



402-404 Wilmslow Road

Withington

Manchester M20 3BN

Proposed Residential Rear Extension/Conversion

Flood Risk Assessment

For: Concorde No.1 Ltd.

Integra Consulting
Suite 4
14-32 Hewitt Street
Manchester
M15 4GB

Ref: 3301-FRA
Job: 3301
Rev: E
By: NS

Date: Aug 2022

Environmental

Geotechnical

Highways

Structural

Civil

CONTENTS

- 1.0 INTRODUCTION**
- 2.0 EXECUTIVE SUMMARY**
- 3.0 STANDARDS AND LIMITATIONS**
- 4.0 EXISTING SITE, FLOOD RISK, EXISTING DRAINAGE MODE**
- 5.0 PROPOSALS, NEW DRAINAGE**
- 6.0 SURFACE WATER RUNOFF**
- 7.0 NATIONAL PLANNING POLICY FRAMEWORK, TECHNICAL GUIDANCE AND EA MAPPING**
- 8.0 RESPONSE TO EA / LLFA CONSULTATION COMMENTS**
- 9.0 MANAGEMENT AND MAINTENANCE OF SUDS**

APPENDICES

Appendix 1	Site Location Plan & Aerial View of Building
Appendix 2	Topographical Survey
Appendix 3	Environment Agency Flood Data / Maps / Risk Levels
Appendix 4	United Utilities Sewer Plan
Appendix 5	Existing Plans
Appendix 6	Proposed Site Drawings
Appendix 7	Groundwater Flood Mapping
Appendix 8	Statutory Flood Risk and Drainage Consultee Correspondence
Appendix 9	Site Photographs – Rear of Building
Appendix 10	Defra / Environment Agency: Flood Risks to People – Phase 2
Appendix 11	Schematic Surface Water Drainage Strategy Layout
Appendix 12	Surface Water Attenuation Calculations
Appendix 13	Micro Drainage Simulations
Appendix 14	Existing Drainage Survey

APPENDIX 13

MICRO DRAINAGE SIMULATIONS

Integra Consulting (Engineers) Ltd		Page 1
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:09 File 3301P3 - NEW MD.MDX	Designed by jansk Checked by	
Innovyze	Network 2019.1	

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	PIMP (%)	100
M5-60 (mm)	18.000	Add Flow / Climate Change (%)	0
Ratio R	0.360	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	400

Designed with Level Inverts

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.074	4-8	0.024

Total Area Contributing (ha) = 0.098

Total Pipe Volume (m³) = 1.570

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
S1.000	2.773	0.110	25.2	0.041	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.001	25.334	0.260	97.4	0.025	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	7.622	0.150	50.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S2.000	10.917	0.110	99.2	0.018	5.00	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)
S1.000	50.00	5.02	33.790	0.041	0.0	0.0	0.0	2.01	35.6	5.6
S1.001	50.00	5.44	33.680	0.066	0.0	0.0	0.0	1.02	18.0	8.9
S1.002	50.00	5.53	33.420	0.066	0.0	0.0	0.0	1.41	25.0	8.9
S2.000	50.00	5.18	33.680	0.018	0.0	0.0	0.0	1.01	17.8	2.4

Integra Consulting (Engineers) Ltd		Page 2
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:09	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

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
S2.001	15.236	0.160	95.2	0.007	0.00	0.0	0.600	o	150	Pipe/Conduit	
S2.002	12.356	0.140	88.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.003	1.500#	0.010	150.0	0.007	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.004	5.000	0.050	100.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S2.001	50.00	5.43	33.570	0.025	0.0	0.0	0.0	1.03	18.2	3.4
S2.002	50.00	5.62	33.410	0.025	0.0	0.0	0.0	1.07	18.9	3.4
S1.003	50.00	5.64	33.270	0.098	0.0	0.0	0.0	1.07	42.4	13.3
S1.004	50.00	5.71	33.240	0.098	0.0	0.0	0.0	1.31	52.0	13.3

Integra Consulting (Engineers) Ltd		Page 3
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:09	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

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	34.500	0.710	Open Manhole	150	S1.000	33.790	150				
S2	34.600	0.920	Open Manhole	450	S1.001	33.680	150	S1.000	33.680	150	
S3	36.100	2.680	Open Manhole	450	S1.002	33.420	150	S1.001	33.420	150	
S4	34.600	0.920	Open Manhole	450	S2.000	33.680	150				
S5	35.100	1.530	Open Manhole	450	S2.001	33.570	150	S2.000	33.570	150	
S6	36.100	2.690	Open Manhole	450	S2.002	33.410	150	S2.001	33.410	150	
S4	34.800	1.530	Open Manhole	450	S1.003	33.270	225	S1.002	33.270	150	
								S2.002	33.270	150	
S5	35.600	2.360	Open Manhole	450	S1.004	33.240	225	S1.003	33.260	225	20
S	35.000	1.810	Open Manhole	0		OUTFALL		S1.004	33.190	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	449828.007	418744.959	449828.007	418744.959	Required	
S2	449828.281	418742.199	449828.281	418742.199	Required	
S3	449828.268	418716.865	449828.268	418716.865	Required	
S4	449845.407	418742.343	449845.407	418742.343	Required	
S5	449847.889	418731.712	449847.889	418731.712	Required	
S6	449847.881	418716.476	449847.881	418716.476	Required	
S4	449835.629	418714.885	449835.629	418714.885	Required	
S5	449835.760	418709.386	449835.760	418709.386	Required	
S	449831.355	418707.021			No Entry	

Integra Consulting (Engineers) Ltd		Page 4
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:09	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

PIPELINE SCHEDULES for Storm

Upstream Manhole

- Indicates pipe length does not match coordinates

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	150	S1	34.500	33.790	0.560	Open Manhole	150
S1.001	o	150	S2	34.600	33.680	0.770	Open Manhole	450
S1.002	o	150	S3	36.100	33.420	2.530	Open Manhole	450
S2.000	o	150	S4	34.600	33.680	0.770	Open Manhole	450
S2.001	o	150	S5	35.100	33.570	1.380	Open Manhole	450
S2.002	o	150	S6	36.100	33.410	2.540	Open Manhole	450
S1.003	o	225	S4	34.800	33.270	1.305	Open Manhole	450
S1.004	o	225	S5	35.600	33.240	2.135	Open Manhole	450

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	2.773	25.2	S2	34.600	33.680	0.770	Open Manhole	450
S1.001	25.334	97.4	S3	36.100	33.420	2.530	Open Manhole	450
S1.002	7.622	50.8	S4	34.800	33.270	1.380	Open Manhole	450
S2.000	10.917	99.2	S5	35.100	33.570	1.380	Open Manhole	450
S2.001	15.236	95.2	S6	36.100	33.410	2.540	Open Manhole	450
S2.002	12.356	88.3	S4	34.800	33.270	1.380	Open Manhole	450
S1.003	1.500#	150.0	S5	35.600	33.260	2.115	Open Manhole	450
S1.004	5.000	100.0	S	35.000	33.190	1.585	Open Manhole	0

Integra Consulting (Engineers) Ltd		Page 5
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:09	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.041	0.041	0.041
1.001	-	-	100	0.025	0.025	0.025
1.002	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.018	0.018	0.018
2.001	-	-	100	0.007	0.007	0.007
2.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.007	0.007	0.007
1.004	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.098	0.098	0.098

Integra Consulting (Engineers) Ltd		Page 6
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:09	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

Network Classifications for Storm

PN	USMH	Pipe	Min Cover	Max Cover	Pipe Type	MH	MH	MH Ring	MH Type
	Name	Dia	Depth	Depth		Dia	Width	Depth	
		(mm)	(m)	(m)		(mm)	(mm)	(m)	
S1.000	S1	150	0.560	0.770	Unclassified	150	0	0.560	Unclassified
S1.001	S2	150	0.770	2.530	Unclassified	450	0	0.770	Unclassified
S1.002	S3	150	1.380	2.530	Unclassified	450	0	2.530	Unclassified
S2.000	S4	150	0.770	1.380	Unclassified	450	0	0.770	Unclassified
S2.001	S5	150	1.380	2.540	Unclassified	450	0	1.380	Unclassified
S2.002	S6	150	1.380	2.540	Unclassified	450	0	2.540	Unclassified
S1.003	S4	225	1.305	2.115	Unclassified	450	0	1.305	Unclassified
S1.004	S5	225	1.585	2.135	Unclassified	450	0	2.135	Unclassified

Free Flowing Outfall Details for Storm

Outfall	Outfall	C. Level	I. Level	Min	D,L	W
Pipe Number	Name	(m)	(m)	I. Level	(mm)	(mm)
				(m)		

S1.004	S	35.000	33.190	0.000	0	0
--------	---	--------	--------	-------	---	---

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	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	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.360		

Integra Consulting (Engineers) Ltd		Page 7
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:09	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

Online Controls for Storm

Hydro-Brake® Optimum Manhole: S5, DS/PN: S1.004, Volume (m³): 0.4

Unit Reference	MD-SHE-0066-2000-1100-2000
Design Head (m)	1.100
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	66
Invert Level (m)	33.240
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.100	2.0
Flush-Flo™	0.289	1.8
Kick-Flo®	0.584	1.5
Mean Flow over Head Range	-	1.7

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.6	1.200	2.1	3.000	3.2	7.000	4.7
0.200	1.8	1.400	2.2	3.500	3.4	7.500	4.9
0.300	1.8	1.600	2.4	4.000	3.6	8.000	5.0
0.400	1.8	1.800	2.5	4.500	3.8	8.500	5.1
0.500	1.7	2.000	2.6	5.000	4.0	9.000	5.3
0.600	1.5	2.200	2.7	5.500	4.2	9.500	5.4
0.800	1.7	2.400	2.9	6.000	4.4		
1.000	1.9	2.600	3.0	6.500	4.5		

Integra Consulting (Engineers) Ltd		Page 8
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:09	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

Storage Structures for Storm

Cellular Storage Manhole: S5, DS/PN: S1.004

Invert Level (m) 33.240 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	32.5	0.0	1.076	0.0	0.0
1.075	32.5	0.0			

Manhole Headloss for Storm

PN	US/MH	US/MH
	Name	Headloss
S1.000	S1	0.500
S1.001	S2	0.500
S1.002	S3	0.500
S2.000	S4	0.500
S2.001	S5	0.500
S2.002	S6	0.500
S1.003	S4	0.500
S1.004	S5	0.500

Integra Consulting (Engineers) Ltd		Page 9
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:09	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

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

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 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 0.360
 Region England and Wales Cv (Summer) 0.750
 M5-60 (mm) 18.000 Cv (Winter) 0.840

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

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600,
 720, 960, 1440, 2160, 2880, 4320, 5760,
 7200, 8640, 10080
 Return Period(s) (years) 2
 Climate Change (%) 0

									Water
PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Level (m)
S1.000	S1	15 Winter	2	+0%					33.847
S1.001	S2	15 Winter	2	+0%					33.762
S1.002	S3	15 Winter	2	+0%					33.491
S2.000	S4	15 Winter	2	+0%					33.722
S2.001	S5	15 Winter	2	+0%					33.618
S2.002	S6	60 Winter	2	+0%					33.483
S1.003	S4	60 Winter	2	+0%					33.481
S1.004	S5	60 Winter	2	+0%	2/60 Winter				33.481

		Surcharged			Flooded		Pipe			
PN	US/MH Name	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	Status	Level Exceeded		
S1.000	S1	-0.093	0.000	0.31		6.4	OK			
S1.001	S2	-0.068	0.000	0.56		9.6	OK			
S1.002	S3	-0.079	0.000	0.45		9.7	OK			
S2.000	S4	-0.108	0.000	0.18		2.8	OK			

Integra Consulting (Engineers) Ltd		Page 10
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:09	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

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

PN	US/MH Name	Surcharged Flooded		Flow / Overflow		Pipe Flow	Status	Level Exceeded
		Depth (m)	Volume (m³)	Cap.	(l/s)	(l/s)		
S2.001	S5	-0.102	0.000	0.22		3.7	OK	
S2.002	S6	-0.077	0.000	0.12		2.1	OK	
S1.003	S4	-0.014	0.000	0.26		7.6	OK	
S1.004	S5	0.016	0.000	0.06		1.8	SURCHARGED	

Integra Consulting (Engineers) Ltd		Page 1
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:11 File 3301P3 - NEW MD.MDX	Designed by jansk Checked by	
Innovyze	Network 2019.1	

STORM SEWER DESIGN by the Modified Rational Method

Pipe Sizes STANDARD Manhole Sizes STANDARD

Designed with Level Inverts

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.074	4-8	0.024

Total Pipe Volume (m³) = 1.570

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
S1.000	2.773	0.110	25.2	0.041	5.00	0.0	0.600	o	150	Pipe/Conduit	
S1.001	25.334	0.260	97.4	0.025	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.002	7.622	0.150	50.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S2.000	10.917	0.110	99.2	0.018	5.00	0.0	0.600	o	150	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	5.02	33.790	0.041	0.0	0.0	0.0	2.01	35.6	5.6
S1.001	50.00	5.44	33.680	0.066	0.0	0.0	0.0	1.02	18.0	8.9
S1.002	50.00	5.53	33.420	0.066	0.0	0.0	0.0	1.41	25.0	8.9
S2.000	50.00	5.18	33.680	0.018	0.0	0.0	0.0	1.01	17.8	2.4

Integra Consulting (Engineers) Ltd		Page 2
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:11	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

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
S2.001	15.236	0.160	95.2	0.007	0.00	0.0	0.600	o	150	Pipe/Conduit	
S2.002	12.356	0.140	88.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.003	1.500#	0.010	150.0	0.007	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.004	5.000	0.050	100.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S2.001	50.00	5.43	33.570	0.025	0.0	0.0	0.0	1.03	18.2	3.4
S2.002	50.00	5.62	33.410	0.025	0.0	0.0	0.0	1.07	18.9	3.4
S1.003	50.00	5.64	33.270	0.098	0.0	0.0	0.0	1.07	42.4	13.3
S1.004	50.00	5.71	33.240	0.098	0.0	0.0	0.0	1.31	52.0	13.3

Integra Consulting (Engineers) Ltd		Page 4
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:11	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

PIPELINE SCHEDULES for Storm

Upstream Manhole

- Indicates pipe length does not match coordinates

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	150	S1	34.500	33.790	0.560	Open Manhole	150
S1.001	o	150	S2	34.600	33.680	0.770	Open Manhole	450
S1.002	o	150	S3	36.100	33.420	2.530	Open Manhole	450
S2.000	o	150	S4	34.600	33.680	0.770	Open Manhole	450
S2.001	o	150	S5	35.100	33.570	1.380	Open Manhole	450
S2.002	o	150	S6	36.100	33.410	2.540	Open Manhole	450
S1.003	o	225	S4	34.800	33.270	1.305	Open Manhole	450
S1.004	o	225	S5	35.600	33.240	2.135	Open Manhole	450

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	2.773	25.2	S2	34.600	33.680	0.770	Open Manhole	450
S1.001	25.334	97.4	S3	36.100	33.420	2.530	Open Manhole	450
S1.002	7.622	50.8	S4	34.800	33.270	1.380	Open Manhole	450
S2.000	10.917	99.2	S5	35.100	33.570	1.380	Open Manhole	450
S2.001	15.236	95.2	S6	36.100	33.410	2.540	Open Manhole	450
S2.002	12.356	88.3	S4	34.800	33.270	1.380	Open Manhole	450
S1.003	1.500#	150.0	S5	35.600	33.260	2.115	Open Manhole	450
S1.004	5.000	100.0	S	35.000	33.190	1.585	Open Manhole	0

Integra Consulting (Engineers) Ltd		Page 5
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:11	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.041	0.041	0.041
1.001	-	-	100	0.025	0.025	0.025
1.002	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.018	0.018	0.018
2.001	-	-	100	0.007	0.007	0.007
2.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.007	0.007	0.007
1.004	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.098	0.098	0.098

Integra Consulting (Engineers) Ltd		Page 6
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:11	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

Network Classifications for Storm

PN	USMH	Pipe	Min Cover	Max Cover	Pipe Type	MH	MH	MH Ring	MH Type
	Name	Dia	Depth	Depth		Dia	Width	Depth	
		(mm)	(m)	(m)		(mm)	(mm)	(m)	
S1.000	S1	150	0.560	0.770	Unclassified	150	0	0.560	Unclassified
S1.001	S2	150	0.770	2.530	Unclassified	450	0	0.770	Unclassified
S1.002	S3	150	1.380	2.530	Unclassified	450	0	2.530	Unclassified
S2.000	S4	150	0.770	1.380	Unclassified	450	0	0.770	Unclassified
S2.001	S5	150	1.380	2.540	Unclassified	450	0	1.380	Unclassified
S2.002	S6	150	1.380	2.540	Unclassified	450	0	2.540	Unclassified
S1.003	S4	225	1.305	2.115	Unclassified	450	0	1.305	Unclassified
S1.004	S5	225	1.585	2.135	Unclassified	450	0	2.135	Unclassified

Free Flowing Outfall Details for Storm

Outfall	Outfall	C. Level	I. Level	Min	D,L	W
Pipe Number	Name	(m)	(m)	I. Level	(mm)	(mm)
				(m)		

S1.004	S	35.000	33.190	0.000	0	0
--------	---	--------	--------	-------	---	---

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	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	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.360		

Integra Consulting (Engineers) Ltd		Page 7
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:11	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

Online Controls for Storm

Hydro-Brake® Optimum Manhole: S5, DS/PN: S1.004, Volume (m³): 0.4

Unit Reference	MD-SHE-0066-2000-1100-2000
Design Head (m)	1.100
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	66
Invert Level (m)	33.240
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.100	2.0
Flush-Flo™	0.289	1.8
Kick-Flo®	0.584	1.5
Mean Flow over Head Range	-	1.7

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.6	1.200	2.1	3.000	3.2	7.000	4.7
0.200	1.8	1.400	2.2	3.500	3.4	7.500	4.9
0.300	1.8	1.600	2.4	4.000	3.6	8.000	5.0
0.400	1.8	1.800	2.5	4.500	3.8	8.500	5.1
0.500	1.7	2.000	2.6	5.000	4.0	9.000	5.3
0.600	1.5	2.200	2.7	5.500	4.2	9.500	5.4
0.800	1.7	2.400	2.9	6.000	4.4		
1.000	1.9	2.600	3.0	6.500	4.5		

Integra Consulting (Engineers) Ltd		Page 8
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:11	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

Storage Structures for Storm

Cellular Storage Manhole: S5, DS/PN: S1.004

Invert Level (m) 33.240 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	32.5	0.0	1.076	0.0	0.0
1.075	32.5	0.0			

Manhole Headloss for Storm

PN	US/MH	US/MH
	Name	Headloss
S1.000	S1	0.500
S1.001	S2	0.500
S1.002	S3	0.500
S2.000	S4	0.500
S2.001	S5	0.500
S2.002	S6	0.500
S1.003	S4	0.500
S1.004	S5	0.500

Integra Consulting (Engineers) Ltd

Page 9

First Floor, Suite 4
14-32 Hewsitt Street
Manchester, M15 4GB

Date 08/09/2022 11:11
File 3301P3 - NEW MD.MDX

Designed by jansk
Checked by

Innovyze

Network 2019.1

Micro Drainage

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

Simulation Criteria

Areal Reduction Factor 1.000

Additional Flow - % of Total Flow 0.000

Hot Start (mins) 0

MADD Factor * 10m³/ha Storage 2.000

Hot Start Level (mm) 0

Inlet Coefficient 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 0.360

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 18.000

Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status ON

DVD Status ON

Inertia Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080

Return Period(s) (years) 30

Climate Change (%) 0

PN

US/MH Name

Storm

Return Period

Climate Change

First (X) Surge

First (Y) Flood

First (Z) Overflow

Overflow Act.

Water Level (m)

S1.000

S1

15 Winter

30

+0%

33.919

S1.001

S2

15 Winter

30

+0%

30/15 Summer

33.885

S1.002

S3

120 Winter

30

+0%

30/15 Summer

33.792

S2.000

S4

120 Winter

30

+0%

33.793

S2.001

S5

120 Winter

30

+0%

30/60 Winter

33.792

S2.002

S6

120 Winter

30

+0%

30/15 Summer

33.791

S1.003

S4

120 Winter

30

+0%

30/15 Summer

33.789

S1.004

S5

120 Winter

30

+0%

30/15 Summer

33.788

Surcharged Flooded

US/MH Name

Depth (m)

Volume (m³)

Flow / Cap.

Overflow (l/s)

Pipe Flow (l/s)

Status

Level Exceeded

S1.000

S1

-0.021

0.000

0.57

11.8

OK

S1.001

S2

0.055

0.000

1.10

18.8

SURCHARGED

S1.002

S3

0.222

0.000

0.29

6.2

SURCHARGED

S2.000

S4

-0.037

0.000

0.11

1.8

OK

©1982-2019 Innovyze

Integra Consulting (Engineers) Ltd		Page 10
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:11	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

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

PN	US/MH Name	Surcharged Flooded		Flow / Overflow		Pipe Flow	Status	Level Exceeded
		Depth (m)	Volume (m³)	Cap.	(l/s)	(l/s)		
S2.001	S5	0.072	0.000	0.15		2.5	SURCHARGED	
S2.002	S6	0.231	0.000	0.13		2.2	SURCHARGED	
S1.003	S4	0.294	0.000	0.30		8.9	SURCHARGED	
S1.004	S5	0.323	0.000	0.06		1.8	SURCHARGED	

Integra Consulting (Engineers) Ltd		Page 1
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:12 File 3301P3 - NEW MD.MDX	Designed by jansk Checked by	
Innovyze Network 2019.1		

Integra Consulting (Engineers) Ltd		Page 2
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:12	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

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
S2.001	15.236	0.160	95.2	0.007	0.00	0.0	0.600	o	150	Pipe/Conduit	
S2.002	12.356	0.140	88.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.003	1.500#	0.010	150.0	0.007	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.004	5.000	0.050	100.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S2.001	50.00	5.43	33.570	0.025	0.0	0.0	0.0	1.03	18.2	3.4
S2.002	50.00	5.62	33.410	0.025	0.0	0.0	0.0	1.07	18.9	3.4
S1.003	50.00	5.64	33.270	0.098	0.0	0.0	0.0	1.07	42.4	13.3
S1.004	50.00	5.71	33.240	0.098	0.0	0.0	0.0	1.31	52.0	13.3

Integra Consulting (Engineers) Ltd		Page 3
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:12	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze		Network 2019.1

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	34.500	0.710	Open Manhole	150	S1.000	33.790	150				
S2	34.600	0.920	Open Manhole	450	S1.001	33.680	150	S1.000	33.680	150	
S3	36.100	2.680	Open Manhole	450	S1.002	33.420	150	S1.001	33.420	150	
S4	34.600	0.920	Open Manhole	450	S2.000	33.680	150				
S5	35.100	1.530	Open Manhole	450	S2.001	33.570	150	S2.000	33.570	150	
S6	36.100	2.690	Open Manhole	450	S2.002	33.410	150	S2.001	33.410	150	
S4	34.800	1.530	Open Manhole	450	S1.003	33.270	225	S1.002	33.270	150	
								S2.002	33.270	150	
S5	35.600	2.360	Open Manhole	450	S1.004	33.240	225	S1.003	33.260	225	20
S	35.000	1.810	Open Manhole	0		OUTFALL		S1.004	33.190	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	449828.007	418744.959	449828.007	418744.959	Required	
S2	449828.281	418742.199	449828.281	418742.199	Required	
S3	449828.268	418716.865	449828.268	418716.865	Required	
S4	449845.407	418742.343	449845.407	418742.343	Required	
S5	449847.889	418731.712	449847.889	418731.712	Required	
S6	449847.881	418716.476	449847.881	418716.476	Required	
S4	449835.629	418714.885	449835.629	418714.885	Required	
S5	449835.760	418709.386	449835.760	418709.386	Required	
S	449831.355	418707.021			No Entry	

Integra Consulting (Engineers) Ltd		Page 4
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:12	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

PIPELINE SCHEDULES for Storm

Upstream Manhole

- Indicates pipe length does not match coordinates

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	150	S1	34.500	33.790	0.560	Open Manhole	150
S1.001	o	150	S2	34.600	33.680	0.770	Open Manhole	450
S1.002	o	150	S3	36.100	33.420	2.530	Open Manhole	450
S2.000	o	150	S4	34.600	33.680	0.770	Open Manhole	450
S2.001	o	150	S5	35.100	33.570	1.380	Open Manhole	450
S2.002	o	150	S6	36.100	33.410	2.540	Open Manhole	450
S1.003	o	225	S4	34.800	33.270	1.305	Open Manhole	450
S1.004	o	225	S5	35.600	33.240	2.135	Open Manhole	450

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	2.773	25.2	S2	34.600	33.680	0.770	Open Manhole	450
S1.001	25.334	97.4	S3	36.100	33.420	2.530	Open Manhole	450
S1.002	7.622	50.8	S4	34.800	33.270	1.380	Open Manhole	450
S2.000	10.917	99.2	S5	35.100	33.570	1.380	Open Manhole	450
S2.001	15.236	95.2	S6	36.100	33.410	2.540	Open Manhole	450
S2.002	12.356	88.3	S4	34.800	33.270	1.380	Open Manhole	450
S1.003	1.500#	150.0	S5	35.600	33.260	2.115	Open Manhole	450
S1.004	5.000	100.0	S	35.000	33.190	1.585	Open Manhole	0

Integra Consulting (Engineers) Ltd		Page 5
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:12	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.041	0.041	0.041
1.001	-	-	100	0.025	0.025	0.025
1.002	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.018	0.018	0.018
2.001	-	-	100	0.007	0.007	0.007
2.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.007	0.007	0.007
1.004	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.098	0.098	0.098

Integra Consulting (Engineers) Ltd		Page 6
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:12	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

Network Classifications for Storm

PN	USMH	Pipe	Min Cover	Max Cover	Pipe Type	MH	MH	MH Ring	MH Type
	Name	Dia	Depth	Depth		Dia	Width	Depth	
		(mm)	(m)	(m)		(mm)	(mm)	(m)	
S1.000	S1	150	0.560	0.770	Unclassified	150	0	0.560	Unclassified
S1.001	S2	150	0.770	2.530	Unclassified	450	0	0.770	Unclassified
S1.002	S3	150	1.380	2.530	Unclassified	450	0	2.530	Unclassified
S2.000	S4	150	0.770	1.380	Unclassified	450	0	0.770	Unclassified
S2.001	S5	150	1.380	2.540	Unclassified	450	0	1.380	Unclassified
S2.002	S6	150	1.380	2.540	Unclassified	450	0	2.540	Unclassified
S1.003	S4	225	1.305	2.115	Unclassified	450	0	1.305	Unclassified
S1.004	S5	225	1.585	2.135	Unclassified	450	0	2.135	Unclassified

Free Flowing Outfall Details for Storm

Outfall	Outfall	C. Level	I. Level	Min	D,L	W
Pipe Number	Name	(m)	(m)	I. Level	(mm)	(mm)
				(m)		

S1.004	S	35.000	33.190	0.000	0	0
--------	---	--------	--------	-------	---	---

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	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	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.360		

Integra Consulting (Engineers) Ltd		Page 7
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:12	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

Online Controls for Storm

Hydro-Brake® Optimum Manhole: S5, DS/PN: S1.004, Volume (m³): 0.4

Unit Reference	MD-SHE-0066-2000-1100-2000
Design Head (m)	1.100
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	66
Invert Level (m)	33.240
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.100	2.0
Flush-Flo™	0.289	1.8
Kick-Flo®	0.584	1.5
Mean Flow over Head Range	-	1.7

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.6	1.200	2.1	3.000	3.2	7.000	4.7
0.200	1.8	1.400	2.2	3.500	3.4	7.500	4.9
0.300	1.8	1.600	2.4	4.000	3.6	8.000	5.0
0.400	1.8	1.800	2.5	4.500	3.8	8.500	5.1
0.500	1.7	2.000	2.6	5.000	4.0	9.000	5.3
0.600	1.5	2.200	2.7	5.500	4.2	9.500	5.4
0.800	1.7	2.400	2.9	6.000	4.4		
1.000	1.9	2.600	3.0	6.500	4.5		

Integra Consulting (Engineers) Ltd		Page 8
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:12	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

Storage Structures for Storm

Cellular Storage Manhole: S5, DS/PN: S1.004

Invert Level (m) 33.240 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	32.5	0.0	1.076	0.0	0.0
1.075	32.5	0.0			

Manhole Headloss for Storm

PN	US/MH	US/MH
	Name	Headloss
S1.000	S1	0.500
S1.001	S2	0.500
S1.002	S3	0.500
S2.000	S4	0.500
S2.001	S5	0.500
S2.002	S6	0.500
S1.003	S4	0.500
S1.004	S5	0.500

Integra Consulting (Engineers) Ltd

Page 9

First Floor, Suite 4

14-32 Hewsitt Street

Manchester, M15 4GB

Date 08/09/2022 11:12

Designed by jansk

File 3301P3 - NEW MD.MDX

Checked by

Innovyze

Network 2019.1

Micro Drainage

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

Simulation Criteria

Areal Reduction Factor 1.000

Additional Flow - % of Total Flow 0.000

Hot Start (mins) 0

MADD Factor * 10m³/ha Storage 2.000

Hot Start Level (mm) 0

Inlet Coefficient 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 0.360

Region England and Wales Cv (Summer) 0.750

M5-60 (mm) 18.000 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0

Analysis Timestep 2.5 Second Increment (Extended)

DTS Status ON

DVD Status ON

Inertia Status ON

Profile(s) Summer and Winter

Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080

Return Period(s) (years) 100

Climate Change (%) 0

US/MH

Return

Climate

First (X)

First (Y)

First (Z)

Overflow

Water

PN

Name

Storm

Period

Change

Surcharge

Flood

Overflow

Act.

Level

S1.000

S1

15 Winter

100

+0%

100/15 Summer

34.184

S1.001

S2

15 Winter

100

+0%

100/15 Summer

34.137

S1.002

S3

120 Winter

100

+0%

100/15 Summer

34.030

S2.000

S4

120 Winter

100

+0%

100/30 Winter

34.031

S2.001

S5

120 Winter

100

+0%

100/30 Summer

34.030

S2.002

S6

120 Winter

100

+0%

100/15 Summer

34.028

S1.003

S4

120 Winter

100

+0%

100/15 Summer

34.026

S1.004

S5

120 Winter

100

+0%

100/15 Summer

34.026

US/MH

Depth

Volume

Flow /

Overflow

Pipe

Level

PN

Name

(m)

(m³)

Cap.

(l/s)

(l/s)

Status

Exceeded

S1.000

S1

0.244

0.000

0.65

13.6

SURCHARGED

S1.001

S2

0.307

0.000

1.27

21.7

SURCHARGED

S1.002

S3

0.460

0.000

0.38

8.1

SURCHARGED

S2.000

S4

0.201

0.000

0.15

2.4

SURCHARGED

©1982-2019 Innovyze

Integra Consulting (Engineers) Ltd		Page 10
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:12	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

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

PN	US/MH Name	Surcharged Flooded		Flow / Overflow		Pipe Flow	Status	Level Exceeded
		Depth (m)	Volume (m³)	Cap.	(l/s)	(l/s)		
S2.001	S5	0.310	0.000	0.18		3.1	SURCHARGED	
S2.002	S6	0.468	0.000	0.16		2.8	SURCHARGED	
S1.003	S4	0.531	0.000	0.39		11.7	SURCHARGED	
S1.004	S5	0.561	0.000	0.06		1.8	SURCHARGED	

Integra Consulting (Engineers) Ltd		Page 1
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:14 File 3301P3 - NEW MD.MDX	Designed by jansk Checked by	
Innovyze Network 2019.1		

Integra Consulting (Engineers) Ltd		Page 2
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:14	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

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
S2.001	15.236	0.160	95.2	0.007	0.00	0.0	0.600	o	150	Pipe/Conduit	
S2.002	12.356	0.140	88.3	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
S1.003	1.500#	0.010	150.0	0.007	0.00	0.0	0.600	o	225	Pipe/Conduit	
S1.004	5.000	0.050	100.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S2.001	50.00	5.43	33.570	0.025	0.0	0.0	0.0	1.03	18.2	3.4
S2.002	50.00	5.62	33.410	0.025	0.0	0.0	0.0	1.07	18.9	3.4
S1.003	50.00	5.64	33.270	0.098	0.0	0.0	0.0	1.07	42.4	13.3
S1.004	50.00	5.71	33.240	0.098	0.0	0.0	0.0	1.31	52.0	13.3

Integra Consulting (Engineers) Ltd		Page 3
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:14	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

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)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
S1	34.500	0.710	Open Manhole	150	S1.000	33.790	150				
S2	34.600	0.920	Open Manhole	450	S1.001	33.680	150	S1.000	33.680	150	
S3	36.100	2.680	Open Manhole	450	S1.002	33.420	150	S1.001	33.420	150	
S4	34.600	0.920	Open Manhole	450	S2.000	33.680	150				
S5	35.100	1.530	Open Manhole	450	S2.001	33.570	150	S2.000	33.570	150	
S6	36.100	2.690	Open Manhole	450	S2.002	33.410	150	S2.001	33.410	150	
S4	34.800	1.530	Open Manhole	450	S1.003	33.270	225	S1.002	33.270	150	
								S2.002	33.270	150	
S5	35.600	2.360	Open Manhole	450	S1.004	33.240	225	S1.003	33.260	225	20
S	35.000	1.810	Open Manhole	0		OUTFALL		S1.004	33.190	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	449828.007	418744.959	449828.007	418744.959	Required	
S2	449828.281	418742.199	449828.281	418742.199	Required	
S3	449828.268	418716.865	449828.268	418716.865	Required	
S4	449845.407	418742.343	449845.407	418742.343	Required	
S5	449847.889	418731.712	449847.889	418731.712	Required	
S6	449847.881	418716.476	449847.881	418716.476	Required	
S4	449835.629	418714.885	449835.629	418714.885	Required	
S5	449835.760	418709.386	449835.760	418709.386	Required	
S	449831.355	418707.021			No Entry	

Integra Consulting (Engineers) Ltd		Page 4
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:14	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

PIPELINE SCHEDULES for Storm

Upstream Manhole

- Indicates pipe length does not match coordinates

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	150	S1	34.500	33.790	0.560	Open Manhole	150
S1.001	o	150	S2	34.600	33.680	0.770	Open Manhole	450
S1.002	o	150	S3	36.100	33.420	2.530	Open Manhole	450
S2.000	o	150	S4	34.600	33.680	0.770	Open Manhole	450
S2.001	o	150	S5	35.100	33.570	1.380	Open Manhole	450
S2.002	o	150	S6	36.100	33.410	2.540	Open Manhole	450
S1.003	o	225	S4	34.800	33.270	1.305	Open Manhole	450
S1.004	o	225	S5	35.600	33.240	2.135	Open Manhole	450

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	2.773	25.2	S2	34.600	33.680	0.770	Open Manhole	450
S1.001	25.334	97.4	S3	36.100	33.420	2.530	Open Manhole	450
S1.002	7.622	50.8	S4	34.800	33.270	1.380	Open Manhole	450
S2.000	10.917	99.2	S5	35.100	33.570	1.380	Open Manhole	450
S2.001	15.236	95.2	S6	36.100	33.410	2.540	Open Manhole	450
S2.002	12.356	88.3	S4	34.800	33.270	1.380	Open Manhole	450
S1.003	1.500#	150.0	S5	35.600	33.260	2.115	Open Manhole	450
S1.004	5.000	100.0	S	35.000	33.190	1.585	Open Manhole	0

Integra Consulting (Engineers) Ltd		Page 5
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:14	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.041	0.041	0.041
1.001	-	-	100	0.025	0.025	0.025
1.002	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.018	0.018	0.018
2.001	-	-	100	0.007	0.007	0.007
2.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.007	0.007	0.007
1.004	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.098	0.098	0.098

Integra Consulting (Engineers) Ltd		Page 6
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:14	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

Network Classifications for Storm

PN	USMH	Pipe	Min Cover	Max Cover	Pipe Type	MH	MH	MH Ring	MH Type
	Name	Dia	Depth	Depth		Dia	Width	Depth	
		(mm)	(m)	(m)		(mm)	(mm)	(m)	
S1.000	S1	150	0.560	0.770	Unclassified	150	0	0.560	Unclassified
S1.001	S2	150	0.770	2.530	Unclassified	450	0	0.770	Unclassified
S1.002	S3	150	1.380	2.530	Unclassified	450	0	2.530	Unclassified
S2.000	S4	150	0.770	1.380	Unclassified	450	0	0.770	Unclassified
S2.001	S5	150	1.380	2.540	Unclassified	450	0	1.380	Unclassified
S2.002	S6	150	1.380	2.540	Unclassified	450	0	2.540	Unclassified
S1.003	S4	225	1.305	2.115	Unclassified	450	0	1.305	Unclassified
S1.004	S5	225	1.585	2.135	Unclassified	450	0	2.135	Unclassified

Free Flowing Outfall Details for Storm

Outfall	Outfall	C. Level	I. Level	Min	D,L	W
Pipe Number	Name	(m)	(m)	I. Level	(mm)	(mm)
				(m)		

S1.004	S	35.000	33.190	0.000	0	0
--------	---	--------	--------	-------	---	---

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Storage Structures	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	Profile Type	Summer
Return Period (years)	2	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.000	Storm Duration (mins)	30
Ratio R	0.360		

Integra Consulting (Engineers) Ltd		Page 7
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:14	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

Online Controls for Storm

Hydro-Brake® Optimum Manhole: S5, DS/PN: S1.004, Volume (m³): 0.4

Unit Reference	MD-SHE-0066-2000-1100-2000
Design Head (m)	1.100
Design Flow (l/s)	2.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	66
Invert Level (m)	33.240
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.100	2.0
Flush-Flo™	0.289	1.8
Kick-Flo®	0.584	1.5
Mean Flow over Head Range	-	1.7

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.6	1.200	2.1	3.000	3.2	7.000	4.7
0.200	1.8	1.400	2.2	3.500	3.4	7.500	4.9
0.300	1.8	1.600	2.4	4.000	3.6	8.000	5.0
0.400	1.8	1.800	2.5	4.500	3.8	8.500	5.1
0.500	1.7	2.000	2.6	5.000	4.0	9.000	5.3
0.600	1.5	2.200	2.7	5.500	4.2	9.500	5.4
0.800	1.7	2.400	2.9	6.000	4.4		
1.000	1.9	2.600	3.0	6.500	4.5		

Integra Consulting (Engineers) Ltd		Page 8
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:14	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

Storage Structures for Storm

Cellular Storage Manhole: S5, DS/PN: S1.004

Invert Level (m) 33.240 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	32.5	0.0	1.076	0.0	0.0
1.075	32.5	0.0			

Manhole Headloss for Storm

PN	US/MH	US/MH
	Name	Headloss
S1.000	S1	0.500
S1.001	S2	0.500
S1.002	S3	0.500
S2.000	S4	0.500
S2.001	S5	0.500
S2.002	S6	0.500
S1.003	S4	0.500
S1.004	S5	0.500

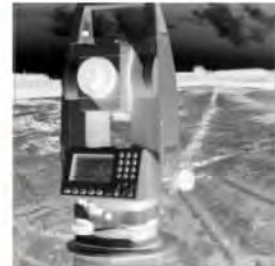
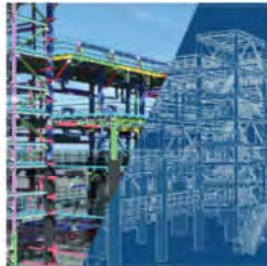
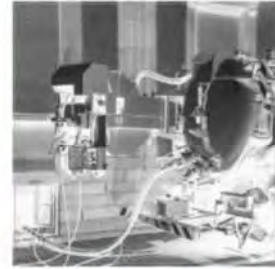
Integra Consulting (Engineers) Ltd		Page 10
First Floor, Suite 4 14-32 Hewsitt Street Manchester, M15 4GB		
Date 08/09/2022 11:14	Designed by jansk	
File 3301P3 - NEW MD.MDX	Checked by	
Innovyze	Network 2019.1	

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

PN	US/MH Name	Water		Surcharged		Flooded		Pipe		Status	Level Exceeded
		Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)				
S2.001	S5	34.552	0.832	0.000	0.19		3.1			SURCHARGED	
S2.002	S6	34.563	1.003	0.000	0.18		3.1			SURCHARGED	
S1.003	S4	34.584	1.089	0.000	0.41		12.2			FLOOD RISK	
S1.004	S5	34.583	1.118	0.000	0.07		2.1			SURCHARGED	

APPENDIX 14

EXISTING DRAINAGE SURVEY



LAYER SURVEYS LTD
SEE THE COMPLETE PICTURE

DRAINAGE SURVEY

Job Number
LAYERSERV0001126Surveyed by (Operator)
CHRIS LUCOCKBase Unit
ELFEIYII63Date
17/01/2022**Client Details:**Integra Consulting
Suite 4,
14-32 Hewitt Street,
Manchester,
M15 4GBClient Contact Name: Neville Shaw
Client Contact Tel: 07740 723 258**Site Details:**402-4040 Wilmslow Road,
Withington
M20 3BNSite Contact Name: Stuart Wall
Site Contact Tel: 07770 382643**Contractor Details:**Layer Surveys Ltd
Francis House
Meadowcroft Business Park
Pope Lane
Preston
Lancashire
PR4 4BA

Office Contact Number: 01772 611634

Purpose of Survey:

Job Number LAYERSERV0001126	Surveyed by (Operator) CHRIS LUCOCK	Base Unit ELFEIYII63	Date 17/01/2022
---------------------------------------	---	--------------------------------	---------------------------

Report Contents

Page 1	Cover Page
Page 2	Job Overview
Page 3	Contents Page
Page 4	Survey Run Sheet(Survey 1 - MH 01 to SOURCE)
Page 7	Survey Run Sheet(Survey 2 - MH 01 to MH 02)
Page 11	Survey Run Sheet(Survey 3 - MH 02 to MH 01)
Page 13	Survey Run Sheet(Survey 4 - MH 02 to BRANCH B)
Page 15	Survey Run Sheet(Survey 5 - MH 02 to MH 03)
Page 18	Survey Run Sheet(Survey 6 - MH 03 to MH 04)
Page 22	Survey Run Sheet(Survey 7 - MH 03 to BRANCH B)
Page 24	Survey Run Sheet(Survey 8 - MH 03 to BRANCH C)
Page 26	Survey Run Sheet(Survey 9 - SVP 1 to MAIN CARRIER)
Page 29	Survey Run Sheet(Survey 10 - SVP 2 to MAIN CARRIER)
Page 31	Final Page

Surveyed by (Operator) CHRIS LUCOCK	Job Number LAYERSERV0001126	Pipe Length Reference(PLR) SOURCE X	Date 18/01/2022	Pre Cleaned Not Cleaned
Weather 1 - Dry	Customer Present	Service Grade/Structural Grade 2/1	Base Unit ELFEIYII63	Section Number 1

Road 402-4040 Wilmslow Road, Place Withington Location M20 3BN	Division District Location Details
---	--

Purpose Duty Combined Catchment	Shape/Size 100mm Material Vitrified clay Category	Start Node MH 01 End Node SOURCE Total length 9.93 metres
--	---	--

Scale 1:0.47 Direction Upstream
--

Start Node Ref:MH 01 I/L :mm Depth: 0.70mm					
Position	Code	Description	Photo	Type/Grade	
0.00	MH	Start node type, manhole, reference MH 01	5938161	Comment / 0	
0.00	WL	Water level 5% height/diameter	5938162	Comment / 0	
0.14	JDM	Joint displaced medium	5938163	Structural / 1	
1.33	RF	Roots fine	5938164	Service / 2	
2.05	DEE	Attached deposits, encrustation from 4 to 8 o'clock 5% cross-sectional area loss	5938168	Service / 2	
2.69	DEE	Attached deposits, encrustation from 3 to 8 o'clock 5% cross-sectional area loss	5938178	Service / 2	
7.43	DEX	Other settled deposits 5% cross-sectional area loss - Remark: LEAF	5938184	Service / 2	
9.45	JDM	Joint displaced medium - Remark: SEAL VISABLE	5938214	Structural / 1	
9.93	LU	Line of drain/sewer deviates up	5938222	Comment / 0	
9.93	OCF	Finish node type, other special chamber, reference REST BEND	5938226	Comment / 0	

End Node Ref:SOURCE | I/L :mm



Job Number
LAYERSERV0001126

Surveyed by (Operator)
CHRIS LUCOCK

Base Unit
ELFEIYII63

Date
18/01/2022



Start node type, manhole, reference MH 01



Water level 5% height/diameter



Joint displaced medium



Roots fine



Attached deposits, encrustation from 4 to 8 o'clock 5% cross-sectional area loss



Attached deposits, encrustation from 3 to 8 o'clock 5% cross-sectional area loss



Job Number
LAYERSERV0001126

Surveyed by (Operator)
CHRIS LUCOCK

Base Unit
ELFEIYII63

Date
18/01/2022



Other settled deposits 5% cross-sectional area loss - Remark: LEAF



Joint displaced medium - Remark: SEAL VISABLE



Line of drain/sewer deviates up



Finish node type, other special chamber, reference REST BEND

Surveyed by (Operator) CHRIS LUCOCK	Job Number LAYERSERV0001126	Pipe Length Reference(PLR) MH 01 X	Date 18/01/2022	Pre Cleaned Not Cleaned
Weather 1 - Dry	Customer Present	Service Grade/Structural Grade 2/1	Base Unit ELFEIYII63	Section Number 2

 Road **402-4040 Wilmslow Road,**
 Place **Withington**
 Location **M20 3BN**

 Division
 District
 Location Details

 Purpose
 Duty **Combined**
 Catchment

 Shape/Size **150mm**
 Material **Vitrified clay**
 Category

 Start Node **MH 01**
 End Node **MH 02**
 Total length **11 metres**

 Scale **1:0.58**
 Direction **Downstream**

Start Node Ref:MH 01 | I/L :mm | Depth: 0.70mm

Position	Code	Description	Photo	Type/Grade
0.00	MH	Start node type, manhole, reference MH 01	5938250	Comment / 0
0.00	WL	Water level 5% height/diameter	5938251	Comment / 0
1.76	LD	Line of drain/sewer deviates down	5938256	Comment / 0
2.43	JDM	Joint displaced medium	5938258	Structural / 1
2.43	JN	Junction at 9 o'clock, diameter 100mm	5938273	Comment / 0
2.71	WL	Water level 10% height/diameter - Remark: DIP IN PIPE	5938274	Comment / 0
3.24	DER	Settled deposits coarse 5% cross-sectional area loss	5938278	Service / 2
3.83	REM	MCPVC - Material of drain/sewer changes to polyvinyl chloride at this point	5938282	Comment / 0
7.12	LD	Line of drain/sewer deviates down	5938286	Comment / 0
8.76	JDM	Joint displaced medium - Remark: SEAL VISABLE	5938290	Structural / 1
9.55	JN	Junction at 10 o'clock, diameter 100mm	5938292	Comment / 0
9.95	JDL	Joint displaced large - Remark: SEAL VISABLE - HOLDING WATER	5938302	Structural / 1
10.05	MCVC	Material of drain/sewer changes to vitrified clay at this point	5938303	Comment / 0
10.21	SA	Survey abandoned - Remark: UNABLE TO PASS DUE TO DISPLACED JOINT - ENCRUSTATION - REPAIR NEEDED	5938338	Comment / 0
10.26	DEE	Attached deposits, encrustation at 5 o'clock 5% cross-sectional area loss	5938313	Service / 2

End Node Ref:MH 02 | I/L :mm



Job Number LAYERSERV0001126	Surveyed by (Operator) CHRIS LUCOCK	Base Unit ELFEIYII63	Date 18/01/2022
			
Start node type, manhole, reference MH 01			
			
Water level 5% height/diameter			
			
Line of drain/sewer deviates down			
			
Joint displaced medium			
			
Junction at 9 o'clock, diameter 100mm			
			
Water level 10% height/diameter - Remark: DIP IN PIPE			



Job Number
LAYERSERV0001126

Surveyed by (Operator)
CHRIS LUCOCK

Base Unit
ELFEIYI63

Date
18/01/2022



Settled deposits coarse 5% cross-sectional area loss



MCPVC - Material of drain/sewer changes to polyvinyl chloride at this point



Line of drain/sewer deviates down



Joint displaced medium - Remark: SEAL VISABLE



Junction at 10 o'clock, diameter 100mm



Joint displaced large - Remark: SEAL VISABLE - HOLDING WATER



Job Number
LAYERSERV0001126

Surveyed by (Operator)
CHRIS LUCOCK

Base Unit
ELFEIYII63

Date
18/01/2022



Material of drain/sewer changes to vitrified clay at this point



Survey abandoned - Remark: UNABLE TO PASS DUE TO DISPLACED JOINT - ENCRUSTATION - REPAIR NEEDED



Attached deposits, encrustation at 5 o'clock 5% cross-sectional area loss

Surveyed by (Operator) CHRIS LUCOCK	Job Number LAYERSERV0001126	Pipe Length Reference(PLR) MH 01 X	Date 18/01/2022	Pre Cleaned Not Cleaned
Weather 1 - Dry	Customer Present	Service Grade/Structural Grade 0/5	Base Unit ELFEIYII63	Section Number 3

Road 402-4040 Wilmslow Road, Place Withington Location M20 3BN	Division District Location Details
---	--

Purpose Duty Combined Catchment	Shape/Size 150mm Material Vitrified clay Category	Start Node MH 02 End Node MH 01 Total length 0.31 metres
--	---	---

Scale 1:0.00 Direction Upstream
--

Start Node Ref:MH 02 | I/L :mm | Depth: 1.10mm

Position	Code	Description	Photo	Type/Grade
0.00	MH	Start node type, manhole, reference MH 02	5938555	Comment / 0
0.00	WL	Water level 5% height/diameter	5938557	Comment / 0
0.14	H	Hole in drain/sewer from 8 to 12 o'clock - Remark: PIPE BROKEN - REPAIR NEEDED	5938574	Structural / 5
0.31	OCF	Finish node type, other special chamber, reference SURVEY OVERLAPPED	5938576	Comment / 0

End Node Ref:MH 01 | I/L :mm | Depth: 0.70mm



Job Number
LAYERSERV0001126

Surveyed by (Operator)
CHRIS LUCOCK

Base Unit
ELFEIYII63

Date
18/01/2022



Start node type, manhole, reference MH 02



Water level 5% height/diameter



Hole in drain/sewer from 8 to 12 o'clock - Remark: PIPE BROKEN - REPAIR NEEDED



Finish node type, other special chamber, reference SURVEY OVERLAPPED

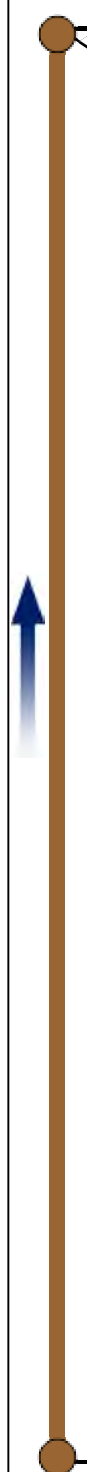
Surveyed by (Operator) CHRIS LUCOCK	Job Number LAYERSERV0001126	Pipe Length Reference(PLR) BRANCH B X	Date 18/01/2022	Pre Cleaned Not Cleaned
Weather 1 - Dry	Customer Present	Service Grade/Structural Grade 0/0	Base Unit ELFEIYII63	Section Number 4

Road 402-4040 Wilmslow Road, Place Withington Location M20 3BN	Division District Location Details
---	--

Purpose Duty Combined Catchment	Shape/Size 100mm Material Vitrified clay Category	Start Node MH 02 End Node BRANCH B Total length 2.45 metres
--	---	--

Scale 1:0.10 Direction Upstream
--

Start Node Ref:MH 02 | I/L :mm | Depth: 1.10mm

Position	Code	Description	Photo	Type/Grade
0.00	MH	Start node type, manhole, reference MH 02	5938585	Comment / 0
0.00	WL	Water level 5% height/diameter	5938587	Comment / 0
				
2.45	GYF	Finish node type, gully, reference GULLY	5938599	Comment / 0

End Node Ref:BRANCH B | I/L :mm



Job Number LAYERSERV0001126	Surveyed by (Operator) CHRIS LUCOCK	Base Unit ELFEIYII63	Date 18/01/2022
 0.00 M Start node type, manhole, reference MH 02		 0.00 M Water level 5% height/diameter	
 2.45 M Finish node type, gully, reference GULLY			

Surveyed by (Operator) CHRIS LUCOCK	Job Number LAYERSERV0001126	Pipe Length Reference(PLR) MH 02 X	Date 18/01/2022	Pre Cleaned Not Cleaned
Weather 1 - Dry	Customer Present	Service Grade/Structural Grade 0/1	Base Unit ELFEIYII63	Section Number 5
Road 402-4040 Wilmslow Road, Place Withington Location M20 3BN		Division District Location Details		
Purpose Duty Combined Catchment	Shape/Size 150mm Material Vitrified clay Category		Start Node MH 02 End Node MH 03 Total length 6.29 metres	

 Scale **1:0.31**
 Direction **Downstream**

Start Node Ref:MH 02 | I/L :mm | Depth: 1.10mm

Position	Code	Description	Photo	Type/Grade
0.00	MH	Start node type, manhole, reference MH 02	5938600	Comment / 0
0.00	WL	Water level 5% height/diameter	5938601	Comment / 0
0.29	OJL	Open joint large - Remark: SEAL VISABLE	5938610	Structural / 1
2.21	JN	Junction at 10 o'clock, diameter 100mm	5938611	Comment / 0
4.45	JN	Junction at 3 o'clock, diameter 150mm	5938616	Comment / 0
4.45	LD	Line of drain/sewer deviates down	5938617	Comment / 0
4.76	LL	Line of drain/sewer deviates left	5938621	Comment / 0
5.64	JN	Junction at 12 o'clock, diameter 100mm	5938631	Comment / 0
6.29	MHF	Finish node type, manhole, reference MH 03	5938632	Comment / 0

End Node Ref:MH 03 | I/L :mm | Depth: 1.80mm



Job Number LAYERSERV0001126	Surveyed by (Operator) CHRIS LUCOCK	Base Unit ELFEIYII63	Date 18/01/2022
 0.00 M Start node type, manhole, reference MH 02			
 0.00 M Water level 5% height/diameter			
 0.29 M Open joint large - Remark: SEAL VISABLE			
 2.21 M Junction at 10 o'clock, diameter 100mm			
 4.45 M Junction at 3 o'clock, diameter 150mm			
 4.45 M Line of drain/sewer deviates down			



Job Number LAYERSERV0001126	Surveyed by (Operator) CHRIS LUCOCK	Base Unit ELFEIYII63	Date 18/01/2022
			
Line of drain/sewer deviates left			
			
Junction at 12 o'clock, diameter 100mm			
			
Finish node type, manhole, reference MH 03			

Surveyed by (Operator) CHRIS LUCOCK	Job Number LAYERSERV0001126	Pipe Length Reference(PLR) MH 03 X	Date 18/01/2022	Pre Cleaned Not Cleaned
Weather 1 - Dry	Customer Present	Service Grade/Structural Grade 4/1	Base Unit ELFEIYII63	Section Number 6

 Road **402-4040 Wilmslow Road,**
 Place **Withington**
 Location **M20 3BN**

 Division
 District
 Location Details

 Purpose
 Duty **Combined**
 Catchment

 Shape/Size **225mm**
 Material **Vitrified clay**
 Category

 Start Node **MH 03**
 End Node **MH 04**
 Total length **40 metres**

 Scale **1:2.10**
 Direction **Downstream**

Start Node Ref:MH 03 | I/L :mm | Depth: 1.80mm

Position	Code	Description	Photo	Type/Grade
0.00	MH	Start node type, manhole, reference MH 03	5939027	Comment / 0
0.00	WL	Water level 10% height/diameter	5939028	Comment / 0
0.31	CN	Connection other than junction at 10 o'clock, diameter 100mm	5939030	Comment / 0
1.40	LL	Line of drain/sewer deviates left	5939031	Comment / 0
20.17	LR	Line of drain/sewer deviates right	5939040	Comment / 0
22.79	LL	Line of drain/sewer deviates left	5939051	Comment / 0
23.36	LD	Line of drain/sewer deviates down	5939052	Comment / 0
24.62	CUW	Loss of vision, camera under water	5939059	Comment / 0
25.10	JDL	Joint displaced large	5939096	Structural / 1
25.10	DER	Settled deposits coarse 15% cross-sectional area loss	5939097	Service / 3
25.14	LL	Line of drain/sewer deviates left	5939116	Comment / 0
25.14	DES	Settled deposits fine 20% cross-sectional area loss	5939129	Service / 4
25.17	RF	Roots fine	5939114	Service / 2
27.50	DER	Settled deposits coarse 20% cross-sectional area loss	5939158	Service / 4
29.00	SA	Survey abandoned - Remark: UNABLE TO PASS DUE TO SILT/ROOTS - CLEANING REQUIRED FOR FURTHER INVESTIGATION	5939263	Comment / 0

End Node Ref:MH 04 | I/L :mm



Job Number
LAYERSERV0001126

Surveyed by (Operator)
CHRIS LUCOCK

Base Unit
ELFEIYII63

Date
18/01/2022



Start node type, manhole, reference MH 03



Water level 10% height/diameter



Connection other than junction at 10 o'clock, diameter 100mm



Line of drain/sewer deviates left



Line of drain/sewer deviates right



Line of drain/sewer deviates left



Job Number
LAYERSERV0001126

Surveyed by (Operator)
CHRIS LUCOCK

Base Unit
ELFEIYII63

Date
18/01/2022



Line of drain/sewer deviates down



Loss of vision, camera under water



Joint displaced large



Settled deposits coarse 15% cross-sectional area loss



Line of drain/sewer deviates left



Settled deposits fine 20% cross-sectional area loss



Job Number LAYERSERV0001126	Surveyed by (Operator) CHRIS LUCOCK	Base Unit ELFEIYII63	Date 18/01/2022
			
Roots fine			
			
Settled deposits coarse 20% cross-sectional area loss			
			
Survey abandoned - Remark: UNABLE TO PASS DUE TO SILT/ROOTS - CLEANING REQUIRED FOR FURTHER INVESTIGATION			

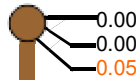
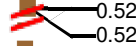
Surveyed by (Operator) CHRIS LUCOCK	Job Number LAYERSERV0001126	Pipe Length Reference(PLR) BRANCH B X	Date 18/01/2022	Pre Cleaned Not Cleaned
Weather 1 - Dry	Customer Present	Service Grade/Structural Grade 4/0	Base Unit ELFEIYII63	Section Number 7

Road 402-4040 Wilmslow Road, Place Withington Location M20 3BN	Division District Location Details
---	--

Purpose Duty Combined Catchment	Shape/Size 100mm Material Vitrified clay Category	Start Node MH 03 End Node BRANCH B Total length 5 metres
--	---	---

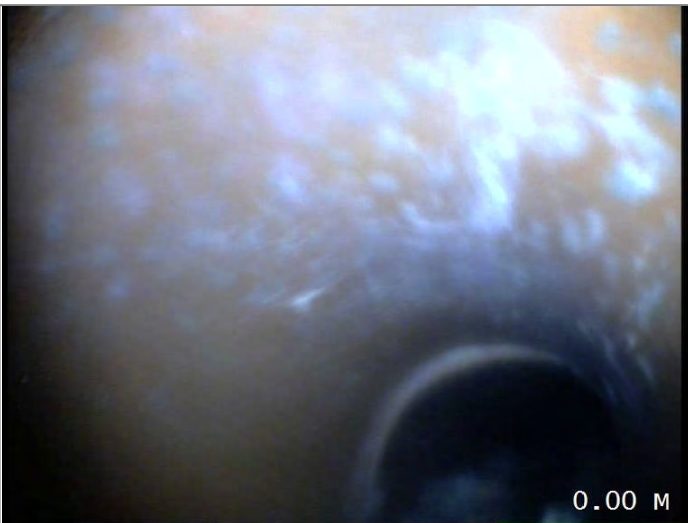
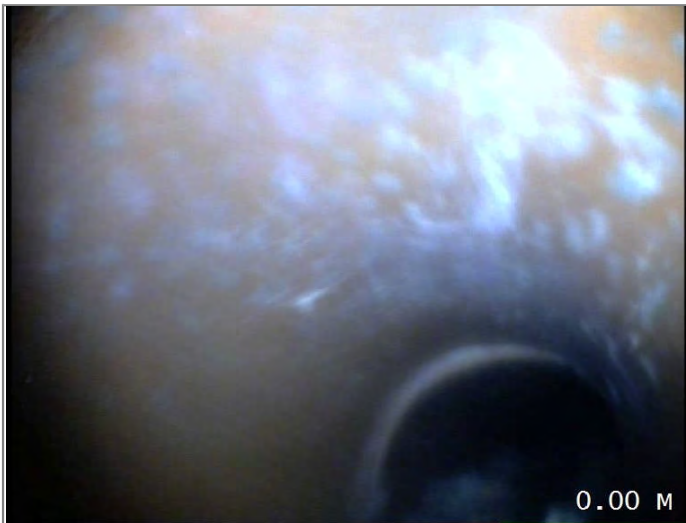
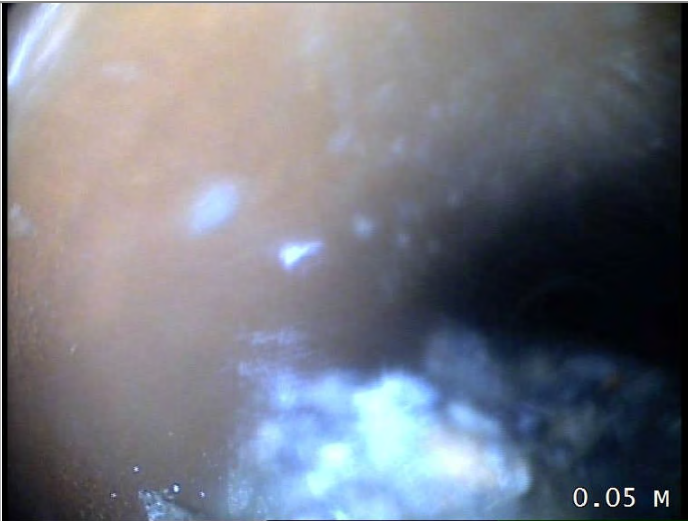
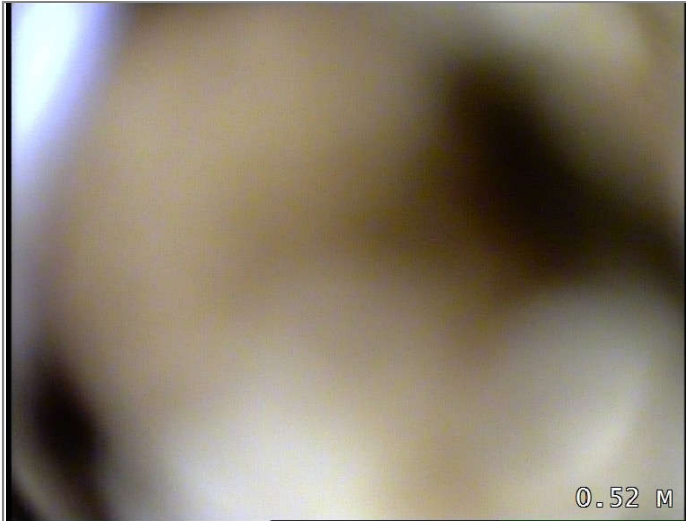
Scale 1:0.26 Direction Upstream
--

Start Node Ref:MH 03 | I/L :mm | Depth: 1.80mm

Position	Code	Description	Photo	Type/Grade
	MH	Start node type, manhole, reference MH 03	5939313	Comment / 0
0.00	WL	Water level 5% height/diameter	5939314	Comment / 0
0.05	DES	Settled deposits fine 25% cross-sectional area loss	5939315	Service / 4
	CUD	Loss of vision, silt	5939316	Comment / 0
0.52	SA	Survey abandoned - Remark: UNABLE TO PASS DUE TO HIGH SILT DEPOSITS CLEANING REQUIRED	5939327	Comment / 0

End Node Ref:BRANCH B | I/L :mm



Job Number LAYERSERV0001126	Surveyed by (Operator) CHRIS LUCOCK	Base Unit ELFEIYII63	Date 18/01/2022
 0.00 M Start node type, manhole, reference MH 03		 0.00 M Water level 5% height/diameter	
 0.05 M Settled deposits fine 25% cross-sectional area loss		 0.52 M Loss of vision, silt	
 0.52 M Survey abandoned - Remark: UNABLE TO PASS DUE TO HIGH SILT DEPOSITS CLEANING REQUIRED			

Surveyed by (Operator) CHRIS LUCOCK	Job Number LAYERSERV0001126	Pipe Length Reference(PLR) BRANCH C X	Date 18/01/2022	Pre Cleaned Not Cleaned
Weather 1 - Dry	Customer Present	Service Grade/Structural Grade 3/0	Base Unit ELFEIYII63	Section Number 8

Road 402-4040 Wilmslow Road, Place Withington Location M20 3BN	Division District Location Details
---	--

Purpose Duty Combined Catchment	Shape/Size 100mm Material Vitrified clay Category	Start Node MH 03 End Node BRANCH C Total length 1.24 metres
--	---	--

Scale 1:0.05 Direction Upstream
--

Start Node Ref:MH 03 I/L :mm Depth: 1.80mm					
Position	Code	Description	Photo	Type/Grade	
0.00	MH	Start node type, manhole, reference MH 03	5939366	Comment / 0	
0.00	WL	Water level 5% height/diameter	5939368	Comment / 0	
0.12	DEE	Attached deposits, encrustation from 6 to 5 o'clock 10% cross-sectional area loss	5939370	Service / 3	
					
1.24	GYF	Finish node type, gully, reference GULLY	5939390	Comment / 0	
End Node Ref:BRANCH C I/L :mm					



Job Number LAYERSERV0001126	Surveyed by (Operator) CHRIS LUCOCK	Base Unit ELFEIYII63	Date 18/01/2022
 0.00 M Start node type, manhole, reference MH 03	 0.00 M Water level 5% height/diameter		
 0.12 M Attached deposits, encrustation from 6 to 5 o'clock 10% cross-sectional area loss	 1.24 M Finish node type, gully, reference GULLY		

Surveyed by (Operator) CHRIS LUCOCK	Job Number LAYERSERV0001126	Pipe Length Reference(PLR) SVP 1 X	Date 18/01/2022	Pre Cleaned Not Cleaned
Weather 1 - Dry	Customer Present	Service Grade/Structural Grade 5/0	Base Unit ELFEIYII63	Section Number 9

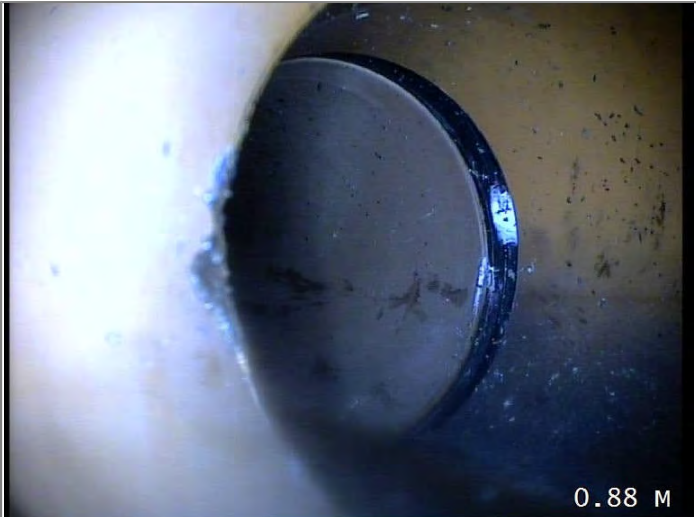
Road 402-4040 Wilmslow Road, Place Withington Location M20 3BN	Division District Location Details
---	--

Purpose Duty Combined Catchment	Shape/Size 100mm Material Vitrified clay Category	Start Node SVP 1 End Node MAIN CARRIER Total length 6.98 metres
--	---	--

Scale 1:0.31 Direction Downstream
--

Start Node Ref:SVP 1 I/L :mm						
Position	Code	Description		Photo	Type/Grade	
0.00	SN	Start node type: SVP		5939596	Comment / 0	
0.00	WL	Water level 5% height/diameter		5939597	Comment / 0	
0.38	LR	Line of drain/sewer deviates right		5939599	Comment / 0	
0.88	LL	Line of drain/sewer deviates left		5939609	Comment / 0	
2.36	OFF	Finish node type, outfall, reference MAIN CARRIER		5939625	Comment / 0	
4.19	RM	Roots mass 50% cross-sectional area loss		5939642	Service / 5	
5.52	RM	Roots mass 100% cross-sectional area loss		5939655	Service / 5	
6.93	RM	Roots mass 100% cross-sectional area loss		5939656	Service / 5	
End Node Ref:MAIN CARRIER I/L :mm						

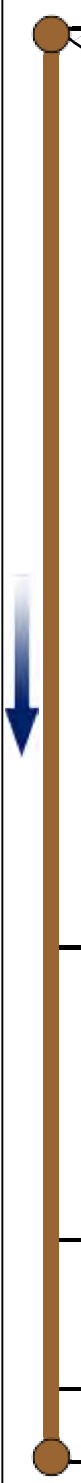


Job Number LAYERSERV0001126	Surveyed by (Operator) CHRIS LUCOCK	Base Unit ELFEIYII63	Date 18/01/2022
 0.00 M Start node type: SVP			
 0.00 M Water level 5% height/diameter			
 0.38 M Line of drain/sewer deviates right			
 0.88 M Line of drain/sewer deviates left			
 2.36 M Finish node type, outfall, reference MAIN CARRIER			
 4.19 M Roots mass 50% cross-sectional area loss			

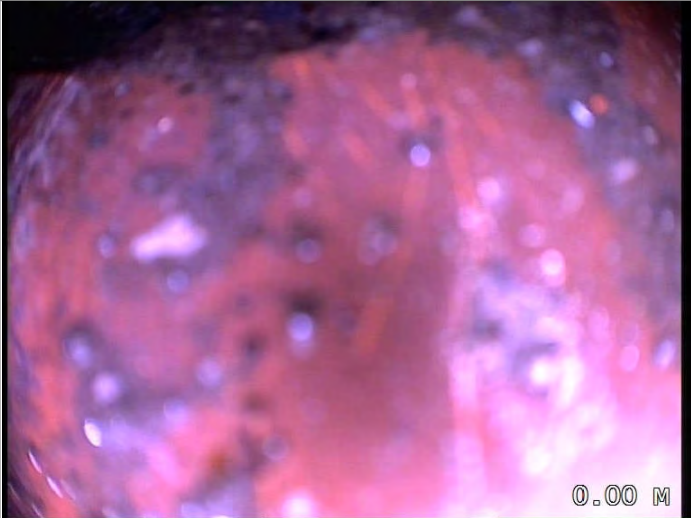
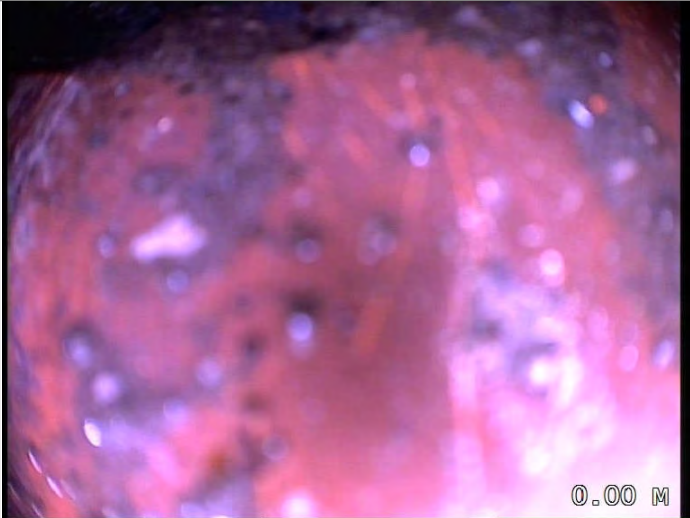


Job Number LAYERSERV0001126	Surveyed by (Operator) CHRIS LUCOCK	Base Unit ELFEIYII63	Date 18/01/2022
 5.52 M Roots mass 100% cross-sectional area loss			
 6.93 M Roots mass 100% cross-sectional area loss			

Surveyed by (Operator) CHRIS LUCOCK	Job Number LAYERSERV0001126	Pipe Length Reference (PLR) SVP 2 X	Date 18/01/2022	Pre Cleaned Not Cleaned
Weather 1 - Dry	Customer Present	Service Grade/Structural Grade 0/0	Base Unit ELFEIYII63	Section Number 10
Road 402-4040 Wilmslow Road, Place Withington Location M20 3BN		Division District Location Details		
Purpose Duty Combined Catchment		Shape/Size 100mm Material Vitrified clay Category	Start Node SVP 2 End Node MAIN CARRIER Total length 9.81 metres	
Scale 1:0.47 Direction Downstream				

Start Node Ref: SVP 2 I/L :mm						
Position	Code	Description		Photo	Type/Grade	
0.00	SN	Start node type: SVP		5939798	Comment / 0	
	WL	Water level 5% height/diameter		5939799	Comment / 0	
						
6.29	JN	Junction at 12 o'clock, diameter 100mm		5939800	Comment / 0	
8.29	LD	Line of drain/sewer deviates down		5939811	Comment / 0	
9.31	LL	Line of drain/sewer deviates left		5939812	Comment / 0	
9.81	OCF	Finish node type, other special chamber, reference MAIN CARRIER		5939818	Comment / 0	
End Node Ref: MAIN CARRIER I/L :mm						



Job Number LAYERSERV0001126	Surveyed by (Operator) CHRIS LUCOCK	Base Unit ELFEIYI63	Date 18/01/2022
 0.00 M Start node type: SVP			
 0.00 M Water level 5% height/diameter			
 6.29 M Junction at 12 o'clock, diameter 100mm			
 8.29 M Line of drain/sewer deviates down			
 9.31 M Line of drain/sewer deviates left			
 9.81 M Finish node type, other special chamber, reference MAIN CARRIER			



LAYER SURVEYS LTD

SEE THE COMPLETE PICTURE

North West Office:

Francis House, Meadowcroft Business Park,
Pope Lane, Preston, PR4 4BA

Midlands Office:

5A Anchor Road,
Aldridge WS9 8PT

Southern Office:

Grove Park Business Estate Waltham Rd,
White Waltham, Maidenhead SL6 3LW

T: 01772 611634

M: 07341 953636

darren@layersurveys.co.uk

www.layersurveys.co.uk

[f @layersurveys](https://www.facebook.com/layersurveys)

LinkedIn



Layer Surveys Ltd

Head Office: Francis House, Meadowcroft Business Park, Pope Lane, Preston, PR4 4BA
T: 01772 611634



LAYER SURVEYS LTD
SEE THE COMPLETE PICTURE

Layer Surveys Ltd Manhole Survey Card

Card No	01	Map No	
Catchment		MH No	MH 01
Location	WILMSLOW ROAD		
Town	WITHINGTON - M20 3BN		

★ PR	Status		Syphon	★ C	Function	★ MH	MH Type	18/01/2022	Date of Survey
---------	--------	--	--------	--------	----------	---------	---------	------------	----------------

COVER DETAILS

☒ Square
 ☐ Rectangle
 ☐ Triangle
 ☐ Dbl Triangle
 ☐ Circular
 ☐ Oval
 ☐ Other
 ☐ Multiple
 ☐ Hinged
 ☐ Lockable

Cover Level		m	H / M / L Cover Duty	★ M	Initials	JP
-------------	--	---	----------------------	--------	----------	----

PIPE DETAILS

Incoming Pipes

Clockwise from pipe X	Pipe	Depth from Invert (m)	Upstream / Downstream MH Ref	Shape	Size (mm)		Pipe Mat	Lining Mat	Back Drop Dia (mm)	Back Drop Depth (m)
	A	0.68		C	Height	Width				
	B					X				
	C					X				
	D					X				
	E					X				
	F					X				

Outgoing Pipes

X	0.70		C	150	X		VC			
Y					X					

Cover Opening at narrowest	610 X 610	mm	Chamber Dimension	610 X 610	mm	Evidence of Surcharge	
Shaft at narrowest		mm	Shaft Depth (from CL)		mm	OX / H2S / METH Toxic atmosphere	

MANHOLE CONSTRUCTION DETAILS

☐ Pre Cast Concrete	☐ In Situ Concrete	☒ Brick	☐ GRP	☐ Arch	☐ Corbel	☐ Taper	☐ Side Entry
☐ Reducing Slab	☐ Segments	☐ No. of Landings	☐ No. of Step Irons	☐ No. of Ladders			
☐ No. of Regulating Brick Courses							

CONDITION INFORMATION (specific in remark)

	Cover	Shaft	Irons / Ladders	Chamber	Benching	Channel
OK	☒	☐	☐	☒	☒	☒
Needs attention	☐	☐	☐	☐	☐	☐
Urgent attention	☐	☐	☐	☐	☐	☐
Depth of Flow		mm	Depth of Silt		mm	Height of Surcharge from CL

REMARKS

LOCATION SKETCH



PLAN OF MANHOLE



STATUS	PU : Public	PR : Private	WC : Culverted Watercourse	} Applies to main outlet
	24 : Section 24	HD : Highway Drain		
FUNCTION	F : Foul	C : Combined	S : Surface Water	} Applies to main outlet
MANHOLE TYPE	IF : Infall	MH : Manhole	CP : Catchpit	CSO :Consented Sewer Overflow
	LH : Lamphole	RE : Rodding Eye	SO : Storm Overflow	DS :Dual system Manhole
	GU : Gully	OF : Outfall	SA : Soakaway	PS :Pumping Station
COVER DUTY	L : Light Duty	M : Medium Duty	H : Heavy Duty	
SHAPE	C : Circular	E : Egg	R : Rectangular	
	S : Square	T : Trapezoidal	A : Arched	
	B : Barrel	H : Horseshoe (Inverted U)	U : U-shaped with flat top	
	X : Other (state in words)			
PIPE (OR LINING) MATERIAL	AK : Alkathene	AC : Asbestos Cement	BR : Brick	
	CI : Cast Iron	SI : Spun (Grey) Iron	CO : Concrete	
	CSB : Concrete Segments (Bolted)	CSU : Concrete Segments (Unbolted)	CC : Concrete Box Culvert	
	DI : Ductile Iron	GRC : Glass Reinforced Concrete	GRP : Glass Reinforced Plastic	
	PSC : Plastic/Steel Composite	PVC : Polyvinyl Chloride	PE : Polyethylene	
	RPN : Reinforced Plastic Matrix	ST : Steel	VC : Vitrified Clay	
	PP : Polypropylene	PF : Pitch Fibre	MAC : Masonry, Coursed	
	MAR : Masonry, Randon Courses	XXX : Other (State in remarks)		
LINING	BL : Bitumen	RL : Resin	IS : Insituform	
	CL : Cement	PI : Plastic		

Layer Surveys Ltd

Head Office: Francis House, Meadowcroft Business Park, Pope Lane, Preston, PR4 4BA
T: 01772 611634



LAYER SURVEYS LTD
SEE THE COMPLETE PICTURE

Layer Surveys Ltd Manhole Survey Card

Card No	02	Map No	
Catchment		MH No	MH 02
Location	WILMSLOW ROAD		
Town	WITHINGTON - M20 3BN		

★ PR Status	Syphon	★ C Function	★ MH MH Type	18/01/2022 Date of Survey
---	-----------------------------	--	--	--

COVER DETAILS

☐ Square
 ☒ Rectangle
 ☐ Triangle
 ☐ Dbl Triangle
 ☐ Circular
 ☐ Oval
 ☐ Other
 ☐ Multiple
 ☐ Hinged
 ☐ Lockable

Cover Level m
 H / M / L Cover Duty
 Initials

PIPE DETAILS

Incoming Pipes

Clockwise from pipe X	Pipe	Depth from Invert (m)	Upstream / Downstream MH Ref	Shape	Size (mm)		Pipe Mat	Lining Mat	Back Drop Dia (mm)	Back Drop Depth (m)
	A	1.09		C	150	X	VC			
	B	1.05		C	100	X	VC			
	C					X				
	D					X				
	E					X				
	F					X				

Outgoing Pipes

X	1.10		C	150	X		VC			
Y					X					

Cover Opening at narrowest	550 X 690 mm	Chamber Dimension	450 X 630 mm	Evidence of Surcharge	
Shaft at narrowest	mm	Shaft Depth (from CL)	mm	OX / H2S / METH Toxic atmosphere	

MANHOLE CONSTRUCTION DETAILS

☒ Pre Cast Concrete
 ☐ In Situ Concrete
 ☐ Brick
 ☐ GRP
 ☐ Arch
 ☐ Corbel
 ☐ Taper
 ☐ Side Entry

☐ Reducing Slab
 ☐ Segments
 ☐ No. of Landings
 ☐ No. of Step Irons
 ☐ No. of Ladders

☐ No. of Regulating Brick Courses

CONDITION INFORMATION (specific in remark)

	Cover	Shaft	Irons / Ladders	Chamber	Benching	Channel
OK	☒	☐	☐	☒	☒	☒
Needs attention	☐	☐	☐	☐	☐	☐
Urgent attention	☐	☐	☐	☐	☐	☐

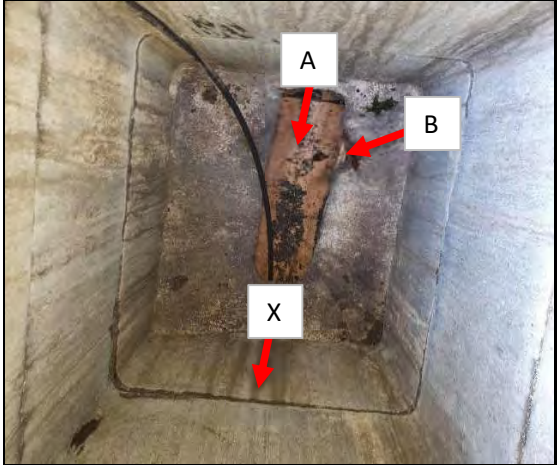
Depth of Flow mm
 Depth of Silt mm
 Height of Surcharge from CL mm

REMARKS

LOCATION SKETCH



PLAN OF MANHOLE



STATUS	PU : Public	PR : Private	WC : Culverted Watercourse	} Applies to main outlet
	24 : Section 24	HD : Highway Drain		
FUNCTION	F : Foul	C : Combined	S : Surface Water	} Applies to main outlet
MANHOLE TYPE	IF : Infall	MH : Manhole	CP : Catchpit	CSO :Consented Sewer Overflow
	LH : Lamphole	RE : Rodding Eye	SO : Storm Overflow	DS :Dual system Manhole
	GU : Gully	OF : Outfall	SA : Soakaway	PS :Pumping Station
COVER DUTY	L : Light Duty	M : Medium Duty	H : Heavy Duty	
SHAPE	C : Circular	E : Egg	R : Rectangular	
	S : Square	T : Trapezoidal	A : Arched	
	B : Barrel	H : Horseshoe (Inverted U)	U : U-shaped with flat top	
	X : Other (state in words)			
PIPE (OR LINING) MATERIAL	AK : Alkathene	AC : Asbestos Cement	BR : Brick	
	CI : Cast Iron	SI : Spun (Grey) Iron	CO : Concrete	
	CSB : Concrete Segments (Bolted)	CSU : Concrete Segments (Unbolted)	CC : Concrete Box Culvert	
	DI : Ductile Iron	GRC : Glass Reinforced Concrete	GRP : Glass Reinforced Plastic	
	PSC : Plastic/Steel Composite	PVC : Polyvinyl Chloride	PE : Polyethylene	
	RPV : Reinforced Plastic Matrix	ST : Steel	VC : Vitrified Clay	
	PP : Polypropylene	PF : Pitch Fibre	MAC : Masonry, Coursed	
	MAR : Masonry, Randon Courses	XXX : Other (State in remarks)		
LINING	BL : Bitumen	RL : Resin	IS : Insituform	
	CL : Cement	PI : Plastic		

Layer Surveys Ltd

Head Office: Francis House, Meadowcroft Business Park, Pope Lane, Preston, PR4 4BA
T: 01772 611634



LAYER SURVEYS LTD
SEE THE COMPLETE PICTURE

Layer Surveys Ltd Manhole Survey Card

Card No	03	Map No	
Catchment		MH No	MH 03
Location	WILMSLOW ROAD		
Town	WITHINGTON - M20 3BN		

★	PR Status	Syphon	★	C Function	★	MH MH Type	18/01/2022 Date of Survey
---	--	-----------------------------	---	---	---	---	--

COVER DETAILS

☐ Square	☒ Rectangle	☐ Triangle	☐ Dbl Triangle	☐ Circular	☐ Oval	☐ Other	☐ Multiple	☐ Hinged	☐ Lockable
Cover Level	m	H / M / L Cover Duty	<input checked="" type="text" value="H"/>	Initials	JP				

PIPE DETAILS

Incoming Pipes

Clockwise from pipe X	Pipe	Depth from Invert (m)	Upstream / Downstream MH Ref	Shape	Size (mm)		Pipe Mat	Lining Mat	Back Drop Dia (mm)	Back Drop Depth (m)
	A	1.79		C	225	X	VC			
	B	1.49		C	100	X	VC		100	0.69
	C	1.64		C	100	X	VC		100.00	1.20
	D					X				
	E					X				
	F					X				

Outgoing Pipes

X	1.80		C	225	X		VC			
Y					X					

Cover Opening at narrowest	720 X 860 mm	Chamber Dimension	700 X 650 mm	Evidence of Surcharge	
Shaft at narrowest	mm	Shaft Depth (from CL)	mm	OX / H2S / METH Toxic atmosphere	

MANHOLE CONSTRUCTION DETAILS

☐ Pre Cast Concrete	☐ In Situ Concrete	☒ Brick	☐ GRP	☐ Arch	☐ Corbel	☐ Taper	☐ Side Entry
☐ Reducing Slab	☐ Segments	☐ No. of Landings	2 No. of Step Irons	☐ No. of Ladders			
☐ No. of Regulating Brick Courses							

CONDITION INFORMATION (specific in remark)

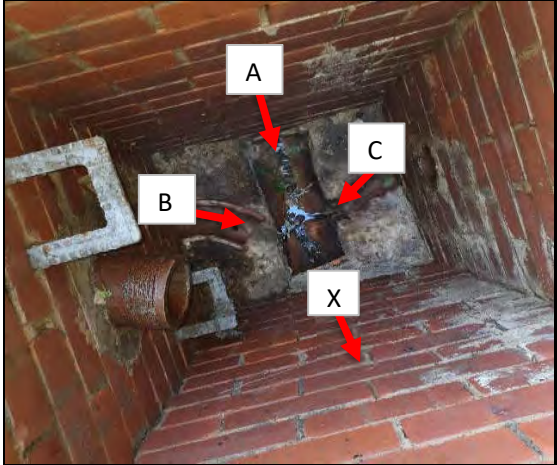
OK	☒ Cover	☐ Shaft	☒ Irons / Ladders	☒ Chamber	☒ Benching	☒ Channel
Needs attention	☐	☐	☐	☐	☐	☐
Urgent attention	☐	☐	☐	☐	☐	☐
Depth of Flow	mm	Depth of Silt	mm	Height of Surcharge from CL	mm	

REMARKS

LOCATION SKETCH



PLAN OF MANHOLE



STATUS	PU : Public	PR : Private	WC : Culverted Watercourse	} Applies to main outlet
	24 : Section 24	HD : Highway Drain		
FUNCTION	F : Foul	C : Combined	S : Surface Water	} Applies to main outlet
MANHOLE TYPE	IF : Infall	MH : Manhole	CP : Catchpit	CSO :Consented Sewer Overflow
	LH : Lamphole	RE : Rodding Eye	SO : Storm Overflow	DS :Dual system Manhole
	GU : Gully	OF : Outfall	SA : Soakaway	PS :Pumping Station
COVER DUTY	L : Light Duty	M : Medium Duty	H : Heavy Duty	
SHAPE	C : Circular	E : Egg	R : Rectangular	
	S : Square	T : Trapezoidal	A : Arched	
	B : Barrel	H : Horseshoe (Inverted U)	U : U-shaped with flat top	
	X : Other (state in words)			
PIPE (OR LINING) MATERIAL	AK : Alkathene	AC : Asbestos Cement	BR : Brick	
	CI : Cast Iron	SI : Spun (Grey) Iron	CO : Concrete	
	CSB : Concrete Segments (Bolted)	CSU : Concrete Segments (Unbolted)	CC : Concrete Box Culvert	
	DI : Ductile Iron	GRC : Glass Reinforced Concrete	GRP : Glass Reinforced Plastic	
	PSC : Plastic/Steel Composite	PVC : Polyvinyl Chloride	PE : Polyethylene	
	RPN : Reinforced Plastic Matrix	ST : Steel	VC : Vitrified Clay	
	PP : Polypropylene	PF : Pitch Fibre	MAC : Masonry, Coursed	
	MAR : Masonry, Randon Courses	XXX : Other (State in remarks)		
LINING	BL : Bitumen	RL : Resin	IS : Insituform	
	CL : Cement	PI : Plastic		