	Open Manhole	1500
S6.001	32.470	108.2	S15	150.825	148.980	1.545	Open Manhole	1500
S6.002	32.969	199.8	S11	150.650	148.815	1.535	Open Manhole	2000
S4.003	7.409	37.0	S8	150.125	148.625	1.125	Open Manhole	2000
S1.007	17.299	494.3	S9	150.125	148.075	1.600	Open Manhole	2000
S1.008	5.762	144.1	S10	150.225	148.035	1.740	Open Manhole	2000
S1.009	15.564	148.2	S	150.100	147.930	1.720	Open Manhole	0

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.134	0.134	0.134
1.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.134	0.134	0.134
1.004	-	-	100	0.000	0.000	0.000
1.005	-	-	100	0.000	0.000	0.000
3.000	-	-	100	0.254	0.254	0.254
3.001	-	-	100	0.000	0.000	0.000
1.006	-	-	100	0.000	0.000	0.000
4.000	-	-	100	0.277	0.277	0.277
4.001	-	-	100	0.000	0.000	0.000
4.002	-	-	100	0.000	0.000	0.000
5.000	-	-	100	0.180	0.180	0.180
5.001	-	-	100	0.000	0.000	0.000
6.000	-	-	100	0.081	0.081	0.081
7.000	-	-	100	0.055	0.055	0.055
8.000	-	-	100	0.125	0.125	0.125
7.001	-	-	100	0.000	0.000	0.000
7.002	-	-	100	0.000	0.000	0.000
6.001	-	-	100	0.000	0.000	0.000
6.002	-	-	100	0.000	0.000	0.000
4.003	-	-	100	0.000	0.000	0.000
1.007	-	-	100	0.000	0.000	0.000
1.008	-	-	100	0.000	0.000	0.000
1.009	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				1.240	1.240	1.240

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)
S1.009	S	150.100	147.930	0.000	0	0

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S10, DS/PN: S1.009, Volume (m³): 7.5

Unit Reference	MD-SHE-0440-1296-1000-1296
Design Head (m)	1.000
Design Flow (l/s)	129.6
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	440
Invert Level (m)	148.035
Minimum Outlet Pipe Diameter (mm)	500
Suggested Manhole Diameter (mm)	Site Specific Design (Contact Hydro International)

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	129.5
Flush-Flo™	0.597	129.4
Kick-Flo®	0.874	121.3
Mean Flow over Head Range	-	95.9

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

Depth (m)	Flow (l/s)						
0.100	11.7	1.200	141.5	3.000	221.4	7.000	335.6
0.200	42.3	1.400	152.6	3.500	238.8	7.500	347.2
0.300	83.7	1.600	162.8	4.000	254.9	8.000	358.4
0.400	123.9	1.800	172.5	4.500	270.1	8.500	369.3
0.500	128.2	2.000	181.6	5.000	284.4	9.000	379.8
0.600	129.4	2.200	190.2	5.500	298.1	9.500	390.0
0.800	125.1	2.400	198.5	6.000	311.1		
1.000	129.5	2.600	206.4	6.500	323.6		

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Storage Structures for Storm

Tank or Pond Manhole: S9, DS/PN: S1.008

Invert Level (m) 148.075

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	316.0	1.000	316.0	1.001	0.0

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 30.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.300
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 17.000 Cv (Winter) 0.840

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

Profile(s) Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
 720, 960, 1440

Return Period(s) (years) 1, 30, 100

Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	15 Winter	1	+0%	100/15 Winter			
S1.001	S2	15 Winter	1	+0%	100/15 Winter			
S1.002	S3	15 Winter	1	+0%	100/15 Winter			
S1.003	S4	15 Winter	1	+0%	100/15 Winter			
S2.000	S5	15 Winter	1	+0%				
S1.004	S5	15 Winter	1	+0%	30/15 Winter			
S1.005	S6	15 Winter	1	+0%				
S3.000	S8	15 Winter	1	+0%	30/15 Winter	100/15 Winter		
S3.001	S9	15 Winter	1	+0%	30/15 Winter			
S1.006	S7	15 Winter	1	+0%	30/15 Winter			
S4.000	S8	15 Winter	1	+0%	100/15 Winter			
S4.001	S9	15 Winter	1	+0%	100/15 Winter			
S4.002	S10	15 Winter	1	+0%				
S5.000	S11	15 Winter	1	+0%	30/15 Winter			
S5.001	S12	15 Winter	1	+0%	30/15 Winter			
S6.000	S13	15 Winter	1	+0%				
S7.000	S14	15 Winter	1	+0%	100/15 Winter			
S8.000	S18	15 Winter	1	+0%	30/15 Winter	100/15 Winter		
S7.001	S15	15 Winter	1	+0%	100/15 Winter			
S7.002	S16	15 Winter	1	+0%	100/15 Winter			

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

PN	US/MH Name	Water	Surcharged	Flooded	Half Drain		Pipe	Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m ³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)		
S1.000	S1	150.386	-0.204	0.000	0.22		18.3	OK	
S1.001	S2	150.276	-0.179	0.000	0.34		18.3	OK	
S1.002	S3	150.238	-0.197	0.000	0.25		18.2	OK	
S1.003	S4	150.068	-0.228	0.000	0.13		18.0	OK	
S2.000	S5	150.288	-0.212	0.000	0.18		18.3	OK	
S1.004	S5	149.886	-0.154	0.000	0.47		34.0	OK	
S1.005	S6	149.636	-0.194	0.000	0.27		34.3	OK	
S3.000	S8	150.149	-0.151	0.000	0.46		32.9	OK	1
S3.001	S9	149.814	-0.155	0.000	0.47		32.8	OK	
S1.006	S7	148.599	-0.126	0.000	0.34		66.5	OK	
S4.000	S8	150.142	-0.183	0.000	0.31		38.3	OK	
S4.001	S9	149.873	-0.187	0.000	0.30		38.2	OK	
S4.002	S10	149.449	-0.351	0.000	0.11		38.6	OK	
S5.000	S11	149.144	-0.081	0.000	0.71		24.7	OK	
S5.001	S12	149.045	-0.050	0.000	0.79		23.6	OK	
S6.000	S13	150.267	-0.233	0.000	0.11		11.3	OK	
S7.000	S14	149.824	-0.151	0.000	0.23		7.5	OK	
S8.000	S18	149.866	-0.109	0.000	0.51		17.1	OK	2
S7.001	S15	149.757	-0.183	0.000	0.32		24.1	OK	
S7.002	S16	149.590	-0.190	0.000	0.29		24.0	OK	

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1 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)
S6.001	S14	15 Winter	1	+0%	30/15 Winter				149.402
S6.002	S15	15 Winter	1	+0%	30/15 Winter				149.126
S4.003	S11	15 Winter	1	+0%	30/15 Winter				149.018
S1.007	S8	15 Winter	1	+0%	1/15 Winter				148.568
S1.008	S9	60 Winter	1	+0%	30/30 Winter				148.285
S1.009	S10	60 Winter	1	+0%	30/30 Winter				148.272

PN	US/MH Name	Surcharged Flooded			Half Drain Pipe		Status	Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Time (mins)		
S6.001	S14	-0.178	0.000	0.35			34.1	OK
S6.002	S15	-0.154	0.000	0.47			33.8	OK
S4.003	S11	-0.182	0.000	0.52			91.5	OK
S1.007	S8	0.008	0.000	1.62			153.7	SURCHARGED
S1.008	S9	-0.240	0.000	0.36			56.8	OK
S1.009	S10	-0.213	0.000	0.31			56.9	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 Additional Flow - % of Total Flow 30.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.300
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 17.000 Cv (Winter) 0.840

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

Profile(s)

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
 720, 960, 1440
 Return Period(s) (years) 1, 30, 100
 Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	15 Winter	30	+0%	100/15 Winter			
S1.001	S2	15 Winter	30	+0%	100/15 Winter			
S1.002	S3	15 Winter	30	+0%	100/15 Winter			
S1.003	S4	15 Winter	30	+0%	100/15 Winter			
S2.000	S5	15 Winter	30	+0%				
S1.004	S5	15 Winter	30	+0%	30/15 Winter			
S1.005	S6	15 Winter	30	+0%				
S3.000	S8	15 Winter	30	+0%	30/15 Winter	100/15 Winter		
S3.001	S9	15 Winter	30	+0%	30/15 Winter			
S1.006	S7	15 Winter	30	+0%	30/15 Winter			
S4.000	S8	15 Winter	30	+0%	100/15 Winter			
S4.001	S9	15 Winter	30	+0%	100/15 Winter			
S4.002	S10	15 Winter	30	+0%				
S5.000	S11	15 Winter	30	+0%	30/15 Winter			
S5.001	S12	15 Winter	30	+0%	30/15 Winter			
S6.000	S13	15 Winter	30	+0%				
S7.000	S14	15 Winter	30	+0%	100/15 Winter			
S8.000	S18	15 Winter	30	+0%	30/15 Winter	100/15 Winter		
S7.001	S15	15 Winter	30	+0%	100/15 Winter			
S7.002	S16	15 Winter	30	+0%	100/15 Winter			

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

PN	US/MH Name	Water	Surcharged	Flooded	Half Drain		Pipe Flow (l/s)	Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)		
S1.000	S1	150.448	-0.142	0.000	0.53		44.6	OK
S1.001	S2	150.366	-0.089	0.000	0.84		44.6	OK
S1.002	S3	150.307	-0.128	0.000	0.62		44.2	OK
S1.003	S4	150.144	-0.152	0.000	0.31		42.1	OK
S2.000	S5	150.343	-0.157	0.000	0.45		44.5	OK
S1.004	S5	150.060	0.020	0.000	1.07		78.0	SURCHARGED
S1.005	S6	149.701	-0.129	0.000	0.61		77.4	OK
S3.000	S8	150.380	0.080	0.000	1.09		78.1	SURCHARGED
S3.001	S9	149.969	0.000	0.000	1.03		71.6	SURCHARGED
S1.006	S7	148.967	0.242	0.000	0.77		150.5	SURCHARGED
S4.000	S8	150.226	-0.099	0.000	0.77		93.3	OK
S4.001	S9	149.954	-0.106	0.000	0.73		92.8	OK
S4.002	S10	149.508	-0.292	0.000	0.27		93.9	OK
S5.000	S11	149.682	0.457	0.000	1.53		52.9	SURCHARGED
S5.001	S12	149.375	0.280	0.000	1.74		51.9	SURCHARGED
S6.000	S13	150.308	-0.192	0.000	0.28		27.5	OK
S7.000	S14	149.877	-0.098	0.000	0.55		17.9	OK
S8.000	S18	150.019	0.044	0.000	1.21		40.4	SURCHARGED
S7.001	S15	149.838	-0.102	0.000	0.76		57.5	OK
S7.002	S16	149.666	-0.114	0.000	0.68		56.3	OK

PN	US/MH Name	Level Exceeded
S1.000	S1	
S1.001	S2	
S1.002	S3	
S1.003	S4	
S2.000	S5	
S1.004	S5	
S1.005	S6	
S3.000	S8	1
S3.001	S9	
S1.006	S7	
S4.000	S8	
S4.001	S9	
S4.002	S10	
S5.000	S11	
S5.001	S12	
S6.000	S13	
S7.000	S14	
S8.000	S18	2
S7.001	S15	
S7.002	S16	

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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)
S6.001	S14	15 Winter	30	+0%	30/15 Winter				149.582
S6.002	S15	15 Winter	30	+0%	30/15 Winter				149.405
S4.003	S11	15 Winter	30	+0%	30/15 Winter				149.241
S1.007	S8	15 Winter	30	+0%	1/15 Winter				148.868
S1.008	S9	60 Winter	30	+0%	30/30 Winter				148.544
S1.009	S10	30 Winter	30	+0%	30/30 Winter				148.514

PN	US/MH Name	Surcharged Flooded			Half Drain Pipe		Status	Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	Time (mins)		
S6.001	S14	0.002	0.000	0.77		74.8	SURCHARGED	
S6.002	S15	0.125	0.000	1.11		79.8	SURCHARGED	
S4.003	S11	0.041	0.000	1.14		198.7	SURCHARGED	
S1.007	S8	0.308	0.000	3.56		338.4	SURCHARGED	
S1.008	S9	0.019	0.000	0.79		126.6	SURCHARGED	
S1.009	S10	0.029	0.000	0.70		127.7	SURCHARGED	

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Birstall Network Simulation
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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 Additional Flow - % of Total Flow 30.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

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

Synthetic Rainfall Details

Rainfall Model FSR Ratio R 0.300
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 17.000 Cv (Winter) 0.840

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

Profile(s) Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
 720, 960, 1440

Return Period(s) (years) 1, 30, 100

Climate Change (%) 0, 0, 30

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1 15	Winter	100	+30%	100/15	Winter		
S1.001	S2 15	Winter	100	+30%	100/15	Winter		
S1.002	S3 15	Winter	100	+30%	100/15	Winter		
S1.003	S4 15	Winter	100	+30%	100/15	Winter		
S2.000	S5 15	Winter	100	+30%				
S1.004	S5 15	Winter	100	+30%	30/15	Winter		
S1.005	S6 15	Winter	100	+30%				
S3.000	S8 15	Winter	100	+30%	30/15	Winter	100/15	Winter
S3.001	S9 15	Winter	100	+30%	30/15	Winter		
S1.006	S7 15	Winter	100	+30%	30/15	Winter		
S4.000	S8 15	Winter	100	+30%	100/15	Winter		
S4.001	S9 15	Winter	100	+30%	100/15	Winter		
S4.002	S10 15	Winter	100	+30%				
S5.000	S11 15	Winter	100	+30%	30/15	Winter		
S5.001	S12 15	Winter	100	+30%	30/15	Winter		
S6.000	S13 15	Winter	100	+30%				
S7.000	S14 15	Winter	100	+30%	100/15	Winter		
S8.000	S18 15	Winter	100	+30%	30/15	Winter	100/15	Winter
S7.001	S15 15	Winter	100	+30%	100/15	Winter		
S7.002	S16 15	Winter	100	+30%	100/15	Winter		

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

PN	US/MH Name	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status
S1.000	S1	150.680	0.090	0.000	0.84		70.6	SURCHARGED
S1.001	S2	150.614	0.159	0.000	1.25		65.9	SURCHARGED
S1.002	S3	150.591	0.156	0.000	0.87		62.2	SURCHARGED
S1.003	S4	150.500	0.204	0.000	0.42		58.1	SURCHARGED
S2.000	S5	150.493	-0.007	0.000	0.72		71.2	OK
S1.004	S5	150.344	0.304	0.000	1.55		113.5	SURCHARGED
S1.005	S6	149.753	-0.077	0.000	0.90		113.9	OK
S3.000	S8	151.001	0.701	0.808	1.61		115.4	FLOOD
S3.001	S9	150.176	0.207	0.000	1.62		112.4	SURCHARGED
S1.006	S7	149.479	0.754	0.000	1.15		225.5	SURCHARGED
S4.000	S8	150.542	0.217	0.000	1.22		148.1	SURCHARGED
S4.001	S9	150.169	0.109	0.000	1.14		146.1	SURCHARGED
S4.002	S10	149.789	-0.011	0.000	0.39		139.0	OK
S5.000	S11	150.668	1.443	0.000	2.39		82.6	FLOOD RISK
S5.001	S12	150.004	0.909	0.000	2.64		79.0	SURCHARGED
S6.000	S13	150.344	-0.156	0.000	0.45		45.2	OK
S7.000	S14	150.346	0.371	0.000	0.80		26.4	FLOOD RISK
S8.000	S18	150.402	0.427	2.172	1.72		57.6	FLOOD
S7.001	S15	150.307	0.367	0.000	0.97		73.5	FLOOD RISK
S7.002	S16	150.238	0.458	0.000	0.79		65.6	SURCHARGED

US/MH Level Exceeded

PN	US/MH Name	Level Exceeded
S1.000	S1	
S1.001	S2	
S1.002	S3	
S1.003	S4	
S2.000	S5	
S1.004	S5	
S1.005	S6	
S3.000	S8	1
S3.001	S9	
S1.006	S7	
S4.000	S8	
S4.001	S9	
S4.002	S10	
S5.000	S11	
S5.001	S12	
S6.000	S13	
S7.000	S14	
S8.000	S18	2
S7.001	S15	
S7.002	S16	

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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)
S6.001	S14	15 Winter	100	+30%	30/15 Winter				150.163
S6.002	S15	15 Winter	100	+30%	30/15 Winter				149.954
S4.003	S11	15 Winter	100	+30%	30/15 Winter				149.741
S1.007	S8	30 Winter	100	+30%	1/15 Winter				149.273
S1.008	S9	60 Winter	100	+30%	30/30 Winter				149.051
S1.009	S10	120 Winter	100	+30%	30/30 Winter				149.418

PN	US/MH Name	Surcharged Flooded			Half Drain Pipe		Status	Level Exceeded
		Depth (m)	Volume (m ³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)		
S6.001	S14	0.583	0.000	0.89		87.2	SURCHARGED	
S6.002	S15	0.674	0.000	1.27		91.2	SURCHARGED	
S4.003	S11	0.541	0.000	1.58		276.6	SURCHARGED	
S1.007	S8	0.713	0.000	4.75		452.2	SURCHARGED	
S1.008	S9	0.526	0.000	0.83		132.8	SURCHARGED	
S1.009	S10	0.933	0.000	0.70		127.6	SURCHARGED	

