



**Chapel Street
Levenshulme
Manchester**

Drainage Strategy

R - 00142 – 001 – DS – 0
April 2024

Report Originator(s)

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Revision Record

Revision	Date	Description	Written	Approved
0	20.03.24	First Issue	WRA	WRA
A	02.04.24	Updated to suit client comments	WRA	WRA
B	28.10.24	Updated to revised layout and amended storm design	WRA	WRA



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Client

Burke Developments

Project

Chapel Street, Levenshulme, Manchester

Title

Drainage Strategy – Rev B

Page no. 2

Project ref 00142

Date October 2024

Contents

1.0	Introduction.....	3
1.1	Design Brief.....	3
1.2	Site Location	3
1.3	Current Land Use	3
1.4	Proposed Development.....	3
2.0	Surface Water Drainage	4
2.1	Existing Surface water drainage	4
2.2	Proposed Storm Drainage Discharge.....	4
2.3	Existing Surface Water Discharge rates.....	5
2.4	Proposed Surface Water Drainage Strategy.....	5
2.5	SUDS	6
2.6	Maintenance.....	7
3.0	Foul Water Drainage	8
3.1	Existing Foul water drainage	8
3.2	Proposed Foul Drainage Strategy	8
4.0	Conclusion	9

Appendices

Appendix A

Site Location Plan

Appendix B

Topographical Survey

Appendix C

Proposed Site Plan

Appendix D

UU Asset Plan

Appendix E

Drained Area Plan

SEA Drawing 00142/E01A

Appendix F

Greenfield Runoff Calculations

Appendix G

EA Climate Change Allowance Extract

Appendix H

Storm Calculations

Appendix J

Drainage Layouts

SEA Drawing 00142/E02C and E03B



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Page no. 3

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1.0 Introduction

1.1 Design Brief

- 1.1.1 The client, Burke Developments Ltd. Requires a drainage design to assist in discharging planning conditions for a new development of 8 dwellings at Chapel Street, Levenshulme, Manchester.
- 1.1.2 This report provides design proposals to ensure stormwater is managed adequately along with a full maintenance plan.
- 1.1.3 This report has been prepared by SEA Consulting Engineers Ltd. With the benefit limited to our instructing Client, Burke Developments Ltd.

1.2 Site Location

- 1.2.1 The site is located to the southeast of Manchester within the Levenshulme area of the city, national grid reference E387490, E394215. The site location plan is presented in Appendix A.

1.3 Current Land Use

- 1.3.1 The site is currently an industrial development, a topographical survey for the development is presented in Appendix B. The site is therefore considered brownfield.

1.4 Proposed Development

- 1.4.1 The proposed development will comprise the construction of 8 new residential dwellings. Appendix C presents a copy of the site plan.

2.0 Surface Water Drainage

2.1 Existing Surface water drainage

- 2.1.1 The existing site is positively drained and outfalls via existing United Utilities combined sewers. A copy of the United Utilities (UU) asset plan is presented in Appendix D

2.2 Proposed Storm Drainage Discharge

- 2.2.1 Paragraph 80 of the Planning Practice Guidance for 'Flood Risk and Coastal Change' defines the hierarchy of drainage options. Where reasonably practicable the aim should be to discharge stormwater as high up the following hierarchy of storm drainage options;

- Into the Ground (infiltration);
- To a surface water body;
- To a surface water sewer, highway drain or another drainage system, and
- To combined sewer

- 2.2.2 Each of these is considered separately below;

Into the ground

- 2.2.3 Given the site's existing use and the fact that it is drained via existing combined sewers the use of soakaways is not considered feasible.

To a surface water body

- 2.2.4 The UU asset plans show a 900mm private sewer with Chapel Street, further research has been carried and it has been determined that it is a culverted watercourse, Fallowfield Brook. Therefore the site shall drain to this watercourse.

To a surface water sewer, highway drain or another drainage system

- 2.2.5 The site will drain via the culverted watercourse noted above

2.3 Existing Surface Water Discharge rates

- 2.3.1 As the site is brownfield we have calculated runoff rates for this site using the modified rational method, (drained area x 0.014, from Building Regulations Part H) based on a rainfall intensity of 50mm/hr. The is currently fully hardened with an area of 1795m². A brownfield runoff rate has therefore been calculated as 25l/s.
- 2.3.2 Local policy requires that new developments restrict storm water flows to as close to greenfield runoff as possible. We have used the HR Wallingford online tool to calculate greenfield runoff rates based on a total drained area of 1070m², SEA drawing E01 presented in appendix E shows the drained areas for the development.

The Qbar value has been calculated as 0.65l/s, calculations are presented in appendix F . Flows at this rate are considered too low for maintenance purposes, therefore flows will be restricted to 2.7l/s which will provide a HydroBrake with a minimum aperture of 75mm. This flow rate provides an 80% betterment on existing surface water flows.

2.4 Proposed Surface Water Drainage Strategy

- 2.4.1 The surface water drainage will comprise a piped network outfalling to the culverted watercourse within Chapel Street. All driveways will be provided with permeable block paving. Flows will be restricted to 2.7l/s with attenuation provided via online geo-modular attenuation tanks located within the access road.
- 2.4.2 The design will use FEH2 rainfall parameters and will be for all drained areas on the site to accommodate storms up to the 1 in 100-year event and allow for the increase in storm intensities up to 45%. This is based on the Environment Agency updates of May 2022 which bases peak rainfall climate change allowance on river management catchment areas. An extract from the EA website based on the site location is presented in Appendix G.
- 2.4.3 The system has been modelled using Causeway Flow for all storm durations up to 10,080mins. The calculations are presented in Appendix H and show that online tanks require a total volume of 31.35m³. A drainage layout is presented in Appendix J which shows all components of the surface water drainage system.

2.5 SUDS

2.5.1 The use of SUDS and pollution control measures have been assessed using the Simple Index Approach set out within the CIRIA SUDS Manual 2015. Based on table 26.2 of the SUDS Manual, the pollution indices for the site are set out in table 3.2 below.

2.5.2

Pollution Hazard Indices for Different land use classifications				
Land use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential Roofs	Very Low	0.2	0.2	0.05
Individual driveways, residential car parks, low traffic roads (Eg Cul De Sacs, homezones and general access roads) and non-residential car parking within infrequent changes (e.g. schools and offices) i.e. <300 movements per day.	Low	0.5	0.4	0.4

Table 3.2 – Extract of table 26.2 of the SUD manual.

2.5.3 The developments will provide permeable paving for all driveways

2.5.4 Table 26.3 of The SuDS Manual shows the mitigation indices for a range of Suds components for discharges to surface waters. An extract of this is provided in Table 3.3 below for the components relevant to the proposed development.

Indicative mitigation indices			
Type of SUDS Component	Mitigation Indices		
	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Permeable Paving	0.7	0.6	0.7

Table 3.3 – Extract from table 26.3 of the SUDS Manual

2.5.5 Based on the above it can be seen that the permeable paving will provide adequate treatment for the sites surface water.

2.6 Maintenance

2.6.1 All new surface water will remain private and maintenance will be the responsibility of the landowner. The following maintenance plan shall be implemented.

2.6.2 Pipe systems, Inspection chambers and manholes.

Maintenance Schedule		
Maintenance Category	Required Action	Frequency
Regular Maintenance	Inspect and identify area that are not operating correctly, if required, take remedial action	Monthly (for the first 3 months) then six monthly
	Debris removal from catchment surface (where may cause risks to performance)	Monthly
Remedial Actions	Remove Blockages	As required
	Cleaning/Jetting	As required
	Repair/rehabilitation of system	As required
Monitoring	Inspect/check all parts of the piped system and inspection chambers to ensure that they are in good condition and operating as required.	Annually and after large storm

Permeable Paving

Maintenance Schedule		
Maintenance Category	Required Action	Frequency
Regular Maintenance	Brushing (Standard cosmetic sweep over all areas)	Once a year, after the autumn leaf fall, or reduced frequency as required, based on site specific observations of clogging or manufacturers recommendations. Particular attention to be paid to areas where water into pervious areas from adjacent impermeable areas as this area is most likely to collect sediment
Occasional maintenance	Stabilise and mow adjacent contributing areas	As required
	Removal of weeds or management using glyphosphate applied directly into the weeds by an applicator rather than spraying	As required
Remedial Actions	Remediate any landscaping which, through vegetation maintenance strip, has been raised to within 50mm of the finished surface	As required
	Remedial work to any depressions, rutting and cracked surfacing considered detrimental to the performance or hazard to users	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10-15 years, or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for 3 month after installation
	Inspect for areas of poor operation and/or weed growth – if required take remedial action	3-monthly, 48hrs after large storms for the first 6 months
	Establish slit accumulation rates and establish appropriate brushing frequencies.	Annually
	Monitor Inspection chambers	Annually



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Drainage Strategy – Rev B

Page no. 8

Project ref 00142

Date October 2024

3.0 Foul Water Drainage

3.1 Existing Foul water drainage

3.1.1 Existing foul water from the development drains to the existing UU Combined Sewers.

3.2 Proposed Foul Drainage Strategy

3.2.1 Foul water from the proposed dwellings will drain to the existing UU Combined sewers. Given that the development is reducing the surface water flows by 80%, capacity for the 8 dwellings will be achievable.



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Page no. 9

Project ref 00142

Date October 2024

4.0 Conclusion

4.1.1 Based on the above, and providing the above strategies are adopted, the developed site will not contribute further to flood risk and therefore satisfying the requirements of the National Planning Policies Framework.

4.1.2 References

- Department for Communities and Local Government (July 2021) - National Planning Policy Framework.
- The Building Regulations (2015) - Drainage and Waste Disposal - Approved Document H.
- BS 8533:2011 Assessing and managing flood risk in development – Code of Practice.
- CIRIA Report C635 Designing for exceedance in urban drainage – good practice.
- The SUDS Manual
- BS 8533:2011 Assessing and managing flood risk in development – Code of Practice.
- Design and Analysis of Urban Storm Drainage – The Wallingford procedure – Volume 1.



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Appendix A

Site Location Plan



LOCATION PLAN

notes

This drawing is subject to a detailed building and site survey, therefore no guarantee of its accuracy can be given.
This drawing has been draughted in accordance with the clients design requirements.
All areas are approximate and are subject to a detailed building and site survey and further design development.
All dimensions should be checked prior to commencement of construction on site. Measurements should not be taken off the drawing.

All dimensions shown are in millimetres (mm).

PL0 Planning Issue

03.04.23

revisions



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D - design

PL - planning

PT - pre-tender

T - tender

P - preliminary

C - construction

R - record

BURKE CONSTRUCTION LTD

NEW BUILD RESIDENTIAL
SITE @ 7 CHAPEL ST,
MANCHESTER, M19 3QB

LOCATION PLAN

scale	date	drawn	checked
1:1250 @ A3	03.04.23		AC
job no	(category) dwg no	revision	
23-1136	(01)001	PL0	
Drawing measurements shall not be obtained by scaling. Verify all dims prior to construction. Immediately report any discrepancies on this drawing to Architect. This drawing shall be read in conjunction with associated specifications and related consultant's documents.			



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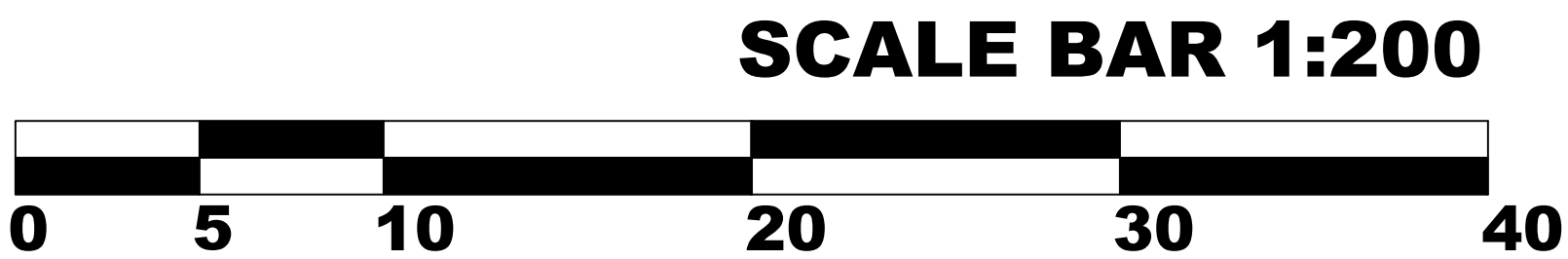
Chapel Street, Levenshulme, Manchester

Title

Drainage Strategy – Rev B

Appendix B

Topographical Survey



SURVEY STATIONS			
Name	Easting		Height
		Northing	
J1	387461.517	394232.720	51.668
J2	387459.293	394193.801	52.054
J1A	387522.880	394231.618	52.282
J1B	387518.578	394230.880	53.076
J3	387502.993	394200.765	52.540
J4	387504.407	394219.681	52.323
J5	387488.254	394220.729	52.314
J6	387477.927	394189.063	52.321

DRAINAGE DISCLAIMER

KEY DIMENSIONS SHOULD BE CHECKED ON
BEFORE COMMENCEMENT OF ANY WORKS

NOTE

[illegible]

 **powers**
Integrated Survey Partner

 **Constructionline**

 **CHAS**

 **iCES**
Quality Approved Partner

 **The Building Trust**

 **NBS**
Building for Business

 **BSI**

 **ISO 9001**

 **ISO 14001**

 **ISO 45001**

 **BSI**

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www.powerstlman.co.uk

Chapel Street		
Levenshulme		
Topographical Survey		
Client :Burke Developments		
Surveyed By : JW	Date : 22/03/23	Scale 1: 200
Drawn By : JW	Drawing No : 6073/01	
Checked By : JL	Amendment :	



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Appendix C

Proposed Site Plan



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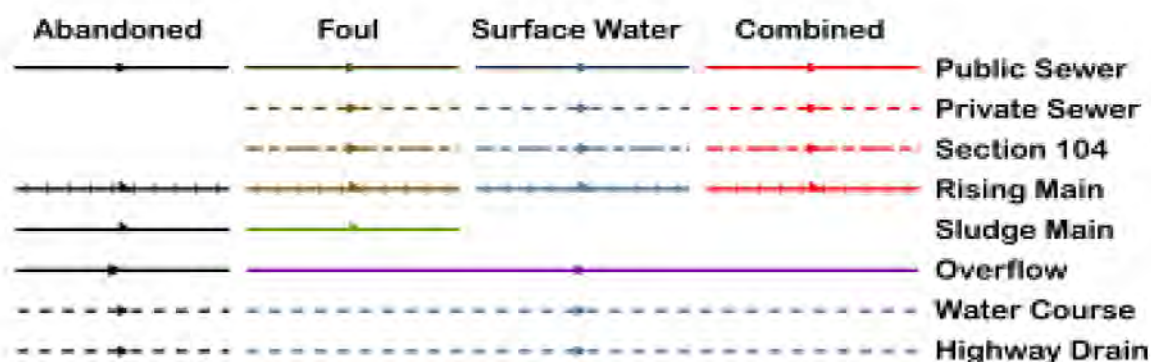
Title

Drainage Strategy – Rev B

Appendix D

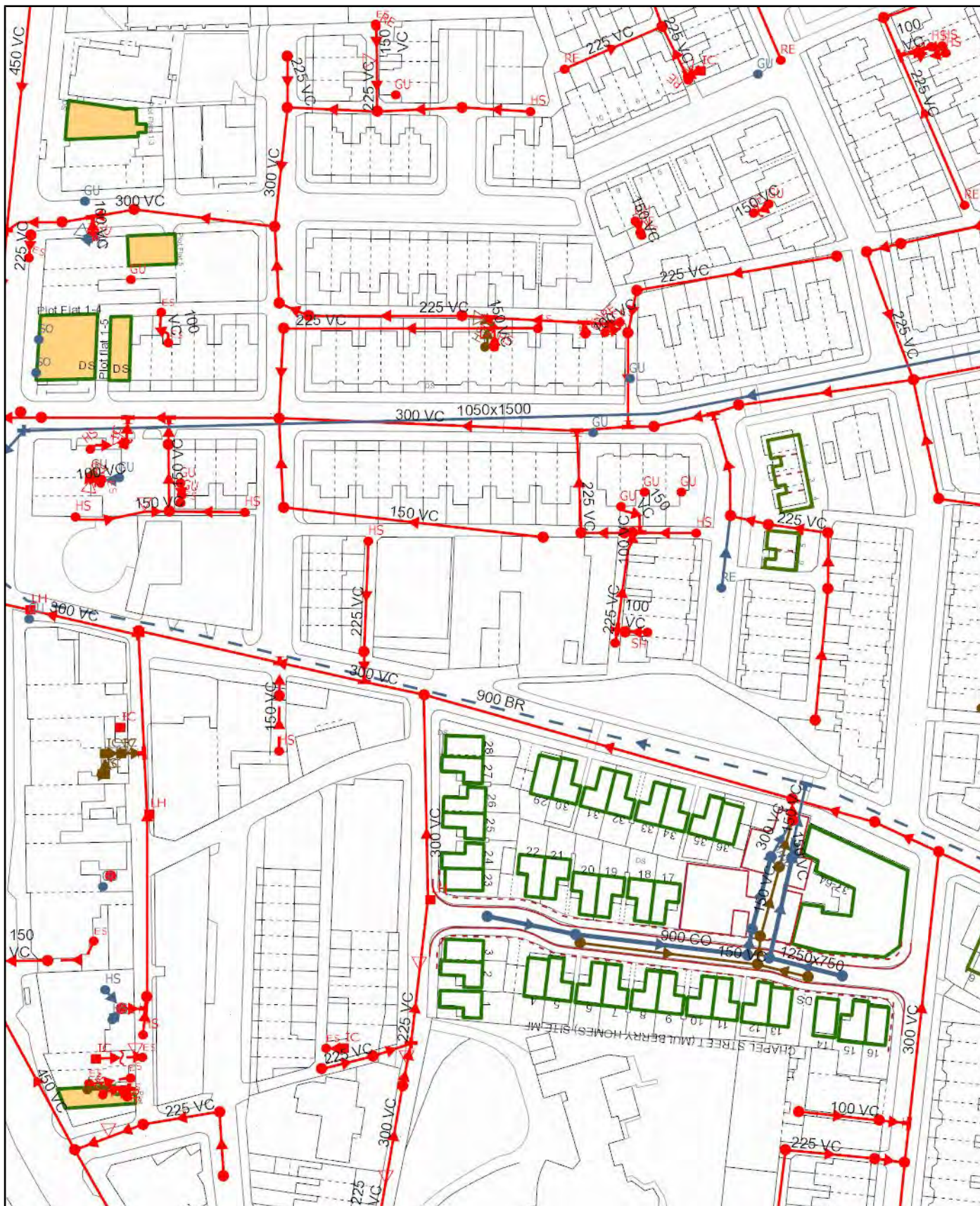
UU Asset Plan

Wastewater Symbolology



All point assets follow the standard colour convention: **red** – combined **brown** - foul
blue – surface water **purple** - overflow

- | | |
|------------------|--------------------------|
| Manhole | Side Entry Manhole |
| Head of System | Outfall |
| Extent of Survey | Screen Chamber |
| Rodding Eye | Inspection Chamber |
| Inlet | Bifurcation Chamber |
| Discharge Point | Lamp Hole |
| Vortex | T Junction / Saddle |
| Penstock | Catchpit |
| Washout Chamber | Valve Chamber |
| Valve | Vent Column |
| Air Valve | Vortex Chamber |
| Non Return Valve | Penstock Chamber |
| Soakaway | Network Storage Tank |
| Gully | Sewer Overflow |
| Cascade | Ww Treatment Works |
| Flow Meter | Ww Pumping Station |
| Hatch Box | Septic Tank |
| Oil Interceptor | Control Kiosk |
| Summit | |
| Drop Shaft | Change of Characteristic |
| Orifice Plate | |



Scale: 1:1250
Date: 24/05/2023

SEWER RECORDS



Water for the North West

Address or Site Reference: BELPER TOOLS 7 CHAPEL STREET,
LEVENSHULME, MANCHESTER, M19 3QB

Printed by: Property Searches

The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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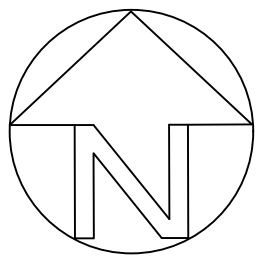
Title

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Appendix E

Drained Area Plan

SEA Drawing 00142/E01A



GENERAL

Do not scale from this drawing.

All dimensions are in millimetres unless noted otherwise.

All setting out to architects drawings.

Drawing to be read in conjunction with all other SEA drawings and architects drawings.

This scheme has been designed using the survey information provided by others. It shall be the responsibility of the contractor to verify levels, boundaries etc prior to commencing any works on site. SEA Structural Engineers Ltd. shall not accept any responsibility for errors resulting from the survey.

All setting out to be in accordance with the Architect's drawings, the Contractor is to check all dimensions and levels prior to commencement of work and report any discrepancies to the Engineer, including any encountered during construction works.

All dimensions should be checked on site prior to construction. Please notify the Engineer of any discrepancies before commencing or continuing any work.

HEALTH, SAFETY & THE ENVIRONMENT

In accordance with the Health and Safety at Work etc Act 1973 and the Construction (Design and Management) Regulations 2015, designs and details on this drawing have been the subject of a Designers Risk Assessment, to identify risks in construction, use, or demolition of the scheme.

It is not considered necessary for Designers to highlight obvious and/or common risks (such as deep excavations, manual handling and working around heavy plant) which Contractors should be familiar with.

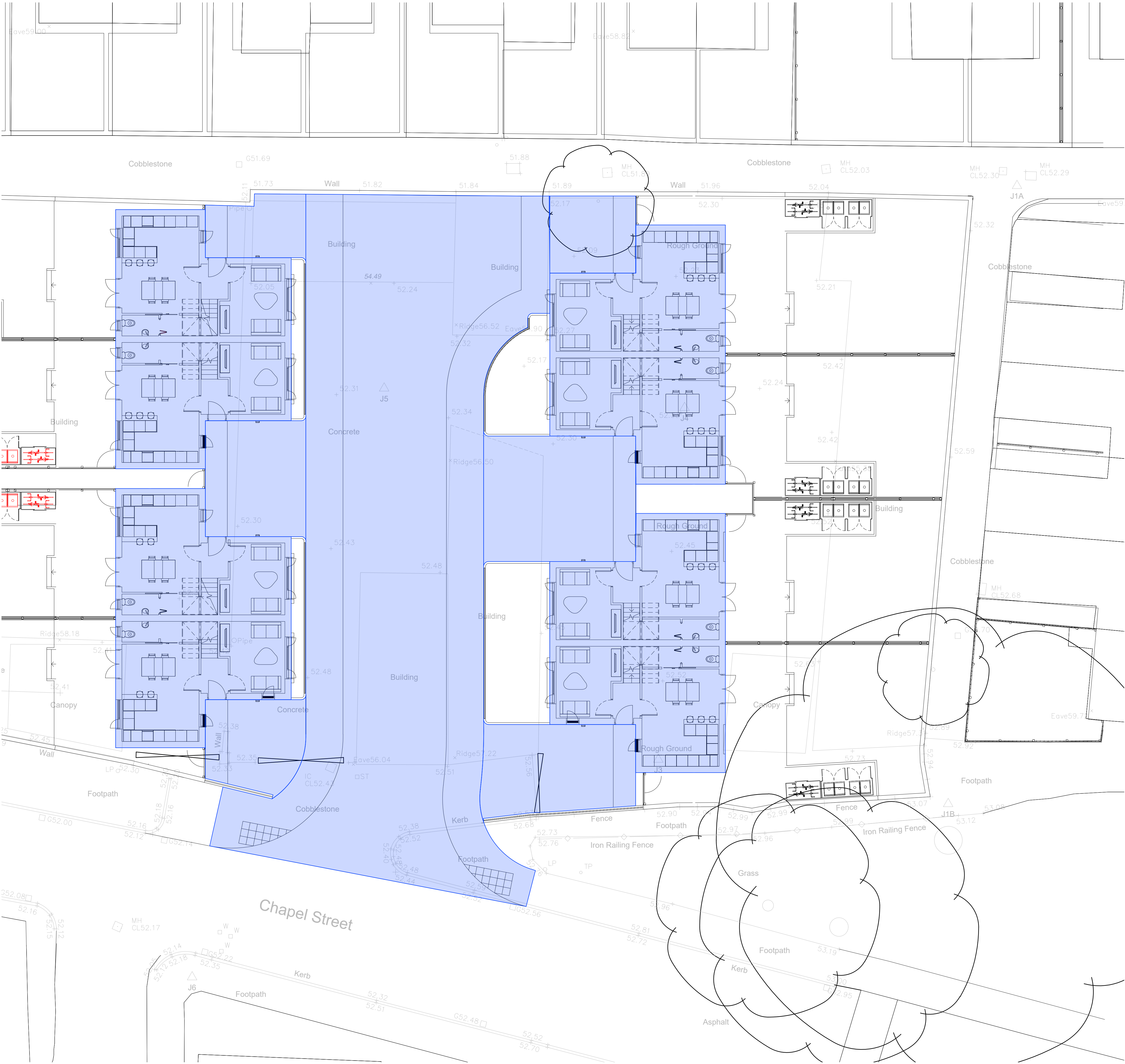
So as far as is reasonably practicable, risks inherent in the design have been eliminated. Where it has been considered that elimination of a risk (or part of a risk) is not reasonably practicable, it has been reduced.

Significant unusual residual risks are identified below, beside the measures which have been adopted to eliminate and/or reduce them:

- Existing services unknown must be confirmed prior to construction

DRAWING KEY:

Proposed Impermeable Area
Roof areas = 435m² + 10% for urban creep = 480m²
Private drive = 190m²
Access Road = 400m²
Total = 1070m²



A 28.10.24 WRA Site Plan Amended			
Rev.	Date	By	Description
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PROJECT RESIDENTIAL DEVELOPMENT CHAPEL LANE LEVENHULME, MANCHESTER			
DRAWING PROPOSED DRAINED AREAS			
SCALE: 1:200@A1		DATE: 20.03.2024	
DRAWN BY: WRA		REV: A	
STATUS: PRELIMINARY			
DWG No: 00142/E01			A



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Appendix F

Greenfield Runoff Calculations

Calculated by:	Warren Allsopp
Site name:	Chapel St, Levenshulme
Site location:	Manchester

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	53.44458° N
Longitude:	2.18983° W
Reference:	1060808593
Date:	Mar 06 2024 13:08

Runoff estimation approach	IH124
----------------------------	-------

Site characteristics

Total site area (ha):	0.103
-----------------------	-------

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Notes

(1) Is $Q_{BAR} < 2.0$ l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

Hydrological characteristics

	Default	Edited
SAAR (mm):	878	878
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	0.65	0.65
1 in 1 year (l/s):	0.56	0.56
1 in 30 years (l/s):	1.1	1.1
1 in 100 year (l/s):	1.35	1.35
1 in 200 years (l/s):	1.54	1.54



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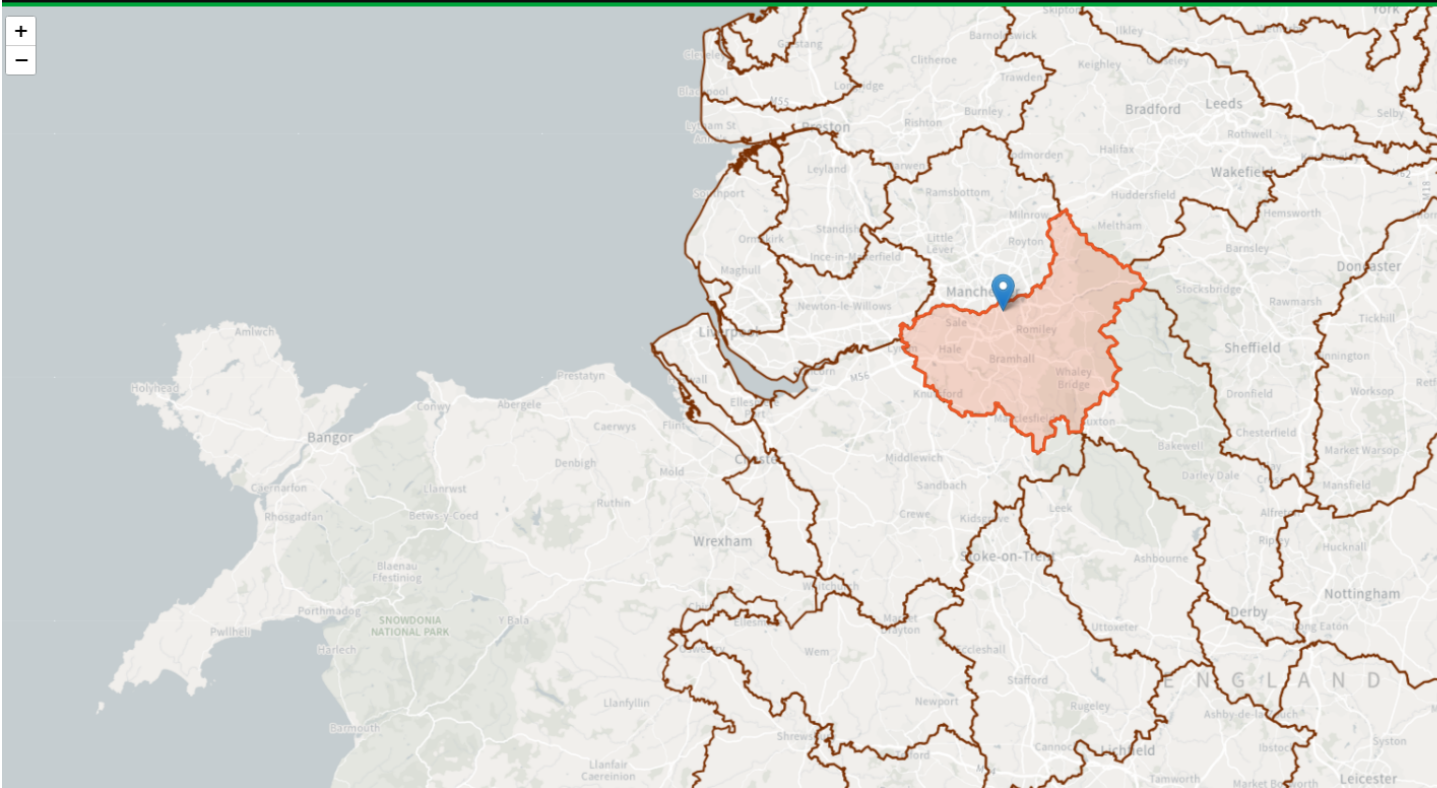
Chapel Street, Levenshulme, Manchester

Title

Drainage Strategy – Rev B

Appendix G

EA Climate Change Allowance Extract



Upper Mersey Management Catchment peak rainfall allowances

3.3% annual exceedance rainfall event

Epoch	Central allowance	Upper end allowance
2050s	20%	35%
2070s	30%	40%

1% annual exceedance rainfall event

Epoch	Central allowance	Upper end allowance
2050s	25%	40%
2070s	30%	45%

*Use '2050s' for development with a lifetime up to 2060 and use the 2070s epoch for development with a lifetime between 2061 and 2125.



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Appendix H

Storm Calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.000
CV	0.750	Preferred Cover Depth (m)	0.450
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	x
Maximum Rainfall (mm/hr)	550.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.007	5.00	52.300	100	387473.048	394223.159	0.550
2	0.006	5.00	52.300	100	387473.048	394208.730	0.550
3	0.009	5.00	52.300	450	387473.048	394215.839	0.940
4	0.003	5.00	52.600	450	387501.327	394201.963	0.750
5	0.004	5.00	52.630	450	387493.989	394201.963	1.125
6	0.005	5.00	52.300	450	387479.088	394201.252	0.700
7	0.013	5.00	52.425	1500	387488.831	394201.527	1.635
8	0.006	5.00	52.450	450	387501.367	394215.085	0.850
9	0.005	5.00	52.520	450	387493.954	394215.087	1.033
10	0.013	5.00	52.275	1200	387488.831	394215.834	1.435
11	0.005	5.00	52.300	450	387479.307	394230.216	0.700
12	0.013	5.00	52.140	1200	387488.831	394229.246	1.255
13	0.006	5.00	52.335	450	387497.658	394229.906	0.878
14	0.012	5.00	52.450	100	387507.985	394200.930	0.550
15			52.450	450	387507.985	394229.906	0.840
C1			52.150	450	387486.822	394193.330	1.420

Links (Input)

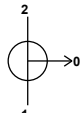
Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
3.000	1	3	7.320	0.600	51.750	51.360	0.390	18.8	100	5.07	51.7
4.000	2	3	7.109	0.600	51.750	51.360	0.390	18.2	100	5.07	51.7
3.001	3	10	15.783	0.600	51.360	51.040	0.320	49.3	100	5.31	50.8
6.000	4	5	7.338	0.600	51.850	51.505	0.345	21.3	100	5.07	51.7
6.001	5	7	5.176	0.600	51.505	50.990	0.515	10.1	100	5.11	51.6
7.000	6	7	9.747	0.600	51.600	50.990	0.610	16.0	100	5.08	51.7
1.005	7	C1	8.440	0.600	50.790	50.730	0.060	140.7	300	6.53	46.3
5.000	8	9	7.413	0.600	51.600	51.487	0.113	65.6	100	5.13	51.5
5.001	9	10	5.177	0.600	51.487	51.040	0.447	11.6	100	5.17	51.3
1.004	10	7	14.307	0.600	50.840	50.790	0.050	286.1	300	6.42	46.7
2.000	11	12	9.573	0.600	51.600	51.085	0.515	18.6	100	5.09	51.6
1.003	12	10	13.412	0.600	50.885	50.840	0.045	300.0	300	6.17	47.6
1.002	13	12	8.852	0.600	51.457	51.035	0.422	21.0	150	5.92	48.4
1.000	14	15	28.976	0.600	51.900	51.610	0.290	99.9	100	5.63	49.6
1.001	15	13	10.327	0.600	51.610	51.507	0.103	100.0	100	5.85	48.7

Pipeline Schedule

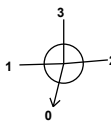
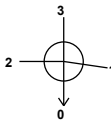
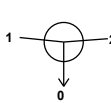
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
3.000	7.320	18.8	100	Circular	52.300	51.750	0.450	52.300	51.360	0.840
4.000	7.109	18.2	100	Circular	52.300	51.750	0.450	52.300	51.360	0.840
3.001	15.783	49.3	100	Circular	52.300	51.360	0.840	52.275	51.040	1.135
6.000	7.338	21.3	100	Circular	52.600	51.850	0.650	52.630	51.505	1.025
6.001	5.176	10.1	100	Circular	52.630	51.505	1.025	52.425	50.990	1.335
7.000	9.747	16.0	100	Circular	52.300	51.600	0.600	52.425	50.990	1.335
1.005	8.440	140.7	300	Circular	52.425	50.790	1.335	52.150	50.730	1.120
5.000	7.413	65.6	100	Circular	52.450	51.600	0.750	52.520	51.487	0.933
5.001	5.177	11.6	100	Circular	52.520	51.487	0.933	52.275	51.040	1.135
1.004	14.307	286.1	300	Circular	52.275	50.840	1.135	52.425	50.790	1.335
2.000	9.573	18.6	100	Circular	52.300	51.600	0.600	52.140	51.085	0.955
1.003	13.412	300.0	300	Circular	52.140	50.885	0.955	52.275	50.840	1.135
1.002	8.852	21.0	150	Circular	52.335	51.457	0.728	52.140	51.035	0.955
1.000	28.976	99.9	100	Circular	52.450	51.900	0.450	52.450	51.610	0.740
1.001	10.327	100.0	100	Circular	52.450	51.610	0.740	52.335	51.507	0.728

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
3.000	1	100	Manhole	Adoptable	3	450	Manhole	Adoptable
4.000	2	100	Manhole	Adoptable	3	450	Manhole	Adoptable
3.001	3	450	Manhole	Adoptable	10	1200	Manhole	Adoptable
6.000	4	450	Manhole	Adoptable	5	450	Manhole	Adoptable
6.001	5	450	Manhole	Adoptable	7	1500	Manhole	Adoptable
7.000	6	450	Manhole	Adoptable	7	1500	Manhole	Adoptable
1.005	7	1500	Manhole	Adoptable	C1	450	Manhole	Adoptable
5.000	8	450	Manhole	Adoptable	9	450	Manhole	Adoptable
5.001	9	450	Manhole	Adoptable	10	1200	Manhole	Adoptable
1.004	10	1200	Manhole	Adoptable	7	1500	Manhole	Adoptable
2.000	11	450	Manhole	Adoptable	12	1200	Manhole	Adoptable
1.003	12	1200	Manhole	Adoptable	10	1200	Manhole	Adoptable
1.002	13	450	Manhole	Adoptable	12	1200	Manhole	Adoptable
1.000	14	100	Manhole	Adoptable	15	450	Manhole	Adoptable
1.001	15	450	Manhole	Adoptable	13	450	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
1	387473.048	394223.159	52.300	0.550	100		0	3.000	51.750	100
2	387473.048	394208.730	52.300	0.550	100		0	4.000	51.750	100
3	387473.048	394215.839	52.300	0.940	450		1 2 0	4.000 3.000 3.001	51.360 51.360 51.360	100 100 100

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
4	387501.327	394201.963	52.600	0.750	450		0	6.000	51.850	100
5	387493.989	394201.963	52.630	1.125	450		1	6.000	51.505	100
						0	6.001	51.505	100	
6	387479.088	394201.252	52.300	0.700	450		0	7.000	51.600	100
7	387488.831	394201.527	52.425	1.635	1500		1	7.000	50.990	100
						2	6.001	50.990	100	
						3	1.004	50.790	300	
						0	1.005	50.790	300	
8	387501.367	394215.085	52.450	0.850	450		0	5.000	51.600	100
9	387493.954	394215.087	52.520	1.033	450		1	5.000	51.487	100
						0	5.001	51.487	100	
10	387488.831	394215.834	52.275	1.435	1200		1	5.001	51.040	100
						2	3.001	51.040	100	
						3	1.003	50.840	300	
						0	1.004	50.840	300	
11	387479.307	394230.216	52.300	0.700	450		0	2.000	51.600	100
12	387488.831	394229.246	52.140	1.255	1200		1	2.000	51.085	100
						2	1.002	51.035	150	
						0	1.003	50.885	300	
13	387497.658	394229.906	52.335	0.878	450		1	1.001	51.507	100
						0	1.002	51.457	150	
14	387507.985	394200.930	52.450	0.550	100		0	1.000	51.900	100
15	387507.985	394229.906	52.450	0.840	450		1	1.000	51.610	100
						0	1.001	51.610	100	
C1	387486.822	394193.330	52.150	1.420	450		1	1.005	50.730	300

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	0.750	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	0.840	Additional Storage (m ³ /ha)	20.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	0	0
30	0	0	0
100	45	0	0

Node 7 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	50.790	Product Number	CTL-SHE-0075-2700-1250-2700
Design Depth (m)	1.250	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	2.7	Min Node Diameter (mm)	1200

Node 10 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	50.850
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	216

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	32.0	0.0	0.500	32.0	0.0	0.501	0.0	0.0

Node 7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	50.805
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	244

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	34.0	0.0	0.500	34.0	0.0	0.501	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.79%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	11	51.767	0.017	0.9	0.0045	0.0000	OK
15 minute summer	2	10	51.766	0.016	0.8	0.0036	0.0000	OK
15 minute winter	3	10	51.400	0.040	2.9	0.0141	0.0000	OK
15 minute winter	4	11	51.862	0.012	0.4	0.0029	0.0000	OK
15 minute winter	5	11	51.520	0.015	0.9	0.0035	0.0000	OK
15 minute winter	6	10	51.615	0.015	0.7	0.0044	0.0000	OK
120 minute winter	7	84	50.919	0.129	4.3	3.9493	0.0000	OK
15 minute summer	8	10	51.623	0.023	0.8	0.0068	0.0000	OK
15 minute winter	9	10	51.507	0.020	1.5	0.0051	0.0000	OK
120 minute winter	10	84	50.919	0.079	3.8	2.2252	0.0000	OK
15 minute winter	11	10	51.615	0.015	0.7	0.0046	0.0000	OK
15 minute winter	12	11	50.940	0.055	4.5	0.0734	0.0000	OK
15 minute winter	13	11	51.482	0.025	2.2	0.0074	0.0000	OK
15 minute winter	14	10	51.935	0.035	1.6	0.0156	0.0000	OK
15 minute winter	15	11	51.645	0.035	1.6	0.0056	0.0000	OK
15 minute summer	C1	1	50.730	0.000	2.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	3.000	3	0.9	0.504	0.064	0.0140	13.7
15 minute summer	2	4.000	3	0.8	0.445	0.055	0.0129	
15 minute winter	3	3.001	10	2.8	0.968	0.323	0.0454	
15 minute winter	4	6.000	5	0.4	0.630	0.030	0.0047	
15 minute winter	5	6.001	7	0.9	1.231	0.047	0.0038	
15 minute winter	6	7.000	7	0.7	0.964	0.044	0.0068	
120 minute winter	7	Hydro-Brake®	C1	2.2				
15 minute summer	8	5.000	9	0.8	0.646	0.102	0.0088	
15 minute winter	9	5.001	10	1.4	1.333	0.080	0.0055	
120 minute winter	10	1.004	7	3.2	0.294	0.049	0.3136	
15 minute winter	11	2.000	12	0.7	0.913	0.047	0.0070	
15 minute winter	12	1.003	10	4.6	0.543	0.072	0.1336	
15 minute winter	13	1.002	12	2.2	1.180	0.057	0.0168	
15 minute winter	14	1.000	15	1.6	0.650	0.257	0.0708	
15 minute winter	15	1.001	13	1.5	0.632	0.254	0.0251	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.79%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	1	10	51.778	0.028	2.4	0.0073	0.0000	OK
15 minute winter	2	10	51.775	0.025	2.0	0.0057	0.0000	OK
15 minute winter	3	10	51.434	0.073	7.4	0.0258	0.0000	OK
15 minute winter	4	11	51.869	0.019	1.0	0.0045	0.0000	OK
15 minute winter	5	11	51.529	0.024	2.3	0.0056	0.0000	OK
15 minute winter	6	10	51.623	0.023	1.7	0.0069	0.0000	OK
60 minute winter	7	59	51.111	0.321	10.7	10.5042	0.0000	SURCHARGED
15 minute winter	8	10	51.637	0.037	2.0	0.0111	0.0000	OK
15 minute winter	9	10	51.520	0.033	3.7	0.0083	0.0000	OK
60 minute winter	10	60	51.111	0.271	13.9	8.2937	0.0000	OK
15 minute winter	11	10	51.624	0.024	1.7	0.0072	0.0000	OK
60 minute winter	12	60	51.111	0.226	6.4	0.3019	0.0000	OK
15 minute winter	13	11	51.498	0.041	5.8	0.0121	0.0000	OK
15 minute winter	14	10	51.960	0.060	4.0	0.0266	0.0000	OK
15 minute winter	15	11	51.672	0.062	3.9	0.0098	0.0000	OK
15 minute summer	C1	1	50.730	0.000	2.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	1	3.000	3	2.4	0.596	0.169	0.0291	
15 minute winter	2	4.000	3	2.0	0.527	0.139	0.0274	
15 minute winter	3	3.001	10	7.2	1.199	0.831	0.0945	
15 minute winter	4	6.000	5	1.0	0.808	0.076	0.0091	
15 minute winter	5	6.001	7	2.3	1.603	0.119	0.0080	
15 minute winter	6	7.000	7	1.7	1.257	0.110	0.0147	
60 minute winter	7	Hydro-Brake®	C1	2.5				27.5
15 minute winter	8	5.000	9	2.0	0.818	0.264	0.0179	
15 minute winter	9	5.001	10	3.6	1.720	0.203	0.0110	
60 minute winter	10	1.004	7	6.3	0.400	0.096	0.9824	
15 minute winter	11	2.000	12	1.7	1.190	0.119	0.0135	
60 minute winter	12	1.003	10	5.7	0.421	0.090	0.8299	
15 minute winter	13	1.002	12	5.8	1.541	0.149	0.0334	
15 minute winter	14	1.000	15	3.9	0.804	0.650	0.1427	
15 minute winter	15	1.001	13	3.9	0.796	0.646	0.0507	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.79%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
120 minute winter	1	116	52.021	0.271	1.4	0.0709	0.0000	FLOOD RISK
120 minute winter	2	116	52.021	0.271	1.2	0.0612	0.0000	FLOOD RISK
120 minute winter	3	116	52.021	0.661	4.3	0.2319	0.0000	FLOOD RISK
120 minute winter	4	118	52.019	0.169	0.6	0.0404	0.0000	SURCHARGED
120 minute winter	5	118	52.019	0.514	1.4	0.1182	0.0000	SURCHARGED
120 minute winter	6	118	52.019	0.419	1.4	0.1266	0.0000	FLOOD RISK
120 minute winter	7	118	52.019	1.229	11.5	18.5492	0.0000	SURCHARGED
120 minute winter	8	118	52.019	0.419	1.3	0.1257	0.0000	SURCHARGED
120 minute winter	9	118	52.019	0.532	2.2	0.1362	0.0000	SURCHARGED
120 minute winter	10	118	52.019	1.179	15.2	16.7772	0.0000	FLOOD RISK
120 minute winter	11	118	52.019	0.419	1.1	0.1265	0.0000	FLOOD RISK
120 minute winter	12	118	52.019	1.134	7.0	1.5173	0.0000	FLOOD RISK
120 minute winter	13	118	52.019	0.562	4.0	0.1664	0.0000	SURCHARGED
15 minute winter	14	11	52.085	0.185	7.4	0.0820	0.0000	SURCHARGED
120 minute winter	15	118	52.020	0.410	2.3	0.0651	0.0000	SURCHARGED
15 minute summer	C1	1	50.730	0.000	2.5	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
120 minute winter	1	3.000	3	1.4	0.560	0.100	0.0573	
120 minute winter	2	4.000	3	1.2	0.496	0.084	0.0556	
120 minute winter	3	3.001	10	4.3	1.054	0.498	0.1235	
120 minute winter	4	6.000	5	0.6	0.714	0.045	0.0574	
120 minute winter	5	6.001	7	1.4	1.264	0.073	0.0405	
120 minute winter	6	7.000	7	1.0	0.977	0.066	0.0763	
120 minute winter	7	Hydro-Brake®	C1	2.7				49.5
120 minute winter	8	5.000	9	1.2	0.739	0.161	0.0580	
120 minute winter	9	5.001	10	2.2	1.443	0.123	0.0405	
120 minute winter	10	1.004	7	6.6	0.395	0.102	1.0075	
120 minute winter	11	2.000	12	1.0	0.996	0.071	0.0749	
120 minute winter	12	1.003	10	6.3	0.380	0.099	0.9445	
120 minute winter	13	1.002	12	3.5	1.280	0.090	0.1558	
15 minute winter	14	1.000	15	6.5	0.867	1.077	0.2267	
120 minute winter	15	1.001	13	2.3	0.702	0.381	0.0808	



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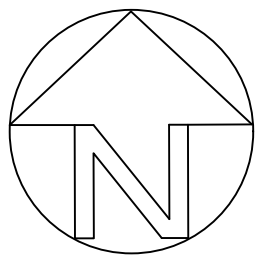
Title

Drainage Strategy – Rev B

Appendix J

Drainage Layouts

SEA Drawing 00142/E02C and E03B



GENERAL

Do not scale from this drawing.

All dimensions are in millimetres unless noted otherwise.

All setting out to architects drawings.

Drawing to be read in conjunction with all other SEA drawings and architects drawings.

This scheme has been designed using the survey information provided by others. It shall be the responsibility of the contractor to verify levels, boundaries etc prior to commencing any works on site. SEA Structural Engineers Ltd. shall not accept any responsibility for errors resulting from the survey.

All setting to be in accordance with the Architect's drawings, the Contractor is to check all dimensions and levels prior to commencement of work and report any discrepancies to the Engineer, including any encountered during construction works.

All dimensions should be checked on site prior to construction. Please notify the Engineer of any discrepancies before commencing or continuing any work.

HEALTH, SAFETY & THE ENVIRONMENT

In accordance with the Health and Safety at Work etc Act 1973 and the Construction (Design and Management) Regulations 2015, designs and details on this drawing have been the subject of a Designers Risk Assessment, to identify risks in construction, use, or demolition of the scheme.

It is not considered necessary for Designers to highlight obvious and/or common risks (such as deep excavations, manual handling and working around heavy plant) which Contractors should be familiar with.

So far as is reasonably practicable, risks inherent in the design have been eliminated. Where it has been considered that elimination of a risk (or part of a risk) is not reasonably practicable, it has been reduced.

Significant unusual residual risks are identified below, beside the measures which have been adopted to eliminate and/or reduce them:

- Existing services unknown must be confirmed prior to construction

DRAINAGE NOTES

All pipe lengths and gradients are based on centre of manhole to centre of manhole.

The exact position, level, size and use of existing sewers to be confirmed on site and reported to the Engineer prior to the commencement of works.

All pipes are to be laid with level soffits/ or as indicated.

All private drainage works to accord with the requirements of Building Regulations 2000, Part H (drainage and waste disposal).

The invert of each horizontal drain at the base of a stack shall be at least 450mm below the center line of the lowest branch pipe. Set the level to ensure at least 50mm clearance to footings.

All pipes to be bedded and backfilled in accordance with Part H, diagram 10. Shallow pipes shall be protected in accordance with Part H, diagram 11.

Unless otherwise stated, all private drainage to be 100mm diameter. Gradients have been shown where there are pipe capacity issues, however minimum gradients are as below:

- Surface water 100mm diameter pipes shall not be laid flatter than 1 in 100
- Foul water 100mm diameter pipes shall not be laid flatter than 1 in 150
- Foul water 100mm diameter pipes shall not be laid flatter than 1 in 40 unless there is a WC connected upstream at which it can be laid at 1 in 80
- Foul water 150mm diameter pipes shall not be laid flatter than 1 in 150 providing there are minimum of 5 WCs connected.

Pipes which run adjacent to buildings shall be installed in strict accordance with Part h, clauses 2.23 to 2.25 and diagram 8.

All private manholes and inspection chambers subject to vehicular loading must have class D400 covers and frames in accordance with BS EN 124:2015. All private manholes and inspection chambers not subject to vehicular loading must have class B125 covers and frames in accordance with BS EN 124:2015.

All drains near existing or proposed trees shall be constructed in accordance with the requirements of NHBC's practice note 3 'building near trees'.

Excavation of drain trenches must not be lower than the foundation of any nearby buildings. If the trench is within 1m of foundations, the trench needs to be filled with concrete up to the lowest level of the foundation. If the trench is further than 1m away from the foundations, the trench needs to be filled with concrete to a level below the lowest level for the building, equal to the distance from the building, less than 150mm.

An opening needs to be formed where a pipe passes through a wall, with a minimum 50mm clearance. A lintel must support the brickwork above and each side of the opening masked with rigid sheet material.

All pipework with less than 1.2m cover shall have a concrete slab to adopting water company's requirements unless in open space where 0.9m cover is acceptable. Where a pipe requires a concrete surround C20 concrete mix should be used with vertical joints formed at the face of each flexible joint using 18mm thick compressible board.

All UPVC pipes with less than 600mm cover need concrete protection. Where two pipes cross with less than 300mm separation, surround each with a C20 concrete mix. Where centered on the crossing point, extend the concrete surrounds as necessary to within 150mm of the next nearest flexible joint.

Adequate surface water drainage systems shall be provided to prevent unregulated discharge of water from a private drive onto the highway. These measures shall be implemented before the development in brought into use.

Perforated pipework to be used for distributor runs within permeable block paved areas.

Trapped road gullies to be used for all gullies designed within he access road

DRAWING KEY:

- Existing UU combined drainage
- Existing 900mmØ brick culverted watercourse
- Proposed storm drainage
- Proposed storm road gully
- Proposed permeable block paving extent - ALL PIPE WORK WITHIN PERMEABLE SUBBASE TO BE PERFORATED
- Proposed storm attenuation tank
- Proposed foul drainage
- Existing Combined drainage Not UU

C 28.10.24 WRA Storm outfall route amended
B 27.10.24 WRA Text made clearer to avoid confusion
A 11.10.24 WRA Foul outfall routes amended

Rev. Date By Description

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PROJECT
**RESIDENTIAL DEVELOPMENT
CHAPEL LANE
LEVENHULME, MANCHESTER**

DRAWING
PROPOSED DRAINAGE LAYOUT

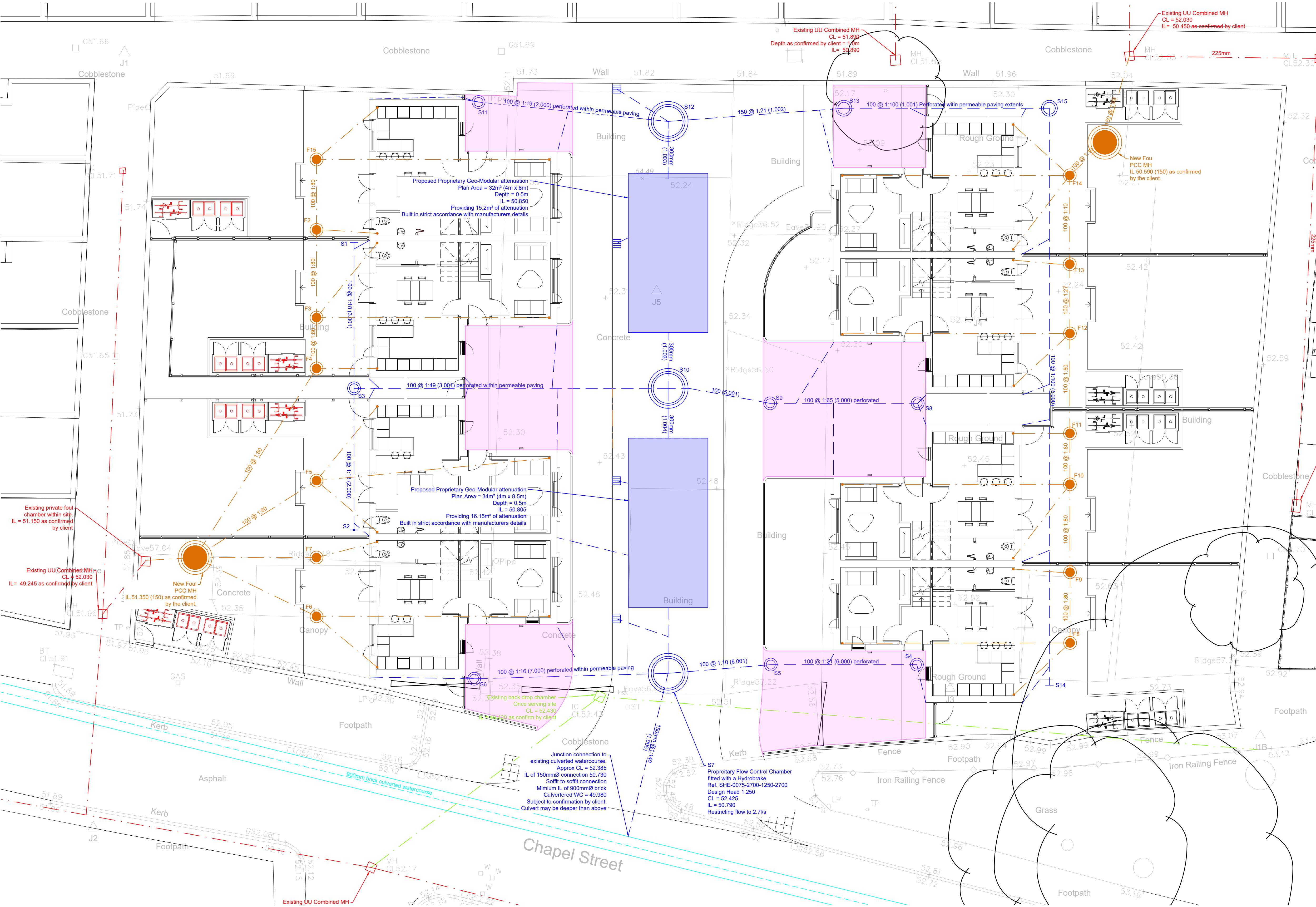
SCALE: 1:100@A1 DATE: 20.03.2024

DRAWN BY: WRA REV: C

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DWG No: 00142/E02

C



CELLULAR STORAGE NOTES

The structural design of the cellular storage tanks shall be in accordance with 'Structural design of buried pipelines under various conditions of loading' BSEN 1295, 'Highways Agency Specification for Highway Works', and Sewers for Adoption, 6th Edition. The design of the cellular storage shall be undertaken by the specialist supplier who will take design responsibility.

SEA Structural Engineers takes no responsibility for the design of the cellular storage, other than providing the required capacity. Full design responsibilities for all other aspects lies with the designer of the cellular storage. Prior to construction, SEA shall be provided with all construction drawings to allow the drawings to be co-ordinated. SEA will not approve the details.

The Cellular storage shall be designed to receive:
Distributed load = 10kN/m²
Concentrated load = 100kN
Dynamic factor = 2
Material factor = 1.5
unfactored
in addition to the dead load of the ground

The cellular storage shall be designed not to float. Groundwater levels are unknown.

The contractor shall provide to the designer of the cellular storage the type of construction plant likely to be used in the area of the cellular storage prior to construction.

For online storage it is essential that pipe work through the cellular storage is provided in order to allow the system to be maintained. Any proposals that do not show how the system can be rodded will not be adequate.

It is essential that construction sediments are not allowed to enter the cellular storage system and the contractor shall provide adequate protection to the drainage network to prevent this.

The designer of the cellular storage shall provide full details of how the cellular storage shall be maintained during the life time of the system.

Installation of the cellular storage shall be carried out by competent personnel only and strictly in accordance with manufactures requirements.

Reference shall be made to CIRIA C698, site hand book for the construction of SUDS, prior to construction.

The design of the cellular storage shall demonstrate compliance with Ciria C680, structural design of modular geocell and drainage tanks

The main contractor and the supplier/installer of the cellular storage shall ensure that the design and installation are co-ordinated with other site works to include, but not limited to, understanding what construction plant may traffic close to or over the cellular storage.

Maintenance Schedule	Required Action	Recommended Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, and then six monthly
	Debris removal from catchment surface (where may cause risks to performance).	Monthly
	Where rainfall infiltrates into blocks from above, check surface of filter for blockages by silt, algae or other matter. Remove and replace surface infiltration medium as necessary. Remove sediment from pre-treatment structures.	Monthly (and after large storms)
Remedial actions	Repair/ rehabilitation of inlets, outlet, overflows and vents.	Annually, or as required.
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are all in good condition and operating as designed.	Annually and after large storms

FOUL MANHOLE SCHEDULE							
Node	CL (m)	Depth (m)	Dia (mm)	MH Type	Connections	IL (m)	Dia (mm)
F1	52.300	0.625	450	PPIC	 0	51.675	100
F2	52.300	0.670	450	PPIC	 1 0	51.630	100
F3	52.300	0.726	450	PPIC	 1 0	51.574	100
F4	52.300	0.758	450	PPIC	 1 0	51.542	100
F5	52.300	0.809	450	PPIC	 0	51.491	100
F6	52.300	0.815	450	PPIC	 0	51.485	100
F7	52.300	0.823	450	PPIC	 0	51.477	100
F8	52.450	0.800	450	PPIC	 0	51.650	100
F9	52.450	0.844	450	PPIC	 1 0	51.606	100
F10	52.450	0.899	450	PPIC	 1 0	51.551	100
F11	52.450	0.931	450	PPIC	 1 0	51.519	100
F12	52.450	0.994	450	PPIC	 1 0	51.456	100
F13	52.450	1.119	450	PPIC	 1 0	51.331	100
F14	52.450	1.565	450	PPIC	 1 0	50.885	100

STORM MANHOLE SCHEDULE							
Node	CL (m)	Depth (m)	Dia (mm)	MH Type	Connections	Link IL (m)	Dia (mm)
S1	52.300	0.550		Rodding Eye	 0	3.000 51.750	100
S2	52.300	0.550		Rodding Eye	 0	4.000 51.750	100
S3	52.300	0.940	450	PPIC	 1 2 0	4.000 51.360 3.000 51.360	100 100
S4	52.600	0.750	450	PPIC	 0	3.001 51.360	100
S5	52.630	1.125	450	PPIC	 1 0	6.000 51.850 6.000 51.505	100 100
S6	52.300	0.700	450	PPIC	 0	6.001 51.505	100
S7	52.425	1.635	1500	PCC FLOW CONTROL CHAMBER	 1 2 3 0	7.000 50.990 6.001 50.990 1.004 50.790	100 100 300
S8	52.450	0.850	450	PPIC	 0	1.005 50.790	150
S9	52.520	1.033	450	PPIC	 1 0	5.000 51.600 5.000 51.487	100 100
S10	52.275	1.435	1200	PCC MH Catchpit	 1 2 3 0	5.001 51.040 3.001 51.040 1.003 50.840	100 100 300
S11	52.300	0.700	450	PPIC	 0	1.004 50.840	300
S12	52.140	1.255	1200	PCC MH Catchpit	 1 2 0	2.000 51.600 2.000 51.085 1.002 51.035	100 100 150
S13	52.335	0.878	450	PPIC	 1 0	1.003 50.885 1.001 51.507	300 100
S14	52.450	0.550		Rodding Eye	 0	1.001 51.457	150
S15	52.450	0.840	450	PPIC	 1 0	1.000 51.900 1.000 51.610	100 100

NB: FOR CLARITY CONNECTIONS FROM INTENRAL FOUL CONNETIONS, RWPS AND GULLIES ARE NOT SHOWN ON THE CONNETION MAPS ON THE ADJACENT SCHEDULE. REFERENCE SHOULD BE MADE TO THE DRAINAGE LAYOUT TO CONFIRM ALL CONNECTIONS

GENERAL

Do not scale from this drawing.

All dimensions are in millimetres unless noted otherwise.

All setting out to architects drawings.

Drawing to be read in conjunction with all other SEA drawings and architects drawings.

This scheme has been designed using the survey information provided by others. It shall be the responsibility of the contractor to verify levels, boundaries etc prior to commencing any works on site. SEA Structural Engineers Ltd. shall not accept any responsibility for errors resulting from the survey.

All setting to be in accordance with the Architect's drawings, the Contractor is to check all dimensions and levels prior to commencement of work and report any discrepancies to the Engineer, including any encountered during construction works.

All dimensions should be checked on site prior to construction. Please notify the Engineer of any discrepancies before commencing or continuing any work.

HEALTH, SAFETY & THE ENVIRONMENT

In accordance with the Health and Safety at Work etc Act 1973 and the Construction (Design and Management) Regulations 2015, designs and details on this drawing have been the subject of a Designers Risk Assessment, to identify risks in construction, use, or demolition of the scheme.

It is not considered necessary for Designers to highlight obvious and/or common risks (such as deep excavations, manual handling and working around heavy plant) which Contractors should be familiar with.

So as far as is reasonably practicable, risks inherent in the design have been eliminated. Where it has been considered that elimination of a risk (or part of a risk) is not reasonably practicable, it has been reduced.

Significant unusual residual risks are identified below, beside the measures which have been adopted to eliminate and/or reduce them:

- Existing services unknown must be confirmed prior to construction

B27.10.24WRAStorm water details amended to suit revised outfall direction

A11.10.24WRAUpdated to suit foul outfall changes

Rev.	Date	By	Description
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PROJECT RESIDENTIAL DEVELOPMENT CHAPEL LANE LEVENHULME, MANCHESTER			
DRAWING PROPOSED MANHOLE SCHEDULE			
SCALE: NTS		DATE: 20.03.2024	
DRAWN BY: WRA		REV: B	
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