

GENERAL NOTES

DO NOT SCALE FROM THIS DRAWING WORK TO FIGURED DIMENSIONS ONLY.

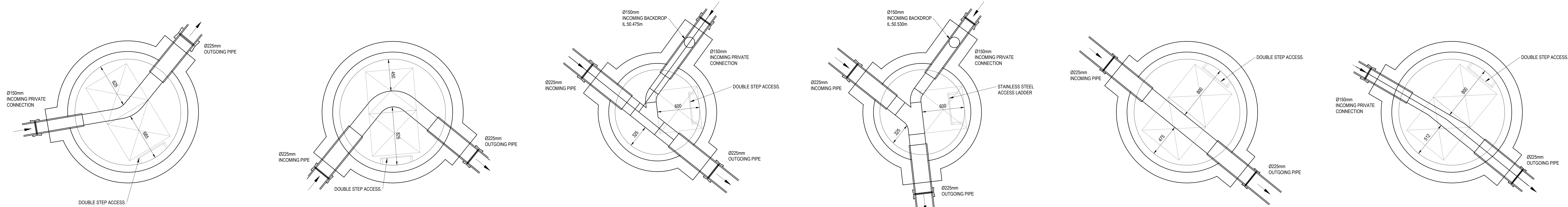
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MANHOLE REF	SETTING OUT	COVER LEVEL	INVERT LEVEL	DEPTH TO SOFFIT	MANHOLE DIAMETER	MANHOLE COVER	MANHOLE TYPE	COVER SLAB OPENING
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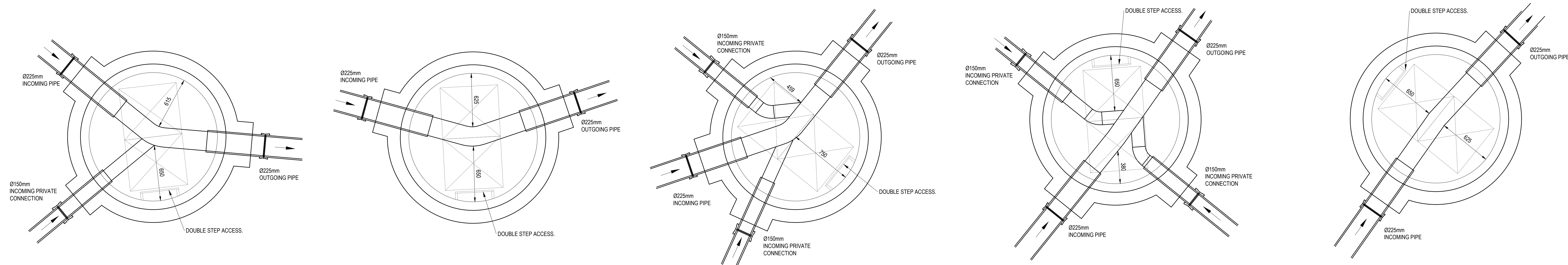
MANHOLE REF	SETTING OUT	COVER LEVEL	INVERT LEVEL	DEPTH TO SOFFIT	MANHOLE DIAMETER	MANHOLE COVER	MANHOLE TYPE	COVER SLAB OPENING
F2	E:381024.850 N:387633.465	51.479m	50.284m	0.970m	1500mm	1200x675 D400 150mm DEEP	PCC TYPE 4	1200x675

MANHOLE REF	SETTING OUT	COVER LEVEL	INVERT LEVEL	DEPTH TO SOFFIT	MANHOLE DIAMETER	MANHOLE COVER	MANHOLE TYPE	COVER SLAB OPENING
F3	E:381045.570 N:387617.545	51.945m	49.830m	1.890m	1200mm	600x600 D400 150mm DEEP	PCC TYPE 1	750x600

MANHOLE REF	SETTING OUT	COVER LEVEL	INVERT LEVEL	DEPTH TO SOFFIT	MANHOLE DIAMETER	MANHOLE COVER	MANHOLE TYPE	COVER SLAB OPENING
F4	E:381060.475 N:387605.620	52.261m	49.561m	2.475m	1200mm	600x600 D400 150mm DEEP	PCC TYPE 1	750x600

MANHOLE REF	SETTING OUT	COVER LEVEL	INVERT LEVEL	DEPTH TO SOFFIT	MANHOLE DIAMETER	MANHOLE COVER	MANHOLE TYPE	COVER SLAB OPENING
F5	E:381049.640 N:387687.715	50.246m	49.775m	1.249m	1500mm	1200x675 D400 150mm DEEP	PCC TYPE 4	1200x675

MANHOLE REF	SETTING OUT	COVER LEVEL	INVERT LEVEL	DEPTH TO SOFFIT	MANHOLE DIAMETER	MANHOLE COVER	MANHOLE TYPE	COVER SLAB OPENING
FS.12	E:381037.265 N:387697.860	50.550m	49.985m	1.340m	1500mm	1200x675 D400 150mm DEEP	PCC TYPE 4	1200x675



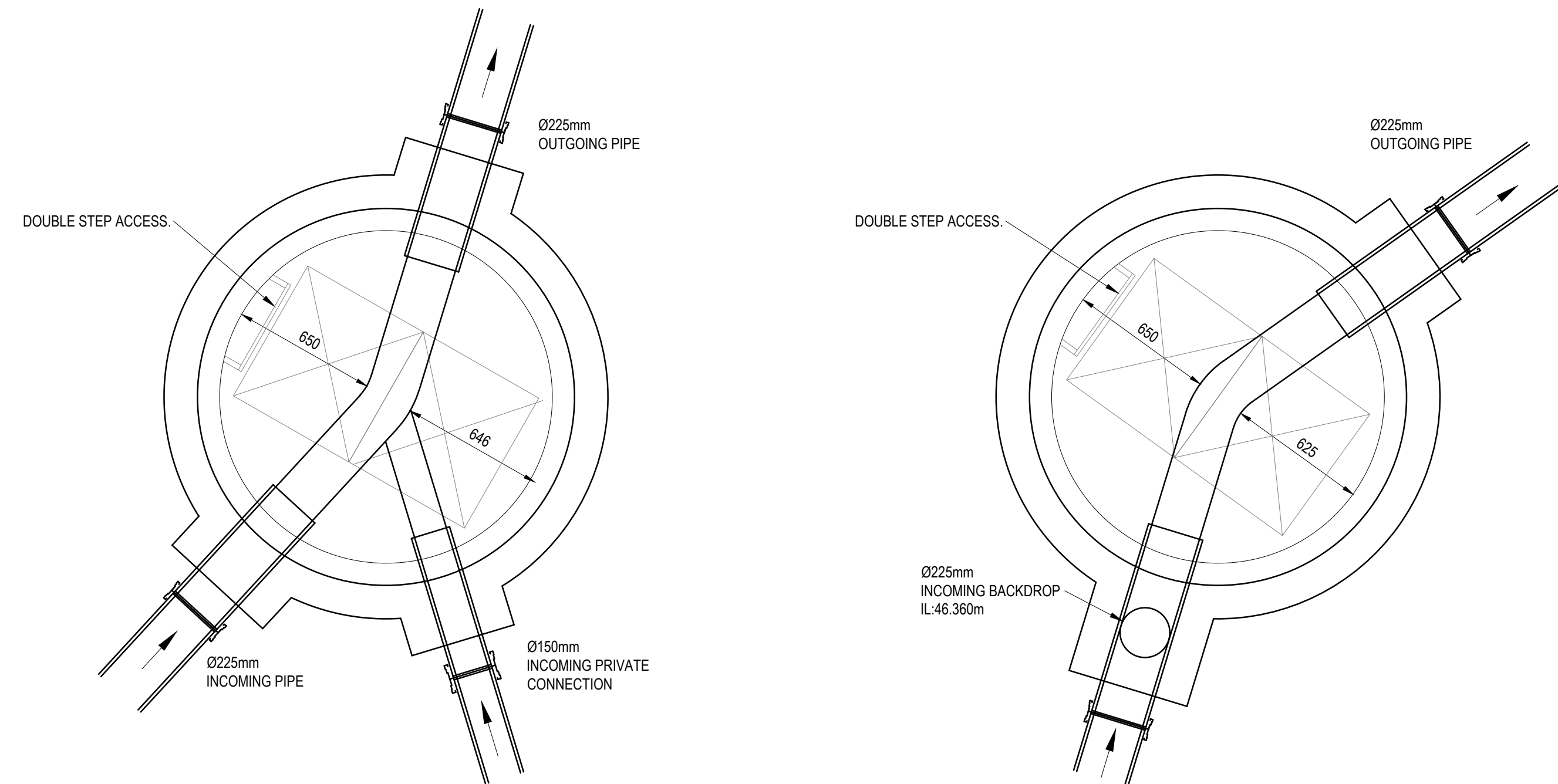
MANHOLE REF	SETTING OUT	COVER LEVEL	INVERT LEVEL	DEPTH TO SOFFIT	MANHOLE DIAMETER	MANHOLE COVER	MANHOLE TYPE	COVER SLAB OPENING
F6	E:381060.600 N:387678.865	50.019m	48.530m	1.264m	1500mm	1200x675 D400 150mm DEEP	PCC TYPE 4	1200x675

MANHOLE REF	SETTING OUT	COVER LEVEL	INVERT LEVEL	DEPTH TO SOFFIT	MANHOLE DIAMETER	MANHOLE COVER	MANHOLE TYPE	COVER SLAB OPENING
F7	E:381065.600 N:387679.460	49.892m	48.493m	1.174m	1500mm	1200x675 D400 150mm DEEP	PCC TYPE 4	1200x675

MANHOLE REF	SETTING OUT	COVER LEVEL	INVERT LEVEL	DEPTH TO SOFFIT	MANHOLE DIAMETER	MANHOLE COVER	MANHOLE TYPE	COVER SLAB OPENING
F8	E:381070.335 N:387680.035	49.802m	48.315m	1.262m	1500mm	1200x675 D400 150mm DEEP	PCC TYPE 4	1200x675

MANHOLE REF	SETTING OUT	COVER LEVEL	INVERT LEVEL	DEPTH TO SOFFIT	MANHOLE DIAMETER	MANHOLE COVER	MANHOLE TYPE	COVER SLAB OPENING
F9	E:381091.685 N:387706.705	49.068m	47.545m	1.295m	1500mm	1200x675 D400 150mm DEEP	PCC TYPE 4	1200x675

MANHOLE REF	SETTING OUT	COVER LEVEL	INVERT LEVEL	DEPTH TO SOFFIT	MANHOLE DIAMETER	MANHOLE COVER	MANHOLE TYPE	COVER SLAB OPENING
F10	E:381100.325 N:387718.780	48.840	48.938m	1.483m	1500mm	1200x675 D400 150mm DEEP	PCC TYPE 4	1200x675



MANHOLE REF	SETTING OUT	COVER LEVEL	INVERT LEVEL	DEPTH TO SOFFIT	MANHOLE DIAMETER	MANHOLE COVER	MANHOLE TYPE	COVER SLAB OPENING
F11	E:381100.325 N:387718.780	48.228	46.283m	1.717m	1500mm	1200x675 D400 150mm DEEP	PCC TYPE 4	1200x675

MANHOLE REF	SETTING OUT	COVER LEVEL	INVERT LEVEL	DEPTH TO SOFFIT	MANHOLE DIAMETER	MANHOLE COVER	MANHOLE TYPE	COVER SLAB OPENING
F12	E:381110.030 N:387735.705	47.770	45.519m	2.026m	1500mm	1200x675 D400 150mm DEEP	PCC TYPE 4	1200x675

ROCKER PIPES TO BE INSTALLED ON ALL RIGID PIPES. JOINT TO BE AS CLOSE AS POSSIBLE TO FACE OF ALL MANHOLES TO PERMIT SATISFACTORY JOINT AND SUBSEQUENT MOVEMENT.

THE RECOMMENDED LENGTH OF THE NEXT PIPE (ROCKER PIPE) AWAY FROM THE MANHOLE FROM SEWERS FOR ADOPTION (6TH EDITION) SHOULD BE AS SHOWN IN THE TABLE BELOW.

NOMINAL DIA. (mm)	EFFECTIVE LENGTH (m)
150 TO 600	0.6
675 TO 750	1.0
825 & OVER	1.25

WHERE LADDERS ARE USED, SEATING RINGS TO BE TURNED 180° TO ENSURE 600x600 ACCESS IS MAINTAINED WITH THE INCLUSION OF LADDERS.

ALL LATERAL CONNECTIONS TO BE MADE AT SOFFIT LEVEL TO THE MAIN CHANNEL.

FINAL CONSTRUCTION

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R01	FINAL CONSTRUCTION ISSUE				11.01.24	DB	LoG
Rev	Amendment				Date	By	Chkd
Project	GLENDENE, WYTHENSHAW						
Client	BTP ARCHITECTS						
Title	SECTION 104 - MANHOLE SCHEDULE SHEET 3 FOUL WATER						
Drawn	DB	Checked	LoG	Date	Scale	AS NOTED @ A0	
WML CONSULTING Chartered Civil and Structural Engineers					No. 8 Oak Green East Road Sutton Green Business Park Chesham Bucks Chesham HP8 5DL Tel: 0161 482 0000 Fax: 0161 481 9210 e-mail: info@wmlconsulting.com www.wmlconsulting.com		
Project	Originator	Volume	Level	Type	Role	Number	Rev
9003	-	WML	-	ZZ - XX - DR -	C -	1023	R01

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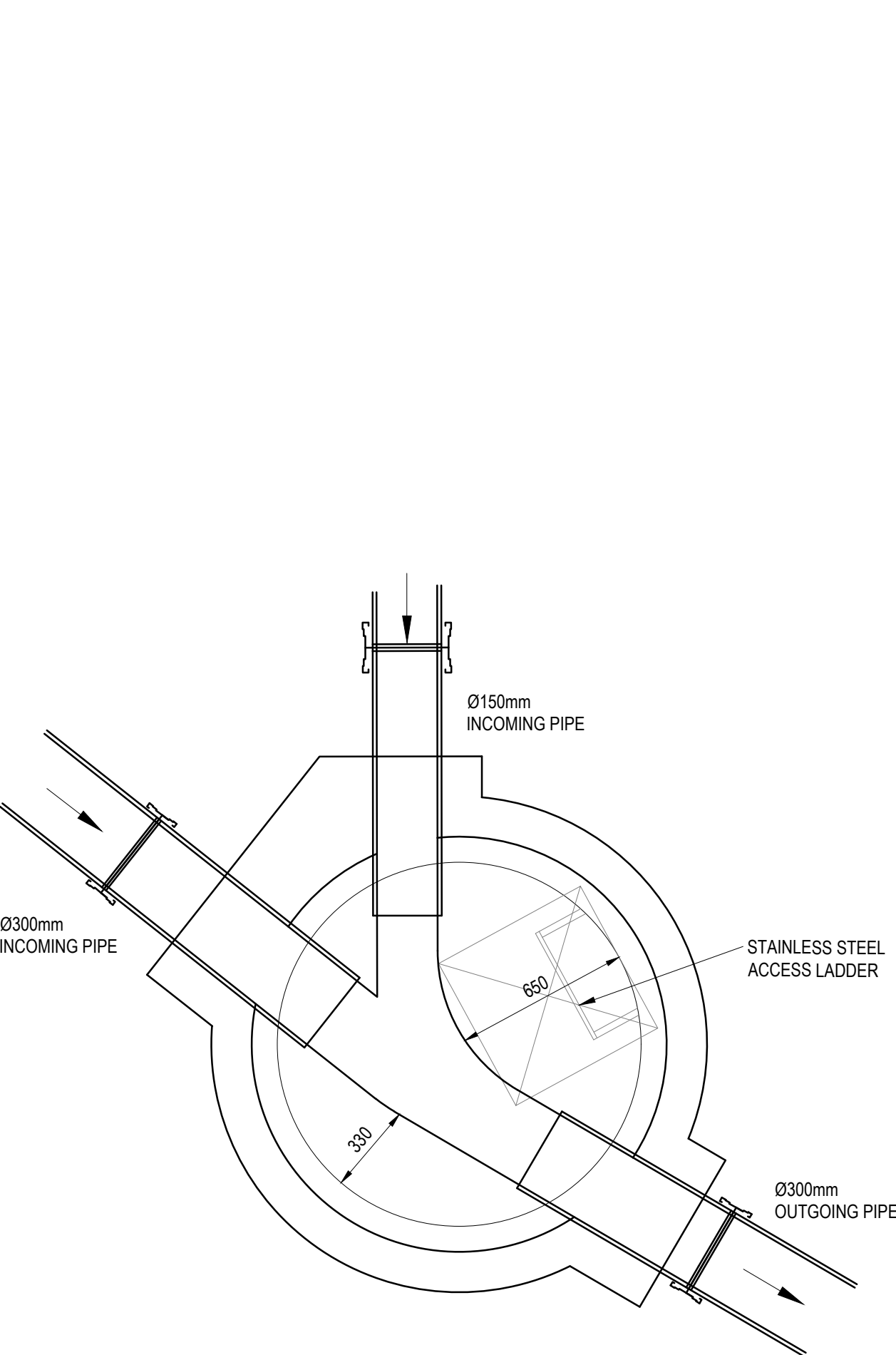
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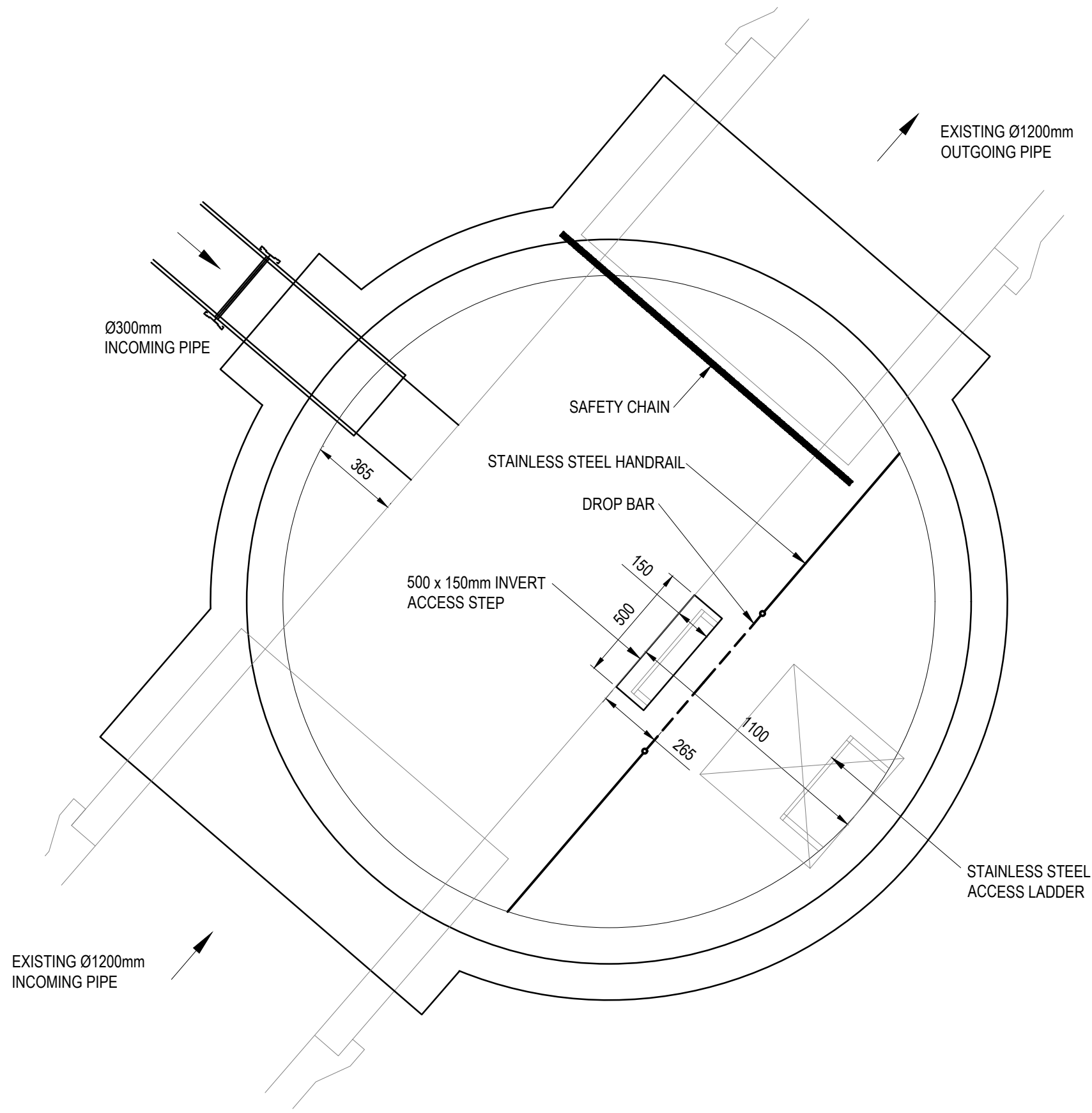
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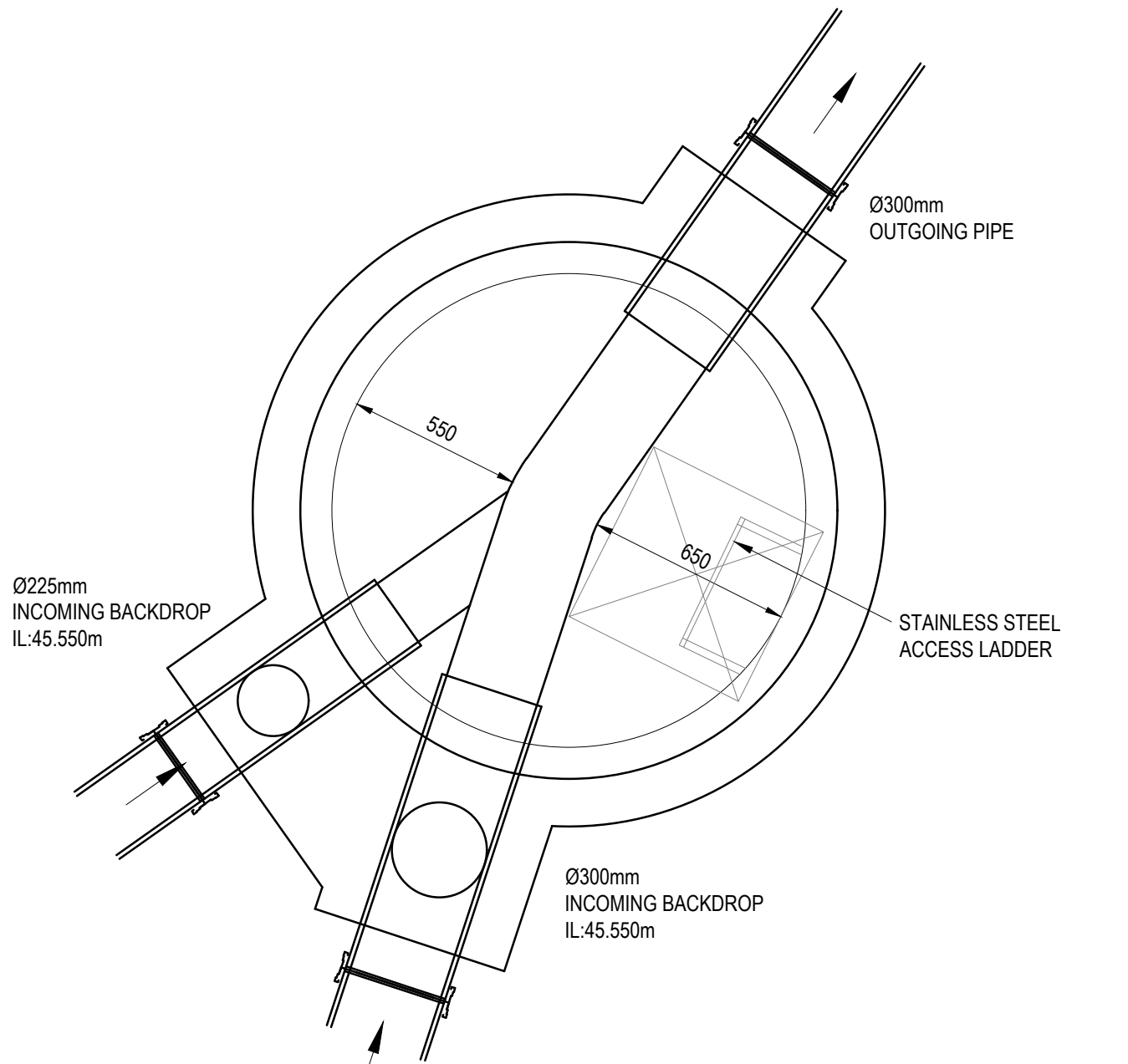
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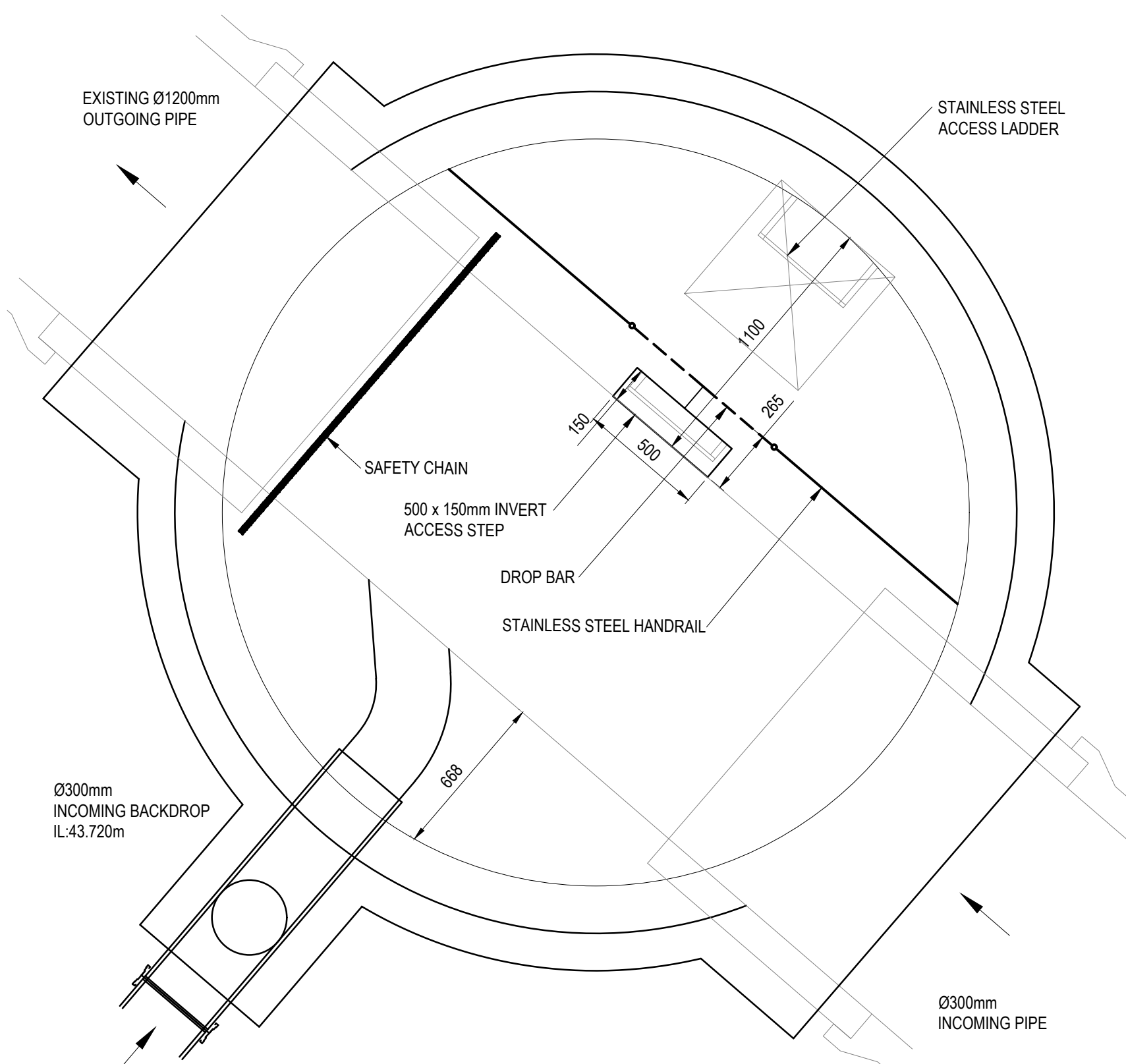
MANHOLE REF	SETTING OUT	COVER LEVEL	INVERT LEVEL	DEPTH TO SOFFIT	MANHOLE DIAMETER	MANHOLE COVER	MANHOLE TYPE	COVER SLAB OPENING
C1	E:381060.460 N:387603.335	52.330m	49.424	2.606m	1.350m	600x600 D400 150mm DEEP	PCC TYPE 1	750x600



MANHOLE REF	SETTING OUT	COVER LEVEL	INVERT LEVEL	DEPTH TO SOFFIT	MANHOLE DIAMETER	MANHOLE COVER	MANHOLE TYPE	COVER SLAB OPENING
C2	E:381065.025 N:387599.425	52.423m	49.400	2.723	2.700m	600x600 D400 150mm DEEP	PCC TYPE 2	750x600



MANHOLE REF	SETTING OUT	COVER LEVEL	INVERT LEVEL	DEPTH TO SOFFIT	MANHOLE DIAMETER	MANHOLE COVER	MANHOLE TYPE	COVER SLAB OPENING
C3	E:381113.195 N:387737.890	47.646m	44.042m	3.304m	1.500m	600x600 D400 150mm DEEP	PCC TYPE 1	750x600



MANHOLE REF	SETTING OUT	COVER LEVEL	INVERT LEVEL	DEPTH TO SOFFIT	MANHOLE DIAMETER	MANHOLE COVER	MANHOLE TYPE	COVER SLAB OPENING
C4	E:381116.025 N:387742.005	47.395m	42.220	3.825	3.000m	1200x675 D400 150mm DEEP	PCC TYPE 2	750x600

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R01	FINAL CONSTRUCTION ISSUE			11/01/24	DB	LoG
Rev.	Amendment			Date	By	Chkd
Project	GLENDENE, WYTHENSHAW					
CLIENT	BTP ARCHITECTS					
Title	SECTION 104 - MANHOLE SCHEDULE SHEET 4 COMBINED WATER					
Drawn	DB	Checked	LoG	Date	SEPT 21	Scale
				AS NOTED @ A0		
WML CONSULTING Chartered Civil and Structural Engineers				No 11 Oak Green East Road Sutton Green Business Park Chesham Bucks Chesham HP8 5DL Tel: 0161 462 0000 Fax: 0161 461 9210 e-mail: info@wmlconsulting.com www.wmlconsulting.com		
Project	Originator	Volume	Level	Type	Role	Number
9003	- WML - ZZ	- XX	- DR	- C	- 1024	R01

SUBJECT TO APPROVAL FROM
AND UNITED UTILITIES

NOTE:
THE SETTING OUT CO-ORDINATES SHOWN ON THIS DRAWING ARE BASED ON THE OS GRID.

- DRAWING KEY:**
- DENOTES EXISTING GROUND PROFILE
 - DENOTES PROPOSED ACCESS ROAD PROFILE
 - DENOTES ADOPTABLE SURFACE WATER SEWER
 - DENOTES ADOPTABLE FOUL WATER SEWER
 - DENOTES ADOPTABLE COMBINED WATER SEWER

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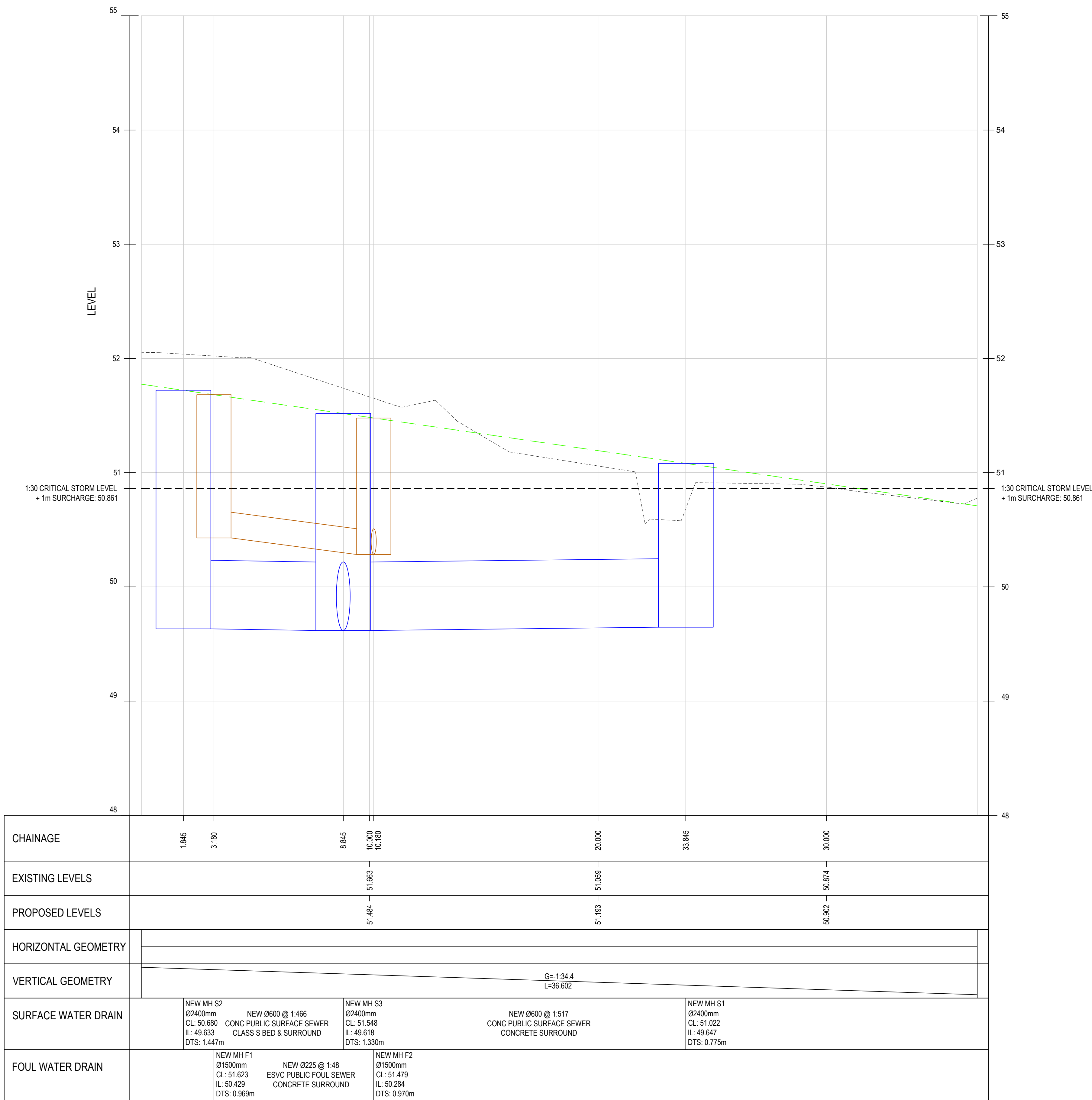
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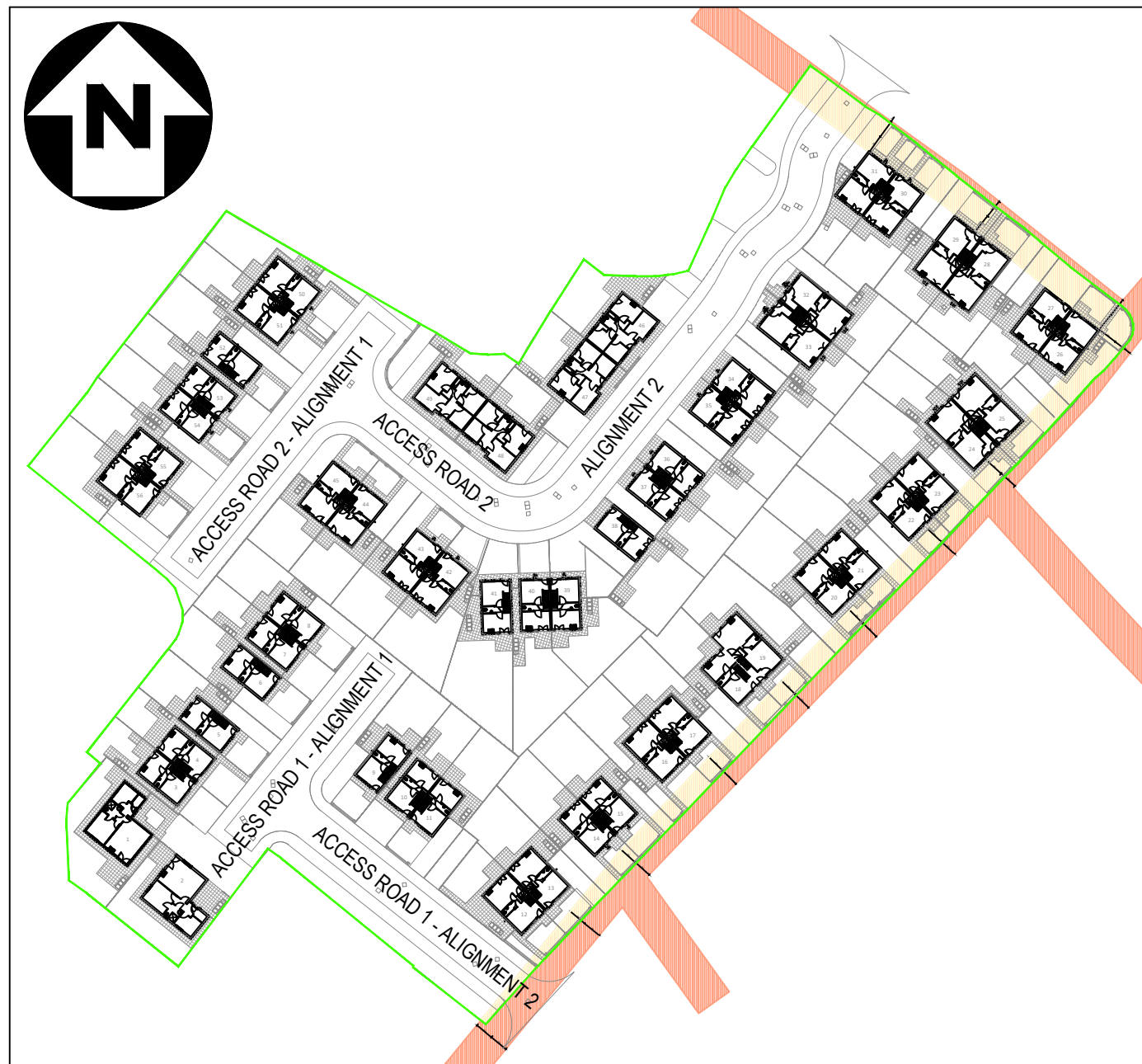
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ACCESS ROAD 1 - ALIGNMENT 1 LONGITUDINAL SECTION
(SCALE 1:100 @ A0)



LOCATION PLAN
(SCALE 1:1000)

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Rev.	Amendment			Date	By	Chkd
Project	GLENDENE, WYTHENSHAW					
CLIENT	BTP ARCHITECTS					
Title	SECTION 104 - LONG SECTIONS SHEET 1					
Drawn	DB	Checked	LoG	Date	Scale	
				SEPT 21	1:200 @ A0	
WML CONSULTING				No 8 Oak Green East Road Sturley Green Business Park Chesham 1980 GL Chesham 1980 GL Tel: 0161 482 0800 Fax: 0161 482 0810 e-mail: info@wmlconsulting.com www.wmlconsulting.com		
Project	Originator	Volume	Level	Type	Role	Number
9003	- WML - ZZ	- XX	- DR	- C	-	1031
						Rev
						R01

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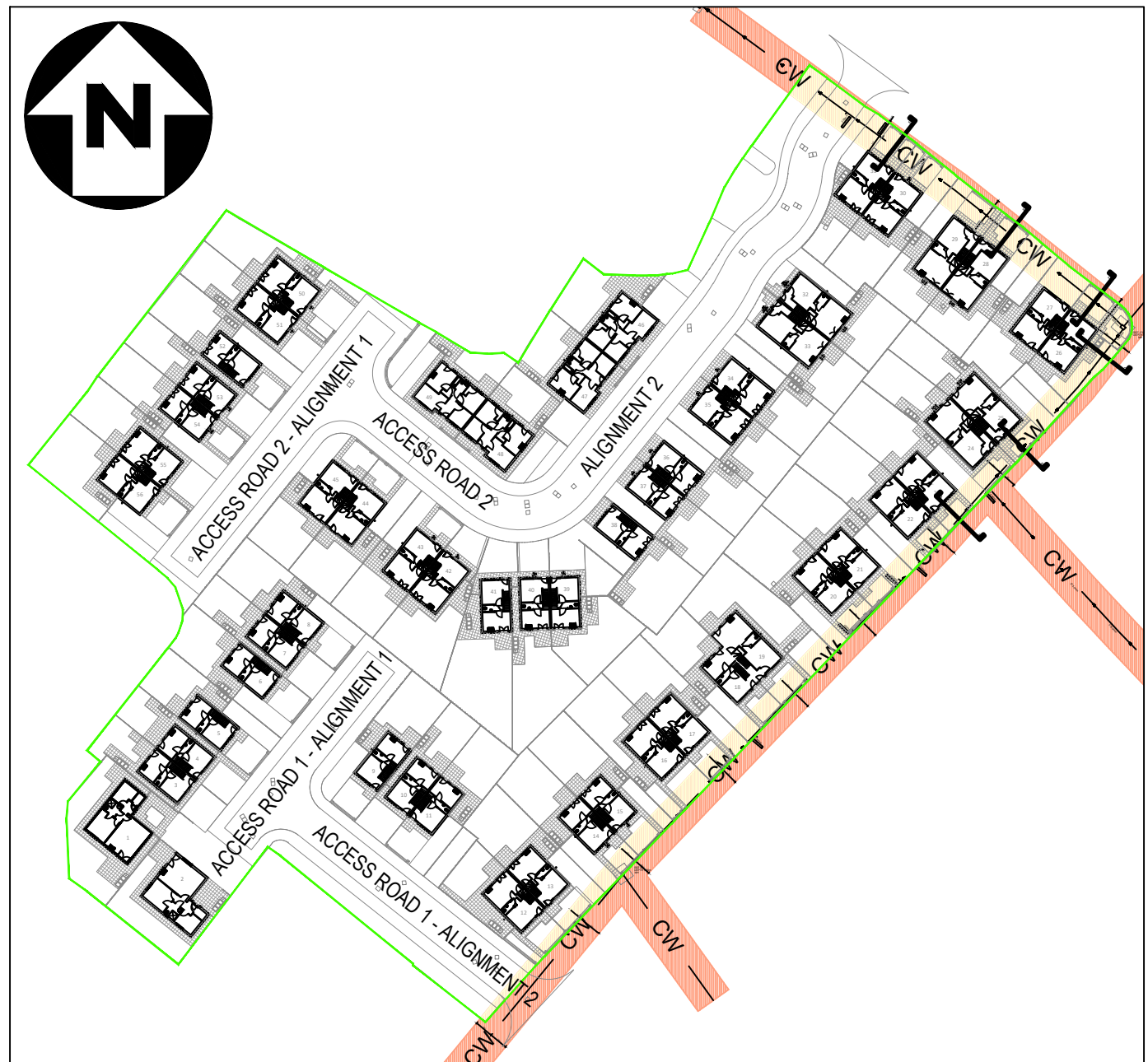
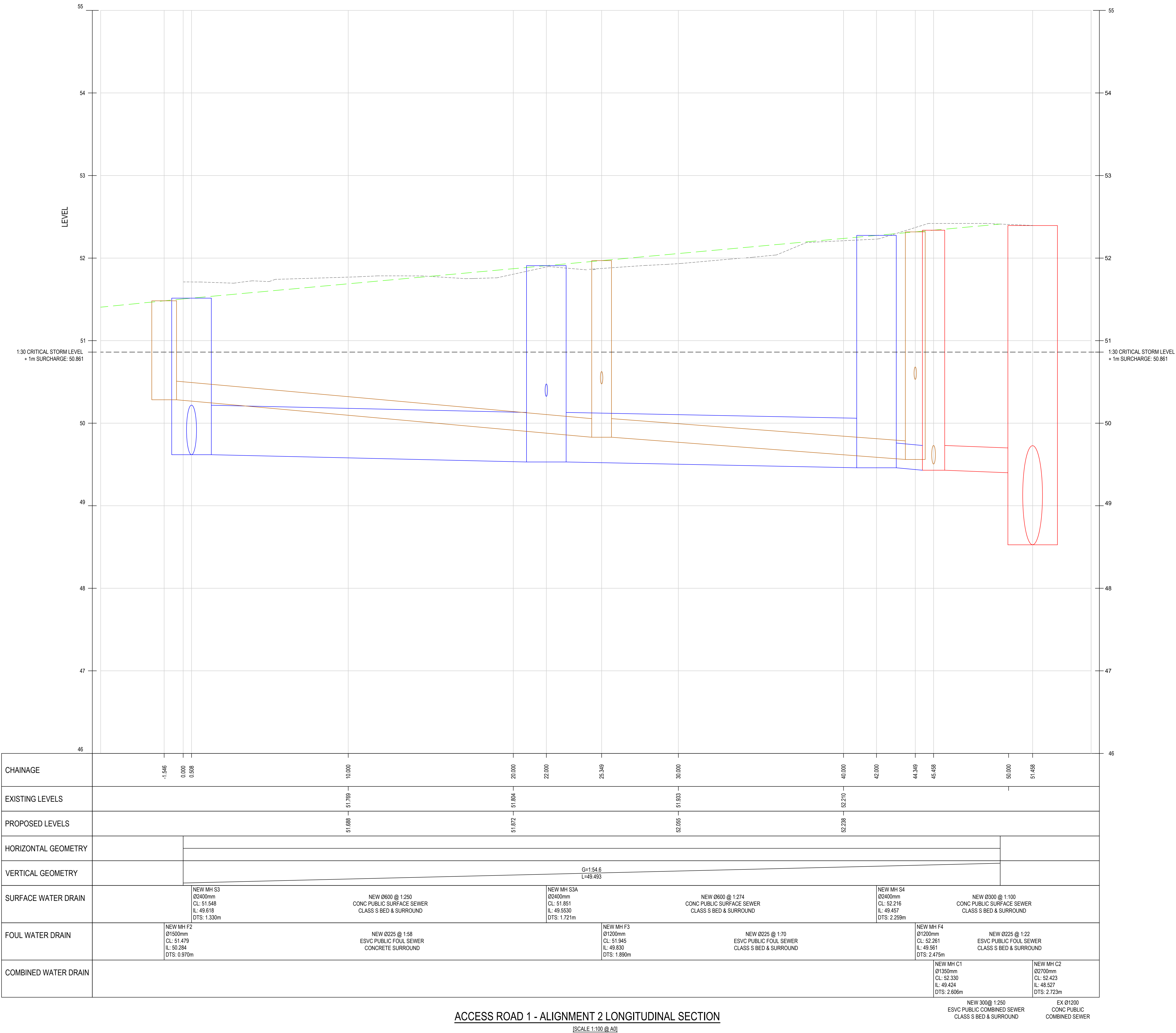
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LOCATION PLAN
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R01 FINAL CONSTRUCTION ISSUE		11.01.24		DB	LoG
Rev.	Amendment	Date	By	Chkd	
Project GLENDENE, WYTHENSHAW					
CLIENT BTP ARCHITECTS					
Title SECTION 104 - LONG SECTIONS SHEET 2					
Drawn	DB	Checked	LoG	Date	SEPT 21
				Scale	1:200 @ A0
WML CONSULTING Chartered Civil and Structural Engineers				No. 8 Oak Green East Road Sutton Green Business Park Chesham Bucks HP8 4JL Tel: 0161 482 0000 Fax: 0161 482 0210 e-mail: info@wmlconsulting.com www.wmlconsulting.com	
Project	Originator	Volume	Level	Type	Role
9003	- WML - ZZ	- XX	- DR	- C	- 1032
					R01

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DRAWING KEY:

----- DENOTES EXISTING GROUND PROFILE

----- DENOTES PROPOSED ACCESS ROAD PROFILE

----- DENOTES ADOPTABLE SURFACE WATER SEWER

----- DENOTES ADOPTABLE FOUL WATER SEWER

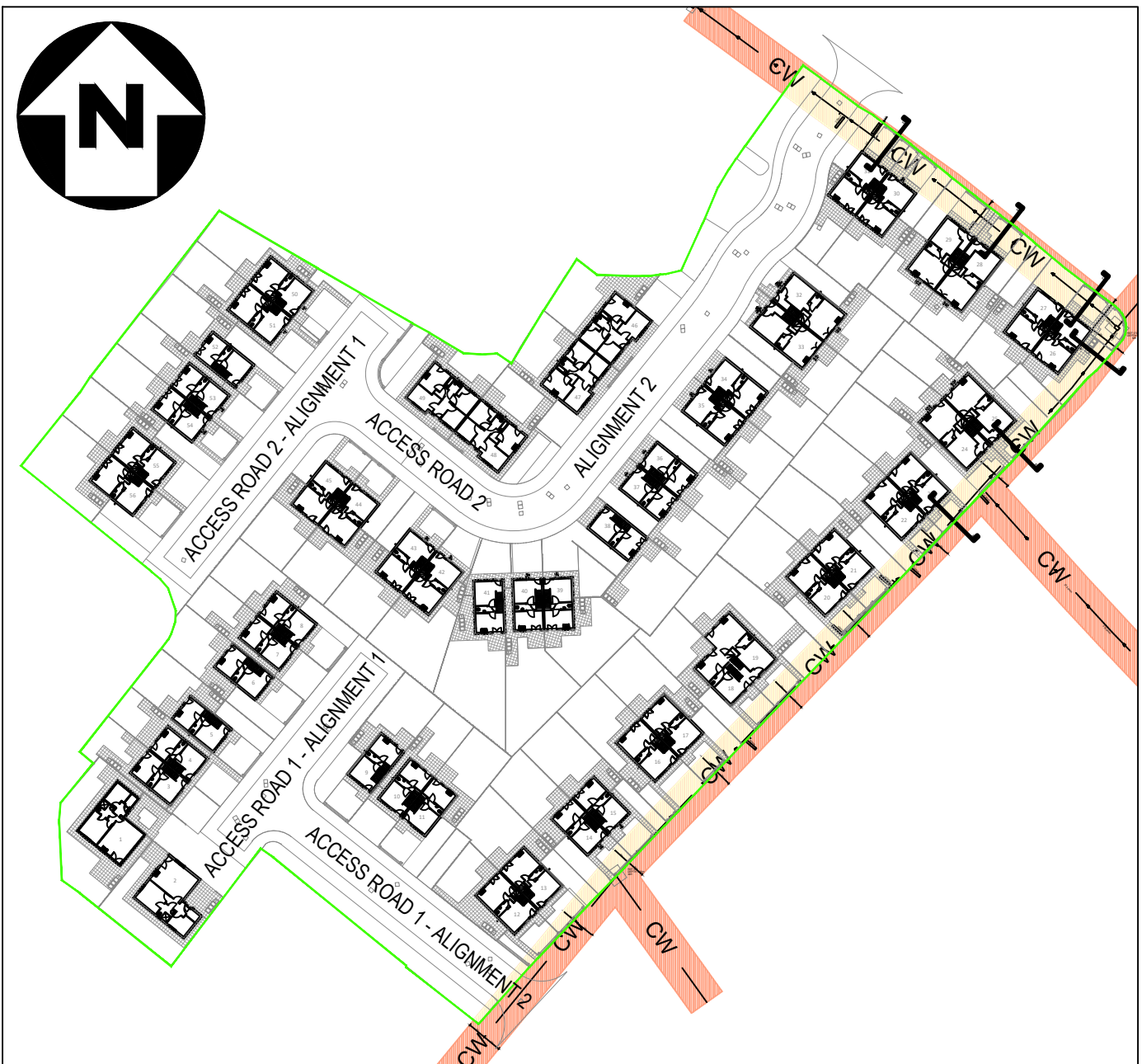
----- DENOTES ADOPTABLE COMBINED WATER SEWER

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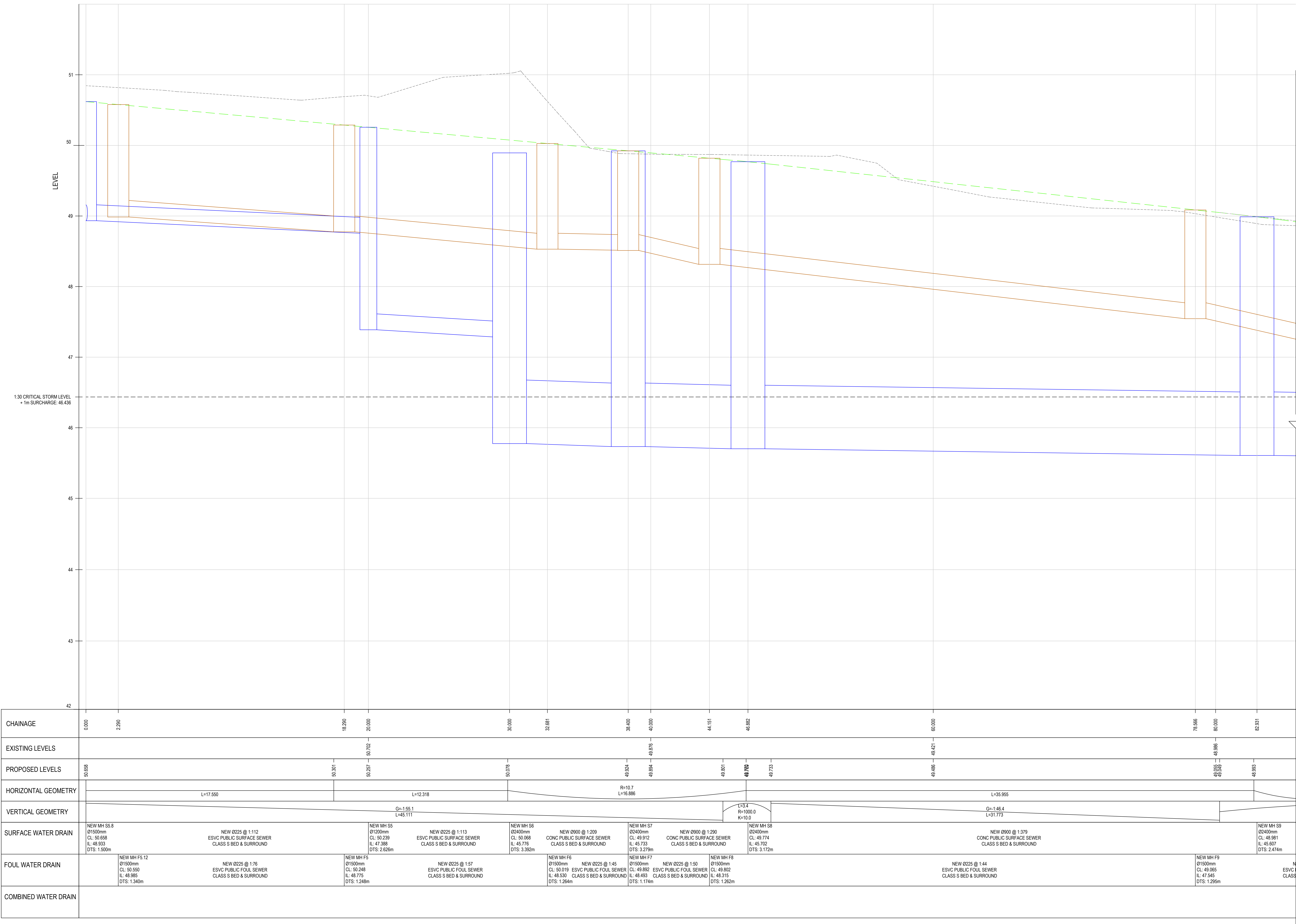


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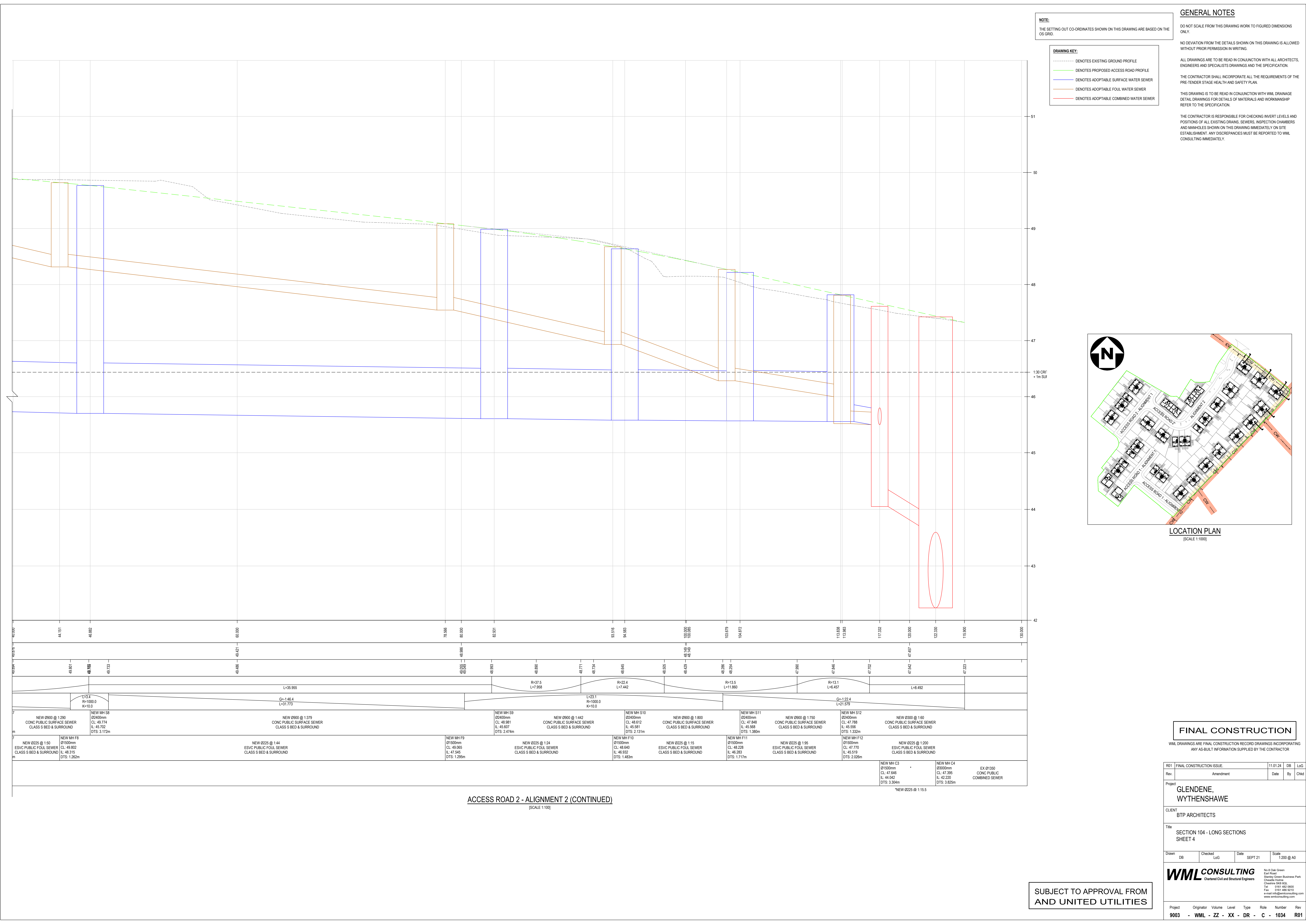
Rev1	FINAL CONSTRUCTION ISSUE					11/01/24	DB	LoG
Rev.	Amendment					Date	By	Chkd
Project	GLENDENE, WYTHENSHAW							
	BTP ARCHITECTS							
Title	SECTION 104 - LONG SECTIONS SHEET 3							
Drawn	DB	Checked	LoG	Date	SEPT 21 Scale 1:200 @ A0			
 WML CONSULTING Chartered Civil and Structural Engineers						No.6 Oak Green East Road Slattery Green Business Park Chesham, Bucks Chesham HP8 3BG Tel: 0161 452 0000 Fax: 0161 452 9212 e-mail: info@wmlconsulting.com www.wmlconsulting.com		
Project	Originator	Volume	Level	Type	Role	Number	Rev	
9003	- WML - ZZ	- XX	- DR	- C	- 1033	R01		

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ACCESS ROAD 2 - ALIGNMENT 2

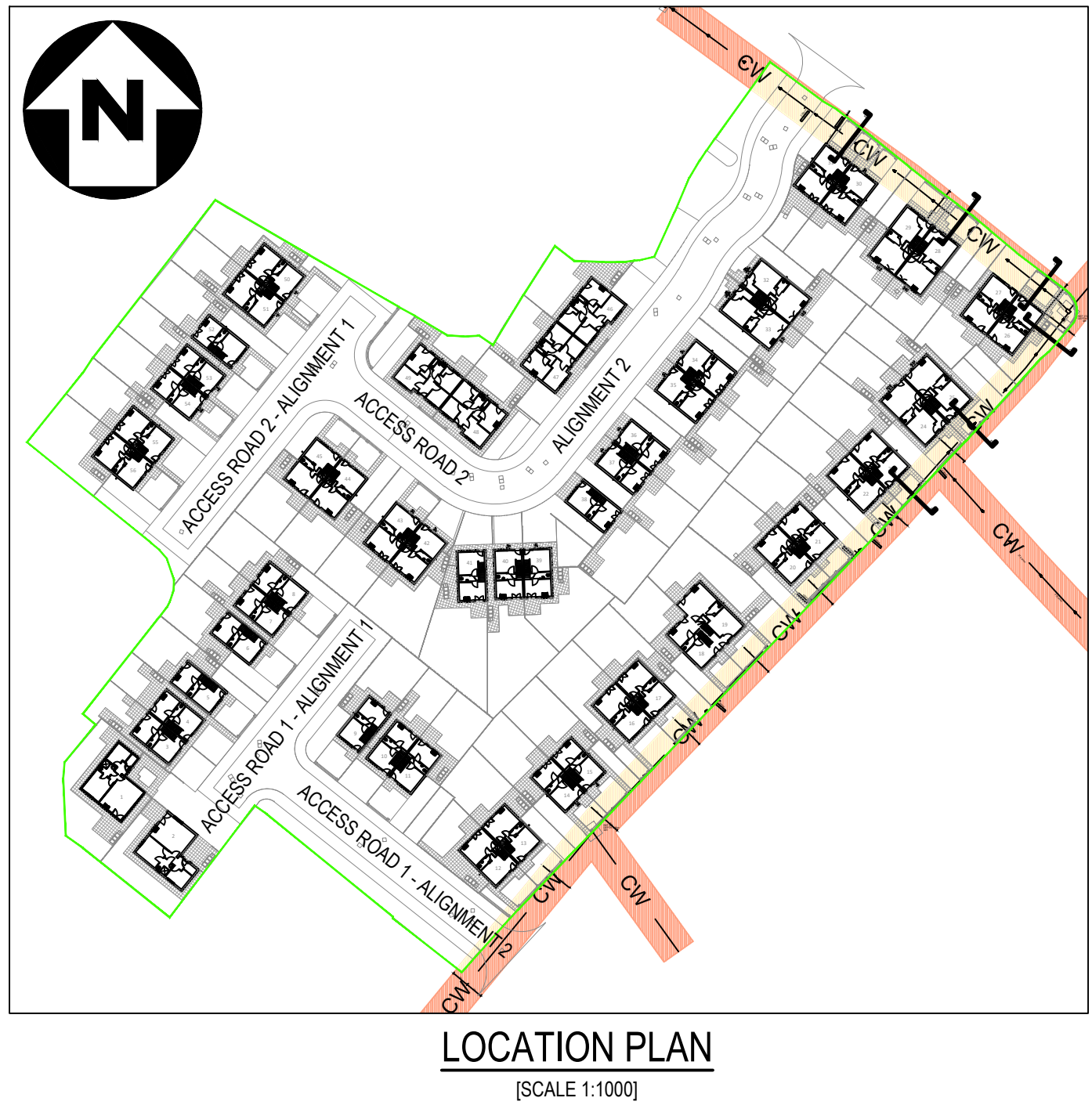
3



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DRAWING KEY:
- - - - - DENOTES EXISTING GROUND PROFILE
- - - - - DENOTES PROPOSED ACCESS ROAD PROFILE
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Rev	Amendment		Date	By	Chkd		
Project	GLENDENE, WYTHENSHAW						
Client	BTP ARCHITECTS						
Title	SECTION 104 - LONG SECTIONS SHEET 4						
Drawn	DB	Checked	LoG	Date	Scale		
				SEPT 21	1:200 @ A0		
WML CONSULTING			No 8 Oak Green East Road Stearns Green, Business Park Cheshire M16 9LJ Owens Road, Warrington Cheshire WA9 6JY Tel 0161 482 0000 Fax 0161 482 0010 e-mail: info@wmlconsulting.com www.wmlconsulting.com				
Project	Originator	Volume	Level	Type	Role	Number	Rev
9003	- WML	- ZZ	- XX	- DR	- C	- 1034	R01

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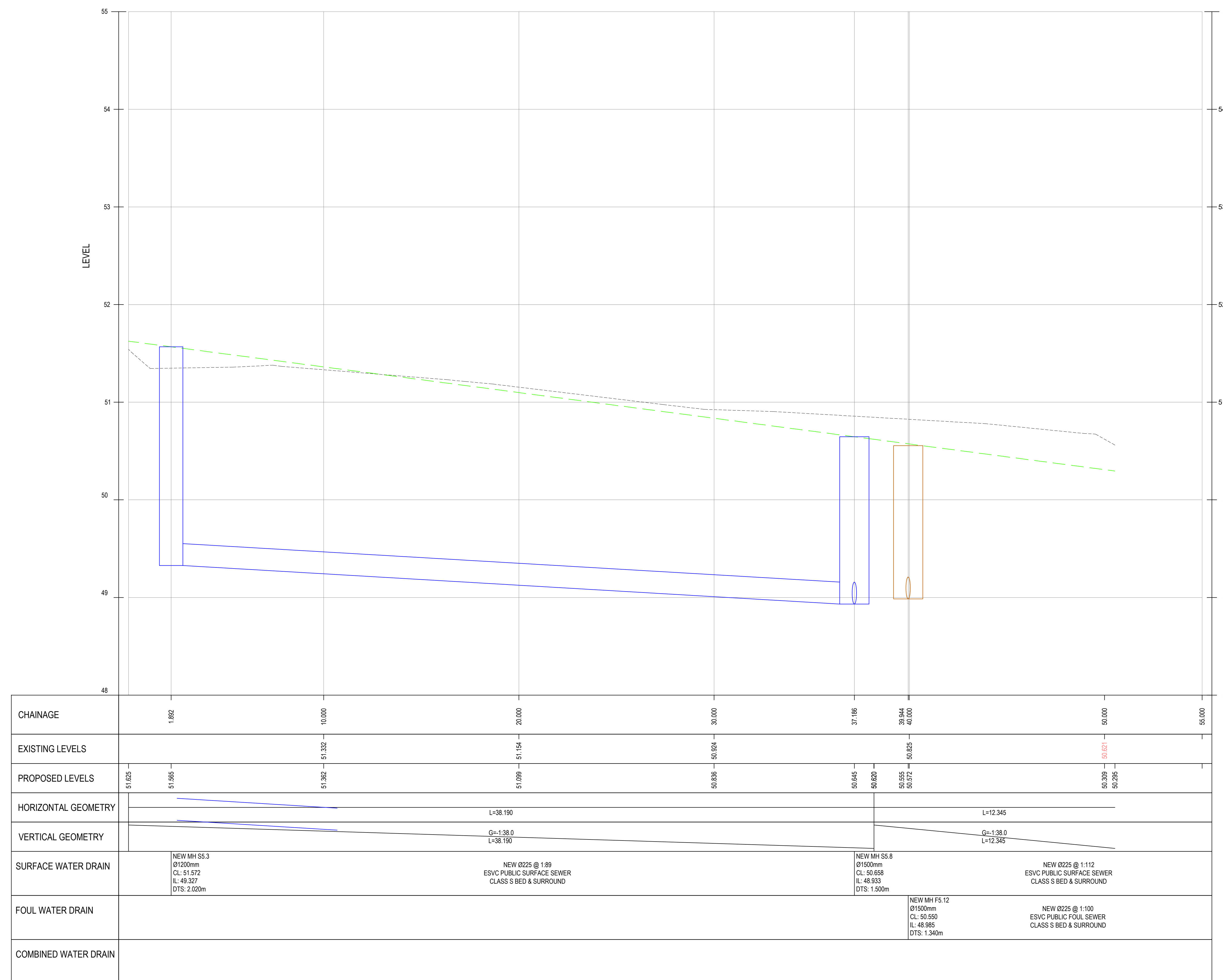
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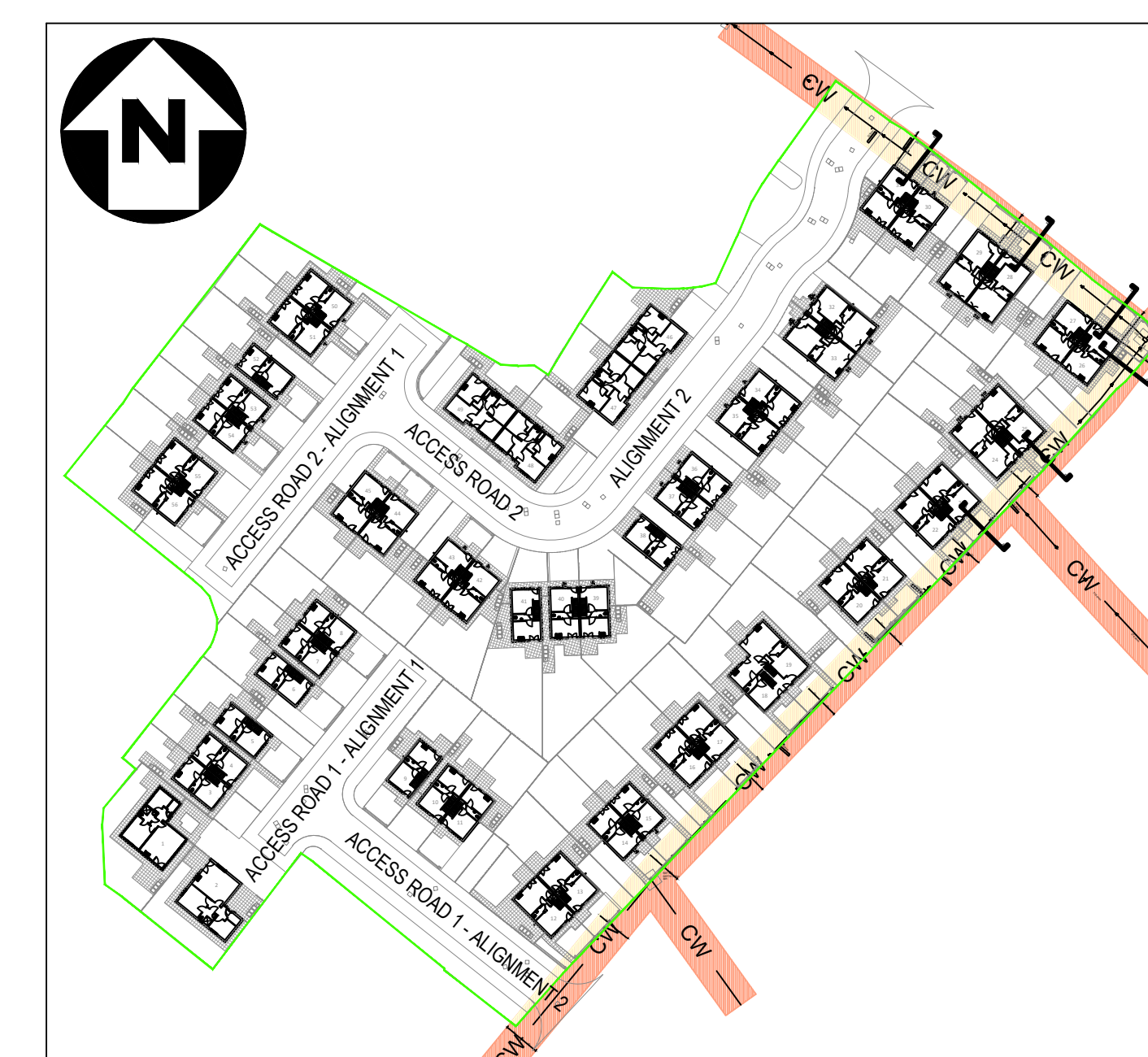
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ACCESS ROAD 2 - ALIGNMENT 1



LOCATION PLAN
(SCALE 1:1000)

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Rev.	Amendment				Date	By	Chk
Project	GLENDENE, WYTHENSHAW						
Client	BTP ARCHITECTS						
Title	SECTION 104 - LONG SECTIONS SHEET 5						
Drawn	DB	Checked	LoG	Date	SEPT 21	Scale	200 @ A0
 WML CONSULTING Chartered Civil and Structural Engineers						No.8 Oak Green East Road Stanley Green Business Park Chester, CH64 1JN Chester, CH64 1JN Tel: 01244 482 0000 Fax: 01244 486 9210 e-mail: info@wmlconsulting.com www.wmlconsulting.com	
Project	Originator	Volume	Level	Type	Role	Number	Rev
9003	- WML	- ZZ	- XX	- DR	- C	- 1035	R01

SUBJECT TO APPROVAL FROM
AND UNITED UTILITIES

APPENDIX B

Surface water drainage calculations

Surface Water Drainage Calculations

For a site referred to as

Glendene,
Wythenshawe

Undertaken on behalf of

Garden City Design & Build Ltd.

Job No: 9003

Document No: 9003-WML-00-XX-CA-C-0001

Date: January 2024

Project No. & Name:	9003 – Glendene, Wythenshawe	Status:	Prepared by:	Rev:	Date:
Document Ref:	9003-WML-00-XX-CA-C-0001	Final Construction	Daniel Baker	R01	Jan 2024

General Notes

1. The calculations within this document have been undertaken using MicroDrainage Software version 2020.
2. This document is to be read in conjunction with the following documents;
 - a. 9003-WML-ZZ-XX-DR-C-1001 - 1005 – Proposed Drainage GAs
 - b. 9003-WML-ZZ-XX-RP-C-1001 – Drainage Strategy Document

Summary of Results

3. The following summary demonstrates that the outgoing flow rates for the new development works are less than or equal to those of the pre-development site.
4. The existing site comprises a combination of Greenfield and Brownfield areas as shown within appendix 01 below.
5. Greenfield Areas have been calculated using MicoDrainage Software version 2020 whilst the existing Brownfield flow rate has been calculated using a 50mm/Hr rainfall intensity as noted within the drainage strategy.

Existing		
Greenfield Runoff Rate (l/s)	Brownfield Runoff Rate (l/s)	Proposed Site Runoff Rate - Total (l/s)
Q1: 4.3 Q30: 8.3 Q100: 10.2	72.9 36.4 - Allowable (50% reduction)	4.3 + 36.4 = 40.7

Proposed				
Proposed Site Runoff Rate - South (l/s)	Proposed Site Runoff Rate - North (l/s)	Actual Site Runoff Rate - South (l/s)	Actual Site Runoff Rate - North (l/s)	Actual Site Runoff Rate - Total (l/s)
10.0	30.0	9.9	30.0	<u>39.9</u>

6. The following calculations are associated with the adoptable drainage only and don't take into account the extensive private drainage network which will provide an additional storage volume and further reduce the risk of flooding.

Existing Site Area Plan



LEGEND

	EXISTING BROWNFIELD AREA: 5,249m ²
	EXISTING GREENFIELD AREA: 8,909m ²

Greenfield Runoff Assessment

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No. 8 Oak Green Stanley Green Business Park Earl Rd, Cheadle Hulme, SK8 6QL		
Date 06/04/2022 16:27 File	Designed by DBaker Checked by	
Innovyze		Source Control 2020.1.3
<u>ICP SUDS Mean Annual Flood</u> Input Return Period (years) 100 Soil 0.450 Area (ha) 0.891 Urban 0.000 SAAR (mm) 849 Region Number Region 10 Results l/s QBAR Rural 4.9 QBAR Urban 4.9 Q100 years 10.2 Q1 year 4.3 Q30 years 8.3 Q100 years 10.2		
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**Proposed Surface Water Network
(South)**

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Network 2020.1.3

Page 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)

100

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)

500

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
S1.000	15.000	0.029	517.2	0.041	5.00	0.0	0.600	o	600	Pipe/Conduit	
S2.000	7.000	0.015	466.7	0.056	5.00	0.0	0.600	o	600	Pipe/Conduit	
S1.001	22.000	0.088	250.0	0.034	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.002	20.000	0.073	274.0	0.021	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.003	2.981	0.033	90.3	0.040	0.00	0.0	0.600	o	300	Pipe/Conduit	
S1.004	6.009	0.024	250.4	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
S1.000	50.00	5.24	49.647	0.041	0.0	0.0	0.0	1.06	300.8	5.6
S2.000	50.00	5.10	49.633	0.056	0.0	0.0	0.0	1.12	316.8	7.6
S1.001	50.00	5.47	49.618	0.131	0.0	0.0	0.0	1.54	434.2	17.7
S1.002	50.00	5.70	49.530	0.152	0.0	0.0	0.0	1.47	414.6	20.6
S1.003	50.00	5.73	49.457	0.192	0.0	0.0	0.0	1.65	117.0	26.0
S1.004	50.00	5.83	49.424	0.192	0.0	0.0	0.0	0.99	69.9	26.0

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Innovyze	Network 2020.1.3	

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	51.022	1.375	Open Manhole	2400	S1.000	49.647	600				
S2	51.680	2.047	Open Manhole	2400	S2.000	49.633	600				
S3	51.548	1.930	Open Manhole	2400	S1.001	49.618	600	S1.000	49.618	600	
								S2.000	49.618	600	
S3A	51.851	2.321	Open Manhole	2400	S1.002	49.530	600	S1.001	49.530	600	
S4	52.216	2.759	Open Manhole	2400	S1.003	49.457	300	S1.002	49.457	600	
S-C1	52.330	2.906	Open Manhole	1350	S1.004	49.424	300	S1.003	49.424	300	
S	52.390	2.990	Open Manhole	0		OUTFALL		S1.004	49.400	300	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S1	381034.560	387642.835	381034.560	387642.835	Required	
S2	381020.730	387625.726	381020.730	387625.726	Required	
S3	381025.130	387631.170	381025.130	387631.170	Required	
S3A	381042.373	387617.507	381042.373	387617.507	Required	
S4	381058.049	387605.086	381058.049	387605.086	Required	
S-C1	381060.462	387603.335	381060.462	387603.335	Required	
S	381065.026	387599.426			No Entry	

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File 9003 - Surface Water - ...

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Network 2020.1.3



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	600	S1	51.022	49.647	0.775	Open Manhole	2400
S2.000	o	600	S2	51.680	49.633	1.447	Open Manhole	2400
S1.001	o	600	S3	51.548	49.618	1.330	Open Manhole	2400
S1.002	o	600	S3A	51.851	49.530	1.721	Open Manhole	2400
S1.003	o	300	S4	52.216	49.457	2.459	Open Manhole	2400
S1.004	o	300	S-C1	52.330	49.424	2.606	Open Manhole	1350

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	15.000	517.2	S3	51.548	49.618	1.330	Open Manhole	2400
S2.000	7.000	466.7	S3	51.548	49.618	1.330	Open Manhole	2400
S1.001	22.000	250.0	S3A	51.851	49.530	1.721	Open Manhole	2400
S1.002	20.000	274.0	S4	52.216	49.457	2.159	Open Manhole	2400
S1.003	2.981	90.3	S-C1	52.330	49.424	2.606	Open Manhole	1350
S1.004	6.009	250.4	S	52.390	49.400	2.690	Open Manhole	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.004	S	52.390	49.400	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	0
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

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No. 8 Oak Green Stanley Green Business Park Earl Rd, Cheadle Hulme, SK8 6QL																						
Date 11/01/2024 16:42	Designed by DBaker																					
File 9003 - Surface Water - ...	Checked by																					
Innovyze	Network 2020.1.3																					
Synthetic Rainfall Details <table><tr><td>Rainfall Model</td><td>FSR</td><td>Profile Type</td><td>Summer</td></tr><tr><td>Return Period (years)</td><td>100</td><td>Cv (Summer)</td><td>0.750</td></tr><tr><td>Region</td><td>England and Wales</td><td>Cv (Winter)</td><td>0.840</td></tr><tr><td>M5-60 (mm)</td><td>18.000</td><td>Storm Duration (mins)</td><td>30</td></tr><tr><td>Ratio R</td><td>0.360</td><td></td><td></td></tr></table>			Rainfall Model	FSR	Profile Type	Summer	Return Period (years)	100	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		
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M5-60 (mm)	18.000	Storm Duration (mins)	30																			
Ratio R	0.360																					
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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S4, DS/PN: S1.003, Volume (m³): 17.5

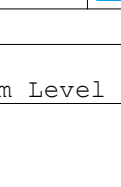
Unit Reference	MD-SHE-0137-1000-1600-1000
Design Head (m)	1.600
Design Flow (l/s)	10.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	137
Invert Level (m)	49.457
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.600	10.0
Flush-Flo™	0.472	10.0
Kick-Flo®	0.989	8.0
Mean Flow over Head Range	-	8.7

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	4.9	1.200	8.7	3.000	13.4	7.000	20.1
0.200	8.8	1.400	9.4	3.500	14.5	7.500	20.8
0.300	9.6	1.600	10.0	4.000	15.4	8.000	21.5
0.400	9.9	1.800	10.5	4.500	16.3	8.500	22.1
0.500	10.0	2.000	11.1	5.000	17.1	9.000	22.7
0.600	9.9	2.200	11.6	5.500	17.9	9.500	23.3
0.800	9.4	2.400	12.1	6.000	18.7		
1.000	8.0	2.600	12.5	6.500	19.4		

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Date 11/01/2024 16:42 File 9003 - Surface Water - ...		
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Innovyze		Network 2020.1.3

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

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	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	0
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	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	30 Winter	2	+0%	100/15 Summer	100/60 Winter		
S2.000	S2	30 Winter	2	+0%	100/15 Summer			
S1.001	S3	30 Winter	2	+0%	100/15 Summer			
S1.002	S3A	30 Winter	2	+0%	100/15 Summer			
S1.003	S4	30 Winter	2	+0%	2/15 Winter			
S1.004	S-C1	30 Winter	2	+0%				

PN	US/MH Name	Water Surcharged Flooded			Half Drain Pipe			Status
		Level (m)	Depth (m)	Volume (m³)	Flow / Overflow Cap. (l/s)	Time (mins)	Flow (l/s)	
S1.000	S1	49.780	-0.467	0.000	0.03		4.4	OK
S2.000	S2	49.779	-0.454	0.000	0.03		6.1	OK
S1.001	S3	49.779	-0.439	0.000	0.04		12.6	OK
S1.002	S3A	49.778	-0.352	0.000	0.03		9.9	OK
S1.003	S4	49.777	0.020	0.000	0.15		9.3	SURCHARGED
S1.004	S-C1	49.512	-0.212	0.000	0.19		9.3	OK

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No. 8 Oak Green Stanley Green Business Park Earl Rd, Cheadle Hulme, SK8 6QL																										
Date 11/01/2024 16:42 File 9003 - Surface Water - ...	Designed by DBaker Checked by																									
Innovyze	Network 2020.1.3																									
<u>2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Storm</u>																										
<table><tr><td></td><td>US/MH</td><td>Level</td></tr><tr><td>PN</td><td>Name</td><td>Exceeded</td></tr><tr><td>S1.000</td><td>S1</td><td>1</td></tr><tr><td>S2.000</td><td>S2</td><td></td></tr><tr><td>S1.001</td><td>S3</td><td></td></tr><tr><td>S1.002</td><td>S3A</td><td></td></tr><tr><td>S1.003</td><td>S4</td><td></td></tr><tr><td>S1.004</td><td>S-C1</td><td></td></tr></table>				US/MH	Level	PN	Name	Exceeded	S1.000	S1	1	S2.000	S2		S1.001	S3		S1.002	S3A		S1.003	S4		S1.004	S-C1	
	US/MH	Level																								
PN	Name	Exceeded																								
S1.000	S1	1																								
S2.000	S2																									
S1.001	S3																									
S1.002	S3A																									
S1.003	S4																									
S1.004	S-C1																									
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No. 8 Oak Green
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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 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 0

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 OFF

DVD Status ON

Inertia Status ON

Profile(s) Summer and Winter

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

Return Period(s) (years) 2, 30, 100

Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	30 Winter	30	+0%	100/15 Summer	100/60 Winter		
S2.000	S2	30 Winter	30	+0%	100/15 Summer			
S1.001	S3	30 Winter	30	+0%	100/15 Summer			
S1.002	S3A	30 Winter	30	+0%	100/15 Summer			
S1.003	S4	30 Winter	30	+0%	2/15 Winter			
S1.004	S-C1	30 Winter	30	+0%				

PN	US/MH Name	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)	Status
S1.000	S1	50.020	-0.227	0.000	0.04			6.2	OK
S2.000	S2	50.020	-0.213	0.000	0.05			9.8	OK
S1.001	S3	50.020	-0.198	0.000	0.05			15.5	OK
S1.002	S3A	50.018	-0.112	0.000	0.03			10.2	OK
S1.003	S4	50.013	0.256	0.000	0.16			9.9	SURCHARGED
S1.004	S-C1	49.515	-0.209	0.000	0.20			9.9	OK

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Date 11/01/2024 16:42 File 9003 - Surface Water - ...	Designed by DBaker Checked by																															
Innovyze	Network 2020.1.3																															
<u>30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)</u> <u>for Storm</u>																																
<table><tr><th rowspan="2">PN</th><th colspan="2">US/MH</th><th rowspan="2">Level Exceeded</th></tr><tr><th>Name</th><th></th></tr><tr><td>S1.000</td><td>S1</td><td></td><td>1</td></tr><tr><td>S2.000</td><td>S2</td><td></td><td></td></tr><tr><td>S1.001</td><td>S3</td><td></td><td></td></tr><tr><td>S1.002</td><td>S3A</td><td></td><td></td></tr><tr><td>S1.003</td><td>S4</td><td></td><td></td></tr><tr><td>S1.004</td><td>S-C1</td><td></td><td></td></tr></table>			PN	US/MH		Level Exceeded	Name		S1.000	S1		1	S2.000	S2			S1.001	S3			S1.002	S3A			S1.003	S4			S1.004	S-C1		
PN	US/MH			Level Exceeded																												
	Name																															
S1.000	S1		1																													
S2.000	S2																															
S1.001	S3																															
S1.002	S3A																															
S1.003	S4																															
S1.004	S-C1																															
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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 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 0

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 OFF

DVD Status ON

Inertia Status ON

Profile(s) Summer and Winter

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

Return Period(s) (years) 2, 30, 100

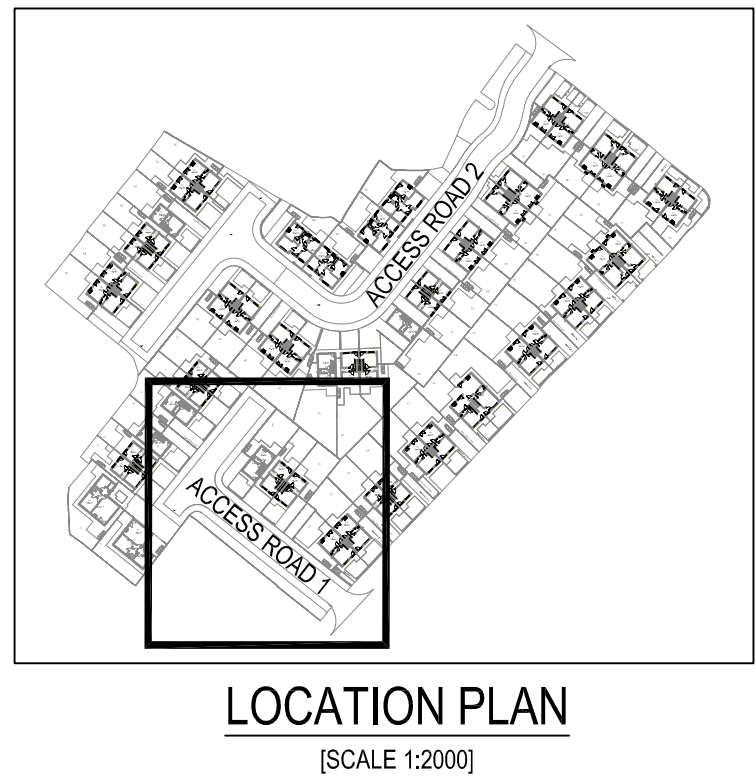
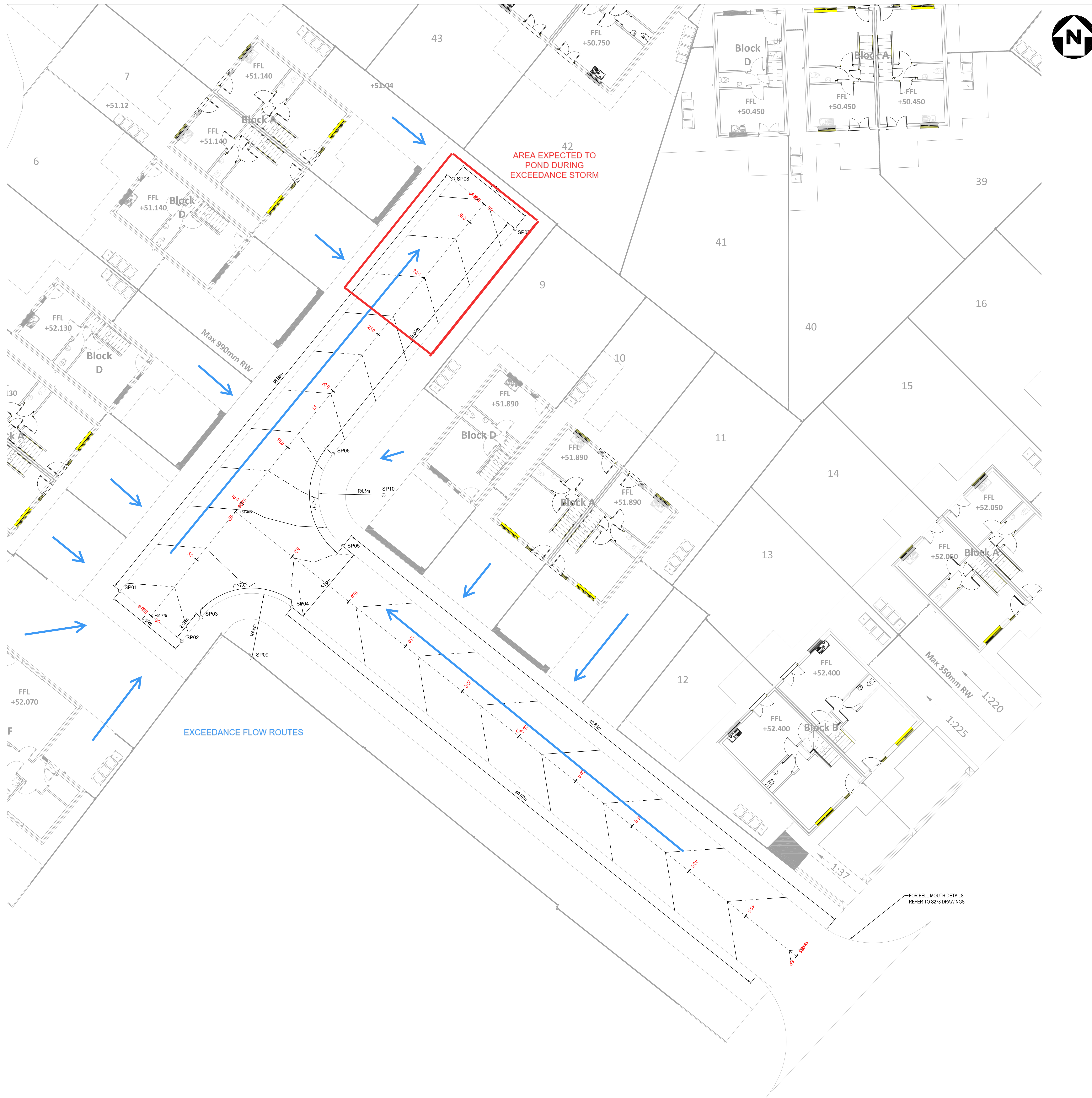
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.
S1.000	S1	60 Winter	100	+40%	100/15 Summer	100/60 Winter		
S2.000	S2	60 Winter	100	+40%	100/15 Summer			
S1.001	S3	60 Winter	100	+40%	100/15 Summer			
S1.002	S3A	60 Winter	100	+40%	100/15 Summer			
S1.003	S4	60 Winter	100	+40%	2/15 Winter			
S1.004	S-C1	360 Summer	100	+40%				

PN	US/MH Name	Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Pipe Flow (l/s)	Status
S1.000	S1	51.025	0.778	2.980	0.17			27.1	FLOOD
S2.000	S2	51.049	0.816	0.000	0.06			11.1	SURCHARGED
S1.001	S3	51.046	0.828	0.000	0.07			24.2	SURCHARGED
S1.002	S3A	51.060	0.930	0.000	0.05			16.6	SURCHARGED
S1.003	S4	51.066	1.309	0.000	0.16			9.9	SURCHARGED
S1.004	S-C1	49.516	-0.208	0.000	0.20			9.9	OK

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Innovyze	Network 2020.1.3																						
<u>100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm</u>																							
<table><thead><tr><th>PN</th><th>US/MH Name</th><th>Level Exceeded</th></tr></thead><tbody><tr><td>S1.000</td><td>S1</td><td>1</td></tr><tr><td>S2.000</td><td>S2</td><td></td></tr><tr><td>S1.001</td><td>S3</td><td></td></tr><tr><td>S1.002</td><td>S3A</td><td></td></tr><tr><td>S1.003</td><td>S4</td><td></td></tr><tr><td>S1.004</td><td>S-C1</td><td></td></tr></tbody></table>			PN	US/MH Name	Level Exceeded	S1.000	S1	1	S2.000	S2		S1.001	S3		S1.002	S3A		S1.003	S4		S1.004	S-C1	
PN	US/MH Name	Level Exceeded																					
S1.000	S1	1																					
S2.000	S2																						
S1.001	S3																						
S1.002	S3A																						
S1.003	S4																						
S1.004	S-C1																						
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**Proposed Surface Water Network
(North)**

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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)
S5.3	51.572	2.245	Open Manhole	1200	S1.000	49.327	225				
S5.8	50.658	1.725	Open Manhole	1500	S1.001	48.933	225	S1.000	48.933	225	
S5	50.239	2.851	Open Manhole	1200	S1.002	47.388	225	S1.001	48.755	225	1367
S6	50.068	4.292	Open Manhole	2400	S1.003	45.776	900	S1.002	47.300	225	849
S7	49.912	4.179	Open Manhole	2400	S1.004	45.733	900	S1.003	45.733	900	
S8	49.774	4.072	Open Manhole	2400	S1.005	45.702	900	S1.004	45.702	900	
S9	48.981	3.374	Open Manhole	2400	S1.006	45.607	900	S1.005	45.607	900	
S10	48.612	3.031	Open Manhole	2400	S1.007	45.581	900	S1.006	45.581	900	
S11	47.848	2.280	Open Manhole	2400	S1.008	45.568	900	S1.007	45.568	900	
S12	47.788	2.232	Open Manhole	2400	S1.009	45.556	300	S1.008	45.556	900	
S-C3	47.660	3.610	Open Manhole	1500	S1.010	44.050	300	S1.009	45.500	300	1450
S	47.395	3.675	Open Manhole	0		OUTFALL		S1.010	43.720	300	
MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)					
S5.3	381011.711	387669.875	381011.711	387669.875	Required						
S5.8	381033.966	387697.173	381033.966	387697.173	Required						
S5	381049.426	387684.718	381049.426	387684.718	Required						
S6	381057.203	387678.650	381057.203	387678.650	Required						
S7	381065.859	387676.184	381065.859	387676.184	Required						
S8	381073.723	387680.560	381073.723	387680.560	Required						
S9	381096.322	387708.583	381096.322	387708.583	Required						
S10	381102.579	387718.352	381102.579	387718.352	Required						
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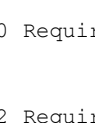
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Manhole Schedules for Storm

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S11	381109.599	387726.020	381109.599	387726.020	Required	
S12	381112.078	387734.662	381112.078	387734.662	Required	
S-C3	381113.196	387737.891	381113.196	387737.891	Required	
S	381116.024	387742.005			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	225	S5.3	51.572	49.327	2.020	Open Manhole	1200
S1.001	o	225	S5.8	50.658	48.933	1.500	Open Manhole	1500
S1.002	o	225	S5	50.239	47.388	2.626	Open Manhole	1200
S1.003	o	900	S6	50.068	45.776	3.392	Open Manhole	2400
S1.004	o	900	S7	49.912	45.733	3.279	Open Manhole	2400
S1.005	o	900	S8	49.774	45.702	3.172	Open Manhole	2400
S1.006	o	900	S9	48.981	45.607	2.474	Open Manhole	2400
S1.007	o	900	S10	48.612	45.581	2.131	Open Manhole	2400
S1.008	o	900	S11	47.848	45.568	1.380	Open Manhole	2400
S1.009	o	300	S12	47.788	45.556	1.932	Open Manhole	2400
S1.010	o	300	S-C3	47.660	44.050	3.310	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	35.219	89.4	S5.8	50.658	48.933	1.500	Open Manhole	1500
S1.001	19.852	111.5	S5	50.239	48.755	1.259	Open Manhole	1200
S1.002	9.865	112.1	S6	50.068	47.300	2.543	Open Manhole	2400
S1.003	9.000	209.3	S7	49.912	45.733	3.279	Open Manhole	2400
S1.004	9.000	290.3	S8	49.774	45.702	3.172	Open Manhole	2400
S1.005	36.000	378.9	S9	48.981	45.607	2.474	Open Manhole	2400
S1.006	11.601	446.2	S10	48.612	45.581	2.131	Open Manhole	2400
S1.007	10.396	799.7	S11	47.848	45.568	1.380	Open Manhole	2400
S1.008	8.991	749.3	S12	47.788	45.556	1.332	Open Manhole	2400
S1.009	3.417	61.0	S-C3	47.660	45.500	1.860	Open Manhole	1500
S1.010	4.992	15.1	S	47.395	43.720	3.375	Open Manhole	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
S1.010	S	47.395	43.720	0.000	0	0

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<u>Simulation Criteria for Storm</u> <table> <tr> <td>Volumetric Runoff Coeff</td> <td>0.750</td> <td>Additional Flow - % of Total Flow</td> <td>0.000</td> </tr> <tr> <td>Areal Reduction Factor</td> <td>1.000</td> <td>MADD Factor * 10m³/ha Storage</td> <td>2.000</td> </tr> <tr> <td>Hot Start (mins)</td> <td>0</td> <td>Inlet Coefficient</td> <td>0.800</td> </tr> <tr> <td>Hot Start Level (mm)</td> <td>0</td> <td>Flow per Person per Day (l/per/day)</td> <td>0.000</td> </tr> <tr> <td>Manhole Headloss Coeff (Global)</td> <td>0.500</td> <td>Run Time (mins)</td> <td>60</td> </tr> <tr> <td>Foul Sewage per hectare (l/s)</td> <td>0.000</td> <td>Output Interval (mins)</td> <td>1</td> </tr> </table> <table> <tr> <td>Number of Input Hydrographs</td> <td>0</td> <td>Number of Storage Structures</td> <td>0</td> </tr> <tr> <td>Number of Online Controls</td> <td>1</td> <td>Number of Time/Area Diagrams</td> <td>0</td> </tr> <tr> <td>Number of Offline Controls</td> <td>0</td> <td>Number of Real Time Controls</td> <td>0</td> </tr> </table> <u>Synthetic Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Profile Type</td> <td>Summer</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>M5-60 (mm)</td> <td>18.000</td> <td>Storm Duration (mins)</td> <td>30</td> </tr> <tr> <td>Ratio R</td> <td>0.360</td> <td></td> <td></td> </tr> </table>			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	0	Number of Online Controls	1	Number of Time/Area Diagrams	0	Number of Offline Controls	0	Number of Real Time Controls	0	Rainfall Model	FSR	Profile Type	Summer	Return Period (years)	100	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		
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Online Controls for Storm

Hydro-Brake® Optimum Manhole: S12, DS/PN: S1.009, Volume (m³): 14.3

Unit Reference	MD-SHE-0220-3000-2200-3000
Design Head (m)	2.200
Design Flow (l/s)	30.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	220
Invert Level (m)	45.556
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1800

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	2.200	30.0
Flush-Flo™	0.635	30.0
Kick-Flo®	1.365	23.9
Mean Flow over Head Range	-	26.1

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

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.4	1.200	27.0	3.000	34.8	7.000	52.4
0.200	21.6	1.400	24.2	3.500	37.5	7.500	54.2
0.300	27.3	1.600	25.8	4.000	40.0	8.000	55.9
0.400	28.9	1.800	27.3	4.500	42.3	8.500	57.6
0.500	29.7	2.000	28.7	5.000	44.5	9.000	59.2
0.600	30.0	2.200	30.0	5.500	46.6	9.500	60.8
0.800	29.7	2.400	31.3	6.000	48.6		
1.000	28.8	2.600	32.5	6.500	50.6		

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