



Client

MORGAN SINDALL

Project 3324

HEXHAM ROAD - MS

Report

PLANNING DRAINAGE REPORT

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Report: HEXHAM ROAD PLANNING DRAINAGE REPORT

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Report: HEXHAM ROAD PLANNING DRAINAGE REPORT

Drainage Planning Report

1.1	Introduction	Page 2
1.2	Surface Water Drainage	Page 3
1.3	Foul Drainage	Page 5
1.4	Maintenance Measures	Page 5
1.5	Drainage programme	Page 7
1.6	Thames Water connection consent	Page 7
Appendix A – Thames Water Asset Search		Page 8
Appendix B – Surface water Microdrainage calculations		Page 17
Appendix C – Foul water Microdrainage calculations		Page 25
Appendix D – Construction programme		Page 30
Appendix E – Thames Water connection consent		Page 32
Appendix F – Proposed drainage layout and detail drawings		Page 36

1.1 INTRODUCTION

This report has been prepared in support of Condition 19 of the planning condition stated in consent No 230279, (for the erection of a building containing a day care centre providing social care services and 42 residential units including specialist housing with landscaping car parking and access) on land at The Willows, 2 Hexham Road, Reading, RG2 7UG. Condition 19 states.

19. No development shall commence on site beyond foundation level until a Sustainable Drainage Strategy and associated detailed design, management and maintenance plan of surface water drainage for the site using SuDS methods has been submitted to and approved in writing by the Local Planning Authority. The plan shall include:

i. a timetable for its implementation, and

ii. a management and annual maintenance plan for the lifetime of the development which shall include the arrangements for adoption by any public body or statutory undertaker, or any other arrangements to secure the operation of the sustainable drainage scheme throughout its lifetime.

REASON: These details are required due to insufficient information being contained within this submission and in order to reduce the risk of flooding onsite or elsewhere in accordance with Policy EN18 of the Reading Borough Local Plan 2019.

This document has been prepared by Terrell Ltd and explains the External Drainage strategy for the Proposed Development. This confirms and follows the Flood Risk Assessment and Drainage Strategy Report Ref E05076-ECH-XX-XX-RP-C-7001 Dated 14.02.23 as provided by Hampshire Engineering Services and submitted and agreed as an approved document.

Existing drainage services

A copy of the original Asset Location Search from Thames Water is shown within Appendix A.

This shows that there are existing foul surface sewers within the site to the south and west and a surface water sewer within the site to the north.

This survey indicates that an 750mm dia surface water drain passes within the site close to the boundary crossing the entrance in an east-westerly direction.

Two existing foul sewers cross into the site.

One sewer, a 450mm dia entering the site at the north-western corner flowing from the north and existing west down Canterbury Road. With a second 225mm dia sewer crossing the southern section of the site close to the boundary flowing in an east to west direction.

Report: HEXHAM ROAD PLANNING DRAINAGE REPORT

Due to the proximity of the existing 750mm dia surface water to the north and the existing 225mm dia foul sewer to the south in relation to the proposed building, permission was obtained on 03.10.22 for a build over agreement.

1.2 SURFACE WATER DRAINAGE STRATEGY

The surface water drainage system for this development has been designed in accordance with recommendations stated within the submitted Flood Risk Assessment and Drainage Strategy Report, Ref E05076-ECH-XX-XX-RP-C-7001-P01.

Within that document calculations have been provided to prove the existing greenfield run off rate and set the final discharge rate to the Thames Water sewer to a restricted rate of 2.5 l/sec. This discharge rate has the agreement of Thames Water.

Below ground geocellular attenuation tanks are proposed to be used within the development to attenuate the surface water generated from the new building and surrounding paving. The attenuation tanks will allow surface water to be stored and released at a gradual rate, reducing the flow rates during rainfall events and minimising the impact to the existing surface water sewer.

The flows from the attenuation tank will be controlled by a hydrobrake manhole. The design is based on the overall site impermeable area and the attenuation tank has been designed for a 100-year event plus a 40% climate change allowance.

Where possible proposed runoff from new hard surfacing has been directed to areas of proposed or existing landscaping for soakage. The surface water run off from the paving to the rear courtyard areas drain by aco channel on either side of the raised central tree planter. On the western side of the planter this drains directly into the surface water network. In the larger paved eastern side, the aco channel firstly discharges via perforated pipe and granular bed to the soil of the planter and will only discharge finally into the surface network once the earth within the planter is saturated.

The single tree pit to the front internal corner of the building will receive the surface water run off from the surrounding paving. Crossfalls from the fire exits to the tree ring is a maximum of 1:30 and these areas will drain directly into the tree ring. Any flooding of this area due to the inability of the tree subsoil not allowing sufficient soakage for an increased storm event will be conveyed away from this area via the the two gullies acting as overflows discharging into the surface water network.

MicroDrainage calculations for the surface water design can be found in Appendix B to this report.

The following drainage hierarchy has been considered under the original FRA and drainage strategy. The design as proposed does not vary from these submitted and approved proposals and are therefore covered within that document.

1. Living Roofs
2. Basins and Ponds
3. Filter Strips and Swales

Report: HEXHAM ROAD PLANNING DRAINAGE REPORT

4. Infiltration Devices
5. Permeable Surfaces and Filter Drains
6. Tanked Systems

The site has been assessed using the simple index approach contained within Chapter 26 of the SuDS Manual and considered as having a 'low' pollution hazard level. At roof level, the land use has been classified as 'Other roofs' due to the nature of the development. At ground level, land use has been identified as being equivalent to residential car parks/low traffic roads as there is only one area for vehicular access.

To meet the pollution hazard index total stated within the submitted Flood Risk Assessment and Drainage Strategy Report, the use of a Aco QuadraCeptor four stage surface water treatment unit (or similar approved) positioned after the hydrobrake has been utilised to treat all surface water discharging from the site, this provides Pollution Mitigation Indices of:

Total Suspended solids 0.8

Metals 0.8

Hydrocarbons 0.8

All three of these values are in excess of the stated requirement.

Storm Design exceedance

The original surface water design was designed in accordance the SuDs manual and current Building regulations. The drainage system as designed is capable of draining the site without flooding for the 1:30 year storm with no discharge from the site boundary for the 1:100 year+40% (climate change allowance) without putting the building at risk.

The current system as designed for construction reduces this risk further by providing a design to ensure that the system will drain the site for the 1:100 year +40% event without discharge from surcharge within the drainage network. For surcharge levels within the system refer to enclosed Microdrainage calculations. Any flooding from surcharge of the proposed surface water system due to exceedance of the above event will be at the installed Aco channel crossing the eastern entrance into the carpark this being the lowest point in the system at the furthest point away from the building. Exceedance flow direction for storm drainage is shown as arrowed on the drainage layout. Preliminary microdrainage calculations show that even for the 1:1000 year storm, the network is robust enough to still convey storm water within the system in surcharge, whilst showing flood at the lowest Aco drainage at the entrance. Therefore during a storm of this magnitude, the drainage network will still drain the site while discharging the excess water at the vehicular entrance away from the proposed building.

The proposed surface water drainage layout and details are shown on drawing numbers HEX-TER-52-OXX-D-C-5001, 5002 and 5003 respectively, all of which are included in Appendix F of this report.

1.3 FOUL WATER DRAINAGE

The existing foul drainage system discharges into the existing Thames Water foul sewer system to the west of the site.

The foul drainage system for the new buildings will be designed hydraulically as recommended in BS EN 752:2008 Drain and Sewer Systems Outside Buildings with the flows calculated using the Discharge Units Method contained in EN 12056-2 Gravity Drainage Systems within Buildings (System Type III is usually used in the UK).

A pre-Development Enquiry was sent to Thames Water to check that their sewer has sufficient capacity to accept the foul run off from the new buildings. Confirmation of sufficient capacity was received and included with the original Flood Risk Assessment and Drainage Strategy Report. A S106 direct sewer connection application has been submitted and agreed by Thames Water for both foul and surface water connections

The proposed foul water drainage layout and details are shown on drawing numbers HEX-TER-52-OXX-D-C-5001, 5002 and 5003 respectively, all of which are included in Appendix E of this report.

1.4 MAINTENANCE MEASURES

Drainage Maintenance measures are suggested as follows: -

- Regular inspection comprising of the inspection and cleaning of roof catchments, gutters, filters etc to reduce the likelihood of contamination; this is recommended to be carried out every 3 to 6 months.
- Visually inspect the roofs quarterly and remove any debris or other items that represent blockage risks particularly in vicinity of the outlets
- After significant storm events, visually inspect the roofs to confirm that the roof outlets are not blocked.
- External gullies, inspection chambers and manholes to be inspected quarterly and any blockages cleared by rodding or jetting as required. Gratings and covers to chambers and Aco channels also to be inspected at the same time and replaced if damaged.

Report: HEXHAM ROAD PLANNING DRAINAGE REPORT

- Vortex Flow Control Devices will be contained within a suitably sized manhole with a cover that can be regularly accessed and inspected from the surface or entered (with appropriate training) to maintain the units if a blockage is detected from the surface. The units will include a pull cord connected to the manhole cover frame to allow the bypass door on the units to be opened to drain down the system in event that the standard orifice is blocked. This allows the chamber to be emptied prior to operatives safely entering the system for maintenance. The inspection regime is expected to be no less than 6-monthly intervals of routine inspection and after large rainfall events, in line with standard best practice.
- Aco QuadraCeptor will be contained within a suitably sized manhole. Maintenance requirements are as per the manufacturers recommendations in terms of inspection, emptying of the silt chamber and the cleaning or replacement of the filters when required. The inspection regime is expected to be no less than 6-monthly intervals of routine inspection and after large rainfall events, in line with standard best practice.

SuDS Elements Maintenance ie for the surface water attenuation crates shall be to the requirements and guidance contained in the SuDS Manual v2 (CIRIA Report C753 2015) and in particular the Operation and Maintenance requirements contained in Table 21.3 for attenuation storage tanks

TABLE 21.3 Operation and maintenance requirements for attenuation storage tanks

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

The drainage maintenance measures above shall be incorporated into any maintenance manuals produced for the site.

1.5 DRAINAGE PROGRAMME

On site drainage works are programmed to commence as follows

Attenuation tank installation

Week start commencing 17.02.25

Finish 11.04.25

Drainage and sub structures

Week start commencing 31.03.25

Finish 13.06.25

Full construction programme given in Appendix D.

1.6 THAMES WATER CONSENT

Permission for connection to the existing Thames Water foul and surface waters drainage was sought and has been granted on the 9th of October 2024. Confirmation of connection approval is shown in Appendix E.

Asset location search



Catherine Reynolds
Hampshire County Council
Business Information Team
Castle Avenue
WINCHESTER
SO23 8UL

Search address supplied The Willows
2
Hexham Road
Reading
RG2 7UG

Your reference N/A

Our reference ALS/ALS Non Chargeable/2020_4155813

Search date 19 February 2020

Knowledge of features below the surface is essential for every development

The benefits of this knowledge not only include ensuring due diligence and avoiding risk, but also being able to ascertain the feasibility of any development.

Did you know that Thames Water Property Searches can also provide a variety of utility searches including a more comprehensive view of utility providers' assets (across up to 35-45 different providers), as well as more focused searches relating to specific major utility companies such as National Grid (gas and electric).

Contact us to find out more.



Thames Water Utilities Ltd
Property Searches, PO Box 3189, Slough SL1 4WW
DX 151280 Slough 13



searches@thameswater.co.uk
www.thameswater-propertysearches.co.uk



0845 070 9148

Asset location search



Search address supplied: The Willows, 2, Hexham Road, Reading, RG2 7UG

Dear Sir / Madam

An Asset Location Search is recommended when undertaking a site development. It is essential to obtain information on the size and location of clean water and sewerage assets to safeguard against expensive damage and allow cost-effective service design.

The following records were searched in compiling this report: - the map of public sewers & the map of waterworks. Thames Water Utilities Ltd (TWUL) holds all of these.

This search provides maps showing the position, size of Thames Water assets close to the proposed development and also manhole cover and invert levels, where available.

Please note that none of the charges made for this report relate to the provision of Ordnance Survey mapping information. The replies contained in this letter are given following inspection of the public service records available to this company. No responsibility can be accepted for any error or omission in the replies.

You should be aware that the information contained on these plans is current only on the day that the plans are issued. The plans should only be used for the duration of the work that is being carried out at the present time. Under no circumstances should this data be copied or transmitted to parties other than those for whom the current work is being carried out.

Thames Water do update these service plans on a regular basis and failure to observe the above conditions could lead to damage arising to new or diverted services at a later date.

Contact Us

If you have any further queries regarding this enquiry please feel free to contact a member of the team on 0845 070 9148, or use the address below:

Thames Water Utilities Ltd
Property Searches
PO Box 3189
Slough
SL1 4WW

Email: searches@thameswater.co.uk

Web: www.thameswater-propertysearches.co.uk

Asset location search



Property Searches

Waste Water Services

Please provide a copy extract from the public sewer map.

Enclosed is a map showing the approximate lines of our sewers. Our plans do not show sewer connections from individual properties or any sewers not owned by Thames Water unless specifically annotated otherwise. Records such as "private" pipework are in some cases available from the Building Control Department of the relevant Local Authority.

Where the Local Authority does not hold such plans it might be advisable to consult the property deeds for the site or contact neighbouring landowners.

This report relates only to sewerage apparatus of Thames Water Utilities Ltd, it does not disclose details of cables and or communications equipment that may be running through or around such apparatus.

The sewer level information contained in this response represents all of the level data available in our existing records. Should you require any further Information, please refer to the relevant section within the 'Further Contacts' page found later in this document.

For your guidance:

- The Company is not generally responsible for rivers, watercourses, ponds, culverts or highway drains. If any of these are shown on the copy extract they are shown for information only.
- Any private sewers or lateral drains which are indicated on the extract of the public sewer map as being subject to an agreement under Section 104 of the Water Industry Act 1991 are not an 'as constructed' record. It is recommended these details be checked with the developer.

Clean Water Services

Please provide a copy extract from the public water main map.

Enclosed is a map showing the approximate positions of our water mains and associated apparatus. Please note that records are not kept of the positions of individual domestic supplies.

For your information, there will be a pressure of at least 10m head at the outside stop valve. If you would like to know the static pressure, please contact our Customer Centre on 0800 316 9800. The Customer Centre can also arrange for a full flow and pressure test to be carried out for a fee.

Asset location search



Property Searches

For your guidance:

- Assets other than vested water mains may be shown on the plan, for information only.
- If an extract of the public water main record is enclosed, this will show known public water mains in the vicinity of the property. It should be possible to estimate the likely length and route of any private water supply pipe connecting the property to the public water network.

Payment for this Search

There is no fee associated with this enquiry, and thus no payment is required.

Asset location search



Further contacts:

Waste Water queries

Should you require verification of the invert levels of public sewers, by site measurement, you will need to approach the relevant Thames Water Area Network Office for permission to lift the appropriate covers. This permission will usually involve you completing a TWOSA form. For further information please contact our Customer Centre on Tel: 0845 920 0800. Alternatively, a survey can be arranged, for a fee, through our Customer Centre on the above number.

If you have any questions regarding sewer connections, budget estimates, diversions, building over issues or any other questions regarding operational issues please direct them to our service desk. Which can be contacted by writing to:

Developer Services (Waste Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Clean Water queries

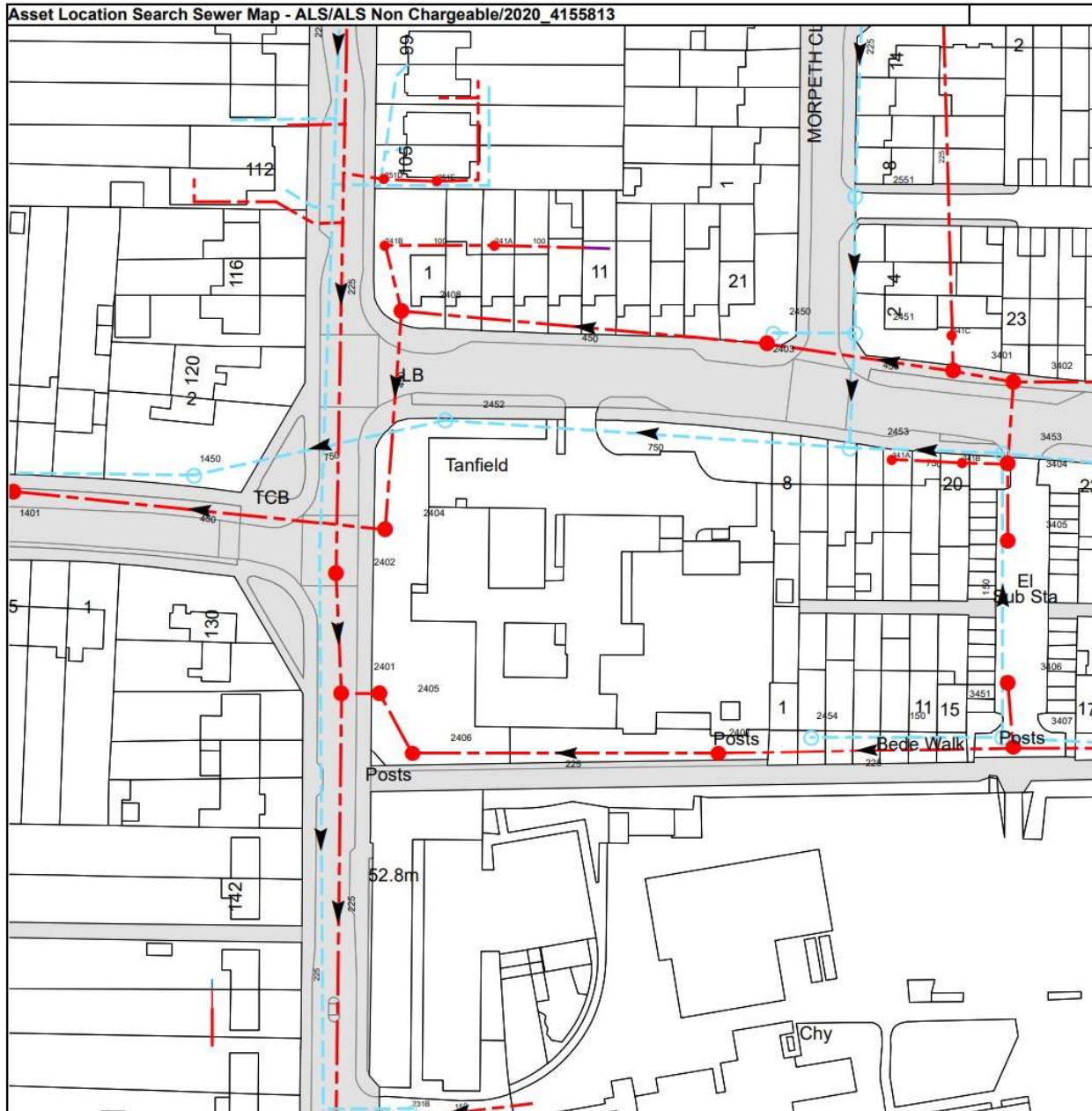
Should you require any advice concerning clean water operational issues or clean water connections, please contact:

Developer Services (Clean Water)
Thames Water
Clearwater Court
Vastern Road
Reading
RG1 8DB

Tel: 0800 009 3921
Email: developer.services@thameswater.co.uk

Report: HEXHAM ROAD PLANNING DRAINAGE REPORT

Asset Location Search Sewer Map - ALS/ALS Non Chargeable/2020_4155813



The width of the displayed area is 200 m and the centre of the map is located at OS coordinates 472244,171438

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Based on the Ordnance Survey Map with the Sanction of the controller of H.M. Stationery Office, License no. 100019345 Crown Copyright Reserved.

Report: HEXHAM ROAD PLANNING DRAINAGE REPORT

NB. Levels quoted in metres Ordnance Newlyn Datum. The value -9999.00 indicates that no survey information is available

Manhole Reference	Manhole Cover Level	Manhole Invert Level
1401	50.04	48.27
1450	n/a	n/a
2402	52.63	50.54
2401	52.67	50.43
2405	52.8	50.45
251D	n/a	n/a
241B	n/a	n/a
2404	52.67	48.86
2408	n/a	n/a
231B	n/a	n/a
2406	n/a	n/a
251E	n/a	n/a
2452	52.5	49.43
241A	n/a	n/a
2407	n/a	n/a
2403	51.73	49.87
2450	51.91	n/a
2454	53.09	52.18
2453	51.83	49.81
2551	53.65	51.9
2451	52.05	50.49
341A	n/a	n/a
341C	n/a	n/a
3401	51.86	49.94
341B	n/a	n/a
3453	51.85	49.9
3451	52.9	51.19
3404	51.84	50.93
3406	52.6	51.46
3405	52.1	51.09
3402	51.85	50
3407	52.92	51.1
3452	53.14	52.07

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken.

Report: HEXHAM ROAD PLANNING DRAINAGE REPORT



ALS Sewer Map Key

Public Sewer Types (Operated & Maintained by Thames Water)

	Foul: A sewer designed to convey waste water from domestic and industrial sources to a treatment works.		Surface Water: A sewer designed to convey surface water (e.g. rain water from roofs, yards and car parks) to rivers or watercourses.
	Combined: A sewer designed to convey both waste water and surface water from domestic and industrial sources to a treatment works.		Trunk Surface Water
	Storm Relief		Trunk Foul
	Vent Pipe		Trunk Combined
	Proposed Thames Surface Water Sewer		Bio-solids (Sludge)
	Gallery		Proposed Thames Water Foul Sewer
	Surface Water Rising Main		Foul Rising Main
	Sludge Rising Main		Combined Rising Main
	Vacuum		Proposed Thames Water Rising Main

Notes:

- 1) All levels associated with the plans are to Ordnance Datum Newlyn.
- 2) All measurements on the plans are metric.
- 3) Arrows (on gravity fed sewers) or flecks (on rising mains) indicate direction of flow.
- 4) Most private pipes are not shown on our plans, as in the past, this information has not been recorded.
- 5) 'na' or '0' on a manhole level indicates that data is unavailable.

Sewer Fittings

A feature in a sewer that does not affect the flow in the pipe. Example: a vent is a fitting as the function of a vent is to release excess gas.

	Air Valve
	Dam Chase
	Fitting
	Meter
	Vent Column

Operational Controls

A feature in a sewer that changes or diverts the flow in the sewer. Example: A hydrobrake limits the flow passing downstream.

	Control Valve
	Drop Pipe
	Ancillary
	Weir

End Items

End symbols appear at the start or end of a sewer pipe. Examples: an Undefined End at the start of a sewer indicates that Thames Water has no knowledge of the position of the sewer upstream of that symbol. Outfall on a surface water sewer indicates that the pipe discharges into a stream or river.

	Outfall
	Undefined End
	Inlet

Other Symbols

Symbols used on maps which do not fall under other general categories

	Public/Private Pumping Station
	Change of characteristic indicator (C.O.C.I.)
	Invert Level
	Summit

Areas

Lines denoting areas of underground surveys, etc.

	Agreement
	Operational Site
	Chamber
	Tunnel
	Conduit Bridge

Other Sewer Types (Not Operated or Maintained by Thames Water)

	Foul Sewer		Surface Water Sewer
	Combined Sewer		Gully
	Culverted Watercourse		Proposed
			Abandoned Sewer

Appendix B Surface water MicroDrainage calculations

Report: HEXHAM ROAD PLANNING DRAINAGE REPORT

Terrell Ltd		Page 2
The Print Rooms 164-180 Union Street London	Hexham Surface water network	
Date 20/01/2025 10:23	Designed by m.d.c.	
File HEXHAM SURFACE 17.01.25.MDX	Checked by	
Micro Drainage		Network 2020.1.3

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
2.004	20.450	0.515	39.7	0.035	0.00	0.0	0.600	o	150	Pipe/Conduit	🔴
1.010	1.000	0.010	100.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	🔴
1.011	1.000	0.050	20.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	🔴
1.012	1.000	0.200	5.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	🟢

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
2.004	31.61	6.42	51.145	0.096	0.0	0.0	0.0	1.60	28.3	8.2
1.010	31.23	6.64	50.480	0.336	0.0	0.0	0.0	1.00	17.8	28.4
1.011	31.22	6.65	50.220	0.336	0.0	0.0	0.0	2.26	40.0	28.4
1.012	31.21	6.65	50.170	0.336	0.0	0.0	0.0	4.54	80.2	28.4

Report: HEXHAM ROAD PLANNING DRAINAGE REPORT

Terrell Ltd		Page 4
The Print Rooms 164-180 Union Street London	Hexham Surface water network	
Date 20/01/2025 10:23	Designed by m.d.c.	
File HEXHAM SURFACE 17.01.25.MDX	Checked by	
Micro Drainage	Network 2020.1.3	

PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	150	S1	52.725	52.125	0.450	Open Manhole	300
1.001	o	150	S2	52.750	51.895	0.705	Open Manhole	450
1.002	o	150	S3	52.750	51.685	0.915	Open Manhole	450
1.003	o	150	S4	52.750	51.200	1.400	Open Manhole	600
1.004	o	150	S5	52.750	51.095	1.505	Open Manhole	600
1.005	o	150	S5B	52.750	50.915	1.685	Open Manhole	600
1.006	o	150	S6	52.625	50.845	1.630	Open Manhole	600
1.007	o	300	TANK	52.625	50.600	1.725	Open Manhole	450
1.008	o	300	S7	52.625	50.570	1.755	Open Manhole	600
1.009	o	300	S8	52.760	50.510	1.950	Open Manhole	600
2.000	o	150	S9	52.750	52.150	0.450	Open Manhole	300
2.001	o	150	S10	52.700	51.975	0.575	Open Manhole	450
2.002	o	150	S11	52.750	51.400	1.200	Open Manhole	450
2.003	o	150	S12	52.700	51.310	1.240	Open Manhole	600
2.004	o	150	S13	52.700	51.145	1.405	Open Manhole	600
1.010	o	150	S14 HYD	52.600	50.480	1.970	Open Manhole	1200
1.011	o	150	S15 FILTER	52.600	50.220	2.230	Open Manhole	1200
1.012	o	150	S16	52.600	50.170	2.280	Open Manhole	450

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	17.275	75.0	S2	52.750	51.895	0.705	Open Manhole	450
1.001	15.145	72.1	S3	52.750	51.685	0.915	Open Manhole	450
1.002	13.140	27.1	S4	52.750	51.200	1.400	Open Manhole	600
1.003	3.195	30.4	S5	52.750	51.095	1.505	Open Manhole	600
1.004	18.955	105.3	S5B	52.750	50.915	1.685	Open Manhole	600
1.005	9.275	132.5	S6	52.625	50.845	1.630	Open Manhole	600
1.006	1.230	12.9	TANK	52.625	50.750	1.725	Open Manhole	450
1.007	7.355	245.2	S7	52.625	50.570	1.755	Open Manhole	600
1.008	16.150	269.2	S8	52.760	50.510	1.950	Open Manhole	600
1.009	6.940	231.3	S14 HYD	52.600	50.480	1.820	Open Manhole	1200
2.000	19.750	112.9	S10	52.700	51.975	0.575	Open Manhole	450
2.001	13.510	23.5	S11	52.750	51.400	1.200	Open Manhole	450
2.002	13.180	146.4	S12	52.700	51.310	1.240	Open Manhole	600
2.003	24.295	147.2	S13	52.700	51.145	1.405	Open Manhole	600
2.004	20.450	39.7	S14 HYD	52.600	50.630	1.820	Open Manhole	1200
1.010	1.000	100.0	S15 FILTER	52.600	50.470	1.980	Open Manhole	1200
1.011	1.000	20.0	S16	52.600	50.170	2.280	Open Manhole	450
1.012	1.000	5.0		52.600	49.970	2.480	Open Manhole	0

Report: HEXHAM ROAD PLANNING DRAINAGE REPORT

Terrell Ltd		Page 5
The Print Rooms 164-180 Union Street London	Hexham Surface water network	
Date 20/01/2025 10:23	Designed by m.d.c.	
File HEXHAM SURFACE 17.01.25.MDX	Checked by	
Micro Drainage	Network 2020.1.3	

Online Controls for Storm

Hydro-Brake® Optimum Manhole: S14 HYD, DS/PN: 1.010, Volume (m³): 3.2

Unit Reference	MD-SHE-0072-2700-1450-2700
Design Head (m)	1.450
Design Flow (l/s)	2.7
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	72
Invert Level (m)	50.480
Minimum Outlet Pipe Diameter (mm)	100
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.450	2.7	Kick-Flo®	0.642	1.9
Flush-Flo™	0.314	2.3	Mean Flow over Head Range	-	2.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	1.9	0.800	2.1	2.000	3.1	4.000	4.3	7.000	5.6
0.200	2.2	1.000	2.3	2.200	3.3	4.500	4.6	7.500	5.8
0.300	2.3	1.200	2.5	2.400	3.4	5.000	4.8	8.000	6.0
0.400	2.3	1.400	2.7	2.600	3.5	5.500	5.0	8.500	6.2
0.500	2.2	1.600	2.8	3.000	3.8	6.000	5.2	9.000	6.3
0.600	2.0	1.800	3.0	3.500	4.1	6.500	5.4	9.500	6.5

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Report: HEXHAM ROAD PLANNING DRAINAGE REPORT

Terrell Ltd		Page 6																		
The Print Rooms 164-180 Union Street London	Hexham Surface water network																			
Date 20/01/2025 10:23 File HEXHAM SURFACE 17.01.25.MDX	Designed by m.d.c. Checked by																			
Micro Drainage Network 2020.1.3																				
<u>Storage Structures for Storm</u> <u>Cellular Storage Manhole: TANK, DS/PN: 1.007</u> Invert Level (m) 50.600 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr><tr><td>0.000</td><td>201.5</td><td>201.5</td><td>1.200</td><td>201.5</td><td>291.5</td><td>1.201</td><td>0.0</td><td>291.5</td></tr></table>			Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	201.5	201.5	1.200	201.5	291.5	1.201	0.0	291.5
Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)												
0.000	201.5	201.5	1.200	201.5	291.5	1.201	0.0	291.5												
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Report: HEXHAM ROAD PLANNING DRAINAGE REPORT

Terrell Ltd		Page 7
The Print Rooms 164-180 Union Street London	Hexham Surface water network	
Date 20/01/2025 10:23 File HEXHAM SURFACE 17.01.25.MDX	Designed by m.d.c. Checked by	
Micro Drainage		
Network 2020.1.3		

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FSR M5-60 (mm) 14.000 Cv (Summer) 0.750
 Region England and Wales Ratio R 0.200 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status ON
 DVD Status ON
 Inertia Status OFF

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960,
 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
 Return Period(s) (years) 100
 Climate Change (%) 40

PN	US/MH Name	Event	US/CL (m)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m ³)	Pipe Flow / Cap.	Flow (l/s)	Status
1.000	S1	15 minute 100 year Winter I+40%	52.725	52.195	-0.080	0.000	0.44	8.5	OK
1.001	S2	15 minute 100 year Winter I+40%	52.750	51.982	-0.062	0.000	0.63	12.2	OK
1.002	S3	30 minute 100 year Summer I+40%	52.750	51.781	-0.054	0.000	0.46	14.5	OK
1.003	S4	1440 minute 100 year Winter I+40%	52.750	51.707	0.357	0.000	0.12	2.5	SURCHARGED
1.004	S5	1440 minute 100 year Winter I+40%	52.750	51.706	0.461	0.000	0.15	2.5	SURCHARGED
1.005	S5B	1440 minute 100 year Winter I+40%	52.750	51.703	0.638	0.000	0.19	2.5	SURCHARGED
1.006	S6	1440 minute 100 year Winter I+40%	52.625	51.702	0.707	0.000	0.14	2.7	SURCHARGED
1.007	TANK	1440 minute 100 year Winter I+40%	52.625	51.702	0.802	0.000	0.41	21.4	SURCHARGED
1.008	S7	1440 minute 100 year Winter I+40%	52.625	51.761	0.891	0.000	0.29	16.4	SURCHARGED
1.009	S8	1440 minute 100 year Winter I+40%	52.760	51.808	0.998	0.000	0.23	12.2	SURCHARGED
2.000	S9	15 minute 100 year Winter I+40%	52.750	52.216	-0.084	0.000	0.39	6.1	OK
2.001	S10	15 minute 100 year Winter I+40%	52.700	52.028	-0.097	0.000	0.26	8.8	OK
2.002	S11	15 minute 100 year Winter I+40%	52.750	51.959	0.409	0.000	1.14	15.2	SURCHARGED
2.003	S12	15 minute 100 year Winter I+40%	52.700	51.846	0.386	0.000	1.28	17.7	SURCHARGED
2.004	S13	1440 minute 100 year Winter I+40%	52.700	51.793	0.498	0.000	0.19	5.1	SURCHARGED
1.010	S14 HYD	1440 minute 100 year Winter I+40%	52.600	51.816	1.186	0.000	0.23	2.5	SURCHARGED
1.011	S15 FILTER	1440 minute 100 year Winter I+40%	52.600	50.263	-0.107	0.000	0.18	2.5	OK
1.012	S16	1440 minute 100 year Winter I+40%	52.600	50.200	-0.120	0.000	0.09	2.5	OK

Appendix C Foul water MicroDrainage Calculations

Report: HEXHAM ROAD PLANNING DRAINAGE REPORT

Terrell Ltd		Page 1	
The Print Rooms 164-180 Union Street London		Hexham Foul Water network	
Date 17/01/2025		Designed by m.d.c.	
File Hexham foul revised 17.01.25.MDX		Checked by	
Micro Drainage		Network 2020.1.3	

FOUL SEWERAGE DESIGN

Design Criteria for Foul - Unit

Pipe Sizes STANDARD Manhole Sizes STANDARD

Industrial Flow (l/s/ha)	0.00	Add Flow / Climate Change (%)	0
Industrial Peak Flow Factor	0.00	Minimum Backdrop Height (m)	0.200
Calculation Method	EN 752	Maximum Backdrop Height (m)	1.500
Frequency Factor	0.50	Min Design Depth for Optimisation (m)	1.200
Domestic (l/s/ha)	0.00	Min Vel for Auto Design only (m/s)	0.75
Domestic Peak Flow Factor	6.00	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Foul - Unit

PN	Length (m)	Fall (m)	Slope (1:X)	Area (ha)	Units	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	7.230	0.095	76.1	0.000	13.4	0.0	1.500	o	100	Pipe/Conduit	🟢
1.001	2.750	0.035	78.6	0.000	6.6	0.0	1.500	o	100	Pipe/Conduit	🟢
1.002	20.130	0.150	134.2	0.000	9.5	0.0	1.500	o	150	Pipe/Conduit	🟢
1.003	11.380	0.085	133.9	0.000	1.8	0.0	1.500	o	150	Pipe/Conduit	🟢
1.004	3.865	0.030	130.0	0.000	4.2	0.0	1.500	o	150	Pipe/Conduit	🟢
1.005	8.315	0.064	129.9	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	🟢
1.006	3.475	0.026	133.7	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	🟢
1.007	11.435	0.085	134.5	0.000	18.6	0.0	1.500	o	150	Pipe/Conduit	🟢
1.008	8.624	0.110	78.4	0.000	22.3	0.0	1.500	o	150	Pipe/Conduit	🟢
1.009	19.835	0.180	110.2	0.000	11.9	0.0	1.500	o	150	Pipe/Conduit	🟢
1.010	10.655	0.170	62.7	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	🔴
2.000	7.350	0.095	77.4	0.000	31.9	0.0	1.500	o	100	Pipe/Conduit	🟢
2.001	10.380	0.090	115.3	0.000	23.8	0.0	1.500	o	150	Pipe/Conduit	🟢
2.002	13.680	0.100	136.8	0.000	0.6	0.0	1.500	o	150	Pipe/Conduit	🟢
2.003	12.750	0.095	134.2	0.000	0.0	0.0	1.500	o	150	Pipe/Conduit	🟢
2.004	22.040	0.175	125.9	0.000	57.5	0.0	1.500	o	150	Pipe/Conduit	🟢
2.005	8.780	0.075	117.1	0.000	31.3	0.0	1.500	o	150	Pipe/Conduit	🔴

Network Results Table

PN	US/IL (m)	E Area (ha)	E Base Flow (l/s)	E Units	Add Flow (l/s)	P.Dep (mm)	P.Vel (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.900	0.000	0.0	13.4	0.0	38	0.67	0.76	6.0	1.8
1.001	50.805	0.000	0.0	20.0	0.0	43	0.70	0.75	5.9	2.2
1.002	50.720	0.000	0.0	29.5	0.0	46	0.59	0.76	13.3	2.7
1.003	50.570	0.000	0.0	31.3	0.0	47	0.60	0.76	13.4	2.8
1.004	50.485	0.000	0.0	35.5	0.0	48	0.61	0.77	13.6	3.0
1.005	50.455	0.000	0.0	35.5	0.0	48	0.61	0.77	13.6	3.0
1.006	50.391	0.000	0.0	35.5	0.0	48	0.61	0.76	13.4	3.0
1.007	50.365	0.000	0.0	54.1	0.0	54	0.64	0.75	13.3	3.7
1.008	50.280	0.000	0.0	76.4	0.0	51	0.82	0.99	17.5	4.4
1.009	50.170	0.000	0.0	88.3	0.0	58	0.74	0.83	14.7	4.7
1.010	49.990	0.000	0.0	88.3	0.0	50	0.91	1.11	19.6	4.7
2.000	51.400	0.000	0.0	31.9	0.0	49	0.75	0.76	5.9	2.8
2.001	51.255	0.000	0.0	55.7	0.0	52	0.68	0.82	14.4	3.7
2.002	51.165	0.000	0.0	56.3	0.0	55	0.64	0.75	13.2	3.8
2.003	51.065	0.000	0.0	56.3	0.0	54	0.65	0.76	13.3	3.8
2.004	50.970	0.000	0.0	113.8	0.0	65	0.73	0.78	13.8	5.3
2.005	50.795	0.000	0.0	145.1	0.0	68	0.77	0.81	14.3	6.0

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Report: HEXHAM ROAD PLANNING DRAINAGE REPORT

Terrell Ltd		Page 3
The Print Rooms 164-180 Union Street London	Hexham Foul Water network	
Date 17/01/2025	Designed by m.d.c.	
File Hexham foul revised 17.01.25.MDX	Checked by	
Micro Drainage	Network 2020.1.3	

Manhole Schedules for Foul - Unit

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
1	52.755	1.855	Open Manhole	1200	1.000	50.900	100				
2	52.755	1.950	Open Manhole	1200	1.001	50.805	100	1.000	50.805	100	
3	52.755	2.035	Open Manhole	1200	1.002	50.720	150	1.001	50.770	100	
5	52.755	2.185	Open Manhole	1200	1.003	50.570	150	1.002	50.570	150	
5a	52.755	2.270	Open Manhole	1200	1.004	50.485	150	1.003	50.485	150	
5b	52.755	2.300	Open Manhole	1200	1.005	50.455	150	1.004	50.455	150	
5c	52.755	2.364	Open Manhole	1200	1.006	50.391	150	1.005	50.391	150	
6	52.755	2.390	Open Manhole	1200	1.007	50.365	150	1.006	50.365	150	
8	52.755	2.475	Open Manhole	1200	1.008	50.280	150	1.007	50.280	150	
10	52.625	2.455	Open Manhole	1200	1.009	50.170	150	1.008	50.170	150	
11	52.600	2.610	Open Manhole	1200	1.010	49.990	150	1.009	49.990	150	
12	52.720	1.320	Open Manhole	1200	2.000	51.400	100				
13	52.720	1.465	Open Manhole	1200	2.001	51.255	150	2.000	51.305	100	
14	52.750	1.585	Open Manhole	1200	2.002	51.165	150	2.001	51.165	150	
15	52.750	1.685	Open Manhole	1200	2.003	51.065	150	2.002	51.065	150	
16	52.700	1.730	Open Manhole	1200	2.004	50.970	150	2.003	50.970	150	
20	52.700	1.905	Open Manhole	1200	2.005	50.795	150	2.004	50.795	150	
23	52.700	2.880	Open Manhole	1200	1.011	49.820	150	1.010	49.820	150	
								2.005	50.720	150	900
	0.000		Open Manhole	0		OUTFALL		1.011	49.220	150	

No coordinates have been specified, layout information cannot be produced.

Report: HEXHAM ROAD PLANNING DRAINAGE REPORT

Terrell Ltd		Page 4
The Print Rooms 164-180 Union Street London	Hexham Foul Water network	
Date 17/01/2025	Designed by m.d.c.	
File Hexham foul revised 17.01.25.MDX	Checked by	
Micro Drainage		Network 2020.1.3

PIPELINE SCHEDULES for Foul - Unit

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	100	1	52.755	50.900	1.755	Open Manhole	1200
1.001	o	100	2	52.755	50.805	1.850	Open Manhole	1200
1.002	o	150	3	52.755	50.720	1.885	Open Manhole	1200
1.003	o	150	5	52.755	50.570	2.035	Open Manhole	1200
1.004	o	150	5a	52.755	50.485	2.120	Open Manhole	1200
1.005	o	150	5b	52.755	50.455	2.150	Open Manhole	1200
1.006	o	150	5c	52.755	50.391	2.214	Open Manhole	1200
1.007	o	150	6	52.755	50.365	2.240	Open Manhole	1200
1.008	o	150	8	52.755	50.280	2.325	Open Manhole	1200
1.009	o	150	10	52.625	50.170	2.305	Open Manhole	1200
1.010	o	150	11	52.600	49.990	2.460	Open Manhole	1200
2.000	o	100	12	52.720	51.400	1.220	Open Manhole	1200
2.001	o	150	13	52.720	51.255	1.315	Open Manhole	1200
2.002	o	150	14	52.750	51.165	1.435	Open Manhole	1200
2.003	o	150	15	52.750	51.065	1.535	Open Manhole	1200
2.004	o	150	16	52.700	50.970	1.580	Open Manhole	1200
2.005	o	150	20	52.700	50.795	1.755	Open Manhole	1200
1.011	o	150	23	52.700	49.820	2.730	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	7.230	76.1	2	52.755	50.805	1.850	Open Manhole	1200
1.001	2.750	78.6	3	52.755	50.770	1.885	Open Manhole	1200
1.002	20.130	134.2	5	52.755	50.570	2.035	Open Manhole	1200
1.003	11.380	133.9	5a	52.755	50.485	2.120	Open Manhole	1200
1.004	3.865	130.0	5b	52.755	50.455	2.150	Open Manhole	1200
1.005	8.315	129.9	5c	52.755	50.391	2.214	Open Manhole	1200
1.006	3.475	133.7	6	52.755	50.365	2.240	Open Manhole	1200
1.007	11.435	134.5	8	52.755	50.280	2.325	Open Manhole	1200
1.008	8.624	78.4	10	52.625	50.170	2.305	Open Manhole	1200
1.009	19.835	110.2	11	52.600	49.990	2.460	Open Manhole	1200
1.010	10.655	62.7	23	52.700	49.820	2.730	Open Manhole	1200
2.000	7.350	77.4	13	52.720	51.305	1.315	Open Manhole	1200
2.001	10.380	115.3	14	52.750	51.165	1.435	Open Manhole	1200
2.002	13.680	136.8	15	52.750	51.065	1.535	Open Manhole	1200
2.003	12.750	134.2	16	52.700	50.970	1.580	Open Manhole	1200
2.004	22.040	125.9	20	52.700	50.795	1.755	Open Manhole	1200
2.005	8.780	117.1	23	52.700	50.720	1.830	Open Manhole	1200
1.011	6.260	10.4		0.000	49.220		Open Manhole	0

Appendix D Construction programme

Appendix E Thames Water connection consent

Report: HEXHAM ROAD PLANNING DRAINAGE REPORT



Mr. Kevin Hendley
Morgan Sindall
Construction &
Infrastructure
Aquasulis, 10 -14 Bath Rd
Slough, Berkshire
SL1 3SA

DS reference: DS6117087

developer.services@thameswater.co.uk

0800 009 3921

Monday to Friday, 8am to 5pm

thameswater.co.uk/developerservices

09 October 2024

Notice of consent to connect to a public sewer / public lateral drain

Site address: The Willows, 2 Hexham Road, Reading, Berkshire, RG2 7UG

Thank you for your application for a new sewer connection at the above address.

We are pleased to inform you that we have given our conditional consent for your proposed connection(s) to the public sewer under Section 106 of the Water Industry Act 1991.

What is this consent for?

This consent is given solely for the legal right of communication (i.e. method/mode of connection) with the public sewer, in accordance with the description in the below box.

This consent does not and cannot be used to discharge any drainage related planning conditions. Any planning conditions related to drainage should be applied to be removed to the LPA and Thames Waters Development Control team. For pre-planning capacity-based enquiries or pre-planning concerns regarding our network please make a Pre-Planning Enquiry application. Applications can be made on the Thames Water website.

This Consent does not give you any inferred right to enter or cross land owned by a third party and must not be used to discharge any drainage-related planning conditions. You will be responsible for obtaining any necessary licenses and/or permission from the highway authority, planning authority and/or private/third-party landowners.

Inspections and Completion certificates

We will need to physically inspect the connection to our sewer before you back-fill the trench. Please call us on 0800 009 3921, at least **ten working days** prior to backfilling the connection works to schedule an inspection visit. Please refer to the "Conditions of Consent (5)" for further details. When the connection has been completed satisfactorily, a completion certificate will be issued. This certificate authenticates the standards to which your connection works were carried out and does not infer adoption of your new drains or sewers. You will be responsible for repairs and maintenance of all drains including those outside your site boundary. You will need to submit an adoption agreement under section 102 or 104 of the Water Industry Act if you want us to adopt any of your drains or sewers. You can do this via

<https://developers.thameswater.co.uk/Developing-a-large-site/Apply-and-pay-for-services/Wastewater-services/Adopting-sewers-and-other-assets>

Report: HEXHAM ROAD PLANNING DRAINAGE REPORT



Sewer Connection Quotes

If you would like us to carry out the connection works on your behalf, we will provide you a quote and deliver in accordance with the below.

Waste connection only (no pipe laying)

We will discuss the requirements with you and quote for the works required and charge in accordance with section 7 (pages 25-28) of our current fixed price charging arrangements.

lateral drain and sewer requisitions

Waste connections include pipelaying for the provision of a lateral drain (pipe serving one property or one curtilage) and/or a new sewer (pipe serving more than one property).

If there is no public sewer easily accessible to your property or your site has no means to connect your lateral drain and/or sewer due to third party land, you can requisition (formally request) Thames Water to lay these pipes as part of our public network under Section 98-101 of the Water Industry Act 1991. Please refer to section 8 (pages 29-31) of our current charging arrangements.

You can estimate the costs for these connections yourself by referring to section 7 and 8 of our current charging arrangements here.

Our consent is subject to the conditions below:

Location	Description
The Willows, 2 Hexham Road, Reading, Berkshire, RG2 7UG	Direct Foul water Connection 1 x 150mm internal diameter direct foul water connection into an existing 450mm internal diameter foul water sewer located Hexham Roadside via an existing manhole chamber referenced chamber in accordance with Code for Adoption sewerage. As per drawing No. HEX-TER-52-0XX-D-C-5001 Rev T01
	Direct Surface water Connection 1 x 150mm internal diameter direct surface water connection into an existing 750mm internal diameter surface water sewer located at Northumberland Avenue side via an existing manhole chamber referenced 2404 chamber in accordance with Code for Adoption sewerage.
	As per drawing No. HEX-TER-52-0XX-D-C-5001 Rev T01

Please note that we will allow ONE amendment to be made to this consent within 12 months from the date of issue. Any more than ONE amendment within this time period will entail additional fees. Any amendments sought beyond this time period will require a new application to be submitted.

Report: HEXHAM ROAD PLANNING DRAINAGE REPORT



The reference number for your application is DS6117087. Please quote this in any future correspondence.

If you're proposing to build within three metres of a public sewer, or within one metre of a lateral drain, you'll need to apply to us for a separate build over agreement. You can do this via thameswater.co.uk/buildover.

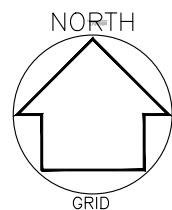
If you've any queries, please call our helpdesk on 0800 009 3921 (8am to 5pm, Monday to Friday) or email developer.services@thameswater.co.uk.

Yours sincerely,

A handwritten signature in black ink, appearing to be "Ade Oluwa Bankole".

AdeOluwa Bankole (on behalf of Jade Almeida)
Project Engineer – Wastewater Connections
Developer Services – Wastewater

Appendix F Proposed drainage layout and detail drawings



PLANNING NOTES.
1. Surface water network, storage volume and restricted discharge hydrobrake control as specified, are calculated to provide a maximum restricted discharge of 2.5 l/sec with no flooding for the 1:100+40% storm event in accordance with the submitted document 'Flood Risk Assessment & Drainage Strategy Report Ref E05076-ECN-XX-RP-C-7001-P01 and as agreed within Thames Waters Pre-planning enquiry stated within the above report.
2. Exceedance flow routes shown as arrowed. Maximum flood levels within the tank for the 1:100+40% year event calculated at 51.702m with a top of tank level of 51.800m. Therefore storage tank has a potential spare capacity of approx 19m³ (8% of total tank volume).
Under extreme exceedance conditions the lowest outlet in the surface water system is the aco cutoff drain across the eastern entrance. This low point will act as an overflow when the internal flood level reaches a level of 51.750, 1.0m below the proposed threshold levels.

Existing Thames Water foul water manhole 2404
CL 52.700
IL 49.920
3.780dp
(As surveyed cover and invert levels)

Note. Paved areas to drain to grassed areas for soakage to ground

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Proposed highway gully connection from Section 278 works to connect to existing Thames Water sewer, refer to drawing HEX-TER-54-0XX-D-C-6001

For all proposed works within the highway boundary refer to drawing HEX-TER-54-0XX-D-C-6001

Proposed highway gully connection from Section 278 works to connect to existing Thames Water sewer, refer to drawing HEX-TER-54-0XX-D-C-6001

Aco H range RD 150V single access unit adjacent to kerb and connected into top of tank via the bottom knock out connection with a 100mm pipe bed Type Z, all to act as a tank vent.

Hexham Road

Gullies to act as overflow to natural drainage through tree pit once saturation point met.

Note. All paving gullies in courtyard areas are picking up canopy drainage and subject to revision upon further information from canopy supplier

The survey is on a Local Grid that is coincident with the Ordnance Survey National Grid
The Scale Factor = 1
All Levels refer to Ordnance Survey Datum established using GNSS at Stn S103 (52.595m)
Survey Date: June 2020

DRAINAGE KEY SURFACE WATER

- 300mm inspection chamber, cover level, invert level and depth shown.
- 450mm inspection chamber, cover level, invert level and depth shown.
- 600mm inspection chamber, cover level, invert level and depth shown.
- 600mm inspection chamber catch pit, cover level, invert level and depth shown.
- Paving gully with 150mm connection and bed type Z (concrete surround).
- Surface water main run, pipe diameter and gradient shown.
- Aco channel threshold drain.
- Aco channel to paved areas.
- Hydrobrake manhole, cover level, invert level, diameter and depth shown.
- Stormhark water treatment device unit as shown in construction details.
- Proposed surface water storage open void rate tank to stated dimensions, tank to be vented via a 100mm pipe with the use of a ground level vent box.
- Aco drainage discharge points to planters providing a first point of discharge to ground until saturation, refer to drainage details.
- Approximate exceedance route flow direction where storm event is greater than 1:100+40%.

DRAINAGE KEY FOUL WATER

- 250mm inspection chamber, cover level, invert level and depth shown.
- 450mm inspection chamber, cover level, invert level and depth shown.
- Concrete surrounded backdrop to inspection chamber as detailed.
- Foul water main run, pipe diameter and gradient where necessary shown.
- Paving gully with 150mm connection and bed type Z (concrete surround).
- Floor gully set into slab with 100mm connection and bed type Z (concrete surround).

NOTES

- All drainage pipework through slab to be provided with a roddable access point at a maximum level of 1200mm above FFL. All foul water connections to be 100mm unless stated otherwise laid to a minimum gradient no flatter than 1:40, surface water under slab connections to be 150mm laid to a gradient no flatter than 1:80.
- All foul and surface water drains must be constructed in accordance with Part H of the Building Regulations 2000, BS EN 752 (parts 1-7) and where appropriate the relevant Agreement Certificates.
- Unless noted otherwise pipes of differing diameters within the same manhole shall be laid with common soffits.
- All cover levels to external chambers as shown subject to revision once further information received regarding proposed external levels.
- Refer to M and E services drawings for through slab connection co-ordinates.
- A petrol interceptor has not been deemed a requirement for the surface water system as the parking area is less than 800m² and less than 50 parking spaces.

SURFACE WATER MANHOLE SCHEDULE

No	CL	IL	Depth	Type	Dia	Easting	Northing
S1	52.725	52.125	0.600	3B	300	472256.241	171426.104
S2	52.750	51.895	0.855	3B	450	472264.691	171411.039
S3	52.750	51.685	1.065	3B	450	472279.835	171411.267
S4	52.750	51.200	1.550	3B	450	472280.070	171424.403
S5	52.750	51.095	1.655	3B	450	472281.337	171426.361
S5B	52.750	50.915	1.835	3B	450	472281.139	171446.288
S6	52.625	50.845	1.780	CP	600	472272.115	171448.048
S7	52.430	50.570	1.860	3C	600	472244.802	171461.350
S8	52.760	50.510	2.250	3A	600	472228.657	171461.656
S9	52.750	52.150	0.600	3B	300	472246.730	171425.570
S10	52.955	51.975	0.980	3B	450	472246.499	171405.823
S11	52.730	51.400	1.330	3B	450	472232.992	171405.591
S12	52.700	51.310	1.390	3B	450	472222.005	171412.868
S13	52.700	51.145	1.555	3B	450	472222.007	171437.167
S14	52.600	50.480	2.620	HYD	1200	472222.089	171458.112
S15	52.650	50.470	3.805	FILTER	750	472222.964	171460.043
S16	52.650	50.170	2.480	3B	450	472223.628	171461.914

Notes:
Total depth of S14 includes 500mm sump.
All external covers within paved footpath areas to be installed with inset covers to accept adjacent paving.

FOUL WATER MANHOLE SCHEDULE

No	CL	IL	Depth	Type	Dia	Easting	Northing
F1	52.755	50.900	1.855	3B	450	472279.223	171419.069
F2	52.755	50.805	1.950	3B	450	472279.449	171425.127
F2A	52.755	50.720	2.035	3B	450	472281.735	171425.588
F3	52.755	51.000	1.755	3B	450	472279.218	171431.373
F4	52.755	51.000	1.755	3B	450	472279.218	171433.371
F5	52.755	50.570	2.185	3B	450	472281.892	171446.476
F5A	52.755	50.485	2.270	3B	450	472270.517	171446.700
F5B	52.755	50.455	2.300	3B	450	472266.652	171446.699
F5C	52.755	50.391	2.364	3B	450	472258.337	171446.697
F6	52.755	50.385	2.390	3B	450	472254.861	171446.697
F7	52.760	51.200	1.560	3B	450	472243.005	171440.399
F8	52.755	50.280	2.475	3B	450	472243.429	171446.925
F9	52.750	51.400	1.350	3B	450	472241.225	171451.224
F10	52.760	50.170	2.590	3B	450	472242.959	171455.536
F11	52.600	49.990	2.610	3A	450	472223.123	171455.460
F12	52.720	51.400	1.670	3B	450	472245.741	171424.184
F13	52.720	51.255	1.465	3B	450	472245.957	171416.456
F14	52.750	51.165	1.585	3B	450	472243.737	171406.317
F15	52.735	51.065	1.670	3B	450	472230.105	171406.301
F16	52.700	50.970	1.730	3B	450	472220.795	171414.998
F17	52.760	51.000	1.760	3B	450	472223.061	171416.058
F18	52.760	51.000	1.760	3B	450	472222.796	171423.743
F19	52.760	51.000	1.760	3B	450	472223.114	171432.396
F20	52.700	50.795	1.905	3A	450	472220.740	171437.042
F21	52.760	51.000	1.760	3B	450	472222.786	171442.780
F22	52.760	51.000	1.760	3B	450	472222.651	171449.337
F23	52.700	49.820	2.880	3A	450	472218.978	171445.646

Note all external covers within paved footpath areas to be installed with inset covers to accept adjacent paving.

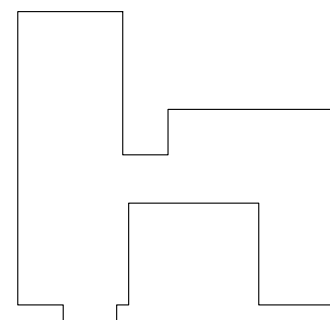
NOTE.
Only stated dimensions and coordinates to be worked to.

Tree protection areas

Root protection areas for existing and retained trees. Positioning taken from influence landscaping drawing HEX-CPM-01-000-D-L-90201

Rev	Description	Date	Issued by
C10	ACO DRAINAGE TO PLANTERS ADDED IN COURTYARD. ACO AT TREE PLANTER REVISED TO OVERFLOW GULLY	13.05.25	SPO
C09	MINOR REVISIONS TO DRAINAGE POSITIONS THROUGH SLAB. COORD NOTE ADDED.	30.04.25	SPO
C08	MINOR REVISIONS TO LEVELS IN SCHEDULES S15 FILTER MANHOLE REVISED	10.04.25	SPO
C07	ADDITIONAL INFORMATION ADDED FOR PLANNING. SOME ACO CHANNEL REMOVED	05.03.25	SPO
C06	MINOR REVISIONS TO THRESHOLD DRAINAGE S7 COVER LEVEL CORRECTED	25.02.25	SPO
C05	F2, F2A, S5 REPOSITIONED TO ACCOMMODATE CHANGES IN SPRINKLER TANK. BACK DROP REMOVED F23.	17.02.25	SPO
C04	CRANE BASE ADDED. S12 F16 REPOSITIONED. DRAINAGE REALIGNED TO REMOVE MANHOLES IN MEP PLANT AREA	20.01.25	SPO
C03	COORDINATION AMENDMENTS. TREATMENT FILTER ADDED	10.12.24	SPO
C02	REVISED DUE TO RESPONSE FROM LABC	22.08.24	SPO
C01	TREE PROTECTION AREAS ADDED. REVISION OF SUPRIRPS. FOUL AND SURFACE WATER NETWORK. ADDITIONAL GULLIES ADDED. TABLES REVISED. TANK VENT ADDED.	05.07.24	SPO
T01	FOR TENDER	16.04.24	SPO
P01	FOR COORDINATION	13.03.24	SPO

KEY PLAN



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DRAWING TITLE

3324 Hexham Road-MS

DRAINAGE LAYOUT

SCALE (A1)

1:200@A1

START DATE

MARCH 24

DESIGN STAGE

RIBA 4

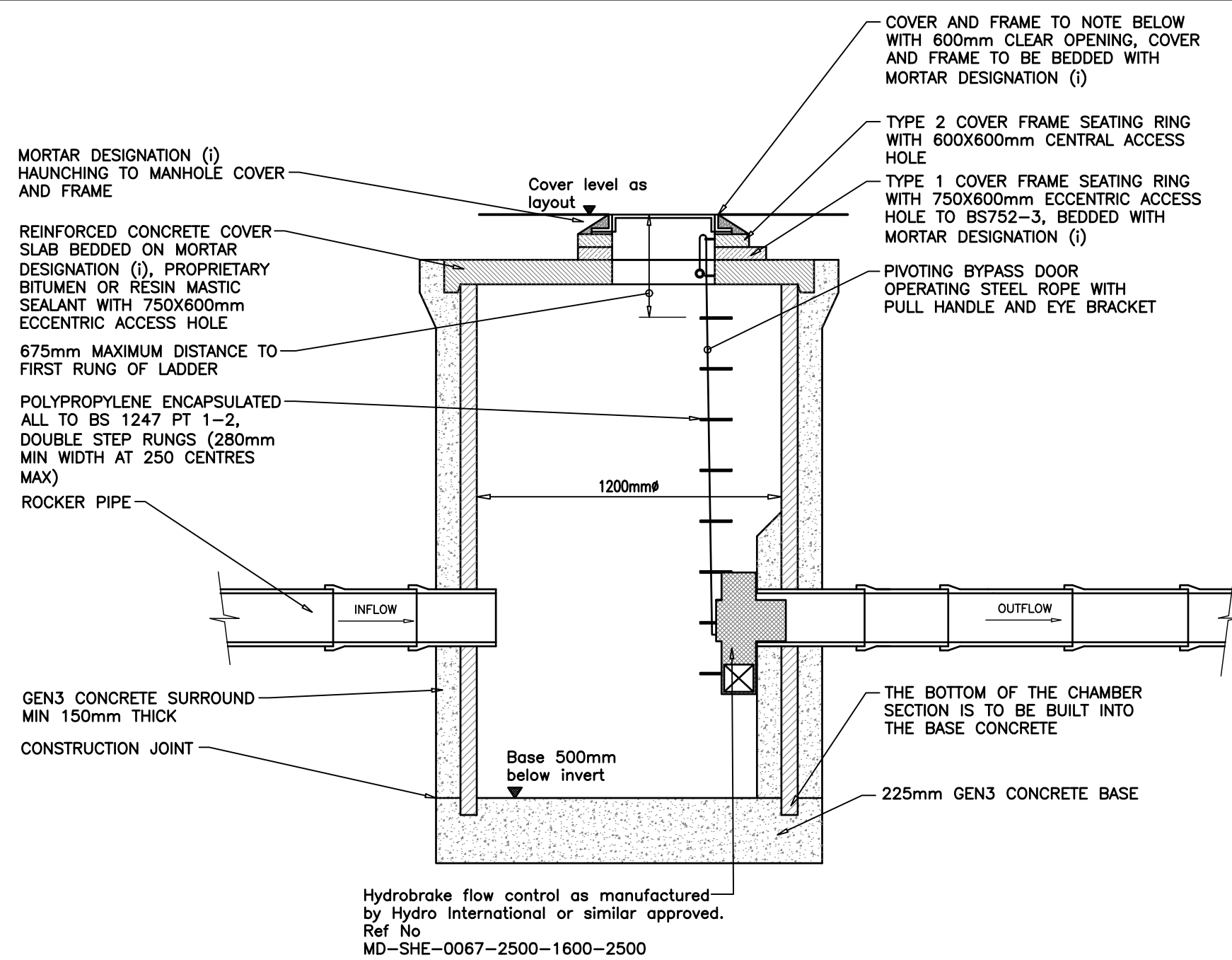
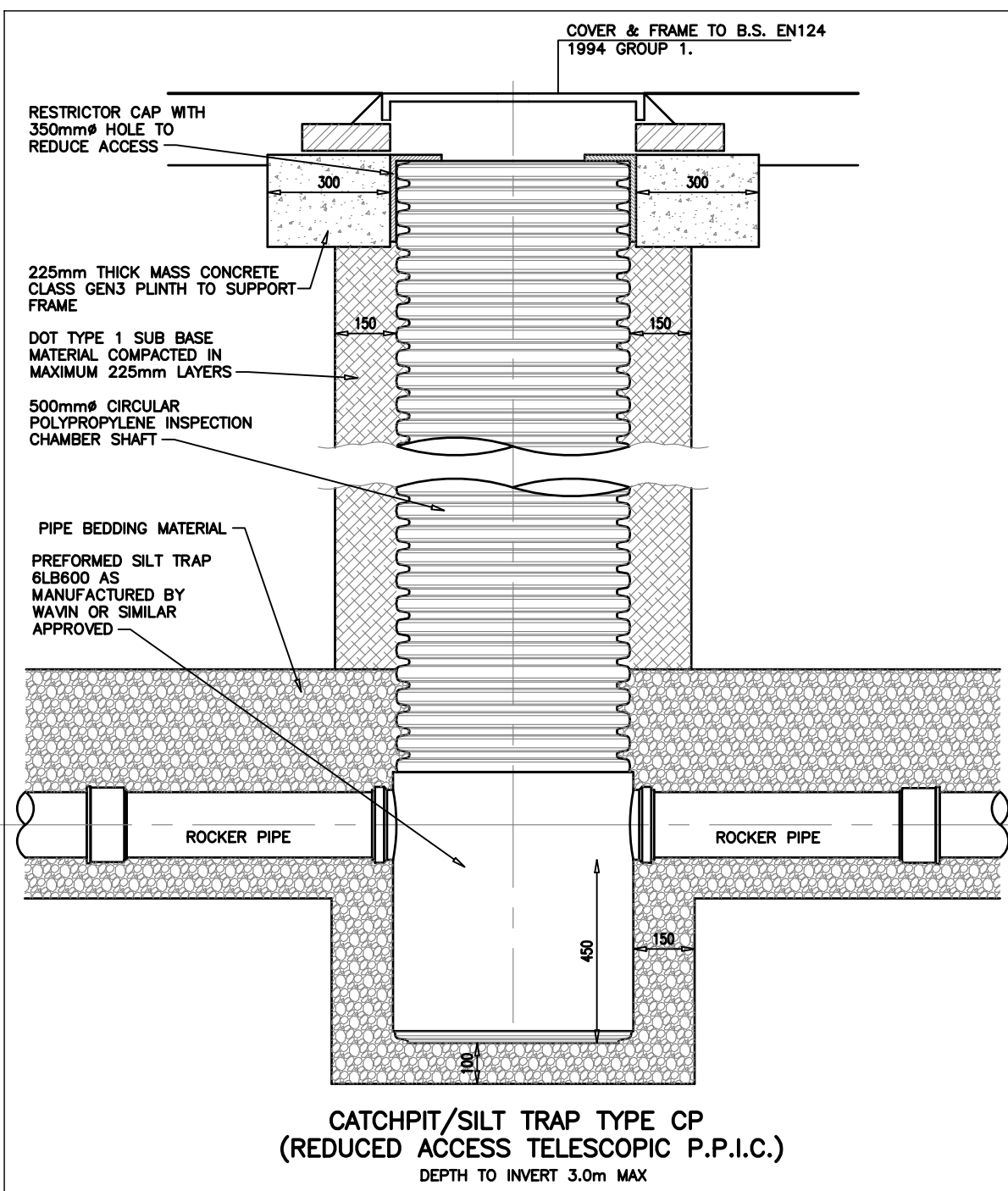
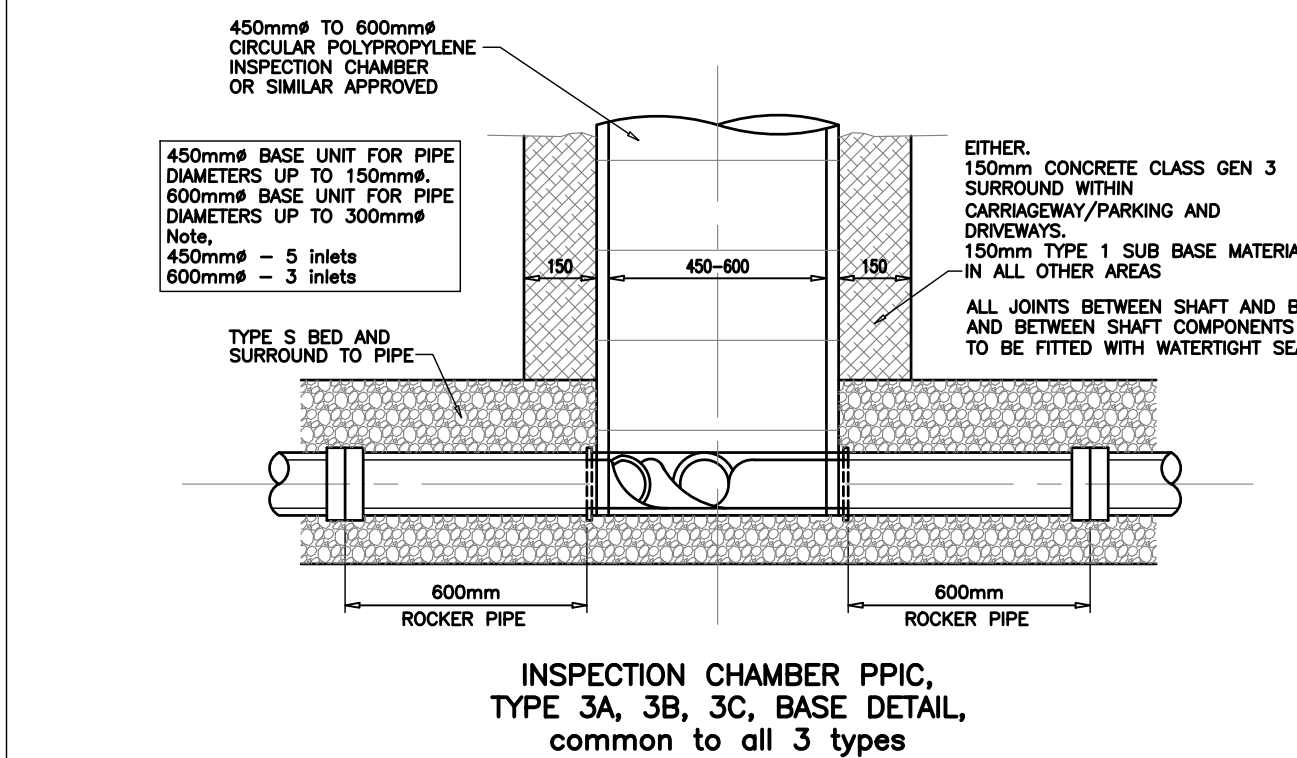
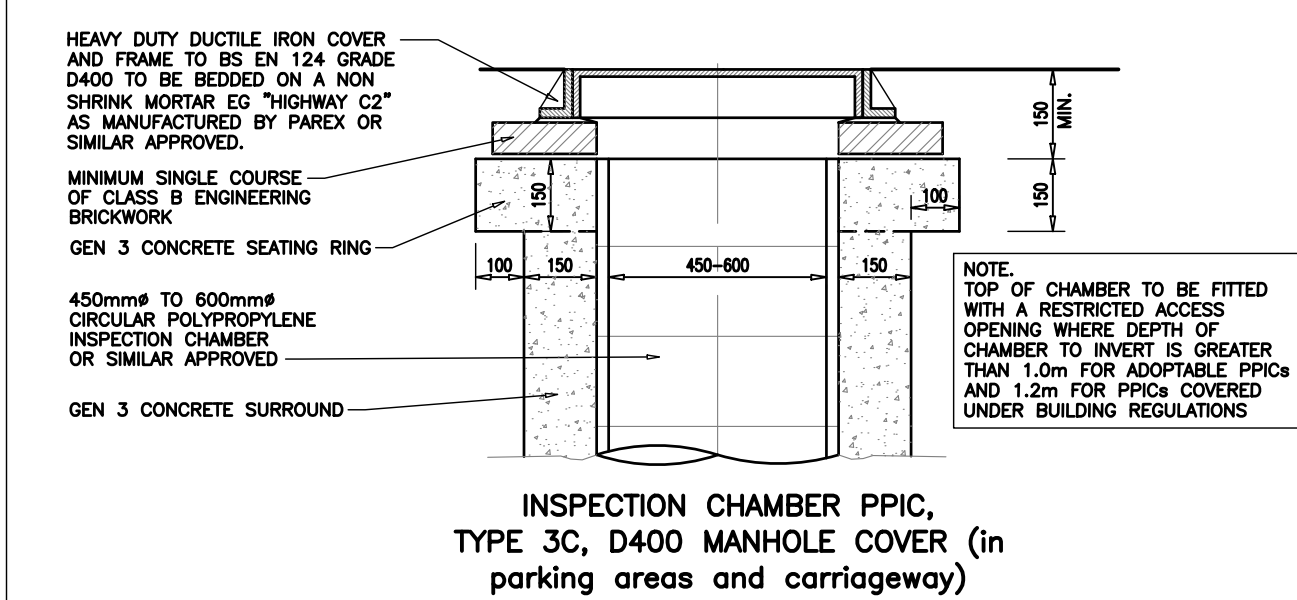
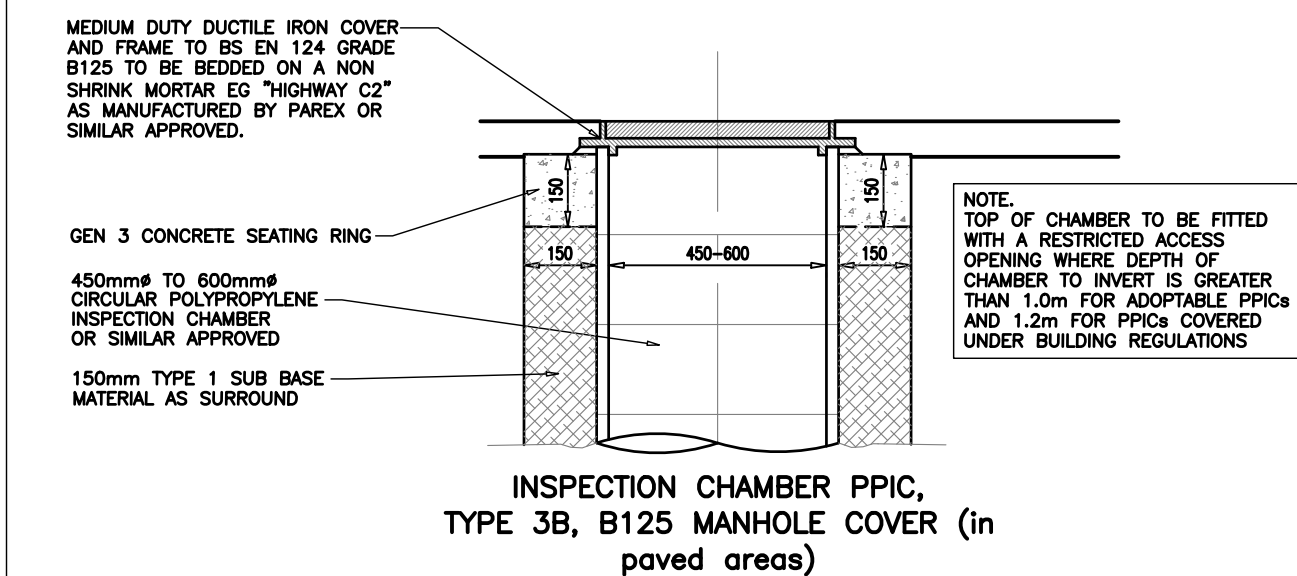
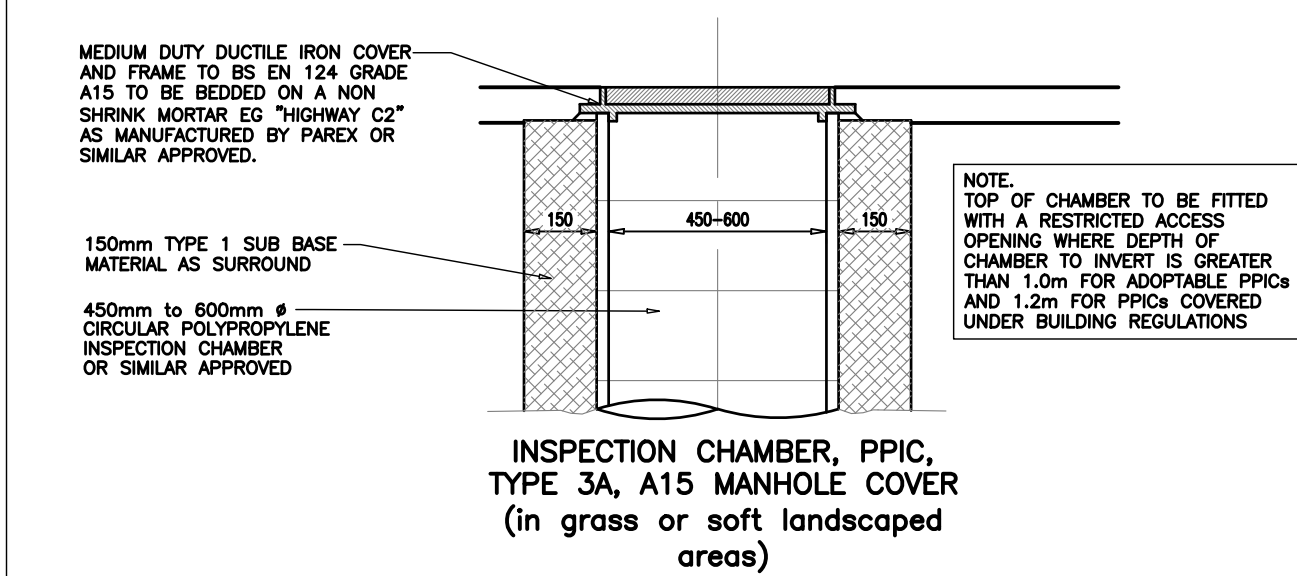
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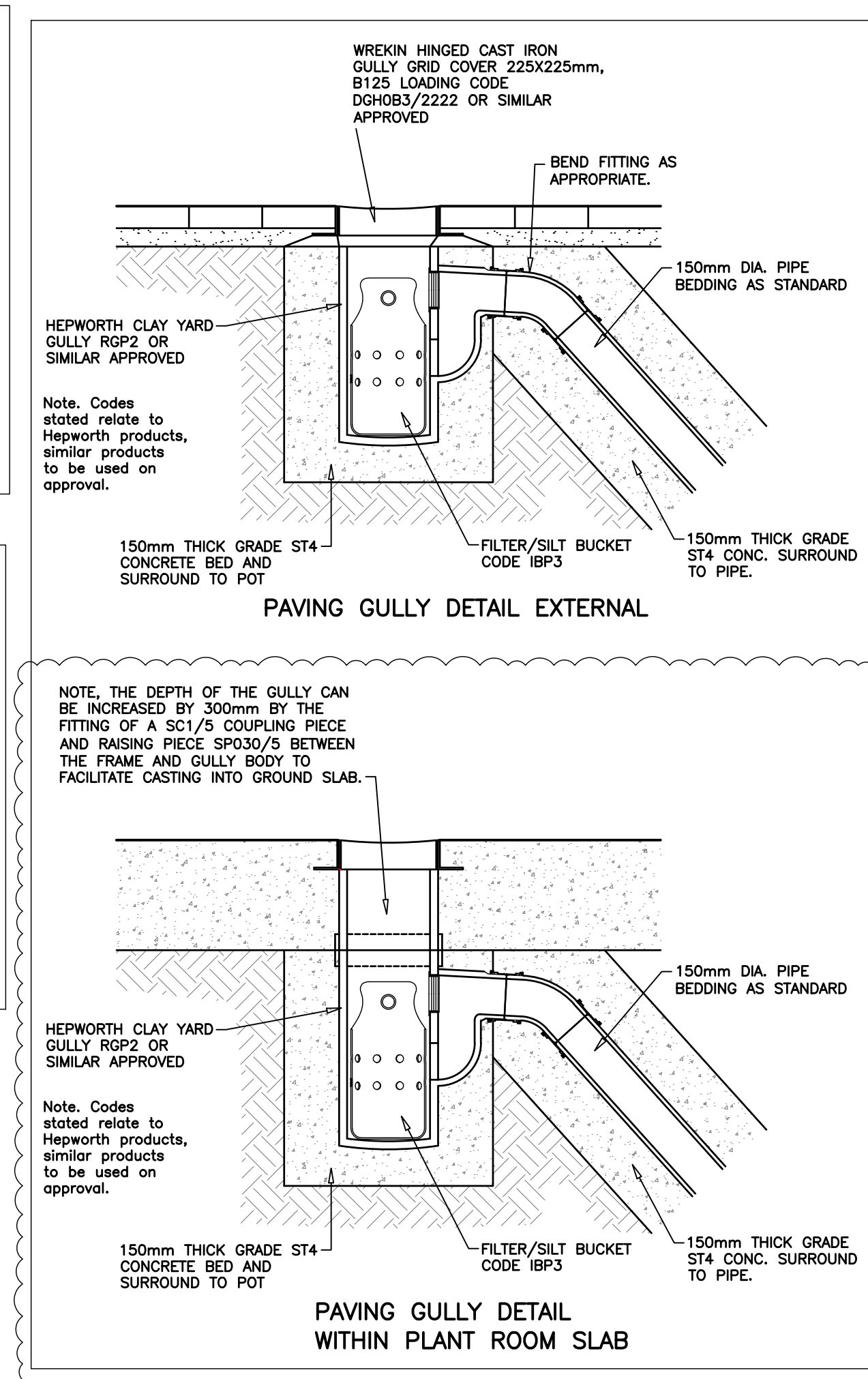
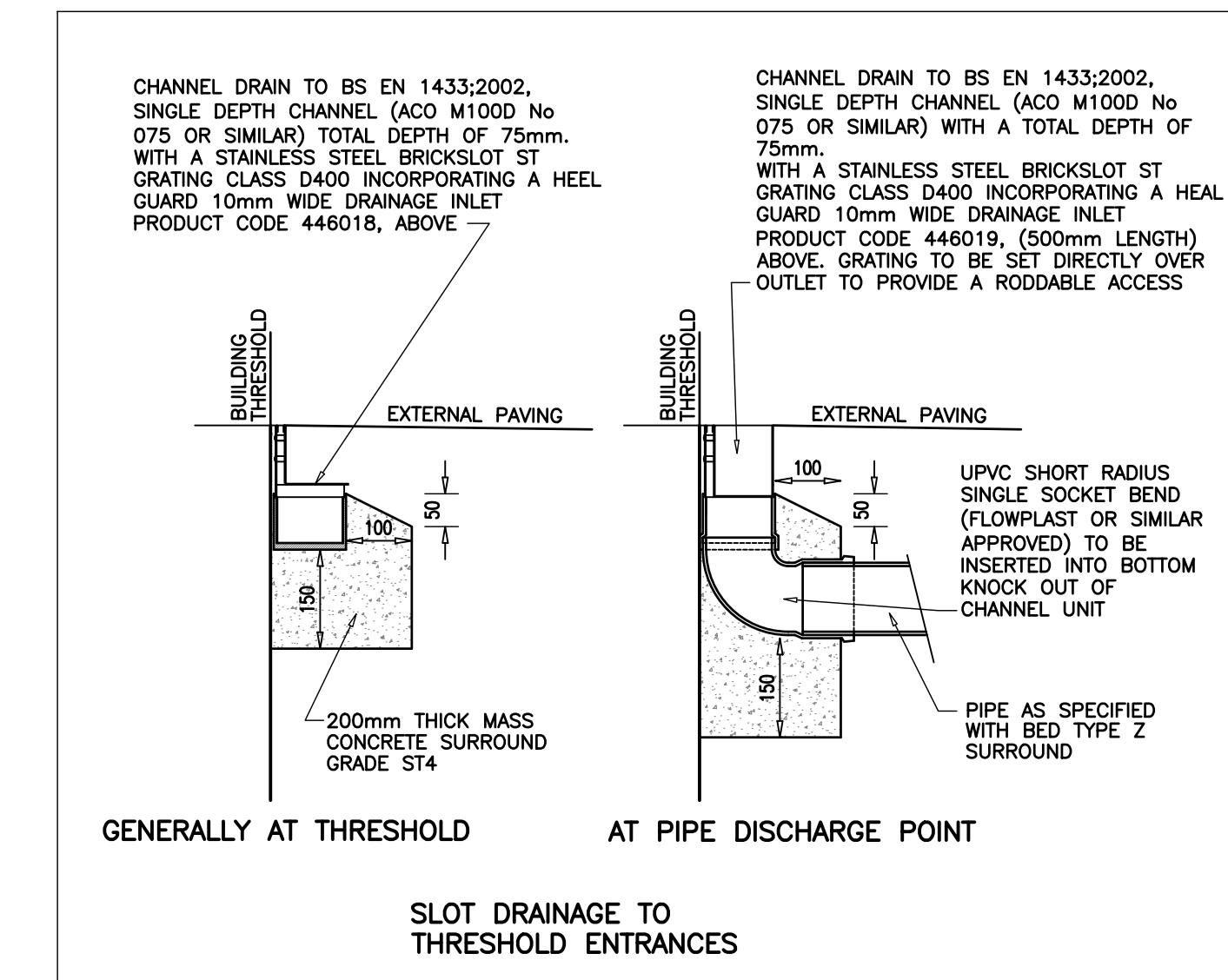
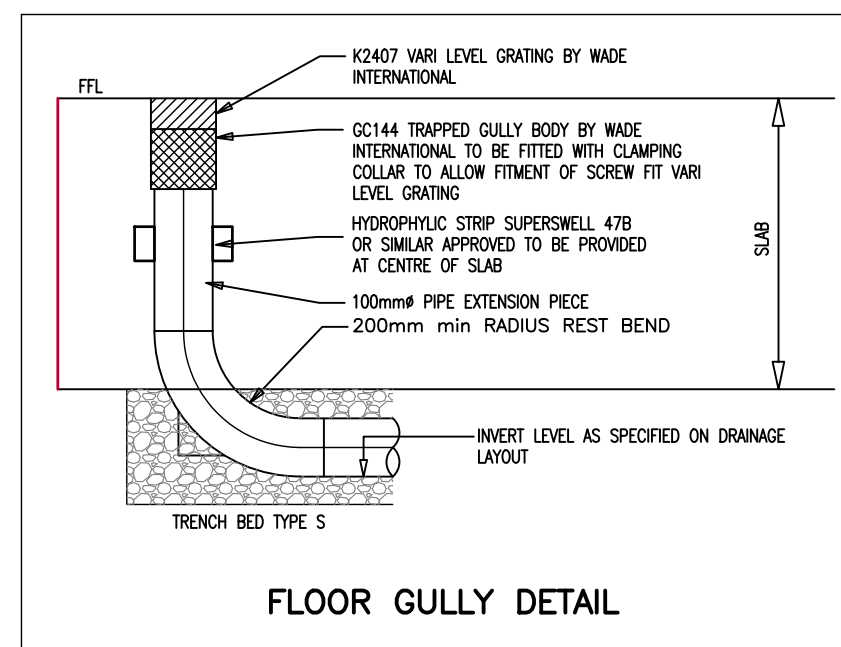
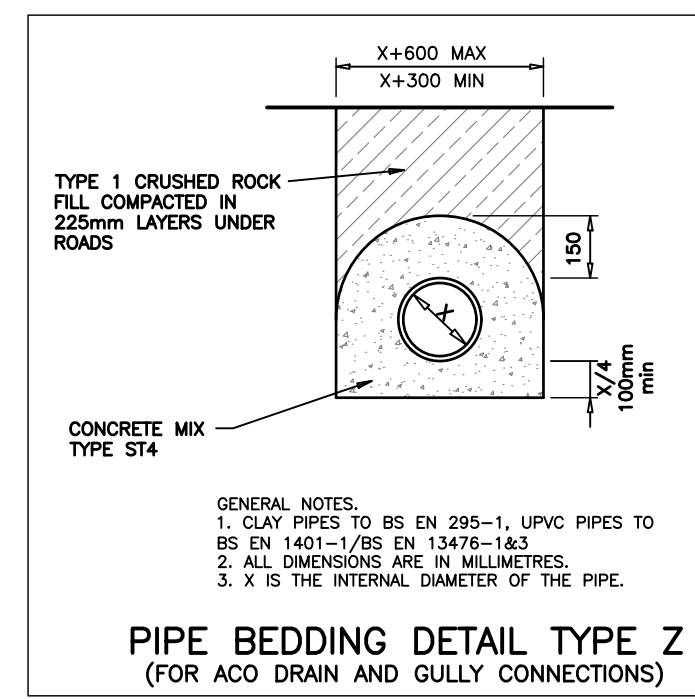
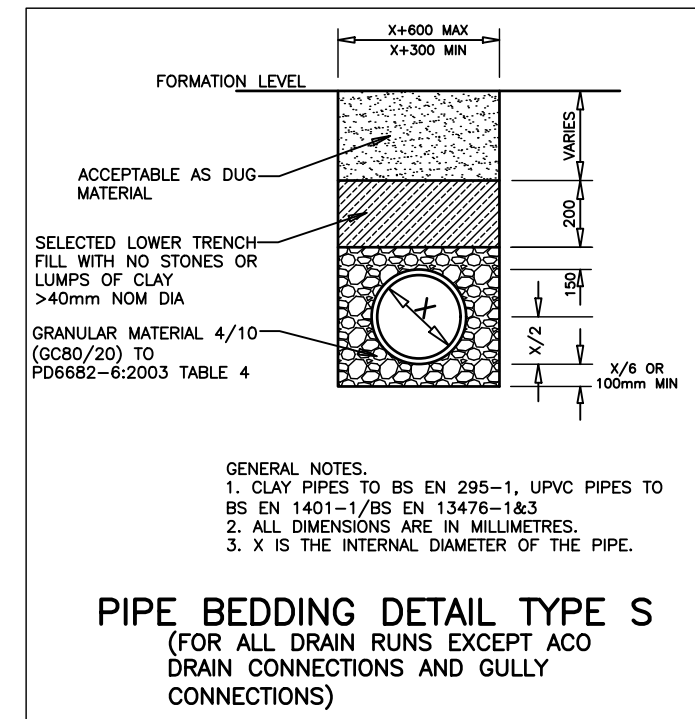
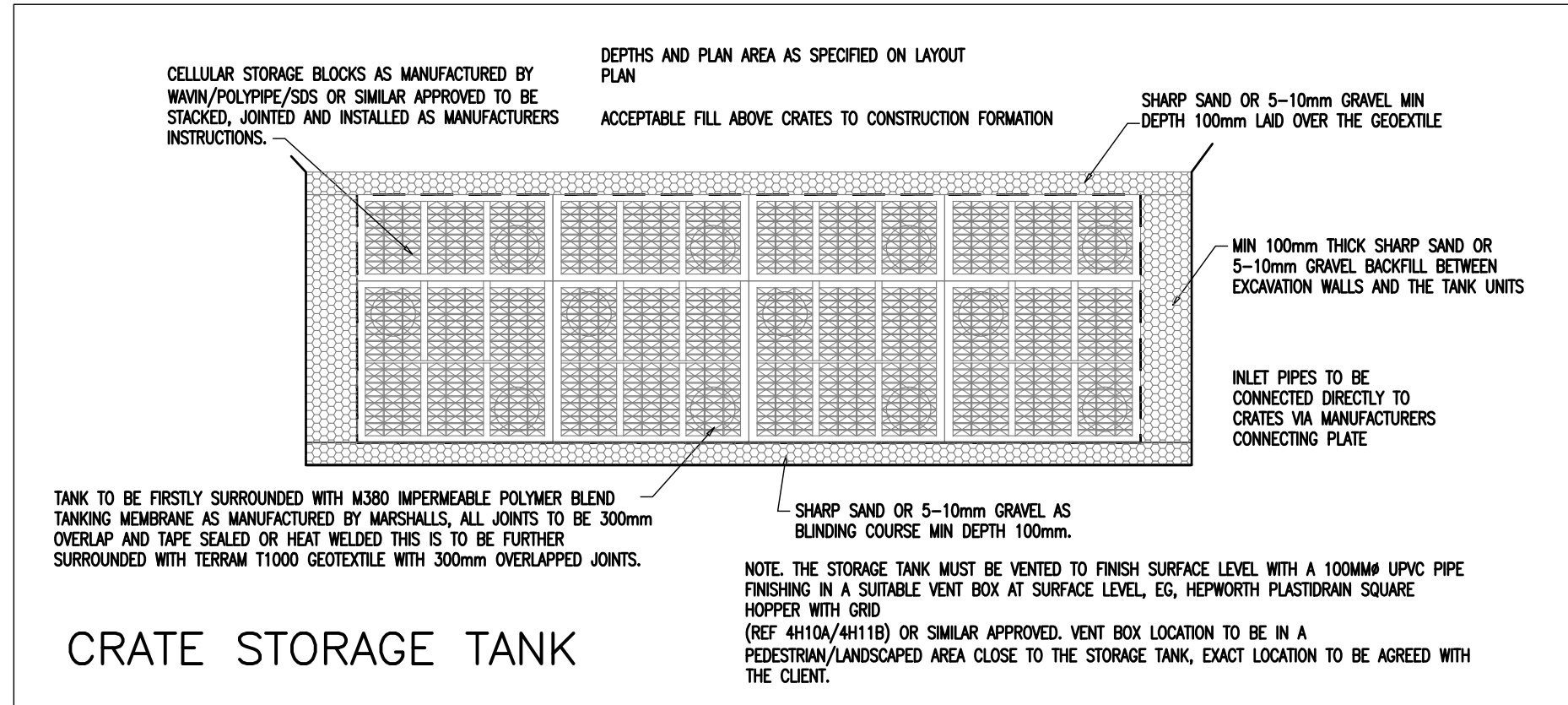
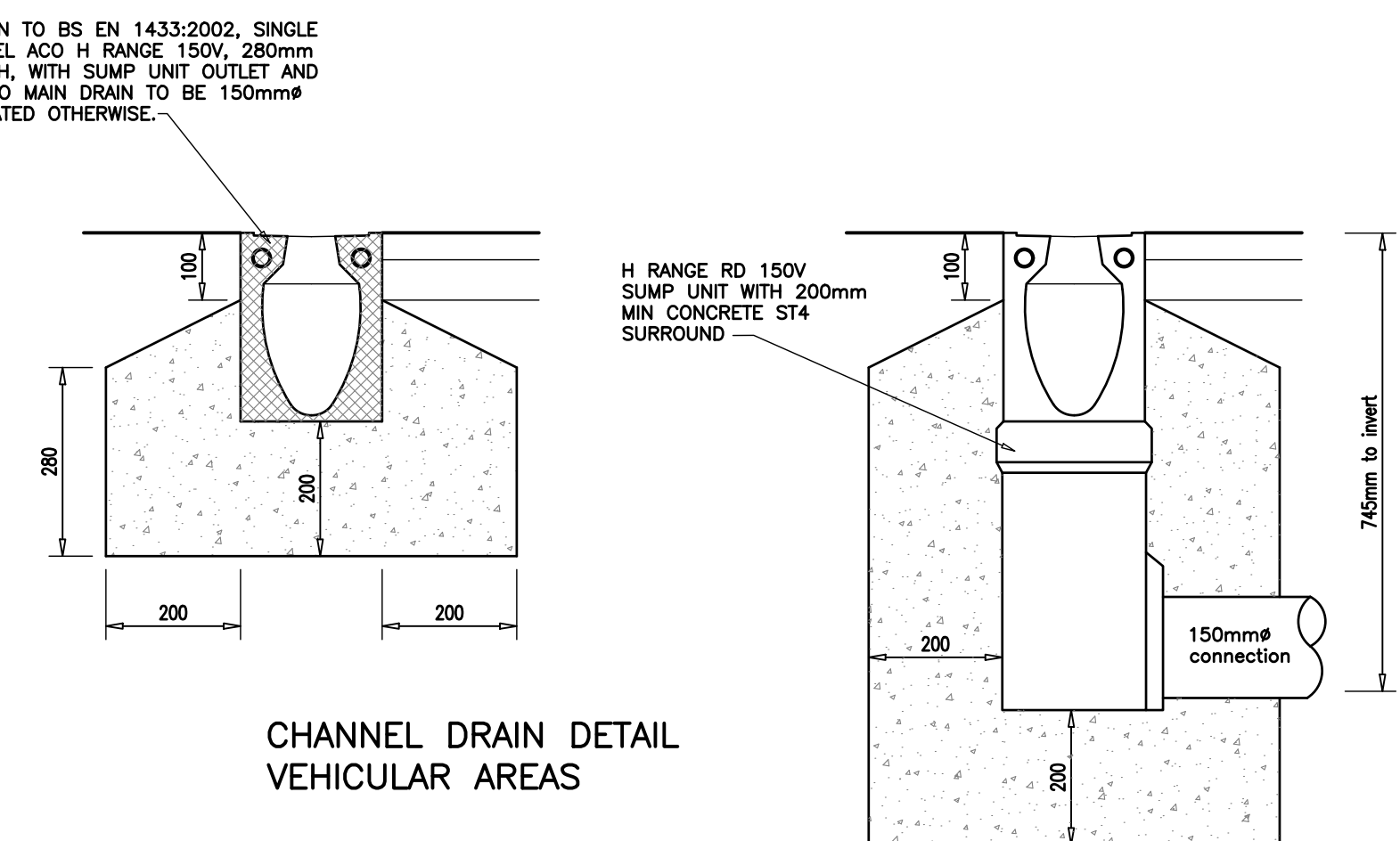
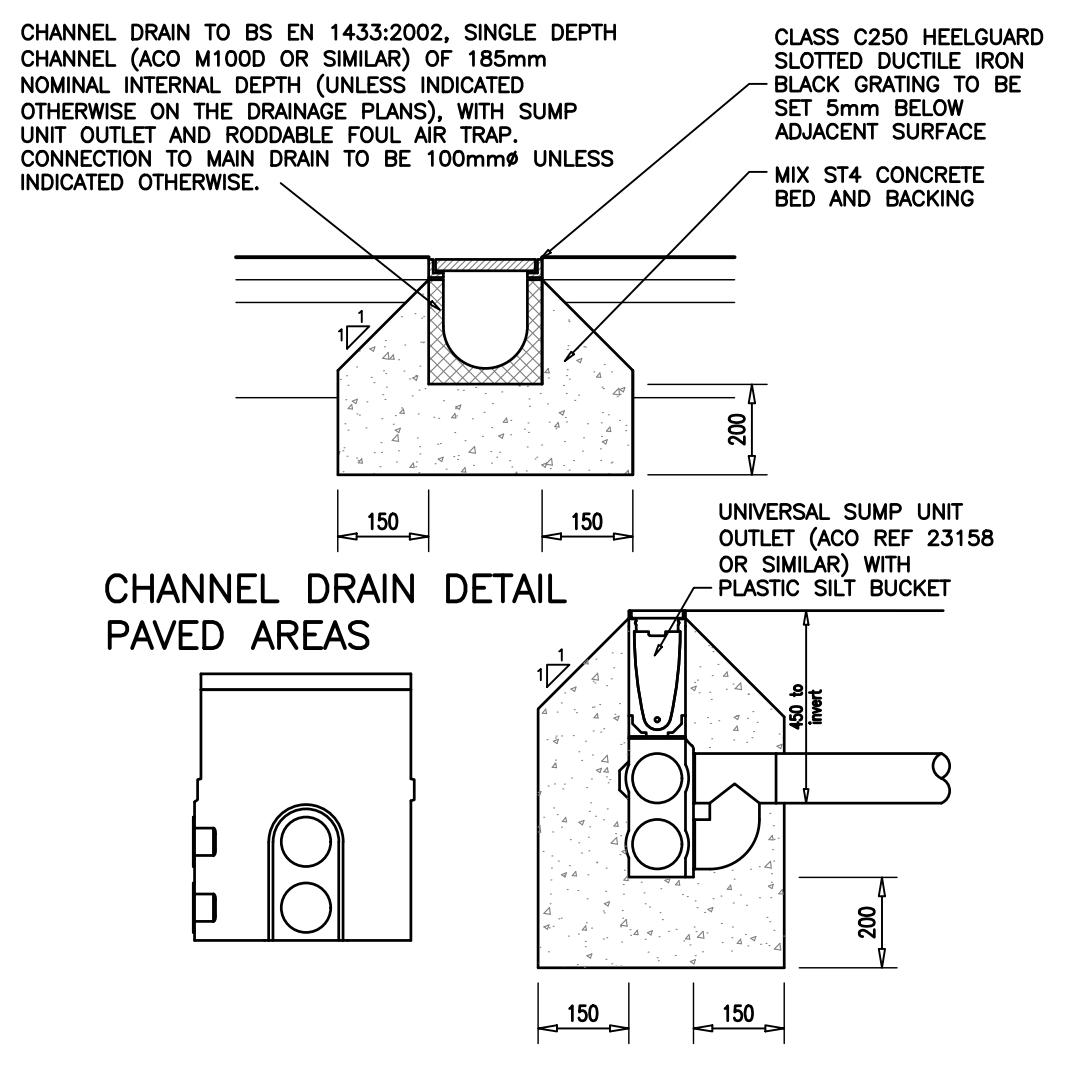
PROPOSED STATUS

S3 - For construction

HEX-TER-52-0XX-D-C-5001



PIPE ϕ	ROCKER PIPE LENGTH
< 600mm	600mm
675-750mm	1000mm
> 825mm	1250mm



Rev	Description	Date	Issued by
C01	FOR CONSTRUCTION	05.07.24	SPO
T01	FOR TENDER	19.04.24	SPO
P01	FOR REVIEW AND COMMENT	13.03.24	SPO

KEY PLAN

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DRAWING TITLE

3324 Hexham Road-MS

DRAINAGE DETAILS

SHEET 1 OF 2

SCALE (A1)
N.T.S.

START DATE
MARCH 24

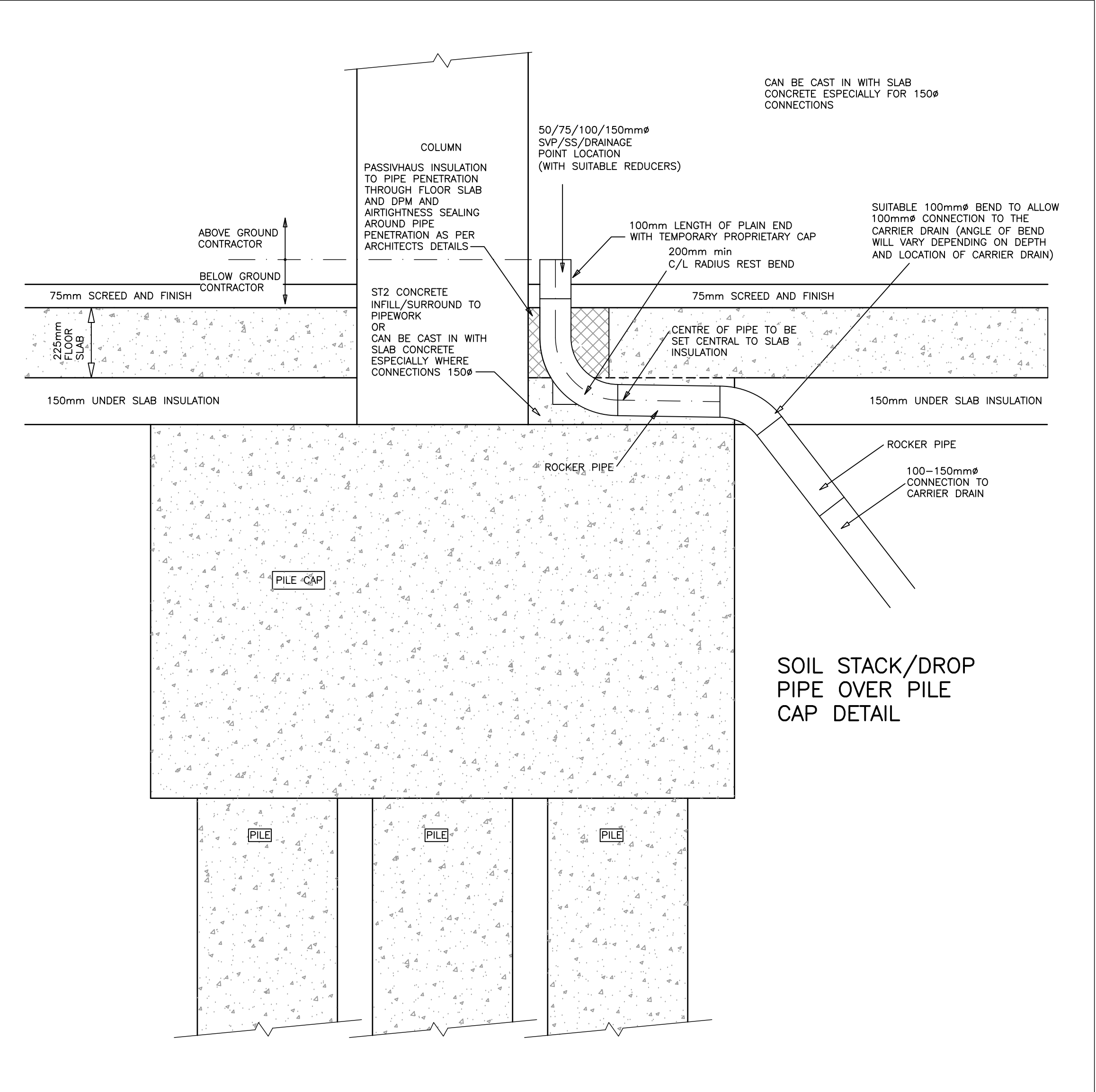
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RIBA 4

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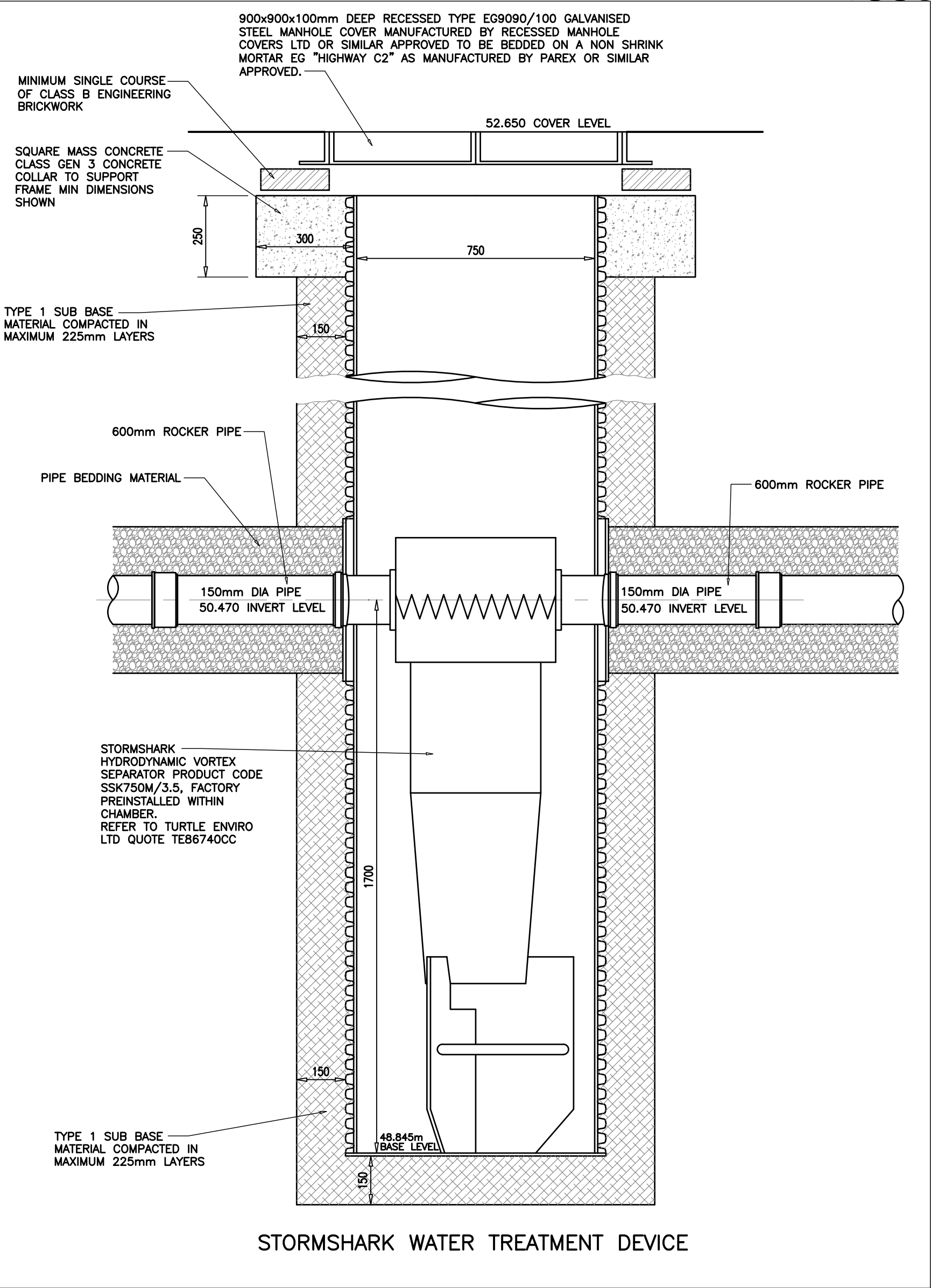
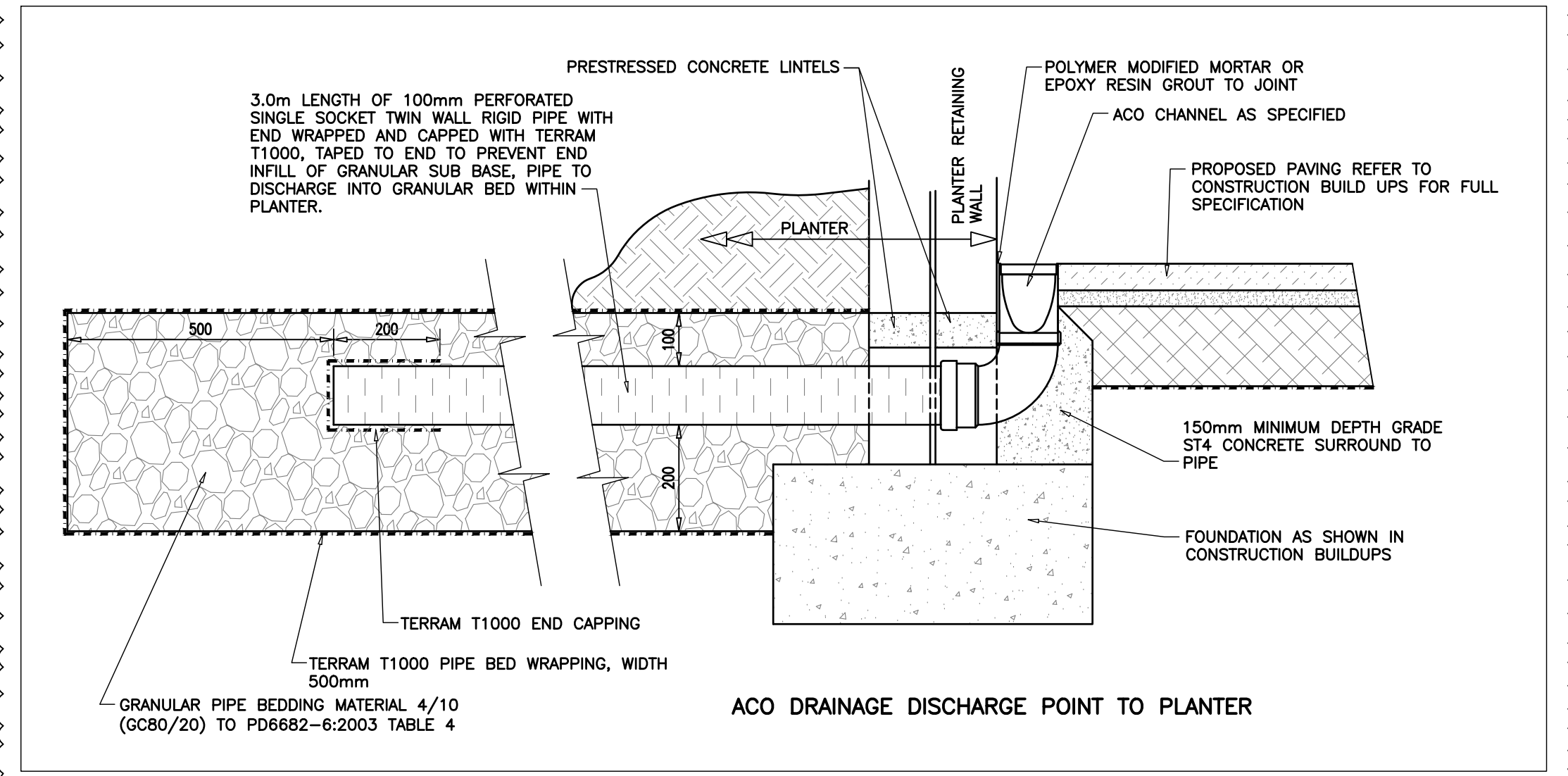
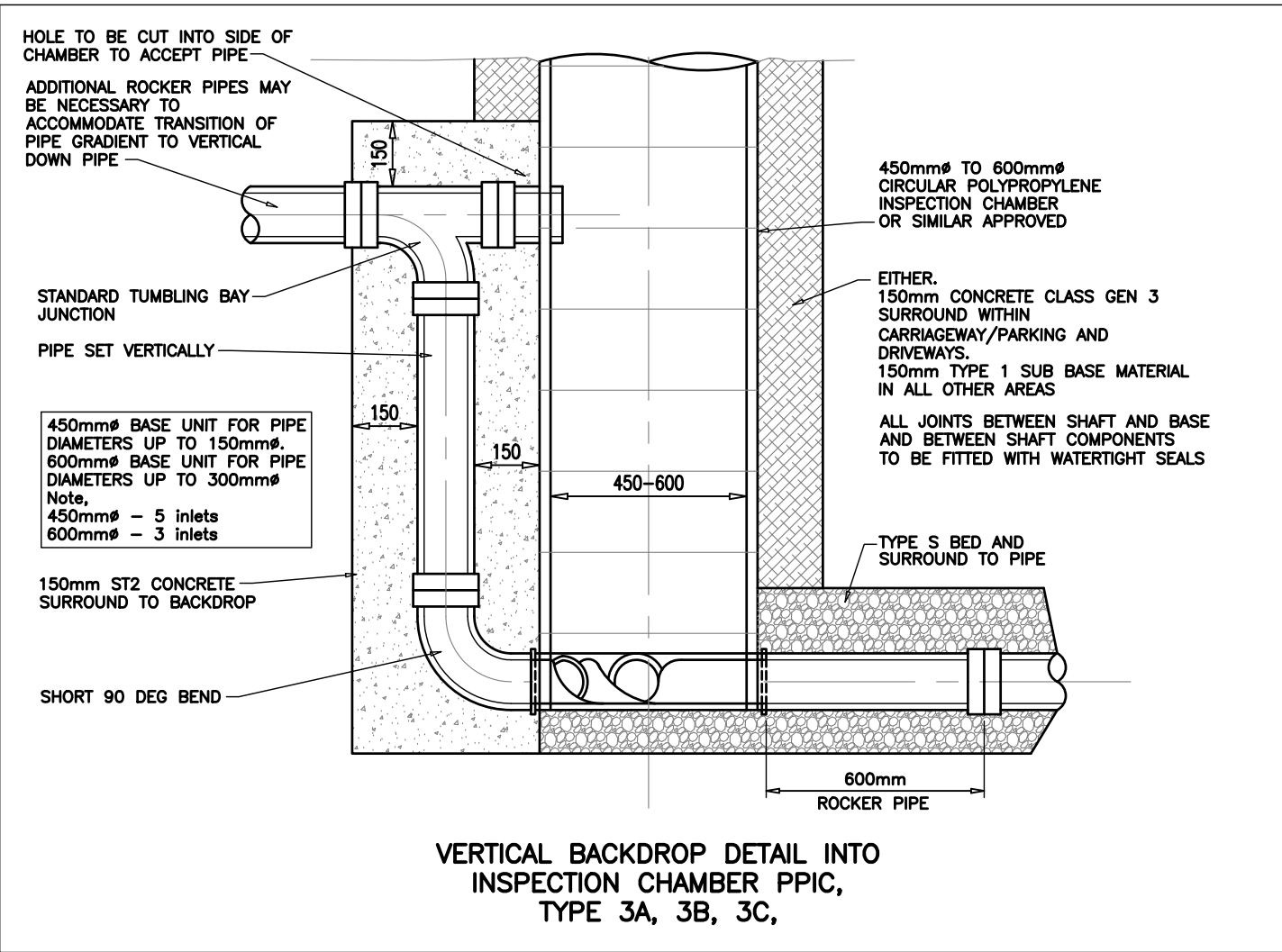
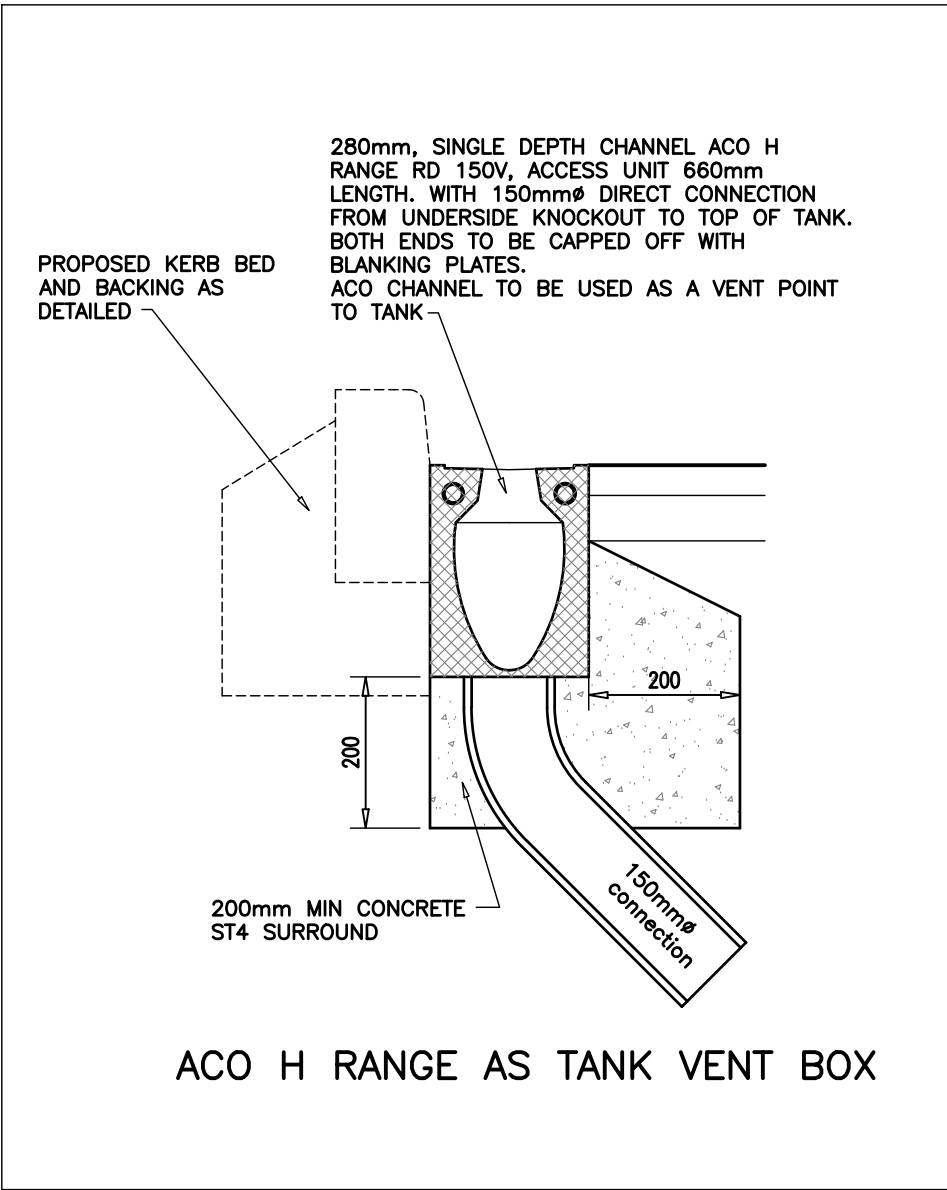
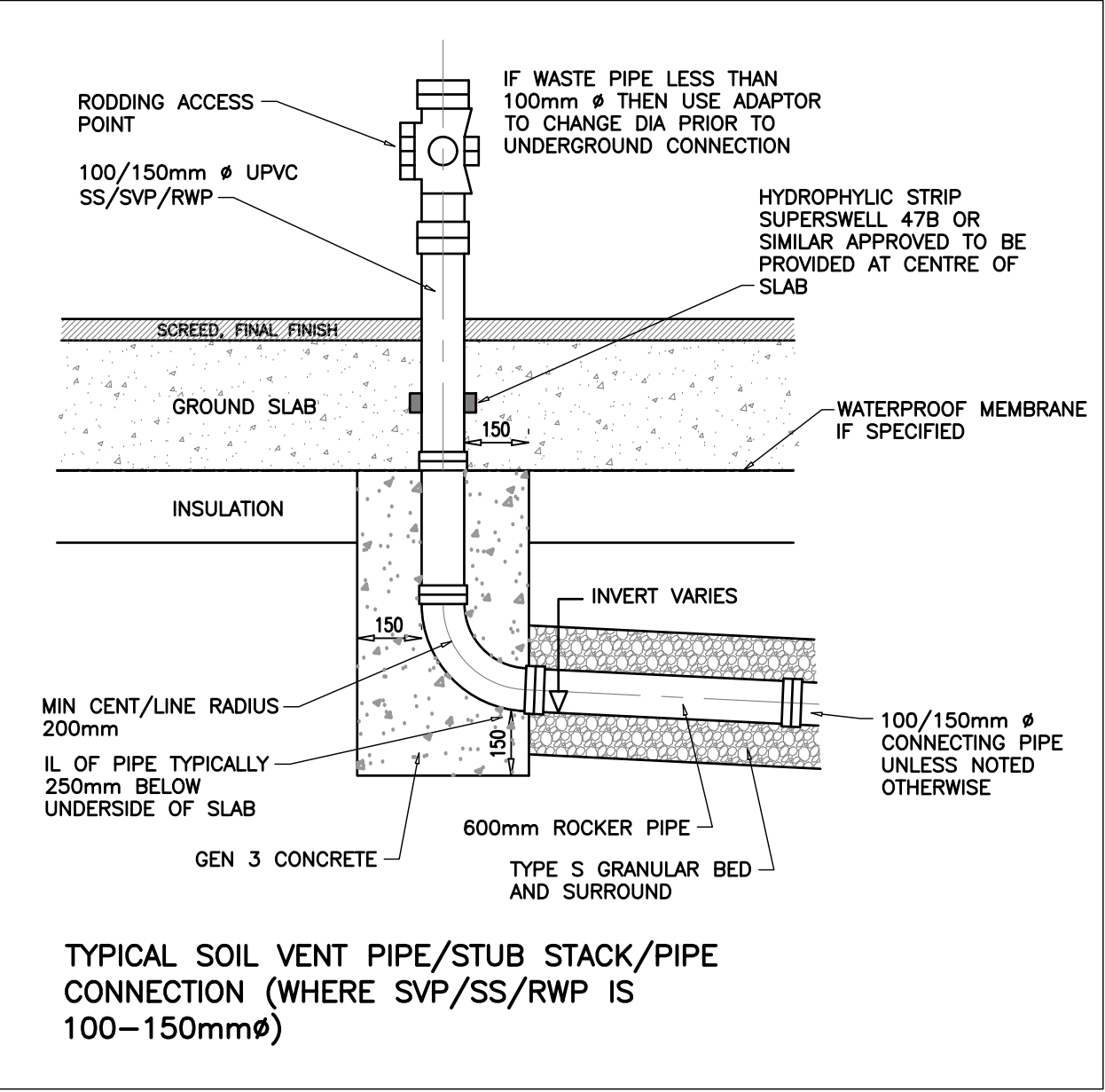
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HEX-TER-53-0XX-D-C-5002

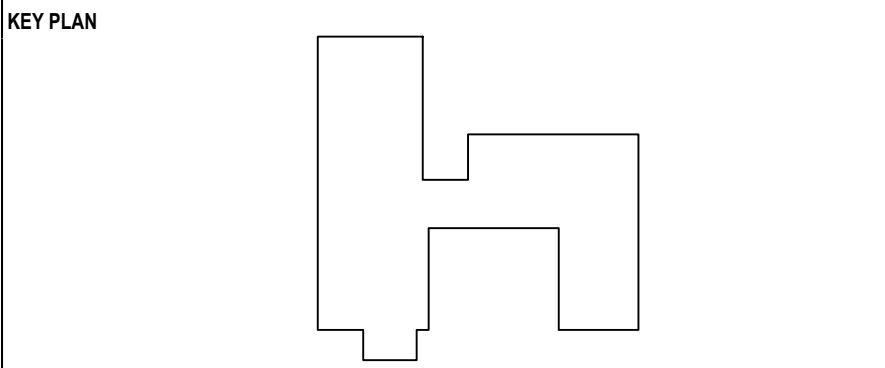
C01



SOIL STACK/DROP PIPE OVER PILE CAP DETAIL



Rev	Description	Date	Issued by
C05	ACO DISCHARGE POINT DETAIL ADDED	13.05.25	SPO
C04	WATER TREATMENT FILTER REDESIGNED TO UTILISE STORMSHARK FLOW DEVICE	10.04.25	SPO
C03	PASSIVHAUS NOTE ADDED	17.01.25	SPO
C02	COORDINATION AMENDMENT DETAIL ADDED	10.12.24	SPO
C01	FOR CONSTRUCTION	05.07.24	SPO



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paris@terrellgroup.net

DRAWING TITLE		3324 Hexham Road-MS	
DRAINAGE DETAILS SHEET 2 OF 2			
SCALE (A1) N.T.S.		FILENAME HEX-TER-53-0XX-D-C-5003-C05 DRAINAGE DETAILS	
START DATE MARCH 24		PROPOSED STATUS	
DESIGN STAGE RIBA 4		S3 - FOR CONSTRUCTION	
HEX-TER-53-0XX-D-C-5003			
			C05