

**PROJECT: LANDS AT WATTS CLOSE,
LONDON. N15 5DW**

PROJECT NO: 22778

DOCUMENT TITLE: DRAINAGE STRATEGY REPORT

DOCUMENT NO: 22778-RP-01

DATE: 30TH JANUARY 2023

	Project				Job Ref.	
	Lands at Watts Close, London, N15 5DW				22778	
	Section				Sheet no./rev.	
	Drainage Strategy Report				2	
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1. GENERAL

1.0. General

The subject development site is located in a predominantly residential area between Watts Close and Lomond Close, approximately 300m to the north-west of Seven Sisters Station. The site can be found by the national grid reference TQ 32163 62589, with the proposed site location as outlined in Figure 1 & 2 below.

The proposed development will consist of the demolition of 11 existing bungalows and a community building to provide lands for the provision of 18 new homes for council rent. The proposed development will comprise 6No. two-storey family houses (three & four bedrooms) and 12No. apartments (one & two bedrooms) in two, three-storey blocks including two wheelchair user dwellings. The development will also include two wheelchair parking spaces, amenity and play space, landscaping and cycle and refuse/recycling storage. The overall site area within the site boundary is approximately 0.278ha.



Figure 1: Proposed Site Plan

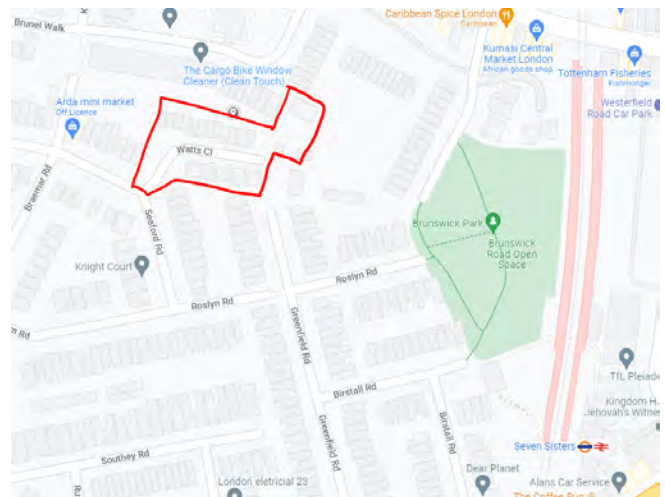


Figure 2: Site Location Plan

The report has been commissioned by the client to discharge Planning Condition 11 of the Planning Decision Notice which states:

Condition 11 (Drainage)

The authorised development shall not begin except for demolition works until drainage works have been carried out in accordance with details to be submitted to and approved by the Local Planning Authority. This shall include drainage calculations and confirmation of rate and point of discharge from the water authority.

Reason: *In order to ensure a satisfactory provision from drainage on site and ensure suitable drainage provision for the authorised development and comply with Policy SI13 of the London Plan 2021, Policies SP0 and SP4 of the Haringey Local Plan 2017 and Policy DM24 of The Development Management DPD 2017.*

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1.1. Brief

The purpose of this document is to outline the drainage strategy for the proposed development, and to provide details of the proposed storm & foul outfall connections to the existing public drainage infrastructure serving the area. It is intended that this document will be submitted to Haringey Local Authority for discharge of Condition 11 of the planning decision notice.

The report should be read in conjunction with the drainage drawings included in Appendix I. Please see Appendix I for further details.

1.2. Design Information

Title:	Drainage Strategy Report
Site:	Lands at Watts Close, London, N15 5DW
Report Ref:	22778-RP-01
Local Authority:	London Borough of Haringey
Calculations:	Arash Fehmi BE(Hons), MSc
Checked:	David Barden BE(Hons), DipStructEng, AdvDipPM, CEng, MIEI, MStructE

1.3. Design Reference

Reference has been made to the following documents to produce this report:

- CIRIA SuDS Manual 2015 C753
- The Haringey Sustainable Drainage Evaluation Guide
- National Planning Policy Framework (NPPF)
- Planning Practice Guidance – Flood Risk and Coastal Change
- The Haringey Sustainable Drainage planning guide
- The London Sustainable Drainage Proforma
- Environment Agency climate change guidance
- Environmental Agency (EA) Flood maps.

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2. SURFACE WATER DRAINAGE SYSTEM

2.0. Existing Surface Water Drainage

A utilities survey within the site indicates that the existing surface water drainage connects to a Thameswater (TW) sewer located in the adjacent highway. (Please refer to Appendix II & III for Utilities Survey & TW Asset Search respectively). The existing surface water drainage does not appear to contain any on-site attenuation or flow control device to restrict surface water runoff from the site.

2.1. Proposed Surface Water Drainage

The proposed development marginally increases the impermeable area at the site, leading to an increase in surface water run-off generated by the site. This surface water run-off, will however, be managed in the proposed scheme to mitigate off-site flood risk and to comply with planning requirements.

It is proposed to reduce surface water runoff from the Site to the 1 in 100-year greenfield runoff rates in accordance with the London Sustainable Drainage Action Plan and CIRIA SuDS Manual 2015.

To both reduce and attenuate flow, the proposed Site will be designed in accordance with the principles of SuDS in line with the London Plan Policy 5:13 as set out in the London Sustainable Drainage Action Plan, as listed below in order of preference for surface water disposal:

1. Store rainwater for later use: The presence of green roofs will reduce the volume of water available for collection and reuse, however it is still proposed to provide water butts to the properties. Green roofs have been specified for the wider environmental benefits to the site.
2. Use of infiltration techniques: Infiltration is not deemed to be viable due to the underlying geology of London Clay which is of low permeability.
3. Attenuate rainwater in ponds or open water features for gradual release: Due to the small site area, the use of ponds or other open water features are not considered suitable.
4. Attenuate rainwater by storing in tanks or sealed water features for gradual release: Attenuation will be provided in the form of a modular attenuation tank, with outflow restricted by a pumping chamber. Green roofs are proposed throughout the development on both the housing and apartment blocks.
5. Discharge rainwater direct to a watercourse: There are no nearby watercourses suitable for the discharge of surface water run-off.
6. Discharge rainwater to a surface water or combined sewer drain: It is proposed to discharge surface water run-off to the TW surface water sewer located adjacent to the site, as per the existing regime, via existing lateral pipe.

2.2. Proposed Discharge Rates

As the site is situated in London the requirements of Policy SI 13 Sustainable drainage are relevant to the site. This states that the re-development of the site should aim to reduce the surface water run-off from the site to greenfield run-off rates. The greenfield run-off discharge rates have been calculated for the impermeable areas of the proposed development. Greenfield run-off was calculated using the method described in the Institute of Hydrology report 124 'Flood Estimation for Small Catchments' (see Greenfield Calculations in Appendix IV). The greenfield rates applicable to the site are summarised in table below: -

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Hardstanding Area (ha)	Greenfield rate (l/s)			
	Qbar	1-year	30-year	100-year
0.188	0.8	0.7	1.9	2.5

It is proposed to restrict discharge of surface water run-off from the site to the 1% AEP greenfield run-off rate in all events up to and including the 1% AEP rainfall event inclusive of 40% climate change event. Discharge will be limited by a pump sump flow control device.

The proposals therefore reduce the existing run-off rate in line with the London Plan and the Haringey SWMP.

2.3. Attenuation

Attenuation is provided within the site to manage the run-off storage volume required for rainfall events up to and including the 1% AEP annual probability event inclusive of 40% climate change. Attenuation will be provided using below ground modular attenuation storage crates located in central landscaped reserve to the front of the site. A full set of storm network and attenuation calculations are provided in Appendix IV of this report. (Please refer to Appendix IV for further details).

2.4. Green Roofs

Green roofs are to be provided to the apartment & housing blocks, which provide the benefit of reducing peak flow rates to the site drainage system for small and medium-sized events, as well as biodiversity benefits. As described in C753, their impact tends to be most significant in summer, where intense short duration events may generate very little run-off from the roof.

However, the reduction in volume of run-off from a green roof for an extreme event is unlikely to impact on downstream attenuation storage requirements, and the proposed attenuation tank has therefore conservatively been sized not accounting any benefit from the green roof storage volumes.

2.5. Maintenance

Maintenance of the proposed SuDS strategy shall include for regular inspections at varying intervals depending on the system requirements. The SuDS system proposed is Attenuation Storage and Green Roofs.

1. Attenuation Storage: The attenuation manhole inflow & outflow inspection chambers are to be monitored regularly by visual inspection for silt build up and cleaned as required. During the development it is recommended to inspect the chambers more frequently due to higher risk of sediment/debris build up. A visual inspection once a week is advised.

On completion of the development, a yearly check is recommended with additional inspections following heavy storm events. The proposed pump should be operated under a maintenance/emergency call out contract with a suitably experienced and resourced pump maintenance contractor. It is recommended that a 24 hour call out contract is agreed.

The responsibility of maintaining the proposed SuDS system in this instance will be with the property owner.

2. Typical Green Roof Maintenance: During the first 3 months whilst the green roof becomes established regular maintenance will be required, including irrigation as necessary, and subject to specifiers advise, an initial application of slow-release fertiliser. Once the green roof is established, a suitably qualified specialist green

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roof maintenance contractor should be employed to carry out two visits a year. Typical maintenance tasks will include:

- Inspection of vegetation and reporting any problems on plant establishment.
- Removal of unwanted weeds such as Buddleia, Canadian fleabane, sow-thistles, and docks.
- Clearance of drainage pits and vegetation barriers around the perimeter.

Please refer to the full drainage maintenance plan is included in Appendix VI of this report for further details.

3. FOUL DRAINAGE SYSTEM

3.0. Existing Foul Drainage Infrastructure

The existing site was previously served by an existing 150mm diameter foul sewer, connected to a TW foul sewer located in the adjacent highway. The proposed foul discharge rate needs to be compared to the existing foul discharge rate (as outlined below) to determine if there is any increase in foul discharge rates to the existing public sewer. An existing population equivalent of 104 persons (11x4 persons for Bungalows + 60 persons for the Community Building) has been assumed for the previous occupied site.

3.1. Proposed Foul Sewer System

The proposed domestic foul flow rates from the site are taken from the British Water Code of Practice Flows and Load which allows 150 l/person/day for domestic use. A population equivalent of 72 persons has been taken for the site based on the accommodation schedule as outlined below.

Accommodation Schedule

	Unit	Level	1B2P	1B2P WCH	2B4P	3B5P	4B6P
Flats A West	1	G	✓				
	2	G		✓			
	3	1			✓		
	4	1			✓		
	5	2			✓		
	6	2			✓		
Houses Watts Cl.	7	G/1				✓	
	8	G/1				✓	
	9	G/1				✓	
	10	G/1				✓	
Flats B East	11	G	✓				
	12	G		✓			
	13	1			✓		
	14	1			✓		
	15	2			✓		
	16	2			✓		
Houses Lomond Cl.	17	G/1					✓
	18	G/1					✓
Sub-total			2	2	8	4	2
TOTAL					18		

$$QF = (\text{No. of occupants per unit}) \times (\text{Average Foul Discharge Rate})$$

$$QPEAK = (6) \times (QF)$$

Where:

QF = Discharge per unit (litres/second/unit)

QPEAK = Peak Discharge (litres/second/unit)

Average Foul Discharge Rate = 225 (litres/day/person)

Flow type: Domestic (150 litres/day/person)

Flow type: Community Centre (60 litres/day/person)

$$\text{Proposed QF} = (72 \text{ people}) \times (150 \text{ litres/day/person})$$

$$= 10,800 \text{ litres/day}$$

$$\text{Proposed QPEAK} = (6) \times (10,800 \text{ litres/day})$$

$$= 64,800 \text{ litres/day}$$

$$= 0.750 \text{ litres/second}$$

$$\text{Existing QF} = (44 \text{ people}) \times (150 \text{ litres/day/person}) + (60 \text{ people}) \times (60 \text{ litres/day/person})$$

$$= 10,200 \text{ litres/day}$$

$$\text{Proposed QPEAK} = (6) \times (10,200 \text{ litres/day})$$

$$= 61,200 \text{ litres/day}$$

$$= 0.708 \text{ litres/second}$$

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As indicated from the above calculation, it is anticipated there will be negligible change in foul flows from the proposed development.

4. CONCLUSION

Surface water drainage will utilise SuDS techniques to improve water quality and to provide attenuation on site to reduce the unrestricted discharge rate from the site to the 1% AEP greenfield run-off rate as a maximum for all storm events up to and including the 1% AEP rainfall event inclusive of 40% climate change.

As outlined in Section 3, it is anticipated there will be negligible change in foul flows from the proposed development.

In the context of flood risk, the proposals are considered safe and appropriate, and do not cause increased flood risk. This report outlines details of the proposed SuDS techniques, and describes a strategy for maintaining these techniques throughout the lifetime of the development.



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APPENDIX I – PROPOSED DRAINAGE DRAWINGS

FOR CONSTRUCTION

NOTES

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECTS DRAWINGS. FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT-ASK.
- CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.

CIVIL LEGEND

EX. FOUL MANHOLE	Ex. F
EX. FOUL PIPE	PIPE DESCRIPTION
NEW FOUL MANHOLE	F
NEW FOUL PIPE	1000
EX. SURFACE WATER MANHOLE	Ex. S
EX. SURFACE WATER PIPE	EXISTING SW PIPE ADJACENT ROAD
NEW SURFACE WATER MANHOLE	S
NEW SURFACE WATER PIPE	PIPE DESCRIPTION
EX. COMBINED MANHOLE	Ex. C
EX. COMBINED PIPE	PIPE DESCRIPTION
NEW COMBINED MANHOLE	C
NEW COMBINED PIPE	PIPE DESCRIPTION
NEW RISING MAIN	PUMPED RISING MAIN
PIPE CROSSOVER	
EX. ROOF RAIN WATER MANHOLE	Ex. R
EX. ROOF RAIN WATER PIPE	PIPE DESCRIPTION
NEW ROOF RAIN WATER MANHOLE	R
NEW ROOF RAIN WATER PIPE	PIPE DESCRIPTION
RAINWATER PIPE	RWP
SOIL VENT PIPE	SVP
ROAD GULLEY	RG
BACK INLET GULLEY TRAP	BIGT
FOUL RODDING EYE	RE
SURFACE RODDING EYE	RE
GULLEY TRAP	GT
ACO DRAINAGE CHANNEL	
SINGLE 90mm BT DUCT	
MDPE CWM - SIZE T.B.C.	
SINGLE 100mm POWER	
SINGLE 100mm DATA	

NOTE:
ALL COVER LEVELS AND PUBLIC SEWER INVERT LEVELS SUBJECT TO SITE CONFIRMATION BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORKS

NOTE:
DENOTES BACK INLET GULLEY TRAP

NOTE:
DENOTES ACO DRAIN. ALL ACO DRAINS TO BE CONNECTED SEPARATELY FOR EACH INDIVIDUAL DEMISE



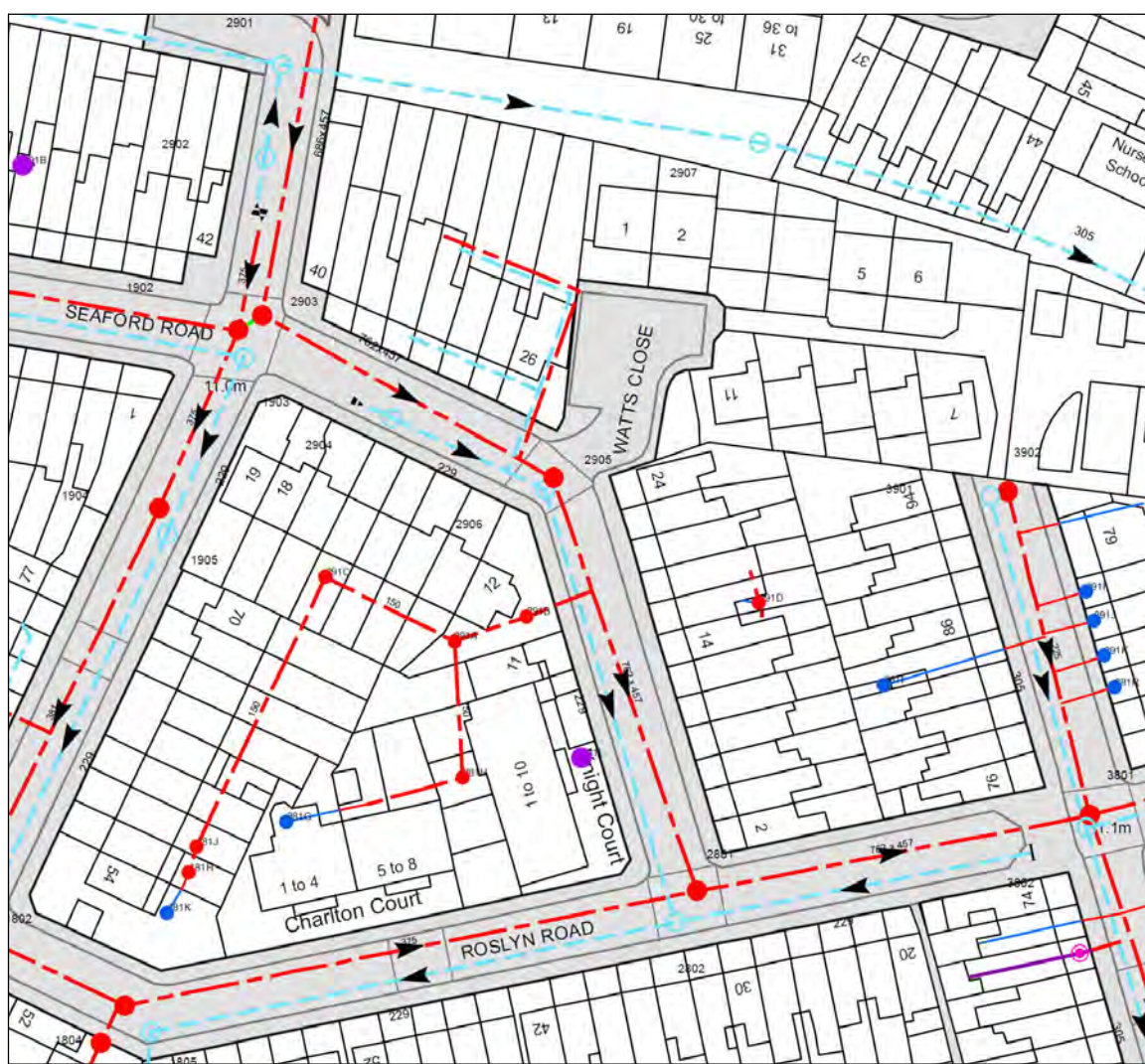
LITECAST DRAINAGE HANGERS AS INDICATED



BLOCK & BEAM DRAINAGE HANGER

0m 3m 6m 9m 12m 15m

VISUAL SCALE @ A1: 1:150
VISUAL SCALE @ A3: 1:300



PUBLIC SEWER KEY PLAN

SCALE @ A1: 1:500
SCALE @ A3: 1:1000

PROPOSED DRAINAGE PLAN

SCALE @ A1: 1:150
SCALE @ A3: 1:300

PROPOSED FOUL WATER MANHOLE SCHEDULE					
REF.	TYPE	COVER LEVEL	INVERT LEVEL	SIZE	REMARKS
Ex F 1.0	uPVC-AJ	+11.000	+8.830	450mm Ø	NEW FOUL MH AT EX MH LOCATION
F 1.0	uPVC-AJ	+11.000	+8.920	450mm Ø	-
F 1.1	uPVC-AJ	+11.000	+8.950	450mm Ø	-
F 1.2	uPVC-AJ	+11.000	+9.020	450mm Ø	-
F 1.3	uPVC-AJ	+11.000	+9.200	450mm Ø	-
F 1.4	uPVC-AJ	+11.000	+9.350	450mm Ø	-
F 1.5	uPVC-AJ	+11.000	+9.400	450mm Ø	-
F 1.6	uPVC-AJ	+11.000	+9.460	450mm Ø	-
F 1.7	uPVC-AJ	+11.000	+9.540	450mm Ø	-
F 1.8	uPVC-AJ	+11.000	+9.560	450mm Ø	-
F 1.9	uPVC-AJ	+11.000	+9.570	450mm Ø	-
F 1.10	uPVC-AJ	+11.000	+9.600	450mm Ø	-
F 1.11	uPVC-AJ	+11.000	+9.670	450mm Ø	-
F 1.12	uPVC-AJ	+11.000	+9.700	450mm Ø	-
F 1.13	uPVC-AJ	+11.000	+9.710	450mm Ø	-
F 1.14	uPVC-AJ	+11.000	+9.740	450mm Ø	-
F 1.15	uPVC-AJ	+11.000	+9.810	450mm Ø	-
F 1.16	uPVC-AJ	+11.000	+9.880	450mm Ø	-
F 1.17	uPVC-AJ	+11.000	+9.890	450mm Ø	-
F 1.18	uPVC-AJ	+11.000	+10.030	450mm Ø	BACKDROP MANHOLE
F 1.19	uPVC-AJ	+11.000	+10.450	450mm Ø	-
F 1.20	uPVC-AJ	+11.565	+10.520	450mm Ø	-
F 1.21	uPVC-AJ	+11.565	+10.670	450mm Ø	-
F 1.22	uPVC-AJ	+11.565	+10.720	450mm Ø	-
F 1.23	uPVC-AJ	+11.565	+10.890	450mm Ø	-
F 1.24	uPVC-AJ	+11.565	+11.070	450mm Ø	-
F 1.25	uPVC-AJ	+11.565	+11.220	450mm Ø	-
F 2.0	uPVC-AJ	+11.000	+10.110	450mm Ø	-
F 2.1	uPVC-AJ	+11.000	+10.230	450mm Ø	-
F 2.2	uPVC-AJ	+11.000	+10.300	450mm Ø	-
F 2.3	uPVC-AJ	+11.000	+10.480	450mm Ø	-
F 3.0	uPVC-AJ	+11.565	+10.720	450mm Ø	-
F 3.1	uPVC-AJ	+11.565	+10.830	450mm Ø	-
F 4.0	uPVC-AJ	+11.000	+10.300	900mm Ø	-

PROPOSED SURFACE WATER MANHOLE SCHEDULE					
REF.	TYPE	COVER LEVEL	INVERT LEVEL	SIZE	REMARKS
Ex S 1.0	uPVC-AJ	+11.000	+10.120	450mm Ø	EXISTING STORM MH RE-USED
S 1.0	uPVC-AJ	+11.000	+10.250	450mm Ø	SW TREATMENT MANHOLE
S 1.1	uPVC-AJ	+11.000	+8.370	450mm Ø	FLOW CONTROL MANHOLE
S 1.2	uPVC-AJ	+11.000	+8.220	450mm Ø	ATTENUATION INLET CATCHPIT MANHOLE
S 1.3	uPVC-AJ	+11.000	+10.130	450mm Ø	-
S 1.4	uPVC-AJ	+11.000	+10.170	450mm Ø	-
S 1.5	uPVC-AJ	+11.000	+10.190	450mm Ø	-
S 1.6	uPVC-AJ	+11.000	+10.350	450mm Ø	-
S 1.7	uPVC-AJ	+11.565	+10.790	450mm Ø	-
S 1.8	uPVC-AJ	+11.565	+10.880	450mm Ø	-
S 1.9	uPVC-AJ	+11.565	+10.970	450mm Ø	-
S 2.0	uPVC-AJ	+11.565	+10.970	450mm Ø	-
S 3.0	uPVC-AJ	+11.000	+10.240	450mm Ø	-
S 3.1	uPVC-AJ	+11.000	+10.400	450mm Ø	-
S 4.0	uPVC-AJ	+11.000	+10.270	450mm Ø	-
S 4.1	uPVC-AJ	+11.000	+10.400	450mm Ø	-
S 5.0	uPVC-AJ	+11.000	+10.310	450mm Ø	-
S 5.1	uPVC-AJ	+11.000	+10.400	450mm Ø	-

EXISTING PUBLIC SEWER FOUL WATER MANHOLE SCHEDULE					
REF.	TYPE	COVER LEVEL	INVERT LEVEL	INTERNAL SIZE	COMMENTS
T.W. FMH 2905	T.B.C. ON SITE	+10.010	+7.110	T.B.C. ON SITE	EXISTING PUBLIC MANHOLE
T.W. FMH 2906	T.B.C. ON SITE	+10.920	+10.010	T.B.C. ON SITE	EXISTING PUBLIC MANHOLE

- NOTE:**
- EXACT SET OUT LOCATION OF SVPs TO BE CONFIRMED BY ARCHITECT
 - MINIMUM GRADIENT OF FOUL DRAINAGE TO BE 100mm Ø @ 1:80 OR 150mm Ø @ 1:100
 - CONTRACTOR TO ENSURE THAT WORKS DO NOT AFFECT EXISTING FOUL AND SURFACE RUNS FROM OTHER PROPERTIES. EXISTING SERVICES TO BE KEPT LIVE AT ALL TIMES FOR THE DURATION OF THE WORK
 - INTERNAL MANHOLES AND ACCESS JUNCTIONS TO BE FITTED WITH RECESSED DOUBLE SEALED MANHOLE COVERS TO TAKE FLOOR FINISHES IF REQUIRED
 - TRAPPED CONNECTIONS TO BE PROVIDED TO ALL ABOVE GROUND FOUL DRAINAGE BY CONTRACTOR
 - AIR ADMITTANCE VALVES TO BE PROVIDED BY CONTRACTORS AND TO BE PROVIDED TO ALL GROUND FLOOR SVPs NOT CONNECTED TO A SOIL STACK
 - RODDING ACCESS TO BE PROVIDED BY CONTRACTOR AT ALL ABOVE GROUND DRAINAGE POP UP LOCATIONS. REFER TO SUB STACK DETAIL FOR FURTHER INFORMATION
 - EXISTING DRAINAGE INFORMATION SUBJECT TO CONFIRMATION BY CONTRACTOR VIA OPENING UP WORKS ON SITE
 - PUMPED FOUL AND SURFACE WATER DRAINAGE SYSTEMS TO BE FITTED WITH A SUITABLE WARNING SYSTEM GIVING VISUAL AND/OR AUDIBLE SIGNALS TO INDICATE SYSTEM MALFUNCTION
 - A NOTICE PLATE SHOULD BE PROVIDED IN THE OFFICE CONFIRMING TYPE OF WASTE SYSTEM AND MAINTENANCE PERIODS. THE LABEL SHALL BE ROBUST INDELIBLY MARKED AND SECURELY FIXED IN AN UNOBTUSIVE BUT OBVIOUS POSITION WITHIN THE BUILDING

C3	13.01.23	POP OPPOSITIONS REVISED	M.A.	D.B.	D.B.	D.B.
C2	16.11.22	REVISED AS CLOUDED	M.A.	A.McC.	D.B.	D.B.
C1	27.10.22	ISSUED FOR CONSTRUCTION	M.A.	A.McC.	D.B.	D.B.
T2	12.10.22	UPDATED FOR ARCHITECTS COMMENTS	M.A.	D.B.	D.B.	D.B.
T1	06.10.22	ISSUED FOR TENDER	M.A.	D.B.	D.B.	D.B.
P2	29.09.22	ISSUED FOR INFORMATION	K.O.	D.B.	D.B.	D.B.
P1	23.09.22	ISSUED FOR INFORMATION	A.L.	D.B.	D.B.	D.B.
ISSUE	DATE	DESCRIPTION	DRN.	ORIG.	P.E.	P.D.
ISSUE STATUS ☐ PRELIMINARY (P1, P2, P3 etc.) ☐ PLANNING (PL1, PL2, PL3 etc) ☐ TENDER (T1, T2, T3 etc.) ☒ CONSTRUCTION (C1, C2 etc.)						



CLIENT
FORMATION GROUP

PROJECT TITLE
WATTS CLOSE, LONDON. N15 EDW

DRAWING TITLE
PROPOSED GROUND FLOOR DRAINAGE

JOB NO. **22778** DRAWING REF. **WAT-BC-XX-00-DR-S-1000** ISSUE **C3**

FOR CONSTRUCTION

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECTS DRAWINGS. FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT-ASK
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.

C2	13.01.23	REVISED AS CLOUDED	M.A.	D.B.	D.B.	D.B.
C1	27.10.22	ISSUED FOR CONSTRUCTION	M.A.	A.McC.	D.B.	D.B.
T1	06.10.22	ISSUED FOR TENDER	M.A.	D.B.	D.B.	D.B.
P1	29.09.22	ISSUED FOR INFORMATION	K.O.	D.B.	D.B.	D.B.
ISSUE	DATE	DESCRIPTION	DRN.	ORIG.	P.E.	P.D.
ISSUE STATUS ☐ PRELIMINARY (P1, P2, P3 etc.) ☐ PLANNING (PL1, PL2, PL3 etc) ☐ TENDER (T1,T2, T3 etc.) ☒ CONSTRUCTION (O.1, 2 etc.)						

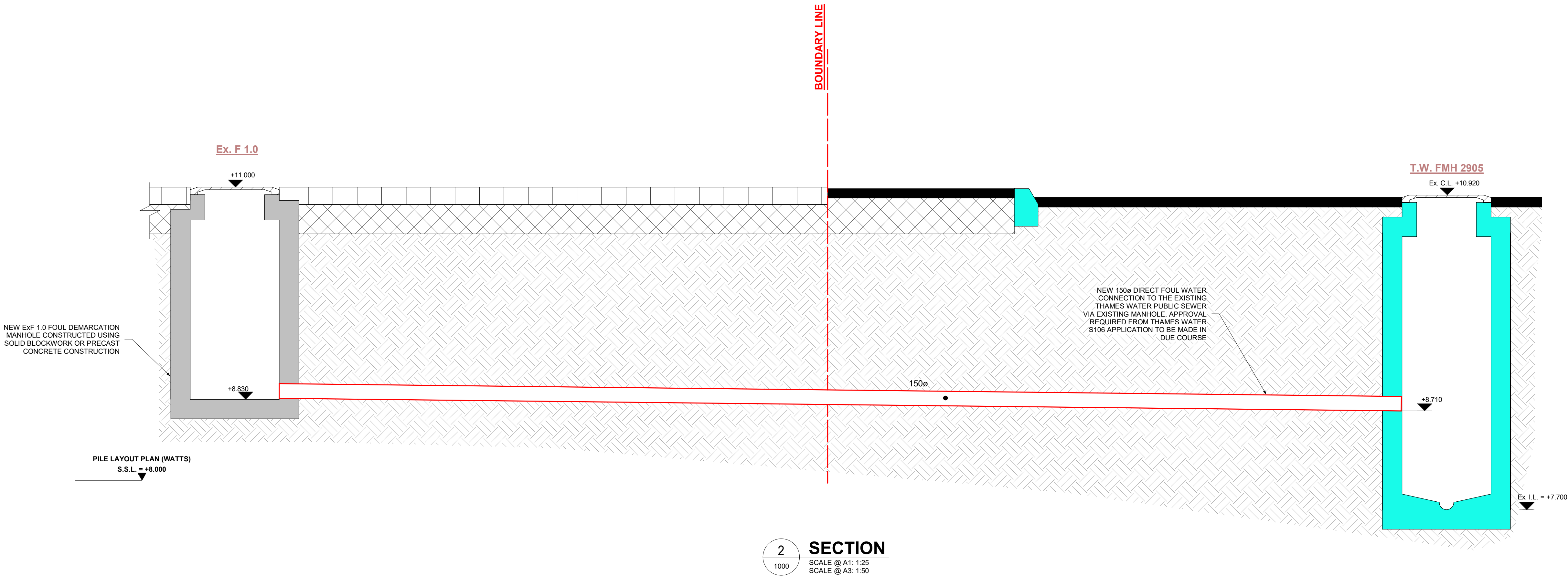
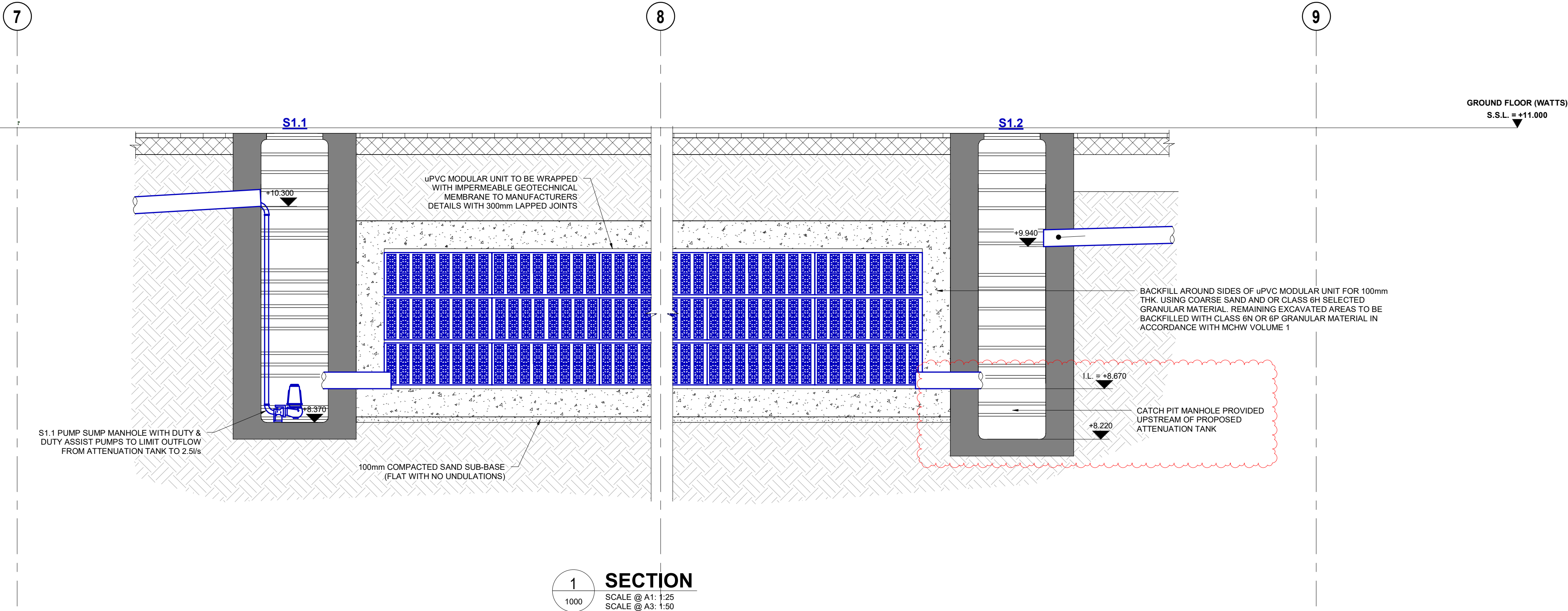


CLIENT
FORMATION GROUP

PROJECT TITLE
WATTS CLOSE, LONDON. N15 EDW

DRAWING TITLE
**DRAINAGE SECTION AND DETAILS
SHEET 1**

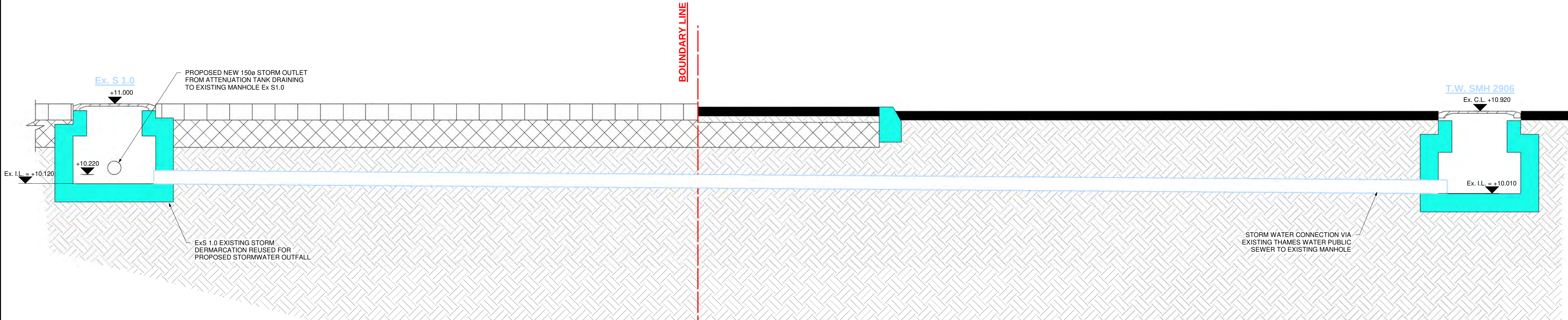
JOB NO.	DRAWING REF.	ISSUE
22778	WAT-BC-XX-XX-DR-S-1100	C2



PRELIMINARY

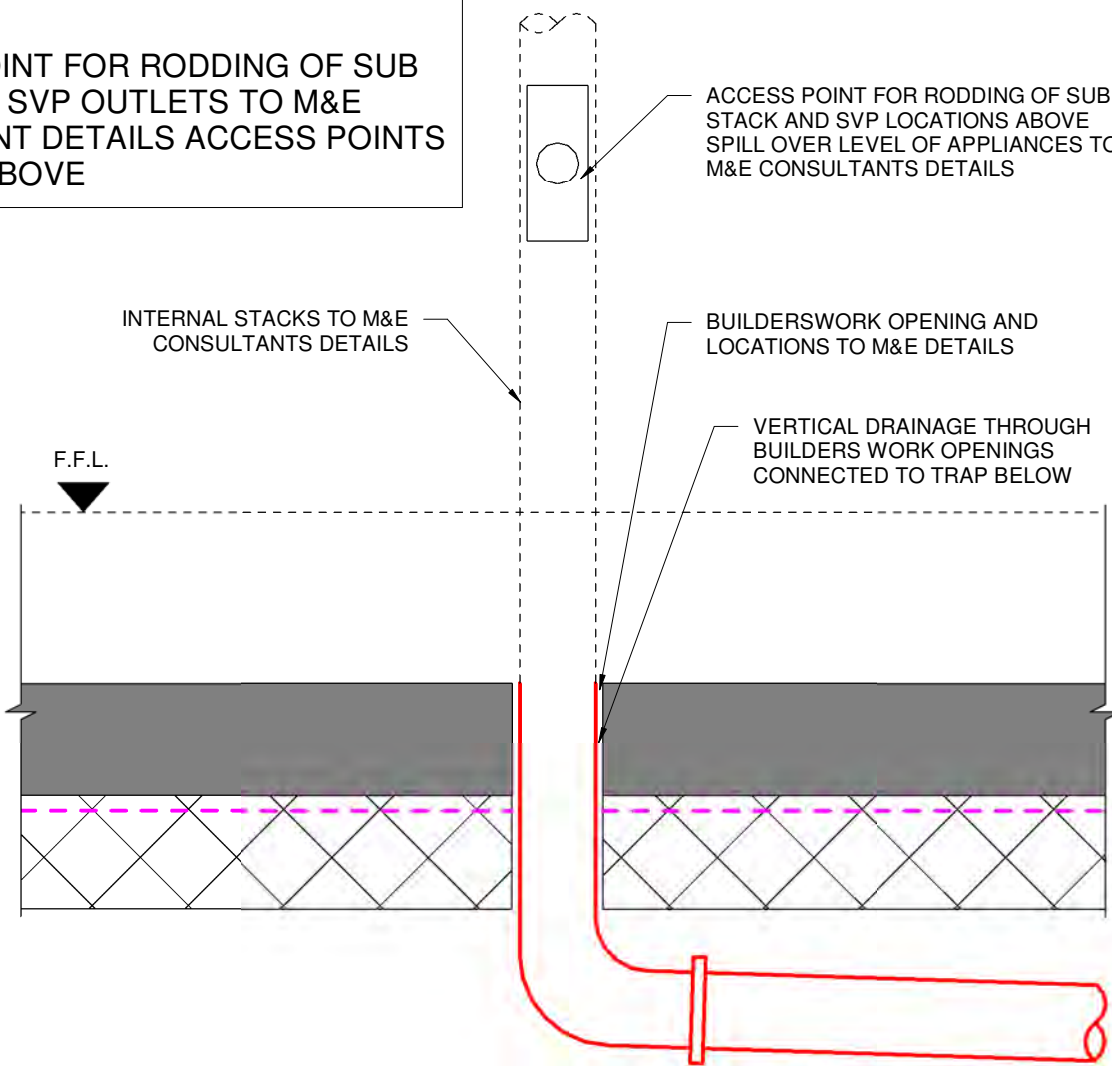
NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECTS DRAWINGS. FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT-ASK
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.

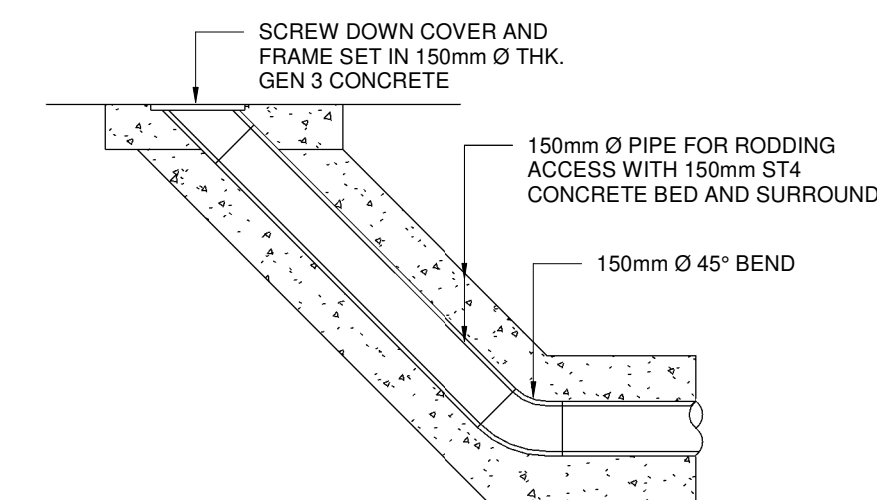


3
1000
SECTION
SCALE @ A1: 1:25
SCALE @ A3: 1:50

NOTE:
ACCESS POINT FOR RODDING OF SUB
STACK AND SVP OUTLETS TO M&E
CONSULTANT DETAILS ACCESS POINTS
LOCATED ABOVE

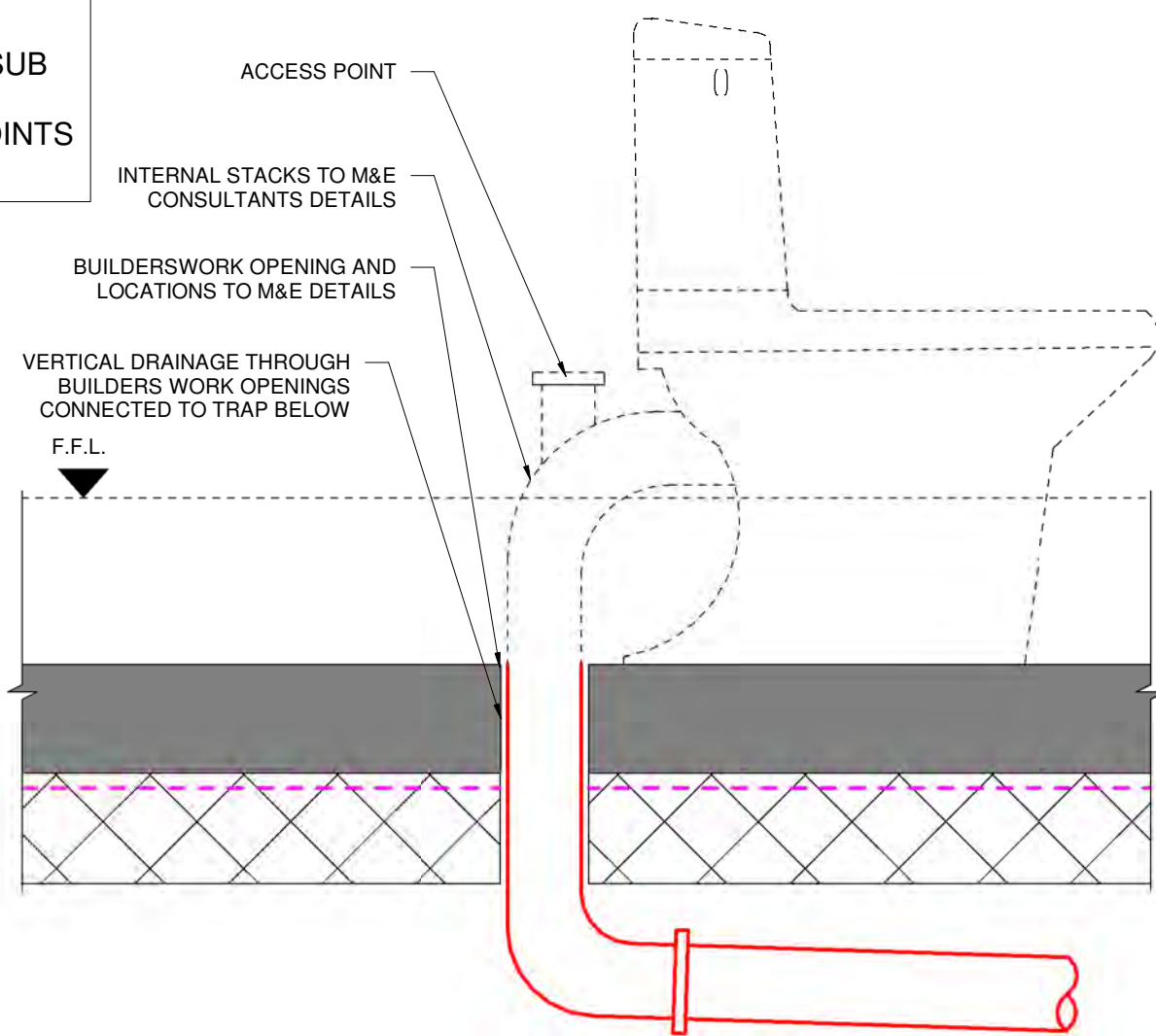


DETAIL A
SCALE @ A1: 1:10
SCALE @ A3: 1:20

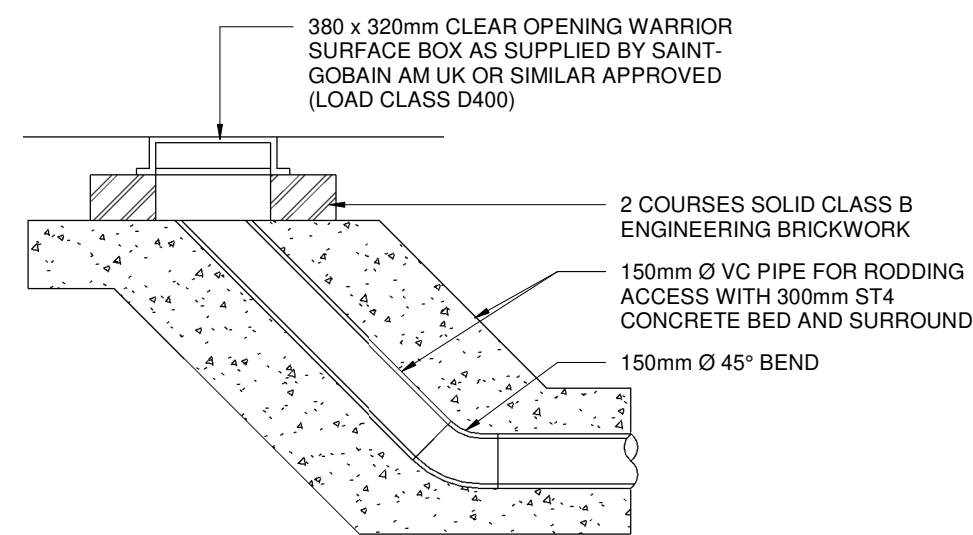


RODDING ACCESS DETAIL
(NON- TRAFFICKED AREAS)

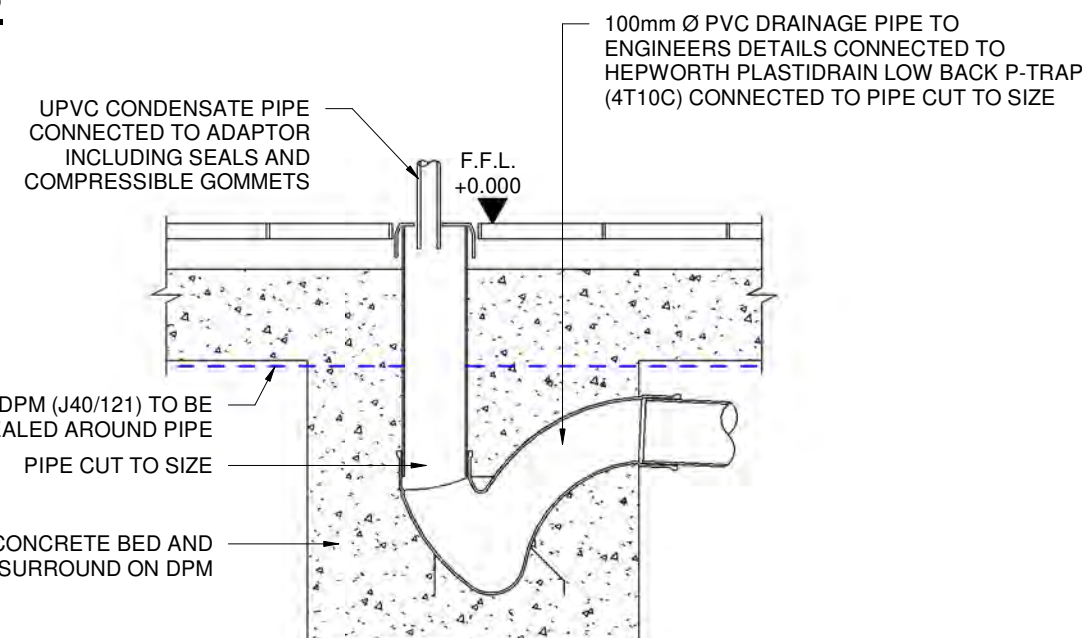
NOTE:
ACCESS POINT FOR RODDING OF SUB
STACK AND SVP OUTLETS TO M&E
CONSULTANT DETAILS ACCESS POINTS
LOCATED ABOVE



DETAIL B
SCALE @ A1: 1:10
SCALE @ A3: 1:20



SURFACE BOX RODDING ACCESS DETAIL
(TRAFFICKED AREAS)

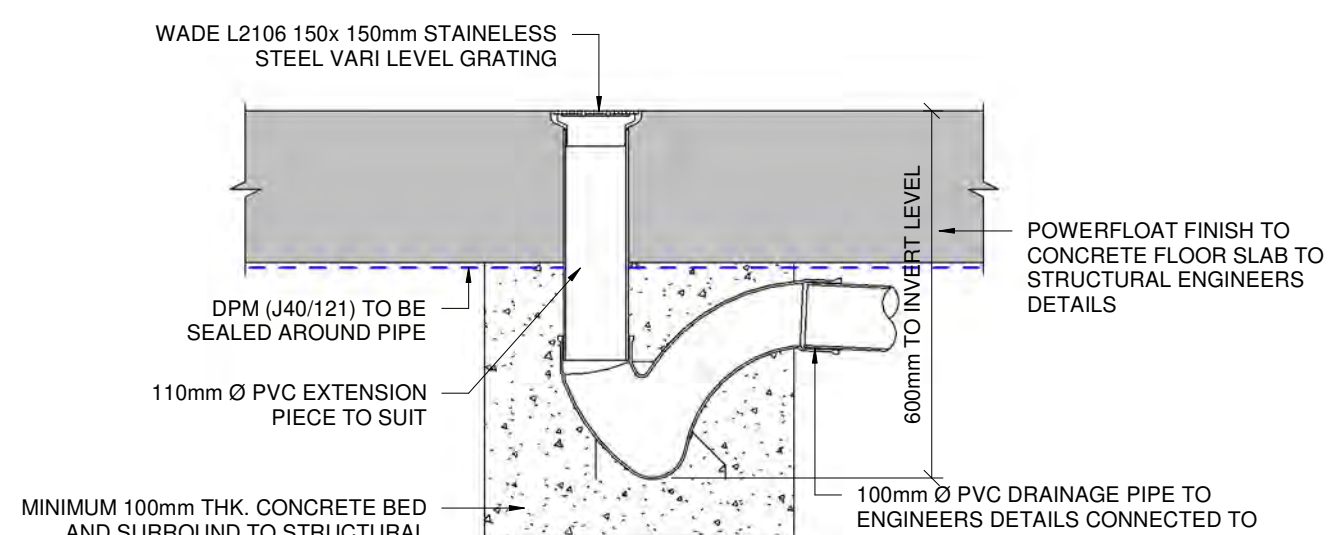


CONDENSATE DRAIN DETAIL

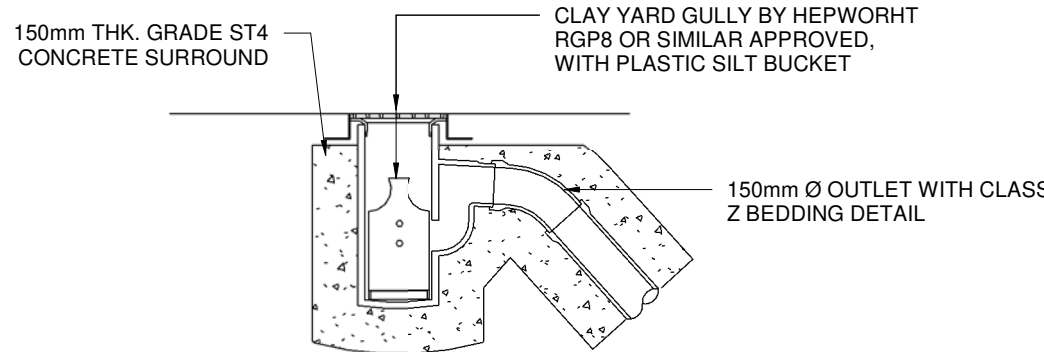


**LITECAST DRAINAGE
HANGERS AS INDICATED**

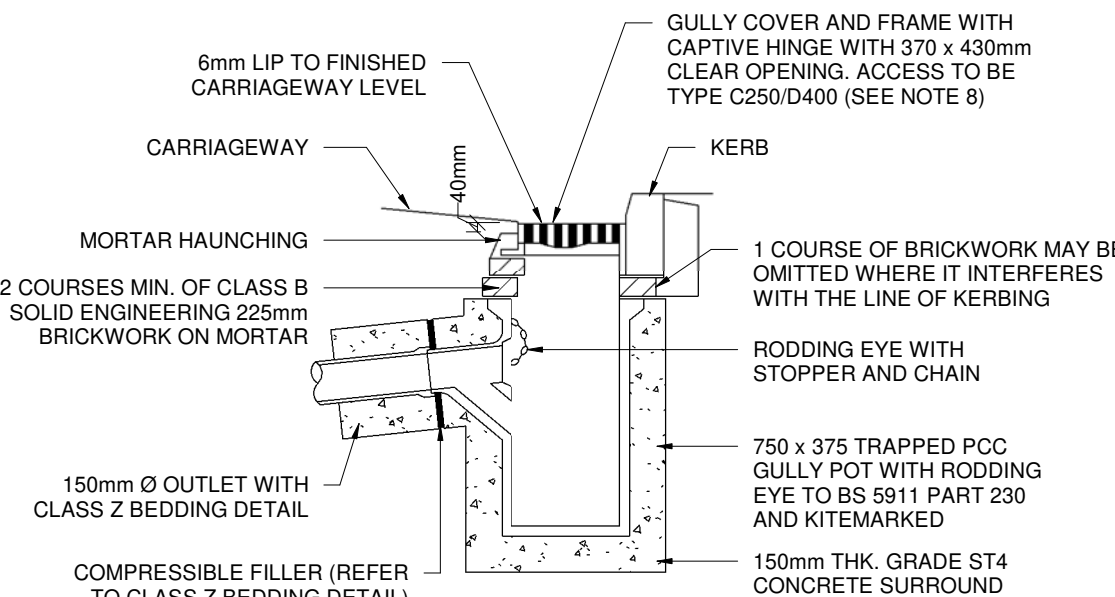
BLOCK & BEAM DRAINAGE HANGER



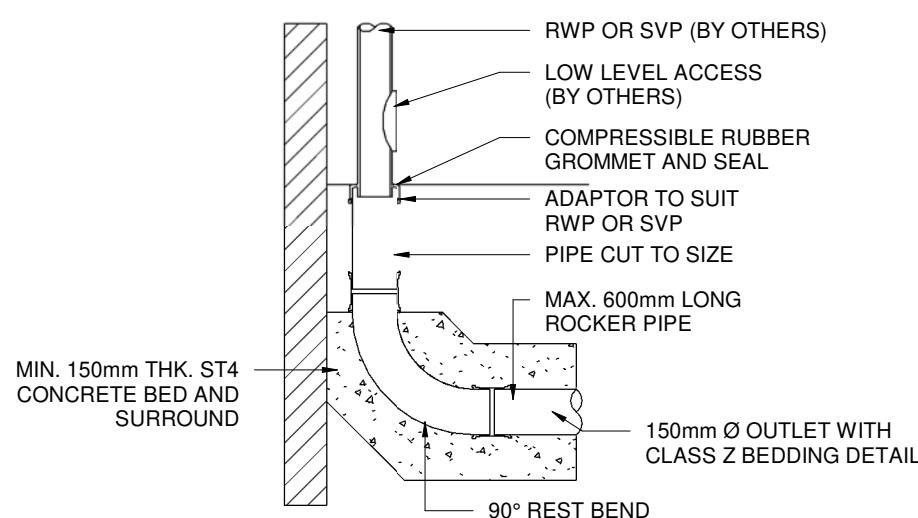
FLOOR GULLY DETAIL



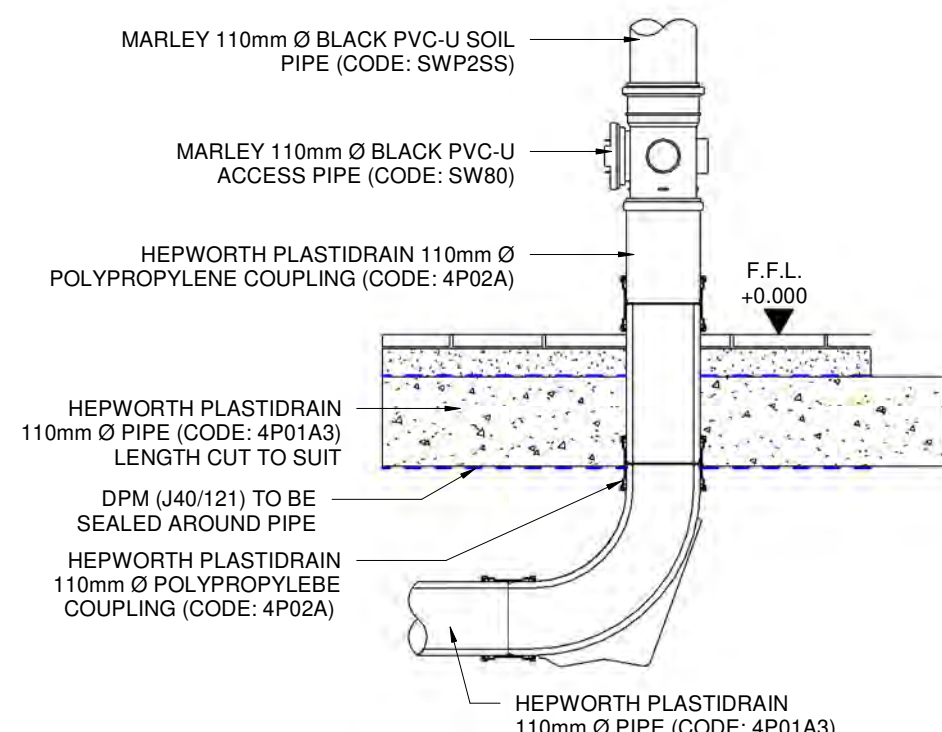
TYPICAL YARD GULLY DETAIL
(MEDIUM DUTY SUITABLE FOR LIGHTLY TRAFFICKED AREAS)



TYPICAL ROAD GULLY DETAIL
(375 x 750mm NOT ADOPTED)



TYPICAL EXTERNAL RWP OR SVP CONNECTION DETAIL



CONNECTION TO SVP DETAIL

ISSUE	DATE	DESCRIPTION	K.O.	D.B.	D.B.	D.B.
P1	29.09.22	ISSUED FOR INFORMATION				

ISSUE STATUS ☒ PRELIMINARY (P1, P2, P3 etc.) ☐ PLANNING (PL1, PL2, PL3 etc.)
☐ TENDER (T1, T2, T3 etc.) ☐ CONSTRUCTION (O, 1, 2 etc.)



CLIENT
FORMATION GROUP

PROJECT TITLE
WATTS CLOSE, LONDON. N15 EDW

DRAWING TITLE
**DRAINAGE SECTION AND DETAILS
SHEET 2**

JOB NO.	DRAWING REF.	ISSUE
22778	WAT-BC-XX-XX-DR-S-1101	P1

MANHOLE LENGTH: ALSO
SEE NOTE 39 REGARDING
BRANCHES

MANHOLE LENGTH: ALSO
SEE NOTE 39 REGARDING
BRANCHES

**FOR PIPE DIAMETERS 150, 225, 300, 375
& 450mm MANHOLES TYPE A, B, & C.**

BLOCKWORK / IN-SITU CONCRETE MANHOLE DETAILS

POLY

CHAMBER

MISCELL

ANCHOR LENGTH: ALSO
SEE NOTE 39 REGARDING
ANCHORS

**FOR PIPE DIAMETERS 525, 600, 675, &
750mm MANHOLES TYPE D, & E.**

CONCRETE MANHOLE DETAILS

TYPICAL

MAN
RAM

RAMP MANHOLE

BEND FOR PIPES 450mm
OR GREATER

SCALE: 1: 50

MANHOLE TYPE C

36 * NOTE: 100 MIN. 36 100 MIN.

WHERE 'D' IS
CONCRETE FILL TO LEVEL

CONCRETE PIPE LAID NEAR FOUNDATIONS

DETAILS P, Q, R & S

SEE COMMON
DETAILS



SEE COMMON
DETAILS

MANHOLE TYPE L

PRE

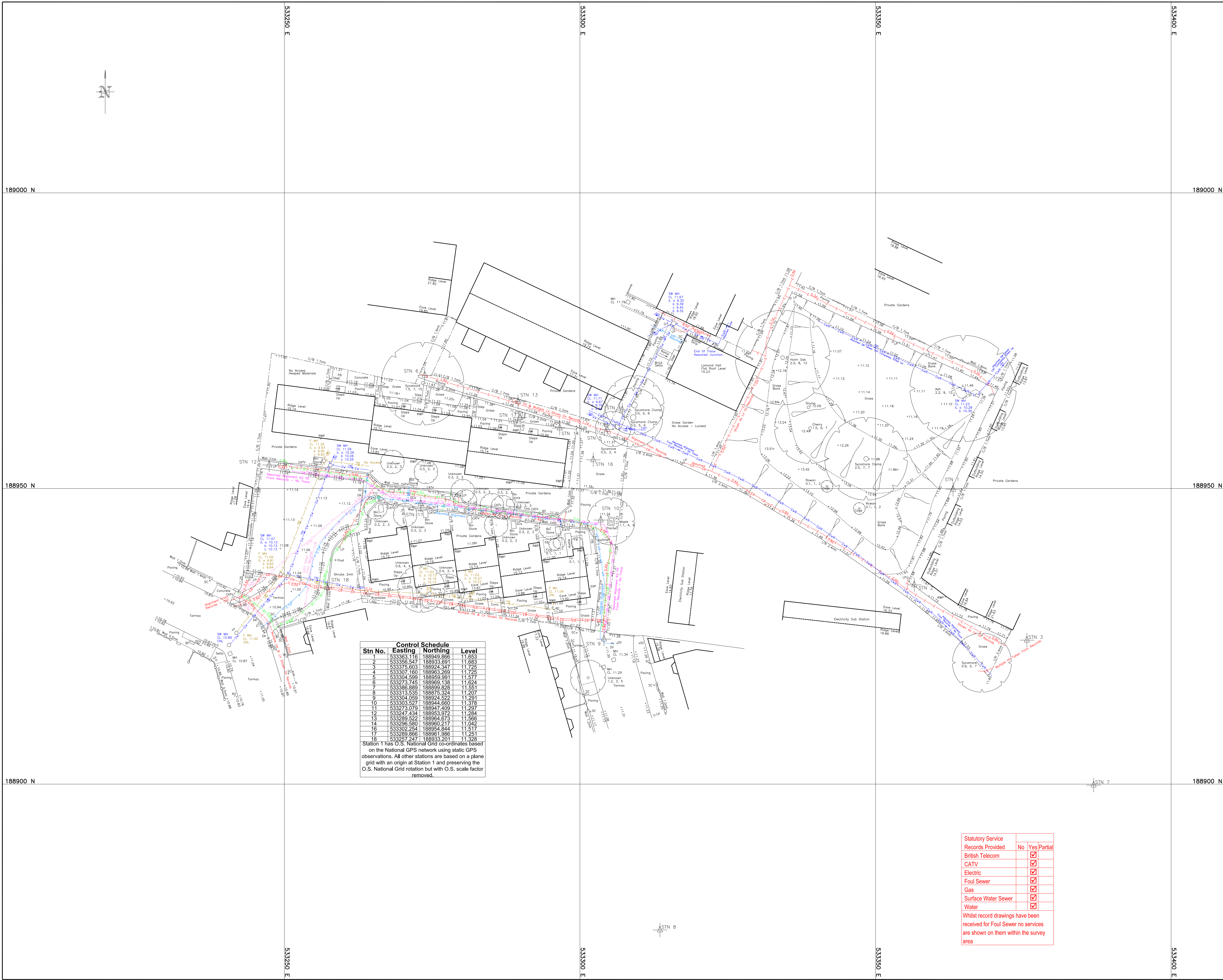
MANHOLE DETAILS

[illegible]



Project Lands at Watts Close, London, N15 5DW				Job Ref. 22778	
Section Drainage Strategy Report				Sheet no./rev. 14	
Calc. by MG	Date 26/04/2022	Chk'd by DB	Date 26/04/2022	App'd by DB	Date 26/04/2022

APPENDIX II – UTILITY SURVEY

[illegible]



Project Lands at Watts Close, London, N15 5DW				Job Ref. 22778	
Section Drainage Strategy Report				Sheet no./rev. 16	
Calc. by MG	Date 26/04/2022	Chk'd by DB	Date 26/04/2022	App'd by DB	Date 26/04/2022

APPENDIX III – TW ASSET SEARCH

Asset location search



Property Searches

Sweco
IPSWICH
IP2 8PN

Search address supplied Watts Close
London
N15 5DW

Your reference 65202627

Our reference ALS/ALS/24/2021_4505133

Search date 16 September 2021

Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.



Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13



searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk



0800 009 4540

Search address supplied: Watts Close, London, N15 5DW

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This search provides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0800 009 4540, or use the address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk
Web: www.thameswater-propertysearches.co.uk

Waste Water Services

Please provide a copy extract from the public sewer map.

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.



For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Payment for this Search

A charge will be added to your suppliers account.

Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

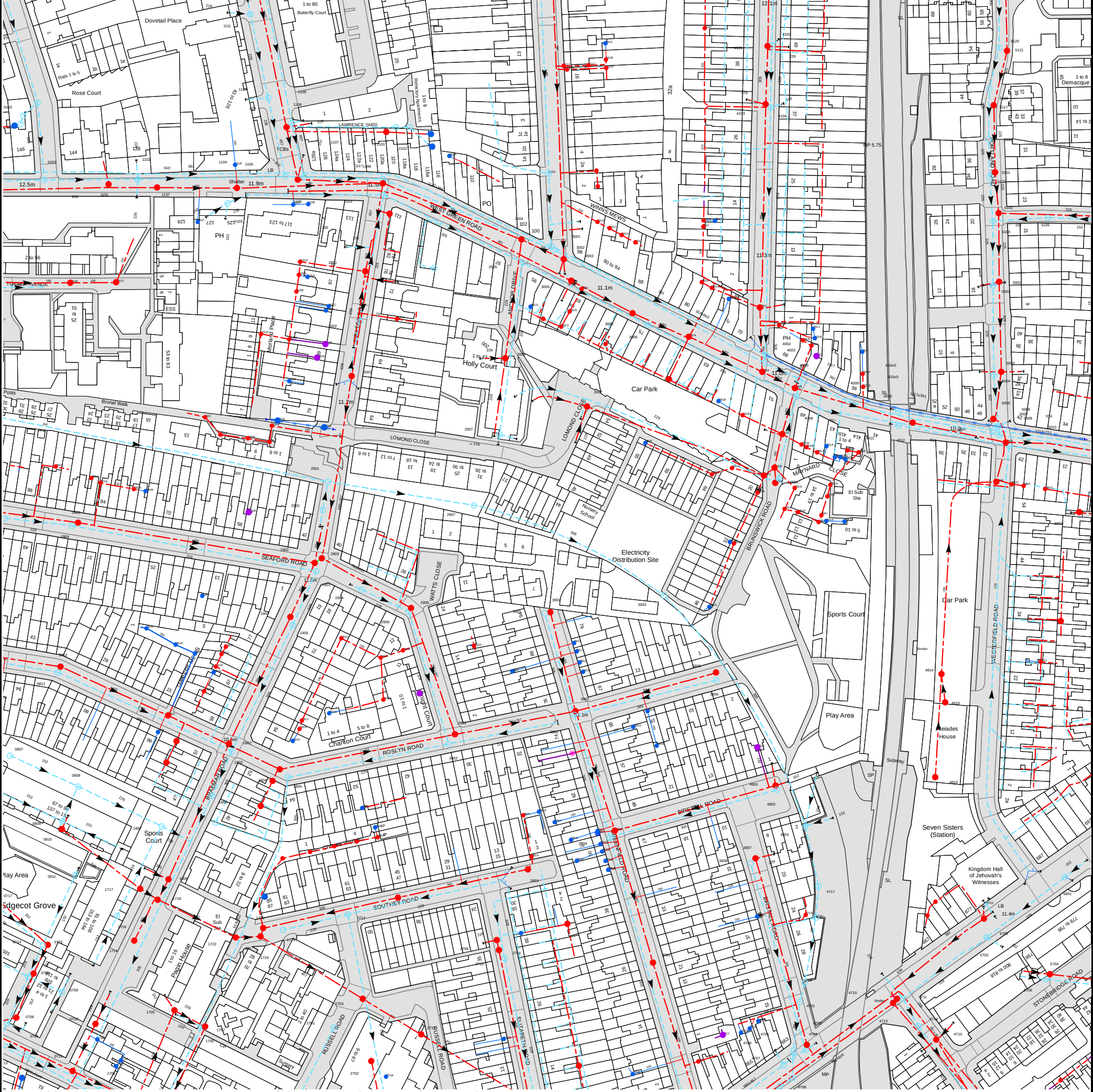
Clean Water queries

Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Asset Location Search Sewer Map - ALS/ALS/24/2021 4505133



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 533305,188956
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
01YT	n/a	n/a
01ZP	n/a	n/a
01ZQ	n/a	n/a
0102	12.78	11.56
111E	n/a	n/a
2101	11.4	9.63
1107	11.52	9.72
1105	11.66	9.73
211A	n/a	n/a
21YS	n/a	n/a
21XZ	n/a	n/a
21XX	n/a	n/a
21YQ	n/a	n/a
1108	11.88	8.01
21YP	n/a	n/a
1109	11.8	10.13
1110	12.02	11.14
1111	12.53	11.45
311I	n/a	n/a
311G	n/a	n/a
311J	n/a	n/a
311H	n/a	n/a
3107	n/a	n/a
3101	11.06	9.84
3108	n/a	n/a
4104	11.76	10.6
4103	11.8	9.86
311E	n/a	n/a
311D	n/a	n/a
311F	n/a	n/a
311C	n/a	n/a
311B	n/a	n/a
4101	11.97	10.1
4102	11.93	10.94
311A	n/a	n/a
311K	n/a	n/a
001B	n/a	n/a
0103	12.36	10.22
1101	12.28	11.05
101O	n/a	n/a
1102	12.08	10
1137	n/a	n/a
111F	n/a	n/a
1103	n/a	n/a
1104	11.87	10.68
101D	n/a	n/a
101C	n/a	n/a
111A	n/a	n/a
101B	n/a	n/a
1106	11.64	7.65
101G	n/a	n/a
101H	n/a	n/a
101A	n/a	n/a
111B	n/a	n/a
101N	n/a	n/a
201F	n/a	n/a
201D	n/a	n/a
201C	n/a	n/a
2002	11.94	10.48
2001	11.93	10.43
2102	11.49	7.54
2103	11.33	9.57
21YV	n/a	n/a
201H	n/a	n/a
20VZ	n/a	n/a
2006	11.19	9.74
5003	10.98	9.44
401I	n/a	n/a
5002	10.99	9.61
5001	11.01	9.2
5104	11.1	9.05
5105	10.74	9.94
5103	11.1	9.75
5102	11.16	9.33
5101	11.13	9.83
5118	11.25	9.42
5117	11.4	9.98
5119	11.5	9.5
5121	12.15	10.13
5120	12.15	9.63
391F	n/a	n/a
391G	n/a	n/a
301K	n/a	n/a
301E	n/a	n/a
3007	11.24	10.19
301B	n/a	n/a
3027	n/a	n/a
3028	n/a	n/a
301A	n/a	n/a
301O	n/a	n/a
3006	10.9	9.38

Manhole Reference	Manhole Cover Level	Manhole Invert Level
3026	n/a	n/a
3005	10.95	9.78
301N	n/a	n/a
201G	n/a	n/a
301M	n/a	n/a
301L	n/a	n/a
301G	n/a	n/a
301F	n/a	n/a
3004	11	9.89
2005	10.94	9.57
3003	10.97	8.79
3002	10.91	9.74
3001	10.93	10.27
301I	n/a	n/a
2004	11.05	8.59
301H	n/a	n/a
301J	n/a	n/a
491D	n/a	n/a
491G	n/a	n/a
4904	11.21	9.81
4903	11.23	10.24
4901	11.2	9.92
491N	n/a	n/a
491M	n/a	n/a
491C	n/a	n/a
491L	n/a	n/a
491A	n/a	n/a
491O	n/a	n/a
491B	n/a	n/a
401A	n/a	n/a
401M	n/a	n/a
401C	n/a	n/a
4009	10.89	9.12
4008	10.92	9.2
4006	10.98	8.52
4005	11.01	9.23
4004	10.93	8.6
4003	10.94	9.22
401L	n/a	n/a
4002	10.9	9.61
401F	n/a	n/a
401E	n/a	n/a
401B	n/a	n/a
401J	n/a	n/a
401K	n/a	n/a
4001	11.19	8.95
491E	n/a	n/a
401H	n/a	n/a
401G	n/a	n/a
4010	10.62	8.05
4011	10.59	7.97
4012	10.75	8.37
5005	10.89	9.47
5007	10.8	7.5
5004	10.97	9.39
591E	n/a	n/a
5006	10.79	9.47
5008	10.9	9.07
5009	10.91	8.32
5010	10.73	7.52
591C	n/a	n/a
591F	n/a	n/a
591G	n/a	n/a
0904	12.23	10.47
0903	12.25	9.71
0902	12.19	10.58
091C	n/a	n/a
2906	10.92	10.01
2905	10.01	7.11
191I	n/a	n/a
2904	10.92	10.18
1903	10.99	9.93
1902	11.05	9.05
2903	11.02	7.22
191B	n/a	n/a
2902	10.94	9.39
2907	11.82	8.82
191M	n/a	n/a
191N	n/a	n/a
191A	n/a	n/a
2901	10.55	8.96
091A	n/a	n/a
101L	n/a	n/a
101K	n/a	n/a
101J	n/a	n/a
2007	11.35	10.34
201E	n/a	n/a
101M	n/a	n/a
101E	n/a	n/a
101I	n/a	n/a
101F	n/a	n/a
2003	11.94	7.47
59VS	n/a	n/a

Manhole Reference	Manhole Cover Level	Manhole Invert Level
5902	10.99	10.13
3901	11.29	10.14
3902	11.34	9.75
3802	11.17	9.67
391I	n/a	n/a
391J	n/a	n/a
391K	n/a	n/a
381R	n/a	n/a
381O	n/a	n/a
381N	n/a	n/a
3903	11.62	8.7
391D	n/a	n/a
3805	11.55	9.11
3806	11.49	9.98
391H	n/a	n/a
391E	n/a	n/a
391A	n/a	n/a
491F	n/a	n/a
491P	n/a	n/a
491H	n/a	n/a
491I	n/a	n/a
491K	n/a	n/a
491Q	n/a	n/a
491J	n/a	n/a
4814	n/a	n/a
4816	n/a	n/a
591I	n/a	n/a
2712	10.63	8.89
17WY	n/a	n/a
18XT	n/a	n/a
181G	n/a	n/a
281D	n/a	n/a
281C	n/a	n/a
281B	n/a	n/a
281E	n/a	n/a
18TV	n/a	n/a
18TT	n/a	n/a
1805	10.57	9.6
1803	10.48	9.44
2802	10.81	9.74
181K	n/a	n/a
181H	n/a	n/a
181J	n/a	n/a
281G	n/a	n/a
281H	n/a	n/a
291A	n/a	n/a
191G	n/a	n/a
191F	n/a	n/a
291C	n/a	n/a
1905	10.87	9.77
1904	10.9	8.96
5704	11.37	9.88
5801	11.52	10.31
571A	n/a	n/a
1807	10.14	9.6
1815	n/a	n/a
1801	10.71	7.79
1808	10.17	7.98
191K	n/a	n/a
1814	n/a	n/a
191J	n/a	n/a
181F	n/a	n/a
1806	10.29	9.35
181D	n/a	n/a
18VV	n/a	n/a
181E	n/a	n/a
1802	10.52	8.75
1804	10.69	7.61
281J	n/a	n/a
291B	n/a	n/a
281L	n/a	n/a
2801	11.9	7.06
291D	n/a	n/a
0807	n/a	n/a
0812	11.17	9.81
0813	11.26	8.11
0810	n/a	n/a
0809	n/a	n/a
0811	n/a	n/a
0808	n/a	n/a
1717	10.41	8.97
191L	n/a	n/a
1718	10.18	7.97
181I	n/a	n/a
4707	10.59	8.87
4706	10.65	7.93
4705	10.69	8.26
4704	10.69	8.87
4703	10.77	7.09
4715	10.8	9.18
4714	10.84	9.4
471B	n/a	n/a
4713	10.95	6.47

Manhole Reference	Manhole Cover Level	Manhole Invert Level
4701	10.77	8.34
4711	10.94	9.47
4710	10.99	n/a
471D	n/a	n/a
5705	11.29	10.08
5703	11.29	9.91
5702	11.36	8.34
471C	n/a	n/a
371C	n/a	n/a
4732	n/a	n/a
471A	n/a	n/a
5701	11.28	10.48
4733	n/a	n/a
4717	10.83	8.47
4803	11.4	8.46
4802	11.48	9.78
4801	11.47	8.58
4815	n/a	n/a
381S	n/a	n/a
3702	n/a	n/a
371I	n/a	n/a
371J	n/a	n/a
371D	n/a	n/a
371E	n/a	n/a
3701	10.59	6.79
27YP	n/a	n/a
37WZ	n/a	n/a
381E	n/a	n/a
381A	n/a	n/a
2803	10.85	9.52
3808	11.09	9.47
381B	n/a	n/a
381C	n/a	n/a
3807	11.16	8.36
281A	n/a	n/a
381G	n/a	n/a
381Q	n/a	n/a
381D	n/a	n/a
3804	10.82	9.34
381J	n/a	n/a
381I	n/a	n/a
3803	10.91	6.92
381P	n/a	n/a
281F	n/a	n/a
381K	n/a	n/a
381M	n/a	n/a
3801	11.2	7
281I	n/a	n/a
1704	10.27	8.46
07VW	n/a	n/a
0711	10.33	7.21
171C	n/a	n/a
171A	n/a	n/a
0712	10.36	8.58
171B	n/a	n/a
1707	10.28	8.16
1706	10.29	8.91
0710	10.28	8.68
0705	n/a	n/a
0706	n/a	n/a
1705	10.33	8.26
0709	n/a	n/a
0707	n/a	n/a
0708	n/a	n/a
0714	n/a	n/a
0715	n/a	n/a
1714	10.2	8.98
1722	10.26	7.83
1724	10.21	7.86
1716	n/a	n/a
371G	n/a	n/a
4709	10.51	9.29
4708	10.53	8.27
271B	n/a	n/a
2702	10.18	8.47
271A	n/a	n/a
2717	n/a	n/a
2701	10.3	9.15
2703	10.43	7.77
2711	10.61	9.5
2710	10.57	9.07
2709	10.61	9.18
1725	10.42	9.29
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.		



ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

 **Foul:** A sewer designed to convey waste water from domestic and industrial sources to a treatment works.

 **Surface Water:** A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.

 **Combined:** A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.

 Trunk Surface Water

 Trunk Foul

 Storm Relief

 Trunk Combined

 Vent Pipe

 Bio-solids (Sludge)

 Proposed Thames Surface Water Sewer

 Proposed Thames Water Foul Sewer

 Gallery

 Foul Rising Main

 Surface Water Rising Main

 Combined Rising Main

 Sludge Rising Main

 Proposed Thames Water Rising Main

 Vacuum

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

-  Air Valve
-  Dam Chase
-  Fitting
-  Meter
-  Vent Column

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

-  Control Valve
-  Drop Pipe
-  Ancillary
-  Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol, Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

-  Outfall
-  Undefined End
-  Inlet

Other Symbols

Symbols used on maps which do not fall under other general categories.

-  Public/Private Pumping Station
-  Change of characteristic indicator (C.O.C.I.)
-  Invert Level
-  Summit

Areas

Lines denoting areas of underground surveys, etc.

-  Agreement
-  Operational Site
-  Chamber
-  Tunnel
-  Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

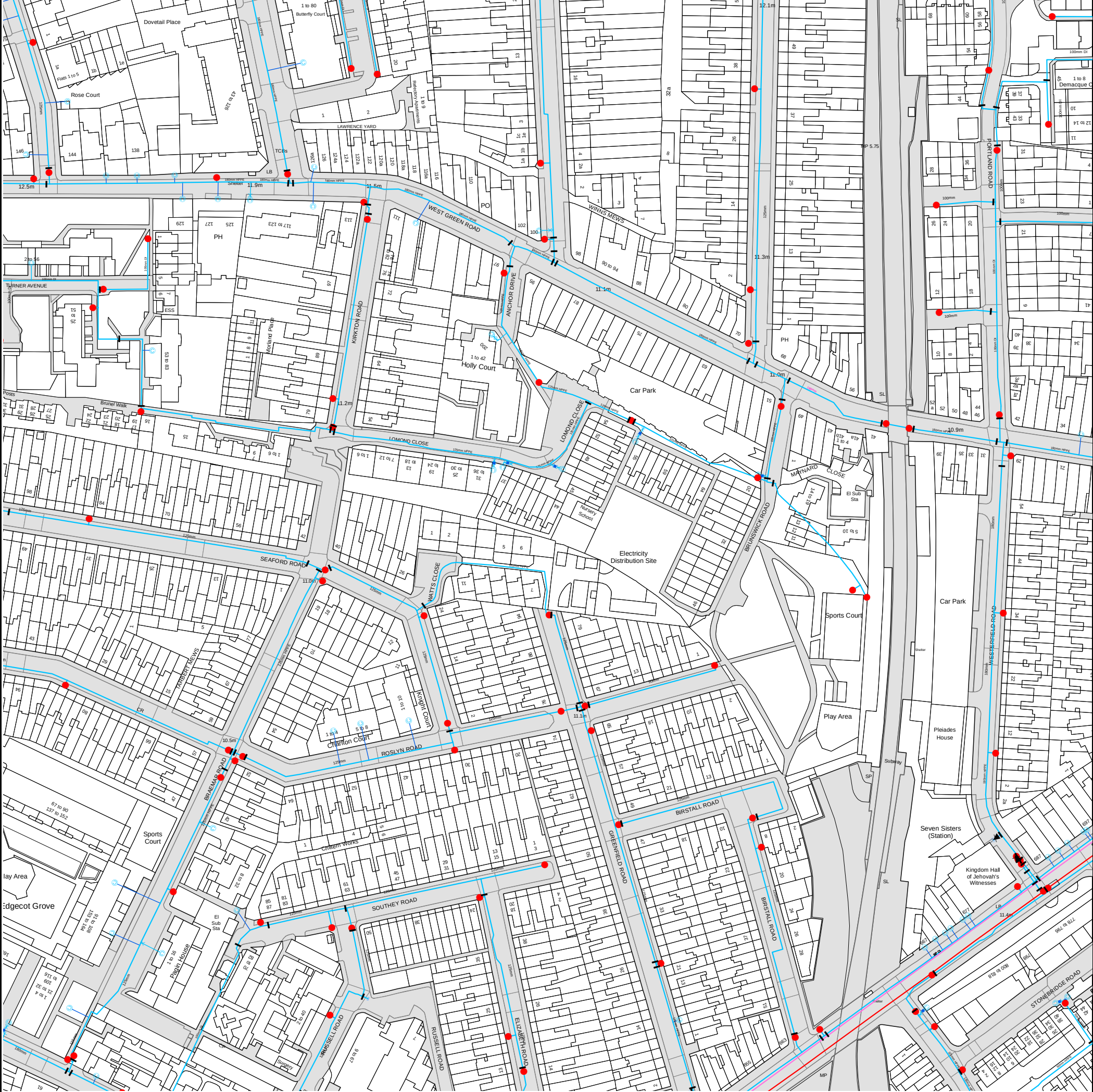
-  Foul Sewer
-  Surface Water Sewer
-  Combined Sewer
-  Gully
-  Culverted Watercourse
-  Proposed
-  Abandoned Sewer

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
- 5) 'na' or 'D' on a manhole level indicates that data is unavailable.

- 6) The text appearing alongside a sewer line indicates the internal diameter of the pipe in millimetres. Text next to a manhole indicates the manhole reference number and should not be taken as a measurement. If you are unsure about any text or symbology present on the plan, please contact a member of Property Searches on 0800 009 4540.

Asset Location Search Water Map - ALS/ALS/24/2021 4505133



The width of the displayed area is 500 m and the centre of the map is located at OS coordinates 533305, 188956.
The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.



ALS Water Map Key

Water Pipes (Operated & Maintained by Thames Water)

4"	Distribution Main: The most common pipe shown on water maps. With few exceptions, domestic connections are only made to distribution mains.
16"	Trunk Main: A main carrying water from a source of supply to a treatment plant or reservoir, or from one treatment plant or reservoir to another. Also a main transferring water in bulk to smaller water mains used for supplying individual customers.
3" SUPPLY	Supply Main: A supply main indicates that the water main is used as a supply for a single property or group of properties.
3" FIRE	Fire Main: Where a pipe is used as a fire supply, the word FIRE will be displayed along the pipe.
3" METERED	Metered Pipe: A metered main indicates that the pipe in question supplies water for a single property or group of properties and that quantity of water passing through the pipe is metered even though there may be no meter symbol shown.
	Transmission Tunnel: A very large diameter water pipe. Most tunnels are buried very deep underground. These pipes are not expected to affect the structural integrity of buildings shown on the map provided.
	Proposed Main: A main that is still in the planning stages or in the process of being laid. More details of the proposed main and its reference number are generally included near the main.

PIPE DIAMETER	DEPTH BELOW GROUND
Up to 300mm (12")	900mm (3')
300mm - 600mm (12" - 24")	1100mm (3' 8")
600mm and bigger (24" plus)	1200mm (4')

Valves

	General Purpose Valve
	Air Valve
	Pressure Control Valve
	Customer Valve

Hydrants

	Single Hydrant
--	----------------

Meters

	Meter
--	-------

End Items

Symbol indicating what happens at the end of a water main.

	Blank Flange
	Capped End
	Emptying Pit
	Undefined End
	Manifold
	Customer Supply
	Fire Supply

Operational Sites

	Booster Station
	Other
	Other (Proposed)
	Pumping Station
	Service Reservoir
	Shaft Inspection
	Treatment Works
	Unknown
	Water Tower

Other Symbols

	Data Logger
--	-------------

Other Water Pipes (Not Operated or Maintained by Thames Water)

	Other Water Company Main: Occasionally other water company water pipes may overlap the border of our clean water coverage area. These mains are denoted in purple and in most cases have the owner of the pipe displayed along them.
	Private Main: Indicates that the water main in question is not owned by Thames Water. These mains normally have text associated with them indicating the diameter and owner of the pipe.

Terms and Conditions

All sales are made in accordance with Thames Water Utilities Limited (TWUL) standard terms and conditions unless previously agreed in writing.

1. All goods remain in the property of Thames Water Utilities Ltd until full payment is received.
2. Provision of service will be in accordance with all legal requirements and published TWUL policies.
3. All invoices are strictly due for payment 14 days from due date of the invoice. Any other terms must be accepted/agreed in writing prior to provision of goods or service, or will be held to be invalid.
4. Thames Water does not accept post-dated cheques-any cheques received will be processed for payment on date of receipt.
5. In case of dispute TWUL's terms and conditions shall apply.
6. Penalty interest may be invoked by TWUL in the event of unjustifiable payment delay. Interest charges will be in line with UK Statute Law 'The Late Payment of Commercial Debts (Interest) Act 1998'.
7. Interest will be charged in line with current Court Interest Charges, if legal action is taken.
8. A charge may be made at the discretion of the company for increased administration costs.

A copy of Thames Water's standard terms and conditions are available from the Commercial Billing Team (cashoperations@thameswater.co.uk).

We publish several Codes of Practice including a guaranteed standards scheme. You can obtain copies of these leaflets by calling us on 0800 316 9800

If you are unhappy with our service you can speak to your original goods or customer service provider. If you are not satisfied with the response, your complaint will be reviewed by the Customer Services Director. You can write to her at: Thames Water Utilities Ltd. PO Box 492, Swindon, SN38 8TU.

If the Goods or Services covered by this invoice falls under the regulation of the 1991 Water Industry Act, and you remain dissatisfied you can refer your complaint to Consumer Council for Water on 0121 345 1000 or write to them at Consumer Council for Water, 1st Floor, Victoria Square House, Victoria Square, Birmingham, B2 4AJ.

Ways to pay your bill

Credit Card	BACS Payment	Telephone Banking	Cheque
Call 0800 009 4540 quoting your invoice number starting CBA or ADS / OSS	Account number 90478703 Sort code 60-00-01 A remittance advice must be sent to: Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW. or email ps.billing@thameswater.co.uk	By calling your bank and quoting: Account number 90478703 Sort code 60-00-01 and your invoice number	Made payable to ' Thames Water Utilities Ltd ' Write your Thames Water account number on the back. Send to: Thames Water Utilities Ltd., PO Box 3189, Slough SL1 4WW or by DX to 151280 Slough 13

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Project Lands at Watts Close, London, N15 5DW				Job Ref. 22778	
Section Drainage Strategy Report				Sheet no./rev. 31	
Calc. by MG	Date 26/04/2022	Chk'd by DB	Date 26/04/2022	App'd by DB	Date 26/04/2022

APPENDIX IV – STORM WATER DESIGN CALCULATIONS

Design Settings

Rainfall Methodology	FEH-13	Minimum Velocity (m/s)	0.76
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	0.750	Preferred Cover Depth (m)	0.500
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1.9	0.010	5.00	11.815	450	51.450	29.400	0.925
S1.8	0.010	5.00	11.815	450	48.900	20.900	0.935
S2.0	0.010	5.00	11.815	450	43.100	31.900	0.845
S1.7	0.010	5.00	11.815	450	40.500	23.650	1.025
S1.6	0.010	5.00	11.260	450	36.850	20.000	0.910
S3.1	0.010	5.00	11.260	450	11.950	18.750	0.860
S3.0	0.010	5.00	11.260	450	28.250	18.750	1.020
S1.5	0.010	5.00	11.260	450	36.850	15.900	1.073
S1.4	0.010	5.00	11.260	450	39.750	12.550	1.090
S1.3	0.012	5.00	11.260	450	39.750	1.940	1.196
S1.2	0.012	5.00	11.260	450	27.700	1.300	2.670
S5.1	0.010	5.00	11.260	450	0.400	10.900	0.860
S5.0	0.012	5.00	11.260	450	0.400	1.850	0.949
S4.1	0.012	5.00	11.260	450	27.100	7.750	0.860
S4.0	0.012	5.00	11.260	450	13.300	7.750	0.990
Storage			11.260		20.100	1.125	2.746
Outfall			11.260	450	12.500	0.950	2.682

Links

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)
M9	S1.9	S1.8	8.874	0.600	10.890	10.880	0.010	887.4	100	5.59	50.0
M8	S1.8	S1.7	8.839	0.600	10.880	10.790	0.090	98.2	100	5.78	50.0
S20	S2.0	S1.7	8.650	0.600	10.970	10.796	0.174	49.7	100	5.13	50.0
M7	S1.7	S1.6	5.162	0.600	10.790	10.399	0.391	13.2	150	5.81	50.0
M6	S1.6	S1.5	4.100	0.600	10.350	10.190	0.160	25.6	150	5.85	50.0
S31	S3.1	S3.0	16.300	0.600	10.400	10.240	0.160	101.9	100	5.36	50.0
S30	S3.0	S1.5	9.060	0.600	10.240	10.187	0.053	170.9	150	5.55	50.0
M5	S1.5	S1.4	4.431	0.600	10.190	10.170	0.020	221.5	225	5.93	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
M9	0.251	2.0	1.4	0.825	0.835	0.010	0.0
M8	0.776	6.1	2.7	0.835	0.925	0.020	0.0
S20	1.095	8.6	1.4	0.745	0.919	0.010	0.0
M7	2.787	49.3	5.4	0.875	0.711	0.040	0.0
M6	1.997	35.3	6.8	0.760	0.920	0.050	0.0
S31	0.761	6.0	1.4	0.760	0.920	0.010	0.0
S30	0.765	13.5	2.7	0.870	0.923	0.020	0.0
M5	0.874	34.8	10.8	0.845	0.865	0.080	0.0

Links

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)
M4	S1.4	S1.3	10.610	0.600	10.170	10.064	0.106	100.0	225	6.06	50.0
M3	S1.3	S1.2	12.067	0.600	10.130	10.009	0.121	100.0	225	6.22	50.0
M2	S1.2	Storage	7.602	0.600	8.590	8.514	0.076	100.0	225	6.32	50.0
S51	S5.1	S5.0	9.050	0.600	10.400	10.311	0.089	101.7	100	5.20	50.0
S50	S5.0	Storage	19.713	0.600	10.311	10.118	0.193	102.1	100	5.63	50.0
S41	S4.1	S4.0	13.800	0.600	10.400	10.270	0.130	106.2	100	5.31	50.0
S40	S4.0	Storage	9.494	0.600	10.270	10.177	0.093	102.1	100	5.52	50.0
M1	Storage	Outfall	1.000	0.600	8.590	8.578	0.012	80.0	225	6.33	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
M4	1.307	52.0	12.2	0.865	0.971	0.090	0.0
M3	1.307	52.0	13.8	0.905	1.026	0.102	0.0
M2	1.307	52.0	15.4	2.445	2.521	0.114	0.0
S51	0.762	6.0	1.4	0.760	0.849	0.010	0.0
S50	0.760	6.0	3.0	0.849	1.042	0.022	0.0
S41	0.746	5.9	1.6	0.760	0.890	0.012	0.0
S40	0.761	6.0	3.3	0.890	0.983	0.024	0.0
M1	1.463	58.2	21.7	2.445	2.457	0.160	0.0

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)
M9	8.874	887.4	100	Circular	11.815	10.890	0.825	11.815	10.880	0.835
M8	8.839	98.2	100	Circular	11.815	10.880	0.835	11.815	10.790	0.925
S20	8.650	49.7	100	Circular	11.815	10.970	0.745	11.815	10.796	0.919
M7	5.162	13.2	150	Circular	11.815	10.790	0.875	11.260	10.399	0.711
M6	4.100	25.6	150	Circular	11.260	10.350	0.760	11.260	10.190	0.920
S31	16.300	101.9	100	Circular	11.260	10.400	0.760	11.260	10.240	0.920
S30	9.060	170.9	150	Circular	11.260	10.240	0.870	11.260	10.187	0.923
M5	4.431	221.5	225	Circular	11.260	10.190	0.845	11.260	10.170	0.865
M4	10.610	100.0	225	Circular	11.260	10.170	0.865	11.260	10.064	0.971
M3	12.067	100.0	225	Circular	11.260	10.130	0.905	11.260	10.009	1.026
M2	7.602	100.0	225	Circular	11.260	8.590	2.445	11.260	8.514	2.521
S51	9.050	101.7	100	Circular	11.260	10.400	0.760	11.260	10.311	0.849

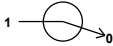
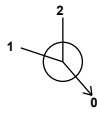
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
M9	S1.9	450	Manhole	Adoptable	S1.8	450	Manhole	Adoptable
M8	S1.8	450	Manhole	Adoptable	S1.7	450	Manhole	Adoptable
S20	S2.0	450	Manhole	Adoptable	S1.7	450	Manhole	Adoptable
M7	S1.7	450	Manhole	Adoptable	S1.6	450	Manhole	Adoptable
M6	S1.6	450	Manhole	Adoptable	S1.5	450	Manhole	Adoptable
S31	S3.1	450	Manhole	Adoptable	S3.0	450	Manhole	Adoptable
S30	S3.0	450	Manhole	Adoptable	S1.5	450	Manhole	Adoptable
M5	S1.5	450	Manhole	Adoptable	S1.4	450	Manhole	Adoptable
M4	S1.4	450	Manhole	Adoptable	S1.3	450	Manhole	Adoptable
M3	S1.3	450	Manhole	Adoptable	S1.2	450	Manhole	Adoptable
M2	S1.2	450	Manhole	Adoptable	Storage		Junction	
S51	S5.1	450	Manhole	Adoptable	S5.0	450	Manhole	Adoptable

Pipeline Schedule

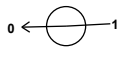
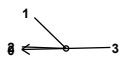
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
S50	19.713	102.1	100	Circular	11.260	10.311	0.849	11.260	10.118	1.042
S41	13.800	106.2	100	Circular	11.260	10.400	0.760	11.260	10.270	0.890
S40	9.494	102.1	100	Circular	11.260	10.270	0.890	11.260	10.177	0.983
M1	1.000	80.0	225	Circular	11.260	8.590	2.445	11.260	8.578	2.457

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
S50	S5.0	450	Manhole	Adoptable	Storage		Junction	
S41	S4.1	450	Manhole	Adoptable	S4.0	450	Manhole	Adoptable
S40	S4.0	450	Manhole	Adoptable	Storage		Junction	
M1	Storage		Junction		Outfall	450	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1.9	51.450	29.400	11.815	0.925	450				
S1.8	48.900	20.900	11.815	0.935	450		0 M9	10.890	100
						1 M9	10.880	100	
						0 M8	10.880	100	
S2.0	43.100	31.900	11.815	0.845	450				
S1.7	40.500	23.650	11.815	1.025	450		0 S20	10.970	100
						1 S20	10.796	100	
						2 M8	10.790	100	
						0 M7	10.790	150	
S1.6	36.850	20.000	11.260	0.910	450		1 M7	10.399	150
						0 M6	10.350	150	
S3.1	11.950	18.750	11.260	0.860	450				
						0 S31	10.400	100	
S3.0	28.250	18.750	11.260	1.020	450		1 S31	10.240	100
						0 S30	10.240	150	
S1.5	36.850	15.900	11.260	1.073	450		1 S30	10.187	150
						2 M6	10.190	150	
						0 M5	10.190	225	
S1.4	39.750	12.550	11.260	1.090	450		1 M5	10.170	225
						0 M4	10.170	225	

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1.3	39.750	1.940	11.260	1.196	450		1 M4	10.064	225
S1.2	27.700	1.300	11.260	2.670	450		0 M3 1 M3	10.130 10.009	225 225
S5.1	0.400	10.900	11.260	0.860	450		0 S51	8.590	225
S5.0	0.400	1.850	11.260	0.949	450		1 S51 0 S50	10.400 10.311	100 100
S4.1	27.100	7.750	11.260	0.860	450		0 S41	10.400	100
S4.0	13.300	7.750	11.260	0.990	450		1 S41 0 S40	10.270 10.270	100 100
Storage	20.100	1.125	11.260	2.746			1 S40 2 S50 3 M2 0 M1	10.177 10.118 8.514 8.590	100 100 225 225
Outfall	12.500	0.950	11.260	2.682	450		1 M1	8.578	225

Simulation Settings

Rainfall Methodology	FEH-13	Drain Down Time (mins)	240	100 year (l/s)	2.5
Summer CV	0.750	Additional Storage (m³/ha)	20.0	Check Discharge Volume	✓
Winter CV	0.840	Check Discharge Rate(s)	✓	100 year 360 minute (m³)	51
Analysis Speed	Normal	1 year (l/s)	0.7		
Skip Steady State	x	30 year (l/s)	1.9		

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	0	0	0
100	40	0	0

Pre-development Discharge Rate

Site Makeup	Greenfield	Growth Factor 30 year	2.40
Greenfield Method	IH124	Growth Factor 100 year	3.19
Positively Drained Area (ha)	0.188	Betterment (%)	0
SAAR (mm)	620	QBar	0.8
Soil Index	4	Q 1 year (l/s)	0.7
SPR	0.47	Q 30 year (l/s)	1.9
Region	6	Q 100 year (l/s)	2.5
Growth Factor 1 year	0.85		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)	0.188	Storm Duration (mins)	360
Soil Index	4	Betterment (%)	0
SPR	0.47	PR	0.431
CWI	93.333	Runoff Volume (m³)	51

Node Storage Online Pump Control

Flap Valve	x	Design Depth (m)	1.500	Switch off depth (m)	0.000
Replaces Downstream Link	x	Design Flow (l/s)	2.5		
Invert Level (m)	8.590	Switch on depth (m)	1.000		

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.001	2.500	1.500	2.500

Node Storage Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	8.590
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	85.0	0.0	1.500	85.0	0.0	1.501	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 96.13%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1.9	11	10.948	0.058	1.4	0.0216	0.0000	OK
15 minute winter	S1.8	11	10.929	0.049	2.7	0.0184	0.0000	OK
15 minute winter	S2.0	10	10.998	0.028	1.4	0.0109	0.0000	OK
15 minute winter	S1.7	10	10.826	0.036	5.4	0.0126	0.0000	OK
15 minute winter	S1.6	10	10.397	0.047	6.8	0.0177	0.0000	OK
15 minute winter	S3.1	10	10.432	0.032	1.4	0.0127	0.0000	OK
15 minute winter	S3.0	11	10.285	0.045	2.8	0.0160	0.0000	OK
15 minute winter	S1.5	11	10.279	0.092	10.8	0.0316	0.0000	OK
15 minute winter	S1.4	11	10.243	0.073	12.1	0.0252	0.0000	OK
15 minute winter	S1.3	11	10.214	0.150	13.6	0.0539	0.0000	OK
1440 minute winter	S1.2	1170	9.068	0.478	1.4	0.1190	0.0000	SURCHARGED
15 minute winter	S5.1	10	10.433	0.033	1.4	0.0127	0.0000	OK
15 minute winter	S5.0	11	10.361	0.050	3.0	0.0204	0.0000	OK
15 minute winter	S4.1	10	10.435	0.035	1.6	0.0154	0.0000	OK
15 minute winter	S4.0	11	10.322	0.052	3.2	0.0209	0.0000	OK
1440 minute winter	Storage	1290	9.068	0.554	2.6	38.6195	0.0000	SURCHARGED
15 minute summer	Outfall	1	8.578	0.000	0.0	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	S1.9	M9	S1.8	1.3	0.314	0.679	0.0377	
15 minute winter	S1.8	M8	S1.7	2.7	0.848	0.440	0.0280	
15 minute winter	S2.0	S20	S1.7	1.4	0.747	0.160	0.0160	
15 minute winter	S1.7	M7	S1.6	5.4	1.750	0.109	0.0158	
15 minute winter	S1.6	M6	S1.5	6.7	0.873	0.190	0.0317	
15 minute winter	S3.1	S31	S3.0	1.4	0.486	0.227	0.0458	
15 minute winter	S3.0	S30	S1.5	2.7	0.344	0.198	0.0712	
15 minute winter	S1.5	M5	S1.4	10.8	0.837	0.310	0.0570	
15 minute winter	S1.4	M4	S1.3	12.1	0.618	0.233	0.2083	
15 minute winter	S1.3	M3	S1.2	13.7	1.069	0.264	0.1550	
1440 minute winter	S1.2	M2	Storage	2.2	0.128	0.042	0.3023	
15 minute winter	S5.1	S51	S5.0	1.4	0.457	0.229	0.0273	
15 minute winter	S5.0	S50	Storage	2.9	0.754	0.484	0.0756	
15 minute winter	S4.1	S41	S4.0	1.6	0.477	0.267	0.0454	
15 minute winter	S4.0	S40	Storage	3.1	0.761	0.518	0.0386	
1440 minute winter	Storage	M1	Outfall	0.0	0.000	0.000	0.0000	0.0

Results for 30 year Critical Storm Duration. Lowest mass balance: 96.13%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1.9	11	11.083	0.193	4.2	0.0725	0.0000	SURCHARGED
15 minute winter	S1.8	11	11.041	0.161	7.7	0.0600	0.0000	SURCHARGED
15 minute winter	S2.0	10	11.021	0.051	4.2	0.0201	0.0000	OK
15 minute winter	S1.7	10	10.855	0.065	15.4	0.0229	0.0000	OK
15 minute winter	S1.6	11	10.461	0.111	19.5	0.0419	0.0000	OK
15 minute winter	S3.1	11	10.471	0.071	4.2	0.0278	0.0000	OK
15 minute winter	S3.0	11	10.411	0.171	8.1	0.0607	0.0000	SURCHARGED
15 minute winter	S1.5	11	10.387	0.200	31.1	0.0690	0.0000	OK
15 minute winter	S1.4	11	10.346	0.176	35.1	0.0604	0.0000	OK
15 minute winter	S1.3	11	10.294	0.230	39.9	0.0830	0.0000	OK
360 minute winter	S1.2	368	9.590	1.000	6.8	0.2490	0.0000	SURCHARGED
15 minute winter	S5.1	12	10.559	0.159	4.2	0.0622	0.0000	SURCHARGED
15 minute winter	S5.0	12	10.520	0.209	8.1	0.0861	0.0000	SURCHARGED
15 minute winter	S4.1	11	10.569	0.169	5.0	0.0742	0.0000	SURCHARGED
15 minute winter	S4.0	11	10.485	0.215	9.0	0.0864	0.0000	SURCHARGED
360 minute winter	Storage	368	9.590	1.076	9.4	80.7892	0.0000	SURCHARGED
360 minute winter	Outfall	376	8.610	0.032	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)
15 minute winter	S1.9	M9	S1.8	3.7	0.476	1.893	0.0694	
15 minute winter	S1.8	M8	S1.7	7.5	1.045	1.225	0.0582	
15 minute winter	S2.0	S20	S1.7	4.1	0.946	0.482	0.0379	
15 minute winter	S1.7	M7	S1.6	15.3	2.250	0.311	0.0360	
15 minute winter	S1.6	M6	S1.5	19.4	1.143	0.548	0.0646	
15 minute winter	S3.1	S31	S3.0	3.9	0.545	0.650	0.1121	
15 minute winter	S3.0	S30	S1.5	7.9	0.446	0.581	0.1595	
15 minute winter	S1.5	M5	S1.4	31.2	0.901	0.897	0.1555	
15 minute winter	S1.4	M4	S1.3	35.2	0.932	0.677	0.3878	
15 minute winter	S1.3	M3	S1.2	40.0	1.368	0.770	0.3525	
360 minute winter	S1.2	M2	Storage	6.7	0.180	0.129	0.3023	
15 minute winter	S5.1	S51	S5.0	3.5	0.551	0.590	0.0708	
15 minute winter	S5.0	S50	Storage	7.7	0.986	1.289	0.1491	
15 minute winter	S4.1	S41	S4.0	4.4	0.566	0.745	0.1080	
15 minute winter	S4.0	S40	Storage	8.7	1.114	1.458	0.0728	
360 minute winter	Storage	M1	Outfall	2.5	0.682	0.043	0.0037	34.2

Results for 100 year Critical Storm Duration. Lowest mass balance: 96.13%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1.9	11	11.221	0.331	5.5	0.1241	0.0000	SURCHARGED
15 minute winter	S1.8	11	11.152	0.272	9.9	0.1016	0.0000	SURCHARGED
15 minute winter	S2.0	10	11.031	0.061	5.5	0.0243	0.0000	OK
15 minute winter	S1.7	11	10.867	0.077	20.0	0.0272	0.0000	OK
15 minute winter	S1.6	11	10.634	0.284	25.1	0.1075	0.0000	SURCHARGED
15 minute winter	S3.1	12	10.646	0.246	5.5	0.0964	0.0000	SURCHARGED
15 minute winter	S3.0	11	10.533	0.293	9.8	0.1041	0.0000	SURCHARGED
15 minute winter	S1.5	11	10.498	0.311	39.4	0.1072	0.0000	SURCHARGED
15 minute winter	S1.4	11	10.446	0.276	44.3	0.0948	0.0000	SURCHARGED
15 minute winter	S1.3	11	10.334	0.270	50.4	0.0973	0.0000	OK
960 minute winter	S1.2	675	9.747	1.157	4.4	0.2881	0.0000	SURCHARGED
15 minute winter	S5.1	12	10.788	0.388	5.5	0.1520	0.0000	SURCHARGED
15 minute winter	S5.0	12	10.731	0.420	10.3	0.1728	0.0000	SURCHARGED
15 minute winter	S4.1	12	10.779	0.379	6.6	0.1661	0.0000	SURCHARGED
15 minute winter	S4.0	12	10.636	0.366	11.7	0.1467	0.0000	SURCHARGED
960 minute winter	Storage	675	9.747	1.233	5.9	93.4596	0.0000	SURCHARGED
480 minute winter	Outfall	288	8.610	0.032	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)
15 minute winter	S1.9	M9	S1.8	4.8	0.608	2.418	0.0694	
15 minute winter	S1.8	M8	S1.7	9.5	1.275	1.560	0.0631	
15 minute winter	S2.0	S20	S1.7	5.5	1.051	0.635	0.0465	
15 minute winter	S1.7	M7	S1.6	19.9	2.243	0.404	0.0689	
15 minute winter	S1.6	M6	S1.5	24.7	1.405	0.701	0.0722	
15 minute winter	S3.1	S31	S3.0	4.8	0.618	0.809	0.1275	
15 minute winter	S3.0	S30	S1.5	9.8	0.554	0.721	0.1595	
15 minute winter	S1.5	M5	S1.4	39.1	0.984	1.126	0.1762	
15 minute winter	S1.4	M4	S1.3	44.1	1.110	0.849	0.4220	
15 minute winter	S1.3	M3	S1.2	50.0	1.411	0.962	0.4279	
960 minute winter	S1.2	M2	Storage	4.3	0.150	0.083	0.3023	
15 minute winter	S5.1	S51	S5.0	4.3	0.555	0.725	0.0708	
15 minute winter	S5.0	S50	Storage	9.5	1.219	1.596	0.1521	
15 minute winter	S4.1	S41	S4.0	5.6	0.721	0.963	0.1080	
15 minute winter	S4.0	S40	Storage	11.3	1.438	1.884	0.0735	
960 minute winter	Storage	M1	Outfall	2.5	0.682	0.043	0.0037	102.4

Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 96.13%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1.9	12	11.604	0.714	7.8	0.2677	0.0000	FLOOD RISK
15 minute winter	S1.8	12	11.503	0.623	13.0	0.2324	0.0000	SURCHARGED
15 minute winter	S2.0	12	11.210	0.240	7.8	0.0951	0.0000	SURCHARGED
15 minute winter	S1.7	12	11.093	0.303	24.5	0.1072	0.0000	SURCHARGED
480 minute winter	S1.6	440	11.045	0.695	4.5	0.2636	0.0000	FLOOD RISK
480 minute winter	S3.1	440	11.046	0.646	0.9	0.2533	0.0000	FLOOD RISK
480 minute winter	S3.0	448	11.046	0.806	1.8	0.2860	0.0000	FLOOD RISK
480 minute winter	S1.5	448	11.045	0.858	7.2	0.2959	0.0000	FLOOD RISK
480 minute winter	S1.4	440	11.046	0.876	8.1	0.3004	0.0000	FLOOD RISK
480 minute winter	S1.3	448	11.045	0.981	9.2	0.3531	0.0000	FLOOD RISK
480 minute winter	S1.2	440	11.046	2.456	10.3	0.6115	0.0000	FLOOD RISK
15 minute winter	S5.1	12	11.209	0.809	7.8	0.3170	0.0000	FLOOD RISK
15 minute winter	S5.0	12	11.112	0.801	13.9	0.3299	0.0000	FLOOD RISK
15 minute winter	S4.1	12	11.175	0.775	9.3	0.3394	0.0000	FLOOD RISK
480 minute winter	S4.0	448	11.047	0.777	2.2	0.3115	0.0000	FLOOD RISK
480 minute winter	Storage	440	11.045	2.531	14.4	121.2057	0.0000	FLOOD RISK
1440 minute summer	Outfall	720	8.610	0.032	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)
15 minute winter	S1.9	M9	S1.8	5.9	0.760	3.020	0.0694	
15 minute winter	S1.8	M8	S1.7	11.9	1.522	1.954	0.0692	
15 minute winter	S2.0	S20	S1.7	7.0	1.092	0.817	0.0677	
15 minute winter	S1.7	M7	S1.6	24.3	2.247	0.494	0.0909	
480 minute winter	S1.6	M6	S1.5	4.5	0.788	0.128	0.0722	
480 minute winter	S3.1	S31	S3.0	0.9	0.426	0.150	0.1275	
480 minute winter	S3.0	S30	S1.5	1.8	0.302	0.133	0.1595	
480 minute winter	S1.5	M5	S1.4	7.2	0.747	0.207	0.1762	
480 minute winter	S1.4	M4	S1.3	8.1	0.500	0.156	0.4220	
480 minute winter	S1.3	M3	S1.2	9.2	0.962	0.177	0.4799	
480 minute winter	S1.2	M2	Storage	10.2	0.255	0.195	0.3023	
15 minute winter	S5.1	S51	S5.0	5.7	0.732	0.957	0.0708	
15 minute winter	S5.0	S50	Storage	12.5	1.601	2.097	0.1527	
15 minute winter	S4.1	S41	S4.0	7.5	0.953	1.273	0.1080	
480 minute winter	S4.0	S40	Storage	2.2	0.698	0.368	0.0743	
480 minute winter	Storage	M1	Outfall	2.5	0.682	0.043	0.0037	71.4



Project Lands at Watts Close, London, N15 5DW				Job Ref. 22778	
Section Drainage Strategy Report				Sheet no./rev. 41	
Calc. by MG	Date 26/04/2022	Chk'd by DB	Date 26/04/2022	App'd by DB	Date 26/04/2022

APPENDIX V – FOUL WATER DESIGN CALCULATIONS

Design Settings

Frequency of use (kDU)	1.00	Minimum Velocity (m/s)	0.76
Flow per dwelling per day (l/day)	900	Connection Type	Level Inverts
Domestic Flow (l/s/ha)	0.0	Minimum Backdrop Height (m)	0.200
Industrial Flow (l/s/ha)	0.0	Preferred Cover Depth (m)	0.900
Additional Flow (%)	0	Include Intermediate Ground	✓

Nodes

Name	Dwellings	Cover Level (m)	Node Type	Manhole Type	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
✓ Ex. F 1.0		11.000	Manhole	Adoptable	450	3.700	0.000	2.155
✓ F1.0		11.000	Manhole	Adoptable	450	0.000	1.600	2.079
✓ F1.1		11.000	Manhole	Adoptable	450	0.000	3.100	2.050
✓ F1.2	10	11.000	Manhole	Adoptable	450	0.000	6.830	1.981
✓ F1.3		11.000	Manhole	Adoptable	450	0.000	16.410	1.801
✓ F1.4		11.000	Manhole	Adoptable	450	7.910	16.410	1.667
✓ F1.5		11.000	Manhole	Adoptable	450	10.730	16.410	1.599
✓ F1.6		11.000	Manhole	Adoptable	450	10.730	19.560	1.541
✓ F1.7	5	11.000	Manhole	Adoptable	450	14.670	19.560	1.467
✓ F1.8	5	11.000	Manhole	Adoptable	450	16.070	19.560	1.440
✓ F1.9		11.000	Manhole	Adoptable	450	16.570	19.560	1.427
✓ F1.10		11.000	Manhole	Adoptable	450	17.970	19.560	1.401
✓ F1.11		11.000	Manhole	Adoptable	450	22.270	19.560	1.319
✓ F1.12	5	11.000	Manhole	Adoptable	450	23.670	19.560	1.293
✓ F1.13	5	11.000	Manhole	Adoptable	450	24.210	19.560	1.281
✓ F1.14	10	11.000	Manhole	Adoptable	450	25.580	19.560	1.254
✓ F1.15		11.000	Manhole	Adoptable	450	29.480	19.560	1.181
✓ F1.16		11.000	Manhole	Adoptable	450	29.480	16.440	1.122
✓ F1.17	10	11.000	Manhole	Adoptable	450	32.280	16.440	1.069
✓ F1.18		11.000	Manhole	Adoptable	450	37.380	16.440	0.974
✓ F1.19		11.565	Manhole	Adoptable	450	37.380	20.440	1.115
✓ F1.20		11.565	Manhole	Adoptable	450	39.830	22.790	1.045
✓ F1.21		11.565	Manhole	Adoptable	450	43.580	21.640	0.895
✓ F1.22		11.565	Manhole	Adoptable	450	45.030	21.240	0.845
✓ F1.23		11.565	Manhole	Adoptable	450	49.380	20.440	0.675
✓ F1.24	6	11.565	Manhole	Adoptable	450	50.780	25.090	0.495
✓ F1.25		11.565	Manhole	Adoptable	450	52.030	29.090	0.345
✓ F2.0		11.000	Manhole	Adoptable	450	40.230	12.890	0.890
✓ F2.1	10	11.000	Manhole	Adoptable	450	40.230	6.820	0.770
✓ F2.2		11.000	Manhole	Adoptable	450	40.230	3.090	0.700
✓ F2.3		11.000	Manhole	Adoptable	450	35.410	3.090	0.520
✓ F3.0	6	11.565	Manhole	Adoptable	450	41.630	27.990	0.935
✓ F3.1		11.565	Manhole	Adoptable	450	42.780	32.000	0.845
✓ F4.0		11.000	Manhole	Adoptable	450	4.900	3.000	0.700
✓ Outfall		10.010	Manhole	Adoptable	450	1.000	-10.800	4.324

Links (Input)

	Name	US Node	DS Node	Length (m)	ks (mm) / n	Velocity Equation	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	Link Type
?	M0	F1.0	Ex. F 1.0	6.040	1.500	Colebrook-White	8.921	8.845	0.076	79.5	100	Circular
?	M1	F1.1	F1.0	2.310	1.500	Colebrook-White	8.950	8.921	0.029	79.7	100	Circular
?	M2	F1.2	F1.1	5.520	1.500	Colebrook-White	9.019	8.950	0.069	80.0	100	Circular
?	M3	F1.3	F1.2	14.330	1.500	Colebrook-White	9.199	9.019	0.180	79.6	100	Circular
✓	M4	F1.4	F1.3	10.660	1.500	Colebrook-White	9.333	9.199	0.134	79.6	100	Circular
✓	M5	F1.5	F1.4	5.430	1.500	Colebrook-White	9.401	9.333	0.068	79.9	100	Circular
✓	M6	F1.6	F1.5	4.610	1.500	Colebrook-White	9.459	9.401	0.058	79.5	100	Circular
✓	M7	F1.7	F1.6	5.920	1.500	Colebrook-White	9.533	9.459	0.074	80.0	100	Circular
✓	M8	F1.8	F1.7	2.110	1.500	Colebrook-White	9.560	9.533	0.027	78.1	100	Circular
✓	M9	F1.9	F1.8	1.000	1.500	Colebrook-White	9.573	9.560	0.013	76.9	100	Circular
✓	M10	F1.10	F1.9	2.020	1.500	Colebrook-White	9.599	9.573	0.026	77.7	100	Circular
✓	M11	F1.11	F1.10	6.560	1.500	Colebrook-White	9.681	9.599	0.082	80.0	100	Circular
✓	M12	F1.12	F1.11	2.040	1.500	Colebrook-White	9.707	9.681	0.026	78.5	100	Circular
✓	M13	F1.13	F1.12	1.000	1.500	Colebrook-White	9.719	9.707	0.012	80.0	100	Circular
✓	M14	F1.14	F1.13	2.160	1.500	Colebrook-White	9.746	9.719	0.027	80.0	100	Circular
✓	M15	F1.15	F1.14	5.850	1.500	Colebrook-White	9.819	9.746	0.073	80.0	100	Circular
✓	M16	F1.16	F1.15	4.700	1.500	Colebrook-White	9.878	9.819	0.059	79.7	100	Circular
✓	M17	F1.17	F1.16	4.250	1.500	Colebrook-White	9.931	9.878	0.053	80.0	100	Circular
?	M18	F1.18	F1.17	7.590	1.500	Colebrook-White	10.026	9.931	0.095	79.9	100	Circular
?	M19	F1.19	F1.18	6.060	1.500	Colebrook-White	10.450	10.030	0.420	14.4	100	Circular
✓	M20	F1.20	F1.19	5.030	1.500	Colebrook-White	10.520	10.450	0.070	71.9	100	Circular
?	M21	F1.21	F1.20	5.940	1.500	Colebrook-White	10.670	10.520	0.150	39.6	100	Circular
?	M22	F1.22	F1.21	2.280	1.500	Colebrook-White	10.720	10.670	0.050	45.6	100	Circular
?	M23	F1.23	F1.22	6.520	1.500	Colebrook-White	10.890	10.720	0.170	38.4	100	Circular
?	M24	F1.24	F1.23	7.400	1.500	Colebrook-White	11.070	10.890	0.180	41.1	100	Circular
?	M25	F1.25	F1.24	6.230	1.500	Colebrook-White	11.220	11.070	0.150	41.5	100	Circular
?	S2-0	F2.0	F1.18	6.760	1.500	Colebrook-White	10.110	10.026	0.084	80.0	100	Circular
?	S2-1	F2.1	F2.0	9.240	1.500	Colebrook-White	10.230	10.110	0.120	77.0	100	Circular
?	S2-2	F2.2	F2.1	5.500	1.500	Colebrook-White	10.300	10.230	0.070	78.6	100	Circular
?	S2-3	F2.3	F2.2	7.230	1.500	Colebrook-White	10.480	10.300	0.180	40.2	100	Circular
?	S3-0	F3.0	F1.20	8.150	1.500	Colebrook-White	10.630	10.520	0.110	74.1	100	Circular
?	S3-1	F3.1	F3.0	6.200	1.500	Colebrook-White	10.720	10.630	0.090	68.9	100	Circular
?	S4-0	F4.0	F1.1	7.390	1.500	Colebrook-White	10.300	10.115	0.185	40.0	100	Circular
?	Q0	Ex. F 1.0	Outfall	12.210	1.500	Colebrook-White	8.845	5.686	3.159	3.9	450	Circular

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)
M0	6.040	79.5	100	Circular	11.000	8.921	1.979	11.000	8.845	2.055
M1	2.310	79.7	100	Circular	11.000	8.950	1.950	11.000	8.921	1.979
M2	5.520	80.0	100	Circular	11.000	9.019	1.881	11.000	8.950	1.950
M3	14.330	79.6	100	Circular	11.000	9.199	1.701	11.000	9.019	1.881
M4	10.660	79.6	100	Circular	11.000	9.333	1.567	11.000	9.199	1.701
M5	5.430	79.9	100	Circular	11.000	9.401	1.499	11.000	9.333	1.567
M6	4.610	79.5	100	Circular	11.000	9.459	1.441	11.000	9.401	1.499
M7	5.920	80.0	100	Circular	11.000	9.533	1.367	11.000	9.459	1.441
M8	2.110	78.1	100	Circular	11.000	9.560	1.340	11.000	9.533	1.367
M9	1.000	76.9	100	Circular	11.000	9.573	1.327	11.000	9.560	1.340
M10	2.020	77.7	100	Circular	11.000	9.599	1.301	11.000	9.573	1.327
M11	6.560	80.0	100	Circular	11.000	9.681	1.219	11.000	9.599	1.301
M12	2.040	78.5	100	Circular	11.000	9.707	1.193	11.000	9.681	1.219
M13	1.000	80.0	100	Circular	11.000	9.719	1.181	11.000	9.707	1.193
M14	2.160	80.0	100	Circular	11.000	9.746	1.154	11.000	9.719	1.181
M15	5.850	80.0	100	Circular	11.000	9.819	1.081	11.000	9.746	1.154
M16	4.700	79.7	100	Circular	11.000	9.878	1.022	11.000	9.819	1.081
M17	4.250	80.0	100	Circular	11.000	9.931	0.969	11.000	9.878	1.022
M18	7.590	79.9	100	Circular	11.000	10.026	0.874	11.000	9.931	0.969
M19	6.060	14.4	100	Circular	11.565	10.450	1.015	11.000	10.030	0.870
M20	5.030	71.9	100	Circular	11.565	10.520	0.945	11.565	10.450	1.015
M21	5.940	39.6	100	Circular	11.565	10.670	0.795	11.565	10.520	0.945
M22	2.280	45.6	100	Circular	11.565	10.720	0.745	11.565	10.670	0.795
M23	6.520	38.4	100	Circular	11.565	10.890	0.575	11.565	10.720	0.745
M24	7.400	41.1	100	Circular	11.565	11.070	0.395	11.565	10.890	0.575

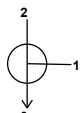
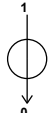
Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
M0	F1.0	450	Manhole	Adoptable	Ex. F 1.0	450	Manhole	Adoptable
M1	F1.1	450	Manhole	Adoptable	F1.0	450	Manhole	Adoptable
M2	F1.2	450	Manhole	Adoptable	F1.1	450	Manhole	Adoptable
M3	F1.3	450	Manhole	Adoptable	F1.2	450	Manhole	Adoptable
M4	F1.4	450	Manhole	Adoptable	F1.3	450	Manhole	Adoptable
M5	F1.5	450	Manhole	Adoptable	F1.4	450	Manhole	Adoptable
M6	F1.6	450	Manhole	Adoptable	F1.5	450	Manhole	Adoptable
M7	F1.7	450	Manhole	Adoptable	F1.6	450	Manhole	Adoptable
M8	F1.8	450	Manhole	Adoptable	F1.7	450	Manhole	Adoptable
M9	F1.9	450	Manhole	Adoptable	F1.8	450	Manhole	Adoptable
M10	F1.10	450	Manhole	Adoptable	F1.9	450	Manhole	Adoptable
M11	F1.11	450	Manhole	Adoptable	F1.10	450	Manhole	Adoptable
M12	F1.12	450	Manhole	Adoptable	F1.11	450	Manhole	Adoptable
M13	F1.13	450	Manhole	Adoptable	F1.12	450	Manhole	Adoptable
M14	F1.14	450	Manhole	Adoptable	F1.13	450	Manhole	Adoptable
M15	F1.15	450	Manhole	Adoptable	F1.14	450	Manhole	Adoptable
M16	F1.16	450	Manhole	Adoptable	F1.15	450	Manhole	Adoptable
M17	F1.17	450	Manhole	Adoptable	F1.16	450	Manhole	Adoptable
M18	F1.18	450	Manhole	Adoptable	F1.17	450	Manhole	Adoptable
M19	F1.19	450	Manhole	Adoptable	F1.18	450	Manhole	Adoptable
M20	F1.20	450	Manhole	Adoptable	F1.19	450	Manhole	Adoptable
M21	F1.21	450	Manhole	Adoptable	F1.20	450	Manhole	Adoptable
M22	F1.22	450	Manhole	Adoptable	F1.21	450	Manhole	Adoptable
M23	F1.23	450	Manhole	Adoptable	F1.22	450	Manhole	Adoptable
M24	F1.24	450	Manhole	Adoptable	F1.23	450	Manhole	Adoptable

Pipeline Schedule

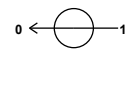
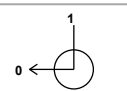
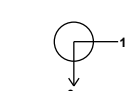
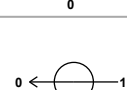
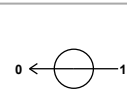
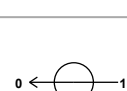
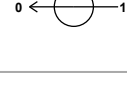
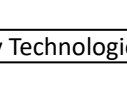
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
M25	6.230	41.5	100	Circular	11.565	11.220	0.245	11.565	11.070	0.395
S2-0	6.760	80.0	100	Circular	11.000	10.110	0.790	11.000	10.026	0.874
S2-1	9.240	77.0	100	Circular	11.000	10.230	0.670	11.000	10.110	0.790
S2-2	5.500	78.6	100	Circular	11.000	10.300	0.600	11.000	10.230	0.670
S2-3	7.230	40.2	100	Circular	11.000	10.480	0.420	11.000	10.300	0.600
S3-0	8.150	74.1	100	Circular	11.565	10.630	0.835	11.565	10.520	0.945
S3-1	6.200	68.9	100	Circular	11.565	10.720	0.745	11.565	10.630	0.835
S4-0	7.390	40.0	100	Circular	11.000	10.300	0.600	11.000	10.115	0.785
Q0	12.210	3.9	450	Circular	11.000	8.845	1.705	10.010	5.686	3.874

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
M25	F1.25	450	Manhole	Adoptable	F1.24	450	Manhole	Adoptable
S2-0	F2.0	450	Manhole	Adoptable	F1.18	450	Manhole	Adoptable
S2-1	F2.1	450	Manhole	Adoptable	F2.0	450	Manhole	Adoptable
S2-2	F2.2	450	Manhole	Adoptable	F2.1	450	Manhole	Adoptable
S2-3	F2.3	450	Manhole	Adoptable	F2.2	450	Manhole	Adoptable
S3-0	F3.0	450	Manhole	Adoptable	F1.20	450	Manhole	Adoptable
S3-1	F3.1	450	Manhole	Adoptable	F3.0	450	Manhole	Adoptable
S4-0	F4.0	450	Manhole	Adoptable	F1.1	450	Manhole	Adoptable
Q0	Ex. F 1.0	450	Manhole	Adoptable	Outfall	450	Manhole	Adoptable

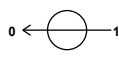
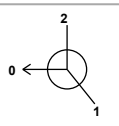
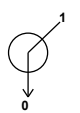
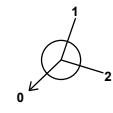
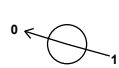
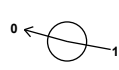
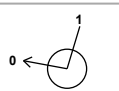
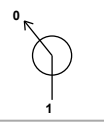
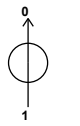
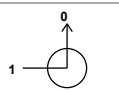
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type
Ex. F 1.0	3.700	0.000	11.000	2.155	450	Manhole	Adoptable		1 M0	8.845	100	Circular
F1.0	0.000	1.600	11.000	2.079	450	Manhole	Adoptable		1 M1	8.921	100	Circular
F1.1	0.000	3.100	11.000	2.050	450	Manhole	Adoptable		1 S4-0	10.115	100	Circular
									2 M2	8.950	100	Circular
									0 M1	8.950	100	Circular
F1.2	0.000	6.830	11.000	1.981	450	Manhole	Adoptable		1 M3	9.019	100	Circular
									0 M2	9.019	100	Circular

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type	
F1.3	0.000	16.410	11.000	1.801	450	Manhole	Adoptable		1	M4	9.199	100	Circular
F1.4	7.910	16.410	11.000	1.667	450	Manhole	Adoptable		0	M3	9.199	100	Circular
									1	M5	9.333	100	Circular
F1.5	10.730	16.410	11.000	1.599	450	Manhole	Adoptable		0	M4	9.333	100	Circular
									1	M6	9.401	100	Circular
F1.6	10.730	19.560	11.000	1.541	450	Manhole	Adoptable		1	M7	9.459	100	Circular
									0	M6	9.459	100	Circular
F1.7	14.670	19.560	11.000	1.467	450	Manhole	Adoptable		1	M8	9.533	100	Circular
									0	M7	9.533	100	Circular
F1.8	16.070	19.560	11.000	1.440	450	Manhole	Adoptable		1	M9	9.560	100	Circular
									0	M8	9.560	100	Circular
F1.9	16.570	19.560	11.000	1.427	450	Manhole	Adoptable		1	M10	9.573	100	Circular
									0	M9	9.573	100	Circular
F1.10	17.970	19.560	11.000	1.401	450	Manhole	Adoptable		1	M11	9.599	100	Circular
									0	M10	9.599	100	Circular
F1.11	22.270	19.560	11.000	1.319	450	Manhole	Adoptable		1	M12	9.681	100	Circular
									0	M11	9.681	100	Circular
F1.12	23.670	19.560	11.000	1.293	450	Manhole	Adoptable		1	M13	9.707	100	Circular
									0	M12	9.707	100	Circular
F1.13	24.210	19.560	11.000	1.281	450	Manhole	Adoptable		1	M14	9.719	100	Circular
									0	M13	9.719	100	Circular
F1.14	25.580	19.560	11.000	1.254	450	Manhole	Adoptable		1	M15	9.746	100	Circular
									0	M14	9.746	100	Circular
F1.15	29.480	19.560	11.000	1.181	450	Manhole	Adoptable		1	M16	9.819	100	Circular
									0	M15	9.819	100	Circular

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections		Link	IL (m)	Dia (mm)	Link Type
F1.16	29.480	16.440	11.000	1.122	450	Manhole	Adoptable		1	M17	9.878	100	Circular
									0	M16	9.878	100	Circular
F1.17	32.280	16.440	11.000	1.069	450	Manhole	Adoptable		1	M18	9.931	100	Circular
									0	M17	9.931	100	Circular
F1.18	37.380	16.440	11.000	0.974	450	Manhole	Adoptable		1	S2-0	10.026	100	Circular
									2	M19	10.030	100	Circular
									0	M18	10.026	100	Circular
F1.19	37.380	20.440	11.565	1.115	450	Manhole	Adoptable		1	M20	10.450	100	Circular
									0	M19	10.450	100	Circular
F1.20	39.830	22.790	11.565	1.045	450	Manhole	Adoptable		1	S3-0	10.520	100	Circular
									2	M21	10.520	100	Circular
									0	M20	10.520	100	Circular
F1.21	43.580	21.640	11.565	0.895	450	Manhole	Adoptable		1	M22	10.670	100	Circular
									0	M21	10.670	100	Circular
F1.22	45.030	21.240	11.565	0.845	450	Manhole	Adoptable		1	M23	10.720	100	Circular
									0	M22	10.720	100	Circular
F1.23	49.380	20.440	11.565	0.675	450	Manhole	Adoptable		1	M24	10.890	100	Circular
									0	M23	10.890	100	Circular
F1.24	50.780	25.090	11.565	0.495	450	Manhole	Adoptable		1	M25	11.070	100	Circular
									0	M24	11.070	100	Circular
F1.25	52.030	29.090	11.565	0.345	450	Manhole	Adoptable		0	M25	11.220	100	Circular
F2.0	40.230	12.890	11.000	0.890	450	Manhole	Adoptable		1	S2-1	10.110	100	Circular
									0	S2-0	10.110	100	Circular
F2.1	40.230	6.820	11.000	0.770	450	Manhole	Adoptable		1	S2-2	10.230	100	Circular
									0	S2-1	10.230	100	Circular
F2.2	40.230	3.090	11.000	0.700	450	Manhole	Adoptable		1	S2-3	10.300	100	Circular
									0	S2-2	10.300	100	Circular

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Node Type	MH Type	Connections	Link	IL (m)	Dia (mm)	Link Type	
F2.3	35.410	3.090	11.000	0.520	450	Manhole	Adoptable		0	S2-3	10.480	100	Circular
F3.0	41.630	27.990	11.565	0.935	450	Manhole	Adoptable		1	S3-1	10.630	100	Circular
F3.1	42.780	32.000	11.565	0.845	450	Manhole	Adoptable		0	S3-0	10.630	100	Circular
F4.0	4.900	3.000	11.000	0.700	450	Manhole	Adoptable		0	S4-0	10.300	100	Circular
Outfall	1.000	-10.800	10.010	4.324	450	Manhole	Adoptable		1	Q0	5.686	450	Circular



Project Lands at Watts Close, London, N15 5DW				Job Ref. 22778	
Section Drainage Strategy Report				Sheet no./rev. 49	
Calc. by MG	Date 26/04/2022	Chk'd by DB	Date 26/04/2022	App'd by DB	Date 26/04/2022

APPENDIX VI – DRAINAGE MAINTENANCE PLAN

**PROJECT: LANDS AT WATTS CLOSE,
LONDON. N15 5DW**

PROJECT NO: 22778

DOCUMENT TITLE: DRAINAGE STRATEGY REPORT

DOCUMENT NO: 22778-RP-01

DATE: 30th JANUARY 2023

Project Lands at Watts Close, London, N15 5DW				Job Ref. 22778	
Section Drainage Maintenance Plan				Sheet no./rev. 2	
Calc. by BC	Date 30/01/23	Chk'd by DB	Date 30/01/23	App'd by DB	Date 30/01/23

1. GENERAL

Sustainable Drainage Systems (SuDS) are an environmentally friendly approach to managing rainfall. SuDS techniques use landscape features to deal with surface water with the aim to:

- Control the flow, volume and frequency of water leaving a development.
- Prevent pollution by intercepting silt and cleaning runoff from hard surfaces.
- Provide attractive surroundings for the community.

The surface water drainage strategy for this development utilises an attenuation tank as the main SUDs feature. The below section provides a brief description of proposed SUDs features and outlines the maintenance programme that should be adopted.

2. CLEANING OF THE DRAINAGE SYSTEM

Drainage systems should be inspected at regular intervals and where necessary, thoroughly cleaned out during the inspection. Any defects discovered should be made good.

The following operations should be carried out during the periodic cleaning of a drainage system: -

Product Type	Period	Responsibility	Maintenance Methods
<i>Silt Trap</i>	As necessary and before wet season	Owner or Maintenance Company for communal areas	• Sediment and debris that accumulated during summer needs to be removed before the wet season. • Inspect and clean out routinely prior to inlet pipework to minimise debris reaching the tank. • Conduct inspections more frequently during the wet season for the area where sediment or trash accumulates more often. Clean and repair as needed.
<i>Standard Manholes/ Inspection Chambers</i>	As necessary	Owner or Maintenance Company for communal areas	• Remove and clean any soil and vegetation that covers the manhole cover to prevent blockage of the drainage system at the manhole.
			• Renew/replace any damaged/missing bolts and damaged/missing manhole covers.
<i>Drainage Pipes</i>	Six monthly interval	Owner or Maintenance Company for communal areas	• Inspect underground drainage pipes to ensure that the distribution pipework arrangement is operational and free from blockages. If required, take remedial action.
<i>Orifice Plate and attenuation tank</i>	Monthly for 3 months	Owner/ Maintenance Company	• Inspect and identify any areas that are not operating correctly. If required, take remedial action.

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	Monthly	Owner/ Maintenance Company	Debris removal from catchment surface (where may cause risks to performance).
	Annually and after large storms	Owner/ Maintenance Company	Inspection/check all inlets and outlets to ensure that they are in good condition and operating as designed.
Aco Channels	As necessary and before wet season	Owner or Maintenance Company for communal areas	- All ACO drains to be fitted with individual channel drain sump units with silt buckets for each private property. - Sediment and debris that accumulated during summer needs to be removed before the wet season. - Inspect and clean out routinely prior to minimize debris travelling downstream to the attenuation tank, and to prevent local blockage. - Conduct inspections more frequently during the wet season for the area where sediment or trash accumulates more often. Clean and repair as needed.

3. CLEANING OF THE DRAINAGE SYSTEM

The locations of the above features can be found by examining the drawings contained in Appendices of this report.



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Project Lands at Watts Close, London, N15 5DW				Job Ref. 22778	
Section Drainage Strategy Report				Sheet no./rev. 54	
Calc. by MG	Date 26/04/2022	Chk'd by DB	Date 26/04/2022	App'd by DB	Date 26/04/2022

APPENDIX VII – HARDSTANDING & OVERLAND FLOW DRAWINGS

1. HARDSTANDING LEGEND

1.1 BASIC LINETYPES

	GRIDLINE
	CENTRELINE
	VISIBLE EDGE OF STRUCTURE
	HIDDEN EDGE OF STRUCTURE

1.2 DIMENSIONS

The image contains four separate diagrams, each illustrating a different type of dimension line used in technical drawing. Each diagram is followed by a label and a unit.

- Linear Dimension in Millimetres:** A horizontal dimension line with arrows at both ends. The dimension value "2000" is written above the line. The label "DIMENSIONS IN MILLIMETRES" is to the right.
- Linear Dimension in Metres:** A horizontal dimension line with arrows at both ends. The dimension value "2.0m" is written above the line. The label "DIMENSIONS IN METRES" is to the right.
- Radial Dimension:** A curved dimension line (arc) with arrows at both ends. The dimension value "R = 150.0" is written along the arc. The label "RADIAL DIMENSION" is to the right.
- Angular Dimension:** A dimension line forming an angle with a horizontal reference line. The dimension value "25°" is written inside the angle. The label "ANGULAR DIMENSION" is to the right.

1.3 GRID REFERENCES

The diagram illustrates four types of grid references on a grid background. A horizontal dashed line separates the top half (Horizontal Grid Reference) from the bottom half (Vertical Grid Reference). A vertical dashed line separates the left half (Supplemental Grids if Required) from the right half (Supplemental Grids if Required).

- Horizontal Grid Reference:** A circle containing the number '1' is shown. A horizontal line extends to the right from the circle. Text above the line reads: "Horizontal Grid references to be a numerical".
- Vertical Grid Reference:** A circle containing the letter 'A' is shown. A vertical line extends downwards from the circle. Text to the right of the line reads: "Vertical Grid references to be a alphabetic".
- SUPPLEMENTARY GRIDS IF REQUIRED:** A circle containing the number '1.1' is shown. A horizontal line extends to the right from the circle.
- SUPPLEMENTARY GRIDS IF REQUIRED:** A circle containing the letters 'Aa' is shown. A vertical line extends downwards from the circle.

1.4 CALLUPS

FLOOR PLAN

SCALE @ A1: 1:50	TITLE
SCALE @ A3: 1:100	

Section references are numerical

1

X-XXXX

Indicates where

TYPICAL SECTION CUT MARK

Section references are numerical

1

SECTION

TYPICAL SECTION TITLE

SCALE @ A1: 1:25

SCALE @ A3: 1:50

X-XXXX

Indicates where

Section reference
X1, X2, X3 etc...

X1

X-XXXX

Indicates where
section is drawn

FULL HEIGHT CROSS
SECTION CUT MARK

Section references are numerical

X1

X-XXXX

SECTION

SCALE @ A1: 1:25

SCALE @ A3: 1:50

FULL HEIGHT CROSS SECTION TITLE

Indicates where

Diagram illustrating a detail locator. A circle contains the letter 'A' and the text 'X-XXXX'. A dashed circle is labeled 'Size to suit'. A line connects the circle to the text 'DETAIL LOCATOR'.

Detail references to be letters,

A

X-XXXX

DETAIL

SCALE @ A1: 1:25
SCALE @ A3: 1:50

DETAIL TITLE

indicates where detail is drawn

be prefixed by E, ie E1, E2 etc...

Indicates where elevation is cut

TYPICAL ELEVATION VIEW LOCATOR

be prefixed by E, ie E1,
E2 etc...

MK-99

ELEVATION

X-XXXX

SCALE @ A1: 1:25
SCALE @ A3: 1:50

ELEVATION TITLE

Indicate where

S.S.L. = +22.400

STRUCTURAL LEVEL CALLUP
ON PLAN IN METRES,
REFERRED TO ORDNANCE
DATUM

FIRST FLOOR
S.S.L. = +20.400
▼

STRUCTURAL LEVEL CALLUP
ON SECTION IN METRES,
REFERRED TO ORDNANCE
DATUM

← 100% FALL (GRADIENT)



REVISION REFERENCE FOR
CLOUDED ELEMENT

1.5 ABBREVIATIONS GENERAL

Crs.	CENTRE TO CENTRE	DRG. No.	DRAWING NUMBER
COL.	COLUMN	N.T.S.	NOT TO SCALE
CONC.	CONCRETE	REINF.	REINFORCEMENT
D.P.M.	DAMP PROOF MEMBRANE	TYP.	TYPICAL
Dp.	DEEP	U/S	UNDERSIDE
Ø	DIAMETER	U.N.O.	UNLESS NOTED OTHERWISE

1.6 HARDSTANDING SURFACES ON PLAN

	BOUNDARY LINE
	PRECAST CONCRETE FLAG PAVEMENT
	PERMEABLE FLAG PAVEMENT
	BLOCK PAVER PAVEMENT PEDESTRIAN AREAS
	BLOCK PAVER PAVEMENT CAR PARK & VEHICULAR AREAS
	PERMEABLE BLOCK PAVER PAVEMENT PEDESTRIAN AREAS
	BLOCK PAVER PAVEMENT PEDESTRIAN AREAS
	POLYMETRIC SURFACED AMENITY AREA (BY OTHERS)
	RESIN BOUND SURFACE
	MOWN GRASS SOFT LANDSCAPING AREA (BY OTHERS)
	PROPOSED SOFT-LANDSCAPE PLATING (BY OTHERS)
	TARMAC SURFACING
	POROUS TARMAC SURFACING
	EXISTING CONCRETE YARD SLAB
	NEW EXTERNAL CONCRETE YARD SLAB
	PROPOSED NEW CONCRETE SURFACING
	PROPOSED SEDUM ROOF
	DENOTES EXISTING LEVEL RETAINED
	EXISTING KERBS RETAINED
	PROPOSED NEW KERBING
	EXISTING SURVEY LEVEL FROM SITE
	PROPOSED TANGENT POINT LEVEL FOR PROPOSED SLAB
	PROPOSED NEW LEVEL
	PROPOSED ROAD GULLY LEVEL
	PROPOSED TREE (BY OTHERS)
	EXISTING TREE
	ROOT PROTECTION AREA
	INTERNAL FFL OF BUILDING
	MASS CONCRETE STEPS

1.7 HARDSTANDING WALLS/FENCING

The diagrams show four different types of fencing and retaining walls:

- PROPOSED TIMBER FENCING (BY OTHERS):** A yellow line with a small square post.
- PROPOSED STEEL FENCING (BY OTHERS):** A red line with a small square post.
- PROPOSED RETAINING WALL:** A grey L-shaped wall.
- PROPOSED NEW MASONRY WALL:** A brown L-shaped wall.

1.8 HARDSTANDING DRAINAGE ELEMENTS

	RG	ROAD GULLEY
	GT	GULLEY TRAP
	ACO	ACO DRAIN
	SD	SLOT DRAIN

FOR CONSTRUCTION

NOTES

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2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.

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ISSUE	DATE	DESCRIPTION	DRN ORIG	P.E. P.D.

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CLIENT **FORMATION GROUP**

PROJECT TITLE
WATTS CLOSE, LONDON. N15 EDW

DRAWING TITLE

HARDSTANDING LEGEND

SCALE @ A1	JOB NO.	DRAWING NO.	ISSUE
AS SHOWN	22778	C-1200	C1

NOTES

1. ALTERNATIVE BASE COURSE MATERIAL:
NOT USED
2. USE OF BASE COURSE FOR CONSTRUCTION TRAFFIC:
NOT USED
3. DEPTH OF SUB-BASE & CAPPING LAYER:
THE DEPTH OF THE SUB-BASE AND CAPPING LAYERS WILL VARY WITH THE SUBGRADE STRENGTH, AS INDICATED BY THE CBR TEST RESULTS.
THE THICKNESS OF THE SUB-BASE LAYER SHOULD BE 150mm FOR ALL FORMS OF ROADWAY CONSTRUCTION.
THE THICKNESS OF THE CAPPING LAYER WILL VARY WITH THE CBR VALUE, AS INDICATED IN TABLE 3.1 BELOW. IF THE CBR VALUE OF THE SUBGRADE EXCEEDS 15%, NO CAPPING LAYER IS REQUIRED.
- | LOWEST SUBGRADE CBR (%) | MINIMUM CAPPING LAYER THICKNESS (mm) |
|-------------------------|--------------------------------------|
| * LESS THAN 2 | (SEE FOOTNOTE) |
| 2-5 | 450-250 |
| 5-15 | 250-150 |
| MORE THAN 15 | NO CAPPING LAYER REQUIRED |

* FOR SUBGRADES WITH A CBR OF LESS THAN 2%, A GEOTEXTILE SEPARATOR (e.g. TERRAM 1000) SHOULD BE USED AND SPECIALIST ADVICE SOUGHT REGARDING MINIMUM THICKNESS.

IF THE CONTRACTOR PROPOSES TO USE THE SUB-BASE FOR CONSTRUCTION TRAFFIC HE SHOULD SEEK APPROVAL FROM THE ENGINEER TO DO SO. SUCH APPROVAL WILL ONLY NORMALLY BE GIVEN ON CONDITION THAT THE SUB-BASE THICKNESS IS INCREASED. TYPICALLY FOR CBR VALUES ≤ 4% THE SUB-BASE THICKNESS WILL HAVE TO BE INCREASED BY 150mm. FOR CBR VALUES > 4% AN INCREASE OF 80mm WILL BE SUFFICIENT.

SUBGRADE STRENGTH SHOULD BE ESTABLISHED BY MEANS OF THE CALIFORNIA BEARING RATIO (CBR) TEST, IN ACCORDANCE WITH BS 1377-4:1990. SAMPLES SHOULD BE TAKEN AT THE RATE OF ONE PER 100m OF ROAD AND WHERE SIGNIFICANT VARIATIONS IN SOIL TYPE ARE ANTICIPATED. EXTRA SAMPLES MAY BE REQUIRED BY THE LOCAL AUTHORITY WHERE THE DIFFERENCE IN STRENGTH BETWEEN TWO ADJACENT SAMPLES INDICATES A SIGNIFICANT VARIATION IN SOIL TYPE. IN PREPARING THE TEST SPECIMEN, THE METHOD OF COMPACTION SHOULD BE THE STATIC COMPACTION METHOD 2, AS SPECIFIED IN PARAGRAPH 7.2.3.3 OF BS 1377-4:1990.

4. MATERIAL SPECIFICATION FOR SUB-BASE AND CAPPING LAYER:

(a) SUB-BASE
SUB-BASE MATERIAL SHOULD COMPRISE TYPE 2 UNBOUND MIXTURE IN ACCORDANCE WITH CLAUSE 804 OF THE SPECIFICATIONS FOR HIGHWAY WORKS. THE MATERIAL SHOULD LIE WITHIN THE GRADING LIMITS SET OUT IN TABLE 4.1 BELOW.

ISO SIEVE SIZE (mm)	OVERALL GRADING RANGE	SUPP. DECLARED VALUE GRADING RANGE	TOLERANCE
63	100	NR	NR
31.5	80-99	NR	NR
16	55-85	NR	NR
8	35-65	NR	NR
4	22-60	NR	NR
1	10-35	NR	NR
0.063	0-7	NR	NR

PARTICLE SIZE DISTRIBUTION SHOULD BE DETERMINED BY THE WASHING AND SIEVING METHOD OF BS EN 933-1. ALL MATERIAL USED SHOULD BE FROST RESISTANT.

MATERIAL PASSING THE 0.425mm SIEVE, WHEN TESTED IN ACCORDANCE WITH BS 1377-2, SHOULD BE NON-PLASTIC.

THE MATERIAL SHOULD HAVE A TEN PERCENT FINES VALUE OF 100kN, OR MORE, WHEN TESTED IN ACCORDANCE WITH BS EN 933-1.

THE SUB-BASE SHOULD BE LAID AND COMPACTED TO THE REQUIREMENTS OF CLAUSE 802 OF THE DFT SPECIFICATION FOR HIGHWAY WORKS, WITHOUT DRYING OUT, OR SEGREGATION.

(b) CAPPING LAYER

THE CAPPING LAYER SHALL BE CONSTRUCTED WITH CLASS 6F1 OR 6F2 MATERIAL AS PER SERIES 600 OF THE DFT SPECIFICATION FOR HIGHWAY WORKS AND COMPRISING OF EITHER CRUSHED ROCK, NATURAL GRAVEL, CRUSHED GRAVEL OR CRUSHED CONCRETE. THE MATERIAL SHOULD HAVE A MAXIMUM SIZE OF 100mm AND THE MAXIMUM ALLOWABLE PASSING THE 63 MICRON SHOULD BE 10%. THE MATERIAL SHOULD BE WELL GRADED THROUGHOUT ALL SIZES.

SELECTED DEMOLITION MATERIALS WHICH MEET THE ABOVE REQUIREMENTS MAY ALSO BE USED, SUBJECT TO APPROVAL.

5. CONCRETE FOR ROAD PAVEMENTS:

PAVING QUALITY CONCRETE SHOULD BE PAV2 MIX (AIR ENTRAINED CONCRETE, OR SIMILAR APPROVED BBV MIX) MADE FROM NATURAL AGGREGATES, CEMENT, WATER AND AIR ENTRAINING AGENT COMPLYING WITH BS 2061, BS 8500-1, BS 8500-2, EN 13877-2 AND THE REQUIREMENTS OF SERIES 1000 OF THE DFT SPECIFICATION FOR HIGHWAY WORKS.

TABLE 5.1 CONSTITUENTS FOR PAVING QUALITY CONCRETE	
MINIMUM CEMENT CONTENT	340kg/m ³
MAXIMUM FREE WATER/CEMENT RATIO	0.45
MAXIMUM AGGREGATE SIZE	20mm
MINIMUM STRENGTH CLASS	C32/40
AIR CONTENT	4.5 %
SUMP CLASS	S3



FOR CONSTRUCTION

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KEY

KEY	SPECIFICATION
	PRECAST CONCRETE FLAG PAVEMENT Paving Slabs to Architects Details 50mm Compacted Thk Sharp Sand Bedding 150mm Type 1 Compacted Granular Sub-base
	BLOCK PAVER PAVEMENT PEDESTRIAN AREAS Block Paving to Architects Details 50mm Compacted Thk Sharp Sand Bedding 150mm Type 1 Compacted Granular Sub-base
	BLOCK PAVER PAVEMENT CAR PARK & VEHICULAR AREAS Block Paving to Architects Details 50mm Compacted Thk Sharp Sand Laying Course (See Note 11) 150mm Type 2 Compacted Granular Sub-base (See Note 3) "X"mm min thk Capping Layer (See Note 4) on Subgrade
	POLYMERIC SURFACED AMENITY AREA (BY OTHERS) Polymeric Surface to Specialist Supplier Details (Build up to Specialist Supplier Details but typically) 25mm Open textured Surface Course Macadam AC20/14 50mm open textured Binder Course Macadam AC20/14 150mm Type 1 Compacted Granular Sub-base Capping Layer as per General Notes
	MOWN GRASS SOFT LANDSCAPING AREA (BY OTHERS) Mown Grass Soft Landscaping Areas to LA Details
	PROPOSED SOFT-LANDSCAPE PLATING (BY OTHERS) Soft Landscaping Planting Areas to LA Details

KEY

KEY	SPECIFICATION
	W1 215mm Thk brickwork wall max height 1.2m Movement Joints at max 9.0m crs. 500w x 300dp Strip footing with 1 layer of A393 central mesh. Lean mix trench fill to 1.5m BGL Steel railings to be fixed directly to Strip Footing
	W2 215mm Thk brickwork wall max height 1.2m Movement Joints at max 9.0m crs. 500w x 200dp Strip footing with 1 layer of A393 central mesh. Lean mix trench fill to 1.5m BGL
	W3 Steel Railings to Railing Suppliers Details
	W4 215mm Thk brickwork wall max height 1.8m Movement Joints at max 9.0m crs. 500w x 300dp Strip footing with 1 layer of A393 central mesh. Lean mix trench fill to 1.5m BGL
	W5 Steel Railings to Railing Suppliers Details
	W6 Steel Railings to Railing Suppliers Details
	W7 Timber Boarding Fence to Fence Suppliers Details
	W8 Steel Railings to Railing Suppliers Details

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Civil & Structural Design Consultants

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FORMATION GROUP

PROJECT TITLE

WATTS CLOSE, LONDON. N15 EDW

DRAWING TITLE

HARDSTANDING LAYOUT PLAN

SCALE @ A1	JOB NO.	DRAWING NO.	ISSUE
AS SHOWN	22778	C-1201	C1

HARDSTANDING LAYOUT PLAN

SCALE @ A1: 1:150
SCALE @ A3: 1:300

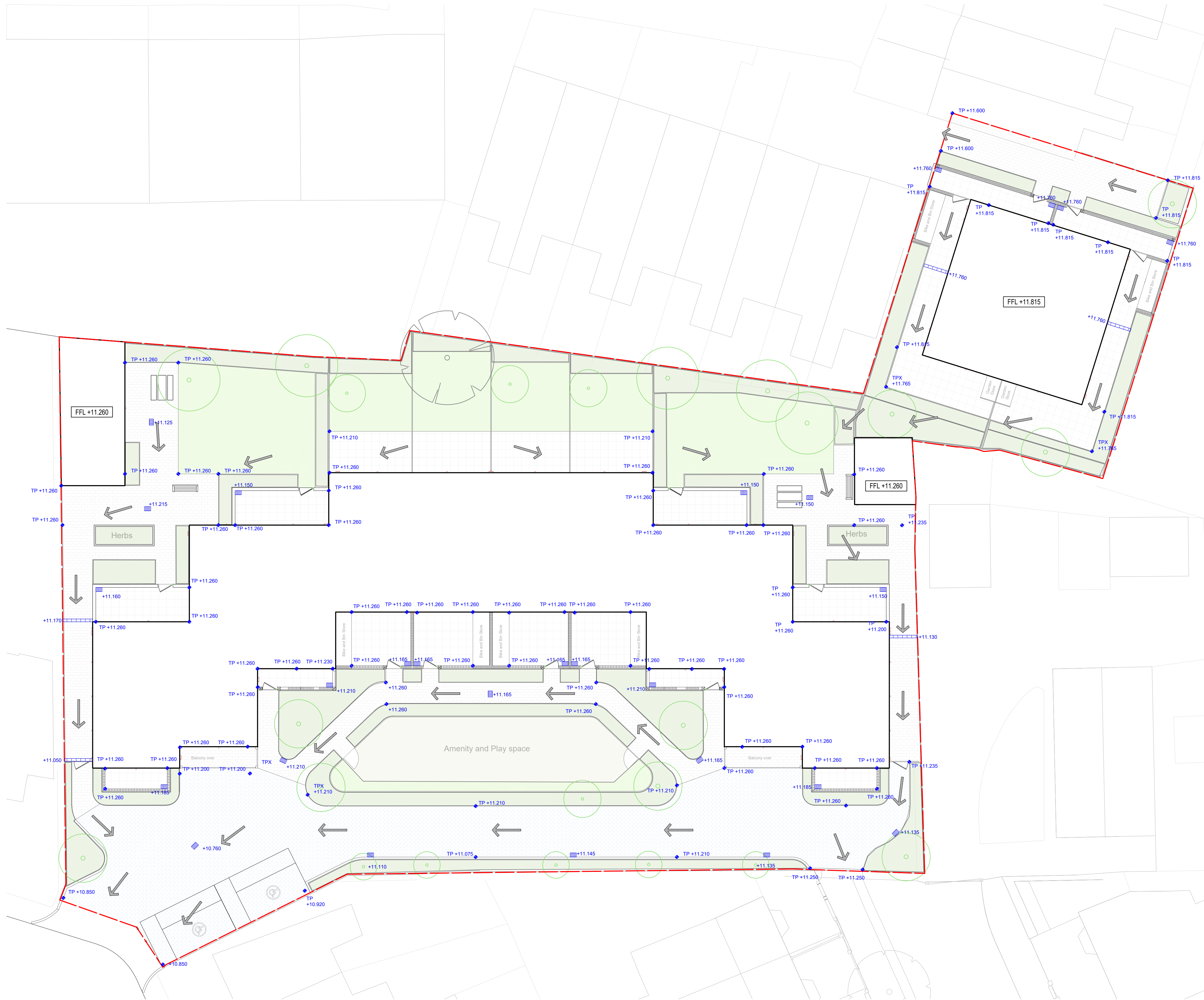
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NOTES

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- CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.
- THIS DRAWING IS FOR DISCHARGE OF PLANNING IN CONJUNCTION WITH ALL RELEVANT SERIES DESIGN DRAWINGS, SPECIFICATIONS AND DOCUMENTATION.
- CONSTRUCTION TO BE IN ACCORDANCE WITH ALL BRITISH AND EUROPEAN STANDARDS AND BUILDING REGULATIONS.
- ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES ABOVE LOCAL DATUM.
- ANY DISCREPANCIES IN THE DETAILS SHOWN ARE TO BE REPORTED TO THE EMPLOYERS REPRESENTATIVE/ENGINEER PRIOR TO CONSTRUCTION.
- ALL EXISTING SERVICES ARE TO BE LOCATED PRIOR TO THE COMMENCEMENT OF ANY WORKS. THE CONTRACTOR MUST NOTIFY THE ENGINEER IMMEDIATELY OF ANY CONFLICT WITH THE PROPOSED WORKS.
- THE GENERAL SPECIFICATION OF MATERIALS AND WORKMANSHIPS FOR THE CONSTRUCTION OF THE ACCESS ROAD, FOOTPATHS AND OTHER AREAS OF HARDSTANDING SHALL BE THE MANUAL OF CONTRACT DOCUMENTS FOR HIGHWAY WORKS, VOLUME 1, SPECIFICATION OF HIGHWAY WORKS (SHW) PUBLISHED BY THE STATIONARY OFFICE.

LEGEND

- FFL +11.260 FINISHED FLOOR LEVEL
- OVERLAND FLOW



PROPOSED OVERLAND DRAINAGE FLOWS

SCALE @ A1: 1:150
SCALE @ A3: 1:300

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DRAWING TITLE
PROPOSED OVERLAND DRAINAGE FLOWS

SCALE @ A1 AS SHOWN	JOB NO. 22778	DRAWING NO. C-1202	ISSUE C1
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