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Drainage Planning Conditions

Subject: Plot F, Great Jackson Street (Building F2/Phase 1)

Ref: 078524/DPCC/P1 Rev V01

Date: 28/07/2023

The Planning Permission Ref: 132199/FO/2021
Conditions 10, 20 and 21 relates to Pre-Commencement drainage proposals for the development.

Proposed Drainage:

The proposed drainage system consists of a separate foul and surface water network.
Reference should be made to the following drainage design documents:

- Z1-CUR-G580-PL-GRD-92500-P01_Proposed Drainage Strategy
- Z1-CUR-G580-PL-GRD-92501-P01_Proposed Drainage Strategy Phase 1
- Z1-CUR-G580-Pl-GRD-92510 – P01_Drainage Notes
- Z1-CUR-G580-Pl-XX-92520 – P01_Manhole Schedule
- Z1-CUR-G580-DE-XX-92530-P01_ Drainage Details 1
- Z1-CUR-G580-DE-XX-92531-P01_ Drainage Details 2
- Z1-CUR-G580-DE-XX-92531-P01_ Drainage Details 3
- Z1-CUR-G580-DE-XX-92531-P01_ Drainage Details 4
- Z1-CUR-G580-PL-GRD-92000-P01_Existing Impermeable Areas
- Z1-CUR-G580-PL-GRD-92001-P01_Proposed Impermeable Areas
- Z1-CUR-G580-PL-GRD-92002-P01_Overland Flow Routes
- Surface Water Calcs Without Surcharged Outfall
- Surface Water Calcs With Surcharged Outfall

With specific reference to the conditioned points:

Condition 10

Foul and surface water shall be drained on separate systems.	**Pre-Commencement**

Foul and Surface Water are proposed to be drained via separate systems. The foul drainage is proposed to be connected to the Combined public sewer in Owen Street and the Surface Water is proposed to be discharged into the existing outfall to the River Medlock. Refer to the drainage drawings enclosed within this report.

Condition 20

The drainage for Phase 1 of the development hereby approved, shall be carried out in accordance with principles set out in the submitted Foul & Surface Water Drainage Design Drawing 078524 CUR XX XX DR C 092500, Rev P03 dated 22/03/21 by Curtins. For the avoidance of doubt, surface water shall drain at the restricted rate of 115 l/s. No surface water shall be permitted to drain directly or indirectly into the public sewer. The development shall be completed in accordance with the approved details.	**Pre-Commencement**

The current Drainage Strategy proposals are detailed on the drawings enclosed within this report. These proposals are based on the principals set out on drawing 078524 CUR XX XX DR C 092500, Rev P03.

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Surface Water is proposed to be discharged into the existing outfall to the River Medlock at a maximum pass forward flow rate of 115 l/s.

Condition 21

Prior to the commencement of development within Phase 1, details of surface water drainage works in accordance with Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015), or any subsequent replacement national standards, shall be submitted to and approved in writing by the City Council as local planning authority. The details shall include the following information: o Consideration of alternative green SuDS solution if practicable; o Details and calculations of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment, i.e. at least a 50% reduction in runoff rate compared to the existing rates, as the site is located within Conurbation Core Critical Drainage Area; o For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event; o An existing and proposed impermeable areas drawing to accompany all discharge rate calculations; o Runoff volume in the 1 in 100 year, 6 hours rainfall shall be constrained to a value as close as is reasonable practicable to the greenfield runoff volume for the same event, but never to exceed the runoff volume from the development site prior to redevelopment; o Evidence that the drainage system has been designed (unless an area is designated to hold and/or convey water as part of the design) so that flooding does not occur during a 1 in 100 year rainfall event with allowance for 40% climate change in any part of a building; o Details of drainage to prevent surface water flows into basement levels. o Assessment of overland flow routes for extreme events that is diverted away from buildings (including basements). Overland flow routes need to be designed to convey the flood water in a safe manner in the event of a blockage or exceedance of the proposed drainage system capacity including inlet structures. A layout with overland flow routes needs to be presented with appreciation of these overland flow routes with regards to the properties on site and adjacent properties off site; o As the site is proposed to drain to a Main River the Environment Agency should be consulted. An email of acceptance of proposed flows will suffice. The Environment Agency should also be consulted to confirm the level of surcharge which should be used on the outfall for the proposed hydraulic model; o Where an application is part of a larger site which already has planning permission it is essential that the new proposal does not compromise the drainage scheme already approved; o Hydraulic calculation of the proposed drainage system; o Construction details of flow control and SuDS elements. The approved scheme shall be implemented before first occupation of Phase 1.	**Pre-Commencement**

Consideration of alternative green SuDS solution if practicable.

As the site is largely covered by basement, and infiltration is not compatible, there is limited opportunities for components such as green swales and ponds. However, a large portion of the external podium will be covered by permeable finishes which will locally attenuate surface water run-off. The permeable finishes will vary between soft and hard landscape and as such will be considered as localised green SuDS. There are also tree corridor, which will actively accept run-off and will require connection to the drainage network. There components will provide source control to the local areas they serve.

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Details and calculations of surface water attenuation that offers a reduction in surface water runoff rate in line with the Manchester Trafford and Salford Strategic Flood Risk Assessment, i.e. at least a 50% reduction in runoff rate compared to the existing rates, as the site is located within Conurbation Core Critical Drainage Area.
Refer to the Drainage Calculations enclosed in Appendix B.
Calculations are based on an overall maximum discharge of 115 l/s, as agreed during planning.

For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.
Discharge rates are based on a maximum of 115 l/s as agreed at planning. This was agreed on the basis of a 50% reduction acknowledging that there is a 100% removal of surface water flows into the combined sewer network.

An existing and proposed impermeable areas drawing to accompany all discharge rate calculations.
Refer to Impermeable Areas drawings in Appendix C.

Runoff volume in the 1 in 100 year, 6 hours rainfall shall be constrained to a value as close as is reasonable practicable to the greenfield runoff volume for the same event, but never to exceed the runoff volume from the development site prior to redevelopment.

The greenfield run-off volume for the site is estimated as 221m3 for the 100 year 6 hour event as shown below.

Pre-development discharge

Site Makeup	Greenfield
Greenfield Method	FSR/FEH
Positively Drained Area (ha)	0.750
Soil Index	4
SPR	0.47
Catchment Wetness Index	120.442
Return Period (years)	100
Climate Change (%)	0
Storm Duration (mins)	360
Betterment (%)	0
	Calc
PR	0.495
Runoff Volume (m³)	221

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The post development run off volume is 523m3 for the 100 year 6 hour event as shown below.

US Node ID	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status	Link ID	DS Node ID	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
S1	192	30.806	0.056	3.3	0.0999	0.0000	OK	1.000	S1A	3.3	0.268	0.044	0.0894	
S1A	192	30.804	0.086	13.5	0.0863	0.0000	OK	1.001	US1	13.5	0.691	0.181	0.4087	
US1	184	30.731	0.108	20.6	0.1256	0.0000	OK	1.002	S3	20.6	0.820	0.276	0.7295	
S2	192	30.616	0.046	0.0	0.0661	0.0000	OK	3.000	S3	0.0	-0.009	-0.001	0.2344	
S3	192	30.616	0.125	24.1	6.1267	0.0000	OK	1.003	S4	24.0	0.910	0.322	0.2951	
S4	192	30.425	0.285	35.9	0.8970	0.0000	OK	1.005	US2	35.8	0.390	0.149	4.8382	
US2	192	30.422	0.324	42.2	0.0000	0.0000	OK	1.005_1	S5	42.1	0.366	0.175	4.0150	
S5	192	30.420	0.353	47.4	0.6232	0.0000	OK	1.006	US3	47.3	0.336	0.196	4.4842	
US3	192	30.417	0.381	50.8	0.1403	0.0000	OK	1.007	US4	50.7	0.311	0.210	1.9037	
US4	192	30.417	0.393	54.2	0.1401	0.0000	OK	1.008_1	S8	54.2	0.300	0.225	3.5852	
S6	184	32.019	0.039	3.6	0.0687	0.0000	OK	6.000	S7	3.6	0.840	0.145	0.1433	
S7	184	31.379	0.049	5.2	0.0702	0.0000	OK	6.001	S8	5.2	1.079	0.206	0.0342	
S8	192	30.414	0.435	59.3	0.7694	0.0000	OK	Hydro-Brake®	RED	59.3				
RED	192	30.162	0.211	59.3	0.0000	0.0000	OK	1.010	EX_S2_OF	59.2	1.185	0.836	0.3655	523.4
EX_S2_OF	192	30.110	0.189	59.2	0.0000	0.0000	OK							
PP01	200	31.568	0.038	7.1	4.0197	0.0000	OK	2.000	S1A	6.9	2.726	0.241	0.0058	
PP02	192	31.753	0.043	6.4	0.0694	0.0000	OK	4.000	US2	6.4	1.994	0.375	0.0456	
PP03	192	32.031	0.031	5.3	2.0738	0.0000	OK	5.000	S5	5.2	2.691	0.179	0.0084	

Although there is an increase in volume post development, the existing site was likely to have discharged far in excess of the equivalent greenfield volume. The site is 100% impermeable and actively draining. There is also no application of climate change on the existing greenfield volumes whereas the proposed is +40%.

Evidence that the drainage system has been designed (unless an area is designated to hold and/or convey water as part of the design) so that flooding does not occur during a 1 in 100-year rainfall event with allowance for 40% climate change in any part of a building.

The system has been designed to accommodate the 100-year event with an allowance of 40% climate change. Refer to calculations enclosed in Appendix B.

Details of drainage to prevent surface water flows into basement levels.
Drainage is locally suspended within the basement below the ground floor slab and will be fully sealed. Drainage at lower basement levels will be pumped up to ground level and therefore backflows are not possible.

Assessment of overland flow routes for extreme events that is diverted away from buildings (including basements). Overland flow routes need to be designed to convey the flood water in a safe manner in the event of a blockage or exceedance of the proposed drainage system capacity including inlet structures. A layout with overland flow routes needs to be presented with appreciation of these overland flow routes with regards to the properties on site and adjacent properties off site.
Refer to the Overland Flow Routes drawing enclosed in Appendix C.

As the site is proposed to drain to a Main River the Environment Agency should be consulted. An email of acceptance of proposed flows will suffice. The Environment Agency should also be consulted to confirm the level of surcharge which should be used on the outfall for the proposed hydraulic model.
The Environment Agency have confirmed that the LLFA should approve the discharge rates, which were agreed at planning.
The surcharged level in the river has been obtained and based on the 100 year + 35% climate change event the water level has been modelled as 28.8m AoD. The existing outfall connection is at 29.775m AoD and is therefore not impacted by high river levels.
The Environment Agenncy Correspondence and River Model Map and Levels is enclosed in Appendix D.

Refer to calculations enclosed in Appendix B with and without surcharged outfall.

Where an application is part of a larger site which already has planning permission it is essential that the new proposal does not compromise the drainage scheme already approved.

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The system has been designed holistically as Phase 1 and Phase 2.

Hydraulic calculation of the proposed drainage system.

Refer to calculations enclosed in Appendix B.

Construction details of flow control and SuDS elements.
Refer to the Drainage Details drawing enclosed in Appendix A.

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Appendix A

- Z1-CUR-G580-PL-GRD-92500-P01_Proposed Drainage Strategy
- Z1-CUR-G580-PL-GRD-92501-P01_Proposed Drainage Strategy Phase 1
- Z1-CUR-G580-Pl-GRD-92510 – P01_Drainage Notes
- Z1-CUR-G580-Pl-XX-92520 – P01_Manhole Schedule
- Z1-CUR-G580-DE-XX-92530-P01_ Drainage Details 1
- Z1-CUR-G580-DE-XX-92531-P01_ Drainage Details 2
- Z1-CUR-G580-DE-XX-92531-P01_ Drainage Details 3
- Z1-CUR-G580-DE-XX-92531-P01_ Drainage Details 4

KEY:

- RED LINE PLANNING BOUNDARY
- SITE OWNERSHIP BOUNDARY (OFFSET INSIDE REDLINE FOR CLARITY)
- PHASE 1 BOUNDARY (OFFSET INSIDE OWNERSHIP FOR CLARITY)
- PHASE 2 BOUNDARY (OFFSET INSIDE OWNERSHIP FOR CLARITY)
- EXISTING PUBLIC COMBINED SEWER (APPROXIMATE LOCATION)
- EXISTING PRIVATE SW SEWER
- EXISTING PRIVATE FW SEWER
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED SURFACE WATER (100Ø PERFORATED PIPE)
- PROPOSED FOUL WATER DRAINAGE
- PERMEABLE PAVING
- PROPOSED ATTENUATION TANK
- PROPOSED SURFACE WATER GULLY (Filter Traps required to all Gullies - Naylor Smart Gullies O.S.A)
- PROPOSED CHANNEL DRAIN (TYPE TBA)
- EXISTING DRAINAGE TO BE ABANDONED

GENERAL NOTES:

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5. FOR DRAINAGE NOTES, REFER TO DRAWING Z1-CUR-G580-PI-GRD-92510.
6. FOR MANHOLE SCHEDULE, REFER TO DRAWING Z1-CUR-G580-PL-XX-92520.

EXISTING OUTFALL TO MEDLOCK RIVER

MH S1, 1200 DIA PCC RING CL 32.075 IL29.790

300mm SURFACE WATER SEWER 1:200

EXG MH S2, 1200 DIA PCC RING CL 32.900 TBC IL29.921

EXISTING 300mm SURFACE WATER SEWER 1:200

EXISTING OUTFALL PIPE, EXACT LINE AND DEPTH TBC

450Ø - 300Ø REDUCER PIECE REQUIRED.

(ASSUMED) EXG SWMH1 CL 32.860 IL31.750

S8 - 2100Ø FCC HYDROBRAKE REF: CTL-SHE-0408-1150-2100-1150 FLOW 115 l/s HEAD 1.8m CL 32.900 IL 29.975 (APPROX)

EXISTING CULVERT APPEARS TO SERVE ONLY ROAD GULLIES ALONG POND STREET AND CONNECTS TO FOUL SYSTEM (REF SURVEY Z1-RBL-JC10-PI-XX-002_Ver1). ADDITIONAL SURVEYS REQUIRED TO CONFIRM THIS IS ONLY SERVING POND STREET. IT IS ASSUMED POND STREET DRAINAGE WILL BE RECONNECTED TO NEW SURFACE WATER NETWORK TO RIVER OUTFALL. THEREFORE SHOWN AS TO BE REMOVED.

INDICATIVE TREE CORRIDOR - TB BY TPM

EXISTING PIPE TO BE REMOVED

EXISTING MH TO BE REMOVED

EXG MH S3, 1200 DIA PCC RING CL 33.050 TBC IL30.000

(ASSUMED) EXG MANHOLE 7 CL 32.616 IL28.616 BD 31.360

(ASSUMED) EXG SWMH2 CL 32.580 IL31.370

F5 - 1200Ø CL 32.500 IL 30.720

CONNECT VIA NEW BD 30.650

S13 - 1200Ø CATCHPIT CL 32.800 IL 30.310

S7 - 1200Ø CL 32.800 IL 30.490

ALL MANHOLES AND DRAINAGE IN POND STREET TO BE SURVEYED

CAPACITY OF EXISTING FOUL DRAINAGE TBC - DEANSGATE SQUARE DESIGN REQUIRED.

ALL EXISTING CONNECTIONS TO THE EXISTING SEWER IN POND STREET TO BE RECONNECTED TO THE NEW SURFACE WATER SEWER IN POND STREET

S12 - 1200Ø CL 32.700 IL 30.335

S11 - 600Ø CL 32.550 IL 30.375

F3 - 600Ø CL 32.550 IL 30.800

MINIMUM 350mm STONE LAYER (TYPE 3) BELOW PERMEABLE PAVING BUILD UP

1500 TREE PIT DRAIN (TBC)

F4 - 600Ø CL 32.500 IL 30.750

S9 - 600Ø CL 32.450 IL 31.400

INVERT LEVEL 30.860

INVERT LEVEL 30.820

S10 - 600Ø CL 32.500 IL 30.400

INVERT LEVEL 30.860

INVERT LEVEL 30.860

DRAINAGE TO RAMP BOTTOM OF RAMP TO BE DESIGNED BY M&E ENGINEER

1500 MWS @ 150

S6 - 1200Ø CL 33.200 IL 31.980

CHANNEL

MINIMUM 350mm STONE LAYER (TYPE 3) BELOW PERMEABLE PAVING BUILD UP

PIPE DROPS INTO BASEMENT LOCALLY (M&E)

UPSTAND TO SEPARATE PERMEABLE BUILD UP ZONES

PIPE THROUGH EDGING/UPSTAND

PIPE THROUGH UPSTAND

EDGING/UPSTAND REQUIRED TO EDGE OF PERMEABLE ZONE

UPSTAND TO SEPARATE PERMEABLE TO IMPERMEABLE BUILD UP ZONES

MINIMUM 150mm STONE LAYER (TYPE 3) BELOW PERMEABLE PAVING BUILD UP

CHANNELS TO BE COORDINATED WITH TREE PITS

CHANNEL

S1 - 1200Ø CL 31.950 IL 30.750

S1A - 1200Ø CATCHPIT CL 31.850 IL 30.720

3709 EXISTING COMBINED SEWER

300Ø SWS @ 1:200

CONNECTION TO DROP ONTO MAIN LINE

DRAINAGE TO BE CONNECTED THROUGH TRENCH ABOVE SLAB LEVEL TOWARDS MELBOURNE STREET.TRENCH DETAILS TBC

INVERT LEVEL 31.330

INVERT LEVEL 31.360

CONNECTIONS TO DROP ONTO MAIN LINE

INVERT LEVEL 31.520

INVERT LEVEL 31.340

INVERT LEVEL 31.300

DRAINAGE TO RAMP BOTTOM OF RAMP TO BE DESIGNED BY M&E ENGINEER

CHANNEL

EXISTING CULVERT APPEARS TO SERVE ONLY ROAD GULLIES ALONG POND STREET AND CONNECTS TO FOUL SYSTEM (REF SURVEY Z1-RBL-JC10-PI-XX-002_Ver1). ADDITIONAL SURVEYS REQUIRED TO CONFIRM THIS IS ONLY SERVING POND STREET. IT IS ASSUMED POND STREET DRAINAGE WILL BE RECONNECTED TO NEW SURFACE WATER NETWORK TO RIVER OUTFALL. THEREFORE SHOWN AS TO BE REMOVED.

(ASSUMED) EXG SWMH3 CL 32.230 IL31.700

EXMH21 CL 32.176 IL21.680

F2 - 1200Ø CL 32.200 IL 31.165 POTENTIALLY ONLINE EXG

600Ø SWS @ 1:600

S5 - 1500Ø CATCHPIT MH CL 32.300 IL 30.120

S4 - 1500Ø CATCHPIT MH CL 32.200 IL 30.170

1500Ø FWS @ 1:200

1500Ø SWS @ 1:200

F1 - 1200Ø CL 32.200 IL 31.200

S2 - 1500Ø CATCHPIT MH CL 32.200 IL 30.490

300Ø SWS @ 1:200

PROPOSED LEVELS TBC BY TPM

CHANNEL

ATTENUATION TANK 47m³ x 1.2m DEEP PROVIDING 54m³ ATTENUATION BASED ON 95% VOID RATIO

S3 - 1200Ø CL 32.500 IL 30.570

APPROXIMATE ROUTE OF EXISTING 375mm PUBLIC SEWER. LOCATION TO BE CONFIRMED BY SURVEY. 6m EASEMENT REQUIRED BY UNITED UTILITIES WITHIN PRIVATE LAND, EASEMENT POSITIONED 3m EITHER SIDE OF CENTRELINE. ALL PROPOSALS WITHIN THE EASEMENT TO BE AGREED WITH UNITED UTILITIES.

375mm COMBINED SEWER

Rev.	Description:	Date:	By:	Chkd:
P01	ISSUED FOR STAGE 3/PLANNING CONDITIONS	28/07/23	KS	CG

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Status: SUITABLE FOR INFORMATION — S2

Project: PLOT F, GREAT JACKSON STREET

Drg Title: PROPOSED DRAINAGE LAYOUT

Drawn By:	Designed By:	Checked By:
KS	KS	CG

Project No:	Date:	Scales @ A0:
078524	25/07/23	1:250

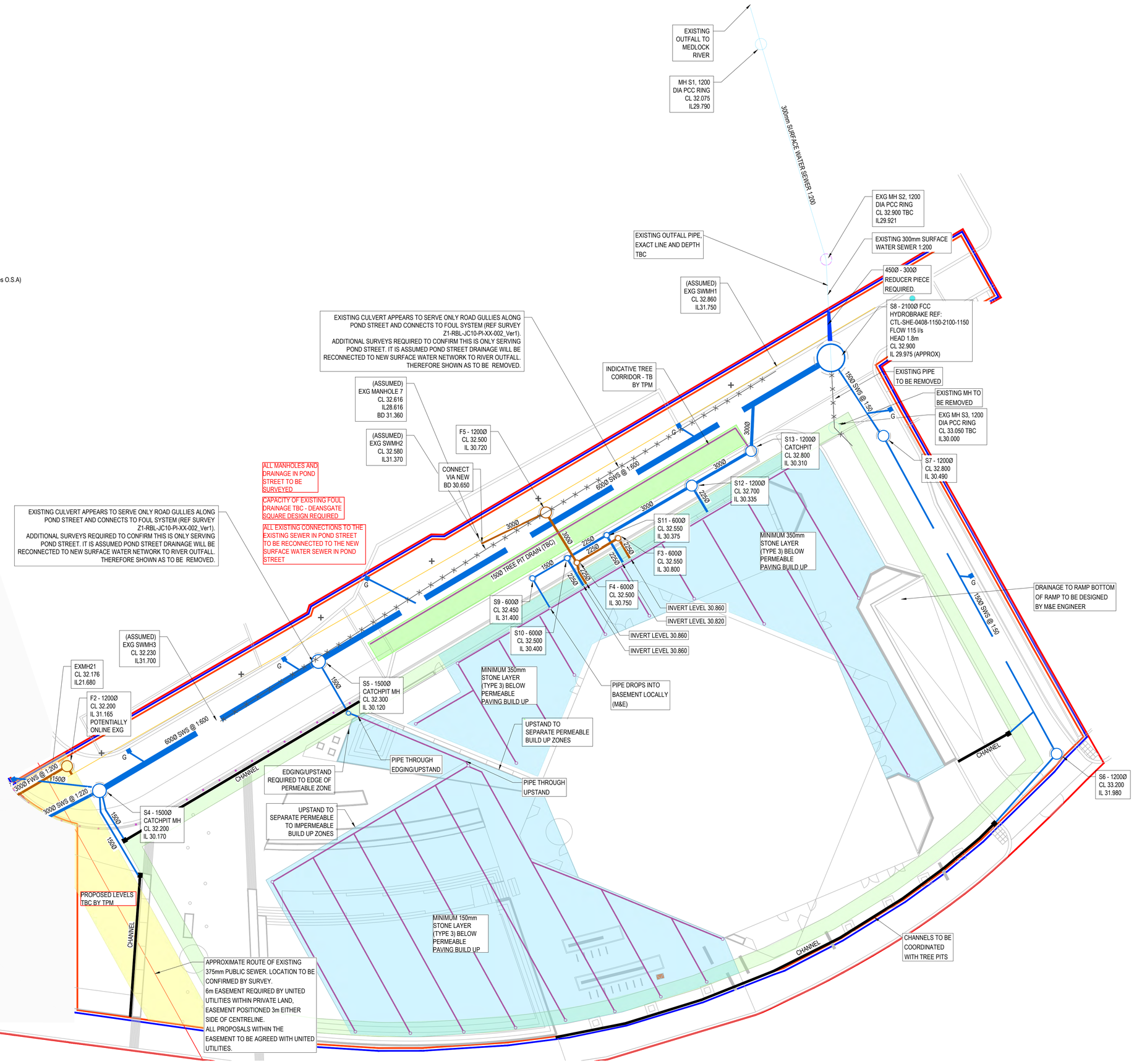
Project Code - Originator - Function - Spatial - Form - Discipline - Number	Revision
Z1-CUR- G580 - PI - GRD - 92500	P01

1:1 0 10 20 30 40 50 60 70 80 90 100

Issued/CAD Files/Z1-078524 - 375000/078524 - Plot F Great Jackson Street/04-Production/Arcmap & Adobe Illustrator/Z1-CUR-G580-PI-GRD-92500_P01.mxd

KEY:

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6. FOR MANHOLE SCHEDULE, REFER TO DRAWING Z1-CUR-G580-PL-XX-92520.

Rev:	Description:	Date:	By:	Chkd:
P01	ISSUED FOR STAGE 3 / PLANNING CONDITION DISCHARGE	28/07/23	CG	CG

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Status: SUITABLE FOR INFORMATION — S2

Project: PLOT F, GREAT JACKSON STREET

Drg Title: PROPOSED DRAINAGE LAYOUT PHASE 1 (PLOT F2)

Drawn By	Designed By	Checked By
KS	CG	CG

Project No	Date	Scales @ A1
078524	25/07/23	1:200

Project Code - Originator - Function - Spatial - Form - Discipline - Number: Z1-CUR -G580 - PL - GRD - 92501

Revision: P01

\\mel\07Projects\078001 - 079000\078524 - Plot F Great Jackson Street\04-Production\04-Models-Drawings\

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 "DESIGN AND CONSTRUCTION GUIDANCE FOR FOUL AND SURFACE WATER SEWERS OFFERED FOR ADOPTION - LATEST 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. WHERE EXISTING DRAINAGE IS BEING USED, ALLOWANCES SHOULD BE MADE TO REMEDIATE THIS DRAINAGE IN LINE WITH AVAILABLE CCTV SURVEY INFORMATION. IF NO SURVEY IS AVAILABLE, IT IS ADVISED TO OBTAIN ONE PRIOR TO COMMENCEMENT OF WORKS.

7. ALL EXISTING SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, AND WHERE NECESSARY PROTECTION OR DIVERSIONS TO BE UNDERTAKEN TO AVOID CONFLICT WITH THE PROPOSED WORK.

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

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

10. 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.

11. 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.

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

13. 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.

14. 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.

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

16. 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.

17. 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.

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

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

20. 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.

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.

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

35. GREASE TRAPS SHOULD BE PROVIDED ABOVE GROUND WITHIN AN ENZYME TREATMENT SYSTEM, BY APPROPRIATE SPECIALIST DESIGNER. WHERE A BELOW GROUND GREASE TREATMENT SYSTEM IS REQUIRED - THIS SHOULD BE CONFIRMED TO ALLOW APPROPRIATE GREASE TREATMENT SIZING.

36. THE DESIGN IS BASED ON A GRAVITY RAINWATER SYSTEM. WHERE A SIPHONIC SYSTEM IS PROPOSED ADDITIONAL NOTES REQUIRED AND DESIGN ADJUSTED TO SUIT.

GENERAL NOTES:

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P01	ISSUED FOR STAGE 3/PLANNING CONDITIONS	28/07/23	KS	CG

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Project: PLOT F, GREAT JACKSON STREET

Drg Title: DRAINAGE NOTES

Drawn By	Designed By	Checked By
KS	KS	CG
Curtins Project Reference 078524	**Date** 05/07/23	**Scales @ A1** NTS

Project No - Originator - Function - Spatial - Form - Discipline - Number	Revision
Z1 - CUR - G580 - PL GRD - 92510	P01

\\mafs\27Projects\078001 - 079000\078524 - Plot F Great Jackson Street\04-Production\4A-Models-Drawings\

Surface Water Manhole schedule

MH REF	CL (mAOD)	IL (mAOD)	DEPTH TO SOFFIT (m)	DS PIPE DIA (mm)	MH DIA (mm)	MH TYPE	COVER SIZE (mm)	COVER CLASS	COVER TYPE	RECESSED	RESTRICTED ACCESS	HIGH LEVEL CONN	BACK DROP	COMMENTS	EASTING	NORTHING
S1	31.950	30.750	0.900	300	1200	TYPE B	750X750	D400	SINGLE SEALED	N	N	Y	N			
S1A	31.850	30.720	0.830	300	1200	TYPE B	750X750	D400	SINGLE SEALED	N	N	Y	N	CATCHPIT		
S2	32.200	30.490	1.410	300	1500	TYPE B	600X600	D400	SINGLE SEALED	Y	N	N	N	CATCHPIT		
S3	32.200	30.570	1.330	300	1200	TYPE B	600X600	D400	SINGLE SEALED	Y	N	N	N			
S4	32.200	30.170	1.430	600	1500	TYPE B	600X600	D400	SINGLE SEALED	N	N	Y	N			
S5	32.300	30.120	1.580	600	1500	TYPE B	600X600	D400	SINGLE SEALED	N	N	N	N	CATCHPIT		
S6	33.200	31.980	1.070	150	1200	TYPE B	600X600	D400	SINGLE SEALED	N	N	N	N			
S7	32.800	30.490	2.160	150	1200	TYPE B	600X600	D400	SINGLE SEALED	N	N	N	N			
S8	32.900	29.975	2.475	450	2100	TYPE B	600X600	D400	SINGLE SEALED	N	N	N	N	FLOW CONTROL CHAMBER FLOWS RESTRICTED TO 5l/s TBC BY HYDRO-INTERNATIONAL		
S9	32.450	31.400	0.900	150	600	PPIC	600X600	D400	SINGLE SEALED	N	N	N	N			
S10	32.500	30.400	1.875	225	600	PPIC	600X600	D400	SINGLE SEALED	N	N	N	N			
S11	32.550	30.375	1.875	300	600	PPIC	600X600	D400	SINGLE SEALED	N	N	N	N			
S12	32.700	30.335	2.065	300	1200	TYPE B	600X600	D400	SINGLE SEALED	N	N	N	N			
S13	32.800	30.310	2.190	300	1200	TYPE B	600X600	D400	SINGLE SEALED	N	N	N	N	CATCHPIT		

Foul Water Manhole schedule

MH REF	CL (mAOD)	IL (mAOD)	DEPTH TO SOFFIT (m)	DS PIPE DIA (mm)	MH DIA (mm)	MH TYPE	COVER SIZE (mm)	COVER CLASS	COVER TYPE	RECESSED	RESTRICTED ACCESS	HIGH LEVEL CONN	BACK DROP	COMMENTS	EASTING	NORTHING
F1	32.200	31.200	0.700	300	1200	TYPE B	750X750	D400	SINGLE SEALED	N	N	N	N			
F2	32.200	31.165	0.735	300	1200	TYPE B	750X750	D400	SINGLE SEALED	N	N	N	N			
F3	32.550	30.800	1.525	225	600	PPIC	600X600	D400	SINGLE SEALED	N	N	N	N			
F4	32.500	30.750	1.450	300	600	PPIC	600X600	D400	SINGLE SEALED	N	N	N	N			
F5	32.500	30.720	1.480	300	1200	TYPE B	600X600	D400	SINGLE SEALED	N	N	N	N			

COVER LEVELS ARE INDICATIVE AND TO BE CONFIRMED BY LANDSCAPE ARCHITECT

CO-ORDINATES TBC AT ST4

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 "DESIGN AND CONSTRUCTION GUIDANCE FOR FOUL AND SURFACE WATER SEWERS OFFERED FOR ADOPTION - LATEST 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. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
5. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
6. THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION MAY NEED TO BE INCREASED TO ACCOMMODATE THE CONNECTIONS AND BENDS.
7. COVER LEVELS BASED ON LANDSCAPE GENERAL ARRANGEMENTS.
8. COVER LEVELS, GULLY POSITIONS, AND BUILDING 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 MANHOLE COVERS IN BLOCK/SLAB AND EXTERNAL PAVING AREAS MAY REQUIRE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT THE LANDSCAPE ARCHITECT'S PAVING PROPOSAL. TBC BY LANDSCAPE ARCHITECT.
10. THE LANDSCAPE ARCHITECT MAY REQUIRE THE ORIENTATION OF CHAMBER COVERS TO BE CO-ORDINATED WITH THE PAVING PATTERN. THIS WILL BE SUBJECT TO REVIEW WITH THE MANHOLE INTERNAL BENCHING ARRANGEMENT, LANDING AND STEP LOCATION AND IF REQUIRED, SHOULD BE ADVISED TO US AS SOON AS POSSIBLE.
11. ALL MANHOLE, GULLY AND CHANNEL (ACCESS/OUTLET) COVERS (IRONWORK) SHOULD BE THE FOLLOWING SPECIFICATION:
    - B125 LOAD CLASS IN PEDESTRIAN AREAS
    - D400 LOAD CLASS IN VEHICULAR AREAS.

    ANY AMBIGUITIES ON DRAWINGS/ACCESS AND MAINTENANCE STRATEGY SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY.
12. ALL SURFACE CHANNEL ACCESS BOXES/OUTLET BOXES IN BLOCK/SLAB AND EXTERNAL PAVING AREAS MAY REQUIRE RECESSED COVERS OF THE APPROPRIATE GRADE TO ACCEPT THE LANDSCAPE ARCHITECT'S PAVING PROPOSAL. TBC BY LANDSCAPE ARCHITECT AND SUBJECT TO AVAILABILITY FROM MANUFACTURER.
13. ALL SURFACE CHANNELS TO BE OF THE TREADSAFE TYPE, UNLESS OTHERWISE SPECIFIED.
14. ALL PROPRIETARY PRODUCTS TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.

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P01	ISSUED FOR STAGE 3/PLANNING CONDITIONS	28/07/23	KS	CG

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Status: SUITABLE FOR INFORMATION — S2

Project: PLOT F, GREAT JACKSON STREET

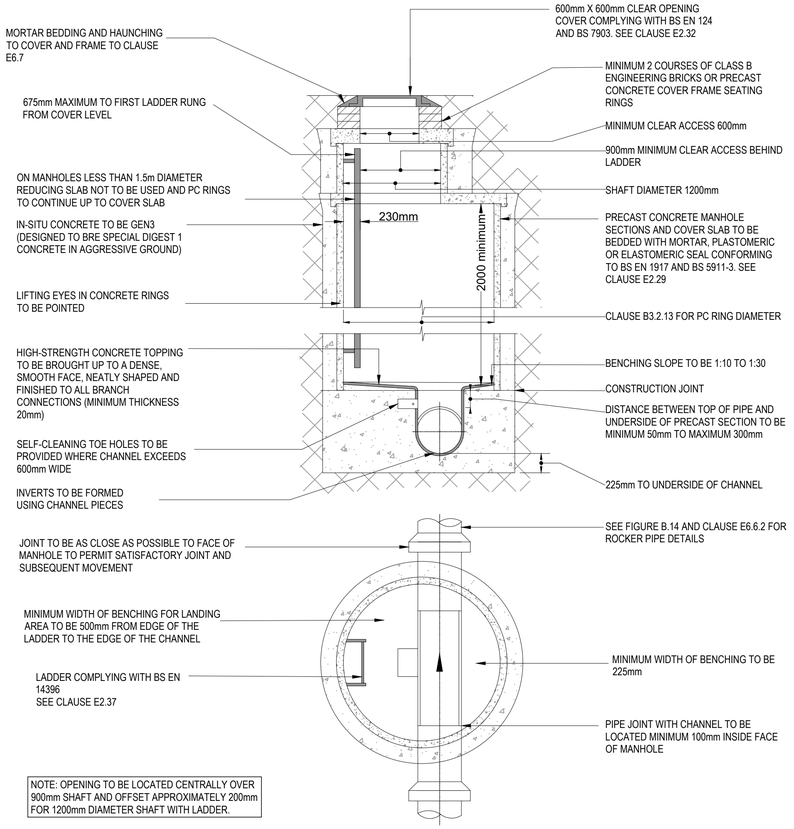
Drg Title: MANHOLE SCHEDULE

Drawn By	Designed By	Checked By
KS	KS	CG
Curtins Project Reference 078524	**Date** 05/07/23	**Scales @ A1** NTS

Project No - Originator - Function - Spatial - Form - Discipline - Number: Z1 - CUR - G580 - PL -XX- 92520

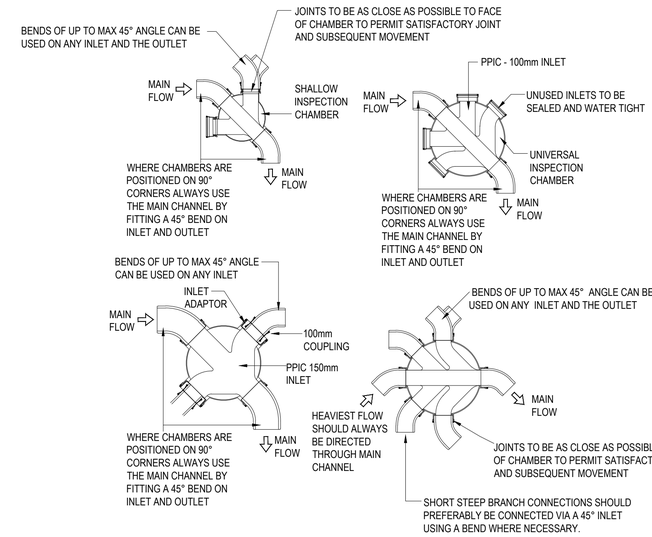
Revision: P01

\\mafs02\Projects\078001 - 079000\078524 - Plot F Great Jackson Street\04-Production\4A-Models-Drawings\CIVIL\DWG\

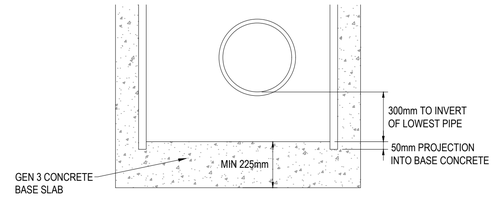


NOTE: OPENING TO BE LOCATED CENTRALLY OVER 900mm SHAFT AND OFFSET APPROXIMATELY 200mm FOR 1200mm DIAMETER SHAFT WITH LADDER.

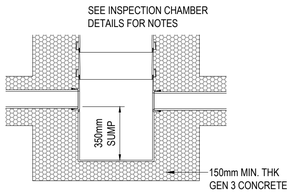
TYPICAL MANHOLE DETAIL - TYPE A1
(DEPTH FROM COVER TO SOFFIT OF PIPE 3m TO 6m)



INSPECTION CHAMBER BASE DETAILS



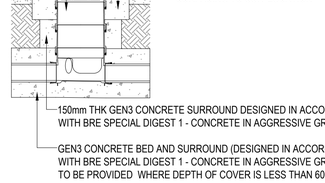
CATCH PIT DETAIL



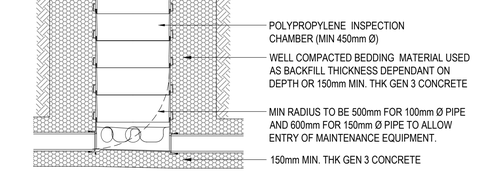
PPIC CATCHPIT BASE DETAIL

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. 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.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
4. FOR FULL DRAINAGE NOTES REFER TO DWG Z1-CUR-G580-PL-GRD-92510.

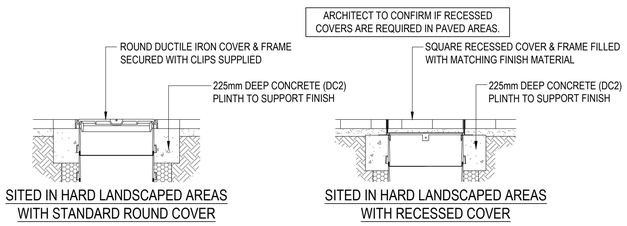


SHALLOW INSPECTION CHAMBER
MAX DEPTH 0.6m



DEEP INSPECTION CHAMBER
DEPTHS BETWEEN 1.2m AND 3.0m

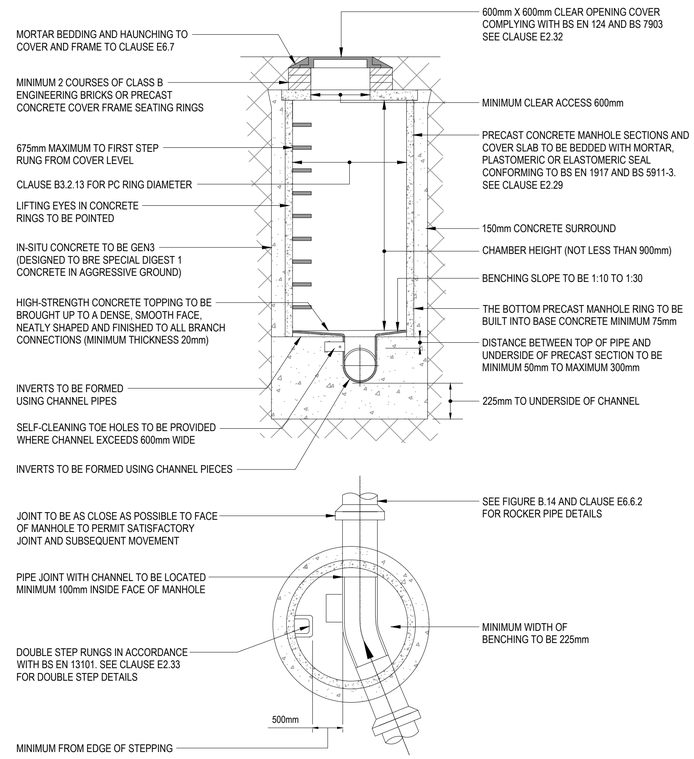
TYPICAL INSPECTION CHAMBER DETAILS - PPIC



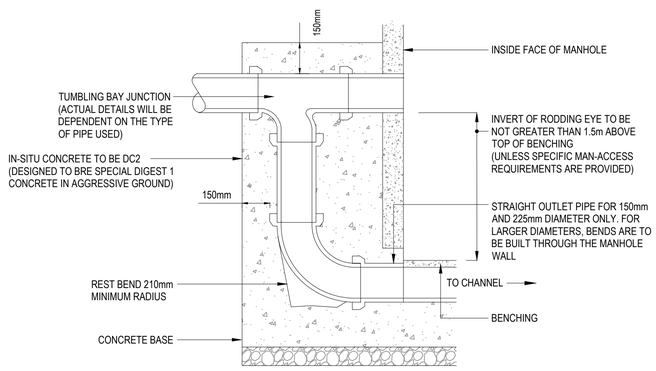
SITED IN HARD LANDSCAPED AREAS WITH STANDARD ROUND COVER

SITED IN HARD LANDSCAPED AREAS WITH RECESSED COVER

TYPICAL INSPECTION CHAMBER COVER DETAILS



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



EXTERNAL VERTICAL BACKDROP

Rev:	Description:	Date:	By:	Chkd:
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Status: SUITABLE FOR INFORMATION **S2**

Project: PLOT F, GREAT JACKSON STREET

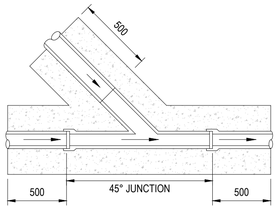
Drg Title: DRAINAGE DETAILS SHEET 1

Drawn By	Designed By	Checked By
KS	KS	CG
Curtins Project Reference 078524	Date 05/07/23	Scales @ A1 NTS

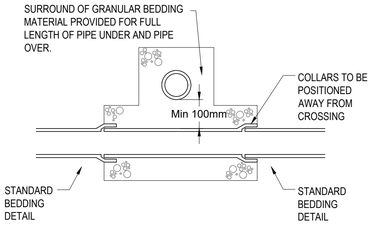
Project No - Originator - Function - Spatial - Form - Discipline - Number: Z1 - CUR - G580 - DE -XX- 92530

Revision: P01

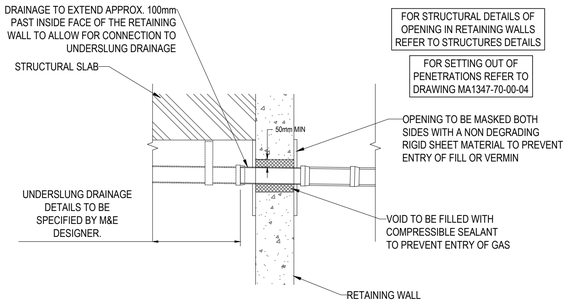
\\mafs02\Projects\078001 - 079000\078524 - Plot F Great Jackson Street\04-Production\4A-Models-Drawings\CAD\92530_



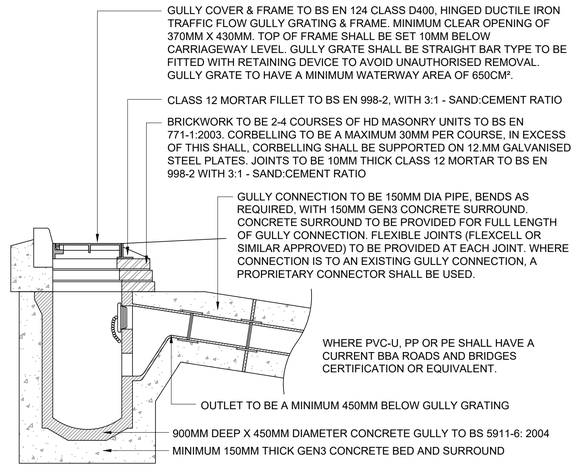
TYPICAL SADDLE CONNECTION



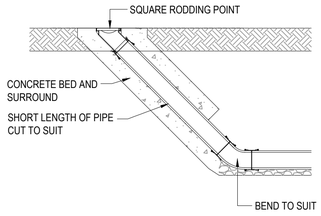
PIPE CROSSINGS DETAIL



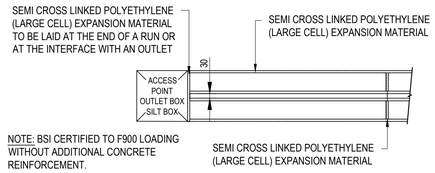
PENTRATION DETAIL THROUGH RETAINING WALL



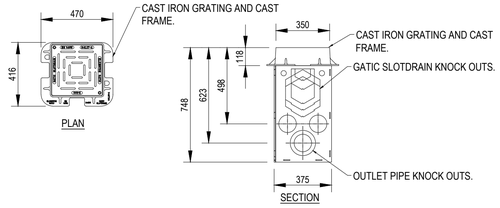
ROAD GULLY DETAIL



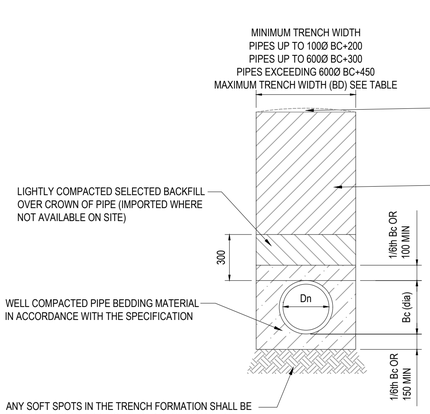
RODDING POINT DETAIL (RE)



GATIC PLAN DETAIL



GATIC SLOTDRAIN 350mm OUTLET UNIT
SECTION AND PLAN DETAILS
NTS

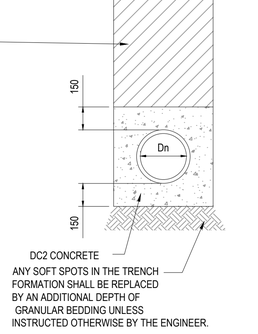


CLASS S - 360° GRANULAR SURROUND PIPE BEDDING DETAIL

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

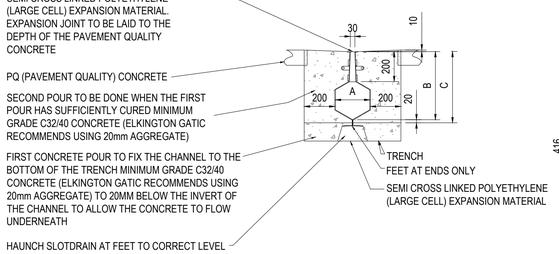
Dn	Bd
150	0.6
225	0.7
300	0.85
375	1.05
450	1.15
525	1.25
600	1.35
675	1.45
750	1.50

MAXIMUM TRENCH WIDTH

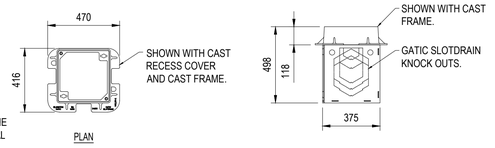


CLASS Z - CONCRETE BED AND SURROUND PIPE BEDDING DETAIL
(COVER < 900mm IN VEHICULAR LOADING AND OPEN FIELD. COVER <600mm ELSEWHERE EXCEPT UNDER BUILDINGS.)

CASTSLOT SLOTDRAIN		
WIDTH 'A'	INVERT 'B'	DEPTH 'C'
100	308	358



GATIC SLOTDRAIN CASTSLOT
CONCRETE INSTALLATION



350 ACCESS BOX
SECTION AND PLAN DETAILS
NTS

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3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
4. FOR FULL DRAINAGE NOTES REFER TO DWG Z1-CUR-G580-PL-GRD-92510.

Rev:	Description:	Date:	By:	Chkd:
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Status: SUITABLE FOR INFORMATION — S2

Project: PLOT F, GREAT JACKSON STREET

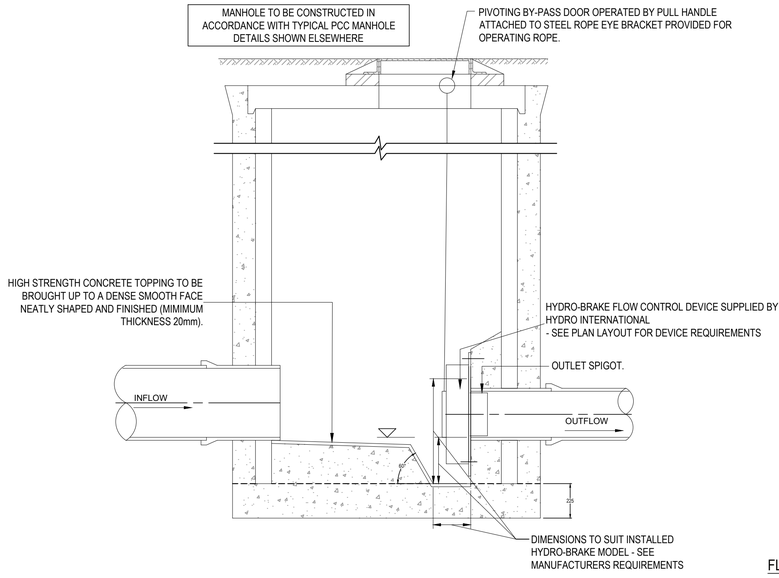
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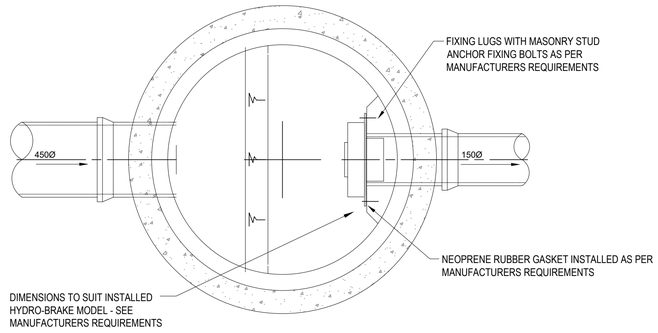
Drawn By	Designed By	Checked By
KS	KS	CG
Curtins Project Reference 078524	Date 05/07/23	Scales @ A1 NTS

Project No - Originator - Function - Spatial - Form - Discipline - Number: Z1 - CUR - G580 - DE - XX - 92531

Revision: P01

\\mafile02\Projects\078001 - 079000\078524 - Plot F Great Jackson Street\04-Production\4A-Models-Drawings\CAD\92531





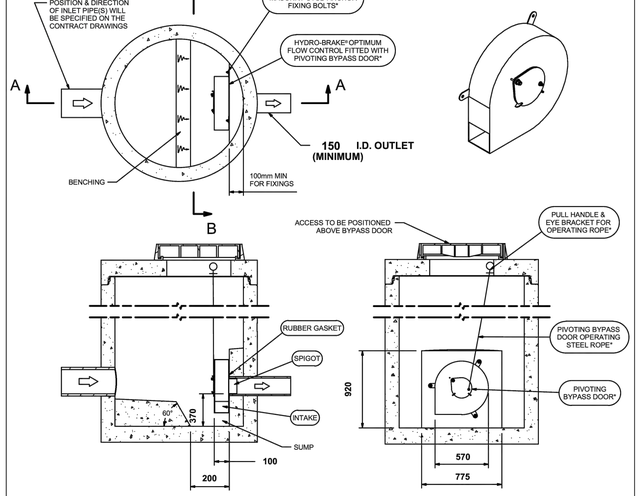
FLOW CONTROL MANHOLE (HYDRO-BRAKE)

Technical Specification		
Control Point	Head (m)	Flow (l/s)
Primary Design	1.800	5.000
Flush-Flo™	0.411	4.387
Kick-Flo®	0.838	3.510
Mean Flow		4.064

hydro-int.com/patents

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



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-0094-5000-1800-5000 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.

Hydro International

DATE	07/07/2023 13:47
SITE	PLOT F
DESIGNER	Kiran Sawyer
REF	

SHE-0094-5000-1800-5000
Hydro-Brake® Optimum

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kiran.sawyer@curtins.com

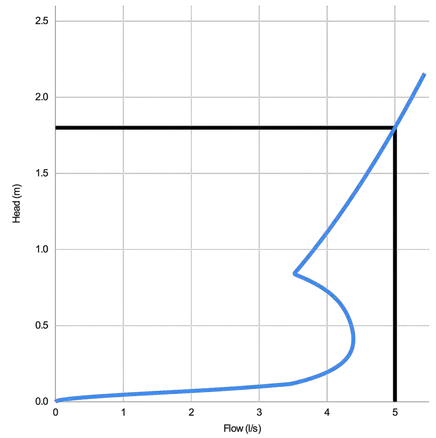
Technical Specification		
Control Point	Head (m)	Flow (l/s)
Primary Design	1.800	5.000
Flush-Flo	0.411	4.387
Kick-Flo®	0.838	3.510
Mean Flow		4.064

hydro-int.com/patents

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE No 08/4596

wrc approved PT/503/0422 Valid: 01/04/2022 - 31/03/2027

Head (m)	Flow (l/s)
0.000	0.000
0.062	1.639
0.124	3.530
0.186	3.960
0.248	4.202
0.310	4.328
0.372	4.380
0.434	4.385
0.497	4.359
0.559	4.309
0.621	4.232
0.683	4.116
0.745	3.942
0.807	3.685
0.869	3.569
0.931	3.684
0.993	3.795
1.055	3.902
1.117	4.007
1.179	4.108
1.241	4.206
1.303	4.302
1.366	4.396
1.428	4.488
1.490	4.577
1.552	4.665
1.614	4.750
1.676	4.834
1.738	4.917
1.800	4.998



DESIGN ADVICE !

The head/flow characteristics of this SHE-0094-5000-1800-5000 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.

Hydro International

DATE	07/07/2023 13:47
Site	PLOT F
DESIGNER	Kiran Sawyer
Ref	

SHE-0094-5000-1800-5000
Hydro-Brake Optimum®

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3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
4. REFER TO DRAINAGE LAYOUT Z1-CUR-G580-PL-GRD-92500 FOR THE LOCATION OF THE ATTENUATION TANK.
5. FLOW CONTROL TO BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS, INSTRUCTIONS AND RECOMMENDATIONS.
6. WHERE ALTERNATIVE FLOW CONTROL DEVICE IS PREFERRED, IT WILL BE SUBJECT TO REDESIGN TO CONFIRM WHETHER THE SYSTEM HAS CAPACITY.
7. FOR FULL DRAINAGE NOTES REFER TO DWG Z1-CUR-G580-PL-GRD-92510.

Rev.	Description:	Date:	By:	Chkd:
P01	ISSUED FOR STAGE 3/PLANNING CONDITIONS	28/07/23	KS	CG

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Status: SUITABLE FOR INFORMATION **S2**

Project: PLOT F, GREAT JACKSON STREET

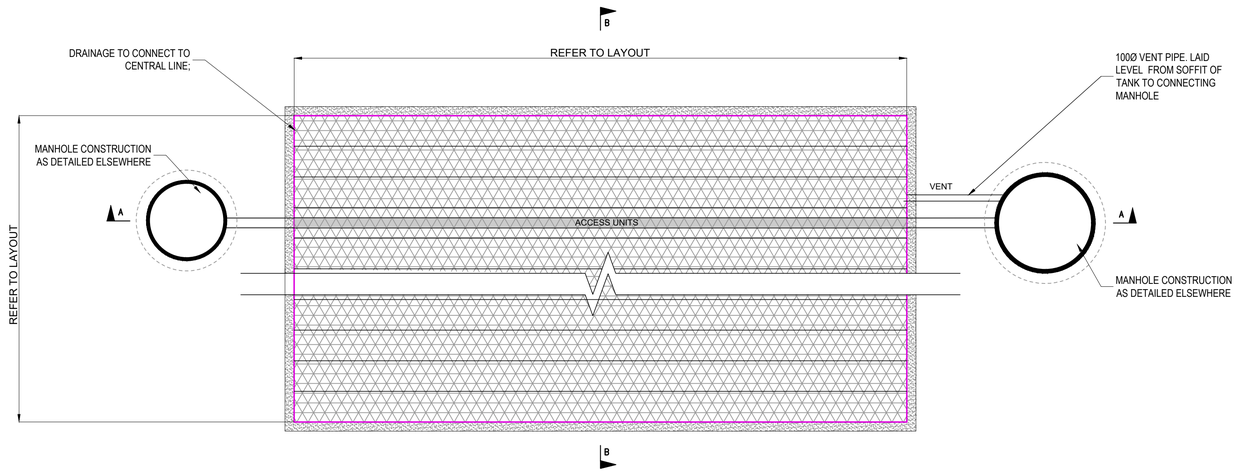
Drg Title: DRAINAGE DETAILS SHEET 3

Drawn By	Designed By	Checked By
KS	KS	CG

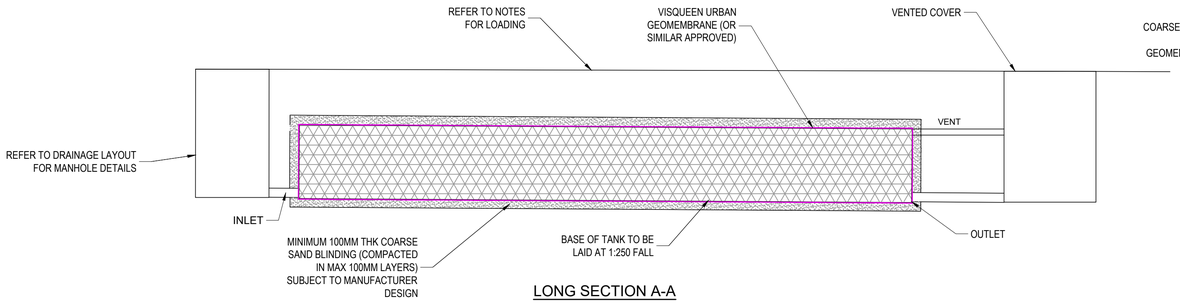
Curtins Project Reference	Date	Scales @ A1
078524	05/07/23	NTS

Project No - Originator - Function - Spatial - Form - Discipline - Number	Revision
Z1 - CUR - G580 - DE -XX- 92532	P01

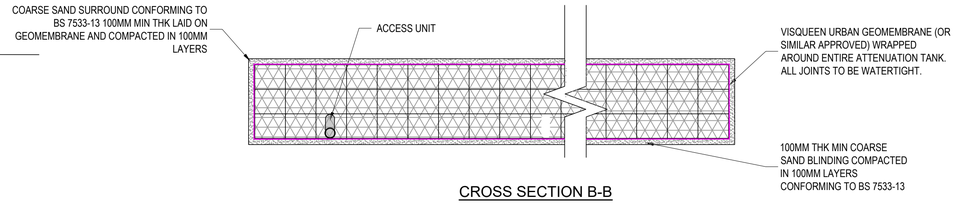
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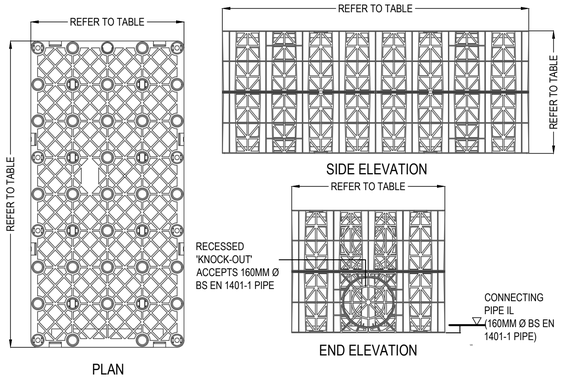
TYPICAL ATTENUATION TANK PLAN



LONG SECTION A-A



CROSS SECTION B-B

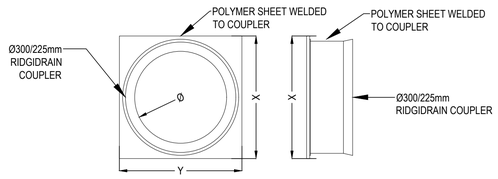


POLYPIPE POLYSTORM PSM1 ONE UNIT TYPICAL DETAILS

POLYSTORM FLANGE ADAPTER TABLE

FLANGE CODE	Ø (mm)	X (mm)	Y (mm)
PSMFA300	375	385	450

* FLANGE ADAPTERS ARE COMPATIBLE WITH THE PSM1, PSM1A,PSM2, PSM5 CELLS.
* CONSIDERATION TO HYDRAULIC PERFORMANCE SHOULD BE TAKEN WHEN USING A FLANGE ADAPTER



POLYSTORM FLANGE ADAPTER DETAIL

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3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
4. REFER TO DRAINAGE LAYOUT Z1-CUR-G580-PL-GRD-92500 FOR THE LOCATION OF THE ATTENUATION TANK.
5. ATTENUATION TANK TO BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
6. WHERE AN ALTERNATIVE ATTENUATION TANK DEVICE IS PREFERRED, IT WILL BE SUBJECT TO REDESIGN TO CONFIRM WHETHER THE SYSTEM HAS CAPACITY.
7. THE DESIGN OF THE TANK SHOULD BE PROVIDED BY THE MANUFACTURER OR SUPPLIER TO ENSURE THE TANK IS SUFFICIENT FOR THE SITE SPECIFIC CRITERIA.
8. THE TANK DESIGN SHOULD INCORPORATE:
   - CRATES SUBJECT TO REGULAR HEAVY VEHICLE LOADING,
   - SUITABLE MAINTENANCE ACCESS; AND
   - VENTING TO PREVENT TRAPPED AIR POCKETS.
9. THE STRENGTH OF THE TANK SHOULD COMPLY WITH CIRIA C680 STRUCTURAL DESIGN OF MODULAR GEOCELLULAR DRAINAGE TANKS.
10. ACCESS FOR MAINTENANCE SHOULD BE IN ACCORDANCE WITH CIRIA GUIDANCE.
11. VENTING TO THE TANK SHOULD BE CONFIRMED BY THE TANK MANUFACTURER. VENTING SHOULD BE LOCATED WITHIN LANDSCAPED AREAS, OR ROUTED BACK TO THE NEAREST MANHOLE ABOVE THE DESIGN WATER LEVEL.
12. CONSTRUCTION AND INSTALLATION OF THE TANK SHOULD BE STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION REQUIREMENTS.
13. THE CURRENT DESIGN OF THE TANK IS BASED ON USE OF POLYPIPE MODULES, TO ALLOW AN ASSUMPTION OF UNIT SIZES WITHIN THE OVERALL DESIGN. HOWEVER, WHERE AN ALTERNATIVE SYSTEM IS PROPOSED, THE DIMENSIONS OF THE UNITS WILL NEED TO BE CHECKED WITHIN THE DESIGN AND MAY RESULT IN A REDESIGN.
14. THE CONTRACTOR SHALL PROHIBIT THE MOVEMENT OF CONSTRUCTION PLANT ACROSS THE STORAGE TANK AND WHERE NECESSARY PROVIDE ADDITIONAL SUPPORT AND PROTECTION TO THE STRUCTURE. PARTICULARLY POST CONSTRUCTION. TEMPORARY FENCING CAN BE USED TO PROHIBIT TRADE STOCKS, PILLING MATERIALS, HEAVY PLANTS ETC.
15. FOR FULL DRAINAGE NOTES REFER TO DWG Z1-CUR-G580-PL-GRD-92510

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Project: PLOT F, GREAT JACKSON STREET

Drg Title: DRAINAGE DETAILS SHEET 4

Drawn By	Designed By	Checked By
KS	KS	CG
Curtins Project Reference 078524	Date 05/07/23	Scales @ A1 NTS

Project No - Originator - Function - Spatial - Form - Discipline - Number: Z1 - CUR - G580 - DE - XX - 92533

Revision: P01

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Appendix B

- Surface Water Calcs Plan
- Surface Water Calcs Without Surcharged Outfall
- Surface Water Calcs With Surcharged Outfall

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)	18.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.358	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)
S1	0.040	5.00	31.950	1200	383358.322	397287.016	1.200
S1A	0.044	5.00	31.940	600	383361.696	397280.909	1.222
US1	0.088	5.00	32.130		383371.618	397262.597	1.507
S2		5.00	32.500	1350	383382.841	397222.732	1.930
S3	0.043	5.00	32.200	1350	383385.759	397237.343	1.709
S4	0.149	5.00	32.300	1500	383396.692	397239.682	2.160
US2			32.310		383404.607	397244.331	2.212
S5			32.320	1500	383425.753	397256.750	2.253
US3	0.044	5.00	32.430		383447.172	397269.329	2.394
US4	0.044	5.00	32.490		383455.718	397274.348	2.466
S6	0.044	5.00	33.330	1200	383492.097	397249.762	1.350
S7	0.020	5.00	32.680	1200	383476.322	397279.142	1.350
S8			32.500	1500	383470.891	397283.737	2.521
RED			32.700		383470.558	397290.457	2.749
EX_S2_OF			32.900	1350	383470.197	397297.763	2.979
PP01	0.088	10.00	32.000	100	383359.696	397279.804	0.470
PP02	0.079	10.00	32.700	100	383411.801	397232.082	0.990
PP03	0.066	10.00	32.450	100	383427.937	397253.032	0.450

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)
1.000	6.977	220.0	300	1 STANDARD	31.950	30.750	0.900	31.940	30.718	0.922
1.001	20.827	220.0	300	1 STANDARD	31.940	30.718	0.922	32.130	30.623	1.207
1.002	28.944	220.0	300	1 STANDARD	32.130	30.623	1.207	32.200	30.491	1.409
3.000	14.900	220.0	300	1 STANDARD	32.500	30.570	1.630	32.200	30.502	1.398
1.003	11.180	220.0	300	1 STANDARD	32.200	30.491	1.409	32.300	30.440	1.560
1.005	33.702	802.4	600	1 STANDARD	32.300	30.140	1.560	32.310	30.098	1.612
1.005_1	24.523	800.0	600	1 STANDARD	32.310	30.098	1.612	32.320	30.067	1.653

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1	1200	Manhole	1 STANDARD	S1A	600	Manhole	1 STANDARD
1.001	S1A	600	Manhole	1 STANDARD	US1		Junction	
1.002	US1		Junction		S3	1350	Manhole	1 STANDARD
3.000	S2	1350	Manhole	1 STANDARD	S3	1350	Manhole	1 STANDARD
1.003	S3	1350	Manhole	1 STANDARD	S4	1500	Manhole	1 STANDARD
1.005	S4	1500	Manhole	1 STANDARD	US2		Junction	
1.005_1	US2		Junction		S5	1500	Manhole	1 STANDARD

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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)
1.006	24.840	800.0	600	1 STANDARD	32.320	30.067	1.653	32.430	30.036	1.794
1.007	9.911	800.0	600	1 STANDARD	32.430	30.036	1.794	32.490	30.024	1.866
1.008_1	17.843	800.0	600	1 STANDARD	32.490	30.024	1.866	32.500	30.002	1.898
6.000	33.347	51.3	150	1 STANDARD	33.330	31.980	1.200	32.680	31.330	1.200
6.001	7.114	50.0	150	1 STANDARD	32.680	31.330	1.200	32.500	31.188	1.162
1.008	6.728	240.3	450	1 STANDARD	32.500	29.979	2.071	32.700	29.951	2.299
1.010	7.315	243.8	300	1 STANDARD	32.700	29.951	2.449	32.900	29.921	2.679
2.000	2.285	4.6	100	1 STANDARD	32.000	31.530	0.370	31.940	31.030	0.810
4.000	14.205	12.8	100	1 STANDARD	32.700	31.710	0.890	32.310	30.598	1.612
5.000	4.312	4.4	100	1 STANDARD	32.450	32.000	0.350	32.320	31.020	1.200

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.006	S5	1500	Manhole	1 STANDARD	US3		Junction	
1.007	US3		Junction		US4		Junction	
1.008_1	US4		Junction		S8	1500	Manhole	1 STANDARD
6.000	S6	1200	Manhole	1 STANDARD	S7	1200	Manhole	1 STANDARD
6.001	S7	1200	Manhole	1 STANDARD	S8	1500	Manhole	1 STANDARD
1.008	S8	1500	Manhole	1 STANDARD	RED		Junction	
1.010	RED		Junction		EX_S2_OF	1350	Manhole	1 STANDARD
2.000	PP01	100	Manhole	1 STANDARD	S1A	600	Manhole	1 STANDARD
4.000	PP02	100	Manhole	1 STANDARD	US2		Junction	
5.000	PP03	100	Manhole	1 STANDARD	S5	1500	Manhole	1 STANDARD

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S1	383358.322	397287.016	31.950	1.200	1200	0	1.000	30.750	300
S1A	383361.696	397280.909	31.940	1.222	600	1	2.000	31.030	100
						2	1.000	30.718	300
						0	1.001	30.718	300
US1	383371.618	397262.597	32.130	1.507		1	1.001	30.623	300
						0	1.002	30.623	300
S2	383382.841	397222.732	32.500	1.930	1350	0	3.000	30.570	300
S3	383385.759	397237.343	32.200	1.709	1350	1	3.000	30.502	300
						2	1.002	30.491	300
						0	1.003	30.491	300

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Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
S4	383396.692	397239.682	32.300	2.160	1500	1	1.003	30.440	300
						0	1.005	30.140	600
US2	383404.607	397244.331	32.310	2.212		1	4.000	30.598	100
						2	1.005	30.098	600
						0	1.005_1	30.098	600
S5	383425.753	397256.750	32.320	2.253	1500	1	5.000	31.020	100
						2	1.005_1	30.067	600
						0	1.006	30.067	600
US3	383447.172	397269.329	32.430	2.394		1	1.006	30.036	600
						0	1.007	30.036	600
US4	383455.718	397274.348	32.490	2.466		1	1.007	30.024	600
						0	1.008_1	30.024	600
S6	383492.097	397249.762	33.330	1.350	1200	0	6.000	31.980	150
S7	383476.322	397279.142	32.680	1.350	1200	1	6.000	31.330	150
						0	6.001	31.330	150
S8	383470.891	397283.737	32.500	2.521	1500	1	6.001	31.188	150
						2	1.008_1	30.002	600
						0	1.008	29.979	450
RED	383470.558	397290.457	32.700	2.749		1	1.008	29.951	450
						0	1.010	29.951	300
EX_S2_OF	383470.197	397297.763	32.900	2.979	1350	1	1.010	29.921	300
PP01	383359.696	397279.804	32.000	0.470	100	0	2.000	31.530	100
PP02	383411.801	397232.082	32.700	0.990	100	0	4.000	31.710	100
PP03	383427.937	397253.032	32.450	0.450	100	0	5.000	32.000	100

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Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	England and Wales	Skip Steady State	x
M5-60 (mm)	18.000	Drain Down Time (mins)	240
Ratio-R	0.358	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 %)
100	40	0	0

Node S8 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	29.979	Product Number	CTL-SHE-0408-1150-1800-1150
Design Depth (m)	1.800	Min Outlet Diameter (m)	0.450
Design Flow (l/s)	115.0	Min Node Diameter (mm)	

Node S3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	30.491
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	11

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	47.0	0.0	1.200	47.0	0.0	1.201	0.0	0.0

Node PP01 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	31.530	Slope (1:X)	1000.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.350
Safety Factor	2.0	Width (m)	17.500	Inf Depth (m)	
Porosity	0.30	Length (m)	50.000		

Node PP03 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	32.000	Slope (1:X)	1000.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.350
Safety Factor	2.0	Width (m)	14.000	Inf Depth (m)	
Porosity	0.30	Length (m)	47.000		

Node PP02 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	32.310	Slope (1:X)	1000.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	0.350
Safety Factor	2.0	Width (m)	16.000	Inf Depth (m)	
Porosity	1.00	Length (m)	49.000		

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Results for 100 year +40% CC Critical Storm Duration. Lowest mass balance: 99.96%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute winter	S1	24	31.481	0.731	17.0	1.3143	0.0000	SURCHARGED
30 minute winter	S1A	24	31.481	0.763	45.1	0.7649	0.0000	SURCHARGED
30 minute winter	US1	25	31.471	0.848	80.2	0.9907	0.0000	SURCHARGED
30 minute winter	S2	24	31.440	0.870	11.9	1.2457	0.0000	SURCHARGED
30 minute winter	S3	25	31.444	0.953	129.0	46.6350	0.0000	SURCHARGED
30 minute winter	S4	25	31.422	1.282	120.7	4.0354	0.0000	SURCHARGED
30 minute winter	US2	24	31.418	1.320	112.1	0.0000	0.0000	SURCHARGED
30 minute winter	S5	24	31.413	1.346	108.0	2.3783	0.0000	SURCHARGED
30 minute winter	US3	25	31.409	1.373	110.2	0.5053	0.0000	SURCHARGED
30 minute winter	US4	25	31.408	1.384	111.4	0.4940	0.0000	SURCHARGED
15 minute winter	S6	11	32.183	0.203	23.7	0.3626	0.0000	SURCHARGED
15 minute winter	S7	10	31.644	0.314	32.4	0.4475	0.0000	SURCHARGED
30 minute winter	S8	25	31.402	1.423	122.0	2.5140	0.0000	SURCHARGED
30 minute winter	RED	18	30.308	0.357	114.9	0.0000	0.0000	SURCHARGED
30 minute summer	EX_S2_OF	32	30.181	0.260	114.9	0.0000	0.0000	OK
30 minute winter	PP01	28	31.613	0.083	31.8	15.6180	0.0000	OK
30 minute winter	PP02	27	32.335	0.625	28.5	5.8859	0.0000	SURCHARGED
30 minute winter	PP03	25	32.061	0.061	23.8	7.5927	0.0000	OK

Link Event (Outflow)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S1	1.000	S1A	18.4	0.462	0.247	0.4913	
15 minute winter	S1A	1.001	US1	44.4	0.752	0.595	1.4666	
15 minute winter	US1	1.002	S3	89.6	1.420	1.201	2.0382	
30 minute winter	S2	3.000	S3	-11.9	-0.181	-0.160	1.0492	
30 minute winter	S3	1.003	S4	91.9	1.305	1.231	0.7873	
15 minute winter	S4	1.005	US2	114.3	0.674	0.475	9.4931	
30 minute winter	US2	1.005_1	S5	100.3	0.522	0.416	6.9076	
15 minute winter	S5	1.006	US3	110.3	0.392	0.457	6.9969	
30 minute winter	US3	1.007	US4	111.4	0.396	0.462	2.7917	
15 minute summer	US4	1.008_1	S8	113.1	0.401	0.469	5.0260	
15 minute summer	S6	6.000	S7	21.6	1.254	0.870	0.5529	
15 minute summer	S7	6.001	S8	31.4	1.783	1.246	0.1240	
30 minute winter	S8	Hydro-Brake®	RED	114.9				
30 minute summer	RED	1.010	EX_S2_OF	114.9	1.638	1.622	0.4947	222.5
30 minute winter	PP01	2.000	S1A	18.2	3.197	0.636	0.0169	
15 minute winter	PP02	4.000	US2	19.1	2.443	1.120	0.1111	
15 minute winter	PP03	5.000	S5	17.2	3.339	0.591	0.0269	

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Appendix C

- Z1-CUR-G580-PL-GRD-92000-P01_Existing Impermeable Areas
- Z1-CUR-G580-PL-GRD-92001-P01_Proposed Impermeable Areas
- Z1-CUR-G580-PL-GRD-92002-P01_Overland Flow Routes

KEY:

RED LINE BOUNDARY

SITE OWNERSHIP BOUNDARY

PHASE 1 BOUNDARY

PHASE 2 BOUNDARY

CATCHMENT AREAS		
CATCHMENT NO.	AREA (m²)	HATCH
TOTAL IMPERMEABLE AREA	8650	

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DESIGN BASED ON TOPOGRAPHICAL SURVEY INFORMATION AVAILABLE AT THE TIME OF DESIGN.
3. 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.
4. ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES ABOVE ORDNANCE DATUM UNLESS OTHERWISE NOTED.

Rev:	Description:	Date:	By:	Chkd:
P01	ISSUED FOR INFORMATION	28/07/23	KS	CG

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Status: SUITABLE FOR INFORMATION — S2

Project: Plot F, Great Jackson Street, Manchester

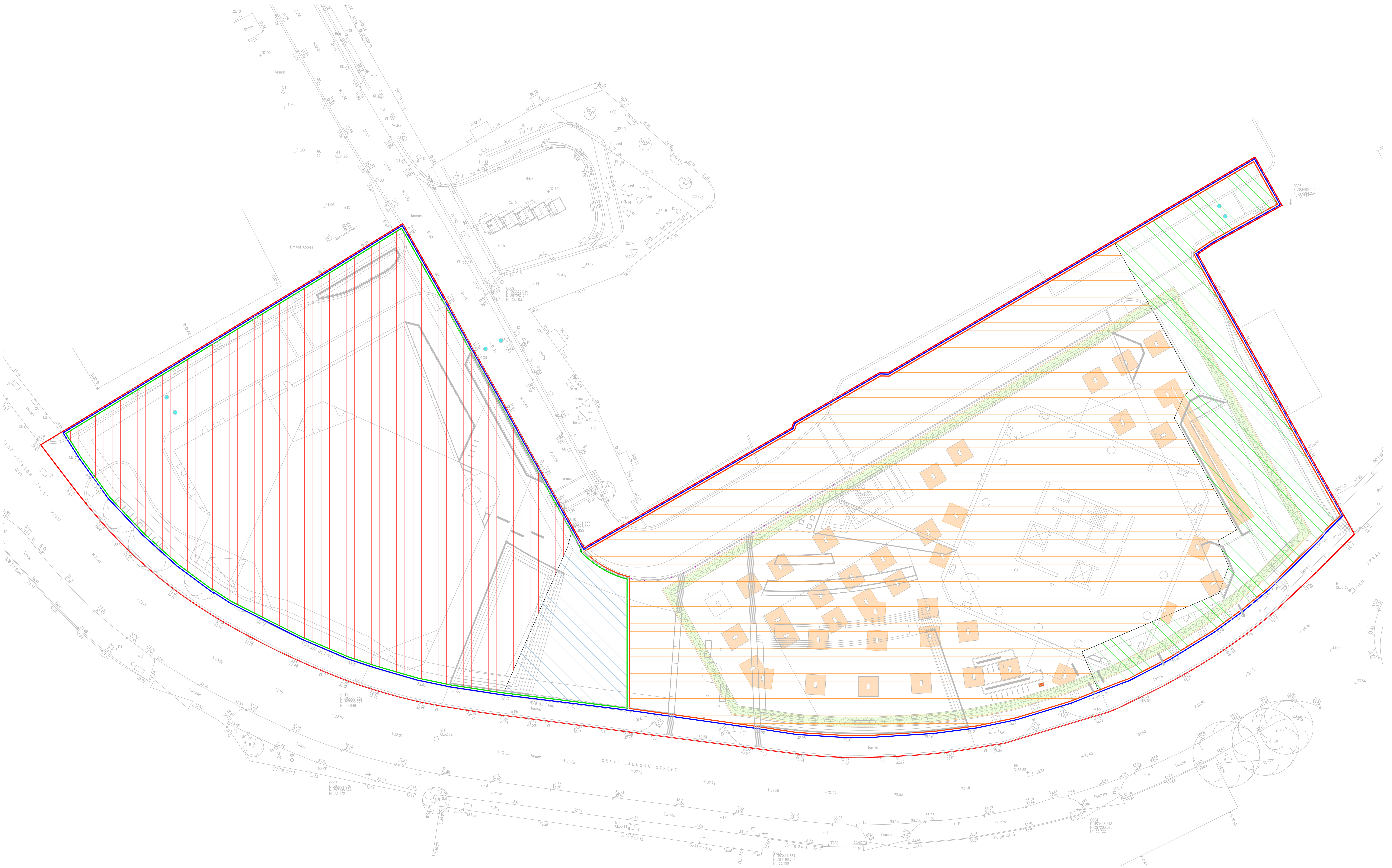
Drg Title: EXISTING IMPERMEABLE AREAS

Size:	Date:	Drawn By:	Designed By:	Checked By:
A0	23/06/23	KS	CG	CG

Scale: 1:200

Project No.	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
Z1	- CUR -	G580 -	PL -	GRD -	-	92000 -	P01

Issued to Planning Portal - 7300003/88264 - Plot F Great Jackson Street.pln Produced on 24 July 2023 by CADLINE



KEY:

- RED LINE BOUNDARY
- SITE OWNERSHIP BOUNDARY
- PHASE 1 BOUNDARY
- PHASE 2 BOUNDARY

CATCHMENT AREAS		
CATCHMENT NO.	AREA (m^2)	HATCH
1.00	2972	
2.00	300	
3.00	4271	
4.00	943	

GENERAL NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
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p01	ISSUED FOR INFORMATION	28/07/23	KS	CG

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Status: SUITABLE FOR INFORMATION S2

Project: Plot F, Great Jackson Street, Manchester

Drg Title: PROPOSED IMPERMEABLE AREAS

Size:	Date:	Drawn By:	Designed By:	Checked By:
A0	23/06/23	KS	CG	CG
Scale: 1:200				

Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
Z1	CUR	G580	PL	GRD		92001	P01

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KEY

- INDICATES THE FLOW ROUTE BASED ON FULL INLET CAPACITY OF COMPONENTS . i.e FALLS AT SURFACE
- INDICATES THE GENERAL GROUND LEVEL FALLS TO THE DRAINAGE SYSTEM
- GROUND LEVELS TO FALL AWAY FROM THE PROPOSED BUILDING
- RED LINE BOUNDARY
- SITE OWNERSHIP BOUNDARY
- PHASE 1 BOUNDARY
- PHASE 2 BOUNDARY

Rev:	Description:	Date:	By:	Chkd:
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Status: SUITABLE FOR INFORMATION — S2

Project: Plot F, Great Jackson Street, Manchester

Drg Title: PROPOSED OVERLAND FLOW ROUTES

Size:	Date:	Drawn By:	Designed By:	Checked By:
A0	23/06/23	KS	CG	CG

Scale: 1:200

Project No:	Originator:	Volume:	Level:	Type:	Role:	Category / Number:	Rev:
Z1	- CUR	-G580-	PL	-GRD-	-	92002	- P01

Date/07/Tues/25/08/23 - 17/0003/08/24 - Plot F Great Jackson Street/Cad Production/Land Mark Drawings/Z1-CUR-XX-XX-DR-C-92002-P01-Proposed Overland Flow Routes.dwg

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Appendix D

- Environment Agency Correspondence
- River Medlock Flood Model Map
- River Medlock Flood Model Levels Table

Chloé Grimsley

From: SPPlanning.RFH <SPPlanning.RFH@environment-agency.gov.uk>
Sent: 05 July 2023 09:26
To: Chloé Grimsley
Cc: Enquiries, Unit
Subject: RE: 230626/MC16 Plot F, Great Jackson Street - POST PLANNING ADVICE

Good Morning Chloé,

Thank you for your email.

We do not normally comment on discharge rates, this falls to the LLFA as they are the competent authority.

With regards to the surcharge levels, the standard of surcharge expected also needs to be specified by the LLFA. The Flood Risk Assessment for the development should contain flood levels associated with the River Medlock, if it doesn't, the river model data can be requested at the following email address: InfoRequests.GMMC@environment-agency.gov.uk.

Kind regards,

Siobhan Martin
Pronouns: she/her
Planning Advisor, Sustainable Places | Greater Manchester, Merseyside, Cheshire
Environment Agency | Richard Fairclough House, Knutsford Road, Latchford, Warrington WA4 1HT
Team email: SPPlanning.RFH@environment-agency.gov.uk



From: Enquiries, Unit <enquiries@environment-agency.gov.uk>
Sent: 26 June 2023 16:41
To: Chloé Grimsley <Chloe.Grimsley@curtins.com>
Subject: RE: 230626/MC16 Plot F, Great Jackson Street - POST PLANNING ADVICE

Good afternoon,

I have passed your enquiry to our Sustainable Places team for the relevant area and they will be in touch with you shortly.

The Freedom of Information Act and Environmental Information Regulations state that a public authority must respond to requests for information within 20 working days, but we aim to respond to all enquiries as quickly as we can.

However due to the ongoing COVID-19 pandemic affecting staff and resources we may take longer than the 20 working days to reply. We will aim to provide an answer as soon as we can.

You can find more information about our service commitment by clicking on the link below:

https://www.gov.uk/government/publications/environment-agency-customer-service-commitment

Should you wish to contact the Sustainable Places team directly, please use the contact details below. Please quote your Enquiry Reference 230626/MC16 in any correspondence with us regarding this matter.

Sustainable Places
Environment Agency
Greater Manchester, Merseyside and Cheshire Area
Richard Fairclough House
Knutsford Road
Latchford
Warrington
WA4 1HT

SPPlanning.RFH@environment-agency.gov.uk

Kind Regards

Matthew Codd (He/Him)
Customer Service Advisor
Environment Agency: Contact Centre Services - Part of Operations, Regulation, Monitoring & Customer
Phone: 03708 506506
Working hours: Monday – Friday

Please accept my thanks for your email in advance - each UK adult sending one less 'thank you' email a day would save more than 16,400 tonnes of carbon a year

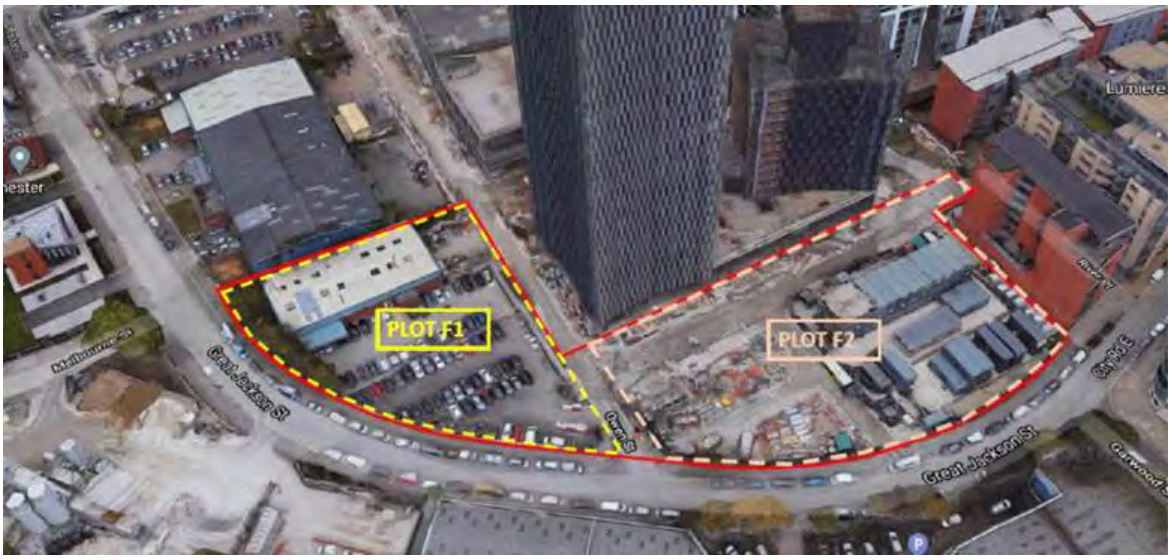


From: Chloé Grimsley <Chloe.Grimsley@curtins.com>
Sent: 13 June 2023 14:48
To: Enquiries, Unit <enquiries@environment-agency.gov.uk>
Subject: 230626/MC16 Plot F, Great Jackson Street - POST PLANNING ADVICE

Good Afternoon,

We are currently completing the detailed design for a new development at Great Jackson Street – Plot F on behalf of Renaker.
The site location is shown below:





The development has planning approval – **Planning Reference No. 132199/FO/2021**

The development comprises two new 51 storey apartment towers, plus basements for Car Parking. Building F1 is located west of Owen Street and Building F2 is located east of Owen Street.

Curtins completed the Approved FRA and Drainage Strategy and the proposed Drainage Strategy, and the proposed Drainage Strategy is attached.

The Foul Water drainage is proposed to discharge to the combined public sewer on site and the Surface Water drainage is proposed to discharge to the River Medlock via an existing 300mm sewer outfall which was constructed as part of an earlier phase by Renaker. It is proposed that the single outfall will serve both building plots.

The existing surface water discharge rates have been estimated as 230 l/s based on the site area, therefore the proposed rates are to be limited to a maximum of 115 l/s. Manchester Lead Local Flood Authority (LLFA) have been consulted regarding discharge rates and they have confirmed during a meeting (15th June 2021) that the above discharge rates would be acceptable. Planning Conditions associated with the planning approval are based on a maximum discharge of 115 l/s.

However, the planning conditions also note:
As the site is proposed to drain to a Main River, the Environment Agency should be consulted. An email of acceptance of proposed flows will suffice. The Environment Agency should also be consulted to confirm the level of surcharge which should be used on the outfall for the proposed hydraulic model;

Based on the above, please could you therefore confirm if the flows are acceptable based on the agreement with MCC of 115 l/s and what the surcharge level in the river we should design for at the outfall. The outfall location is shown below.



Kind Regards,
Chloé

Chloé Grimsley
Principal Civil Engineer
T. 0161 236 2394
chloe.grimsley@curtins.com

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17-19 Whitworth Street West
Manchester M1 5WG

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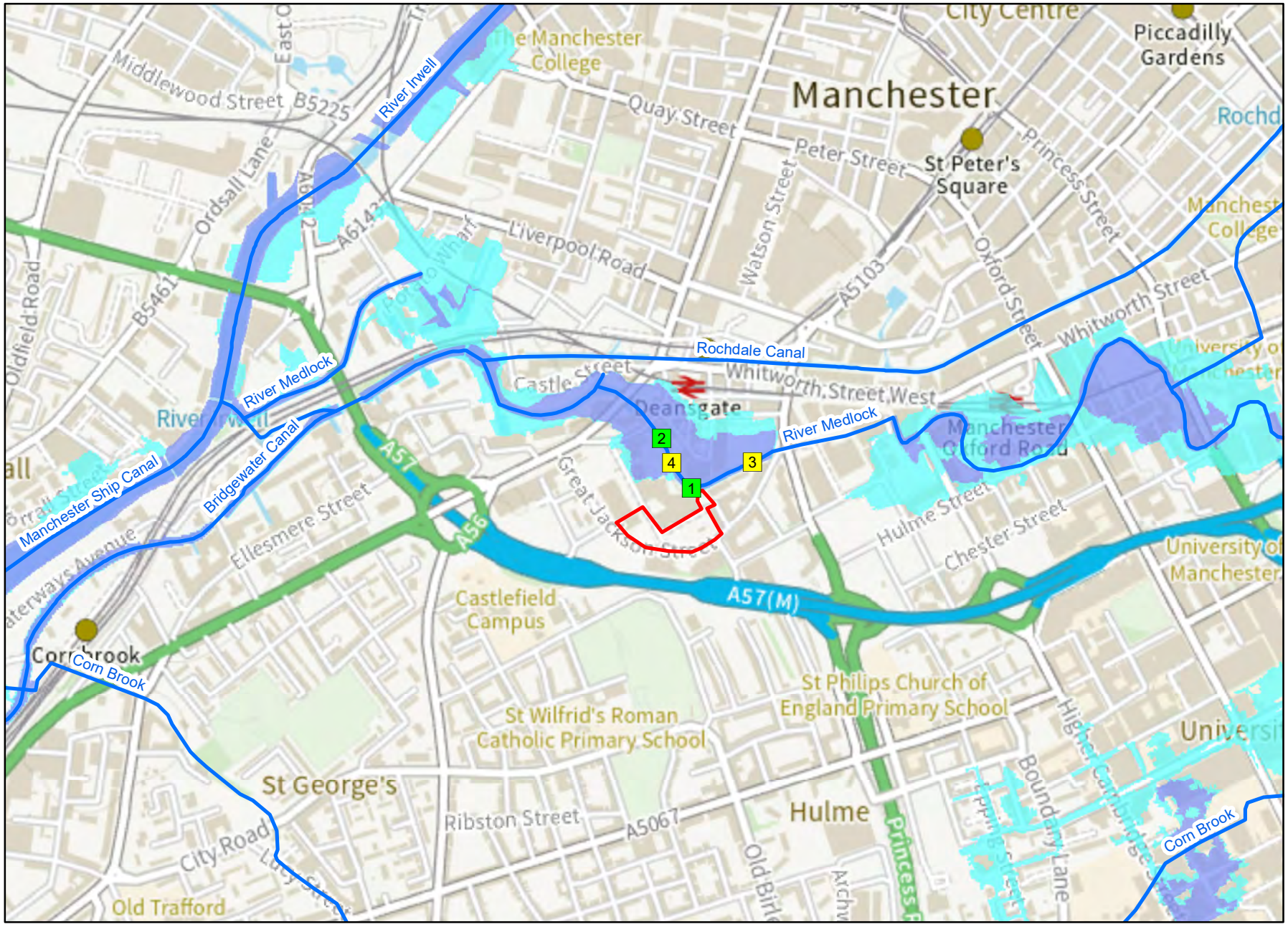
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Detailed Flood Map Centred on Owen Street, Manchester, M15 4TP.
Created 15/06/2023 [GMMC313800JM]



Environment Agency

1:10,001

N

Legend

- Site Location
- Medlock
- Manchester Ship Canal
- Main River
- Flood Zone 3
- Flood Zone 2

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					Undefended				
Map Reference	Model Node Reference	Easting	Northing	Data	4 % AEP (1 in 25 year)	1 % AEP (1 in 100 year)	1 % AEP (1 in 100 year) + 35% increase in flow	1 % AEP (1 in 100 year) + 70% increase in flow	0.1 % AEP (1 in 1000 year)
1	ea013_Model_MEDL01_00003	383445	397325	Modelled Water Level (m aodN)	27.83	28.13	28.80	29.04	29.22
				Modelled Flow (cumecs)	51.45	59.55	69.16	77.04	88.55
2	ea013_Model_MEDL01_00001	383390	397417	Modelled Water Level (m aodN)	27.77	28.07	28.76	29.02	29.22
				Modelled Flow (cumecs)	51.45	59.54	69.13	71.56	73.35

Model data taken from Medlock 2011

AEP - Annual Exceedence Probability

m aodN - metres above ordnance datum Newlyn

cumecs - cubic metres per second

Notes: *Climate Change Scenario - 30%, 35% and 70% increases in flow calculated for the 2080's (2070 - 2115). Please see https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances for more information regarding the new climate change guidance. The location of the site and the type (vulnerability) of development determine the climate change allowances to consider in any flood risk assessment.

					Normal Operation											1 Gate Closed	All Gates Closed	
Map Reference	Model Node Reference	Easting	Northing	Data	20 % AEP (1 in 5 year)	10 % AEP (1 in 10 year)	4 % AEP (1 in 25 year)	2 % AEP (1 in 50 year)	1.33 % AEP (1 in 75 year)	1 % AEP (1 in 100 year)	1 % AEP (1 in 100 year) + 30% increase in flow	1 % AEP (1 in 100 year) + 35% increase in flow	1 % AEP (1 in 100 year) + 70% increase in flow	0.5 % AEP (1 in 200 year)	0.1 % AEP (1 in 1000 year)	1 % AEP (1 in 100 year)	1 % AEP (1 in 100 year)	0.1 % AEP (1 in 1000 year)
3	ea013_0251_MEDL01_0270	383558	397373	Modelled Water Level (m aodN)	28.64	28.80	28.96	29.12	29.23	29.31	29.62	29.67	30.03	29.54	30.35	29.31	29.31	30.35
				Modelled Flow (cumecs)	32.32	37.75	44.58	51.82	56.89	61.19	78.00	80.77	102.62	73.19	122.66	61.19	61.19	122.77
4	ea013_0251_MEDL01_0074	383409	397372	Modelled Water Level (m aodN)	28.60	28.74	28.89	29.04	29.13	29.20	29.48	29.52	29.82	29.40	30.11	29.20	29.20	30.12
				Modelled Flow (cumecs)	32.59	38.06	44.95	52.25	57.36	61.70	78.66	81.45	103.23	73.80	125.99	61.70	61.70	126.18

Model data taken from Manchester Ship Canal 2016

AEP - Annual Exceedence Probability

m aodN - metres above ordnance datum Newlyn

cumecs - cubic metres per second

Notes: *Climate Change Scenario - 30%, 35% and 70% increases in flow calculated for the 2080's (2070 - 2115). Please see https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances for more information regarding the new climate change guidance. The location of the site and the type (vulnerability) of development determine the climate change allowances to consider in any flood risk assessment.

For the Manchester Ship Canal Model, we provide the following three scenarios:
1. Normal Operation: All sluice gates operate automatically to maintain a navigable pounded water level upstream of each set of sluice gates. During times of high flow the gates are opened automatically to allow excess water pass downstream. During extreme conditions the sluice gates can be manually overridden to extend the opening heights.
2. Latchford 1 Gate Closed Scenario: This scenario represents a single operational sluice gate at Latchford Locks fixed closed. Therefore, only operational movements from 2 active sluice gates.The model setup removes the gate from PID controller setup and an IED file is used to define the sluice gate as fixed in the closed position.
3. Latchford 3 Gates Closed Scenario: This scenario has been defined as the removal of operational rules at all three sluice gates at Latchford Locks, thus, all gates are fixed in the closed position resulting in no regulation of upstream water levels. The model setup removes each of the gates from PID controller setup and an IED file is used to define sluice gates fixed in the closed position.