

21031.CL107
Laystall Street,
Manchester, M4 6DE

Planning Condition 7
Drainage Calculations

Contract No:	21031
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Contract: Laystall Street, Manchester

Project No: 21031

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Issue	Prepared by	Checked by	Notes	Date
-	EL		First Issue	16/09/2024

1.0 Introduction

This document details the response to Planning Condition 7 of the planning permission granted to the proposed development at Laystall Street, Ancoats, Manchester, M4 6DE.

The development proposal is for the erection of a 20-storey hotel with 154 bedrooms, including two basement levels, as well as associated amenities including a café, bar, restaurant, and gym.

2.0 Planning Condition 7

See below, full text of planning Condition 7, as set out in the planning response received from Manchester City Council, reference 135662/FO/2022.

Notwithstanding the details as set out within condition 2 no development shall take place until details of the surface water drainage works in accordance with Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacements national standards and details that have been submitted to and approved in writing by the Local Planning Authority. This shall include:

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

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

**Details 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 with the aim of reducing to the Greenfield runoff rates, as the site is located within Conurbation Core Critical Drainage Area. Where this is calculated as less than 5 l/s, blockage risk shall be considered and a capped rate of 5 l/s may be used.*

**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;

**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 45% climate change in any part of a building;*

**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.*

**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.*

**Hydraulic calculation of the proposed drainage system;*

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

The approved details shall be implemented as part of the development.

Reason: To promote sustainable development, secure proper drainage and to manage the risk of flooding and pollution. This condition is imposed in light of national policies within the NPPF and NPPG and local policies EN08 and EN14.

3.0 Responses to Planning Condition 7

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

Please refer to Shear Design drawing 21031-101 – Proposed Drainage Layout (Appendix A).

Maximised integration of green SuDS components (utilising infiltration or attenuation) if practicable;

Please refer to Shear Design drawing 21031-101 in Appendix A. The proposed SuDS features include a blue roof covering much of the high-level roof and a permeable paved area which will offer treatment to surface water runoff.

Details 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 with the aim of reducing to the Greenfield runoff rates, as the site is located within Conurbation Core Critical Drainage Area. Where this is calculated as less than 5 l/s, blockage risk shall be considered and a capped rate of 5 l/s may be used.

Please refer to calculations in Appendix B – Site Runoff Rate that show the existing surface water runoff rate for the proposed site is less than 5 L/s. Therefore, the peak surface water runoff for the site is to be restricted to 5 L/s (21031-Variable Runoff Method).

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;

Refer to Appendix C for a comparison of the pre- and post-development runoff volume that shows the post-development runoff volume has been reduced to the lowest possible value.

The pre-development runoff volume for the 360-minute storm is 21m³. The calculated discharge volume for the same storm event post-development is 27.8m³.

The runoff volume cannot practically be reduced any further because the small size of the site makes it very difficult to reduce to the greenfield runoff volume, especially considering there does not appear to be any positive drainage on the site. Despite this, the runoff volume

will be reduced by evapotranspiration through the permeable paving and blue roof. However, due to the small nature of the site, it is not possible to provide lots of green aspects to the development as this would hinder access to the proposed building.

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 45% climate change in any part of a building;

Refer to Appendix D – Hydraulic Drainage Calculations that show the proposed drainage network has been modelled for the 1 in 100-year +45% climate change critical storm event, and does not flood. Furthermore, the blue roof calculations from ACO have been analysed using a 45% value for climate change (the Blue Roof calculations are also in Appendix D).

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 Appendix E – Proposed Flood Exceedance Routes for drawing 21031-SK112 showing the proposed flood exceedance routes for the development. The proposed flood exceedance routes drawing shows that in the event that the drainage system is exceeded, whether through an extreme storm event or system failure, that surface water flows are conveyed away from the building.

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.

Refer to Appendix F – Correspondence: United Utilities, containing confirmation from United Utilities that they agree in principle to the proposed peak surface water flow rate of 5 L/s.

Furthermore, see below, a summary of the steps of the drainage hierarchy that were considered during discussions with United Utilities and choosing a surface water drainage strategy:

- Infiltration is not a suitable option due to the small size of the site, as any proposed soakaway would not be possible to be placed 5m from a proposed building, noting the building footprint covers most of the site.
- Discharge to a surface water body is not possible due to there being no suitable discharge location nearby.
- Discharge to a surface water sewer is not possible due to there being no suitable discharge location nearby.
- Discharge to a highway drain is not possible due to there being no suitable discharge location nearby.
- Discharge to a combined sewer is the proposed solution due the presence of an existing, adopted, combined sewer network in Lomax Street to the south of the proposed site.

Therefore, the proposed drainage strategy for this site is to discharge surface water flows to the combined sewer in Lomax Street. It is further proposed to restrict the peak surface water flow rate from the site to 5 L/s in accordance with the agreement in principle from United Utilities.

Hydraulic calculation of the proposed drainage system;

Refer to Appendix D which contains the hydraulic calculations for the proposed drainage network. This Appendix contains calculations that show the performance of the proposed drainage system for the critical storm event for the 1 in 100-year return period (including a 45% allowance for climate change) with a peak surface water discharge rate of 5 L/s. Furthermore, calculations from ACO show the performance of the proposed blue roof system for the critical storm event for the 1 in 100-year return period plus a 45% allowance for climate change. The calculations in Appendix D show that the proposed drainage network does not flood for the critical storm event for the 1 in 100-year plus 45% climate change storm event.

Construction details of flow control and SuDS elements.

Refer to Appendix G – Drainage Construction Details which contains Shear Design drawings 21031-109-110-111, Drainage Construction Details (Sheets 1-3). It should be noted that the proposed blue roof is to specialist design by ACO Tehcnologies, in lieu of the design being completed, a typical ACO blue roof detail has been provided, however this may be subject to change following detailed design.

The approved details shall be implemented as part of the development.

Reason: To promote sustainable development, secure proper drainage and to manage the risk of flooding and pollution. This condition is imposed in light of national policies within the NPPF and NPPG and local policies EN08 and EN14.

Noted.

4.0 Appendices

A. Proposed Drainage Layout

B. Site Runoff Rate

C. Pre- and Post-development Runoff Volume

D. Hydraulic Drainage Calculations

E. Proposed Flood Exceedance Routes

F. Correspondence: United Utilities

APPENDIX A

Proposed Drainage Layout

APPENDIX B

Site Runoff Rate

COMMENTS:

UK Variable Runoff Model

This calculation is the Variable UK Runoff Model, to calculate the expected Brownfield runoff percentage for the proposed site at Ancoats Street, Manchester.

$$PR = IF \times PIMP + (100 - IF \times PIMP) \times \frac{NAPI}{PF}$$

Where:

- PR = Percentage runoff
- IF = Effective paved area factor
 - o (Taken as 0.60 – “Fair” surface condition as per table 24.3 CIRIA SuDS Manual p.522)
- PIMP = Percentage permeability
 - o $\frac{\text{Existing Impermeable Area}}{\text{Total Site Area}} = \frac{0.008}{0.032} = 25.00\%$
- PF = Soil moisture depth
 - o Taken as 200mm (p.522 CIRIA)
- NAPI = 30-day antecedent precipitation index (API) (depends on soil type).
 - o Soil types 3 & 4 – between 10-25mm (p.522 CIRIA SuDS Manual).
 - Taken as 15mm.

Therefore:

$$PR (\%) = (0.60 \times 25.00) + (100 - (0.75 \times 35.22)) \times \frac{15}{200}$$

$$PR = 21.09\%$$

Brownfield Runoff Rates

This calculation will use the Wallingford Rational method, combined with the UK Variable Runoff Model to calculate the existing Brownfield runoff rates.

$$Q = 2.78CiA$$

Where:

- Q = Brownfield runoff rate.
- C = Co-efficient of impermeability (taken from UK Variable Runoff Model)
 - o 21.09%
- i = Rainfall intensity
 - o 50 mm/hr
- A = Site Area
 - o 0.032 ha.

Therefore:

$$Q = 2.78 \times 21.09\% \times 50 \times 0.032$$

$$Q = 0.938 \text{ L/s}$$

This flow estimate is very low and any flow control device subject to such a small restriction would be liable to maintenance issues such as blockages. Therefore, it is proposed to use a proposed site discharge rate of 5 L/s.



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Project Title: Printworks, Pacific Road, Cardiff		Project No: 21083	
Element Title: Example Rain Garden Calculations – Units 1-3		Sheet No: CL110	
Des'd by: EB	Date: 22/06/2022	Chk'd by:	Date:

COMMENTS:

APPENDIX C

Pre- and Post-development Runoff Volume

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	0.750
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Simulation Settings

Rainfall Methodology	FEH-22	Additional Storage (m ³ /ha)	0.0
Summer CV	1.000	Check Discharge Rate(s)	✓
Winter CV	1.000	100 year (l/s)	0.1
Analysis Speed	Normal	Check Discharge Volume	✓
Skip Steady State	x	100 year +45% 360 minute (m ³)	21
Drain Down Time (mins)	240		

Storm Durations

360

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

Pre-development Discharge Rate

Site Makeup	Greenfield	QBar/QMed conversion factor	1.075
Greenfield Method	FEH	Growth Factor 100 year	2.08
Positively Drained Area (ha)	0.040	Betterment (%)	0
SAAR (mm)	896	QMed	0.1
Host	17	QBar	0.2
BFIHost	0.610	Q 100 year (l/s)	0.3
Region	10		

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	45
Positively Drained Area (ha)	0.040	Storm Duration (mins)	360
Soil Index	5	Betterment (%)	0
SPR	0.53	PR	0.598
CWI	124.740	Runoff Volume (m ³)	21

Node 5 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	45.250	Product Number	CTL-SHE-0054-1300-1000-1300
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.3	Min Node Diameter (mm)	1200

Node 6 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	46.200	Product Number	CTL-SHE-0056-1300-0800-1300
Design Depth (m)	0.800	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.3	Min Node Diameter (mm)	1200

Node 4 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	46.220	Slope (1:X)	50.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	2.000	Inf Depth (m)	
Porosity	0.30	Length (m)	24.000		

Node 6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	46.750
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	185.0	0.0	0.050	185.0	0.0	0.051	0.0	0.0

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
100 year +45% CC 360 minute summer	57.439	14.781	100 year +45% CC 360 minute winter	37.337	14.781

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute summer	1	192	46.116	0.016	0.3	0.0011	0.0000	OK
360 minute summer	2	192	45.969	0.019	0.7	0.0013	0.0000	OK
360 minute summer	3	192	45.874	0.024	0.8	0.0017	0.0000	OK
360 minute summer	4	192	45.764	0.014	1.2	0.0022	0.0000	OK
360 minute summer	5	200	45.478	0.228	1.2	0.2577	0.0000	SURCHARGED
360 minute winter	7	144	46.123	0.023	1.3	0.0036	0.0000	OK
360 minute winter	8	144	45.765	0.015	1.3	0.0023	0.0000	OK
360 minute summer	9	200	45.129	0.029	2.2	0.0045	0.0000	OK
360 minute summer	9_OUT	200	45.007	0.027	2.2	0.0000	0.0000	OK
360 minute summer	6	232	46.781	0.581	3.7	6.4317	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute summer	1	1.000	2	0.3	0.336	0.052	0.0148	
360 minute summer	2	1.001	3	0.7	0.563	0.077	0.0055	
360 minute summer	3	1.002	4	0.8	0.770	0.109	0.0072	
360 minute summer	4	1.003	5	1.2	0.367	0.040	0.0088	
360 minute summer	5	1.004	9	1.1	1.088	0.023	0.0014	
360 minute winter	7	2.001	8	1.3	1.277	0.095	0.0072	
360 minute winter	8	2.002	9	1.3	1.912	0.041	0.0015	
360 minute summer	9	1.005	9_OUT	2.2	1.004	0.070	0.0082	27.8
360 minute summer	6	2.000	7	1.3	0.574	0.024	0.0219	

Results for 100 year +45% CC 360 minute summer. 600 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute summer	1	192	46.116	0.016	0.3	0.0011	0.0000	OK
360 minute summer	2	192	45.969	0.019	0.7	0.0013	0.0000	OK
360 minute summer	3	192	45.874	0.024	0.8	0.0017	0.0000	OK
360 minute summer	4	192	45.764	0.014	1.2	0.0022	0.0000	OK
360 minute summer	5	200	45.478	0.228	1.2	0.2577	0.0000	SURCHARGED
360 minute summer	7	152	46.123	0.023	1.3	0.0036	0.0000	OK
360 minute summer	8	152	45.765	0.015	1.3	0.0023	0.0000	OK
360 minute summer	9	200	45.129	0.029	2.2	0.0045	0.0000	OK
360 minute summer	9_OUT	200	45.007	0.027	2.2	0.0000	0.0000	OK
360 minute summer	6	232	46.781	0.581	3.7	6.4317	0.0000	FLOOD RISK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute summer	1	1.000	2	0.3	0.336	0.052	0.0148	
360 minute summer	2	1.001	3	0.7	0.563	0.077	0.0055	
360 minute summer	3	1.002	4	0.8	0.770	0.109	0.0072	
360 minute summer	4	1.003	5	1.2	0.367	0.040	0.0088	
360 minute summer	5	1.004	9	1.1	1.088	0.023	0.0014	
360 minute summer	7	2.001	8	1.3	1.276	0.094	0.0072	
360 minute summer	8	2.002	9	1.3	1.910	0.041	0.0015	
360 minute summer	9	1.005	9_OUT	2.2	1.004	0.070	0.0082	27.8
360 minute summer	6	2.000	7	1.3	0.574	0.024	0.0219	

Results for 100 year +45% CC 360 minute winter. 600 minute analysis at 8 minute timestep. Mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
360 minute winter	1	168	46.113	0.013	0.2	0.0009	0.0000	OK
360 minute winter	2	168	45.966	0.016	0.5	0.0011	0.0000	OK
360 minute winter	3	168	45.871	0.021	0.6	0.0015	0.0000	OK
360 minute winter	4	168	45.762	0.012	0.9	0.0019	0.0000	OK
360 minute winter	5	208	45.339	0.089	0.9	0.1003	0.0000	OK
360 minute winter	7	144	46.123	0.023	1.3	0.0036	0.0000	OK
360 minute winter	8	144	45.765	0.015	1.3	0.0023	0.0000	OK
360 minute winter	9	216	45.127	0.027	2.0	0.0043	0.0000	OK
360 minute winter	9_OUT	216	45.005	0.025	2.0	0.0000	0.0000	OK
360 minute winter	6	240	46.774	0.574	2.4	5.1732	0.0000	FLOOD RISK

Link Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
360 minute winter	1	1.000	2	0.2	0.314	0.035	0.0115	
360 minute winter	2	1.001	3	0.5	0.500	0.055	0.0044	
360 minute winter	3	1.002	4	0.6	0.709	0.082	0.0059	
360 minute winter	4	1.003	5	0.9	0.367	0.030	0.0082	
360 minute winter	5	1.004	9	0.9	1.020	0.018	0.0011	
360 minute winter	7	2.001	8	1.3	1.277	0.095	0.0072	
360 minute winter	8	2.002	9	1.3	1.912	0.041	0.0015	
360 minute winter	9	1.005	9_OUT	2.0	0.974	0.062	0.0076	27.9
360 minute winter	6	2.000	7	1.3	0.575	0.025	0.0219	

APPENDIX D

Hydraulic Drainage Calculations

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	2	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	0.750
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Node 5 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	45.250	Product Number	CTL-SHE-0054-1300-1000-1300
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	1.3	Min Node Diameter (mm)	1200

Node 6 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	46.200	Product Number	CTL-SHE-0094-3700-0800-3700
Design Depth (m)	0.800	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	3.7	Min Node Diameter (mm)	1200

Node 4 Carpark Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	46.220	Slope (1:X)	50.0
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)	0	Depth (m)	
Safety Factor	2.0	Width (m)	2.000	Inf Depth (m)	
Porosity	0.30	Length (m)	24.000		

Node 6 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	46.750
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	185.0	0.0	0.050	185.0	0.0	0.051	0.0	0.0

Results for 2 year Critical Storm Duration. Lowest mass balance: 99.18%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	1	25	46.113	0.013	0.2	0.0009	0.0000	OK
30 minute summer	2	25	45.966	0.016	0.5	0.0011	0.0000	OK
30 minute summer	3	25	45.871	0.021	0.6	0.0015	0.0000	OK
30 minute summer	4	25	45.762	0.012	0.9	0.0019	0.0000	OK
30 minute summer	5	25	45.339	0.089	0.9	0.1007	0.0000	OK
15 minute summer	7	12	46.139	0.039	3.5	0.0062	0.0000	OK
15 minute summer	8	12	45.775	0.025	3.5	0.0039	0.0000	OK
15 minute summer	9	12	45.140	0.040	4.2	0.0063	0.0000	OK
15 minute summer	9_OUT	12	45.016	0.036	4.2	0.0000	0.0000	OK
15 minute summer	6	11	46.389	0.189	3.9	0.2142	0.0000	SURCHARGED
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	1	1.000	2	0.2	0.304	0.035	0.0115	
30 minute summer	2	1.001	3	0.5	0.503	0.055	0.0044	
30 minute summer	3	1.002	4	0.6	0.709	0.082	0.0059	
30 minute summer	4	1.003	5	0.9	1.020	0.030	0.0082	
30 minute summer	5	1.004	9	0.9	1.067	0.052	0.0011	
15 minute summer	7	2.001	8	3.5	1.649	0.259	0.0151	
15 minute summer	8	2.002	9	3.5	2.504	0.111	0.0032	
15 minute summer	9	1.005	9_OUT	4.2	1.183	0.129	0.0130	2.3
15 minute summer	6	2.000	7	3.5	0.843	0.196	0.0409	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.18%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	1	24	46.120	0.020	0.5	0.0014	0.0000	OK
30 minute summer	2	21	45.976	0.026	1.3	0.0018	0.0000	OK
30 minute summer	3	21	45.884	0.034	1.6	0.0024	0.0000	OK
30 minute summer	4	29	45.846	0.096	2.3	0.0152	0.0000	OK
30 minute summer	5	29	45.845	0.595	2.3	0.6727	0.0000	SURCHARGED
60 minute winter	7	31	46.140	0.040	3.7	0.0063	0.0000	OK
60 minute winter	8	31	45.775	0.025	3.7	0.0040	0.0000	OK
120 minute summer	9	70	45.143	0.043	4.8	0.0069	0.0000	OK
120 minute summer	9_OUT	70	45.019	0.039	4.8	0.0000	0.0000	OK
30 minute summer	6	22	46.757	0.557	8.9	1.9924	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	1	1.000	2	0.5	0.384	0.087	0.0222	
30 minute summer	2	1.001	3	1.3	0.662	0.139	0.0087	
30 minute summer	3	1.002	4	1.5	0.919	0.206	0.0306	
30 minute summer	4	1.003	5	2.3	1.018	0.076	0.0162	
30 minute summer	5	1.004	9	1.1	1.139	0.067	0.0013	
60 minute winter	7	2.001	8	3.7	1.667	0.271	0.0157	
60 minute winter	8	2.002	9	3.7	2.534	0.117	0.0033	
120 minute summer	9	1.005	9_OUT	4.8	1.228	0.150	0.0145	11.7
30 minute summer	6	2.000	7	3.7	0.853	0.205	0.0423	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.18%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	1	30	46.172	0.072	0.9	0.0051	0.0000	OK
30 minute summer	2	30	46.172	0.222	2.3	0.0158	0.0000	SURCHARGED
30 minute summer	3	30	46.172	0.322	2.8	0.0228	0.0000	SURCHARGED
30 minute summer	4	30	46.170	0.420	4.3	0.0668	0.0000	SURCHARGED
30 minute summer	5	30	46.168	0.918	3.5	1.0388	0.0000	SURCHARGED
180 minute winter	7	96	46.140	0.040	3.7	0.0063	0.0000	OK
180 minute winter	8	96	45.775	0.025	3.7	0.0040	0.0000	OK
240 minute summer	9	120	45.143	0.043	4.8	0.0069	0.0000	OK
240 minute summer	9_OUT	120	45.019	0.039	4.8	0.0000	0.0000	OK
30 minute summer	6	25	46.776	0.576	16.4	5.6448	0.0000	FLOOD RISK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	1	1.000	2	0.9	0.445	0.157	0.1152	
30 minute summer	2	1.001	3	2.3	0.786	0.254	0.0346	
30 minute summer	3	1.002	4	2.9	1.026	0.391	0.0532	
30 minute summer	4	1.003	5	3.5	1.019	0.118	0.0163	
30 minute summer	5	1.004	9	1.2	1.164	0.073	0.0014	
180 minute winter	7	2.001	8	3.7	1.667	0.272	0.0157	
180 minute winter	8	2.002	9	3.7	2.535	0.117	0.0033	
240 minute summer	9	1.005	9_OUT	4.8	1.228	0.150	0.0145	25.4
30 minute summer	6	2.000	7	3.7	0.853	0.205	0.0423	



Project Title

Laystall Street

Design Number

Notes / Reference

Roof

Design Storm Event	1:100
Climate Change	45 %
Runoff Coefficient	1.00
Location	Manchester
Roof Area m²	200.0
Additional Contributing Areas (m²)	
Total Catchment Area (m²)	200.0
Net Roof Area (m²)	170.0
Permitted Outflow (l/s)	3.000
Blue or Blue/Green Roof	Unknown
If B/G, Green Roof Type	Extensive
a. Permanent reservoir above or in storage void	None
b. Required Reservoir Depth (mm)	

Required Net Storm Storage Volume (m³)	3.38
Actual Depth (mm)	22
Porosity	95 %
Selected depth of storage tank (mm)	30
Provided Storage Volume (m³)	4.85
Utilisation	73.7 %

Structural Load Calculations	
Item	kN/m²
Weight of Product (Tank / Cell)	0.051
Weight of Product (Tray)	0.000
Geotextile	0.005
Weight of Permanent Storage	0.000
Weight of Stormwater Storage	0.278

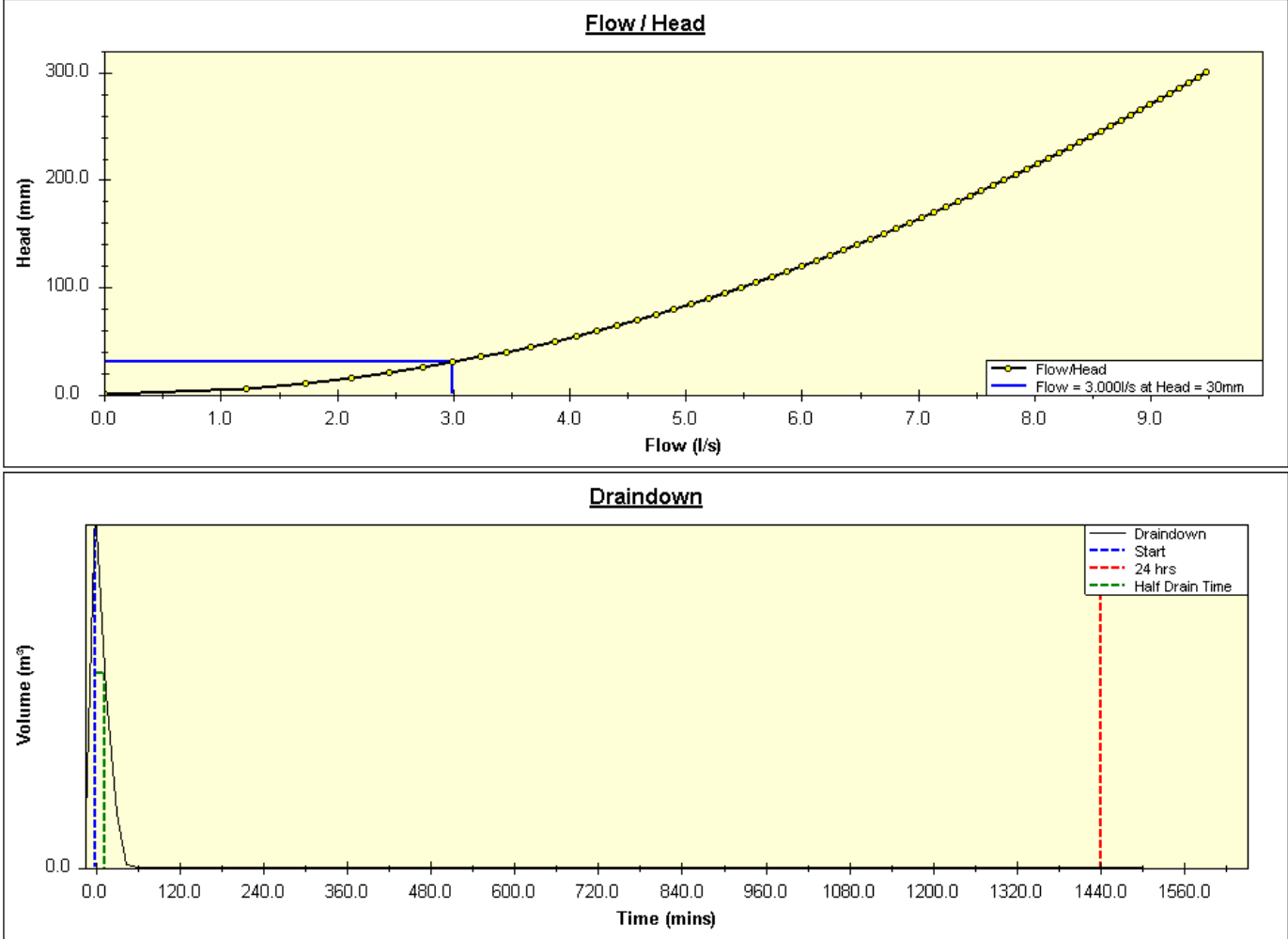
R:	0.28	l/s
M5-60:	19.00	mm/h
DURATION (mins)	INTENSITY (mm/h)	REQUIRED STORAGE VOLUME (m³)
5 mins	177.53	2.06
10 mins	139.55	2.85
15 mins	121.68	3.38
30 mins	80.76	2.68
1 hour	54.82	0.16
2 hours	34.95	0.00
4 hours	20.89	0.00
6 hours	15.28	0.00
10 hours	10.43	0.00
24 hours	5.49	0.00
48 hours	3.08	0.00

Required aperture / outlet plate size: 89 mm

Half Empty Time: 13 mins

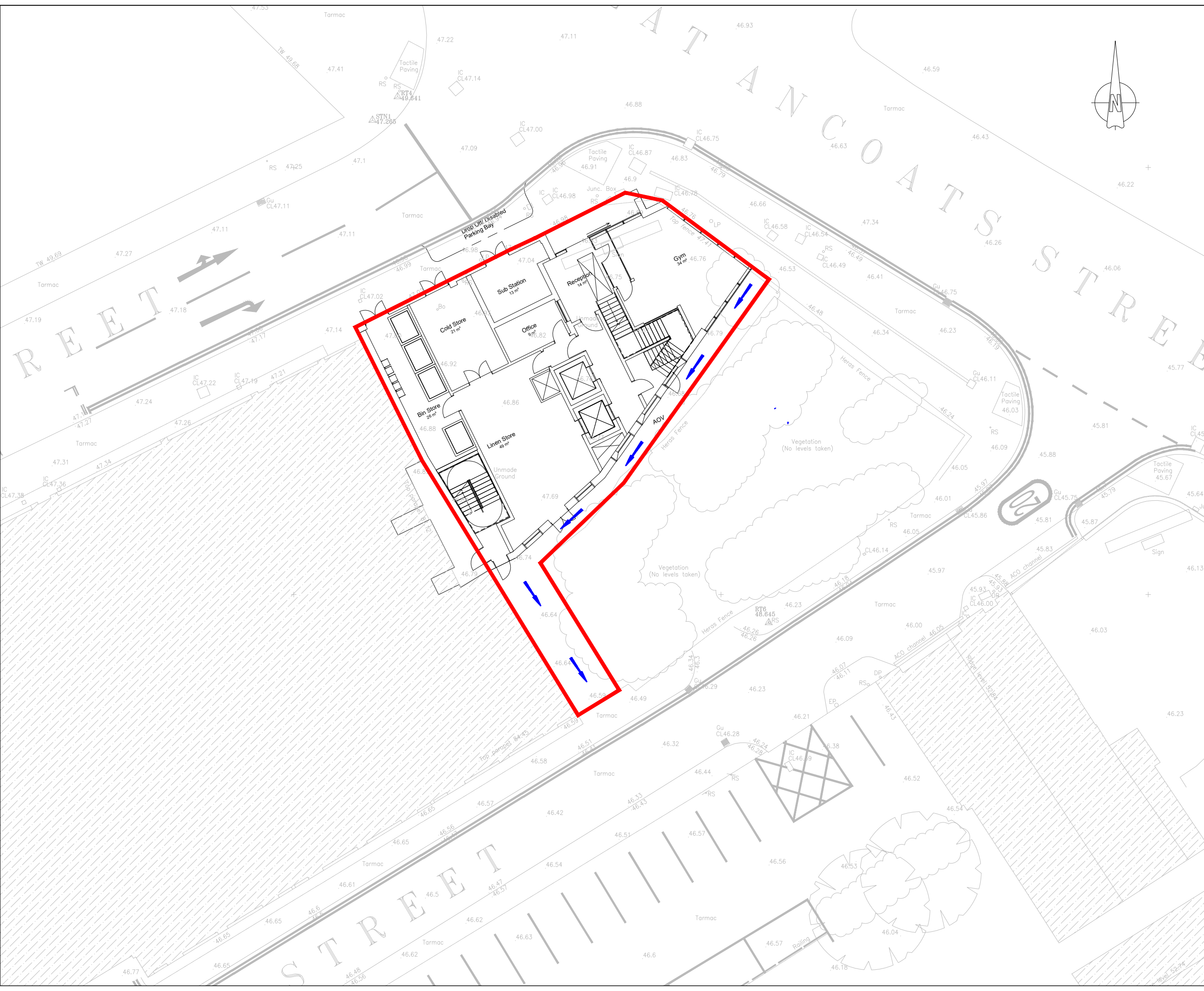
Project Status: PASS

Level & Draindown Graphs



APPENDIX E

Proposed Flood Exceedance Routes



NOTES

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KEY

- PROPOSED SITE BOUNDARY
- PROPOSED FLOOD EXCEEDANCE ROUTE

REV	DATE	DESCRIPTION	BY	CHK
AMENDMENTS				

CLIENT: ANCOATS MANCHESTER LTD

PROJECT: BANKSIDE HILTON MOTTO,
ANCOATS, LAYSTALL STREET

TITLE: PROPOSED FLOOD EXCEEDANCE ROUTES

SHEARdesign
Consulting Civil and Structural Engineers
7 Ashtree Court - Woody Close - Cardiff Gate Business Park - Cardiff - CF23 8RW
Tel: 029 2054 7000 - Fax: 029 2054 7001 - www.shear-design.com - enquiries@shear-design.com

DRAWN:	EB	CHECKED:	DK	DATE:	SEPTEMBER 2022	SCALE:	1:100 @ A1	REVISION:	
SHEAR DESIGN REF:		DRAWING NUMBER:		21031		21031-SK112		STATUS:	

APPENDIX F

Correspondence: United Utilities

From: seweradoptions@uuplc.co.uk
Sent: 28 March 2024 12:00
To: Edward Law (Baczynski)
Cc: Dameon Kilgour; Darren Badham; Billy Hayton
Subject: UU REF 05516060 – WW PDE – Lystall Street, Manchester

Caution! This message was sent from outside your organization.

[Allow sender](#) | [Block sender](#)

Good Afternoon,

Thank you for your WW PDE, please see our response below.

UU REF 05516060 – WW PDE – Lystall Street, Manchester

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 combined sewer system

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.

Should the above be exhausted and a combined connection is required I can confirm we have no objections in principal to 5 l/s.

Please do contact me should you wish to discuss any matters

Regards

Anthony

	Anthony Laithwaite Ww Engineer Developer Services & Metering Customer Services M: 07880 298897 unitedutilities.com
--	--

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

From: wastewaterdeveloperservices@uuplc.co.uk [wastewaterdeveloperservices@uuplc.co.uk]
Sent: 28/03/2024 11:40
To: edward@shear-design.com
Cc: dameon@shear-design.com; darren@shear-design.com; billy@shear-design.com
Subject: RE: FW: 21031 - Pre-development Enquiry

Good Morning,

Please accept this email as receipt of your application received on 27/03/2024 for the above development. This has now been logged on our system and the job reference is 05516060 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: Edward Law [edward@shear-design.com]

Sent: 27/03/2024 11:26

To: wastewaterdeveloperservices@uuplc.co.uk

Cc: dameon@shear-design.com; darren@shear-design.com; billy@shear-design.com

Subject: FW: 21031 - Pre-development Enquiry

See below, enquiry email without attachments as requested, attachments can be re-sent as required.

Good afternoon,

Please find attached a pre-development enquiry form for our client's proposed site at Laystall Street, Great Ancoats, Manchester, M4 6DE.

I believe an enquiry may have been previously submitted but I have been advised by developer services that after 1 year a new submission would be required anyway.

The site is a Brownfield site that was previously used as a car park. The site has received approval in principle from the LLFA to utilise a discharge rate of 5 L/s and planning permission as well.

We would like to enquire as to whether you could confirm your acceptance of the proposed overall site discharge rate of 5 L/s for this site?

If you require anything else to complete your assessment of this site then please let us know.

We have attached for your reference:

- 1. Completed pre-development enquiry form
- 2. Existing site discharge rate calculations
- 3. Email from LLFA confirming acceptance of the 5 L/s discharge rate, subject to UU approval.
- 4. Planning approval notice and conditions.
 - 1. Note Planning Condition 7 relating to drainage.
- 5. Site location plan.
- 6. United Utilities sewer map.
- 7. Topographical survey.
- 8. Desktop site investigation.

We hope that this is enough for you to be able to confirm your acceptance of the proposed discharge rate of 5 L/s however if you need anything else to help with your decision then please let us know.

Kind regards

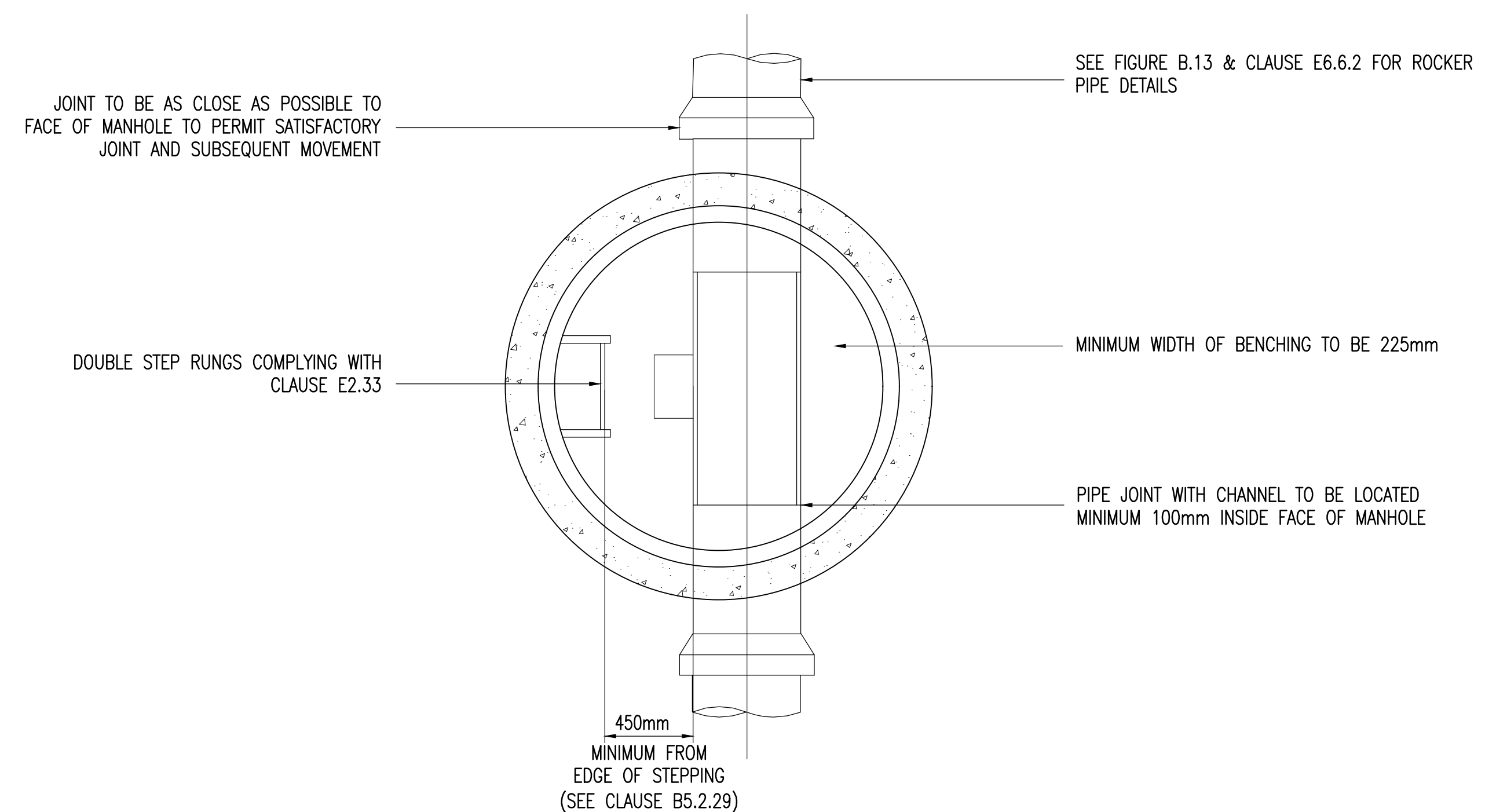
Ed Law (Baczynski)
Assistant Civil Engineer
Shear Design Ltd
7 Ashtree Court | Woodsy Close
Cardiff Gate Business Park
Cardiff | CF23 8RW
T: +44 (0)29 2054 7000

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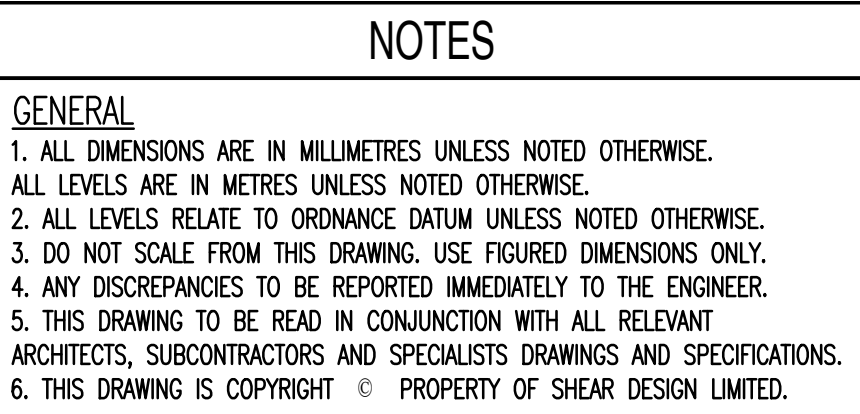
APPENDIX G

Drainage Construction Details



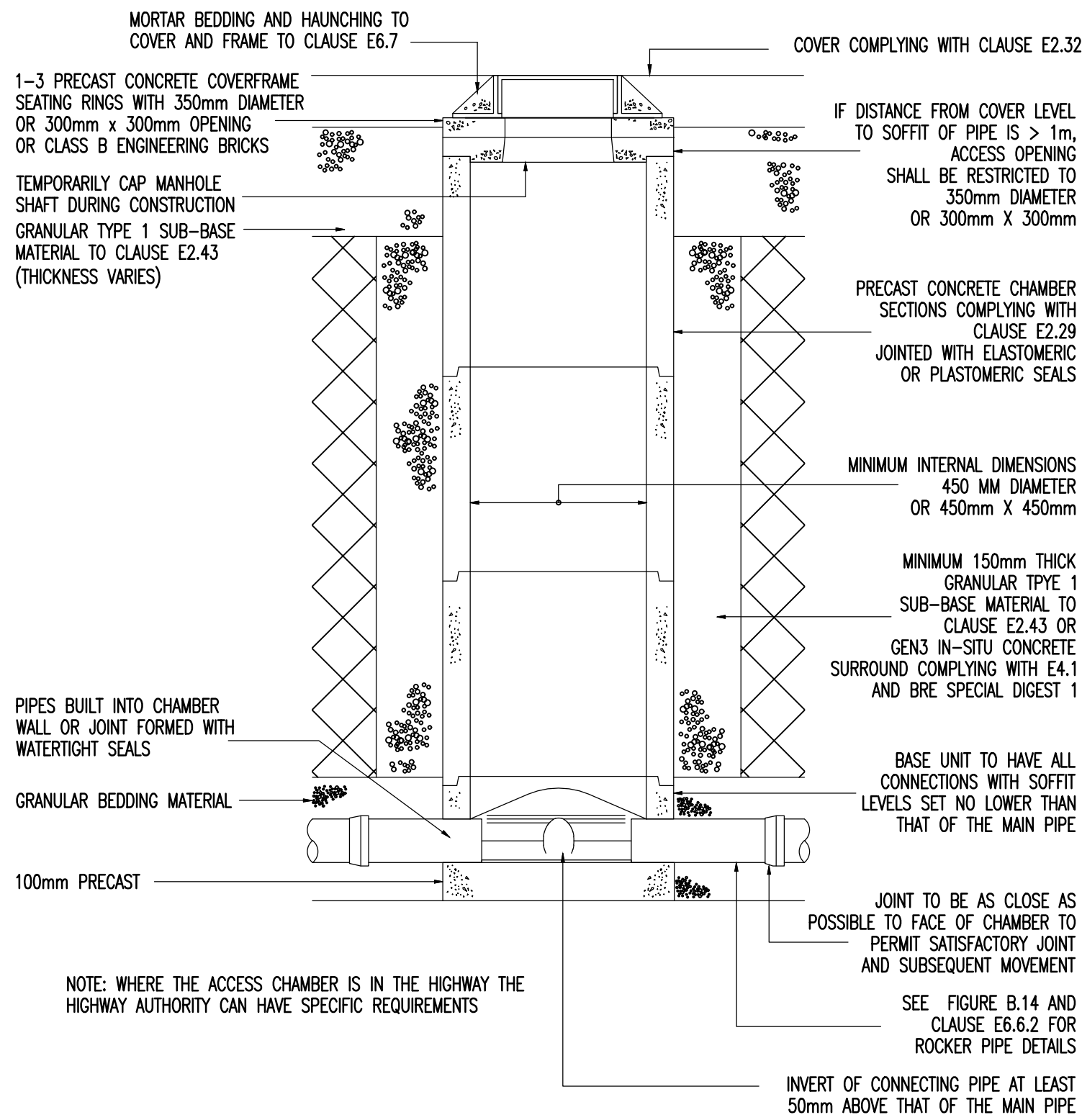
HYDROBRAKE NOTES	
1.	DIMENSIONS GIVEN IN THE TABLE ACROSS ARE CORRECT AT THE TIME OF WRITING AND ARE BASED ON THE INFORMATION PROVIDED BY THE HYDRO INTERNATIONAL WEBSITE.
2.	CARE SHOULD BE TAKEN TO ENSURE THAT THE CORRECT HYDROBRAKE IS ORDERED, BASED ON THE GIVEN HEAD/FLOW RELATIONSHIP.
3.	ALL HYDROBRAKE ORDERS SHOULD BE VERIFIED WITH THE CIVIL ENGINEER PRIOR TO ORDERING.
4.	IF A DIFFERENT FLOW CONTROL DEVICE OR SUPPLIER IS TO BE USED THEN THIS SHOULD BE VERIFIED WITH THE CIVIL ENGINEER TO ENSURE THAT THE DRAINAGE SYSTEM STILL FUNCTIONS CORRECTLY.

HYDROBRAKE UNIT – REF. AND INSTALLATION DIMENSIONS	
HYDRO-INTERNATIONAL REFERENCE	SHE-0053-1300-1000-1300
MANHOLE REFERENCE	S5
MANHOLE DIAMETER	1200
HEAD (metres)	1.000
FLOW (L/s)	1.300
UNIT DEPTH (C) (mm)	60
UNIT WIDTH (E) (mm)	330
MIN. SUMP DEPTH (K) (mm)	275
MIN. SUMP WIDTH (J) (mm)	120
MIN. MOUNTING BLOCK WIDTH (L) (mm)	535
MIN. MOUNTING BLOCK HEIGHT (D) (mm)	675

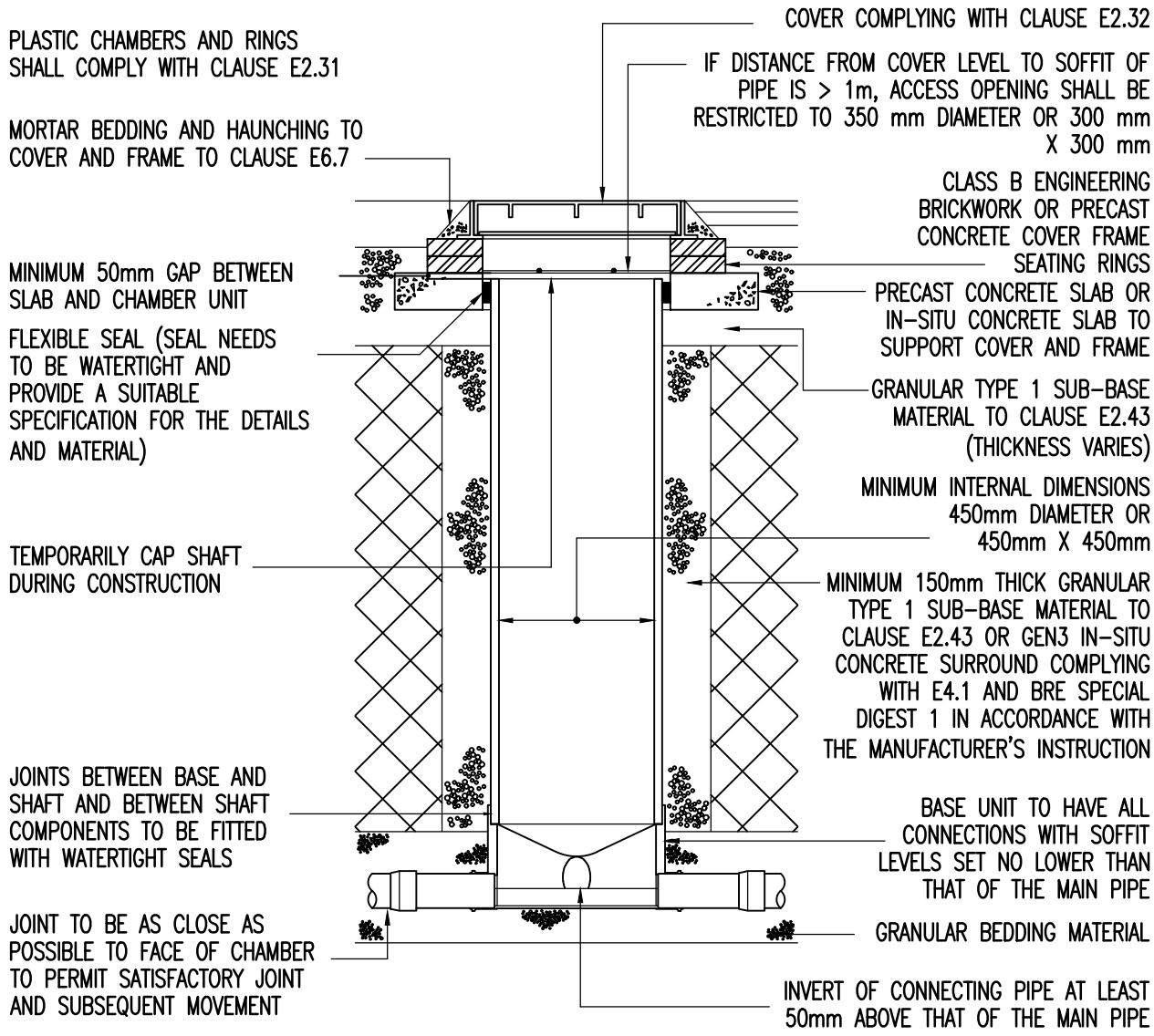


- NOTES:**
1. EXISTING LEVELS, CONTOURS AND SITE INFORMATION TAKEN FROM TOPOGRAPHICAL SURVEY.
 2. **ALL EXISTING LEVELS & DRAINAGE LEVELS TO BE CONFIRMED ON SITE PRIOR TO COMMENCEMENT OF WORKS. ALL FINDINGS TO BE REPORTED TO THE ENGINEER.**
 - 2.1. LEVEL OF PROPOSED OUTFALLS / CONNECTIONS TO SEWER/S TAKEN AND/OR EXTRAPOLATED FROM EXISTING SEWER RECORDS. INVERT LEVEL, PIPE SIZE & CONDITION OF ALL OUTFALL CHAMBERS TO BE SURVEYED BY CONTRACTOR ON SITE AND ALL FINDINGS REPORTED TO THE ENGINEER.
 3. REFER TO SITE TOPOGRAPHICAL SURVEY FOR DETAILS OF EXISTING SITE CONDITIONS AND BENCH MARKS.
 4. PRIOR TO COMMENCEMENT OF THE WORKS THE CONTRACTOR SHALL LIAISE WITH ALL RELEVANT AUTHORITIES TO LOCATE, PROTECT AND WHERE NECESSARY DIVERT ALL EXISTING SERVICES AFFECTED BY THE WORKS.
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 7. SCHEMATIC CONNECTION PLANS ARE NOT TO BE USED FOR TENDER OR CONSTRUCTION PURPOSES.
 8. ALL SETTING OUT OF DRAINAGE POINTS (RWP/S/SPs ETC) BY ARCHITECT OR M&E ENGINEER.
 9. THIS DRAWING IS FOR TENDER PURPOSES ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION

REV	DATE	DESCRIPTION		BY	CHK
AMENDMENTS					
CLIENT: ANCOATS MANCHESTER LTD					
PROJECT: BANKSIDE HILTON MOTTO, ANCOATS, LAYSTALL STREET					
TITLE: PROPOSED DRAINAGE DETAILS SHEET 1					
 SHEAR design Consulting Civil and Structural Engineers 7 Ashtree Court - Woodsey Close - Cardiff Gate Business Park - Cardiff - CF23 8RW Tel: 029 2054 7000 - Fax: 029 2054 7001 - www.shear-design.com - enquiries@shear-design.com					
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21031		21031-110			
				REVISION: T01	
				STATUS: T	

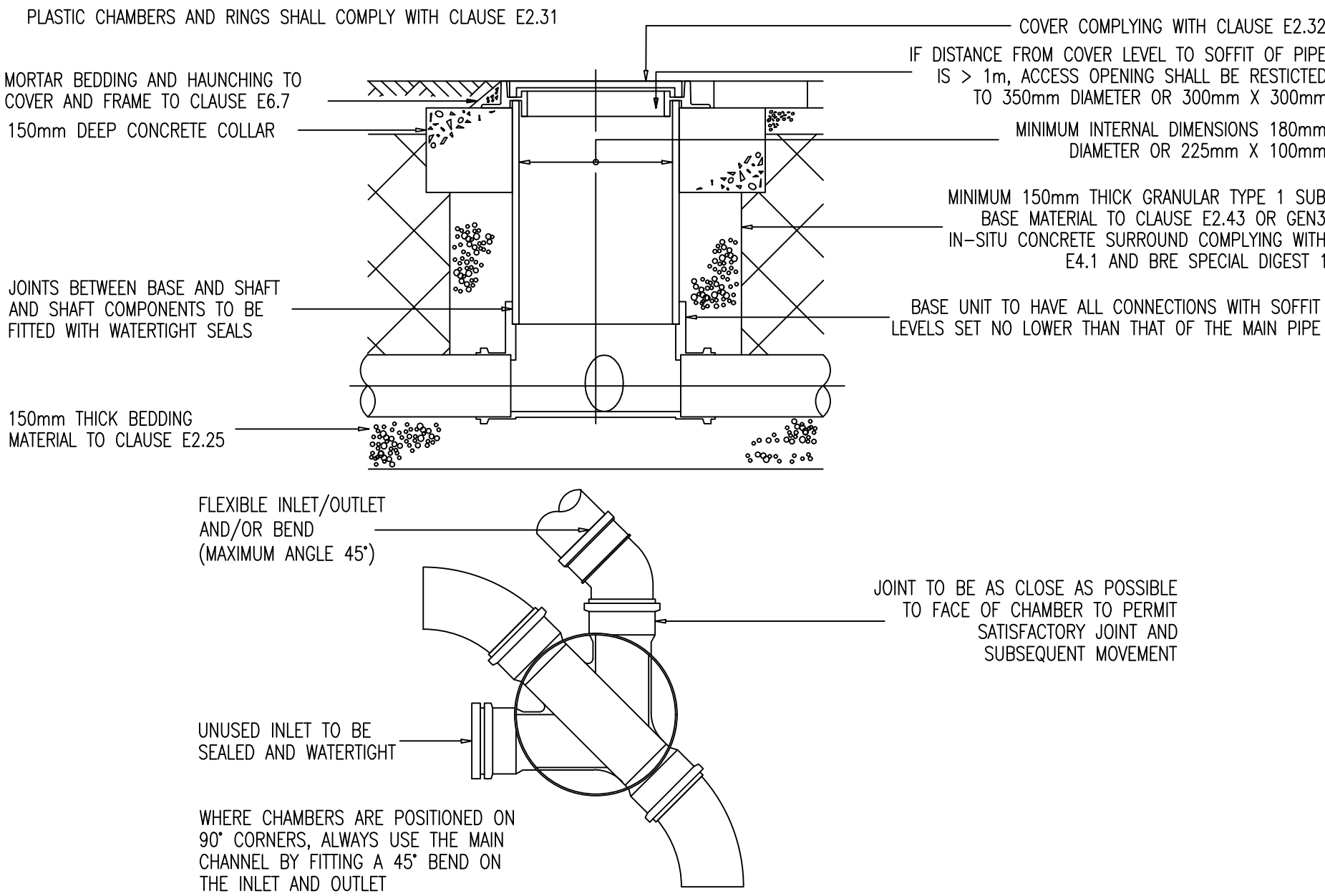


TYPICAL INSPECTION CHAMBER DETAIL – TYPE D (RIGID)
DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE UP TO 3m
RIGID MATERIAL CONSTRUCTION FOR USE IN AREAS SUBJECT TO VEHICLE LOADING



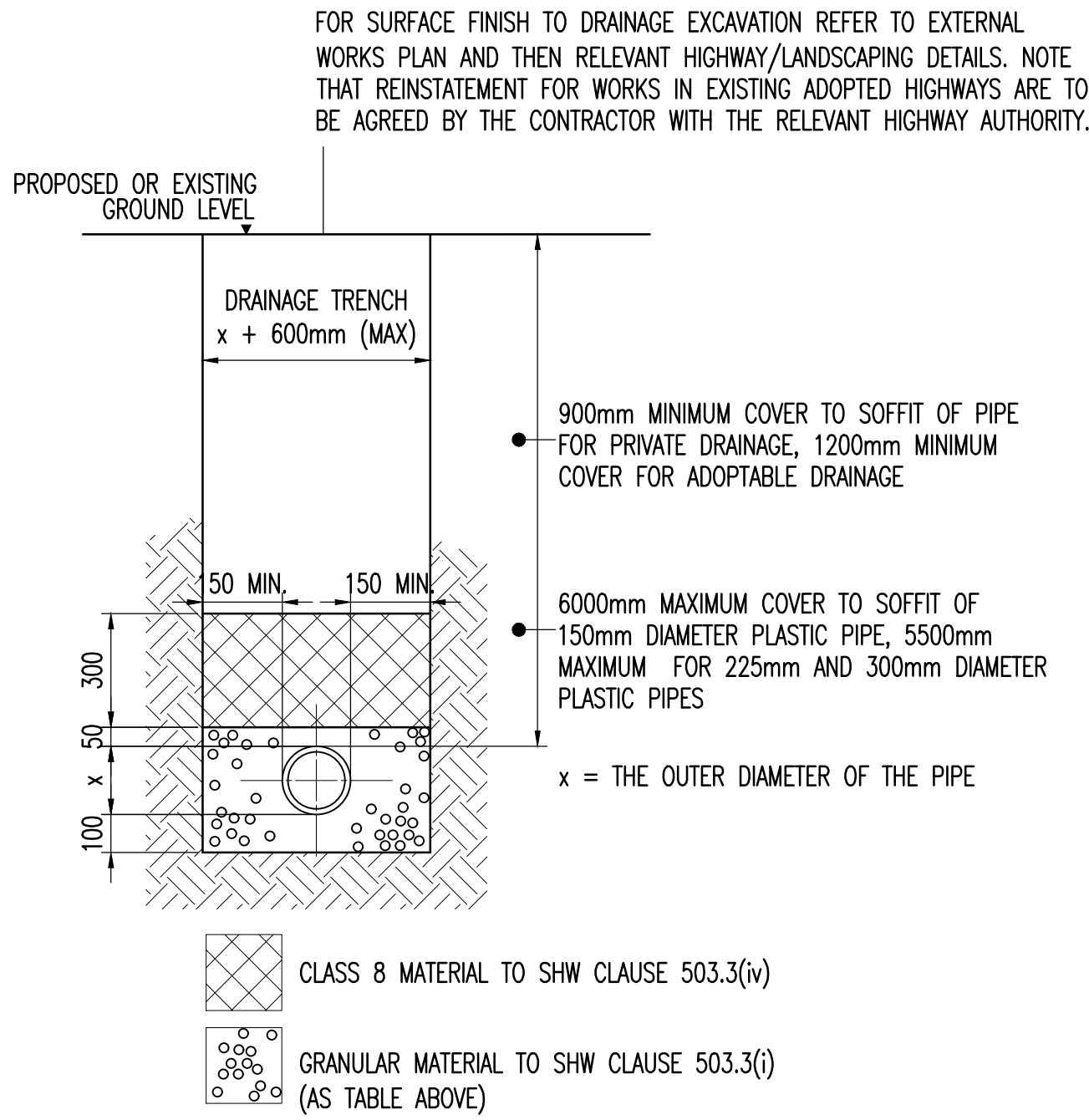
TYPICAL INSPECTION CHAMBER DETAIL – TYPE D (FLEXIBLE)
DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE UP TO 3m
FLEXIBLE MATERIAL CONSTRUCTION FOR USE IN AREAS SUBJECT TO VEHICLE LOADING

NOTES:
-WHERE THE ACCESS CHAMBER IS IN THE HIGHWAY THE HIGHWAY AUTHORITY CAN HAVE SPECIFIC REQUIREMENTS.
-MAXIMUM DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE IN AREAS SUBJECT TO VEHICLE LOADING 3 m, NON-ENTRY.
-PLASTIC CHAMBERS AND RINGS SHALL COMPLY WITH BS EN 13598-1 AND BS EN 13598-2 OR HAVE EQUIVALENT INDEPENDENT APPROVAL.

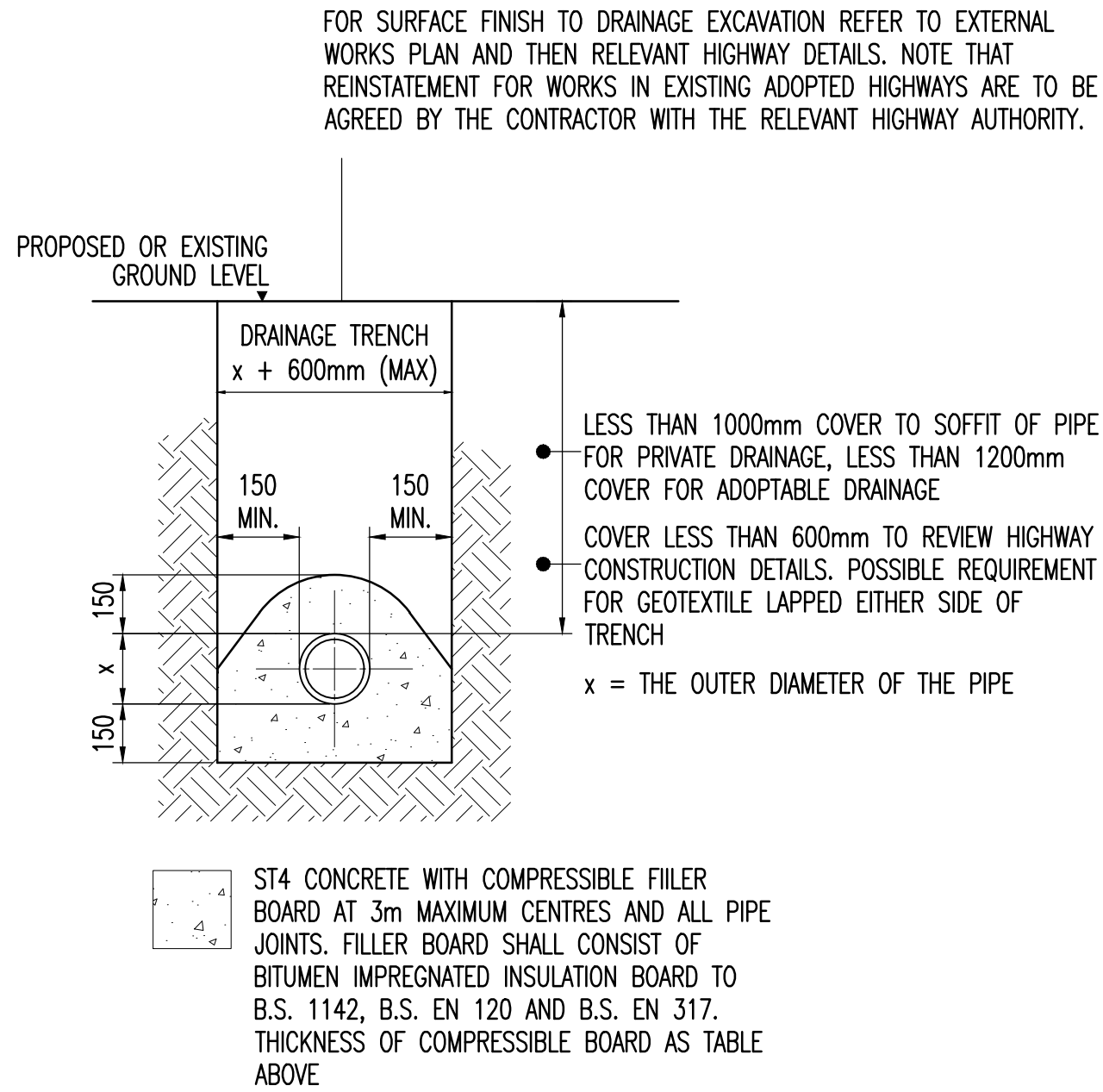


NOTE: WHERE THE ACCESS CHAMBER IS IN THE HIGHWAY(INCLUDING ANY FOOTWAY), THE HIGHWAY AUTHORITY CAN HAVE SPECIFIC REQUIREMENTS

TYPICAL INSPECTION CHAMBER DETAIL – TYPE E
DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE UP TO 2m
(FLEXIBLE MATERIAL DETAIL – SITED IN DRIVEWAYS/PAVED AREAS)



TYPICAL CLASS 'S' BEDDING AND SURROUND DETAILS DETAIL WHERE COVER TO PIPE IS GREATER THAN 1200mm



TYPICAL CLASS 'Z' BEDDING AND SURROUND DETAILS DETAIL WHERE COVER TO PIPE IS LESS THAN 1200mm

NOTES

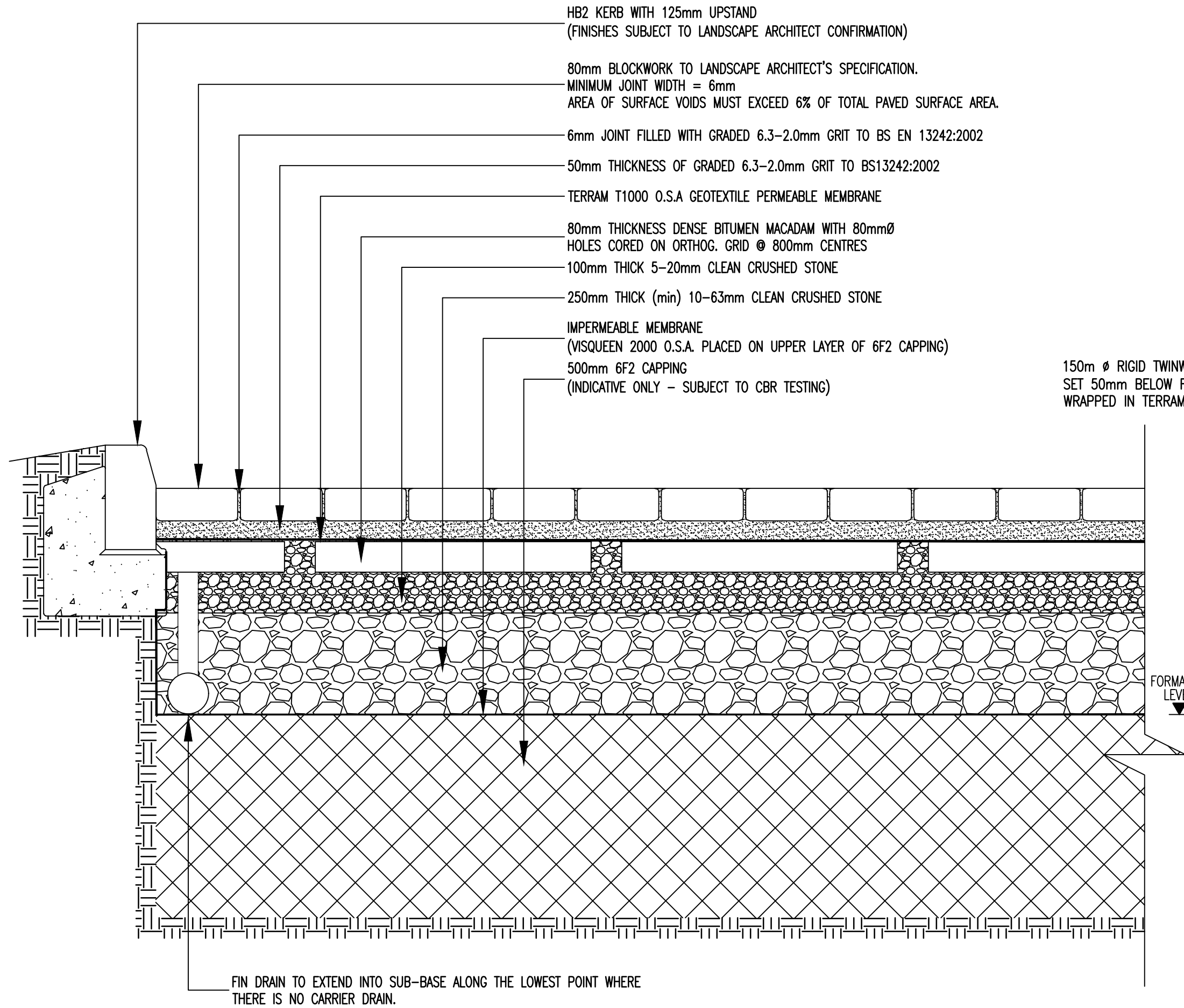
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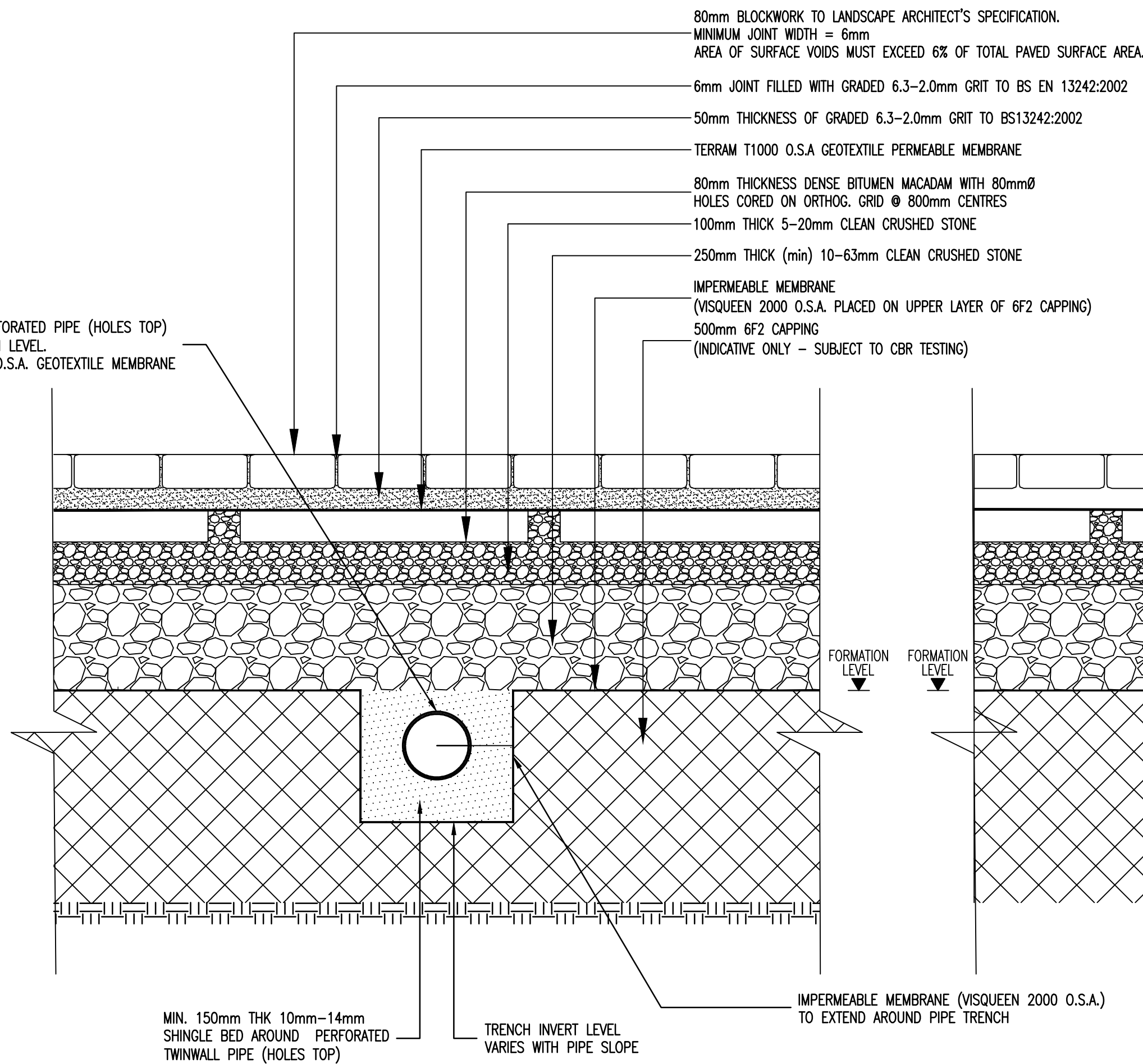
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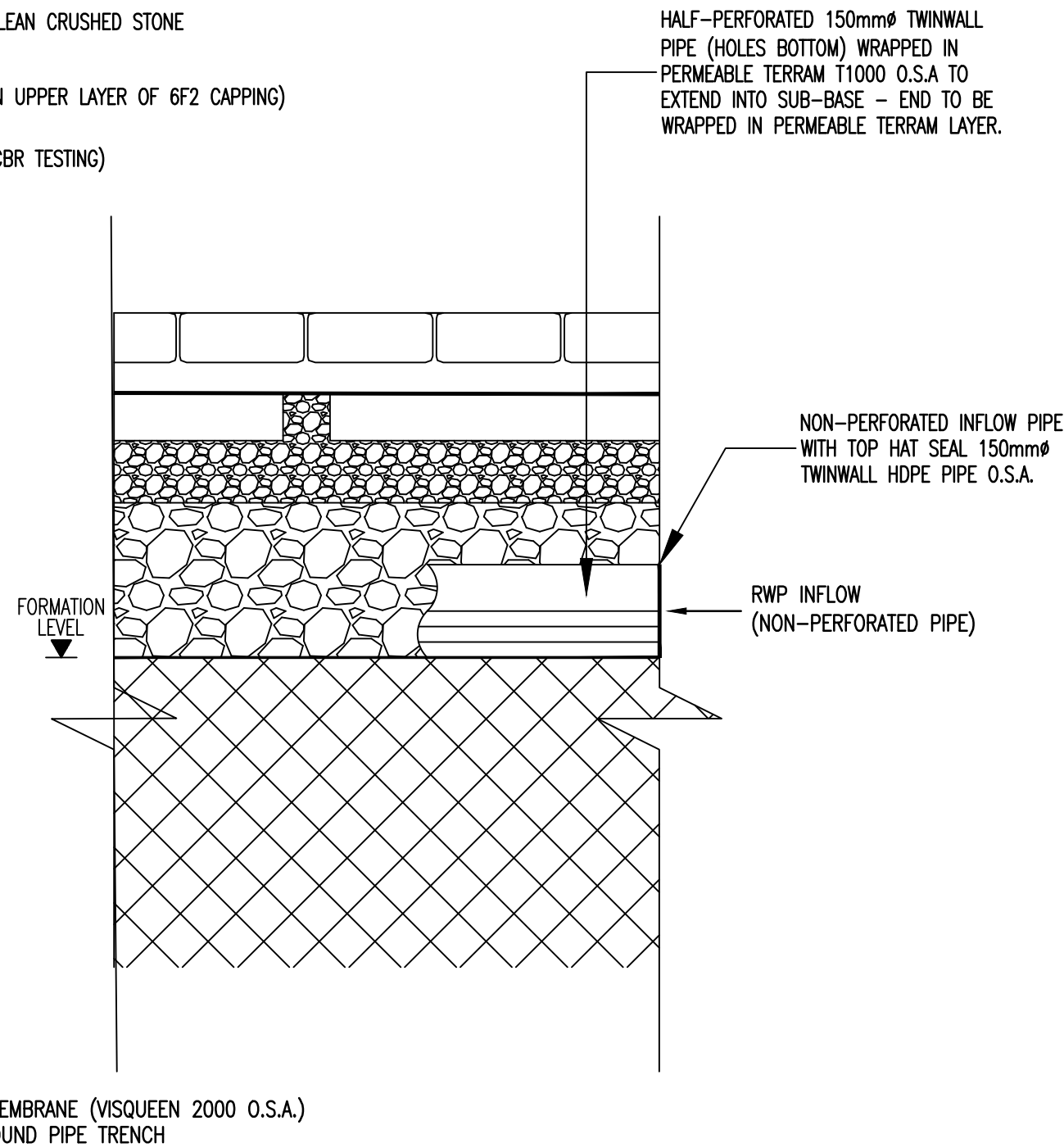
REV	DATE	DESCRIPTION	BY	CHK
AMENDMENTS				
CLIENT: ANCOATS MANCHESTER LTD				
PROJECT: BANKSIDE HILTON MOTTO, ANCOATS, LAYSTALL STREET				
TITLE: PROPOSED DRAINAGE DETAILS SHEET 2				
 Consulting Civil and Structural Engineers				
7 Ashtree Court - Woody Close - Cardiff Gate Business Park - Cardiff - CF23 8RW Tel: 029 2054 7000 - Fax: 029 2054 7001 - www.shear-design.com - enquiries@shear-design.com				
DRAWN: EB	CHECKED: DK	DATE: SEPTEMBER 2022	SCALE: 1:100 @ A1	REVISION: T01
SHEAR DESIGN REF: 21031		DRAWING NUMBER: 21031-110		STATUS: T



PERMEABLE PAVING EDGE DETAIL
(SCALE 1:10)



PERMEABLE PAVING DRAINAGE TRENCH DETAIL
(SCALE 1:10)



PERMEABLE PAVING INFLOW DETAIL
(SCALE 1:10)

NOTES

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 9. THIS DRAWING IS FOR TENDER PURPOSES ONLY AND SHOULD NOT BE USED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	BY	CHK
AMENDMENTS				
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PROJECT: BANKSIDE HILTON MOTTO, ANCOATS, LAYSTALL STREET				
TITLE: SHEET 3				
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