

Drainage Technical Note

Plot 9B,
First Street,
Manchester

for

Vita Meadow Ltd



07/03/2025



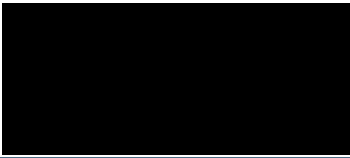
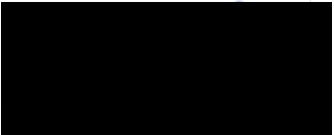
COMPLEX CHALLENGES ...
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Vita Meadow Ltd

TITLE	NAME	SIGNATURE	DATE
Report Author	PAUL GRAVENEY		07/03/25
Approved By	JON SMITH		07/03/25
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02	MAINTENANCE STRATEGY TEXT FOR ATTENUATION TANK ADDED AT 3.1		10/09/25





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1.0 Introduction

1.1 Summary

RoC Consulting has been appointed by Vita Meadow Ltd to provide civil and structural engineering design advice in connection with their proposed development known as Plot 9B, First Street, Manchester.

In 2023 a planning application was submitted to Manchester City Council for a Development comprising the erection of building of up to 33 (+ ground) storeys, comprising purpose-built student accommodation (PBSA) (Sui Generis) and other associated works including public realm, secure cycle parking and servicing arrangements.

This report has been prepared to discuss the overall drainage strategy for the site and it is intended to be submitted for the discharge of the drainage related planning conditions.

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2.0 Drainage Strategy

2.1 Existing Drainage Layout

The United Utilities (UU) sewer records have been reviewed and show that the highways surrounding the development site are well served by a network of existing combined sewers, these include:

- 600x500 vitrified clay sewer in Hulme Street
- 590x680 brick sewer flowing northward through the adjacent development site before changing to 610mm diameter concrete and turning east where it flows through the Plot10a site just inside the northern boundary. This sewer discharges to a combined sewer overflow (CSO) chamber in River Street
- 630mm diameter vitrified clay in River Street to the east discharging into the CSO chamber
- 300mm diameter vitrified clay outfall from the CSO flowing south along River Street
- 300mm diameter vitrified clay overflow from the CSO to the River Medlock
- 630x800 brick sewer flowing north within Medlock Street.

A GPR survey was undertaken by Survey Operations in February 2020 and supplied to RoC for review. This has not indicated any historic drainage networks.

Notwithstanding the above, the GPR survey is limited and only identifies small sections of these networks so is not possible to determine exactly how much of the site these private sewers drained.





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2.2 Geology

Reference to the online British Geological Survey (BGS) map for the site indicates the following ground model:

Drift Geology: Glaciofluvial Sheet Deposits – Sand and Gravel

Solid Geology: Chester Formation – Sandstone

Soilscape England describes the soils as 'slowly permeable seasonally wet acid loamy and clayey soils with impeded drainage'.

A search has also been completed using the BGS Borehole Scans facility to establish what (if any) historic site investigation or borehole data may be available for the development. The table below details the two closest available scans.

BHID	Direction	Distance	Made Ground	Clay	Sand	Clay
SJ89NW102	Southeast	100m	1.07m	2.59m	13.11m	9.45m
SJ89NW1229	North	65m	1.40m	4.0m	-	-

There are no geological faults or features indicated within 500m of the site.

2.3 Hydrological Assessment

A review of the topographical survey, OS Maps and Environment Agency maps would indicate the closest surface water feature to be the River Medlock, which is located circa 130m to the north of the site and is culverted.





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2.4 Sustainable Drainage Strategy

When reviewing the strategy for the disposal of surface water, due cognisance needs to be taken of the hierarchy for discharge as defined current NPPF. These are summarised below with the option of draining to the existing watercourse to the south of the site to be taken forward.

Discharge via Infiltration to Ground

Any impermeable areas that can drain to a soakaway or an alternative method of infiltration would significantly improve the sustainability of any surface water systems.

An intrusive investigation for this and the adjacent development site has previously been undertaken by TerraConsult on behalf of ASK Real Estate and provided to RoC for review. In addition, RoC Consulting have undertaken a Phase 1 Desk Study for the site which also provides information on expected ground conditions.

These indicate Made Ground up to depths of around 1.30m, underlain by clays for a further 5-7m. Sandstone bedrock was encountered in one borehole at over 8m.

Variable head permeability testing was undertaken as part of the TerraConsult intrusive investigation. These indicate infiltration rates between 1.06E^{-08} m/s to 9.35E^{-09} m/s.

Taking this into consideration, plus the fact there are limited external areas to achieve the required 5m offset from foundations, infiltration is not considered to be a feasible method of surface water disposal for the development.

Discharge to a Surface Water Body

As indicated earlier in this report, the nearest watercourse to the site is the River Medlock which is located circa 130m to the northeast of the site and is culverted.

No other water features are present in the vicinity.

To obtain a connection to this feature would require a significant off-site connection through third party land and therefore this method of surface water disposal is not considered to be practicable and has not been considered further.

Discharge to a Surface Water Sewer

Assessing the United Utilities sewer records it is evident that no surface water sewers are located in close proximity.





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Discharge to a Combined Sewer

The only public sewerage infrastructure in the vicinity of the site are all combined sewers. On the basis that infiltration is not considered to be viable, there are no surface water sewers or watercourses in the immediate vicinity and the existing development historically discharged to the public combined sewer network then this is the only viable solution.

It is therefore proposed that the development will mimic the existing drainage regime and discharge surface water to the combined sewer network.

To facilitate the development, a new private combined water drain will need to be constructed through the ASK Development Plot 10 site and outfall to the existing combined water sewer in River Street to the north.

A pre-development enquiry was submitted to United Utilities and a copy of their response is appended to this report.

UU have acknowledged that infiltration and discharge to watercourse are both unfeasible methods of disposal.

UU have confirmed that a connection to the combined sewer in River Street would be acceptable at a peak rate not exceeding 5l/s.

2.5 Proposed Surface Water Drainage Strategy

The general principal of the surface water drainage strategy is to collect the runoff from the roof area of the new building, and direct it to a number of new RWPs that will drop down to a new below ground surface water network. The network will pass around the building and outfall to the stub connection constructed as part of the Plot 10 development that ultimately outfalls to the combined public sewer in River Street at a peak restricted rate not exceeding 3.4l/s. Due to this restricted rate a geocellular crate attenuation tank will be constructed beneath the building.

A climate change allowance of 45% in additional rainfall for the 100-year return period storm event has been applied.

No exceedance flooding for the 100-year return period storm of Critical duration with a 45% allowance has been identified in the hydraulic modelling.

The proposed private drainage layout for the new development building will be designed in accordance with BS EN 752: 2017 and Building Regulations Part H guidance. This is to indicate no surcharge for the 2-year storm event and no flooding for up to the 30-year storm event.





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The proposed surface water drainage layout is indicated on current RoC Drainage GA drawings in Appendix A and accompanying surface water hydraulic calculations in Appendix B.

2.6 Proposed Foul Water Drainage Strategy

Foul water drainage will run in parallel with the surface water and outfall via the same combined connection to the UU combined sewer in River Street. UU have confirmed this as acceptable.

The proposed foul water drainage layout is indicated on current RoC Drainage GA plans in Appendix A.





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3.0 Drainage Related Planning Condition & RoC Responses

3.1 Planning Conditions

Detailed below is the drainage condition in *Italics* with RoC response in Blue beneath to answer each of the sub queries.

Prior to the commencement of the development hereby approved, a surface water drainage scheme in accordance with Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacement national standards, shall be submitted for approval in writing by the City Council, as Local Planning Authority. This shall include:

- *Progression through the drainage hierarchy must be evidence based and supported by site investigation including assessments of ground conditions and infiltration testing in accordance with BRE365. Proposals of attenuation should achieve half drain time within 24 hours.*

As discussed in Section 2.4, infiltration has been discounted due to the cohesive underlying ground conditions and the building taking up the majority of the red line boundary.

- *Where surface water is connected to the public sewer, agreement in principle from United Utilities is required that there is adequate spare capacity in the existing system taking future development requirements into account. An email of acceptance of proposed flows and/or new connection will suffice.*

UU have confirmed via the pre development enquiry in Appendix C that if infiltration is discounted then they will allow connection to the combined sewer at a rate not exceeding 5L/S.

- *Maximised integration of green SuDS components (utilising infiltration or attenuation) if practicable.*

The building takes up the full development footprint and therefore it is not possible to include any green SuDS.

- *Details of surface water attenuation to align with the Manchester, Trafford and Salford Strategic Flood Risk Assessment. For brownfield sites a minimum of 50% betterment is required for reduction in runoff rate compared to the existing rates with the aim of reducing to the Greenfield runoff rates.*

The proposed surface water strategy is to discharge at greenfield rates.

- *A finalised drainage layout showing all components, outfalls, levels and connectivity.*

Refer to the ROC surface water drainage layout drawing in Appendix A. This provides all details and indicates a flow control at the outlet rated at 3.4l/s.





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- *An existing and proposed impermeable areas drawing to accompany all discharge rate calculations.*

Refer to the ROC proposed impermeable area plan in Appendix A.

- *Hydraulic calculations of the proposed drainage system, including all design parameters. Calculations must Include Critical Storm Events for the 1 in 2, 1 in 30 and 1 in 100 + 45% Climate Change. Results must demonstrate no surcharge for the 1 in 2, no flooding in the 1 in 30 and no flooding of buildings for the 1 in 100 + 45% Climate Change.*

Hydraulic model has been simulated in the Causeway Flow Hydraulic design software and confirms no flooding for the 1 in 100 year plus 45% allowance for climate change. Refer to the calculations included at Appendix B.

- *Where a combined sewer diversion or abandonment is proposed, agreement in principle from United Utilities is required. An email of acceptance will suffice.*

Consultants Ramboll have submitted the S185 application to UU on behalf of the current landowner ASK Real Estate. Refer to Appendix D for details of the plans and UU approval for the abandonment of the existing sewer adjacent to the site.

- *A blockage risk assessment must be undertaken as part of the drainage strategy to support proposed flows less than 5 l/s.*

The flow control chamber will be fitted with an internal overflow for the worst case scenario should the flow control become blocked.

- *A plan indicating surface water overland flow routes for extreme events to ensure flows are diverted away from existing and proposed buildings (including basements).*

The building is raised above all external levels which fall into the adjoining highways. Refer to ROC drawing in Appendix A which defines this further.

- *Construction details of flow control and SuDS elements.*

Refer to Appendix A for construction details.

- *A plan indicating easements. SuDS features (including attenuation tanks) should be appropriately positioned, including a 2.5m easement from the existing highway and a 5m easement from any dwellings, guaranteeing accessibility for future maintenance and contingency for asset failure. This practice is in accordance with SuDS Manual (C753). Where minimum easements cannot be met, evidence is required from the structural engineer that the building foundations are appropriately designed to protect the building and tank.*

Tank is located beneath building footprint due to their being no external areas. The building is supported on piled foundations and the excavation for the tank will not go below the excavation for the building pile caps. Thus the attenuation tank does not undermine or have any influence on the building foundations.

Additionally the ground floor slab of the building is suspended from the building columns that are supported off the pile caps. As such there will be no surcharge loading applied to the attenuation tank in the permanent condition from the new building structure.

Regular inspections and maintenance are required to ensure the effective long-term operation of below-ground attenuation systems. The attenuation tank will be maintained in





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accordance with advice provided by the manufacturer, with the responsibility for this maintenance placed with the site facilities management team and/or appointed maintenance company.

The maintenance tasks for the attenuation tank generally include the inspection of the inlets, outlets, air vents, and overflows to identify silt build-up and/or structural damage to determine if remedial actions are required. Internal inspection of the tank itself is not feasible owing to the geo-cellular construction of the tank.

Inspection for silt build up should be carried out on a regular basis in MH S1.03 external to the building and immediately downstream of the tank and in MH S5.00 internal to the building and immediately upstream of the tank. If silt build up is identified in either of these manholes then the tank should be cleaned by jetting from MH S5.00.





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APPENDIX A – RoC DRAINAGE DRAWINGS



Page 1 of 1

	EXISTING COMBINED WATER SEWER
	EXISTING COMBINED WATER SEWER ABANDONED
	PROPOSED FOUL WATER DRAINAGE
	PROPOSED SURFACE WATER DRAINAGE
	PROPOSED COMBINED WATER DRAINAGE (BY OTHERS)
	PROPOSED DRAINAGE CHANNEL (SPEC BY OTHERS)
	PROPOSED THRESHOLD DRAIN (SPEC BY OTHERS)
	GEOCELLULAR ATTENUATION
WPC	WASTE POINT CONNECTION (FOUL)
RWP	RAINWATER PIPE
ITG	INTERNAL TRAPPED GULLY (WADE MULTI LEVEL P TRAPPED STAINLESS STEEL GULLY WITH DUCTILE IRON SQUARE GRATING)
	SITE BOUNDARY

ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.

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

ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER IMMEDIATELY SO THAT AMBIGUITY CAN BE ELIMINATED TO THE COMMENCEMENT OF WORK.

BEFORE STARTING ANY WORKS, CONTRACTOR TO CHECK INVERT LEVELS AND POSITIONS OF EXISTING DRAINS, SEWERS, INSPECTIONS CHAMBERS AND MANHOLES AGAINST INFORMATION SHOWN ON THIS DRAWING.

ROCKER PIPES ARE TO BE PROVIDED AT ALL CONCRETE CASTED INTERFACES.

CLASS 2 CONCRETE SURROUND TO BE PROVIDED FOR PIPES WITH COVER TO BE 150mm ABOVE THE CROWN OF THE PIPE FOR ROADS AND 150mm FOR SOFT AND PEDESTRIAN AREAS ONLY AND UNDER ALL FOUNDATIONS AND WHERE PIPES LAID WITHIN 1m OF FOUNDATIONS.

CONNECTIONS TO EXISTING PUBLIC SEWERS IN ACCORDANCE WITH UNITED UTILITIES REQUIREMENTS, TO BE APPROVED / AGREED WITH THE WATER AUTHORITY.

PROPOSED COVER LEVELS ARE APPROXIMATE AND MUST BE CHECKED BY THE CONTRACTOR ON SITE TO SUIT THE EXACT FINISHED LEVEL AND GRADIENT.

ALL DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY AND IN CONJUNCTION WITH ALL RELEVANT BRITISH STANDARDS, CODES OF PRACTICE AND SEWERS FOR ADAPTION 7th EDITION.

ACCESS COVERS AND FRAMES SHALL COMPLY WITH THE LOADINGS SPECIFIED AND TO BS EN 124 AND KITEMARKED OR IF RECESSED COVERS ARE SPECIFIED THEN IN ACCORDANCE WITH FACTA ASSOCIATION REQUIREMENTS. ALLOW FOR RECESSED MANHOLE COVERS TO ACCEPT LANDSCAPE ARCHITECT FINISHES TO ALL NON-ASPHALT EXTERNAL AREAS.

THE PROPOSED BUILDING LAYOUTS SHOWN ON THIS DRAWING ARE FOR INFORMATION ONLY. REFER TO ARCHITECTS PLANS FOR PRECISE LOCATION SETTING OUT INFORMATION AND DETAILS.

FOR SETTING OUT DIMENSIONS OF SSS, SPPS, RWPS, FLOOR GRILLS AND OTHER DRAINAGE POUP UP LOCATIONS, REFER TO ARCHITECTS OR MECHANICAL & ELECTRICAL ENGINEERS DRAWINGS.

ALL DRAINAGE PIPEWORK SHALL SHOW SHALL BE 100mm DIAMETER FOR FOUR INCH DRAINAGE SURFACE WATER UNLESS NOTED OTHERWISE. ALL DRAINAGE PIPEWORK SHALL BE LAID SOFTLY TO SLOPE UNLESS OTHERWISE STATED.

ALL UNDERSLAND PIPEWORK SHALL BE LAID AT GRADIENTS OF 1:80 MIN. FOR FOUR PIPEWORK AND 1:100 MIN. FOR SURFACE WATER UNLESS NOTED OTHERWISE. ALL UNDERSLAND DRAINAGE SHALL BE CLEAR OF FOUNDATIONS AND FOUNDATIONS SHALL BE SET TO A MINIMUM OF 150mm TO BS EN 404-1. UNLESS NOTED OTHERWISE, SURFACE WATER CAN ALSO BE CONSTRUCTED WITH POLYPIPE TWINWALL PIPES.

AT LEAST ONE SOIL PIPE, ALL HEADWATER PIPES SHALL BE VENTED TO THE ATMOSPHERE. AT ALL RAINWATER PIPES SHALL HAVE ABOVE GROUND RIDDING ACCESS.

ALL PRIVATE DRAINAGE PIPEWORK FOR FOUR AND SURFACE WATER PIPEWORK FOR FOUR INCH DRAINAGE SHALL BE SET TO A MINIMUM OF 150mm TO BS EN 404-1. UNLESS NOTED OTHERWISE, SURFACE WATER CAN ALSO BE CONSTRUCTED WITH POLYPIPE TWINWALL PIPES.

CONCRETE ENCASEMENT OF THE PIPEWORK SHALL BE REQUIRED WHERE THE VERTICAL CLEARANCE BETWEEN TWO PIPES CROSSING IS LESS THAN 300MM.

WHERE NEW DRAINAGE IS SITUATED WITHIN 5 METRES OF NEW OR EXISTING TREES THE PIPEWORK SHALL BE ENCASED IN CONCRETE TO REDUCE THE RISK OF ROOT INGRESS.

ALL NEW DRAINAGE INSTALLATIONS TOGETHER WITH ANY EXISTING DRAINAGE AND CONDUITS SHALL BE SET TO A MINIMUM OF 150mm TO BS EN 404-1. UNLESS NOTED OTHERWISE, SURFACE WATER CAN ALSO BE CONSTRUCTED WITH POLYPIPE TWINWALL PIPES.

ATTENTION SHOWN SURFACE CALCULATIONS INCLUDE CLIMATE CHANGE AND 10% TO 40% IN ACCORDANCE WITH CURRENT ENVIRONMENT AGENCY GUIDELINES.

DRAWING STATUS
PRELIMINARY

Fourways House
RoC Consulting
3rd Floor, 57 Hilton Street
Manchester M1 2EJ
T 0161 214 5390
W rocconsulting.com

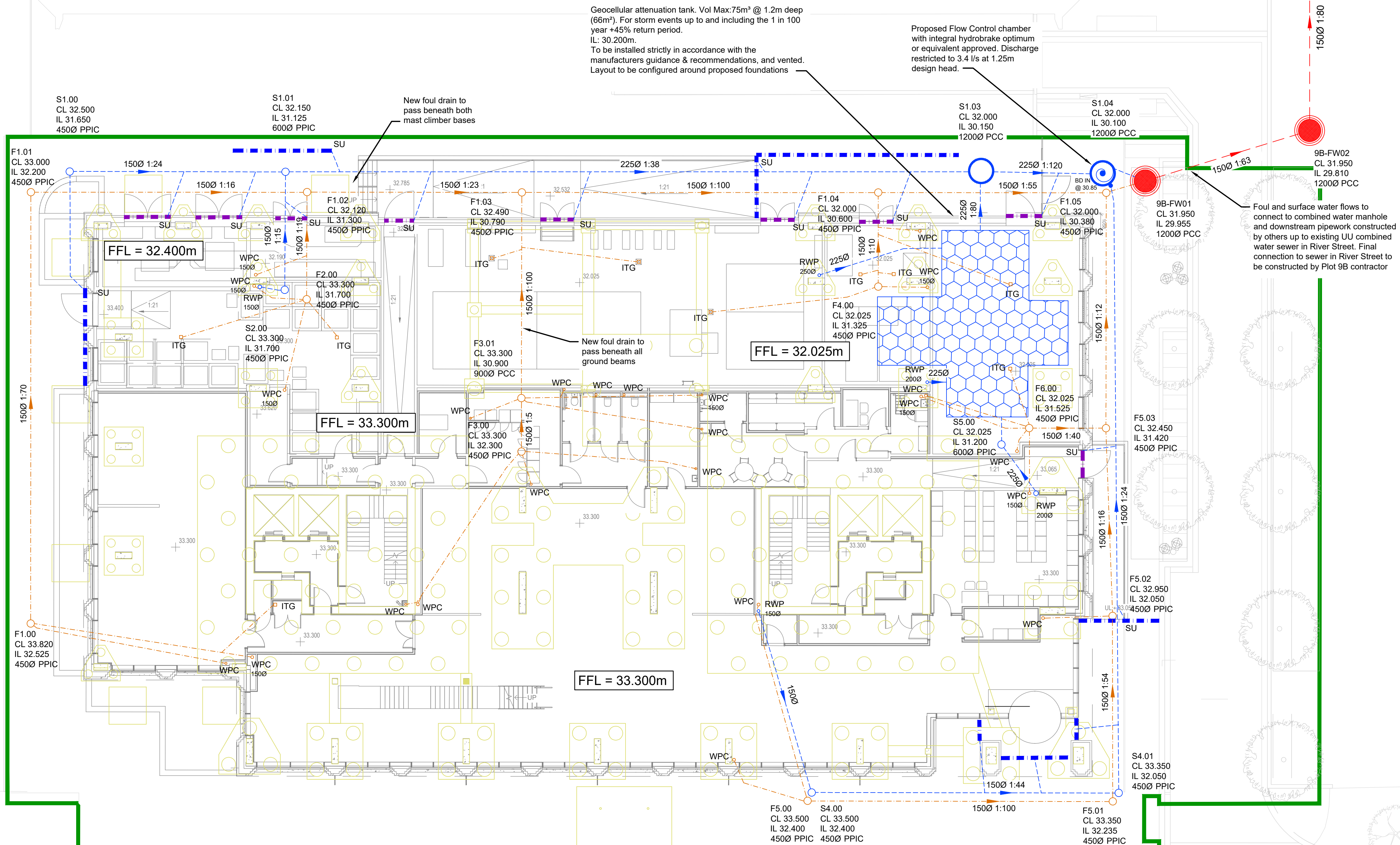
CLIENT
VITA MEADOW LTD

DRAWING TITLE

FOUL & SURFACE DRAINAGE

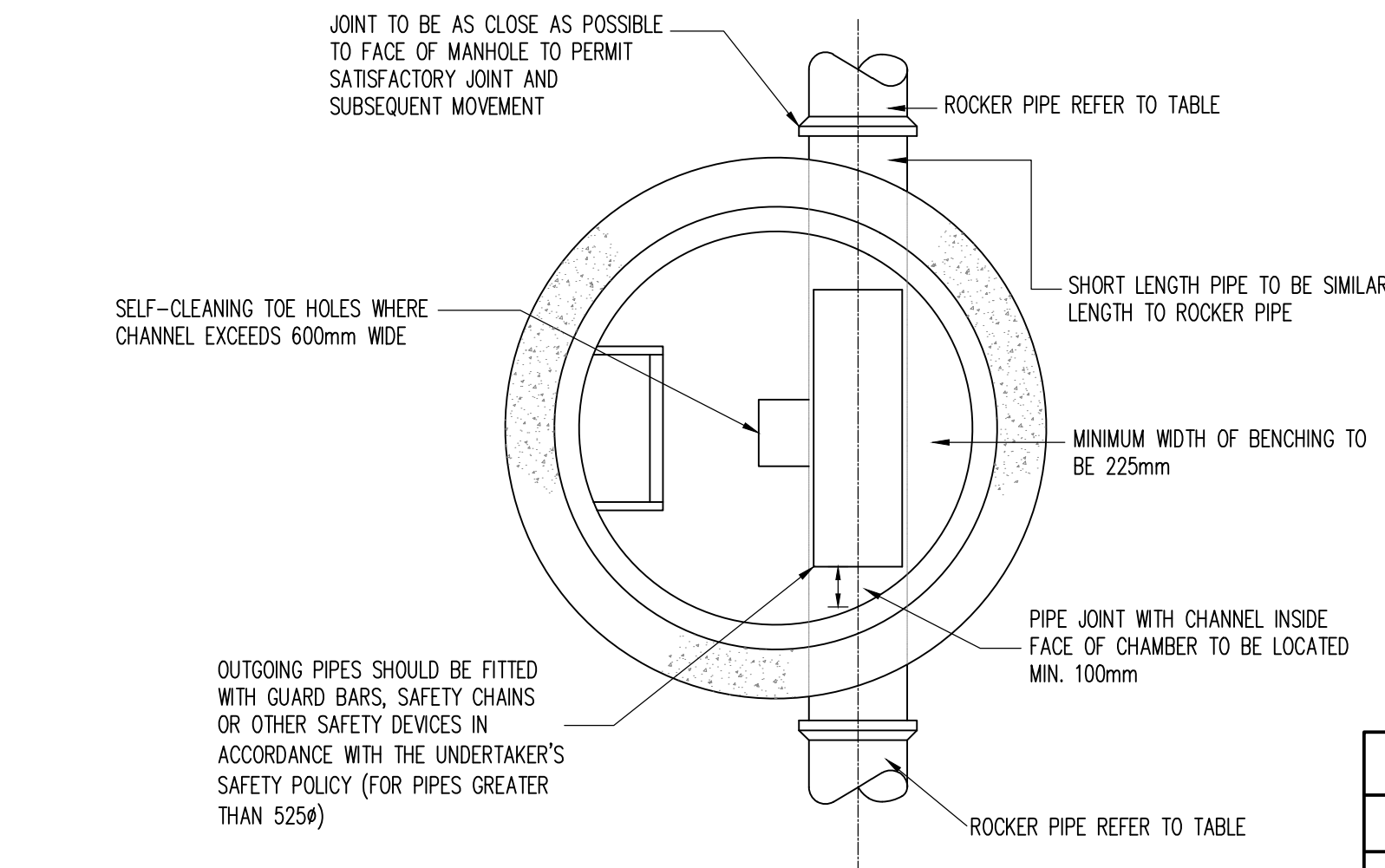
GENERAL ARRANGEMENT

1470 (C) RoCp Ltd.



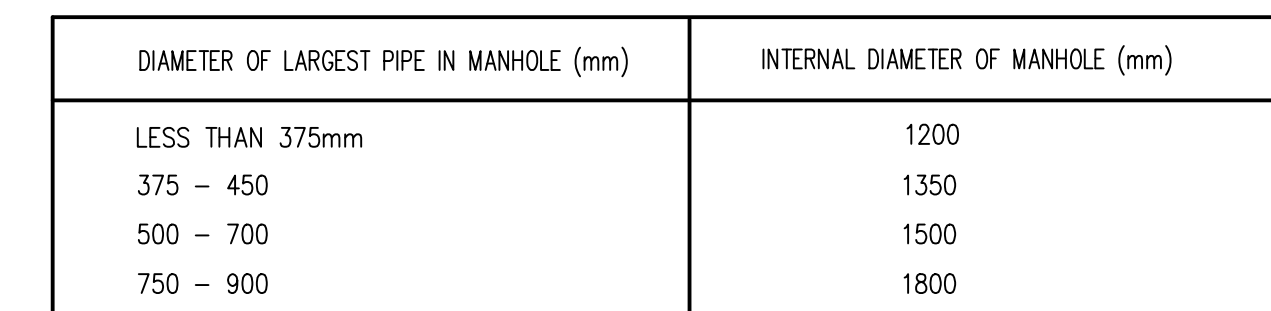
NOTES

1. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.
3. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO THE COMMENCEMENT OF WORK.



DEPTH FROM GROUND LEVEL TO SOFFIT OF PIPE 3m TO 6m
FOR CHAMBERS LESS THAN 1500Ø A TYPE B MANHOLE SHALL BE USED

NOTE:
WIDE WALL P.C.C CHAMBER RINGS MAY BE USED FOR MANHOLES IN AREAS NOT AT RISK FROM FLOATATION DUE TO A POTENTIAL HIGH WATER TABLE. THE RINGS SHALL BE INSTALLED AND SEALED IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. NO CONCRETE SURROUND WILL BE REQUIRED TO THE P.C.C RINGS.



JOINT TO BE AS CLOSE AS POSSIBLE TO FACE OF MANHOLE TO PERMIT SATISFACTORY JOINT AND SUBSEQUENT MOVEMENT

OUTGOING PIPES SHOULD BE FITTED WITH GUARD BARS, SAFETY CHAINS OR OTHER SAFETY DEVICES IN ACCORDANCE WITH THE UNDERTAKER'S SAFETY POLICY (FOR PIPES GREATER THAN 525Ø)

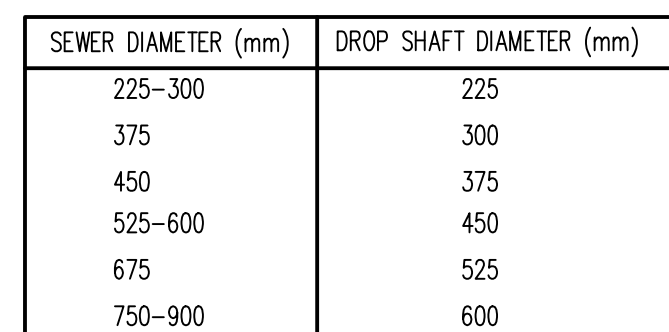
STEP IRONS TO TYPE B ONLY
NO STEP IRONS TO TYPE C

PIPE JOINT WITH CHANNEL INSIDE FACE OF CHAMBER TO BE LOCATED MIN. 100mm

ROCKER PIPE REFER TO TABLE

EFFECTIVE LENGTH (m)
0.6
1.0

FOR MAINTENANCE, ANY MANHOLE CONSTRUCTED WITHOUT DOUBLE STEPS OR A LADDER SHALL BE ACCESSED BY WINCH ONLY.



MINIMUM DIMENSIONS REQUIRED TO CONSTRUCT BACKDROP	
PIPE DIA. (mm)	MIN DIMENSION (mm)
100	530
150	630
225	915
300	1170

NOTE: WHEN THE DROP IS NOT EXCESSIVE A 45° DROP PIPE MAY BE USED

DRAWING STATUS

DRAWING STATUS
PRELIMINARY

RIBA STAGE

STAGE 4



DRAWN PG	DATE MAR 25	SCALES NTS
CHECKED JAS	DATE MAR 25	THE ABOVE SCALES APPLY WHEN PLOTTED AT A1 SIZE --DO NOT SCALE--
APPRVD. JAS	DATE MAR 25	EMAIL FOR DRAWINGS info@roccoconsulting.com

CLIENT _____

VITA MEADOW LTD

PROJECT TITLE

PLOT 9B

FIRST STREET

DRAWING TITLE

TYPICAL DRAINAGE DETAILS

SHEET 1

DRAWING No.	REV.
-------------	------

Z19B-ROC-G580-DE-XX-DR02 | P01

2102 100 0000 2102 1000	1.00

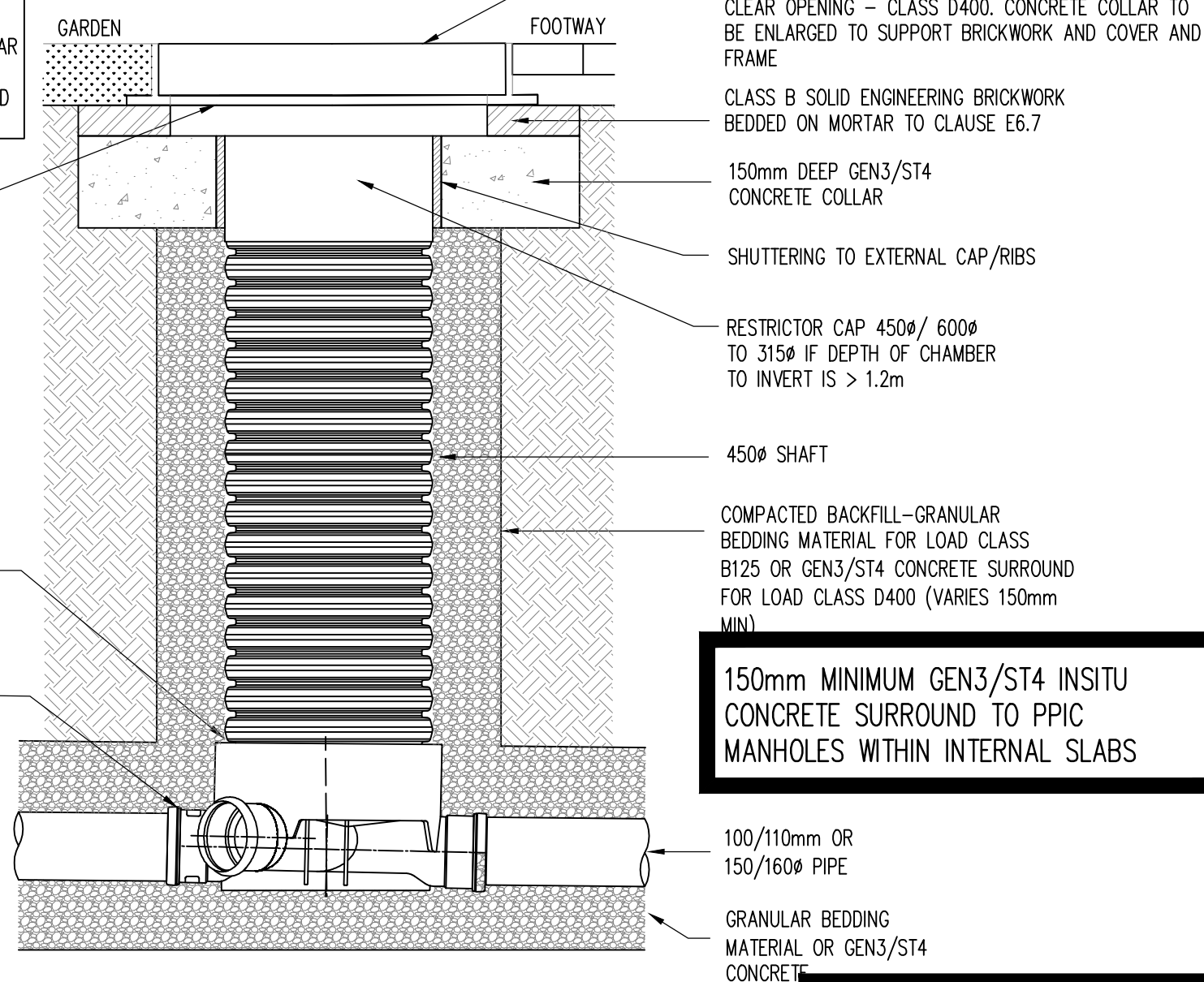
4470 (C) RoCp Ltd.

NOTE: COVER COMPLYING WITH BS EN 124 AND BS 7903 DRIVEWAYS, FOOTWAYS AND LANDSCAPED AREAS 300x300 OR 350x350 CLEAR OPENING-CLASS B125 SEE CLAUSE E2.32 RECESSED COVERS AND FRAMES TO BE USED IN PAVED AREAS.

MORTAR BEDDING AND HAUNCHING TO COVER AND FRAME TO CLAUSE E6.7

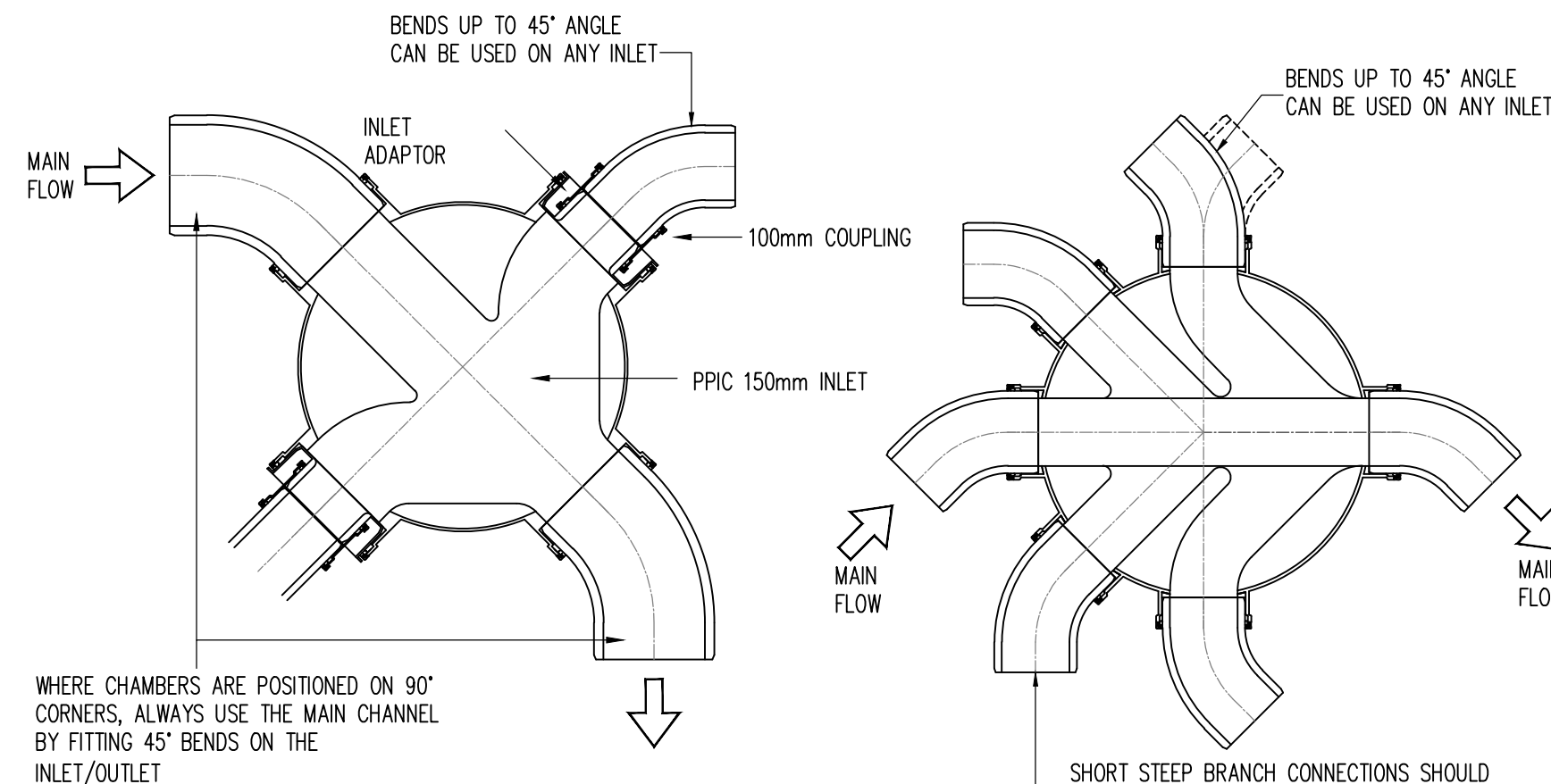
JOINTS BETWEEN BASE AND SHAFT AND SHAFT COMPONENTS TO BE FITTED WITH WATERTIGHT SEALS

JOINT TO BE AS CLOSE AS POSSIBLE TO FACE OF CHAMBER TO PERMIT SATISFACTORY JOINT AND SUBSEQUENT MOVEMENT

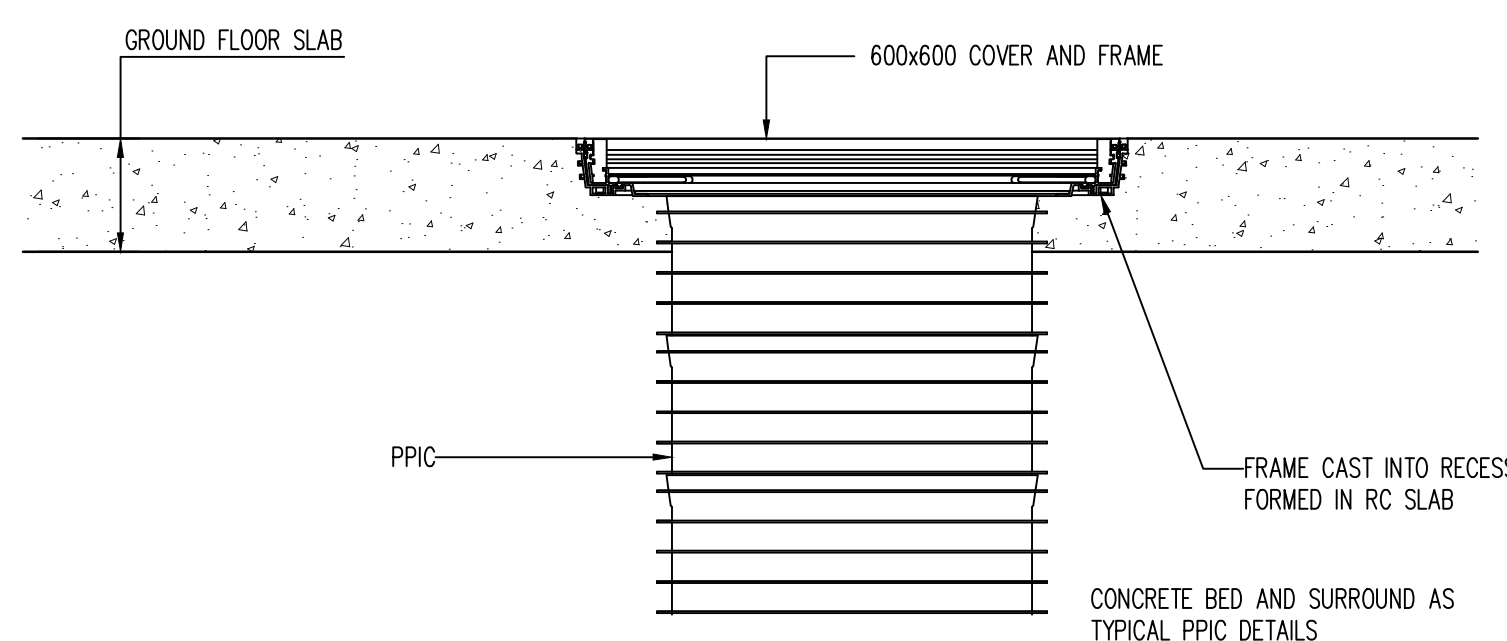


TYPICAL INSPECTION CHAMBER SfA-7 TYPE D (BASED ON WAVIN RANGE 450/600 CHAMBER)

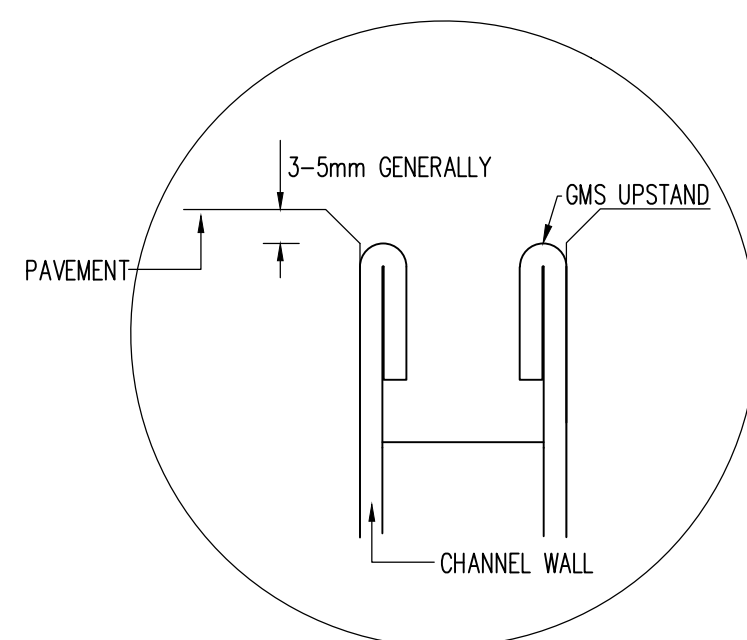
MAXIMUM DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 3m NON-ENTRY



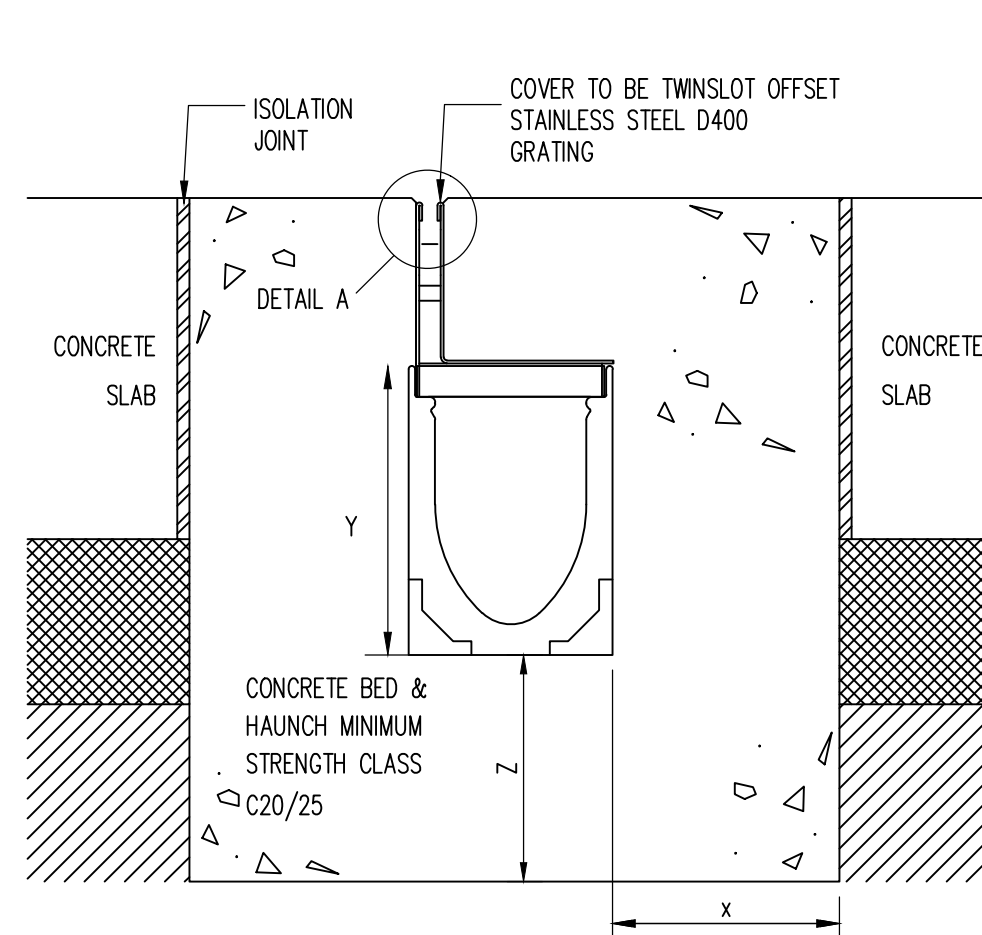
TYPICAL ACCESS CHAMBER / PPIC INSTALLATION DETAIL



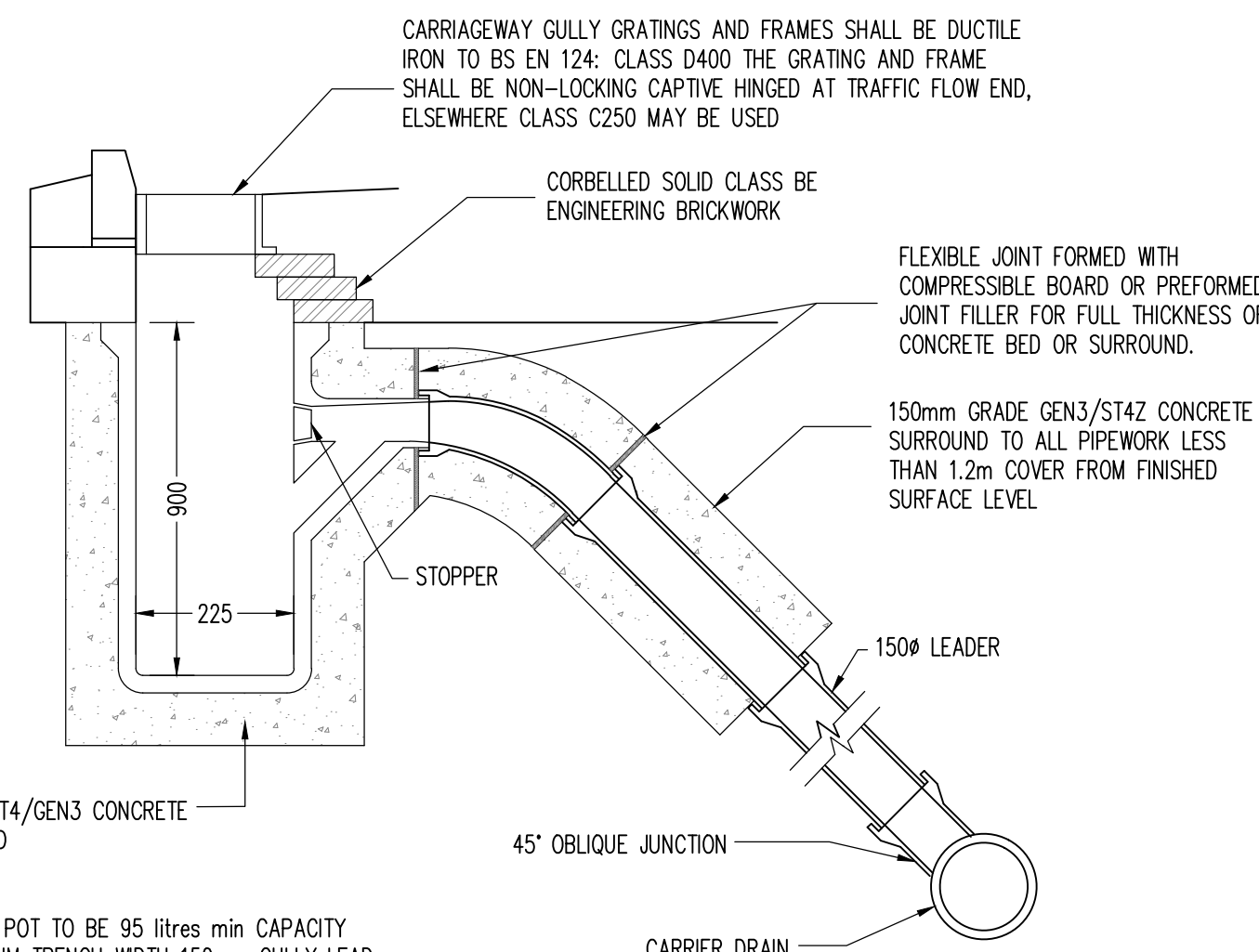
COVER/FRAME TO INTERNAL MANHOLE ON CONCRETE SLAB



DETAIL A

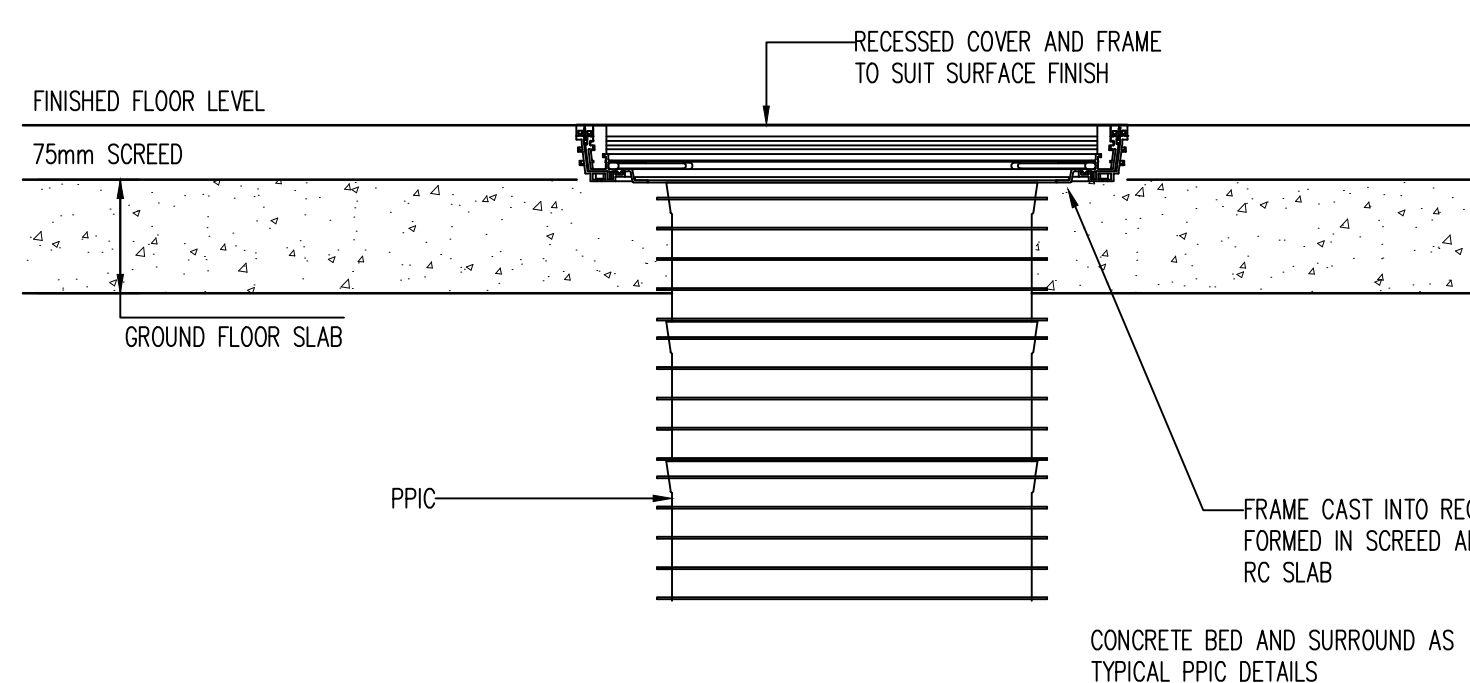


CONCRETE PAVEMENT



TYPICAL ROAD GULLY DETAIL

- NOTES
1. GULLY POT TO BE 95 litres min CAPACITY.
 2. MAXIMUM TRENCH WIDTH 150mm GULLY LEAD 600mm.
 3. NUMBER OF BENDS MAY VARY DUE TO SITE DIFFERENCES.
 4. CONCRETE SURROUND OF PIPES SHALL ALWAYS FINISH AT A JOINT.



COVER/FRAME TO INTERNAL MANHOLE ON SCREED OVER CONCRETE SLAB

1.0 GROUND CONDITIONS: THE CUSTOMER SHOULD ENSURE THAT THE MINIMUM DIMENSIONS SHOWN ARE SUITABLE FOR THE EXISTING GROUND CONDITIONS. ENGINEERING ADVICE MAY BE NECESSARY.

2.0 BLOCK PAVEMENTS: THE CHANNEL MUST BE SUPPORTED Laterally AND THEREFORE BLOCKS MUST BE RESTRAINED FROM MOVEMENT BY BEDDING SECURELY. E.G. BY USING AN EPOXY OR POLYMER MODIFIED MORTAR FOR BED AND PERPENDICULAR JOINTS. (FOR EXAMPLE RONAFIX MORTAR MIX C OR SIMILAR: FROM RONACRETE TEL 01279 638700). ENGINEERING ADVICE MAY BE REQUIRED.

3.0 SURFACE CRACKS: ALTERNATE CRACK CONTROL AND MOVEMENT JOINTS TRANSVERSELY WITHIN BED AND HAUNCH MAY REDUCE UNSIGHTLY SURFACE CRACKING. ENGINEERING ADVICE MAY BE REQUIRED.

4.0 JOINT SEALANT: WHERE ACO DRAIN CHANNEL JOINTS AND FITTINGS ARE TO BE SEALED (WHERE USED IN FOUL WATER APPLICATIONS OR WHERE IMPERMEABILITY IS REQUIRED, FOR EXAMPLE) CONTACT A SEALANT SPECIALIST FOR GUIDANCE ON THE MOST APPROPRIATE SEALING COMPOUND TO USE.

5.0 SURFACE PROTECTION: IN ASPHALT PAVEMENTS AVOID CONTACT BETWEEN COMPACTION EQUIPMENT AND CHANNEL/GRATING. THIS MAY BE ACHIEVED BY ENSURING THAT THE FINISHED SURFACE LEVEL LIES ABOVE THE GRATING LEVEL (BY AT LEAST 3MM). STONES SHOULD BE REMOVED FROM GRATING PRIOR TO LAYING/ROLLING WEARING COURSE.

6.0 GENERAL INSTALLATION NOTES: SEE DRAWING FOR GENERAL NOTES ON INSTALLATION.

7.0 MINIMUM DIMENSIONS OF CONCRETE SURROUND

LOAD CLASS	A15	B125	C250	D400*
MINIMUM DIMENSIONS (mm)				
X	100	150	150	200
Y	Full Channel Height (Less Y2 where necessary)			
Z	100	150	150	200
MAXIMUM DIMENSIONS (mm)				
Y2*	35	35	35	35
Y3	100	60	60	60

* E.G. PARKING AREAS FOR ALL TYPES OF ROAD VEHICLE NOT SUITABLE FOR CARRIAGEWAY OF ROADS OR INDUSTRIAL AREAS.
+ NOTE DASHED LINE PRINTED ON EDGE RAILS 35mm BELOW TOP.

8.0 GRATING SECURITY LOCKS
ALL THE GRATINGS ARE HELD IN THE CHANNEL UNITS BY THE DRAINLOCK™ FIXING. IN ADDITION, GRATINGS TYPE 2340S, 23161 & 23221 (CAST IRON) AND 12680/12682 (COMPOSITE) CAN BE LOCKED IN PLACE WITH AN OPTIONAL SECURITY LOCKING KIT. SEE INSTALLATION NOTES.

INSTALLATION DETAILS FOR ACO MULTIDRAIN M100D DRAINAGE CHANNEL

FFL: VARIES

STOPPER TO UPVC PIPE

SSL: VARIES

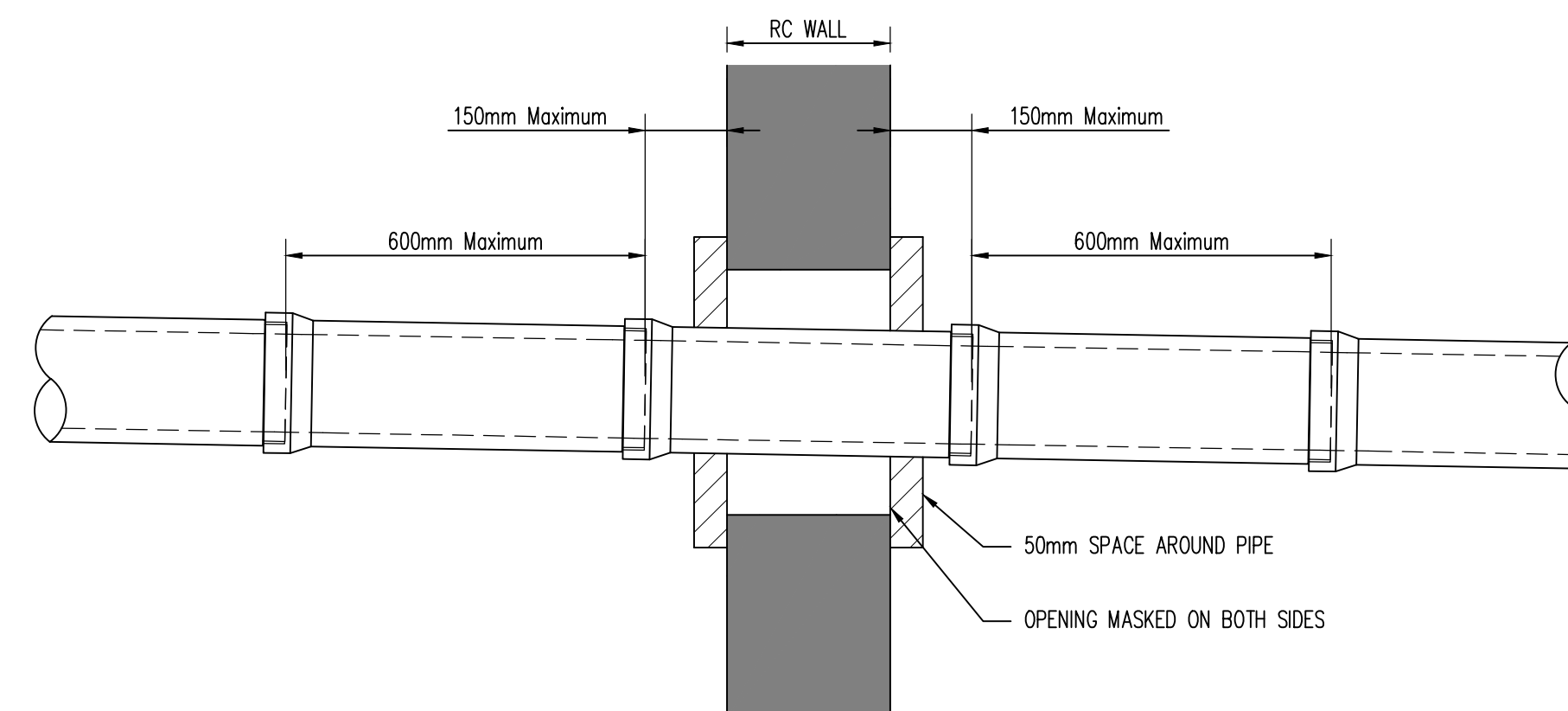
110/160mm UPVC PIPE CUT TO SUIT

ADAPTOR VC TO UPVC PIPE

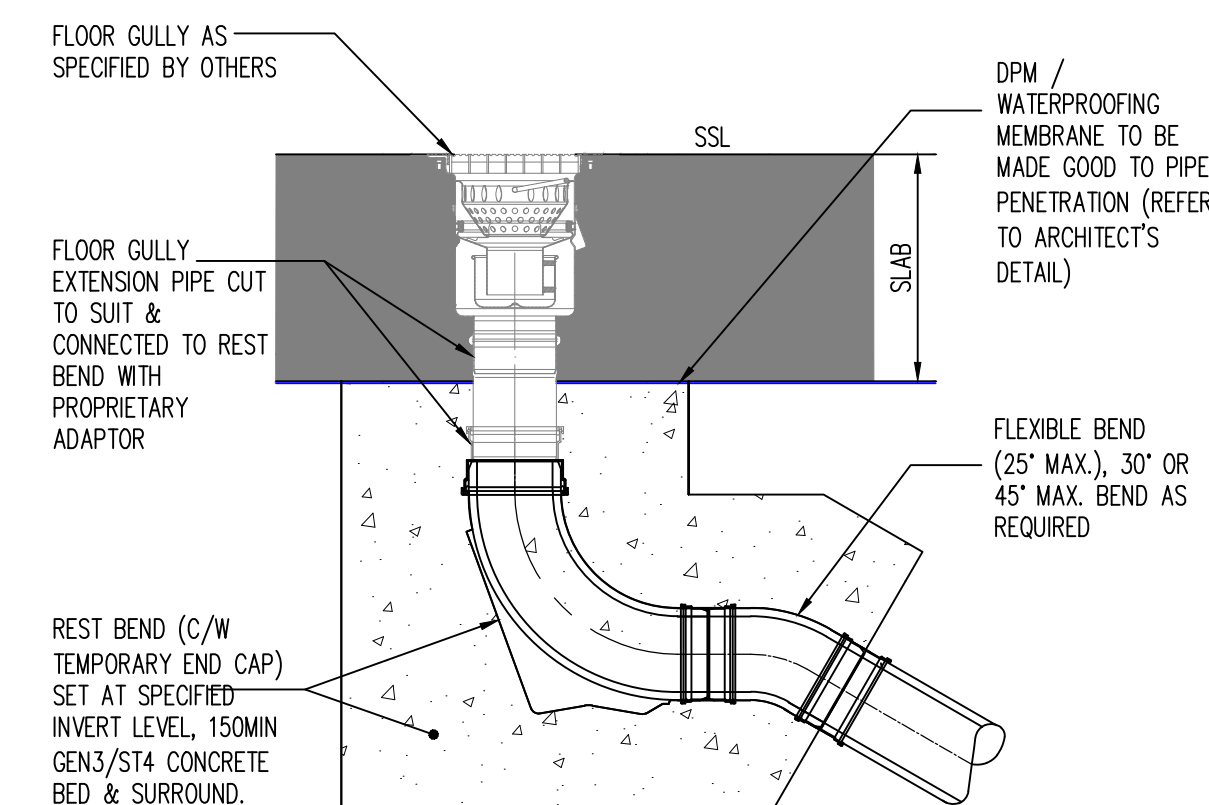
100/150mm VC 90° REST BEND CAST INTO GEN3/ST4 CONCRETE STOOL AS INDICATED

TYPICAL BELOW GROUND WASTE PIPE CONNECTION DETAIL

(INVERT LEVEL FOR 100mm AND 150mm ALL TO BE SET AT MAXIMUM OF 1m BELOW SSL & UPVC PIPE LENGTH TO BE ADJUSTED AS REQUIRED)



PIPE PASSING THROUGH OPENING IN WALL



TRAPPED FLOOR GULLY DETAIL 1 (WASHDOWN)

(BASED BLUCHER TRAPPED FLOOR DRAIN GULLY TYPE 1.3 L/S FLOW 100mm OUTLET)

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NOTES

1. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.
3. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO THE COMMENCEMENT OF WORK.

PG	JAS
REV	DATE
DETAILS	DRN
CHK	

DRAWING STATUS
PRELIMINARY

RIBA STAGE
STAGE 4

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DRAWN PG	DATE MAR 25	SCALES NTS
CHECKED JAS	DATE MAR 25	THE ABOVE SCALES APPLY WHEN PLOTTED AT A1 SIZE -DO NOT SCALE-
APPRVD. JAS	DATE MAR 25	EMAIL FOR DRAWINGS info@roccoconsulting.com

CLIENT
VITA MEADOW LTD

PROJECT TITLE
**PLOT 9B
FIRST STREET**

DRAWING TITLE
**TYPICAL DRAINAGE DETAILS
SHEET 3**

DRAWING No. Z19B-ROC-G580-DE-XX-DR04	REV. P01
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	EXISTING COMBINED WATER SEWER
	EXISTING COMBINED WATER SEWER ABANDONED
	PROPOSED FOUL WATER DRAINAGE
	PROPOSED SURFACE WATER DRAINAGE
	PROPOSED COMBINED WATER DRAINAGE (BY OTHERS)
	PROPOSED DRAINAGE CHANNEL (SPEC BY OTHERS)
	PROPOSED THRESHOLD DRAIN (SPEC BY OTHERS)
	GEOCELLULAR ATTENUATION
WPC	WASTE POINT CONNECTION (FOUL)
RWP	RAINWATER PIPE
ITG	INTERNAL TRAPPED GULLY (WADE MULTI LEVEL P TRAPPED STAINLESS STEEL GULLY WITH DUCTILE IRON SQUARE GRATING)
	OVERLAND FLOOD FLOW ARROWS
	SITE BOUNDARY

NOTES

1. ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.
3. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO THE COMMENCEMENT OF WORK.
4. BEFORE STARTING ANY WORKS, CONTRACTOR TO CHECK INVERT LEVELS AND POSITIONS OF EXISTING DRAINS, SEWERS, INSPECTIONS CHAMBERS AND MANHOLES AGAINST INFORMATION SHOWN ON THE DRAWING.
5. ROCKER PIPES ARE TO BE PROVIDED AT ALL CONCRETE CASED INTERFACES.
6. CLASS 2 CONCRETE SURROUND TO BE PROVIDED FOR PIPES WITH COVER LESS THAN 1.2m ABOVE THE CROWN OF THE PIPE FOR ROADS AND 0.6m FOR SOFT AND PEDESTRIAN AREAS ONLY AND UNDER ALL FOUNDATIONS AND WHERE PIPES LAID WITHIN 1M OF FOUNDATIONS.
7. CONNECTIONS TO EXISTING PUBLIC SEWERS IN ACCORDANCE WITH UNITED KINGDOM REQUIREMENTS, TO BE APPROVED / AGREED WITH THE WATER AUTHORITY.
8. PROPOSED COVER LEVELS ARE APPROXIMATE AND SHALL BE CHECKED BY THE CONTRACTOR ON SITE TO SUIT THE EXACT FINISHED LEVEL AND GRADIENT.
9. ALL DRAINAGE WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY AND IN CONJUNCTION WITH ALL RELEVANT REGULATIONS, CODES OF PRACTICE AND SEWERS FOR ADOPTION 7th EDITION.
10. ACCESS COVERS AND FRAMES SHALL COMPLY WITH THE LOADINGS SPECIFIED AND TO BS EN 124 AND KITEMARKED OR IF RECESSED COVERS ARE USED, THEY SHALL BE IN ACCORDANCE WITH FACT ASSURANCE EQUIVALENT. ALLOW FOR RECESSED MANHOLE COVERS TO ACCEPT LANDSCAPE ARCHITECT FINISHES TO ALL NON ASPHALT EXTERNAL AREAS.
11. THE PROPOSED BUILDING LAYOUTS SHOWN ON THIS DRAWING ARE FOR INFORMATION ONLY. REFER TO ARCHITECTS PLANS FOR PRECISE LOCATING SETTING OUT INFORMATION AND DETAILS.
12. FOR SETTING OUT DIMENSIONS OF SEW, SYP'S, RWPS, FLOOR GULLYS & OTHER DRAINAGE POP UP LOCATIONS, REFER TO ARCHITECTS OR MECHANICAL & ELECTRICAL ENGINEERS DRAWINGS.
13. ALL DRAINAGE PIPEWORK SHALL SHOW SHALL BE 100mm DRAINAGE FOR FOUR AND 150mm DRAINAGE FOR SURFACE WATER UNLESS OTHERWISE STATED.
14. ALL UNDERSLAP DRAINAGE SHALL BE LAID AT GRADIENTS OF 1:80 FURN FOR PIPEWORK AND 1:100 FURN FOR GULLY SURFACE WATER UNLESS NOTED OTHERWISE. ALL UNDERSLAP DRAINAGE SHALL BE CLEAR OF FOUNDATIONS UNLESS SHOWN OTHERWISE. USE OF SHORT LONG RADIIUS BENDS IS ACCEPTABLE PROVIDED THEY ARE KEPT TO A MINIMUM AND USED WHERE UNAVOIDABLE.
15. AT LEAST ONE SOIL PIPE AT THE HEAD OF EACH FLOOR RUN SHALL BE VENTED TO THE ATMOSPHERE. ALL RAINWATER PIPES SHALL ABOVE GROUND RUNNING ACCESS.
16. ALL PRIVATE DRAINAGE PIPEWORK FOR FLOOR AND SURFACE WATER SHALL BE DESIGNED ON THE BASIS OF UP TO BS EN 1401-1, UNLESS NOTED OTHERWISE. SURFACE WATER CAN ALSO BE CONNECTED WITH POLYPIPE TYPWALL PIPES.
17. CONCRETE ENCASEMENT OF THE PIPEWORK SHALL BE REQUIRED WHERE THE VERTICAL CLEARANCE BETWEEN TWO PIPES CROSSING IS LESS THAN 300MM.
18. WHERE NEW DRAINAGE IS SITUATED WITHIN 3 METRES OF NEW OR EXISTING TREES THE PIPEWORK SHALL BE ENCASED IN CONCRETE TO REDUCE THE RISK OF ROOT INGRESS.
19. ALL NEW DRAINAGE INSTALLATIONS TOGETHER WITH ANY EXISTING DRAINAGE TO BE RETAINED SHALL BE SETTED AND COTED SURVEYED UPON COMPLETION, CONTRACTOR TO ENSURE THAT THE DRAINAGE SYSTEM IS FULLY OPERATIONAL, FREE OF EXCESS DEBRIS/SILT AND ALL IDENTIFIED FAULTS RECTIFIED.
20. ATTENTION TO SURFACE CALCULATIONS INCLUDE CLIMATE CHANGE ALLOWANCE OF 45% IN ACCORDANCE WITH CURRENT ENVIRONMENT AGENCY GUIDELINES.

P01	06.03.25	FIRST ISSUE	PG	JAS
REV.	DATE	DETAILS	DRN.	CHK.

DRAWING STATUS
PRELIMINARY

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DRAWN PG	DATE MAR 25	SCALES 1:125
CHECKED JAS	DATE MAR 25	THE ABOVE SCALES APPLY WHEN PLOTTED AT A1 SIZE --DO NOT SCALE--
APPRVD. JAS	DATE MAR 25	EMAIL FOR DRAWINGS info@roccoconsulting.com

CLIENT
VITA MEADOW LTD

PROJECT TITLE
PLOT 9B
FIRST STREET

DRAWING TITLE

IMPERMEABLE AREAS AND
OVERLAND FLOOD FLOWS GA

DRAWING No. Z19B-ROC-G580-PL-XX-DR05	REV. P01
4470  RoCp Ltd.	



**COMPLEX CHALLENGES ...
MADE SIMPLE**

APPENDIX B – HYDRAULIC CALCULATIONS



Calculated by: Paul Graveney

Site name: Plot 9B First Street

Site location: Manchester

Site Details

Latitude: 53.47153° N

Longitude: 2.24652° W

Reference: 3346246404

Date: Nov 01 2024 14:38

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

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 0.26

Methodology

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

SPR estimation method: Calculate from SOIL type

Notes

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

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

Soil characteristics

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

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

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

Hydrological characteristics

	Default	Edited
SAAR (mm):	879	879
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

(3) Is SPR/SPRHOST ≤ 0.3?

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

Q_{BAR} (l/s):	1.64	1.64
1 in 1 year (l/s):	1.43	1.43
1 in 30 years (l/s):	2.79	2.79
1 in 100 year (l/s):	3.41	3.41
1 in 200 years (l/s):	3.88	3.88

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement , which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	10	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)	20.000	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)	4.00	Enforce best practice design rules	✓

Adoptable Manhole Type

Max Width (mm)	Diameter (mm)	Max Width (mm)	Diameter (mm)
374	1200	749	1500
499	1350	900	1800

>900 Link+900 mm

Max Depth (m)	Diameter (mm)	Max Depth (m)	Diameter (mm)
1.500	1050	99.999	1200

Circular Link Type

Shape	Circular	Auto Increment (mm)	75
Barrels	1	Follow Ground	x

Available Diameters (mm)

100 | 150

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Depth (m)
S1.00	0.003	4.00	32.500	450	0.850
S2.00	0.052	4.00	33.300	450	1.600
S1.01	0.016	4.00	32.150	600	1.025
TANK	0.050	4.00	32.025	100	1.825
S1.02			32.000	1200	1.850
S4.00	0.054	4.00	33.500	450	0.900
S4.01	0.001	4.00	33.350	450	1.100
S1.03			32.000	1200	1.900
EX			31.950	1200	1.900

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)
1.000	S1.00	S1.01	11.000	0.600	31.650	31.200	0.450	24.4	150	4.09	50.0
2.000	S2.00	S1.01	7.600	0.600	31.700	31.200	0.500	15.2	150	4.05	50.0
1.001	S1.01	S1.02	37.000	0.600	31.125	30.150	0.975	37.9	225	4.38	50.0
3.000	TANK	S1.02	4.000	0.600	30.200	30.150	0.050	80.0	225	4.05	50.0
1.002	S1.02	S1.03	6.000	0.600	30.150	30.100	0.050	120.0	225	4.46	50.0
4.000	S4.00	S4.01	15.500	0.600	32.600	32.250	0.350	44.3	150	4.17	50.0
4.001	S4.01	S1.03	34.000	0.600	32.250	30.850	1.400	24.3	150	4.45	50.0
1.003	S1.03	EX	2.000	0.600	30.100	30.050	0.050	40.0	225	4.48	50.0

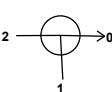
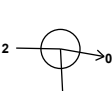
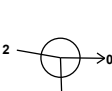
Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	2.045	36.1	0.4	0.700	0.800	0.003	0.0	11	0.680
2.000	2.597	45.9	7.0	1.450	0.800	0.052	0.0	40	1.885
1.001	2.130	84.7	9.6	0.800	1.625	0.071	0.0	51	1.418
3.000	1.463	58.2	6.8	1.600	1.625	0.050	0.0	51	0.982
1.002	1.192	47.4	16.4	1.625	1.675	0.121	0.0	91	1.084
4.000	1.516	26.8	7.3	0.750	0.950	0.054	0.0	54	1.296
4.001	2.052	36.3	7.5	0.950	1.000	0.055	0.0	46	1.618
1.003	2.074	82.5	23.9	1.675	1.675	0.176	0.0	83	1.806

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	11.000	24.4	150	Circular	32.500	31.650	0.700	32.150	31.200	0.800
2.000	7.600	15.2	150	Circular	33.300	31.700	1.450	32.150	31.200	0.800
1.001	37.000	37.9	225	Circular	32.150	31.125	0.800	32.000	30.150	1.625
3.000	4.000	80.0	225	Circular	32.025	30.200	1.600	32.000	30.150	1.625
1.002	6.000	120.0	225	Circular	32.000	30.150	1.625	32.000	30.100	1.675
4.000	15.500	44.3	150	Circular	33.500	32.600	0.750	33.350	32.250	0.950
4.001	34.000	24.3	150	Circular	33.350	32.250	0.950	32.000	30.850	1.000
1.003	2.000	40.0	225	Circular	32.000	30.100	1.675	31.950	30.050	1.675

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	S1.00	450	Manhole	Adoptable	S1.01	600	Manhole	Adoptable
2.000	S2.00	450	Manhole	Adoptable	S1.01	600	Manhole	Adoptable
1.001	S1.01	600	Manhole	Adoptable	S1.02	1200	Manhole	Adoptable
3.000	TANK	100	Manhole	Adoptable	S1.02	1200	Manhole	Adoptable
1.002	S1.02	1200	Manhole	Adoptable	S1.03	1200	Manhole	Adoptable
4.000	S4.00	450	Manhole	Adoptable	S4.01	450	Manhole	Adoptable
4.001	S4.01	450	Manhole	Adoptable	S1.03	1200	Manhole	Adoptable
1.003	S1.03	1200	Manhole	Adoptable	EX	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
S1.00	-42.274	93.517	32.500	0.850	450		0	1.000	31.650	150
S2.00	1.942	71.409	33.300	1.600	450		0	2.000	31.700	150
S1.01	0.754	93.754	32.150	1.025	600		1 2 0	2.000 1.000 1.001	31.200 31.200 31.125	150 150 225
TANK	89.186	68.318	32.025	1.825	100		0	3.000	30.200	225
S1.02	87.997	92.090	32.000	1.850	1200		1 2 0	3.000 1.001 1.002	30.150 30.150 30.150	225 225 225
S4.00	63.907	23.035	33.500	0.900	450		0	4.000	32.600	150
S4.01	116.048	23.151	33.350	1.100	450		1 0	4.000 4.001	32.250 32.250	150 150
S1.03	113.909	87.574	32.000	1.900	1200		1 2 0	4.001 1.002 1.003	30.850 30.100 30.100	150 225 225
EX	132.689	87.336	31.950	1.900	1200		1	1.003	30.050	225

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
Rainfall Events	Singular	Skip Steady State	x
FSR Region	England and Wales	Drain Down Time (mins)	240
M5-60 (mm)	20.000	Additional Storage (m³/ha)	20.0
Ratio-R	0.400	Starting Level (m)	
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

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

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

Node S1.03 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	30.100	Product Number	CTL-SHE-0085-3400-1200-3400
Design Depth (m)	1.200	Min Outlet Diameter (m)	0.100
Design Flow (l/s)	3.4	Min Node Diameter (mm)	1200

Node TANK Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	30.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	228

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	66.0	0.0	1.200	66.0	0.0	1.201	0.0	0.0

Approval Settings

Node Size	✓	Minimum Full Bore Velocity (m/s)	1.000
Node Losses	✓	Maximum Full Bore Velocity (m/s)	3.000
Link Size	✓	Proportional Velocity	✓
Minimum Diameter (mm)	150	Return Period (years)	10
Link Length	✓	Minimum Proportional Velocity (m/s)	0.750
Maximum Length (m)	100.000	Maximum Proportional Velocity (m/s)	3.000
Coordinates	✓	Surcharged Depth	✓
Accuracy (m)	1.000	Return Period (years)	10
Crossings	✓	Maximum Surcharged Depth (m)	0.100
Cover Depth	✓	Flooding	✓
Minimum Cover Depth (m)	1.200	Return Period (years)	30
Maximum Cover Depth (m)	3.000	Time to Half Empty	x
Backdrops	✓	Discharge Rates	✓
Minimum Backdrop Height (m)	0.200	Discharge Volume	✓
Maximum Backdrop Height (m)	1.500	100 year 360 minute (m³)	-28
Full Bore Velocity	✓		

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 15 minute summer	109.521	30.991	1 year 240 minute summer	18.475	4.882
1 year 15 minute winter	76.857	30.991	1 year 240 minute winter	12.274	4.882
1 year 30 minute summer	71.439	20.215	1 year 360 minute summer	14.169	3.646
1 year 30 minute winter	50.133	20.215	1 year 360 minute winter	9.210	3.646
1 year 60 minute summer	48.435	12.800	1 year 480 minute summer	11.185	2.956
1 year 60 minute winter	32.179	12.800	1 year 480 minute winter	7.431	2.956
1 year 120 minute summer	30.053	7.942	1 year 600 minute summer	9.182	2.511
1 year 120 minute winter	19.966	7.942	1 year 600 minute winter	6.274	2.511
1 year 180 minute summer	23.233	5.979	1 year 720 minute summer	8.203	2.199
1 year 180 minute winter	15.102	5.979	1 year 720 minute winter	5.513	2.199

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year 960 minute summer	6.768	1.782	30 year 1440 minute summer	10.161	2.723
1 year 960 minute winter	4.483	1.782	30 year 1440 minute winter	6.829	2.723
1 year 1440 minute summer	4.949	1.326	100 year +45% CC 15 minute summer	505.670	143.087
1 year 1440 minute winter	3.326	1.326	100 year +45% CC 15 minute winter	354.856	143.087
30 year 15 minute summer	268.706	76.035	100 year +45% CC 30 minute summer	332.000	93.944
30 year 15 minute winter	188.566	76.035	100 year +45% CC 30 minute winter	232.982	93.944
30 year 30 minute summer	174.929	49.499	100 year +45% CC 60 minute summer	222.268	58.739
30 year 30 minute winter	122.757	49.499	100 year +45% CC 60 minute winter	147.669	58.739
30 year 60 minute summer	116.589	30.811	100 year +45% CC 120 minute summer	134.215	35.469
30 year 60 minute winter	77.459	30.811	100 year +45% CC 120 minute winter	89.169	35.469
30 year 120 minute summer	70.438	18.615	100 year +45% CC 180 minute summer	101.219	26.047
30 year 120 minute winter	46.797	18.615	100 year +45% CC 180 minute winter	65.795	26.047
30 year 180 minute summer	53.298	13.715	100 year +45% CC 240 minute summer	78.690	20.795
30 year 180 minute winter	34.645	13.715	100 year +45% CC 240 minute winter	52.280	20.795
30 year 240 minute summer	41.604	10.995	100 year +45% CC 360 minute summer	58.701	15.106
30 year 240 minute winter	27.641	10.995	100 year +45% CC 360 minute winter	38.157	15.106
30 year 360 minute summer	31.221	8.034	100 year +45% CC 480 minute summer	45.550	12.038
30 year 360 minute winter	20.295	8.034	100 year +45% CC 480 minute winter	30.262	12.038
30 year 480 minute summer	24.324	6.428	100 year +45% CC 600 minute summer	36.875	10.086
30 year 480 minute winter	16.160	6.428	100 year +45% CC 600 minute winter	25.195	10.086
30 year 600 minute summer	19.756	5.404	100 year +45% CC 720 minute summer	32.556	8.725
30 year 600 minute winter	13.498	5.404	100 year +45% CC 720 minute winter	21.879	8.725
30 year 720 minute summer	17.490	4.687	100 year +45% CC 960 minute summer	26.340	6.936
30 year 720 minute winter	11.754	4.687	100 year +45% CC 960 minute winter	17.448	6.936
30 year 960 minute summer	14.215	3.743	100 year +45% CC 1440 minute summer	18.700	5.012
30 year 960 minute winter	9.416	3.743	100 year +45% CC 1440 minute winter	12.567	5.012

Results for 1 year Critical Storm Duration. Lowest mass balance: 99.43%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1.00	11	31.661	0.011	0.4	0.0026	0.0000	OK
15 minute winter	S2.00	10	31.744	0.044	7.8	0.0359	0.0000	OK
15 minute winter	S1.01	10	31.179	0.054	10.6	0.0319	0.0000	OK
60 minute winter	TANK	48	30.340	0.140	9.2	8.8252	0.0000	OK
60 minute winter	S1.02	48	30.339	0.189	6.1	0.2143	0.0000	OK
15 minute summer	S4.00	10	32.660	0.060	8.1	0.0818	0.0000	OK
15 minute winter	S4.01	10	32.299	0.049	8.2	0.0087	0.0000	OK
60 minute winter	S1.03	48	30.339	0.239	4.1	0.2706	0.0000	SURCHARGED
15 minute summer	EX	1	30.050	0.000	3.3	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S1.00	1.000	S1.01	0.4	0.672	0.011	0.0065	
15 minute winter	S2.00	2.000	S1.01	7.8	1.865	0.170	0.0318	
15 minute winter	S1.01	1.001	S1.02	10.6	0.882	0.125	0.7220	
60 minute winter	TANK	3.000	S1.02	-5.5	0.473	-0.094	0.1231	
60 minute winter	S1.02	1.002	S1.03	3.6	0.298	0.076	0.2264	
15 minute summer	S4.00	4.000	S4.01	8.1	1.401	0.303	0.0901	
15 minute winter	S4.01	4.001	S1.03	8.2	1.643	0.225	0.1691	
60 minute winter	S1.03	Hydro-Brake®	EX	3.3				18.7

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.43%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1.00	10	31.668	0.018	1.1	0.0042	0.0000	OK
15 minute winter	S2.00	10	31.774	0.074	19.0	0.0602	0.0000	OK
15 minute winter	S1.01	10	31.210	0.085	26.0	0.0506	0.0000	OK
60 minute winter	TANK	60	30.701	0.501	26.1	31.6622	0.0000	SURCHARGED
60 minute winter	S1.02	60	30.700	0.550	18.5	0.6225	0.0000	SURCHARGED
15 minute summer	S4.00	10	32.705	0.105	19.8	0.1433	0.0000	OK
15 minute winter	S4.01	10	32.332	0.082	20.2	0.0146	0.0000	OK
60 minute winter	S1.03	60	30.700	0.600	9.7	0.6788	0.0000	SURCHARGED
15 minute summer	EX	1	30.050	0.000	3.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S1.00	1.000	S1.01	1.1	0.911	0.030	0.0133	
15 minute winter	S2.00	2.000	S1.01	19.0	2.323	0.414	0.0622	
15 minute winter	S1.01	1.001	S1.02	26.0	1.017	0.307	0.9899	
60 minute winter	TANK	3.000	S1.02	-17.2	0.480	-0.296	0.1591	
60 minute winter	S1.02	1.002	S1.03	-5.9	0.308	-0.124	0.2386	
15 minute summer	S4.00	4.000	S4.01	19.8	1.709	0.739	0.1794	
15 minute winter	S4.01	4.001	S1.03	20.2	2.074	0.557	0.3309	
60 minute winter	S1.03	Hydro-Brake®	EX	3.4				45.2

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.43%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	S1.00	10	31.675	0.025	2.1	0.0057	0.0000	OK
15 minute winter	S2.00	10	31.818	0.118	35.8	0.0958	0.0000	OK
180 minute winter	S1.01	172	31.385	0.260	11.0	0.1548	0.0000	SURCHARGED
120 minute winter	TANK	118	31.386	1.186	31.5	74.9978	0.0000	SURCHARGED
180 minute winter	S1.02	172	31.386	1.236	16.1	1.3975	0.0000	SURCHARGED
15 minute winter	S4.00	10	33.141	0.541	37.2	0.7355	0.0000	SURCHARGED
15 minute winter	S4.01	10	32.376	0.126	35.8	0.0223	0.0000	OK
180 minute winter	S1.03	172	31.387	1.287	8.5	1.4552	0.0000	SURCHARGED
15 minute summer	EX	1	30.050	0.000	3.4	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	S1.00	1.000	S1.01	2.1	0.934	0.058	0.0425	
15 minute winter	S2.00	2.000	S1.01	35.8	2.610	0.780	0.1039	
180 minute winter	S1.01	1.001	S1.02	11.0	0.633	0.129	1.4715	
120 minute winter	TANK	3.000	S1.02	-21.1	-0.531	-0.363	0.1591	
180 minute winter	S1.02	1.002	S1.03	-5.2	0.210	-0.109	0.2386	
15 minute winter	S4.00	4.000	S4.01	35.1	2.009	1.309	0.2588	
15 minute winter	S4.01	4.001	S1.03	35.9	2.270	0.989	0.5627	
180 minute winter	S1.03	Hydro-Brake®	EX	3.5				77.5



COMPLEX CHALLENGES ...
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APPENDIX C – UU PRE-DEVELOPMENT RESPONSE



Paul Graveney

From: wastewaterdeveloperservices@uuplc.co.uk
Sent: 30 April 2024 09:41
To: Paul Graveney
Cc: Jon Smith
Subject: RE: 05628848 Pre Development Enquiry - Plot 9B, First Street, Manchester

Categories: Filed by Newforma

CAUTION: This email originated from outside the Organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Good morning Paul,

For and on behalf of Anthony Laithwaite

Pre Development Enquiry for: Plot 9b, First Street, Manchester UU Reference Number : 05628848

We have carried out an assessment of your application which is based on the information provided. This pre-development advice on your drainage strategy will be valid for 12 months. Your drainage strategy will need to be reviewed by other competent authorities as part of the planning process, and we advise that you carry out the necessary site investigations to confirm the viability of your proposals.

If your investigations require access to our public sewer network, we ask that you contact our network engineers with a request for an access certificate via our main contact telephone number 0345 6723 723 or refer to the link below:

<https://www.unitedutilities.com/builders-developers/working-near-our-assets/>

Foul Water

Foul flow from this site will be allowed to drain into the public foul water/combined sewer at any convenient connection point at an unrestricted rate. There appears to be multiple combined sewers in and around the site. If you are able to identify an alternative, more suitable point of discharge, we request that you contact us at your earliest convenience so that we can assess suitability.

In accordance with our infrastructure plans we may ask you to change your point of connection. Therefore please contact us when you are ready to formalise your drainage proposals, we would suggest before you submit for Full Planning.

Surface Water

All surface water flow from the proposed development should drain in-line with the drainage hierarchy, as outlined in Paragraph 80, (Reference ID: 7-080-20150323), of the National Planning Practice Guidance. We also recommend you prioritise the use of multi-functional sustainable drainage systems for the management of surface water in accordance with national planning policy.

Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable.

This is outlined as follows, in order of priority:

1. into the ground (infiltration);
2. to a surface waterbody;
3. to a surface water sewer or highway drain;
4. to a combined sewer.

For guidance, The [North West SuDS Pro-Forma](#) provides information on the appropriate evidence required at each stage of the hierarchy, to demonstrate how each level has been discounted.

The Lead Local Flood Authority has responsibility for all surface water drainage concerns and their input to your proposal is critical. You should also consider whether it is necessary to discuss your proposal with the Environment Agency, or Internal Drainage Board (if operating in your area).

The Local Planning Authority are the determining authority for any application for planning permission and the appropriate authority for determining cost viability of a proposed drainage scheme, such assessments are outside of the jurisdiction of United Utilities.

Infiltration

Surface water runoff generated from this development should discharge to the ground via infiltration system where feasible.

A detailed evidence based feasibility assessment must be carried out in line with Chapter 25 of the CIRIA SuDS Manual 2015 to determine whether infiltration is a suitable method of surface water disposal.

Particular attention must be paid to Ground Water Source Protection Zones to ensure that the risk of pollution to these valuable resources is not compromised. Details can be obtained from the government website:

<https://www.gov.uk/guidance/groundwater-source-protection-zones-spzs#find-groundwater-spzs>

If your site is in a Groundwater Source Protection Zone, you should have regard to the Environment Agency's approach to Groundwater Protection. Information on this is available via the link below:

<https://www.gov.uk/government/publications/groundwater-protection-position-statements>

Please note that such a location could have implications for the principle of your development and the need for additional mitigating measures to protect the groundwater environment and public water supply in the detailed design of your site.

Highway Drainage

If an evidence based assessment has been carried out and confirms that infiltration is not feasible, we recommend that you investigate the possibility of draining surface water to the highway drain where this ultimately discharges to a watercourse, by contacting the relevant Highway Authority.

Public Sewer

In accordance with the hierarchy of drainage options within the National Planning Practice Guidance, both discharge to ground via infiltration and discharge to a waterbody should be discounted prior to consideration of discharging surface water to the public sewer system. Evidence should be provided to demonstrate how these have been discounted, as outlined in the North West SuDS pro-forma.

Once evidence is provided as outlined above, United Utilities will consider a connection to drain into the public foul water/combined sewer at any convenient connection point at a pass forward flow to be agreed by the Lead Local Flood Authority. United Utilities request that any agreed rate does not exceed 5l/s. There appears to be multiple combined sewers in and around the site.

As a Water Company, we have no obligation to accept highway drainage into our public sewer network. However, should your proposals include runoff from highways, we would request that consideration is given to SuDS components that deliver source control are incorporated within the design of the scheme to reduce the volume and frequency of discharges of these flows to the public sewer.

Levels

For low-lying sites, (where the ground level of the site or the level of a basement is below the ground level at the point where the drainage connects to the public sewer), care should be taken to ensure that the property is not at increased risk of flooding. If these circumstances exist, we recommend that you contact us to discuss further. It could affect the detailed design of your site and result in the need to incorporate appropriate mitigating measures in your drainage scheme.

Land drainage / Overland flows / track drainage

United Utilities have no obligation, and furthermore we do not accept land drainage, overland flows or track drainage into the public sewerage network under any circumstances

Existing Wastewater Assets Crossing the Site

According to our public sewer records there are public sewers located within your site boundary. We will require unrestricted access to the sewer for maintenance purposes, we would ask that you maintain a minimum clearance of 8m which is measured 4m from the centre line of the pipe unless there happens to be a formal easement agreement in place, in which case the specified easement width would apply. If you cannot achieve this then you may wish to consider diverting and or abandoning the public sewer. **Please be aware, this would be classed as a critical asset, and would be a UU led Diversion.**

Please be aware that any proposed diversion may require modelling. This process may take up to 6 months in order to reach an acceptable design.

Please refer to the link below to obtain full details of the processes involved with sewer diversions:

<https://www.unitedutilities.com/builders-developers/larger-developments/wastewater/sewer-diversions/>

Existing Water Assets Crossing the Site

It is the developer responsibility to identify utilities on-site. Where clean water assets are shown on our records, we recommend that you contact our Water Pre-Development Team, via the following email address:

DeveloperServicesWater@uuplc.co.uk. Further information for this service can be found on our website via the link below:

<https://www.unitedutilities.com/builders-developers/larger-developments/pre-development/water-pre-dev/>

Connection Application

Although we may discuss and agree discharge points and rates in principle, please be aware that you will have to apply for a formal sewer connection. This is so that we can assess the method of construction, Health & Safety requirements and to ultimately inspect the connection when it is made. Details of the application process and the form itself can be obtained from our website by following the link below:

<https://www.unitedutilities.com/builders-developers/wastewater-services/sewer-connections/sewer-connection/>

We recommend that the detailed design should confirm the locations of all utilities in the area and ensure that any proposed drainage solution considers routing and clash checks where required.

If we can be of any further assistance please don't hesitate to contact us further.

Many thanks and kind regards,



Jordan Houghton
Developer Engineer
Developer Services & Metering
Customer Services
T: 07500671544
[unitedutilities.com](https://www.unitedutilities.com)

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----- Original Message -----

From: wastewaterdeveloperservices@uuplc.co.uk [wastewaterdeveloperservices@uuplc.co.uk]

Sent: 23/04/2024 11:59

To: paul.graveney@roconconsulting.com

Cc: jon.smith@roconconsulting.com

Subject: 05628848 Pre Development Enquiry - Plot 9B, First Street, Manchester

Good Morning,

Please accept this email as receipt of your application received on 22/04/2024 for the above development. This has now been logged on our system and the job reference is 05628848 we would ask that you quote this reference in all future correspondence.

I have reviewed your application (and attachments) and can confirm this is suitable to be passed to Anthony Laithwaite for technical assessment. You will receive their response within 10 working days.

Kind regards



Lois Williams

Developer Services Assistant

Developer Services & Metering

Customer Services

unitedutilities.com

Tel: 0345 072 6067 Option 2 for Wastewater Services)

Direct Tel:

If you feel you have received a good service from myself, please can you take two minutes to fill in the survey below. This will be much appreciated



Visit: <https://unitedutilities.thewowawards.co.uk/nominate>

----- Original Message -----

From: Paul Graveney [paul.graveney@rocconsulting.com]

Sent: 22/04/2024 12:07

To: wastewaterdeveloperservices@uuplc.co.uk

Cc: jon.smith@rocconsulting.com

Subject: Pre Development Enquiry - Plot 9B, First Street, Manchester

Good Afternoon,

Please find attached our pre development enquiry for a high rise student accommodation development known as Plot 9B, First Street, Manchester.

Regards

Paul

Paul Graveney

BEng (Hons) CEng MICE

Civil Engineer

T: 0161 214 5390

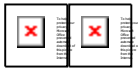
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[Image is no longer available]

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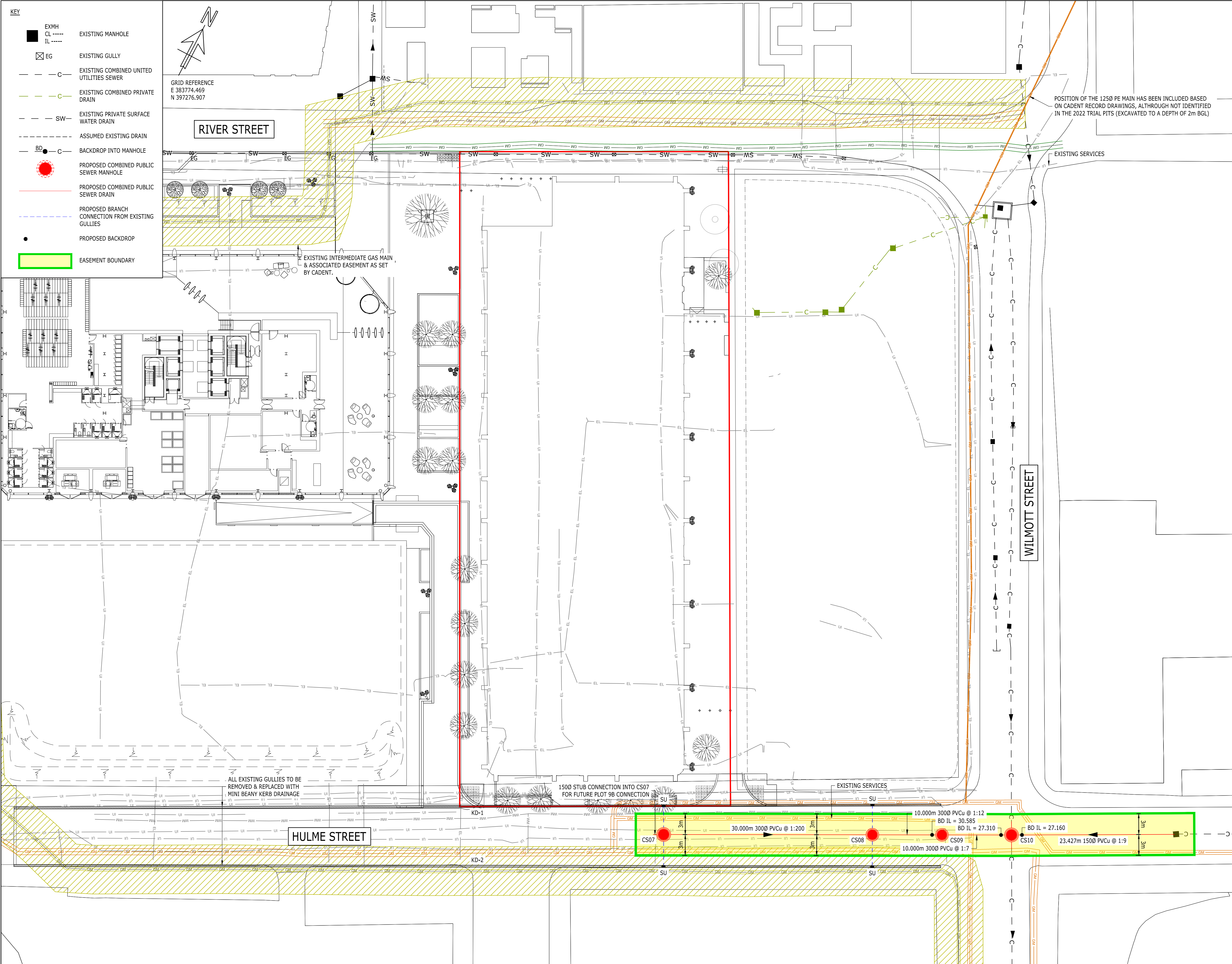
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APPENDIX D – S185 SEWER ABANDONMENT PLAN AND APPROVAL





KEY

- EXMH CL IL EXISTING MANHOLE
- EG EXISTING GULLY
- C EXISTING COMBINED UNITED UTILITIES SEWER
- C EXISTING COMBINED PRIVATE DRAIN
- SW EXISTING PRIVATE SURFACE WATER DRAIN
- - - ASSUMED EXISTING DRAIN
- BD C BACKDROP INTO MANHOLE
- PROPOSED COMBINED PUBLIC SEWER MANHOLE
- PROPOSED COMBINED PUBLIC SEWER DRAIN
- PROPOSED BRANCH CONNECTION FROM EXISTING GULLIES
- PROPOSED BACKDROP
- EASEMENT BOUNDARY

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Notes

- ALL DIMENSIONS ARE MILLIMETRES U.N.O.
- ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM U.N.O.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
- ANY DISCREPANCIES IN DIMENSIONS OR DETAILS ON OR BETWEEN DRAWINGS SHOULD BE DRAWN TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION.
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- MANHOLES TO BE PRECAST CONCRETE RINGS IN ACCORDANCE WITH BS 5911-3 AND BS EN 1917, KITEMARKED, AGREEMENT CERTIFIED OR CE MARKED U.N.O.
- ALL COMBINED DRAINAGE TO BE PVCu SOLID WALL TYPE B TO BS EN 13476-1 AND -3, KITEMARKED, AGREEMENT CERTIFIED OR CE MARKED U.N.O.
- ALL SURFACE WATER PIPES TO BE STRUCTURED WALL HDPE TO BS EN 13476-1 AND -3, KITEMARKED, AGREEMENT CERTIFIED OR CE MARKED U.N.O.
- ALL DRAINAGE WORKS TO BE CARRIED OUT IN ACCORDANCE WITH SEWERAGE SECTOR GUIDANCE AND RELEVANT UTILITY COMPANIES STANDARD AND HEALTH AND SAFETY POLICES
- ANY DISCREPANCIES IN DIMENSIONS OR DETAILS ON OR BETWEEN DRAWINGS SHOULD BE DRAWN TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION
- CONCRETE FOR GENERAL DRAINAGE WORKS TO BE GEN3 TO BS 8500-1, BS EN 206-1 AND ENGINEERS SPECIFICATION
- PIPES ARE NOT DESIGNED FOR CONSTRUCTION TRAFFIC, CONTRACTOR WILL TAKE NECESSARY PRECAUTIONS TO PROTECT PIPES DURING CONSTRUCTION
- REFER TO SEWER ABANDONMENT GENERAL ARRANGEMENT ON DRAWING RAM-XX-XX-DR-C-20010
- REFER TO SEWER DIVERSION SCHEDULES & PLAN SECTIONS ON DRAWING SERIES RAM-XX-XX-DR-C-20200
- REFER TO SEWER DIVERSION LONG SECTIONS ON DRAWING SERIES RAM-XX-XX-DR-C-20250
- REFER TO UNITED UTILITIES DEVELOPER SERVICES CONSTRUCTION DETAILS AND DRAWING SERIES RAM-XX-XX-DR-C-20400 FOR STANDARD DETAILS DRAWINGS

P01	ISSUED FOR APPROVAL	08/03/2023	CO	NM
Rev	Description	Date	By	App
			Chk	

FOR APPROVAL

**PLOT 10A
FIRST STREET
MANCHESTER**

RAMBOLL

tel 01244 311855 chester@ramboll.co.uk
www.ramboll.co.uk

**PROPOSED HULME STREET
SEWER DIVERSION
GENERAL ARRANGEMENT**

Project No:	Scale (@A1):	Drawn:	Date:
1620007819	1:250	CO	02/2023
Drawing No:			Rev
RAM-XX-XX-DR-C-20100			P01

United Utilities Section 185 Final Certificate



United Utilities Reference Number:	03032983
Legal Agreement Reference:	WHO11.11991
Value of Works:	£44,712
Date of Agreement:	03/08/2023

Site Address:	Plot 10a First Street, Manchester		
Adoptions Engineer:	Conor Donaghy	Telephone:	01925 429097
		Email:	conor.donaghy2@uuplc.co.uk
Developer: Contact name:	Ask Real Estate	Telephone:	0161 817 6620
		Email:	neilpickup@askrealestate.co.uk

With reference to the above scheme the Section 185 sewers on this development are now satisfactory for formal adoption.

I enclose the final certificate of completion, for these sewers, duly completed.

Should you require any further information in the meantime, please do not hesitate to contact me.

WHEREAS the whole of the Works have been completed and have satisfactorily passed any final test

AND WHEREAS the Developer has maintained the Works and remedied any defects notified during the period of maintenance

NOW THEREFORE I hereby CERTIFY that the whole of the Works were complete on 12/02/2025

Certificate is issued pursuant to Clause 8 of the Agreement.

United Utilities Water LTD

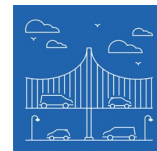
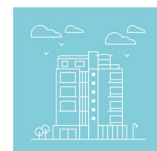
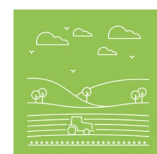
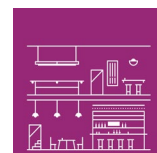
Registered in England and Wales: Registered No. 2366678

Registered Office: Haweswater House, Lingley Mere Business Park, Lingley Green Ave, Gt Sankey, Warrington, WA5 3LP

Issued by:	Lucy Clarke	Date:	03/03/2025
	For Developer Services and Metering		



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