

Proposal: Discharge of condition 16 (drainage)

Location: Every Street Residential, Manchester

MCC Comments 15.04.24

- *Surface water drainage layout including all components, levels, connectivity and proposed overland flow routes for extreme events. – The developer will need to confirm the invert level for C1, this will need to be reflected within the drainage layout.*

CCL response

On-site contractor has confirmed the invert level for C1 is 44.72m. This has been updated on the drainage drawing (1-21590-CCL-XX-XX-DR-C-500-C03).

- *The developer refers to CCTV undertaken in 2019. This must be submitted prior to approval to determine an existing outfall into the public sewer, confirming connectivity.*

CCL response

CCTV confirms connectivity, a copy of the report received from the client has been attached.

- *The overland flow route appears to be demonstrated on a superseded drawing (7261G-WML-00-XX-DR-C-0001-P4). This needs to be reflected within the most recent drawing.*

CCL response

Drawing (1-21590-CCL-XX-XX-DR-C-510-P01) shows overland flow route, which has been appended to this report.

- *Hydraulic calculations to support the drainage proposal. – The modelling must accurately reflect the proposed engineering layout, Manholes: S2, S4, S5, S6 invert levels currently do not correspond with the modelling.*

CCL response

The hydraulic model has been updated to suit the invert levels. Calculation report provided below.

- *Manhole S7 is not included within micro drainage modelling*

CCL response

The Hydraulic model has now been updated incorporating manhole S7 into the design.

- *Details of how the scheme shall be maintained and managed after completion. – The maintenance report must clearly indicate drainage owner. It currently suggests 'it is assumed that a private management company will be responsible'.*

CCL response

Drainage is going to be maintained by Regency Estates located in Bolton, who are employed directly by the developer. This is to be in accordance with the drainage maintenance strategy (DMS) REF: Every Street-DMS 1-21590 appended to this

document. A copy of the DMS should be included in the O&M Manual.

- *Foul manholes F5 and F6 are currently clashing with the surface water network.*

CCL response

Pipe from F5 passes above the SW and drops down into network.

We appreciate the area around F6 is tight however F6 has been tweaked slightly to allow the SW to pass next to the manhole.

- *The proposed drainage layout states: “temporary work required to existing wall to remain, to prevent undermining during drainage and installation”. The developer will need to confirm the temporary work requirements.*

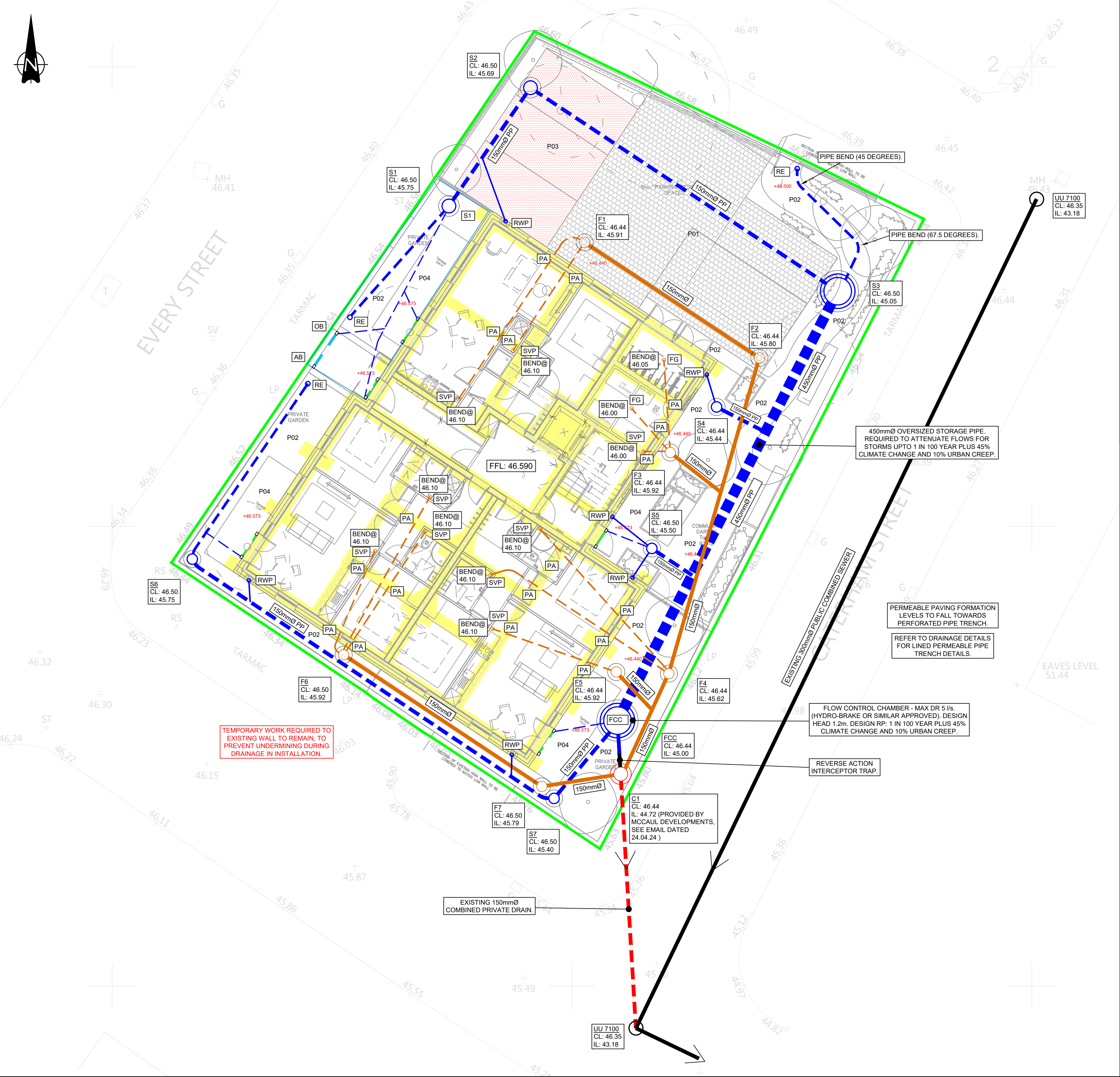
CCL response

Contractor to confirm and provided by others.

- *RE to S3 is appears to be a curved pipe can this please be clarified and amended to suit.*

CCL response

This is a perforated pipe with bends, not a curved pipe – drawing updated to show intent.



KEY:

DEVELOPMENT BOUNDARY

EXISTING PUBLIC COMBINED SEWER

EXISTING PRIVATE COMBINED DRAIN

PROPOSED SURFACE WATER DRAINAGE:
100mm (UNO) PERFORATED PIPE.

PROPOSED FOUL WATER DRAINAGE
150mm UNO

PROPOSED LINED PERMEABLE PAVING

PROPOSED LINED PERMEABLE GRAVEL
(FOOTWAY ONLY)

PROPOSED LINED PERMEABLE GRAVEL
(CAR PARK)

PROPOSED PAVING

FOUNDATIONS

PROPOSED RAIN WATER PIPE AND
100mm CONNECTION. UNO.

PROPOSED SOIL VENT PIPE AND
100mm CONNECTION. UNO.

PROPOSED WASH DOWN GULLY AND
100mm CONNECTION.

PROPOSED RODDING EYE.

PROPOSED 100mm GATIC SLOT DRAIN.
ACCESS AND OUTLET BOXES TO EACH END.
OUTLET SIZE 100mm.

PROPOSED 75mm GATIC FACADE SLOT AT
THRESHOLD. ACCESS AND OUTLET
BOXES TO EACH END OUTLET SIZE 100mm.

PASS ABOVE FOUNDATION.

REFER TO ARCHITECTS LANDSCAPE PROPOSALS FOR LOCATIONS OF P01-P04.

- GENERAL NOTES:**
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS
 - ALL ADAPTABLE DRAINAGE WORKS INCLUDING WORKS TO EXISTING PUBLIC SEWERS TO BE UNDERTAKEN IN ACCORDANCE WITH 'SEWERS FOR ADOPTION 7th EDITION' AND 'CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION' AND CONSTRUCTED TO THE RELEVANT STATUTORY UNDERTAKERS DETAILS.
 - ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH 'CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY 7th EDITION', BS EN 752 2017 'DRAIN AND SEWER SYSTEMS OUTSIDE BUILDINGS' AND THE BUILDING REGULATIONS APPROVED DOCUMENT H.
 - DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
 - DESIGN BASED ON TOPOGRAPHICAL SURVEY AND INFORMATION AVAILABLE AT THE TIME OF THE DESIGN.
 - OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.
 - ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.
 - COVER LEVELS, GULLY POSITIONS, AND BUILDINGS LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT. CONTRACTOR TO ALLOW FOR ADJUSTMENT TO SUIT AGREED POSITIONS AND FINISHED LEVELS, AND CONFIRM ALL COVER LEVELS ON SITE.
 - ALL BELOW SLAB DRAINAGE CONNECTIONS SHOWN TO THE PENETRATION POSITIONS ARE INDICATIVE ONLY. REFER TO DIMENSIONED LOCATIONS AND DIAMETERS ON ARCHITECT'S GROUND FLOOR SETTING-OUT PLANS.
 - ALL UNDERGROUND FOUL DRAINAGE SHOULD BE SUITABLY VENTED AT OR NEAR TO THE HEAD OF RUNS.
 - ALL ACCESS FITTINGS, STACKS, RWP'S AND GULLIES TO BE RODDABLE. ALL TO HAVE LOW LEVEL RODDING ACCESS PLATES UNLESS AN ALTERNATIVE MEANS OF ACCESS IS AGREED. ACCESS POINT TO BE ABOVE ANY GROUND FLOOR CONNECTED APPLIANCE SPILL LEVEL.
 - LARGE ACCESS FITTING REQUIRED ABOVE GROUND WHERE GREATER THAN 12m UP TO 22m TO A JUNCTION. SMALL ACCESS FITTING REQUIRED UP TO 12m TO A JUNCTION.
 - ALL GULLY AND CHANNEL DRAIN OUTLETS AND TERMINATION POINTS TO BE TRAPPED AND RODDABLE. INTERNAL GULLIES AND CHANNEL DRAINS TO BE SPECIFIED BY OTHERS.
 - WHERE NO W/C'S ARE CONNECTED UPSTREAM, UNDERSLAB FW DRAINAGE TO BE LAID AT 1:40 MIN. AFTER THE CONNECTION OF AT LEAST 1NO WC, A MIN. FALL OF 1:80 APPLIES.
 - ALL CONNECTIONS FROM POP-UPS TO BE LAID AT A CONSTANT GRADIENT TO JUNCTION. INSPECTION CHAMBER MANHOLE UNLESS NOTED OTHERWISE. ANY ISSUES RELATING TO CLASHES WITH FOUNDATIONS ARE TO BE FORWARDED TO THE ENGINEER, ALLOWING SUFFICIENT TIME FOR AN ALTERNATIVE SOLUTION TO BE PROPOSED.
 - INVERT LEVELS AT MANHOLES/ INSPECTION CHAMBERS TO BE USED TO SET OUT PIPEWORK. PIPE GRADIENTS ARE SHOWN INDICATIVELY ONLY.
 - ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS.
 - ALL SEWERS, UNLESS AGREED OTHERWISE STATED, SHALL BE:
 - 100mm to 300mm DIA TO BE VITRIFIED CLAY.
 - 375mm DIA AND GREATER TO BE CLASS 120 CONCRETE PIPES.
 - AS AN ALTERNATIVE THE CONTRACTOR MAY USE AN APPROVED UNPLASTICISED POLYVINYL CHLORIDE (PVCU) WITH APPROVAL FROM THE ENGINEER.
 - SEWER PIPES TO BE LAID IN MAXIMUM 3 METRE LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS.
 - THE FIRST PIPE OUT OF MANHOLES TO BE AS SHORT AS PRACTICABLE SO AS TO PROVIDE A FLEXIBLE JOINT AS CLOSE AS POSSIBLE TO THE OUTSIDE FACE OF THE CONCRETE SURROUND AND CONNECTED TO A LENGTH OF ROCKER PIPE.
 - ALL NEW CONNECTIONS INTO EXISTING MANHOLES (OR INTO EXISTING SEWERS) TO BE 'SOFFITS' LEVEL UNLESS OTHERWISE NOTED.
 - ALL PRIVATE DRAINAGE PIPES WITH A COVER OF LESS THAN 600mm IN NON-TRAFFICKED AREAS AND LESS THAN 1200mm IN TRAFFICKED AREAS TO BE BEDDED AND SURROUNDED IN CONCRETE (CLASS 2). COMPRESSIBLE MATERIAL SHALL BE PROVIDED AT EVERY PIPE JOINT. WHERE COVER EXCEEDS THIS DEPTH, PIPES ARE TYPICALLY BEDDED AND SURROUNDED IN CLASS 3. REFER TO PIPE EMBEDMENT DETAILS DRAWING FOR SPECIFIC TYPES.
 - WHERE DRAINAGE PIPES ARE LESS THAN 300mm BELOW THE UNDERSIDE OF THE GROUND FLOOR SLAB, CONCRETE ENCASEMENT IS REQUIRED (CLASS 3). COMPRESSIBLE JOINTS ARE TO BE PROVIDED AT EVERY PIPE JOINT WITHIN THE CONCRETE.
 - WHERE PIPES ARE MORE THAN 300mm BELOW THE UNDERSIDE OF THE SLAB, CLASS 3 BEDDING IS ACCEPTABLE.
 - SULPHATE RESISTANT CEMENT (C20-DC2) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED TO PROVE THAT SUCH PRECAUTIONS ARE NOT REQUIRED.
 - WHERE FOUL SEWERS RUN ABOVE SURFACE SEWERS, CONCRETE PROTECTION MAY BE REQUIRED AT CROSSOVERS TO PREVENT ANY POTENTIAL CONTAMINATION.
 - ALL CONNECTIONS PASSING THROUGH BASES OR EDGE BEAMS TO BE IN SEALED SLEEVES. ALTERNATIVELY CONNECTIONS MAY BE CAST-IN WITH FLEXIBLE JOINTS NOT GREATER THAN 150mm FROM FACE OF CONCRETE.
 - THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION MAY NEED TO BE INCREASED TO ACCOMMODATE THE CONNECTIONS AND BENDS.
 - ALL MANHOLE COVERS IN BLOCKSLAB AND EXTERNAL PAVING AREAS TO HAVE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT ARCHITECT'S PAVING PROPOSAL. ARCHITECT TO CONFIRM.
 - UNLESS NOTED OTHERWISE IN THE MANHOLE SCHEDULE, ALL MANHOLE, GULLY AND CHANNEL COVERS (IRONWORK) SHOULD BE THE FOLLOWING SPECIFICATION:
 - B125 LOAD CLASS IN PEDESTRIAN AREAS
 - D400 LOAD CLASS IN VEHICULAR AREAS
 - ALL PROPRIETARY PRODUCTS TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.
 - CONNECTIONS OUT OF LINEAR DRAINS TO MATCH SIZE OF CHANNEL or minimum 100mm.
 - 100mm CONNECTION SIZE TO POP UPS SUBJECT TO CHANGE FOLLOWING RECEIPT OF ABOVE GROUND DRAINAGE DESIGN. MEP AND ARCHITECT TO CONFIRM.

60 or 80mm BRETT FLOW PERMEABLE PAVING BLOCK (OR SIMILAR APPROVED).

50mm 2-6.3mm CHIPPING IN ACCORDANCE WITH BS7533-13, 2009 TABLE A.2.

350mm MIN COURSE GRADED AGGREGATE TO BS7533-13, 4/20, WITH MIN 30% VOIDS

IMPERMEABLE MEMBRANE IN ACCORDANCE WITH BS 7533-13: 2009 C.L. 6.5.

MIN DEPTH 450mm FOR FROST SUSCEPTIBILITY.

P01 - PERMEABLE PAVING CAR PARK

50mm PLASTIC GRID TO ARCHITECTS SPECIFICATION FILLED WITH FREE DRAINING STONE.

180mm MIN COURSE GRADED AGGREGATE TO BS7533-13, 4/20, WITH MIN 30% VOIDS

IMPERMEABLE MEMBRANE IN ACCORDANCE WITH BS 7533-13: 2009 C.L. 6.5.

MIN DEPTH 450mm FOR FROST SUSCEPTIBILITY.

P02 - PERMEABLE GRAVEL PEDESTRIAN ONLY

80mm PLASTIC GRID TO ARCHITECTS SPECIFICATION FILLED WITH FREE DRAINING STONE.

370mm MIN COURSE GRADED AGGREGATE TO BS7533-13, 4/20, WITH MIN 30% VOIDS

IMPERMEABLE MEMBRANE IN ACCORDANCE WITH BS 7533-13: 2009 C.L. 6.5.

MIN DEPTH 450mm FOR FROST SUSCEPTIBILITY.

P03 - PERMEABLE GRAVEL CAR PARK

SURFACE FINISHES AND LAYING COURSE

COURSE GRADED AGGREGATE REQUIRED FOR ATTENUATION WITH 30% VOIDS

END OF INLET PIPE TO BE WRAPPED IN GEOTEXTILE MEMBRANE. TERRAM O.S.A. PIPE OUTLET ALSO TO BE WRAPPED IN GEOTEXTILE MEMBRANE TO PREVENT INGRESS OF STONE.

FORMATION LEVEL

IMPERMEABLE MEMBRANE IN ACCORDANCE WITH BS 7533-13: 2009 C.L. 6.5.

PIPE SIZE VARIES (mmØ) PERFORATED PIPE TO BE WRAPPED IN GEOTEXTILE MEMBRANE. TERRAM O.S.A.

LINED PIPE TRENCH DETAIL BELOW PERMEABLE SURFACING

TRENCH WIDTH (MIN)
100mmØ PIPE = 300mm
150mmØ PIPE = 450mm
450mmØ PIPE = 750mm

- DRAWINGS BASED ON THE FOLLOWING INFORMATION**
- TOPOGRAPHICAL SURVEY - 100816JC-01
 - UNITED UTILITIES SEWER RECORDS
 - CCTV SURVEY - 11.11.2019 BY GUNN
 - SITE LAYOUT - A695_T_1010-PROPOSED EXTERNAL WORKS PLAN
 - BUILDING OF LAYOUT - A695_T_1102-PROPOSED GROUND FLOOR PLAN
 - FOUNDATIONS - 1-21590-CCL-ZZ-22-M3-S-001
 - MEP INFO - AWAITING

DRAINAGE DESIGN SUBJECT TO APPROVAL FROM THE LEAD LOCAL FLOOD AUTHORITY AND UNITED UTILITIES.

CO1	26.04.24	UPDATED FOR MCC COMMENTS	AA	CD	DS
CO2	29.06.23	CONSTRUCTION ISSUE	CD	SW	DS
CO1	09.06.23	PRELIMINARY CONSTRUCTION	CD	SW	DS
PO1	24.04.23	PRELIMINARY	CD	DS	DS
Rev	Date	Description	By	Check	App.

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Client	MCCAUL DEVELOPMENTS
Project	EVERY STREET, RESIDENTIAL DEVELOPMENT.
Office	ALTRINCHAM
Discipline	CIVILS
Title	DRAINAGE LAYOUT

Scale @ A1	1:100	Status	STAGE 5
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Job Number	Originator	Building/Zone	Level
1-21590	CCL	XX	XX
Type	Discipline	Drawing No.	Revision
DR	C	500	C03

MANHOLE SCHEDULE												
MH REF	CL (mAOD)	IL (mAOD)	DEPTH TO SOFFIT (m)	DS PIPE DIA (m)	MH DIA (mm)	MH TYPE	COVER SIZE (mm)	COVER CLASS	RECESSED	RESTRICTED ACCESS	BACK DROP	COMMENTS
SURFACE WATER												
S1	46.500	45.750	0.60	0.150	600	PPIC	600X600	B125	ARCH TO CONFIRM	N	N	NON ENTRY
S2	46.500	45.687	0.66	0.150	600	PPIC	600X600	D400	ARCH TO CONFIRM	N	N	NON ENTRY
S3	46.500	45.053	1.00	0.450	1200	PCC	600X600	B125	ARCH TO CONFIRM	N	N	NON ENTRY
S4	46.440	45.440	0.85	0.150	450	PPIC	450X450	B125	ARCH TO CONFIRM	N	N	NON ENTRY
S5	46.440	45.500	0.79	0.150	450	PPIC	450X450	B125	ARCH TO CONFIRM	N	N	NON ENTRY
S6	46.500	45.750	0.60	0.150	450	PPIC	450X450	B125	ARCH TO CONFIRM	N	N	NON ENTRY
S7	46.500	45.400	0.95	0.150	450	PPIC	450X450	B125	ARCH TO CONFIRM	N	N	NON ENTRY
FCC	46.500	45.000	1.35	0.150	1200	PCC	600X600	B125	ARCH TO CONFIRM	N	N	FLOW CONTROL CHAMBER
FOUL WATER												
F1	46.440	45.910	0.38	0.15	450	PPIC	450X450	D400	ARCH TO CONFIRM	N	N	NON ENTRY
F2	46.440	45.800	0.49	0.15	450	PPIC	450X450	D400	ARCH TO CONFIRM	N	N	NON ENTRY
F3	46.440	45.920	0.37	0.15	450	PPIC	450X450	B125	ARCH TO CONFIRM	N	N	NON ENTRY
F4	46.440	45.620	0.67	0.15	450	PPIC	450X450	B125	ARCH TO CONFIRM	N	N	NON ENTRY
F5	46.440	45.920	0.37	0.15	450	PPIC	450X450	B125	ARCH TO CONFIRM	N	N	NON ENTRY
F6	46.500	45.920	0.43	0.15	450	PPIC	450X450	B125	ARCH TO CONFIRM	N	N	NON ENTRY
F7	46.500	45.790	0.56	0.15	450	PPIC	450X450	B125	ARCH TO CONFIRM	N	N	NON ENTRY
C1	46.440	44.720	1.57	0.15	600	PPIC	600X600	B125	ARCH TO CONFIRM	N	N	NON ENTRY

NON ENTRY - REDUCER CAP REQUIRED AND FITTED TO SHAFT, PPIC - POLYPROPYLENE INSPECTION CHAMBER, CP - CATCH PIT TYPE, PCC - PRECAST CONCRETE.



KEY:

SITE BOUNDARY

OVERLAND FLOW ROUTE

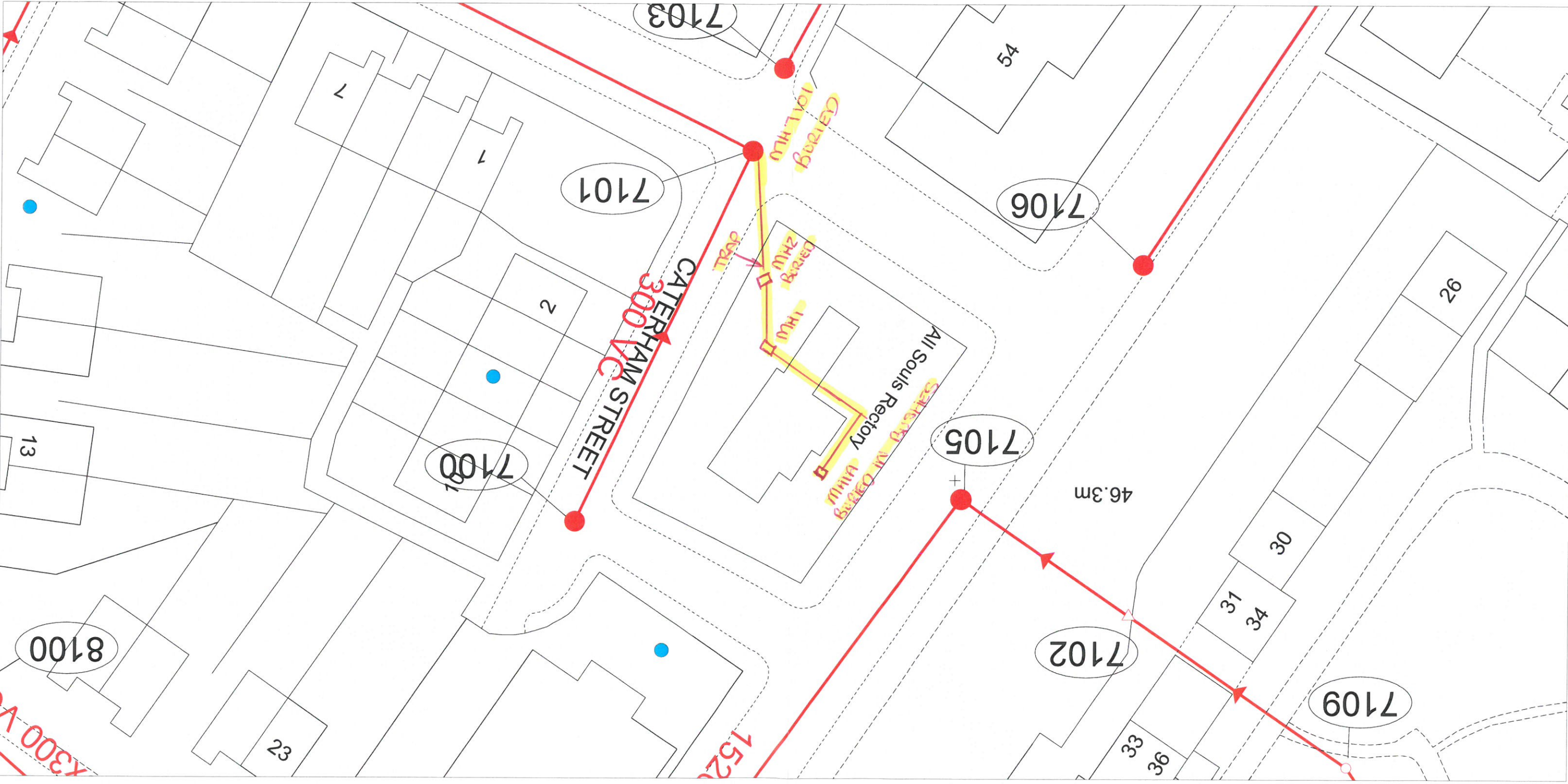
GENERAL FALL ARROWS

LANDSCAPE LEVELS

+46.573



CCTV PLAN AND MANHOLE CARDS



Civil Engineering, Drainage and Groundwork Contractors

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Man Entry Sewer & Culvert Traverse Surveys,
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Sewer Connections and Site Investigation Excavations.



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website: www.generalutilitiesnorthwest.co.uk

CUSTOMER ACCEPTANCE RECEIPT

Company Reg. No. 6468779

4171

SITE ADDRESS

ALL SOULS RECTORY
EVERY ST MANCHESTER

WORK CARRIED OUT

M. TALBOT J. MORRIS

CCTV SURVEY FROM M/H 1 D/S TO
BURIED M/H 2 EXCAVATED THIS M/H
DOWN TO MAIN BURIED M/H SURVEY
LINE A U/S FROM M/H 1 THIS GOES TO
BURIED M/H AT FRONT ALL OTHER LEGS WILL
NEED JETTING TO SURVEY

PLEASE SIGN AND RETURN PINK COPY TO THE ABOVE ADDRESS

RECEIVED

DATE

4/11/19

Manhole number 0 1 Nat grid reference East North Manhole number MH 1

0 2 Location ALL SOULS RECTORY

EVERY ST MANCHESTER

0 3 Year laid * Status * Function C Manhole type MH Date of survey 04 1 19

COVER DETAILS

0 4 Square or rectang. ☒ Double triang. ☐ Single triang. ☐ Circular ☐ Multiple ☐ Hinged ☐ Lockable ☐

PIPE DETAILS

Cover level 1.56 m Cover duty L

Incoming pipes

Pipe	Invert level (m)	Depth from cover (m)	Upstream / downstream M H ref	Shape	Size (mm) ¹ (dia)	Pipe ¹ mat.	Lining ² mat.	Back drop dia (mm)
0 5 A		1.55		C	X 100	VC		
B		1.55		C	X 100	VC		
C		1.55		C	X 100	VC		
D		0.70		C	X 100	VC		100
E					X			
F					X			

Outgoing pipes

X		1.56			X 150	VC		
Y					X			

0 6 Cover¹ opening (dia) 500 X 650 mm Chamber¹ (dia) 900 X 700 mm Evidence of surcharge ☐

0 7 Shaft¹ 460 X 600 mm Shaft depth (from C L) 150 m Toxic atmosphere ☐

MANHOLE CONSTRUCTION DETAILS

0 8 Brick ☒ Pre-cast concrete ☐ In situ concrete ☐ Segments unlined ☐ Segments lined ☐ Step irons 3 Ladder ☐

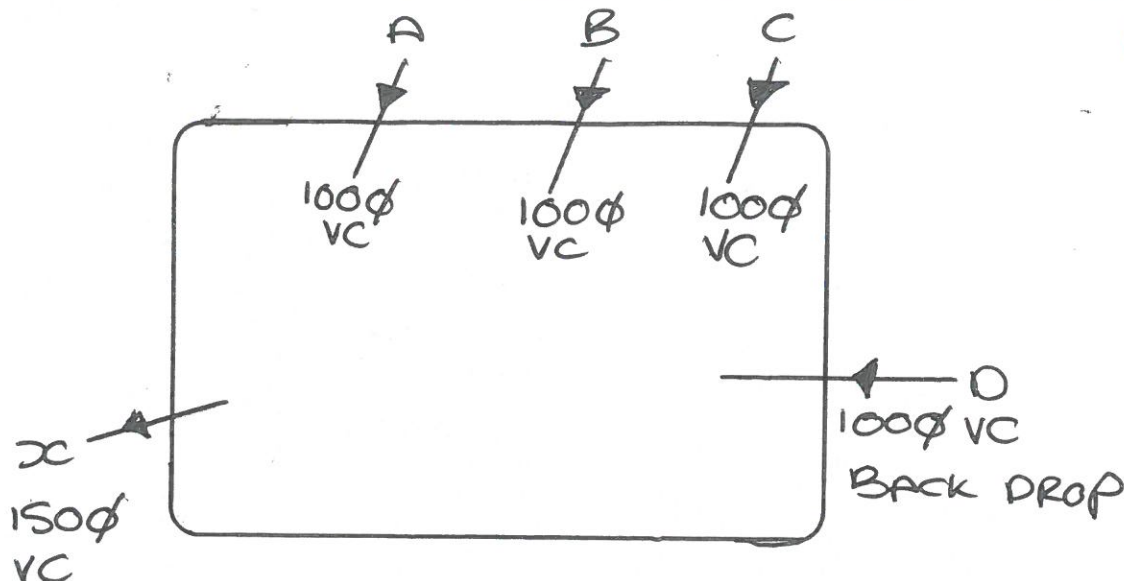
0 9 Reducing slab ☐ Taper ☐ Side entry ☐ No. of landings ☐ No. of regulating¹ brick courses ☐

CONDITION INFORMATION

	Cover	Shaft	Irons/ladder	Chamber	Benching/channel
1 0 O.K.	☐	☒	☒	☒	☒
1 1 Needs attention	☒	☐	☐	☐	☐
1 2 Urgent attention	☐	☐	☐	☐	☐

1 3 REMARKS - COVER CRACKED

DIAGRAM



YEAR LAID	Applies to main outlet	
STATUS	PU	Public
	PR	Private
	24	Section 24
	HD	Highway drain
	WC	Culverted watercourse
} Applies to main outlet		
FUNCTION	F	Foul
	C	Combined
	S	Surface water
} Applies to main outlet		
MANHOLE TYPE	MH	Manhole
	CP	Catchpit
	LH	Lamphole
	RE	Rodding eye
	SO	Storm overflow
COVER DUTY	L	Light duty
	M	Medium duty
	H	Heavy duty
SHAPE	C	Circular
	E	Egg
	R	Rectangular
	S	Square
	T	Trapezoidal
	A	Arched
PIPE (OR LINING) MATERIAL	B	Barrel
	H	Horseshoe (inverted u)
	U	U-shaped with flat top
	X	Other (state in remarks)
	PSC	Plastic/steel composite
	PVC	Polyvinyl chloride
	PE	Polyethylene
	RPM	Reinforced plastic matrix
	ST	Steel
	VC	Vitrified clay
	PP	Polypropylene
	PF	Pitch fibre
	MAC	Masonry, coursed
	MAR	Masonry, random courses
	XXX	Other (state in remarks)
	AK	Alkathene
	AC	Asbestos cement
	BR	Brick
	CI	Cast iron
	SI	Spun (grey) iron
	CO	Concrete
	CSB	Conc. segments (bolted)
	CSU	Conc. segments (unbolted)
	CC	Conc. box culvert
	DI	Ductile iron
	GRC	Glass reinforced conc.
	GRP	Glass reinforced plastic

LINING	BL	Bitumen
	CL	Cement
	RL	Resin
	PL	Plastic
	IS	Insituform



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website: www.generalutilitiesnorthwest.co.uk

Manhole number

01

Nat grid reference

East

North

Manhole number

MH2

02

Location

ALL SOULS RECTORY

EVERY ST MANCHESTER

03

Year laid

Status

Function

C

Manhole type

MH

Date of survey

041119

COVER DETAILS

04

Square or rectang.

Double triang.

Single triang.

Circular

Multiple

Hinged

Lockable

PIPE DETAILS

Cover level

1.26

m

Cover duty

L

Incoming pipes

Pipe	Invert level (m)	Depth from cover (m)	Upstream /downstream M H ref	Shape	Size (mm) ¹ (dia)	Pipe ¹ mat.	Lining ² mat.	Back drop dia (mm)
05A		1.24		C	X 100	VC		
B		1.25		C	X 150	VC		
C		0.50		C	X 100	VC		
D					X			
E					X			
F					X			

Outgoing pipes

X		1.26			X 150	VC		
Y					X			

06

Cover¹ opening

(dia)

680 X 530

mm

Chamber¹

(dia)

720 X 700

mm

Evidence of surcharge

07

Shaft¹

600 X 450

mm

Shaft depth (from C/L)

1.50

m

Toxic atmosphere

MANHOLE CONSTRUCTION DETAILS

08

Brick

Pre-cast concrete

In situ concrete

Segments unlined

Segments lined

Step irons

2

Ladder

09

Reducing slab

Taper

Side entry

No. of landings

No. of regulating¹ brick courses

CONDITION INFORMATION

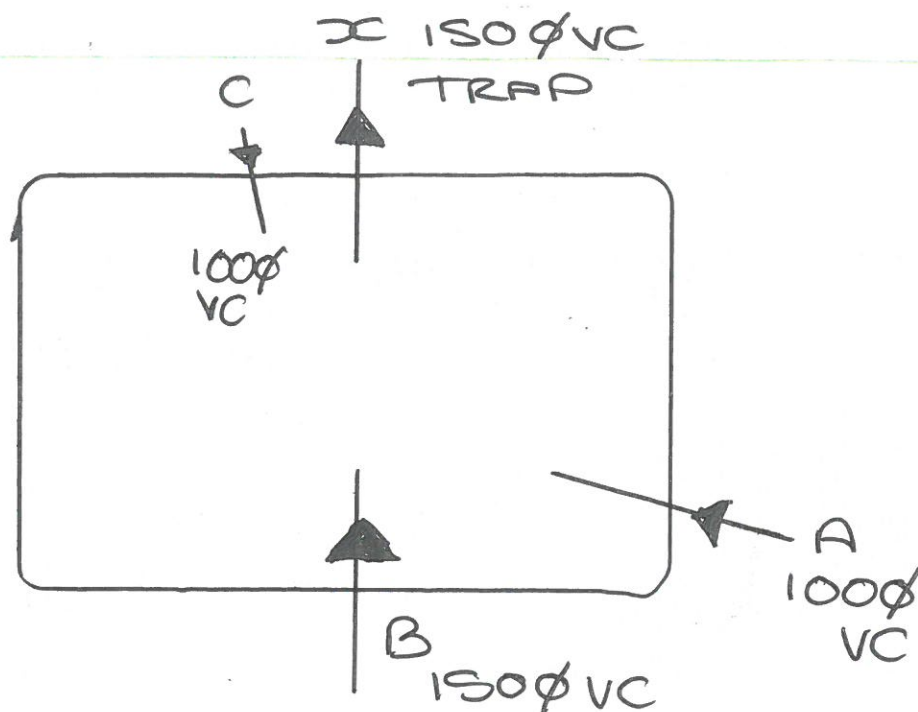
	Cover	Shaft	Irons/ladder	Chamber	Benching/channel
10	O.K.				
11	Needs attention				
12	Urgent attention				

13

REMARKS

BURIED /MANHOLE

DIAGRAM



YEAR LAID

Applies to main outlet

STATUS

PU — Public
PR — Private
24 — Section 24
HD — Highway drain
WC — Culverted watercourse

Applies to main outlet

FUNCTION

F — Foul
C — Combined
S — Surface water

Applies to main outlet

MANHOLE TYPE

MH — Manhole
CP — Catchpit
LH — Lamphole
RE — Rodding eye
SO — Storm overflow

COVER DUTY

L — Light duty
M — Medium duty
H — Heavy duty

SHAPE

C — Circular
E — Egg
R — Rectangular
S — Square
T — Trapezoidal

A — Arched
B — Barrel
H — Horseshoe (inverted u)
U — U-shaped with flat top
X — Other (state in remarks)

PIPE (OR LINING) MATERIAL

AK — Alkathene
AC — Asbestos cement
BR — Brick
CI — Cast iron
SI — Spun (grey) iron
CO — Concrete
CSB — Conc. segments (bolted)
CSU — Conc. segments (unbolted)
CC — Conc. box culvert
DI — Ductile iron
GRC — Glass reinforced conc.
GRP — Glass reinforced plastic

PSC — Plastic/steel composite
PVC — Polyvinyl chloride
PE — Polyethylene
RPM — Reinforced plastic matrix
ST — Steel
VC — Vitrified clay
PP — Polypropylene
PF — Pitch fibre
MAC — Masonry, coursed
MAR — Masonry, random courses
XXX — Other (state in remarks)

LINING

BL — Bitumen
CL — Cement
RL — Resin
PL — Plastic
IS — Insituform



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HYDRAULIC CALCULATIONS

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	1.00
FSR Region	England and Wales	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.400	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
S1	0.009	5.00	46.500	600	385754.641	398173.942	0.750
S2	0.012	5.00	46.500	600	385758.188	398179.089	0.810
S3	0.001	5.00	46.500	1200	385771.510	398170.236	1.450
S4	0.003	5.00	46.440	450	385766.282	398165.196	1.000
JUNCTION 1	0.005	5.00	46.500		385768.411	398164.087	1.467
JUNCTION 2	0.005	5.00	46.500		385765.207	398157.877	1.484
S5	0.005	5.00	46.500	450	385763.466	398159.040	1.000
S6	0.011	5.00	46.500	450	385743.481	398158.578	0.750
S7	0.008	5.00	46.500	450	385759.213	398148.161	1.100
FCC	0.001	5.00	46.440	1200	385761.973	398151.547	1.440
EX MHC1	0.000		46.500	600	385762.113	398149.224	1.600
EX UU MH	0.000		45.100	2400	385762.776	398138.168	1.920

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)
1000	S1	S2	6.251	0.600	45.750	45.690	0.060	104.2	150	5.11	46.2
1001	S2	S3	15.995	0.600	45.690	45.350	0.340	47.0	150	5.29	45.5
1002	S3	JUNCTION 1	6.886	0.600	45.050	45.033	0.017	400.0	450	5.40	45.1
2000	S4	JUNCTION 1	2.401	0.600	45.440	45.033	0.407	5.9	150	5.01	46.6
1003	JUNCTION 1	JUNCTION 2	6.988	0.600	45.033	45.016	0.017	411.0	450	5.52	44.7
3000	S6	S7	18.868	0.600	45.750	45.400	0.350	53.9	150	5.23	45.8
3001	S7	FCC	4.368	0.600	45.400	45.000	0.400	10.9	150	5.25	45.7
1004	FCC	EX MHC1	2.327	0.600	45.000	44.900	0.100	23.3	150	5.66	44.2
1005	EX MHC1	EX UU MH	11.076	0.600	44.900	43.180	1.720	6.4	150	5.71	44.0
3.000	S5	JUNCTION 2	2.094	0.600	45.500	45.016	0.484	4.3	100	5.01	46.6

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1000	0.984	17.4	1.1	0.600	0.660	0.009	0.0	26	0.556
1001	1.470	26.0	2.6	0.660	1.000	0.021	0.0	32	0.942
1002	1.010	160.7	2.7	1.000	1.017	0.022	0.0	40	0.384
2000	4.176	73.8	0.4	0.850	1.317	0.003	0.0	8	1.087
1003	0.996	158.5	3.6	1.017	1.034	0.030	0.0	46	0.415
3000	1.373	24.3	1.4	0.600	0.950	0.011	0.0	24	0.745
3001	3.066	54.2	2.4	0.950	1.290	0.019	0.0	21	1.542
1004	2.096	37.0	7.2	1.290	1.450	0.060	0.0	45	1.630
1005	3.996	70.6	7.2	1.450	1.770	0.060	0.0	32	2.567
3.000	3.744	29.4	0.6	0.900	1.384	0.005	0.0	11	1.530

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)
1.004	JUNCTION 2	FCC	7.108	0.600	45.016	45.000	0.016	444.3	450	5.64	44.2

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.004	0.958	152.3	4.8	1.034	0.990	0.040	0.0	54	0.441

Pipeline Schedule

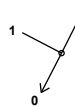
Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1000	6.251	104.2	150	Circular	46.500	45.750	0.600	46.500	45.690	0.660
1001	15.995	47.0	150	Circular	46.500	45.690	0.660	46.500	45.350	1.000
1002	6.886	400.0	450	Circular	46.500	45.050	1.000	46.500	45.033	1.017
2000	2.401	5.9	150	Circular	46.440	45.440	0.850	46.500	45.033	1.317
1003	6.988	411.0	450	Circular	46.500	45.033	1.017	46.500	45.016	1.034
3000	18.868	53.9	150	Circular	46.500	45.750	0.600	46.500	45.400	0.950
3001	4.368	10.9	150	Circular	46.500	45.400	0.950	46.440	45.000	1.290
1004	2.327	23.3	150	Circular	46.440	45.000	1.290	46.500	44.900	1.450
1005	11.076	6.4	150	Circular	46.500	44.900	1.450	45.100	43.180	1.770
3.000	2.094	4.3	100	Circular	46.500	45.500	0.900	46.500	45.016	1.384
1.004	7.108	444.3	450	Circular	46.500	45.016	1.034	46.440	45.000	0.990

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1000	S1	600	Manhole	Adoptable	S2	600	Manhole	Adoptable
1001	S2	600	Manhole	Adoptable	S3	1200	Manhole	Adoptable
1002	S3	1200	Manhole	Adoptable	JUNCTION 1		Junction	
2000	S4	450	Manhole	Adoptable	JUNCTION 1		Junction	
1003	JUNCTION 1		Junction		JUNCTION 2		Junction	
3000	S6	450	Manhole	Adoptable	S7	450	Manhole	Adoptable
3001	S7	450	Manhole	Adoptable	FCC	1200	Manhole	Adoptable
1004	FCC	1200	Manhole	Adoptable	EX MHC1	600	Manhole	Adoptable
1005	EX MHC1	600	Manhole	Adoptable	EX UU MH	2400	Manhole	Adoptable
3.000	S5	450	Manhole	Adoptable	JUNCTION 2		Junction	
1.004	JUNCTION 2		Junction		FCC	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1	385754.641	398173.942	46.500	0.750	600				
						0	1000	45.750	150
S2	385758.188	398179.089	46.500	0.810	600				
						1	1000	45.690	150
						0	1001	45.690	150
S3	385771.510	398170.236	46.500	1.450	1200				
						1	1001	45.350	150
						0	1002	45.050	450

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S4	385766.282	398165.196	46.440	1.000	450				
						0	2000	45.440	150
JUNCTION 1	385768.411	398164.087	46.500	1.467			1	2000	45.033
						2	1002	45.033	150
						0	1003	45.033	450
JUNCTION 2	385765.207	398157.877	46.500	1.484			1	3.000	45.016
						2	1003	45.016	100
						0	1.004	45.016	450
S5	385763.466	398159.040	46.500	1.000	450				
						0	3.000	45.500	100
S6	385743.481	398158.578	46.500	0.750	450				
						0	3000	45.750	150
S7	385759.213	398148.161	46.500	1.100	450		1	3000	45.400
						0	3001	45.400	150
FCC	385761.973	398151.547	46.440	1.440	1200		1	3001	45.000
						2	1.004	45.000	450
						0	1004	45.000	150
EX MHC1	385762.113	398149.224	46.500	1.600	600		1	1004	44.900
						0	1005	44.900	150
EX UU MH	385762.776	398138.168	45.100	1.920	2400		1	1005	43.180

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	17.000	Drain Down Time (mins)	240
Ratio-R	0.400	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440



Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	0	0	0
30	0	0	0
100	45	10	0

Node FCC Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	45.000	Product Number	CTL-SHE-0103-5000-1200-5000
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	10	45.776	0.026	1.1	0.0135	0.0000	OK
15 minute winter	S2	10	45.721	0.031	2.5	0.0182	0.0000	OK
15 minute winter	S3	13	45.138	0.088	2.5	0.1007	0.0000	OK
15 minute winter	S4	10	45.448	0.008	0.4	0.0017	0.0000	OK
15 minute winter	JUNCTION 1	13	45.138	0.105	3.0	0.0071	0.0000	OK
15 minute winter	JUNCTION 2	13	45.138	0.122	3.3	0.0082	0.0000	OK
15 minute winter	S5	10	45.510	0.010	0.6	0.0026	0.0000	OK
15 minute winter	S6	10	45.774	0.024	1.3	0.0109	0.0000	OK
15 minute winter	S7	10	45.421	0.021	2.3	0.0063	0.0000	OK
15 minute winter	FCC	13	45.138	0.138	4.8	0.1577	0.0000	OK
15 minute winter	EX MHC1	13	44.926	0.026	4.3	0.0073	0.0000	OK
15 minute winter	EX UU MH	13	43.205	0.025	4.3	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	1000	S2	1.1	0.459	0.062	0.0146	
15 minute winter	S2	1001	S3	2.4	0.911	0.092	0.0421	
15 minute winter	S3	1002	JUNCTION 1	2.0	0.271	0.013	0.1716	
15 minute winter	S4	2000	JUNCTION 1	0.4	0.221	0.005	0.0161	
15 minute winter	JUNCTION 1	1003	JUNCTION 2	2.2	0.223	0.014	0.2191	
15 minute winter	JUNCTION 2	1.004	FCC	3.0	0.131	0.020	0.2690	
15 minute winter	S5	3.000	JUNCTION 2	0.6	0.452	0.020	0.0086	
15 minute winter	S6	3000	S7	1.3	0.769	0.052	0.0312	
15 minute winter	S7	3001	FCC	2.2	0.854	0.041	0.0393	
15 minute winter	FCC	Hydro-Brake®	EX MHC1	4.3				
15 minute winter	EX MHC1	1005	EX UU MH	4.3	2.185	0.061	0.0220	3.2

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1	10	45.791	0.041	2.6	0.0216	0.0000	OK
15 minute winter	S2	10	45.741	0.051	6.1	0.0293	0.0000	OK
30 minute winter	S3	24	45.398	0.348	4.9	0.3982	0.0000	OK
15 minute winter	S4	10	45.452	0.012	0.9	0.0026	0.0000	OK
30 minute winter	JUNCTION 1	24	45.398	0.365	5.1	0.0248	0.0000	OK
30 minute winter	JUNCTION 2	24	45.398	0.382	4.7	0.0256	0.0000	OK
15 minute winter	S5	10	45.515	0.015	1.5	0.0040	0.0000	OK
15 minute winter	S6	10	45.788	0.038	3.2	0.0173	0.0000	OK
15 minute winter	S7	10	45.432	0.032	5.5	0.0098	0.0000	OK
30 minute winter	FCC	24	45.398	0.398	6.7	0.4558	0.0000	SURCHARGED
30 minute winter	EX MHC1	30	44.928	0.028	5.0	0.0079	0.0000	OK
30 minute winter	EX UU MH	30	43.207	0.027	5.0	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	1000	S2	2.6	0.565	0.148	0.0286	
15 minute winter	S2	1001	S3	6.0	1.173	0.231	0.0817	
30 minute winter	S3	1002	JUNCTION 1	3.3	0.248	0.020	0.9266	
15 minute winter	S4	2000	JUNCTION 1	0.9	0.329	0.012	0.0219	
30 minute winter	JUNCTION 1	1003	JUNCTION 2	2.7	0.228	0.017	0.9821	
30 minute winter	JUNCTION 2	1.004	FCC	3.9	0.140	0.025	1.0370	
15 minute winter	S5	3.000	JUNCTION 2	1.5	0.537	0.051	0.0090	
15 minute winter	S6	3000	S7	3.2	1.007	0.130	0.0592	
15 minute winter	S7	3001	FCC	5.4	0.960	0.100	0.0445	
30 minute winter	FCC	Hydro-Brake®	EX MHC1	5.0				
30 minute winter	EX MHC1	1005	EX UU MH	5.0	2.275	0.071	0.0243	10.4

Results for 100 year +45% CC +10% A Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	S1	29	46.311	0.561	4.2	0.3069	0.0000	FLOOD RISK
30 minute winter	S2	29	46.312	0.622	9.8	0.3785	0.0000	FLOOD RISK
30 minute winter	S3	29	46.309	1.259	10.2	1.4429	0.0000	FLOOD RISK
30 minute winter	S4	29	46.309	0.869	2.6	0.1955	0.0000	FLOOD RISK
30 minute winter	JUNCTION 1	29	46.310	1.277	9.2	0.0958	0.0000	FLOOD RISK
30 minute winter	JUNCTION 2	29	46.309	1.293	8.6	0.0957	0.0000	FLOOD RISK
30 minute winter	S5	29	46.309	0.809	4.7	0.2176	0.0000	FLOOD RISK
30 minute winter	S6	29	46.310	0.560	5.7	0.2700	0.0000	FLOOD RISK
30 minute winter	S7	29	46.309	0.909	8.8	0.2900	0.0000	FLOOD RISK
30 minute winter	FCC	29	46.310	1.310	9.3	1.5009	0.0000	FLOOD RISK
30 minute winter	EX MHC1	29	44.928	0.028	5.2	0.0080	0.0000	OK
30 minute winter	EX UU MH	29	43.208	0.028	5.2	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)
30 minute winter	S1	1000	S2	4.2	0.650	0.244	0.1100	
30 minute winter	S2	1001	S3	9.7	1.254	0.373	0.2816	
30 minute winter	S3	1002	JUNCTION 1	6.9	0.283	0.043	1.0910	
30 minute winter	S4	2000	JUNCTION 1	1.3	0.329	0.017	0.0423	
30 minute winter	JUNCTION 1	1003	JUNCTION 2	6.3	0.246	0.040	1.1072	
30 minute winter	JUNCTION 2	1.004	FCC	4.7	0.163	0.031	1.1262	
30 minute winter	S5	3.000	JUNCTION 2	-2.4	0.522	-0.081	0.0164	
30 minute winter	S6	3000	S7	5.1	1.101	0.210	0.3322	
30 minute winter	S7	3001	FCC	7.3	0.912	0.134	0.0769	
30 minute winter	FCC	Hydro-Brake®	EX MHC1	5.2				
30 minute winter	EX MHC1	1005	EX UU MH	5.2	2.302	0.074	0.0251	21.9

DRAINAGE MAINTENANCE STRATEGY

Every Street – DMS 1-21590

Outline Drainage Maintenance Operations

This section is intended to give an overview of the operation and maintenance for the drainage features included with the drainage strategy and in relation to typical details. Where proprietary products are specified, the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints.

The recommended operations and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation and then adjusted to suit the site requirements.

Drainage components are indicated on Clancy Consulting Ltd Drainage Strategy drawing.

Components

The following components have been included within the drainage design for the proposed development:

- Manhole and Inspection Chambers
- Linear Drains
- Gullies and Floor Drains
- Pipework
- Flow Control Unit – Hydro-brake
- Permeable Paving

A suitable maintenance strategy should be adopted to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented.

It is assumed that the maintenance of the drainage network will be the responsibility of an on-site facilities management team.

A copy of the final construction drainage layout should be provided in the final Operations and Maintenance Manual.

The surface water network has been designed to accommodate the 1 in 100 year storm rainfall event plus an allowance for climate change particular to the requirements of the site. It may be that the exceedance flows above the 1 in 30 year storm rainfall event are stored within the site partially above ground, on non-habitable external landscaping, parking or other space. As the flows are generally being attenuated on site and within SuDS features there will be a period of time after storm events where the network is still partially or fully surcharged and is draining

down. Where this surcharging is still present after 48hrs appropriate action should be taken as noted below.

It is recommended that the drainage system is inspected as a minimum twice a year, with the system also being inspected after any major storm event.

Significant sediment deposition is likely in areas used for storage, so a post clean-up operation may be required including the removal of litter, vegetation, sewerage debris and larger objects.

Long-term management practices include monthly sweeping of external paved areas. The sweeping program will remove sand and contaminants directly from paved surfaces before they become mobilised during storm events and transported to the drainage system.

During the winter months, drainage features such as gullies and channels should be cleared of ice, snow, debris or litter.

Sediment/material removal should be undertaken in consultation with the environmental regulator to confirm appropriate protocols; especially where run-off is taken from potentially contaminated areas such as the filter drains and the upstream/downstream chambers.

Should any oil or fuel spillages occur, these are to be cleaned up locally to prevent contaminants being washed into the surface water system by rainfall. Spillages such as these should not be washed into the drainage system.

Manholes and Inspection Chambers

Description

Manholes providing rodding and jetting access to pipe work.

Normally manholes, in similarity to inspection chambers, are designed for access by operatives. Manholes must only be accessed after a risk assessment, and the implementation of a safe system of work, which identifies the specific risk to confined space.

Maintenance Issues

It is not likely that Manholes will present maintenance issues. However, they allow both the access to the drainage infrastructure and allow visual inspection from the surface of any key maintenance issues.

Schedule	Action Required	Frequency
Routine/regular maintenance (inc. inspections and monitoring)	Remove covers and ensure that there are no blockages. Inspect and ascertain any parts that are not operating correctly and resolve.	For 3 months after installation
	Check covers do not need repairing.	Monthly
	Check drainage is running freely by inspecting manholes and inspection chambers.	Every 6 months and following the leaf fall in autumn.
Occasional maintenance	Suction sweeping and cleansing (to Water Jetting Association standards) and CCTV where appropriate.	2 – 4 Years
Remedial maintenance	• Silt removal • Inlet/outlet repair • Erosion repairs • System recovery following a pollution event • Manhole Cover replacement • Repairs to brickwork or concrete • Chancel repair	When required (tasks to repair problems due to wear, damage or vandalism)

Linear Drains

Description

Surface Water is drained over impermeable sections towards grated, or slot-type linear drains at low points and water is carried to below ground pipework.

Maintenance Issues

Linear drains could get blocked by silt or debris, causing flooding.

Linear drains frequently include silt traps at outlets which can cause siltation of downstream drainage infrastructure if the appropriate maintenance is not undertaken.

Maintenance Regime

Schedule	Action Required	Frequency
Routine/regular maintenance (inc. inspections and monitoring)	Inspect linear drains to make sure that there are no blockages at surface level. Remove covers to outflow boxes and check for blockages or siltation. Inspect and identify any parts that are not operating correctly and resolve.	For 3 months after installation
	Inspect linear drains to make sure that there are no blockages at surface level.	Monthly
	Remove covers to outflow boxes and check for blockages or siltation.	Every 6 months and following the leaf fall in autumn.
Occasional maintenance	Jetting of linear drains and suction vacuuming of outlet boxes (to Water Jetting Association standards) and CCTV where appropriate.	1 – 2 Years
Remedial maintenance	• Silt removal • Inlet/outlet repair • Erosion repairs • System rehabilitation following a pollution event • Linear drain cover replacement • Chancel repair • Ensure that impermeable surfaces surrounding linear drains have not settled below top of linear drain level, causing ponding	When required (tasks to repair problems due to wear, damage or vandalism)

Gullies and Floor Drains

Description

Surface Water is drained over impermeable areas towards grated gullies at low points and water is carried to below ground pipework.

Foul Drains used for washdown purposes within the building.

Maintenance Issues

Gullies can become blocked by silt or debris, causing flooding.

Gullies include integral silt traps which can cause siltation of downstream drainage infrastructure if the appropriate maintenance is not undertaken.

Gullies frequently include a trapped outlet which prevents liquids lighter than water (ie oil and fuel) departing the gully. If silt and light liquids do not get removed regularly silt and oil will move downstream to other areas of the drainage network, some of which may be difficult to access, or totally inaccessible.

Maintenance Regime

Schedule	Action Required	Frequency
Routine/regular maintenance (inc. inspections and monitoring)	Inspect to ensure that there are no blockages at surface level, and that the outfall is operating efficiently.	For 3 months after installation
	Inspect and identify any parts that are not operating correctly and resolve.	
	Check that there are no blockages at surface level.	Monthly
	Remove covers to check for blockages or siltation.	Every 6 months and following the leaf fall in autumn.
Occasional maintenance	Remove oil and silt using specialist vacuum extraction plant.	1 – 2 Years
Remedial maintenance	- Silt removal - Inlet/outlet repair - Erosion repairs - System rehabilitation following a pollution event - Cover replacement - Structural failure of gully pot - Ensure that impermeable surfaces surrounding linear drains have not settled below top of gully cover level, causing ponding	When required (tasks to repair problems due to wear, damage or vandalism)

Pipework

Description

Below ground drainage pipework connects drainage inlets (gullies, linear drains etc) to manholes as well as providing connections between manholes.

Maintenance Issues

Pipes could become blocked by silt, debris fat, grease, or collapse. In addition, it's possible for pipe joints to become displaced or for roots to grow from the surrounding ground into the pipes.

These factors can cause a reduction in, or loss of, the hydraulic capability of the pipes which could cause flooding to land and buildings.

Defects in pipes could cause a reduction in stability to ground underlying foundations, thus, causing settlement and damage to buildings and external surfaces.

The material of pipes and associated couplings can be damaged if aggressive liquids are passed through the pipes.

It is recommended that trees are not planted within 3m of pipes to reduce the risk of root ingress.

Maintenance Regime

Schedule	Action Required	Frequency
Routine/regular maintenance (inc. inspections and monitoring)	Inspect and identify any parts that are not operating correctly and resolve.	For 3 months after installation.
	Monitor working of drainage at ground level. The indications damaged pipework's may include localised flooding or emission of smells.	Monthly
	Remove manholes covers to check for blockages.	Every 6 months
Occasional maintenance	CCTV pipework, clean to WRC Sewer Jetting Code of Practice. Resolve issues as appropriate.	1 – 2 Years
Remedial maintenance	• Silt removal. • Fat and Grease removal. • Erosion repairs. • Joint displacement. • Structural failure, cracking or collapse. • System rehabilitation following a pollution event.	When required (tasks to repair problems due to wear, damage or vandalism)

Vortex Controls

Description

Vortex controls, often called Hydro-brakes, are installed in some manholes to limit the rate of flow. Vortex controls are normally constructed in steel and installed in a manhole with a sump.

Maintenance Issues

Vortex controls could become blocked by debris, plastic bags or other sheet material. If silt is allowed to build up in the sump the operation of the device could be impeded causing flooding upstream.

Maintenance Regime

Schedule	Action Required	Frequency
Routine/regular maintenance (inc. inspections and monitoring)	Check manufacturer's specification. Inspect and identify any parts that are not operating, consult supplier and remediate as required.	For 3 months after installation
	Monitor working of drainage at ground level. Where localised flooding occurs, check the condition of all system elements.	Monthly
	Remove manholes covers to check for blockages. Remove sediment from pre-treatment structures, gullies, catchpits etc.	Every 6 months and following the leaf fall in autumn.
Occasional maintenance	Clean to WRC Sewer Jetting Code of Practice. Resolve issues as appropriate.	1 – 2 Years
Remedial maintenance	Inspect, and remedy to ensure that the features are in fully working order.	As required (tasks to repair problems due to wear, damage or vandalism).

Permeable Pavements

Description

Pervious pavements provide a pavement suitable for pedestrian and vehicular traffic, while allowing rainwater to infiltrate through the surface and into the underlying structural layers. The water is temporarily stored beneath the overlying surface and into the underlying structural layers.

Maintenance Issues

For permeable pavements typical issues relate to the build-up of silt within the voids, causing a decrease in capacity and porosity over time.

Maintenance Regime

Schedule	Action Required	Frequency
Regular Maintenance	Surface brushing for appearance and to reduce silt accumulation.	Monthly
	Brushing and suction sweep or jet wash and suction sweep particularly for block pavement in autumn after leaf fall.	Annually
	Mow grass edges to paving at 35-50mm and remove weeds and leaves.	As required
	Check outlets and control structures.	Monthly depending on detail
Occasional tasks	Jetting and suction where silt has accumulated in joints or voids. Replace grit and vibrate surface to lock for permeable block paving. Replace jointing material as required.	As required
Remedial Work	Where sinkage or surface damage occurs uplift blocks, remove grit bedding layer, geotextile if present and reinstate to design profile	As required

Permeable Pavements Maintenance Information

(Always refer to selected paving manufacturers maintenance guidance)