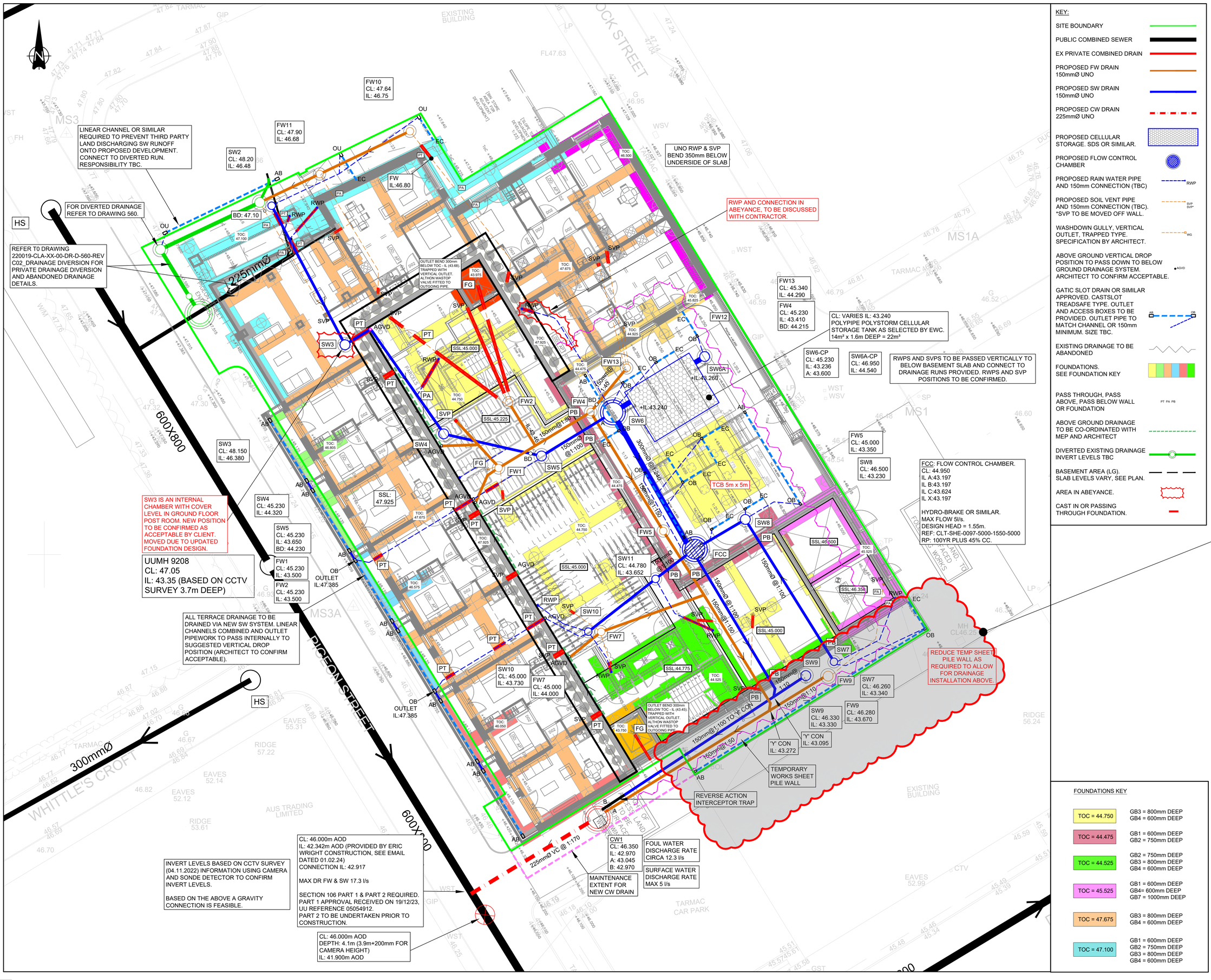

KEY:

- SITE BOUNDARY
- PUBLIC COMBINED SEWER
- EX PRIVATE COMBINED DRAIN
- PROPOSED FW DRAIN 150mmØ UNO
- PROPOSED SW DRAIN 150mmØ UNO
- PROPOSED CW DRAIN 225mmØ UNO
- PROPOSED CELLULAR STORAGE. SDS OR SIMILAR.
- PROPOSED FLOW CONTROL CHAMBER
- PROPOSED RAIN WATER PIPE AND 150mm CONNECTION (TBC) — RWP
- PROPOSED SOIL VENT PIPE AND 150mm CONNECTION (TBC). *SVP TO BE MOVED OFF WALL. — SVP / SVP*
- WASHDOWN GULLY, VERTICAL OUTLET, TRAPPED TYPE. SPECIFICATION BY ARCHITECT. — WG
- ABOVE GROUND VERTICAL DROP POSITION TO PASS DOWN TO BELOW GROUND DRAINAGE SYSTEM. ARCHITECT TO CONFIRM ACCEPTABLE. — AGVD
- GATIC SLOT DRAIN OR SIMILAR APPROVED. CASTSLOT TREADSAFE TYPE. OUTLET AND ACCESS BOXES TO BE PROVIDED. OUTLET PIPE TO MATCH CHANNEL OR 150mm MINIMUM. SIZE TBC. — AB / OB
- EXISTING DRAINAGE TO BE ABANDONED
- FOUNDATIONS. SEE FOUNDATION KEY
- PASS THROUGH, PASS ABOVE, PASS BELOW WALL OR FOUNDATION — PT PA PB
- ABOVE GROUND DRAINAGE TO BE CO-ORDINATED WITH MEP AND ARCHITECT
- DIVERTED EXISTING DRAINAGE INVERT LEVELS TBC
- BASEMENT AREA (LG). SLAB LEVELS VARY, SEE PLAN.
- AREA IN ABEYANCE.
- CAST IN OR PASSING THROUGH FOUNDATION.

GENERAL NOTE:

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWING 1-21458/CLA/XX/00/D/504.

DRAWING BASED ON THE FOLLOWING:

EXISTING SURVEY INFORMATION
- UNITED UTILITIES SEWER RECORDS
- TEAM DRAINAGE CCTV SURVEY INFORMATION 09.11.2022
- TOPOGRAPHICAL SURVEY (L&M SURVEY SERVICES) - 18.01.21 17E111_2D.

ARCHITECTURAL INFORMATION (04.11.2022)
- 1383-OMI-XX-LG-DR-A-L1110-P04
- 1383-OMI-XX-00-DR-A-L1100-P05
- 1383-OMI-XX-RL-DR-A-L1109-P04
- 1383-OMI-XX-RL-DR-A-L1120-P05

FOUNDATION INFORMATION
- 220019-CLA-XX-FN-DR-S-007
- 220019-CLA-XX-FN-DR-S-008
- 220019-CLA-XX-FN-DR-S-009

PROPOSED DRAINAGE SUBJECT TO APPROVAL WITH RELEVANT AUTHORITIES.

Rev	Date	Description	By	Check	App.
C02	13.01.24	REVISED SHEET PILE WALL ADDED AND COMMENTS FROM EWC INCORPORATED WHERE POSSIBLE	AA	CD	CD
C01	10.01.24	CLOUDED AREA FOR CONSTRUCTION ONLY	CD	SW	DS
P8	08.12.23	DRAINAGE UPDATED TO SUIT NEW FOUNDATIONS AND RELOCATED TANK	CD	SW	DS
P7	17.08.23	DRAINAGE WITHIN RIGHT OF ACCESS UPDATED	CD	SW	DS
P6	21.07.23	PRIVATE COMBINED DRAIN ROUTE UPDATED	CD	SW	DS
P5	30.06.23	UPDATED TO SUIT COMMENTS	CD	SW	DS
P4	26.05.23	DRAINAGE UPDATED TO SUIT REVISED BASEMENT PLAN	CD	SW	DS
P3	26.01.23	ATTENUATION REPOSITIONED DRAINAGE UPDATED TO SUIT	CD	DS	DS
P2	11.11.22	STAGE 3	CD	DS	DS
P1	04.11.22	FIRST ISSUE	CD	DS	DS

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Client: GREAT PLACES HOUSING GROUP

Project: LAYSTALL STREET DEVELOPMENT MANCHESTER

Office: MANCHESTER

Discipline: CIVIL AND STRUCTURAL

Title: DRAINAGE LAYOUT

Scale @ A1: 1-100

Status: STAGE 5

FOUNDATIONS KEY

TOC = 44.750	GB3 = 800mm DEEP GB4 = 600mm DEEP
TOC = 44.475	GB1 = 600mm DEEP GB2 = 750mm DEEP
TOC = 44.525	GB2 = 750mm DEEP GB3 = 800mm DEEP GB4 = 600mm DEEP
TOC = 45.525	GB1 = 600mm DEEP GB4= 600mm DEEP GB7 = 1000mm DEEP
TOC = 47.675	GB3 = 800mm DEEP GB4 = 600mm DEEP
TOC = 47.100	GB1 = 600mm DEEP GB2 = 750mm DEEP GB3 = 800mm DEEP GB4 = 600mm DEEP

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Job Number	Originator	Building/Zone	Level
220019	CLA	XX	00
Type	Discipline	Drawing No.	Revision
DR	C	500	C02

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.

2. ALL ADOPTABLE 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.

3. ALL PRIVATE DRAINAGE WORKS TO BE IN ACCORDANCE WITH CURTINS DRAINAGE SPECIFICATION, "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'.

4. 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.

5. DESIGN BASED ON TOPOGRAPHICAL SURVEY AND CCTV SURVEY INFORMATION AVAILABLE AT THE TIME OF THE DESIGN.

6. OUTFALL CONNECTION(S) SUBJECT TO AGREEMENT WITH THE APPROVING AUTHORITY.

7. ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.

8. COVER LEVELS, GULLY POSITIONS, AND BUILDINGS LOCATION ARE APPROXIMATE AND SHALL BE CONFIRMED BY ARCHITECT/ LANDSCAPE ARCHITECT. CONTRACTOR TO ALLOW FOR ADJUSTMENT TO SUIT AGREED POSITIONS AND FINISHED LEVELS, AND CONFIRM ALL COVER LEVELS ON SITE.

9. ALL INTERNAL DRAINAGE CONNECTIONS ARE PROVIDED TO THE PENETRATION POSITIONS SHOWN ON ARCHITECT AND M&E DRAWINGS. REFER TO DIMENSIONED LOCATIONS AND DIAMETERS ON ARCHITECT'S GROUND FLOOR SETTING-OUT PLANS.

10. ALL UNDERGROUND FOUL DRAINAGE SHOULD BE SUITABLY VENTED AT OR NEAR TO THE HEAD OF RUNS.

11. 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.

12. 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.

13. ALL GULLY AND CHANNEL DRAIN OUTLETS AND TERMINATION POINTS TO BE TRAPPED AND RODDABLE. INTERNAL GULLIES AND CHANNEL DRAINS TO BE SPECIFIED BY OTHERS.

14. WHERE NO WC'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.

15. 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.

16. INVERT LEVELS AT MANHOLES/ INSPECTION CHAMBERS TO BE USED TO SET OUT PIPEWORK. PIPE GRADIENTS ARE SHOWN INDICATIVELY ONLY.

17. ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS.

18. ALL PIPWORK, UNLESS AGREED OTHERWISE STATED, SHALL BE:
- 100mm to 300mm DIA TO BE VITRIFIED CLAY.
- 375mm DIA AND GREATER TO BE CLASS 120 CONCRETE PIPES.

19. AS AN ALTERNATIVE THE CONTRACTOR MAY USE AN APPROVED UNPLASTICISED POLYVINYL CHLORIDE (PVCU) WITH APPROVAL FROM THE ENGINEER.

20. SEWER PIPES TO BE LAID IN MAXIMUM 3 METRE LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS.

21. 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.

22. ALL NEW CONNECTIONS INTO EXISTING MANHOLES (OR INTO EXISTING SEWERS) TO BE 'SOFFITS LEVEL' UNLESS OTHERWISE NOTED.

23. ALL ADOPTABLE DRAINAGE PIPES WILL REQUIRE A MINIMUM OF 1200mm COVER, IN ACCORDANCE WITH SEWERAGE UNDERTAKERS REQUIREMENTS. WHERE THIS IS NOT ACHIEVED, IT WILL BE NECESSARY TO AGREE THE BED AND SURROUND DETAIL.

24. 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 Z). COMPRESSIBLE MATERIAL SHALL BE PROVIDED AT EVERY PIPE JOINT. WHERE COVER EXCEEDS THIS DEPTH, PIPES ARE TYPICALLY BEDDED AND SURROUNDED IN CLASS S. REFER TO PIPE EMBEDMENT DETAILS DRAWING FOR SPECIFIC TYPES.

25. WHERE DRAINAGE PIPES ARE LESS THAN 300mm BELOW THE UNDERSIDE OF THE GROUND FLOOR SLAB, CONCRETE ENCASEMENT IS REQUIRED (CLASS Z). COMPRESSIBLE JOINTS ARE TO BE PROVIDED AT EVERY PIPE JOINT WITHIN THE CONCRETE.

26. WHERE PIPES ARE MORE THAN 300mm BELOW THE UNDERSIDE OF THE SLAB, CLASS S BEDDING IS ACCEPTABLE.

27. 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.

28. WHERE FOUL SEWERS RUN ABOVE SURFACE SEWERS, CONCRETE PROTECTION MAY BE REQUIRED AT CROSSOVERS TO PREVENT ANY POTENTIAL CONTAMINATION.

29. 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.

30. THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION MAY NEED TO BE INCREASED TO ACCOMMODATE THE CONNECTIONS AND BENDS.

31. ALL MANHOLE COVERS IN BLOCK/SLAB AND EXTERNAL PAVING AREAS TO HAVE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT ARCHITECT'S PAVING PROPOSAL.

32. ALL INTERNAL COVERS TO HAVE MECHANICALLY JOINTED CORNERS AND DOUBLE SEALED WITH RECESSED TRAY TO ALLOW FOR FINISHES.

33. 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.

35. ALL PROPRIETARY PRODUCTS TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.

36. PRIOR TO ANY DRAINAGE WORKS, CONTRACTOR TO CONFIRM INVERT LEVELS FOR CONNECTION POINTS AND PROVIDE THIS INFORMATION TO THE ENGINEER.

37. CONTRACTOR TO MAKE ALLOWANCE FOR REMEDIATION WORKS TO EXISTING DRAINAGE (I.E. DAMAGED PIPEWORK ETC) TO REMAIN.

38. DRAINAGE LAYOUT SUBJECT TO FORMAL RECEIPT OF ACCEPTANCE OF DRAINAGE STRATEGY BY THE LLFA AND UNITED UTILITIES.

39. WHERE DRAINAGE IS TO BE PASSED THROUGH WALLS OR FOUNDATION, APPROPRIATE WATER PROOFING REQUIRED I.E. WATER BARS AND/OR PUDDLE FLANGE.

40. BELOW GROUND DRAINAGE THAT PASSES INTERNAL TO ABOVE GROUND DRAINAGE TO BE CO-ORDINATED WITH MEP ENGINEER.

41. FOUNDATION AND DRAINAGE CLASH DETECTION REQUIRED AT STAGE 4, TO CONFIRM PIPEWORK REQUIRED TO PASS ABOVE, THROUGH OR BELOW FOUNDATIONS.

42. ARCHITECT OR LANDSCAPE ARCHITECT TO CONFIRM MANHOLE COVER TYPES WITHIN BASEMENT AND EXTERNAL AREAS. ALLOW FOR RECESSED TYPE IN EXTERNAL AREAS TO RECEIVE PAVING FINISHES. ALL INTERNAL MANHOLES TO BE DOUBLE SEALED AND LOCKING TYPE.

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	EASTING	NORTHING
SURFACE WATER														
SW1 - OMITTED														
SW2	48.200	46.480	1.570	0.150	600	PPIC	600X600	B125	Y	Y		NON ENTRY		
SW3	48.150	46.380	1.620	0.150	600	PPIC	600X600	B125	Y	Y		INTERNAL. DOUBLE SEALED AND LOCKING TYPE.		TBC AT STAGE 5
SW4	45.230	44.320	0.760	0.150	600	PPIC	600X600	C250	N	N		NON ENTRY		
SW5	45.230	43.650	1.430	0.150	600	PPIC	600X600	C250	N	Y	BD: 44.23	NON ENTRY		
SW6A	46.950	44.540	2.110	0.300	1200	PCC	600X600	C250	Y	Y		CATCHPIT		
SW6	45.230	43.236	1.694	0.300	1200	PCC	600X600	C250	Y	N		CATCHPIT		
SW7	46.260	43.340	2.770	0.150	600	PPIC	600X600	D400	N	Y		NON ENTRY	384997.621	398243.533
SW8	46.500	43.230	3.120	0.150	600	PPIC	600X600	B125	Y	Y		NON ENTRY		
SW10	45.000	43.730	1.120	0.150	600	PPIC	600X600	B125	Y	Y		NON ENTRY		TBC AT STAGE 5
SW11	44.780	43.652	0.978	0.150	600	PPIC	600X600	B125	Y	N		NON ENTRY		
FCC	44.950	43.197	1.603	0.150	1200	PCC	600X600	B125	Y	N		FLOW CONTROL CHAMBER		
SW9	46.330	43.330	2.850	0.150	600	PPIC	600X600	D400	N	Y		NON ENTRY	384995.924	398242.697
FOUL WATER DIVERSION														
FW1	45.230	43.500	1.580	0.150	450	PPIC	450X450	C250	N	Y		NON ENTRY		
FW2	45.230	43.500	1.580	0.150	450	PPIC	450X450	C250	N	Y		NON ENTRY		
FW3 - OMITTED														
FW4	45.230	43.410	1.670	0.150	450	PPIC	450X450	C250	Y	Y	BD: 44.215	NON ENTRY		TBC AT STAGE 5
FW5	45.000	43.350	1.500	0.150	450	PPIC	450X450	B125	Y	Y		NON ENTRY		
FW6 - OMITTED														
FW7	45.000	44.000	0.850	0.150	450	PPIC	450X450	B125	N	N		NON ENTRY		
FW8 - OMITTED														
FW9	46.280	43.670	2.460	0.150	600	PPIC	600X600	D400	N	Y		NON ENTRY	384997.272	398242.667
FW10 - OMITTED														
FW11 - OMITTED														TBC AT STAGE 5
FW12 - OMITTED														
FW13	45.340	44.290	0.900	0.150	450	PPIC	450X450	C250	Y	N		NON ENTRY		
COMBINED WATER														
CW1	46.350	42.970	3.155	0.225	1200	PCC	600X600	D400	N	N		DS IL TBC.	384983.374	398234.071

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

SW7, SW9, FW9 AND CW1 HIGHLIGHTED YELLOW ISSUED FOR CONSTRUCTION ONLY.

Rev	Date	Description	By	Check	App.
C01	15.02.24	SW7, SW9, FW9 AND CW1 ISSUED FOR CONSTRUCTION ONLY	AA	CD	CD
P3	08.12.23	STAGE 4	CD	SW	DS
P2	30.06.23	UPDATED TO SUIT COMMENTS	CD	SW	DS
P1	26.05.23	FIRST ISSUE	CD	SW	DS

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Client: GREAT PLACES HOUSING GROUP

Project: LAYSTALL STREET DEVELOPMENT MANCHESTER

Office: ALTRINCHAM

Discipline: CIVIL AND STRUCTURAL

Title: DRAINAGE NOTES AND MANAHOLE SCHEDULE

Scale @ A1: NTS

Status: CONSTRUCTION

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Job Number	Originator	Building/Zone	Level
220019	CLA	XX	00
Type	**Discipline**	**Drawing No.**	**Revision**
DR	C	504	C01

2. Surface Water 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	x

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
SW2	0.006	5.00	48.200	600	384963.712	398271.042	1.350
SW3	0.000	5.00	48.150	600	384968.628	398262.956	1.765
VDROP	0.029	5.00	48.150		384969.658	398263.592	3.750
SW4	0.000	5.00	45.225	600	384974.082	398257.278	0.905
SW5	0.002	5.00	45.225	600	384979.980	398255.946	1.575
SW6A		5.00	46.950	600	384991.435	398262.911	2.410
TANK	0.000	5.00	46.500		384987.449	398260.496	3.260
SW6	0.023	5.00	45.225	600	384984.294	398258.573	1.989
SW7	0.004	5.00	46.260	600	385000.981	398245.605	2.920
SW8	0.005	5.00	46.500	600	384995.575	398254.496	3.270
SW10	0.032	5.00	45.000	600	384982.806	398245.350	1.270
SW11	0.009	5.00	44.780	600	384986.862	398248.533	1.128
FCC	0.000	5.00	44.950	1200	384988.993	398250.195	1.754
Junction			46.340		384994.253	398241.598	3.245
CW1			46.200	1200	384983.374	398234.071	3.230
OF	0.000	5.00	46.000	1800	384977.048	398227.517	3.658
EX Buried MH			45.500	1800	384982.329	398218.927	3.920
SW9		5.00	46.330	1200	384996.301	398242.932	3.000

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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)
1.001	SW2	SW3	9.463	0.600	46.850	46.755	0.095	100.0	150	5.16	46.0
1.002	SW3	VDROP	1.211	0.600	46.385	46.373	0.012	100.0	150	5.18	46.0
1.003	VDROP	SW4	7.710	0.600	44.400	44.320	0.080	96.4	150	5.30	45.5
1.004	SW4	SW5	6.047	0.600	44.320	44.260	0.060	100.8	150	5.40	45.1
1.005	SW5	SW6	5.051	0.600	43.650	43.599	0.051	100.0	150	5.49	44.8
2.000	SW6A	TANK	5.100	0.600	44.540	43.240	1.300	3.9	300	5.01	46.6
2.001	TANK	SW6	1.100	0.600	43.240	43.236	0.004	275.0	300	5.03	46.6
1.006	SW6	FCC	9.606	0.600	43.236	43.196	0.040	240.0	300	5.65	44.2
3.000	SW7	SW8	10.406	0.600	43.340	43.230	0.110	94.6	150	5.17	46.0
3.001	SW8	FCC	7.863	0.600	43.230	43.197	0.033	238.3	150	5.37	45.2
4.000	SW10	SW11	5.156	0.600	43.730	43.652	0.078	66.1	150	5.07	46.4
4.001	SW11	FCC	2.702	0.600	43.652	43.625	0.027	100.0	150	5.11	46.2
1.007	FCC	Junction	10.078	0.600	43.197	43.096	0.101	100.0	150	5.81	43.6
1.008	Junction	CW1	13.229	0.600	43.095	42.970	0.125	105.8	150	6.04	42.9
1.009	CW1	OF	9.109	0.600	42.970	42.917	0.053	171.9	225	6.19	42.4
EX SEWER	OF	EX Buried MH	10.084	0.600	42.342	41.580	0.762	13.2	800	6.21	42.3
5.000	SW9	Junction	2.444	0.600	43.330	43.096	0.234	10.4	100	5.02	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)
1.001	1.005	17.8	0.7	1.200	1.245	0.006	0.0	21	0.492
1.002	1.005	17.8	0.7	1.615	1.627	0.006	0.0	21	0.492
1.003	1.024	18.1	4.3	3.600	0.755	0.035	0.0	50	0.839
1.004	1.001	17.7	4.3	0.755	0.815	0.035	0.0	50	0.825
1.005	1.005	17.8	4.5	1.425	1.476	0.037	0.0	51	0.838
2.000	7.989	564.7	0.0	2.110	2.960	0.000	0.0	0	0.000
2.001	0.943	66.7	0.0	2.960	1.689	0.000	0.0	0	0.000
1.006	1.010	71.4	7.2	1.689	1.454	0.060	0.0	64	0.654
3.000	1.033	18.3	0.5	2.770	3.120	0.004	0.0	17	0.449
3.001	0.647	11.4	1.1	3.120	1.603	0.009	0.0	31	0.407
4.000	1.239	21.9	4.0	1.120	0.978	0.032	0.0	44	0.948
4.001	1.005	17.8	5.1	0.978	1.175	0.041	0.0	55	0.872
1.007	1.005	17.8	13.0	1.603	3.094	0.110	0.0	95	1.095
1.008	0.976	17.3	12.8	3.095	3.080	0.110	0.0	96	1.068
1.009	0.994	39.5	12.6	3.005	2.858	0.110	0.0	87	0.887
EX SEWER	8.030	4036.1	12.6	2.858	3.120	0.110	0.0	32	1.884
5.000	2.405	18.9	0.0	2.900	3.144	0.000	0.0	0	0.000

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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)
1.001	9.463	100.0	150	Circular	48.200	46.850	1.200	48.150	46.755	1.245
1.002	1.211	100.0	150	Circular	48.150	46.385	1.615	48.150	46.373	1.627
1.003	7.710	96.4	150	Circular	48.150	44.400	3.600	45.225	44.320	0.755
1.004	6.047	100.8	150	Circular	45.225	44.320	0.755	45.225	44.260	0.815
1.005	5.051	100.0	150	Circular	45.225	43.650	1.425	45.225	43.599	1.476
2.000	5.100	3.9	300	Circular	46.950	44.540	2.110	46.500	43.240	2.960
2.001	1.100	275.0	300	Circular	46.500	43.240	2.960	45.225	43.236	1.689
1.006	9.606	240.0	300	Circular	45.225	43.236	1.689	44.950	43.196	1.454
3.000	10.406	94.6	150	Circular	46.260	43.340	2.770	46.500	43.230	3.120
3.001	7.863	238.3	150	Circular	46.500	43.230	3.120	44.950	43.197	1.603
4.000	5.156	66.1	150	Circular	45.000	43.730	1.120	44.780	43.652	0.978
4.001	2.702	100.0	150	Circular	44.780	43.652	0.978	44.950	43.625	1.175
1.007	10.078	100.0	150	Circular	44.950	43.197	1.603	46.340	43.096	3.094
1.008	13.229	105.8	150	Circular	46.340	43.095	3.095	46.200	42.970	3.080
1.009	9.109	171.9	225	Circular	46.200	42.970	3.005	46.000	42.917	2.858
EX SEWER	10.084	13.2	800	Circular	46.000	42.342	2.858	45.500	41.580	3.120
5.000	2.444	10.4	100	Circular	46.330	43.330	2.900	46.340	43.096	3.144

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.001	SW2	600	Manhole	Adoptable	SW3	600	Manhole	Adoptable
1.002	SW3	600	Manhole	Adoptable	VDROP		Junction	
1.003	VDROP		Junction		SW4	600	Manhole	Adoptable
1.004	SW4	600	Manhole	Adoptable	SW5	600	Manhole	Adoptable
1.005	SW5	600	Manhole	Adoptable	SW6	600	Manhole	Adoptable
2.000	SW6A	600	Manhole	Adoptable	TANK		Junction	
2.001	TANK		Junction		SW6	600	Manhole	Adoptable
1.006	SW6	600	Manhole	Adoptable	FCC	1200	Manhole	Adoptable
3.000	SW7	600	Manhole	Adoptable	SW8	600	Manhole	Adoptable
3.001	SW8	600	Manhole	Adoptable	FCC	1200	Manhole	Adoptable
4.000	SW10	600	Manhole	Adoptable	SW11	600	Manhole	Adoptable
4.001	SW11	600	Manhole	Adoptable	FCC	1200	Manhole	Adoptable
1.007	FCC	1200	Manhole	Adoptable	Junction		Junction	
1.008	Junction		Junction		CW1	1200	Manhole	Adoptable
1.009	CW1	1200	Manhole	Adoptable	OF	1800	Manhole	Adoptable
EX SEWER	OF	1800	Manhole	Adoptable	EX Buried MH	1800	Manhole	Adoptable
5.000	SW9	1200	Manhole	Adoptable	Junction		Junction	

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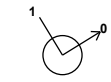
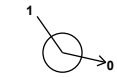
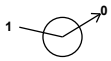
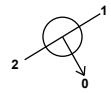
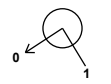
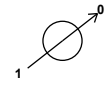
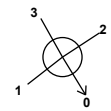
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
SW2	384963.712	398271.042	48.200	1.350	600		0	1.001	46.850	150
SW3	384968.628	398262.956	48.150	1.765	600		1	1.001	46.755	150
							0	1.002	46.385	150
VDROP	384969.658	398263.592	48.150	3.750			1	1.002	46.373	150
							0	1.003	44.400	150
SW4	384974.082	398257.278	45.225	0.905	600		1	1.003	44.320	150
							0	1.004	44.320	150
SW5	384979.980	398255.946	45.225	1.575	600		1	1.004	44.260	150
							0	1.005	43.650	150
SW6A	384991.435	398262.911	46.950	2.410	600		0	2.000	44.540	300
TANK	384987.449	398260.496	46.500	3.260			1	2.000	43.240	300
							0	2.001	43.240	300
SW6	384984.294	398258.573	45.225	1.989	600		1	2.001	43.236	300
							2	1.005	43.599	150
							0	1.006	43.236	300
SW7	385000.981	398245.605	46.260	2.920	600		0	3.000	43.340	150
SW8	384995.575	398254.496	46.500	3.270	600		1	3.000	43.230	150
							0	3.001	43.230	150
SW10	384982.806	398245.350	45.000	1.270	600		0	4.000	43.730	150
SW11	384986.862	398248.533	44.780	1.128	600		1	4.000	43.652	150
							0	4.001	43.652	150
FCC	384988.993	398250.195	44.950	1.754	1200		1	4.001	43.625	150
							2	3.001	43.197	150
							3	1.006	43.196	300
							0	1.007	43.197	150

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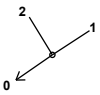
Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Junction	384994.253	398241.598	46.340	3.245		 1	5.000	43.096	100
						2	1.007	43.096	150
						0	1.008	43.095	150
CW1	384983.374	398234.071	46.200	3.230	1200	1	1.008	42.970	150
						0	1.009	42.970	225
OF	384977.048	398227.517	46.000	3.658	1800	1	1.009	42.917	225
						0	EX SEWER	42.342	800
EX Buried MH	384982.329	398218.927	45.500	3.920	1800	1	EX SEWER	41.580	800
SW9	384996.301	398242.932	46.330	3.000	1200	0	5.000	43.330	100

Simulation Settings

Rainfall Methodology	FSR	Drain Down Time (mins)	240
FSR Region	England and Wales	Additional Storage (m³/ha)	20.0
M5-60 (mm)	17.000	Check Discharge Rate(s)	✓
Ratio-R	0.400	1 year (l/s)	10.1
Summer CV	0.750	30 year (l/s)	23.6
Winter CV	0.840	100 year (l/s)	29.8
Analysis Speed	Detailed	Check Discharge Volume	✓
Skip Steady State	x	100 year 360 minute (m³)	65

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	0	0

Pre-development Discharge Rate

Site Makeup	Brownfield	Time of Concentration (mins)	5.00
Brownfield Method	MRM	Betterment (%)	0
Contributing Area (ha)	0.120	Q 1 year (l/s)	20.2
PIMP (%)	100	Q 30 year (l/s)	47.2
CV	1.000	Q 100 year (l/s)	59.5

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Pre-development Discharge Volume

Site Makeup	Brownfield	CV	1.000	Betterment (%)	0
Brownfield Method	MRM	Return Period (years)	100	PR	1.000
Contributing Area (ha)	0.120	Climate Change (%)	0	Runoff Volume (m^3)	65
PIMP (%)	100	Storm Duration (mins)	360		

Node FCC Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	1.007	Sump Available	✓
Replaces Downstream Link	✓	Product Number	CTL-SHE-0097-5000-1550-5000
Invert Level (m)	43.197	Min Outlet Diameter (m)	0.150
Design Depth (m)	1.550	Min Node Diameter (mm)	1200
Design Flow (l/s)	5.0		

Node TANK Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	43.240
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	82

Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)	Depth (m)	Area (m^2)	Inf Area (m^2)
0.000	15.0	0.0	1.500	15.0	0.0	1.501	0.0	0.0

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Results for 1 year Critical Storm Duration. Lowest mass balance: 93.59%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SW2	11	46.871	0.021	0.7	0.0077	0.0000	OK
15 minute winter	SW3	11	46.406	0.021	0.7	0.0060	0.0000	OK
15 minute winter	VDROP	10	44.450	0.050	4.2	0.0078	0.0000	OK
15 minute winter	SW4	10	44.372	0.052	4.1	0.0148	0.0000	OK
15 minute winter	SW5	11	43.704	0.054	4.3	0.0167	0.0000	OK
15 minute summer	SW6A	1	44.540	0.000	0.0	0.0000	0.0000	OK
30 minute winter	TANK	24	43.385	0.145	4.1	2.0651	0.0000	OK
30 minute winter	SW6	24	43.385	0.149	5.4	0.0765	0.0000	OK
15 minute winter	SW7	15	43.385	0.045	0.5	0.0139	0.0000	OK
30 minute winter	SW8	24	43.385	0.155	0.9	0.0486	0.0000	SURCHARGED
15 minute winter	SW10	10	43.775	0.045	3.8	0.0356	0.0000	OK
15 minute winter	SW11	10	43.712	0.060	4.9	0.0265	0.0000	OK
30 minute winter	FCC	24	43.385	0.189	4.8	0.2138	0.0000	SURCHARGED
30 minute winter	Junction	24	43.147	0.052	4.3	0.0000	0.0000	OK
30 minute winter	CW1	25	43.022	0.052	4.3	0.0591	0.0000	OK
30 minute winter	OF	25	42.363	0.021	4.3	0.0525	0.0000	OK
30 minute winter	EX Buried MH	25	41.600	0.020	4.3	0.0000	0.0000	OK
15 minute summer	SW9	1	43.330	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	SW2	1.001	SW3	0.7	0.486	0.039	0.0136	
15 minute winter	SW3	1.002	VDROP	0.7	0.473	0.039	0.0018	
15 minute winter	VDROP	1.003	SW4	4.1	0.780	0.229	0.0410	
15 minute winter	SW4	1.004	SW5	4.1	0.783	0.231	0.0316	
15 minute winter	SW5	1.005	SW6	4.3	0.793	0.243	0.0275	
15 minute summer	SW6A	2.000	TANK	0.0	0.000	0.000	0.0698	
30 minute winter	TANK	2.001	SW6	-4.1	-0.615	-0.062	0.0377	
30 minute winter	SW6	1.006	FCC	3.0	0.273	0.041	0.3922	
15 minute winter	SW7	3.000	SW8	0.5	0.206	0.025	0.1145	
30 minute winter	SW8	3.001	FCC	0.6	0.072	0.052	0.1384	
15 minute winter	SW10	4.000	SW11	3.8	0.685	0.172	0.0285	
15 minute winter	SW11	4.001	FCC	4.8	0.791	0.271	0.0164	
30 minute winter	FCC	Hydro-Brake®	Junction	4.3				
30 minute winter	Junction	1.008	CW1	4.3	0.795	0.250	0.0717	
30 minute winter	CW1	1.009	OF	4.3	0.639	0.109	0.0614	
30 minute winter	OF	EX SEWER	EX Buried MH	4.3	1.351	0.001	0.0322	7.8
15 minute summer	SW9	5.000	Junction	0.0	0.000	0.000	0.0048	

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Results for 30 year Critical Storm Duration. Lowest mass balance: 93.59%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SW2	10	46.882	0.032	1.7	0.0119	0.0000	OK
15 minute winter	SW3	11	46.418	0.033	1.7	0.0093	0.0000	OK
15 minute winter	VDROP	10	44.484	0.084	10.0	0.0130	0.0000	OK
15 minute winter	SW4	10	44.408	0.088	10.0	0.0250	0.0000	OK
30 minute winter	SW5	29	43.818	0.168	8.2	0.0519	0.0000	SURCHARGED
15 minute summer	SW6A	1	44.540	0.000	0.0	0.0000	0.0000	OK
30 minute winter	TANK	29	43.818	0.578	15.1	8.2331	0.0000	SURCHARGED
30 minute winter	SW6	29	43.818	0.582	16.8	0.2990	0.0000	SURCHARGED
30 minute winter	SW7	29	43.819	0.479	1.5	0.1485	0.0000	SURCHARGED
30 minute winter	SW8	29	43.817	0.587	1.8	0.1839	0.0000	SURCHARGED
30 minute winter	SW10	29	43.818	0.088	7.2	0.0696	0.0000	OK
30 minute winter	SW11	29	43.818	0.166	9.2	0.0734	0.0000	SURCHARGED
30 minute winter	FCC	29	43.818	0.622	9.7	0.7030	0.0000	SURCHARGED
15 minute winter	Junction	12	43.150	0.055	4.8	0.0000	0.0000	OK
120 minute summer	CW1	88	43.025	0.055	4.8	0.0625	0.0000	OK
120 minute summer	OF	88	42.364	0.022	4.8	0.0551	0.0000	OK
120 minute summer	EX Buried MH	88	41.601	0.021	4.8	0.0000	0.0000	OK
15 minute summer	SW9	1	43.330	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	SW2	1.001	SW3	1.7	0.622	0.094	0.0253	
15 minute winter	SW3	1.002	VDROP	1.6	0.604	0.093	0.0033	
15 minute winter	VDROP	1.003	SW4	10.0	0.950	0.550	0.0807	
15 minute winter	SW4	1.004	SW5	9.8	0.970	0.554	0.0612	
30 minute winter	SW5	1.005	SW6	8.2	0.930	0.462	0.0889	
15 minute summer	SW6A	2.000	TANK	0.0	0.000	0.000	0.1796	
30 minute winter	TANK	2.001	SW6	-15.1	-0.695	-0.226	0.0775	
30 minute winter	SW6	1.006	FCC	4.0	0.256	0.056	0.6764	
30 minute winter	SW7	3.000	SW8	-0.7	0.207	-0.040	0.1832	
30 minute winter	SW8	3.001	FCC	-0.9	-0.069	-0.076	0.1384	
30 minute winter	SW10	4.000	SW11	7.2	0.777	0.329	0.0733	
30 minute winter	SW11	4.001	FCC	9.2	0.930	0.518	0.0476	
30 minute winter	FCC	Hydro-Brake®	Junction	4.8				
15 minute winter	Junction	1.008	CW1	4.8	0.819	0.279	0.0776	
120 minute summer	CW1	1.009	OF	4.8	0.659	0.122	0.0665	
120 minute summer	OF	EX SEWER	EX Buried MH	4.8	1.398	0.001	0.0347	26.1
15 minute summer	SW9	5.000	Junction	0.0	0.000	0.000	0.0053	

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Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 93.59%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SW2	10	46.895	0.045	3.3	0.0168	0.0000	OK
15 minute winter	SW3	10	46.432	0.047	3.2	0.0132	0.0000	OK
120 minute winter	VDROP	96	44.684	0.284	6.2	0.0440	0.0000	SURCHARGED
120 minute winter	SW4	96	44.683	0.363	6.2	0.1027	0.0000	SURCHARGED
120 minute winter	SW5	96	44.683	1.033	6.6	0.3180	0.0000	SURCHARGED
120 minute winter	SW6A	96	44.682	0.142	0.4	0.0402	0.0000	OK
120 minute winter	TANK	96	44.682	1.442	9.9	20.5496	0.0000	SURCHARGED
120 minute winter	SW6	96	44.682	1.446	10.6	0.7433	0.0000	SURCHARGED
120 minute winter	SW7	96	44.682	1.342	0.9	0.4160	0.0000	SURCHARGED
120 minute winter	SW8	96	44.682	1.452	1.1	0.4545	0.0000	SURCHARGED
120 minute winter	SW10	96	44.683	0.953	5.6	0.7498	0.0000	SURCHARGED
120 minute winter	SW11	96	44.682	1.030	6.5	0.4554	0.0000	FLOOD RISK
120 minute winter	FCC	96	44.682	1.486	6.3	1.6807	0.0000	FLOOD RISK
30 minute summer	Junction	39	43.719	0.624	4.9	0.0000	0.0000	SURCHARGED
30 minute summer	CW1	39	43.704	0.734	5.2	0.8299	0.0000	SURCHARGED
15 minute winter	OF	36	43.702	1.360	4.9	3.4607	0.0000	SURCHARGED
15 minute summer	EX Buried MH	1	43.700	2.120	5.2	0.0000	0.0000	OK
15 minute summer	SW9	37	43.720	0.390	1.1	0.4410	0.0000	SURCHARGED

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	SW2	1.001	SW3	3.2	0.748	0.183	0.0410	
15 minute winter	SW3	1.002	VDROP	3.2	0.725	0.181	0.0054	
120 minute winter	VDROP	1.003	SW4	6.2	0.855	0.343	0.1357	
120 minute winter	SW4	1.004	SW5	6.2	0.869	0.351	0.1065	
120 minute winter	SW5	1.005	SW6	5.9	0.815	0.334	0.0889	
120 minute winter	SW6A	2.000	TANK	-0.4	-0.009	-0.001	0.2633	
120 minute winter	TANK	2.001	SW6	-9.9	-0.502	-0.149	0.0775	
120 minute winter	SW6	1.006	FCC	3.7	0.146	0.051	0.6764	
120 minute winter	SW7	3.000	SW8	0.3	0.195	0.015	0.1832	
120 minute winter	SW8	3.001	FCC	0.6	0.055	0.048	0.1384	
120 minute winter	SW10	4.000	SW11	5.0	0.704	0.228	0.0908	
120 minute winter	SW11	4.001	FCC	5.9	0.816	0.331	0.0476	
120 minute winter	FCC	Hydro-Brake®	Junction	4.8				
30 minute summer	Junction	1.008	CW1	5.2	0.820	0.299	0.2329	
30 minute summer	CW1	1.009	OF	5.7	0.659	0.143	0.3623	
15 minute winter	OF	EX SEWER	EX Buried MH	6.0	0.012	0.001	5.0497	9.3
15 minute summer	SW9	5.000	Junction	-1.1	-0.156	-0.058	0.0191	

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3. UU Connection Approval

S106 Part 1 'Application to connect to a public sewer' Approval Notice

United Utilities Reference Number:					**05054912**	
Applicant details						
Applicant name	**Sam Godfrey**					
Applicant address *(including postcode)*	**Sceptre House Sceptre Way Bamber Bridge Preston PR5 6AW**					
Applicant email	**sgodfrey@ericwright.co.uk**					
Site details: The site / property which is proposed for connection to the public sewer						
Site address *(including postcode)*	**Laystall Street, Manchester, M1 2JZ**					

APPROVED

Your application for connection to the public sewer has been approved, to be made via a new connection:

To a private drain	☐	You may appoint your contractor and advise your appointed building control body (who should inspect the work). United Utilities should be advised when this work is complete.
Direct to the public sewer	☒	**Further action required** You may now appoint an appropriately qualified contractor. Your appointed contractor is responsible for obtaining authorisation to work on a public sewer. (The S106 Part 2 application form **'Request for permission to work on a public sewer'** is available on our website; unitedutilities.com).

Mode of connection approved	**Saddle**					
Sewer connection type	Foul	☐	Surface water	☐	Combined	☒

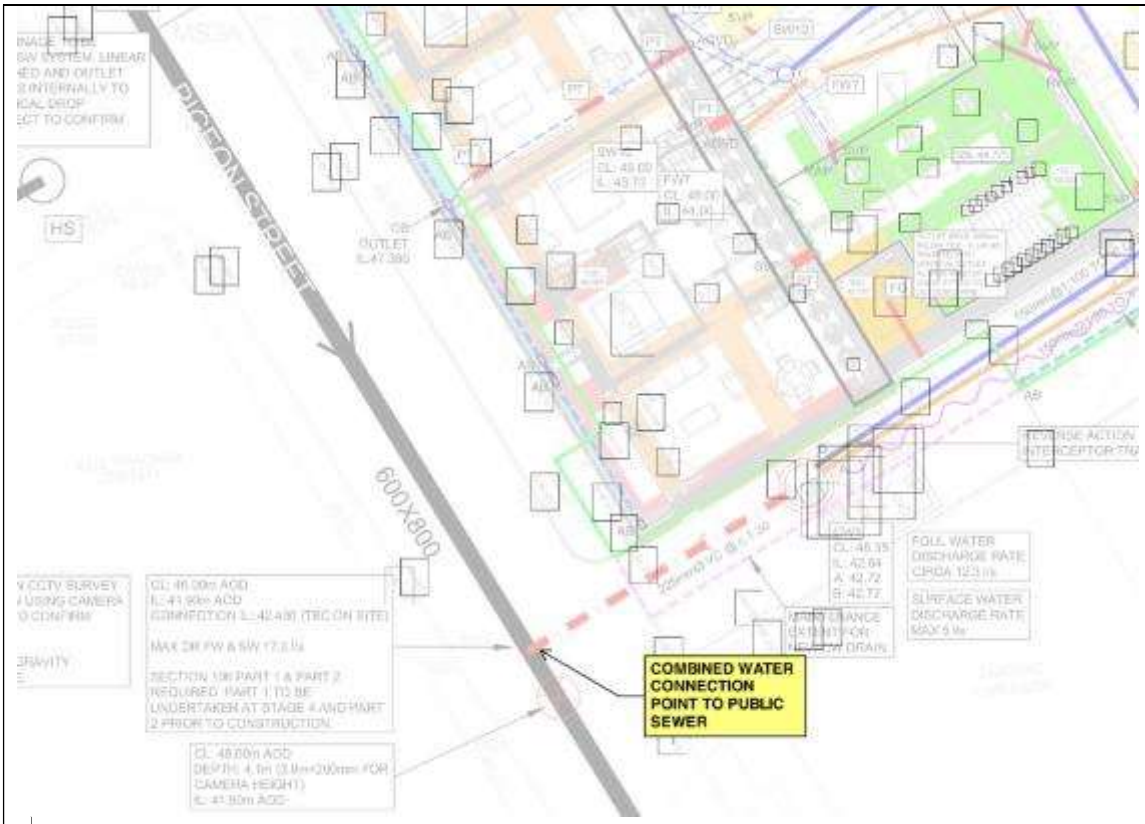
This approval is valid for 12 months from the date below.
This approval does not grant access to third party land, permission should be sought if required between applicant and land owner
If the new connection renders access unsafe or is otherwise detrimental to the manhole or sewer, a new/upgraded manhole will be requested.

Comments

Approval granted for a 225mm combined connection to the 520mm combined brick sewer located in Pigeon street with surface water restricted to 5l/s as per drainage plan below.

Saddle connections should be core drilled with care taken to ensure the core does not fall into the public sewer. Please see details included in the Sewer Connection Pack.

Please note, if you are proposing to connect to an existing, unchartered drain or sewer then it is the developers responsibility to confirm that it communicates with the Public Sewer



Developer Services Inspector	**Wesley Odell**
Contact number	**07789924735**
Date	**19/12/2023**

4. Overland Flow Plan

EXISTING BUILDING RETAINED UNDER SEPARATE APPLICATION

225mm Ø

BROCK STREET ROAD LEVEL c.46.55m AOD

BASEMENT LEVEL 45.00m AOD

LOW LEVEL 46.22m AOD

PIGEON STREET

WHITTLE'S CROFT

UNREGISTERED LAND - TO BE RESURFACED FOLLOWING WORKS

EXISTING BUILDING

TARMAC CAR PARK

KEY:

LEVELS FALL DIRECTION

OVERLAND FLOW DIRECTION

PROPOSED DRAINAGE SUBJECT TO APPROVAL WITH RELEVANT AUTHORITIES.

Rev	Date	Description	By	Check	App.
P1	22.02.24	FIRST ISSUE	AA	CD	SW

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DRAWING MUST BE PRINTED IN BLACK AND WHITE ONLY.

Client: GREAT PLACES HOUSING GROUP

Project: LAYSTALL STREET MANCHESTER

Office: MANCHESTER

Discipline: CIVIL AND STRUCTURAL

Title: OVERLAND FLOW PLAN

Scale @ A1: 1-100

Status: PRELIMINARY

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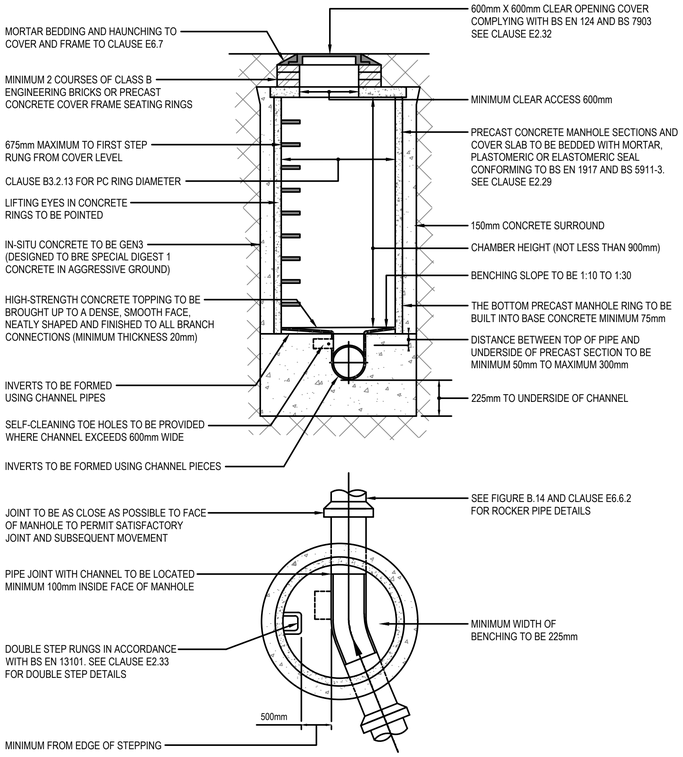
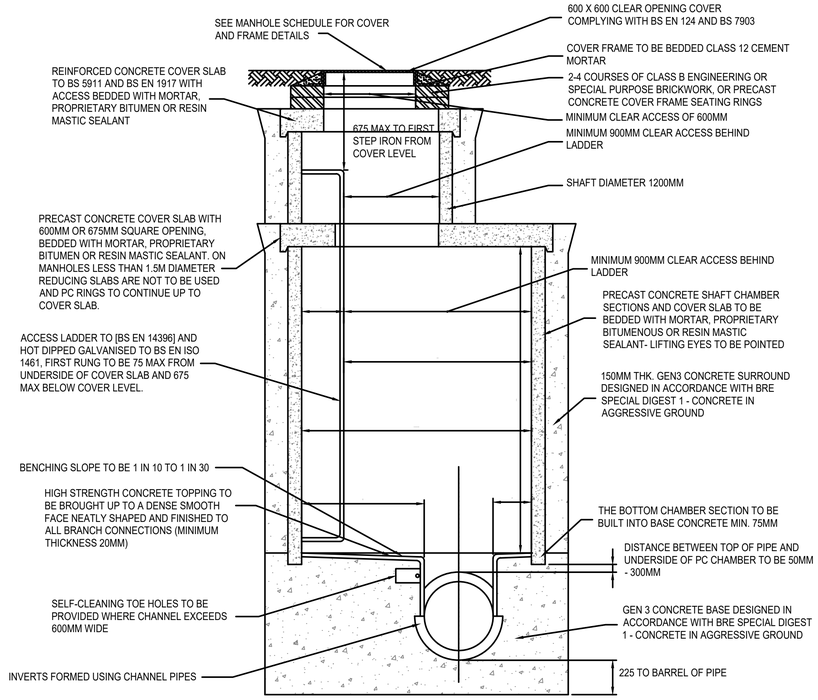
Job Number	Originator	Building/Zone	Level
220019	CLA	XX	00
Type	**Discipline**	**Drawing No.**	**Revision**
DR	C	570	P01

5. Drainage Details

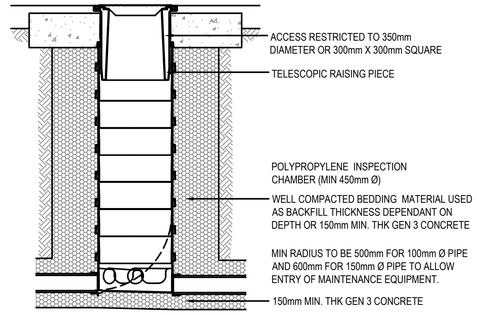


MANHOLE COVERS WITHIN TRAFFICKED PAVED AREAS TO BE D400 RECESSED COVERS.

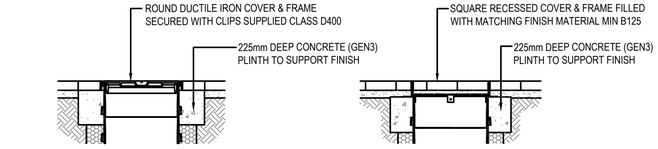
TYPICAL MANHOLE DETAIL - TYPE 2
(MAXIMUM DEPTH FROM COVER TO SOFFIT OF PIPE 3.0 m)



TYPICAL MANHOLE DETAIL - TYPE 1A
(MAXIMUM DEPTH FROM COVER TO SOFFIT OF PIPE 3.0 TO 6.0 m)

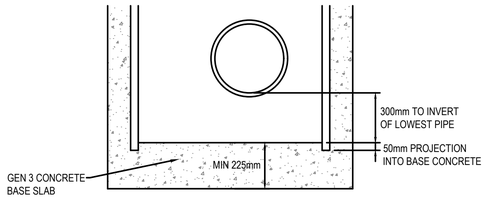


DEEP INSPECTION CHAMBER
UP TO 3.0m TO SOFFIT

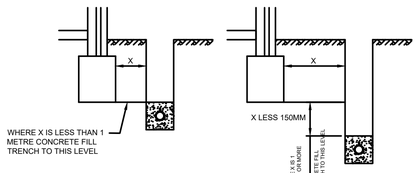


SITED IN HARD LANDSCAPED AREAS WITH STANDARD ROUND COVER

SITED IN HARD LANDSCAPED AREAS WITH RECESSED COVER

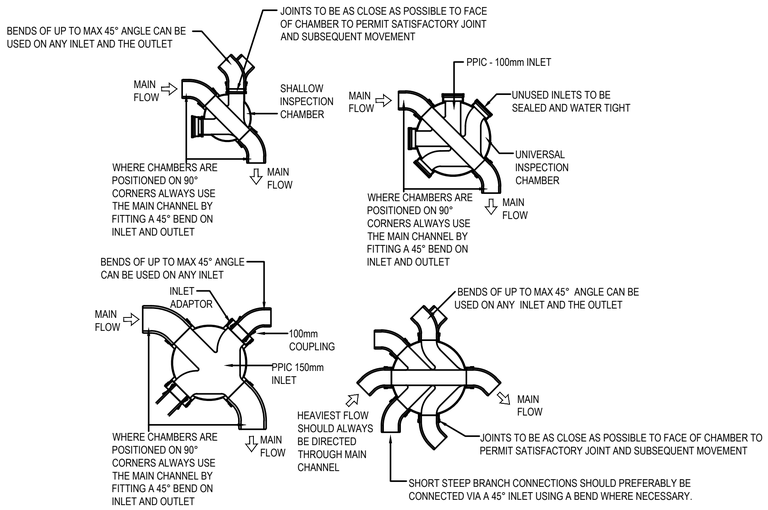


CATCH PIT DETAIL

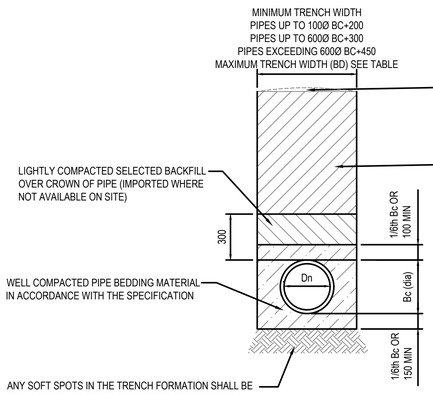


TYPICAL DETAILS WHERE DRAINAGE TRENCH IS DEEPER THAN FOUNDATIONS

TYPICAL INSPECTION CHAMBER COVER DETAILS



INSPECTION CHAMBER BASE DETAILS



CLASS S - 360° GRANULAR SURROUND PIPE BEDDING DETAIL

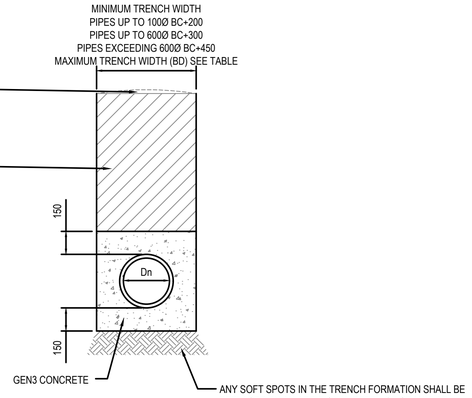
SOFT LANDSCAPE AREAS
IN SOFT LANDSCAPING AREAS TRENCH FILL ABOVE PIPES IS TO BE MOUNDED TO A MAXIMUM DEPTH OF 50MM TO ALLOW FOR FUTURE SETTLEMENT.

HARDSTANDING AREAS
SHW TYPE 1 GRANULAR MATERIAL
SOFT LANDSCAPE AREAS
SELECTED BACKFILL MATERIAL UP TO UNDERSIDE OF TOP-SOIL

THE FLEXIBLE JOINTS IN THE PIPES SHALL BE MAINTAINED AT THE END OF EACH PIPE WITH COMPRESSIBLE SHEET CUT ACCURATELY TO FIT THE PIPE PROFILE TO BREAK THE CONCRETE SURROUND

Dn	Bd
150	0.6
225	0.7
300	0.85
375	1.05
450	1.15
525	1.25
600	1.35
675	1.45
750	1.50

MAXIMUM TRENCH WIDTH



CLASS Z - CONCRETE BED AND SURROUND PIPE BEDDING DETAIL
(COVER < 900mm IN VEHICULAR LOADING AND OPEN FIELD.
COVER <600mm ELSEWHERE EXCEPT UNDER BUILDINGS.)

GENERAL NOTES

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS AND ARCHITECTS DRAWINGS AND SPECIFICATIONS.
4. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ENGINEERS ATTENTION PRIOR TO COMMENCING ANY WORKS SHOWN.
5. ALL DETAILS TO BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL COUNCILS BUILDING CONTROL, OR ANY OTHER RELEVANT STANDARDS BODY.
6. ALL PROPRIETARY PRODUCT TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.

DRAINAGE NOTES

1. NO WORK SHOULD COMMENCE ON SITE UNTIL WRITTEN APPROVAL IS RECEIVED FROM THE ADOPTING HIGHWAY AUTHORITY, ADOPTING SEWERAGE UNDERTAKERS, ENVIRONMENT AGENCY AND/OR ANY OTHER RELEVANT AUTHORITY. WORKS UNDERTAKEN PRIOR TO APPROVAL ARE AT THE DEVELOPER'S RISK AND CURTINS CONSULTING LIMITED WILL NOT BE HELD RESPONSIBLE FOR SUBSEQUENT DELAYS IN APPROVALS, REMEDIAL COSTS OR DELAYS.
2. ALL INVERT LEVELS OF EXISTING FOUL AND SURFACE WATER SYSTEMS ARE TO BE CONFIRMED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF ANY ON SITE DRAINAGE WORKS. ANY DISCREPANCY IN LEVELS IS TO BE REPORTED IMMEDIATELY TO CURTINS CONSULTING LIMITED
3. ALL SEWERS, UNLESS AGREED OTHERWISE STATED, SHALL BE:
150MM DIA TO BE VITRIFIED CLAY.
225MM DIA TO BE VITRIFIED CLAY.
300MM DIA TO BE VITRIFIED CLAY.
375MM DIA AND GREATER TO BE CLASS 120 CONCRETE PIPES.
4. ALL VITRIFIED CLAY PIPES TO BS EN 295-1:
ALL CONCRETE PIPES TO BE TO BS EN 1916.
ALL CONCRETE MANHOLES TO BE TO BS EN1917.
5. LATERAL CONNECTIONS FROM MAIN SEWERS TO DEMARCATION CHAMBER TO BE 150MM DIA MINIMUM UNO AND CONSTRUCTED TO ADOPTABLE STANDARDS.
6. 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.
7. ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS.
8. ALL SEWER WORKS TO COMPLY WITH WRC 'SEWERS FOR ADOPTION, 6TH EDITION', STW'S REQUIREMENTS AND KITE-MARKED(OR SIMILAR APPROVED) WHERE PRACTICABLE. WHERE CONFLICTING DETAILS OCCUR, STW'S DETAILS SHALL TAKE PRECEDENCE IN ALL CASES.
9. MANHOLE COVERS SHALL HAVE A CLEAR OPENING IN ACCORDANCE WITH SFA 6TH EDITION AND SHALL BE CLASS D400 TO BS EN 124 WITH 150MM DEEP FRAMES IN VEHICULAR TRAFFICED AREA. CLASS B125 COVERS AND FRAMES TO BE PROVIDED ON ALL OTHER MANHOLES IN LANDSCAPING.
10. FILLED GROUND MUST BE FILLED AND CONSOLIDATED BEFORE ANY SEWER WORKS ARE CARRIED OUT.
11. WATER AUTHORITIES ARE NOT OBLIGED TO ACCEPT FILTER DRAIN / LAND DRAINAGE RUN OFF INTO THE PUBLIC SEWER NETWORK OR ADOPTABLE DRAINAGE SYSTEM (DIRECTLY OR INDIRECTLY), AN ALTERNATIVE METHOD OF DISPOSAL OF LAND DRAINAGE RUN OFF WILL THEREFORE BE REQUIRED AND ANY PROPOSALS MUST BE AGREED WITH THE LOCAL AUTHORITY LAND DRAINAGE SECTION.
12. COVER SLABS MUST CARRY THE BSI KITEMARK AND SHALL COMPLY WITH BS 5911 PART3 / BS EN 1917 :2000. WHERE THE CLEAR OPENING OF THE KITE-MARKED PRODUCT IS DIFFERENT TO THAT OF THE COVER AND FRAME, A LOAD BEARING SLAB SHOULD BE FITTED ABOVE THE COVER SLAB TO BRING THE SIZE DOWN AS SPECIFIED ABOVE. PLEASE REFER TO CONCRETE PIPELINE SYSTEMS ASSOCIATION (CPSA) 'TECHNICAL BULLETIN' ISSUED AUTUMN 2004 FOR KITE-MARKED COVER SLAB OPENING SIZES.
13. 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.
14. ADOPTABLE SEWERS SHOULD BE A MINIMUM OF 1M AND MANHOLES 0.5M FROM KERB FACES AND SERVICE MARGINS.
15. SEWERS MUST HAVE 5M CLEARANCE FROM TREES AND HEDGES OR TO HAVE SUITABLE ROOT PROTECTION IN ACCORDANCE WITH THE SFA 6TH REQUIREMENTS.
16. ALL PIPES TO HAVE CLASS 'S' GRANULAR BED AND SURROUND UNLESS OTHERWISE STATED. BEDDING AND BACKFILL MATERIALS TO CONFORM TO THE REQUIREMENTS OF WIS 4-08-02 (TABLE A2). WHERE DEPTH OF COVER TO TOP OF SEWER IS LESS THAN 1.2M IN HIGHWAYS AND VERGES (OR LESS THAN 0.9M IN NON-VEHICULAR ACCESSED AREAS), THEN A CLASS 'Z' BEDDING TO BE USED.
17. ALL SEWER TRENCHES AND BRANCH CONNECTIONS TO BE BACKFILLED WITH SUITABLE MATERIAL IN LAYERS NOT EXCEEDING 225MM UNCONSOLIDATED THICKNESS THEN FULLY COMPACTED.
18. ADOPTABLE SEWER PIPES TO BE LAID IN MAXIMUM 3 METRE LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS.
19. PLASTIC CHANNEL SECTIONS WILL NOT BE PERMITTED WITHIN MANHOLE CHAMBERS. CLAYWARE CHANNELS SHALL BE USED WITHIN MANHOLES FOR PIPE SIZES UP TO AND INCLUDING 300MM DIAMETER.
20. THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION IN THEM MAY NEED TO BE INCREASED AN INCREMENT TO ACCOMMODATE THE CONNECTION AND BENDS.
21. SECTION 163 OF THE HIGHWAYS ACT 1980 REQUIRES PROVISION TO BE MADE TO PREVENT WATER FALLING ON OR FLOWING ONTO THE HIGHWAY FROM PRIVATE DRIVEWAYS OR PROPERTIES. ANY DRAINAGE REQUIREMENTS MUST BE CONNECTED INTO THE PRIVATE SURFACE WATER DRAINAGE SYSTEM.
22. THE CONTRACTOR SHALL COMPLY WITH THE FOLLOWING:-
(i) ALL OPERATIONS SHOULD BE CARRIED OUT IN ACCORDANCE WITH THE GENERAL HEALTH AND SAFETY POLICY OF THE DEVELOPER AS REQUIRED BY SECTIONS 2 OF THE HEALTH AND SAFETY AT WORK ACT 1974 AND IN PARTICULAR THE CONSTRUCTION (GENERAL PROVISIONS) REGULATIONS.
(i) THE LOCAL AUTHORITY AND UTILITIES COMPANIES ARE TO BE NOTIFIED PRIOR TO COMMENCEMENT OF WORK ON SITE.
(ii)PRIOR TO CONSTRUCTION THE ACTUAL POSITIONS AND DEPTHS OF SERVICES LIKELY TO BE AFFECTED BY THE WORKS SHOULD BE ESTABLISHED BY MEANS OF HAND DIG IN CLOSE LIAISON WITH THE UTILITY COMPANIES. THE CONTRACTOR SHALL IMMEDIATELY ADVISE THE ENGINEER OF ANY SERVICES EXPOSED WHICH MAY AFFECT THE DESIGN.
(ii) ALL OPERATIVES WORKING ON THE HIGHWAY WORKS MUST HAVE STREET WORKS ACCREDITATION.
23. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH CURTINS SPECIFICATION FOR DRAINAGE WORKS AND ANY OTHER SUBSEQUENT ADDITIONS TO THIS LIST.
24. THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT, AND TEMPORARY AND PERMANENT DIVERSION WORKS, AS NECESSARY TO ALL EXISTING SERVICES.
25. THE CONTRACTOR SHALL ALLOW FOR KEEPING TRENCHES AND EXCAVATIONS AS DRY AS PRACTICABLE BY PUMPING FROM TEMPORARY SUMPS AND DE-WATERING AS APPROPRIATE. THE POINT AND METHOD OF DISCHARGE TO BE AGREED WITH THE DRAINAGE AUTHORITY & LLFA AND ENVIRONMENT AGENCY.
26. ALL DRAINAGE WORKS ARE TO BE CONSTRUCTED FROM THE OUTFALL TOWARDS THE HEAD OF RUN TO ENSURE THE OUTFALL CAN BE ACHIEVED.

Rev	Date	Description	By	Check	App.
P3	22.02.24	UPDATED TO SUIT COMMENTS	AA	CD	CD
P2	08.12.23	STAGE 4	CD	SW	CB
P1	11.11.22	FIRST ISSUE	CD	DS	DS

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Client: GREAT PLACES HOUSING GROUP

Project: LAYSTALL STREET DEVELOPMENT MANCHESTER

Office: ALTRINCHAM

Discipline: CIVIL AND STRUCTURAL

Title: DRAINAGE DETAILS SHEET 1

Scale @ A1: NTS

Status: STAGE 4

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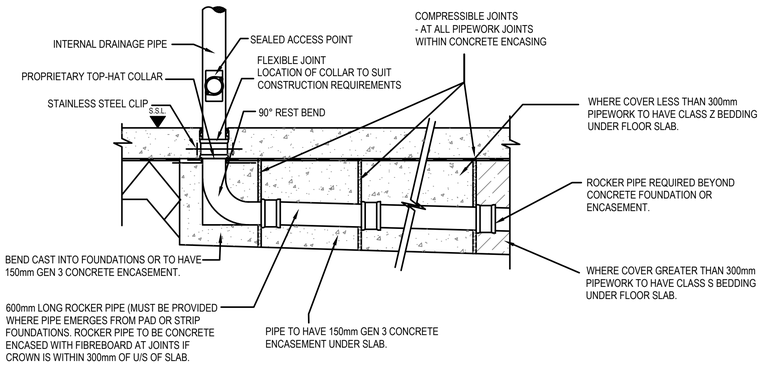
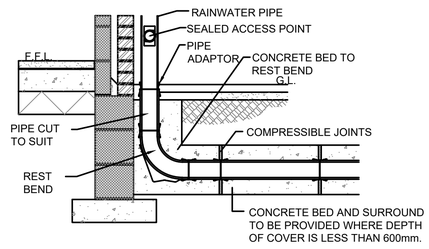
Job Number	Originator	Building/Zone	Level
220019	CLA	XX	00
Type	Discipline	Drawing No.	Revision
DR	C	501	P3

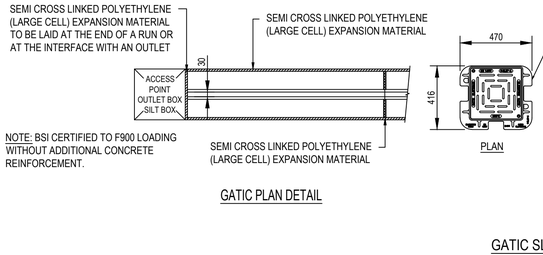


DRAINAGE UNDER BUILDINGS



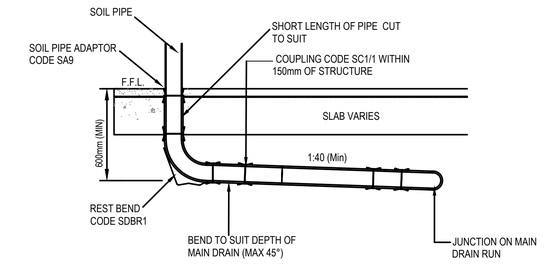
RWP CONNECTION DETAIL

(SCALE 1:20)

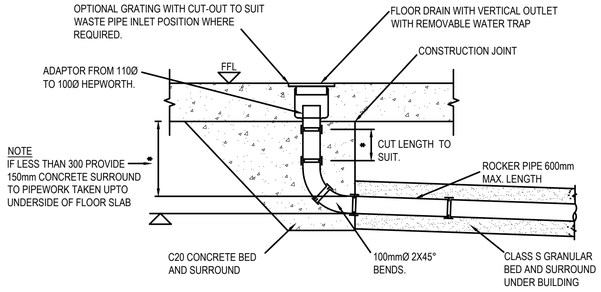


GATIC PLAN DETAIL

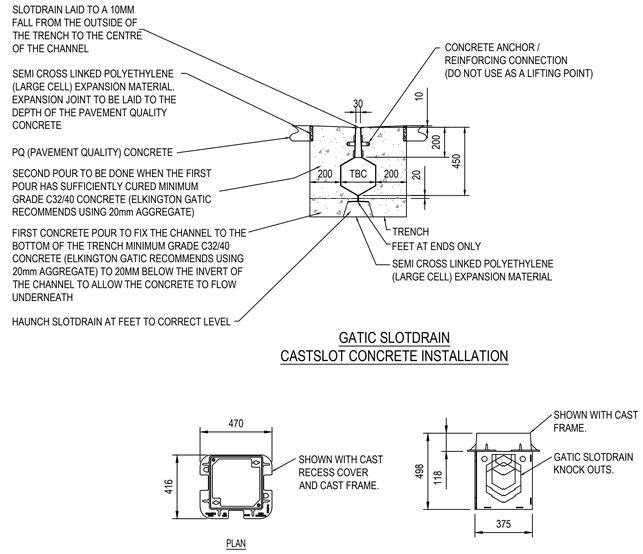
GATIC SLOTDRAIN 350mm OUTLET UNIT SECTION AND PLAN DETAILS NTS



TYPICAL SVP CONNECTION TO MAIN RUN

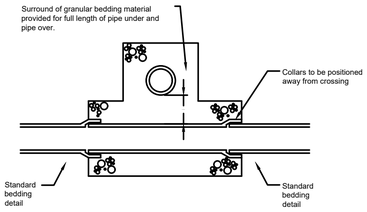


TYPICAL INTERNAL FLOOR DRAIN

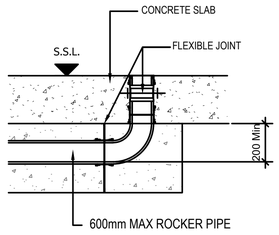


GATIC SLOTDRAIN CASTSLOT CONCRETE INSTALLATION

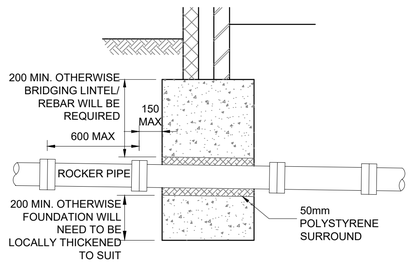
350 ACCESS BOX SECTION AND PLAN DETAILS NTS



PIPE CROSSINGS DETAIL

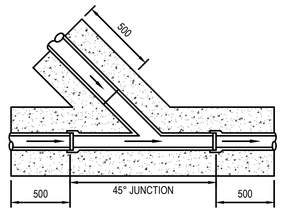


TYPICAL SECTION THROUGH SLAB (100mmØ downpipe)

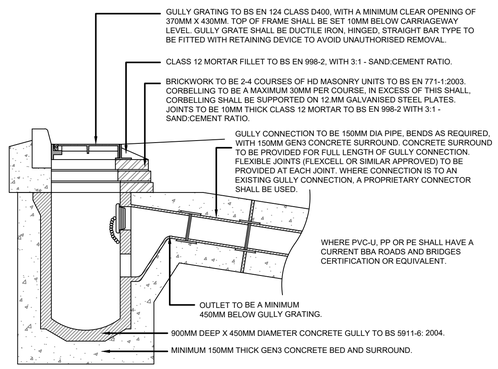


TYPICAL PIPE THROUGH FOUNDATIONS DETAIL

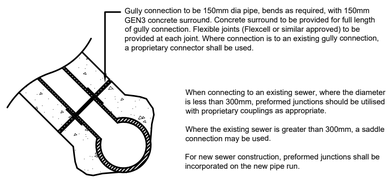
SCALE 1:20



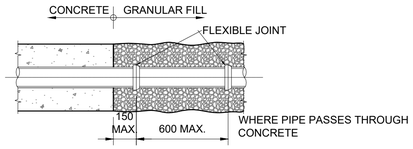
TYPICAL SADDLE CONNECTION



ROAD GULLY(G) DETAIL - TYPE 1

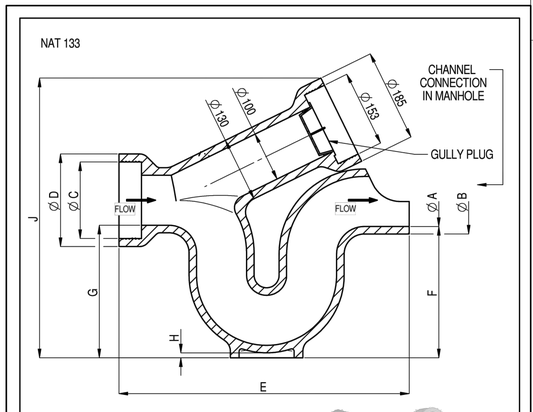


SADDLE CONNECTION TO EXISTING SEWER



TYPICAL ROCKER PIPE DETAIL

SCALE 1:20



ISOMETRIC VIEW

SUPPLIED AS STANDARD WITH
PLASTIC GULLY PLUG.

ALSO AVAILABLE WITH OPTIONAL
LEVER LOCKING STOPPER

CODE No.	A	B	C	D	E	F	G	H	J	WEIGHT (Kg)
KRI3/1	100	130	153	185	580	265	270	40	530	15.35
KRI3/2	150	185	220	250	720	278	300	40	610	23.90
KRI3/3	225	270	300	340	1070	430	450	50	840	57.00

ALL DIMENSIONS IN mm

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AND MUST NOT BE USED IN ANY WAY PREJUDICIAL TO THEIR INTERESTS

± 5% TOLERANCE TO BE APPLIED ON ALL DIMENSIONS

WEIGHT =	DRAWN: GB 26-04-10	SCALE	PROJECTION
DO NOT SCALE	ISSUE: 2 29-08-17	1:5	

TITLE :- REVERSE ACTION INTERCEPTOR

DRAWING No. :- KRI3 A4

GENERAL NOTES

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
3. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS AND ARCHITECTS DRAWINGS AND SPECIFICATIONS.
4. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ENGINEERS ATTENTION PRIOR TO COMMENCING ANY WORKS SHOWN.
5. ALL DETAILS TO BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL COUNCILS BUILDING CONTROL, OR ANY OTHER RELEVANT STANDARDS BODY.
6. ALL PROPRIETARY PRODUCT TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.

DRAINAGE NOTES

1. NO WORK SHOULD COMMENCE ON SITE UNTIL WRITTEN APPROVAL IS RECEIVED FROM THE ADOPTING HIGHWAY AUTHORITY, ADOPTING SEWERAGE UNDERTAKERS, ENVIRONMENT AGENCY AND/OR ANY OTHER RELEVANT AUTHORITY. WORKS UNDERTAKEN PRIOR TO APPROVAL ARE AT THE DEVELOPER'S RISK AND CURTINS CONSULTING LIMITED WILL NOT BE HELD RESPONSIBLE FOR SUBSEQUENT DELAYS IN APPROVALS, REMEDIAL COSTS OR DELAYS.
2. ALL INVERT LEVELS OF EXISTING FOUL AND SURFACE WATER SYSTEMS ARE TO BE CONFIRMED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF ANY ON SITE DRAINAGE WORKS. ANY DISCREPANCY IN LEVELS IS TO BE REPORTED IMMEDIATELY TO CURTINS CONSULTING LIMITED
3. ALL SEWERS, UNLESS AGREED OTHERWISE STATED, SHALL BE:
   150MM DIA TO BE VITRIFIED CLAY.
   225MM DIA TO BE VITRIFIED CLAY.
   300MM DIA TO BE VITRIFIED CLAY.
   375MM DIA AND GREATER TO BE CLASS 120 CONCRETE PIPES.
4. ALL VITRIFIED CLAY PIPES TO BS EN 295-1:
   ALL CONCRETE PIPES TO BE TO BS EN 1916.
   ALL CONCRETE MANHOLES TO BE TO BS EN1917.
5. LATERAL CONNECTIONS FROM MAIN SEWERS TO DEMARCATION CHAMBER TO BE 150MM DIA MINIMUM UNO AND CONSTRUCTED TO ADOPTABLE STANDARDS.
6. 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.
7. ALL PIPE DIAMETERS GIVEN ARE NOMINAL INTERNAL PIPE DIAMETERS.
8. ALL SEWER WORKS TO COMPLY WITH WRC 'SEWERS FOR ADOPTION, 6TH EDITION', STW'S REQUIREMENTS AND KITE-MARKED(OR SIMILAR APPROVED) WHERE PRACTICABLE. WHERE CONFLICTING DETAILS OCCUR, STW'S DETAILS SHALL TAKE PRECEDENCE IN ALL CASES.
9. MANHOLE COVERS SHALL HAVE A CLEAR OPENING IN ACCORDANCE WITH SFA 6TH EDITION AND SHALL BE CLASS D400 TO BS EN 124 WITH 150MM DEEP FRAMES IN VEHICULAR TRAFFICED AREA. CLASS B125 COVERS AND FRAMES TO BE PROVIDED ON ALL OTHER MANHOLES IN LANDSCAPING.
10. FILLED GROUND MUST BE FILLED AND CONSOLIDATED BEFORE ANY SEWER WORKS ARE CARRIED OUT.
11. WATER AUTHORITIES ARE NOT OBLIGED TO ACCEPT FILTER DRAIN / LAND DRAINAGE RUN OFF INTO THE PUBLIC SEWER NETWORK OR ADOPTABLE DRAINAGE SYSTEM (DIRECTLY OR INDIRECTLY). AN ALTERNATIVE METHOD OF DISPOSAL OF LAND DRAINAGE RUN OFF WILL THEREFORE BE REQUIRED AND ANY PROPOSALS MUST BE AGREED WITH THE LOCAL AUTHORITY LAND DRAINAGE SECTION.
12. COVER SLABS MUST CARRY THE BSI KITEMARK AND SHALL COMPLY WITH BS 5911 PART3 / BS EN 1917 :2000. WHERE THE CLEAR OPENING OF THE KITE-MARKED PRODUCT IS DIFFERENT TO THAT OF THE COVER AND FRAME, A LOAD BEARING SLAB SHOULD BE FITTED ABOVE THE COVER SLAB TO BRING THE SIZE DOWN AS SPECIFIED ABOVE. PLEASE REFER TO CONCRETE PIPELINE SYSTEMS ASSOCIATION (CPSA) 'TECHNICAL BULLETIN' ISSUED AUTUMN 2004 FOR KITE-MARKED COVER SLAB OPENING SIZES.
13. 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.
14. ADOPTABLE SEWERS SHOULD BE A MINIMUM OF 1M AND MANHOLES 0.5M FROM KERB FACES AND SERVICE MARGINS.
15. SEWERS MUST HAVE 5M CLEARANCE FROM TREES AND HEDGES OR TO HAVE SUITABLE ROOT PROTECTION IN ACCORDANCE WITH THE SFA 6TH REQUIREMENTS.
16. ALL PIPES TO HAVE CLASS 'S' GRANULAR BED AND SURROUND UNLESS OTHERWISE STATED. BEDDING AND BACKFILL MATERIALS TO CONFORM TO THE REQUIREMENTS OF WIS 4-08-02 (TABLE A2), WHERE DEPTH OF COVER TO TOP OF SEWER IS LESS THAN 1.2M IN HIGHWAYS AND VERGES (OR LESS THAN 0.9M IN NON-VEHICULAR ACCESSED AREAS), THEN A CLASS 'Z' BEDDING TO BE USED.
17. ALL SEWER TRENCHES AND BRANCH CONNECTIONS TO BE BACKFILLED WITH SUITABLE MATERIAL IN LAYERS NOT EXCEEDING 225MM UNCONSOLIDATED THICKNESS THEN FULLY COMPACTED.
18. ADOPTABLE SEWER PIPES TO BE LAID IN MAXIMUM 3 METRE LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER LENGTHS.
19. PLASTIC CHANNEL SECTIONS WILL NOT BE PERMITTED WITHIN MANHOLE CHAMBERS. CLAYWARE CHANNELS SHALL BE USED WITHIN MANHOLES FOR PIPE SIZES UP TO AND INCLUDING 300MM DIAMETER.
20. THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION IN THEM MAY NEED TO BE INCREASED AN INCREMENT TO ACCOMMODATE THE CONNECTION AND BENDS.
21. SECTION 163 OF THE HIGHWAYS ACT 1980 REQUIRES PROVISION TO BE MADE TO PREVENT WATER FALLING ON OR FLOWING ONTO THE HIGHWAY FROM PRIVATE DRIVEWAYS OR PROPERTIES. ANY DRAINAGE REQUIREMENTS MUST BE CONNECTED INTO THE PRIVATE SURFACE WATER DRAINAGE SYSTEM.
22. THE CONTRACTOR SHALL COMPLY WITH THE FOLLOWING:-
   (i) ALL OPERATIONS SHOULD BE CARRIED OUT IN ACCORDANCE WITH THE GENERAL HEALTH AND SAFETY POLICY OF THE DEVELOPER AS REQUIRED BY SECTIONS 2 OF THE HEALTH AND SAFETY AT WORK ACT 1974 AND IN PARTICULAR THE CONSTRUCTION (GENERAL PROVISIONS) REGULATIONS.
   (ii) THE LOCAL AUTHORITY AND UTILITIES COMPANIES ARE TO BE NOTIFIED PRIOR TO COMMENCEMENT OF WORK ON SITE.
   (iii) PRIOR TO CONSTRUCTION THE ACTUAL POSITIONS AND DEPTHS OF SERVICES LIKELY TO BE AFFECTED BY THE WORKS SHOULD BE ESTABLISHED BY MEANS OF HAND DIG IN CLOSE LIAISON WITH THE UTILITY COMPANIES. THE CONTRACTOR SHALL IMMEDIATELY ADVISE THE ENGINEER OF ANY SERVICES EXPOSED WHICH MAY AFFECT THE DESIGN.
   (iv) ALL OPERATIVES WORKING ON THE HIGHWAY WORKS MUST HAVE STREET WORKS ACCREDITATION.
23. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH CURTINS SPECIFICATION FOR DRAINAGE WORKS AND ANY OTHER SUBSEQUENT ADDITIONS TO THIS LIST.
24. THE CONTRACTOR SHALL ALLOW FOR THE PROTECTION, TEMPORARY AND PERMANENT SUPPORT, AND TEMPORARY AND PERMANENT DIVERSION WORKS, AS NECESSARY TO ALL EXISTING SERVICES.
25. THE CONTRACTOR SHALL ALLOW FOR KEEPING TRENCHES AND EXCAVATIONS AS DRY AS PRACTICABLE BY PUMPING FROM TEMPORARY SUMPS AND DE-WATERING AS APPROPRIATE. THE POINT AND METHOD OF DISCHARGE TO BE AGREED WITH THE DRAINAGE AUTHORITY & LLFA AND ENVIRONMENT AGENCY.
26. ALL DRAINAGE WORKS ARE TO BE CONSTRUCTED FROM THE OUTFALL TOWARDS THE HEAD OF RUN TO ENSURE THE OUTFALL CAN BE ACHIEVED.

Rev	Date	Description	By	Check	App.
P3	22.02.24	UPDATED TO SUIT COMMENTS	AA	CD	CD
P2	08.12.23	STAGE 4	CD	SW	CB
P1	11.11.22	FIRST ISSUE	CD	DS	DS

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Client: GREAT PLACES HOUSING GROUP

Project: LAYSTALL STREET DEVELOPMENT MANCHESTER

Office: ALTRINCHAM

Discipline: CIVIL AND STRUCTURAL

Title: DRAINAGE DETAILS SHEET 2

Scale @ A1	Status
NTS	STAGE 4

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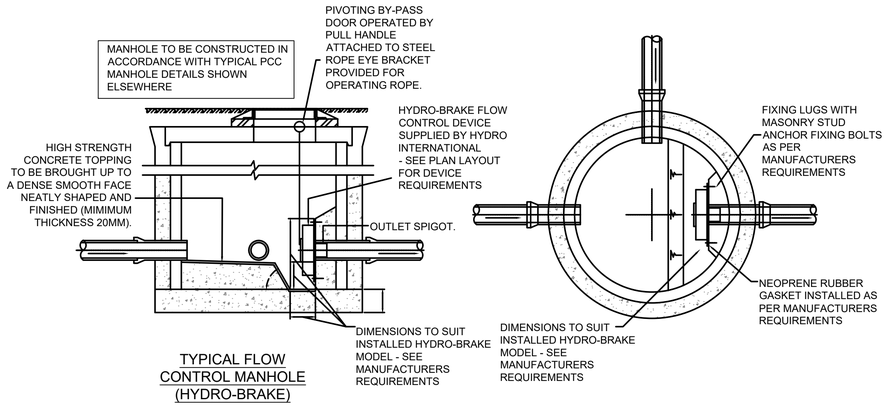
Job Number	Originator	Building/Zone	Level
220019	CLA	XX	00
Type	**Discipline**	**Drawing No.**	**Revision**
DR	C	502	P3

Birmingham 0121 200 3900 · Glasgow 0141 222 7720 · Liverpool 0151 227 5000 · London 020 3077 0370 · Manchester 0161 613 5000 · Newcastle 0191 221 0702 · Norwich 01603 339190 · Prestwick 01292 475375 · Reading 0118 941 7888

DESIGN OF TANK TO BE CONFIRMED BY SELECTED MANUFACTURER. CONTRACTOR TO CONFIRM AND ISSUE TO CLANCY CONSULTING FOR APPROVAL.



TYPICAL FLOW CONTROL MANHOLE (HYDRO-BRAKE)

Technical Specification		
Control Point	Head (m)	Flow (l/s)
Primary Design	1.550	5.000
Flush-Flo™	0.424	4.794
Kick-Flo®	0.868	3.820
Mean Flow		4.268

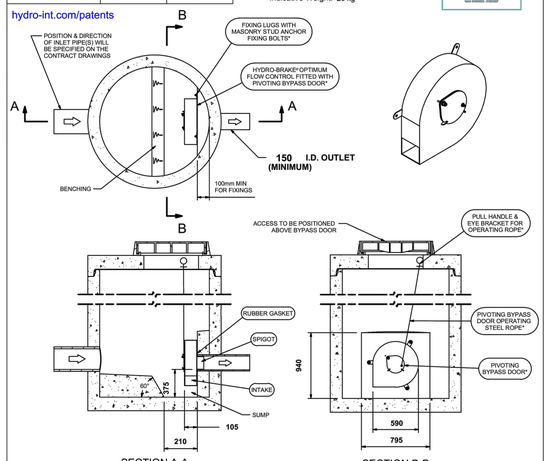
Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Indicative Weight: 20 kg

BBA APPROVAL INSPECTION TESTING CERTIFICATION — CERTIFICATE No. 08/4059B

wrc approved — PT/003/0422

hydro-int.com/patents



IMPORTANT: LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE !	The head/flow characteristics of this SHE-0097-5000-1550-5000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve. **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**
DATE	08/12/2023 11:15
SITE	Laystall Street
DESIGNER	carl dawson
REF	1-21458

Hydro International — A CIRIA COMPANY

SHE-0097-5000-1550-5000
Hydro-Brake® Optimum

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carl.dawson@clancy.co.uk

Technical Specification		
Control Point	Head (m)	Flow (l/s)
Primary Design	1.550	5.000
Flush-Flo	0.424	4.794
Kick-Flo®	0.868	3.820
Mean Flow		4.268

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wrc approved — PT/003/0422

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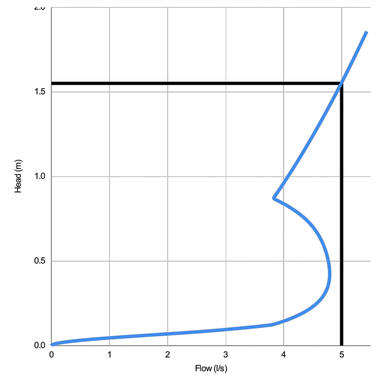

Head (m)	Flow (l/s)
0.000	0.000
0.053	1.322
0.107	3.376
0.160	4.126
0.214	4.434
0.267	4.622
0.321	4.730
0.374	4.781
0.428	4.794
0.481	4.780
0.534	4.747
0.588	4.695
0.641	4.622
0.695	4.519
0.748	4.376
0.802	4.178
0.855	3.908
0.909	3.900
0.962	4.004
1.016	4.105
1.069	4.204
1.122	4.300
1.176	4.393
1.229	4.484
1.283	4.574
1.336	4.661
1.390	4.746
1.443	4.830
1.497	4.913
1.550	4.993

DESIGN ADVICE !	The head/flow characteristics of this SHE-0097-5000-1550-5000 Hydro-Brake Optimum® Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve. **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**
DATE	08/12/2023 11:15
Site	Laystall Street
DESIGNER	carl dawson
Ref	1-21458

Hydro International — A CIRIA COMPANY

SHE-0097-5000-1550-5000
Hydro-Brake Optimum®

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Rev	Date	Description	By	Check	App.
P3	22.02.24	STAGE 4	CD	SW	CB
P2	08.12.23	STAGE 4	CD	SW	CB
P1	11.11.22	FIRST ISSUE	CD	DS	DS

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Client: GREAT PLACES HOUSING GROUP

Project: LAYSTALL STREET DEVELOPMENT
MANCHESTER

Office: ALTRINCHAM

Discipline: CIVIL AND STRUCTURAL

Title: DRAINAGE DETAILS
SHEET 3

Scale @ A1: NTS

Status: STAGE 4

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Job Number	Originator	Building/Zone	Level
220019	CLA	XX	00
Type	**Discipline**	**Drawing No.**	**Revision**
DR	C	503	P3

Polystorm-R Modular Cell

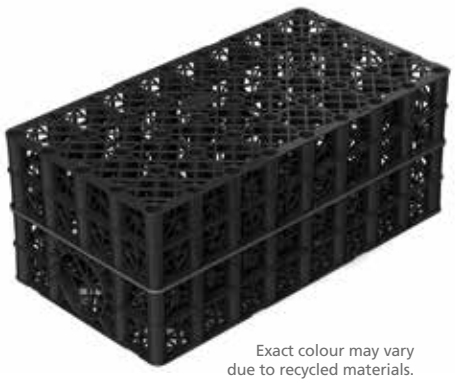
Data Sheet

PRODUCT INFORMATION **P1** **ISSUE 4 - SEPT 2017**

Product code: PSM1A

The Polystorm-R modular cell is ideally suited for loaded applications at greater depths, such as housing, commercial and infrastructure projects and has a compressive strength of up to 61 tonnes/m². It offers all the proven performance of the Polystorm cell, with the added benefits of being manufactured from over 90% recycled material content.

Wherever performance criteria and standards allow, we will always maximise the sustainability of our products by using post consumer plastics in their manufacture. By sourcing and carefully controlling the quality of the recycled material we use our precision injection moulding. Therefore we are able to guarantee consistent quality in our recycled plastic, giving you the confidence and the performance levels you expect from the market leader.



Exact colour may vary due to recycled materials.

Key Benefits

- Made from specially selected and controlled recycled materials
- Environmentally friendly, sustainable solution
- Has undergone stringent testing to ensure product performance
- Compressive strength of 61 tonnes/m²
- Ideal for retention, attenuation and infiltration applications with a suitable geomembrane or geotextile
- BBA approved
- Allow flexibility of shape - ideal for shallow excavation systems, narrow strips or use in restricted areas
- Can be used as part of a value engineered hybrid system with Polystorm, Polystorm Lite and Polystorm Xtra
- Integrated inlet and outlet
- 3D flow throughout the structure
- 95% void ratio
- Light weight yet robust - excellent Health and Safety and installation benefits
- 60 years creep limited life expectancy

Technical Support

Detailed guidance and assistance is available.
For further information, please contact our Technical Team on **+44 (0) 1509 615100** or email **civils@polypipe.com**

BBA BRITISH BOARD OF AGREMENT
CERTIFICATE No. 06/4297

ELEMENT	VALUE
PHYSICAL PROPERTIES	
Length	1m
Width	0.5m
Depth	0.4m
Total volume	0.2m³
Unit weight	9kg (approx)
Unit storage volume	0.19m³ (190 litres)
Void ratio	95%
SHORT TERM COMPRESSIVE STRENGTH	
Vertical	610 kN/m² **
Lateral	63 kN/m² **
SHORT TERM DEFLECTION	
Short-term vertical deflection	60 kN/m² per mm
LONG TERM DEFLECTION	
Estimated long term vertical deflection (creep)	0.2798 Ln (design life in hrs) +0.485 [Based on an applied test load = 162 kN/m²] Creep data limit 60 years
Estimated long term lateral deflection (creep)	1.0192 Ln (design life in hrs) -3.864 [Based on an applied test load = 30.8 kN/m²] Creep data limit 60 years

Note: Polystorm-R is ideal for use in trafficked and pedestrian applications subject to a structural design check and suitable installation conditions

* Each unit includes 4 Clips and 2 Shear Connectors.

** Compressive strength at yield, maximum recommended value for design purposes.

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www.polypipe.com/wms

Polypipe

Polystorm-R Modular Cell

Data Sheet

RECOMMENDED MAXIMUM DEPTH OF INSTALLATION (to cell invert) [m]

TYPICAL SOIL TYPE	TYPICAL ANGLE OF SHEAR RESISTANCE	SOIL WEIGHT kN/m³	WITHOUT GROUNDWATER (below base of cells) NORMAL CASE		WITH GROUNDWATER AT 1M BELOW GROUND LEVEL AND UNITS WRAPPED IN GEOMEMBRANE	
			Pedestrian	Trafficked (cars) <3000kg GVW	Pedestrian	Trafficked (cars) <3000kg GVW
Stiff over consolidated clay e.g. London clay	24	20.0	2.2	1.9	1.8	1.6
Normally consolidated silty sandy clay e.g. alluvium, made ground	26	19.0	2.4	2.2	1.9	1.7
Loose sand and gravel	30	18.0	3.0	2.7	2.0	1.9
Medium dense sand and gravel	33	19.0	3.2	2.9	2.0	1.9
Dense sand and gravel	38	20.0	3.7	3.5	2.1	2.0

Note:
1) Stated depths based on the calculation methodology detailed within CIRIA C680 (2008)
2) Assuming water density = 10.0kN/m³
3) Assumed ultimate limit state (ULS) partial factor of safety applied to: Material = 2.75 Lateral pressure = 1.35

Durability

The polymer material used in the manufacture of the Polystorm-R unit has an adequate resistance to attack from the type and quantities of chemicals that may be expected to naturally occur in uncontaminated soils and rainwater runoff. When installed in accordance with our recommendations, it is expected that the Polystorm-R unit will have a design life in excess of 60 years*. The installer of a proposed geocellular structure should ensure that an appropriate design check has been undertaken, in accordance with the recommended methodology and factors of safety given in CIRIA C680 (2008), Structural Design of Modular Geocellular Drainage Tanks, prior to the commencement of construction activities.

* Derived from long term extrapolated creep testing

Notes

1. Unless stated, all values are nominal and may vary within normal production tolerances.
2. The characteristic unit parameters stated have been based on Polypipe BBA certificate N° 06/4297, sheet 3.
3. Polypipe reserve the right to change product specifications without prior notice.
4. This document is uncontrolled and updates will not be issued automatically.

RECOMMENDED MINIMUM COVER LEVELS [m]

LIVE LOAD CONDITIONS	PEDESTRIAN	LIGHT TRAFFICKED	
		Car park with vehicle mass <GVW	
Minimum cover depth required (m)	0.50	<3000kg 0.50	<9000kg 0.65

Note
1) Stated depths based on the calculation methodology detailed within CIRIA C680 (2008)
2) Assumed serviceability limit state (SLS) partial factor of safety applied to: Material = 1.5 Live load = 1.0 Dead load = 1.0
3) Shallower minimum burial depths may be applicable subject to an assessment of the specific site conditions. For further details please consult our Technical Team on 01509 615100.

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Tel: +44 (0) 1509 615100 Fax: +44 (0) 1509 610215 Email: civils@polypipe.com
www.polypipe.com/wms

Polypipe

6. Architect Correspondence Regarding Green Roof Justification

From: Rob Paton <rob.paton@omiarchitects.com>
Sent: 23 April 2024 10:17
To: Carl Dawson
Cc: Stuart McGrath
Subject: SuDs Strategy DoC

OMI Architects

Hi Carl,

See below.

The submitted drawings and report demonstrate how the scheme achieves the required flow rate of 5l/s. To achieve this a below ground surface water attenuation tank system has been incorporated. We note the request for justification of why a blue green roof system has not been incorporated into the scheme and can confirm this is for the following reasons:

Structural Considerations/Construction Methodology
The scheme is being delivered with a Light Gauge Steel Frame (LGSF) superstructure. LGSF is an efficient form of construction utilising cold rolled steel sections, which delivers a light weight building. The incorporation of a Blue/Green roof would increase the weight on the system, increasing the mass (and overall material use) of both the superstructure and foundations. This would add an unnecessary level of additional embodied carbon into the development when compared to the below ground attenuation solution proposed, and would contradict the Embodied carbon strategy agreed under a separate planning condition.

Maintenance/Risk of Water Ingress
Holding water at roof level is intrinsic to blue roof design. Blue roofs are installed with a waterproofing membrane but if this becomes damaged and begins to leak, the damage that could be caused by water cascading through the building could be catastrophic. Maintenance regimes can be advised however the client's view is that the risk of these not being followed to the letter, or water ingress being caused by a failure of the waterproofing system, is too great a risk. This has led to the below ground attenuation tank solution proposed.

Building Height/Massing
The overall building height approved under the planning and listed building consent was arrived at through close liaison with the planning and conservation officers, to deliver a scheme at an appropriate height to it's context whilst delivering a viable quantum of housing (in this case 100% affordable tenure housing). This requires careful consideration of roof levels and parapets in order to conform to the consented design, and the additional height required to accommodate a blue green roof system cannot be accommodated.

Kind Regards

Rob Paton | Senior Architect

OMI ARCHITECTS
31 Blackfriars Road, Salford, Manchester, M3 7AQ
0161 832 3242 | omiarchitects.com | @omiarchitects