

	TECHNICAL NOTE	
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Project: Cockpit Barn, Knowle Lane, Horton Heath		Date: 04 June 2026
Title: Drainage Summary for Discharge of Condition		No. L038-DON-TN-001.P01

Planning Application Reference F/23/94713

Condition 8 and 9 Drainage Discharge reference DC/25/100186

1. Introduction

Donnager Civil Engineers have been requested to resubmit documentation related to Planning Conditions 8 and 9 of planning application F/23/94713 to align the previously submitted documentation under DC/25/100186 with the approved Landscape Plan L01 Rev F (DC/26/101166) submitted under discharge of Condition 11 and 12.

This technical note and associated drawings form a complete resubmission package for the discharge of Conditions 8 and 9, replacing the previously issued documentation under DC/25/100186 in full.

The submission is predominantly based on the previously issued drainage information, with limited amendments and consolidation of drawings to reflect updated site layout constraints and landscape coordination.

The intent of this submission is to reissue and align the existing drainage strategy approved under F/23/94713 with landscape plans, rather than introduce a revised drainage design.

2. Eastleigh policy DM6

Eastley Policy DM6 sets out requirements for implementation of SuDS on the for the developments. For residential developments, the policy DM6 requires the provision of SuDS for development in areas at risk of flooding or development of more than 10 dwellings that drain to Itchen or Hamble river catchments.

The proposed development comprises 6 dwellings and is not located within an area at risk of flooding, and is on the edge of the River Itchen Catchment. Therefore the development does not meet the threshold criteria to strictly apply three-stage

treatment train is not required and National Policy framework should apply including provision of suitable SuDS.

Nevertheless, 3 stage treatment has been indicatively shown under the original planning application F/23/94713 and further developed under DC/25/100186, and the proposed development therefore follows the overall concept of a 3 stage treatment approach. However, it is important to highlight that strict requirements related to the detailed facilitation and function of the 3 stage treatment should not be interpreted as a specific requirement of Policy DM6 for the development of this scale.

National Policy framework principles for application of SuDS, including provisions within CIRIA C753 for treatment of storm water, are fully incorporated as part of this development.

3. Proposed Drainage Strategy

This Drainage Summary has been prepared in support of the proposed construction of six residential dwellings and associated access roads at Cockpit Barn, Knowle Lane, Horton Heath.

The system is designed to accommodate all storm events up to and including the 1 in 100-year return period, with a 40% allowance for climate change and 3 filtration stages: Primary, Secondary and Tertiary.

The development will incorporate a sustainable drainage system (SuDS) designed to manage surface water through on-site storage, conveyance and treatment.

The site is underlain by the Wittering Formation and nearby borehole records indicate predominantly silty clay and sandy clay strata, suggesting generally low to moderate infiltration potential, with an indicative infiltration rate of up to 1×10^{-6} m/s considered reasonable for sensitivity testing purposes.

The drainage strategy does not rely on infiltration, and the permeable pavement systems are fully tanked. The primary drainage function is therefore provided through storage, attenuation, conveyance and treatment prior to discharge to the receiving watercourse downstream of the development and originally shown on plans submitted under F/23/94713.

However, infiltration is not precluded within the three bioretention basins and may occur where local ground conditions permit. Modelling undertaken using an optimistic infiltration rate of 1×10^{-6} m/s indicates that, under favourable conditions, up to two-thirds of the runoff volume could infiltrate into the underlying soils before reaching the final attenuation basin thus reducing both runoff rate and volume reaching the river, and mimicking the natural infiltration and filtration processes.

Foul drainage will discharge via gravity into the existing private foul sewer within land owned by the developer.

4. Surface Water Design

All surface water runoff from roofs, private access roads, driveways, and parking areas will be conveyed via permeable block paving to the site's internal roads and driveways. Flow will then enter the cellular storage system, as illustrated on drawing L038-DON-DR-C-100.P01.

A total effective storage volume of $\sim 71\text{m}^3$ will be provided within a 450 mm thick infiltration blanket located beneath permeable paved areas and controlled by high discharge hydrobrake discharging to Basins 1.

Basin 1 will provide additional storage within natural detention basin, providing additional $\sim 73\text{m}^3$ of storage and is controlled by second hydrobrake restricting the site discharge to previously accepted 2.5 l/s discharge rate to Basin 2.

Basin 2 is acting as a flow through bioretention, providing secondary treatment and conveyancing and pollution mitigation before discharging to the Basin 3.

Basin 3 provides overall storage volume of $\sim 92\text{m}^2$ which would then infiltrate during lower intensity storms (1-in-1 and 1 in 2 year storms) which carry the highest pollution load. Based on estimated soil infiltration rate its possible that basin could accept higher intensity storms, however primary purpose of Basin 2 is to treat the flow before the water can naturally flow over the end of the basin 3 banks and sheet flow towards the watercourse located on the edge of the site.

The proposed Basin 2 and 3 are not attenuation elements; their sole function is water quality treatment, not storage. Basin 1 provides attenuation and storage during extreme events while the bulk of attenuation storage is provided within the 450mm deep permeable pavements sub-bases.

Surface water will discharge watercourse located at the edge of the property via natural overland flow as previously described in Drainage plan under F/23/94713 with conveyance and filtration provided through bioretention which are not lined and natural infiltration would occur.

It should be noted that under CIRIA C753, the 51m overland flow distance between Basin 3 and the waterbody is natural grassland and is in itself provides treatment similar to filter strip provision under CIRIA C752 and could be considered a 4th treatment train in the system.

5. Water Quality Treatment

The water quality is accessed using simplified index approach provide in Chapter 26 of the CIRIA C753 The SuDS Manual and is contained below

TABLE 26.2 Pollution hazard indices for different land use classifications				
Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4

Notably Report previously produced for discharge of condition 8 and 9 assumed a higher pollutions index, which is more consistent with commercial size and heavy use areas. For purposes of consistency, this report addresses higher pollution risk.

Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways ¹	Medium	0.7	0.6	0.7
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The approach to index mitigation would be consistent to that provided within CIRIA C753 where more than 1 component are installed in a series:

$$\text{Total SuDS mitigation index} = \text{mitigation index}_1 + 0.5 (\text{mitigation index}_2)$$

CIRIA C753 Table 26.3 would apply for discharge to surface water body, however as the site does not preclude infiltration, a more stringent approach provided in Table 26.4 is appropriate to be used.

Primary Treatment – Permeable Pavements

The primary treatment is provided by Permeable Pavements which provides

- Attenuation
- Cellular storage
- Primary treatment

CIRIA C753 Table 26.4 assumes full infiltration, whereas CIRIA C753 Table 26.3 only provides a typical mitigation factors for all permeable pavements. Both provide same mitigation index.

TABLE 26.4	Indicative SuDS mitigation indices for discharges to groundwater			
	Characteristics of the material overlying the proposed infiltration surface, through which the runoff percolates¹	TSS	Metals	Hydrocarbons
	Constructed permeable pavement (where a suitable filtration layer is included that provides treatment, and including a geotextile at the base separating the foundation from the subgrade) underlain by a soil with good contaminant attenuation potential ² of at least 300 mm in depth ³	0.7	0.6	0.7

TABLE 26.3	Indicative SuDS mitigation indices for discharges to surface waters			
		Mitigation indices¹		
	Type of SuDS component	TSS	Metals	Hydrocarbons
	Permeable pavement	0.7	0.6	0.7

Permeable pavement alone provides sufficient mitigation and water leading the side is clean and suitable for both infiltration into the ground and discharge to a natural water body, and consequently and as a flow through the 3-stage treatment previously proposed.

Roofs are not connected to permeable pavements and would carry pollutants to Basin 1.

Basin 1 – Treatment

Basin 1 is a bioretention / attenuation system with the following mitigation potential:

TABLE 26.3 Indicative SuDS mitigation indices for discharges to surface waters				
Type of SuDS component	Mitigation indices ¹			
	TSS	Metals	Hydrocarbons	
Bioretention system	0.8	0.8	0.8	

TABLE 26.4 Indicative SuDS mitigation indices for discharges to groundwater				
Characteristics of the material overlying the proposed infiltration surface, through which the runoff percolates ¹		TSS	Metals	Hydrocarbons
Bioretention underlain by a soil with good contaminant attenuation potential ² of at least 300 mm in depth ³		0.8 ⁴	0.8	0.8

Based on criteria set out by CIRIA C753 The SuDS Manual, all water leaving Basin 1 and flowing to Basins 2 and 3 is clean and does not carry pollutants.

Basin 2 and 3 provides additional pollution mitigation factors as described below. It also important to flag that long grass bank from Basin 3 to the ditch is also discussed in CIRIA C753 and provides further mitigation.

Basin 2

TABLE 26.4 Indicative SuDS mitigation indices for discharges to groundwater				
Characteristics of the material overlying the proposed infiltration surface, through which the runoff percolates ¹		TSS	Metals	Hydrocarbons
Bioretention underlain by a soil with good contaminant attenuation potential ² of at least 300 mm in depth ³		0.8 ⁴	0.8	0.8

Basin 3

TABLE 26.4 Indicative SuDS mitigation indices for discharges to groundwater				
Characteristics of the material overlying the proposed infiltration surface, through which the runoff percolates ¹		TSS	Metals	Hydrocarbons
Bioretention underlain by a soil with good contaminant attenuation potential ² of at least 300 mm in depth ³		0.8 ⁴	0.8	0.8

Glass strip between Basin 3 and Watercourse

TABLE 26.4	Indicative SuDS mitigation indices for discharges to groundwater			
	Characteristics of the material overlying the proposed infiltration surface, through which the runoff percolates ¹	TSS	Metals	Hydrocarbons
	A layer of dense vegetation underlain by a soil with good contaminant attenuation potential ² of at least 300 mm in depth ³	0.6 ⁴	0.5	0.6

Overall mitigation index achieved for development is

TSS: 2.2 | Metals 2.05 | Hydrocarbons 2.2

Viewed from DM6 policy angle the design consists of 5 treatment stages which majority of pollutants are treated by Permeable Pavements and are captured by Basin 1. Subsequent 3 stages result in clean uncontaminated water reaching natural water body and provides a safety net for the system. The proposed system exceeds national standards and fully meets EBC policy requirements.

6. Exceedance Routes

Exceedance routes are not normally planned for small development of this scale under national policy, however to completeness drawing L038-DON-DR-C-400.P01 shows indicative flow paths from the 6 houses to the canal. Most of these are long paths over natural grassland with low Mannings k values and this would spread and generally mimic natural flows. Contamination consideration at exceedance events scale are not considered due to pollution dilution as outlined within CIRIA C753 The SuDS Manual and other drainage literature.

In case of blockage of any drainage system, the resulting exceedance flows would follow the outlined paths to the watercourse with natural grass providing good filtration.

7. Surface Water Flow and Biodiversity

The basins have been positioned along the site's natural runoff pathway, maintaining discharge at the natural QBAR rate from site. Post-development flows will follow the same route at the same rate, ensuring no adverse impact on adjacent root protection zones (RPZs) or watercourses.

While the basins could be enlarged to enhance Biodiversity Net Gain (BNG), there is no hydraulic necessity to do so. Proposed planting and landscaping within the basins and swales is detailed as part of the Condition 11 discharge submission.

8. Maintenance Schedule and Protection

The maintenance schedule is typically constructed using general guidance provided by CIRIA C753 in terms of systems, frequency and type of work that is needed to specific element of the design and tweaked for site specific requirements.

The general guidance would generally be applicable to all drainage systems and provided good quality basis for a specialist maintenance company to develop an overall site wide management plan.

Although strictly not stated with CIRIA C753, the maintenance of soft landscaping elements would be developed by landscape team which provides separate maintenance schedule specific to maintenance of specific plants and species used as part of landscape proposed.

The overall maintenance plan for the development therefore consists of two previously produced documents, appended below.

General CIRIA C753 Guidance	Please refer to the provided 'Drainage Maintenance Report' produced by Cowan Consultancy dated, July 2025.
Landscape Specific Guidance	Please refer to Landscape Plan L01_Rev F.

Post planning, specialist maintenance company would use above two documents to develop fully detailed plans for overall site maintenance. This sits outside of planning conditions.

Drawings

Site Location Plan – Title Plan

L038-DON-DR-C-100.P01 – Overall Site Layout Foul and Storm

L038-DON-DR-C-101.P01 – Development Site Layout Foul and Storm

L038-DON-DR-C-200.P01 – Private Drainage Details Sheet 1

L038-DON-DR-C-201.P01 – Private Drainage Details Sheet 2

L038-DON-DR-C-400.P01 – Exceedance Flow Paths

Southern Water Asset Map

Maintenance Section Report and Drawings

Drainage Maintenance Report. Cowan Consultancy dated, July 2025.

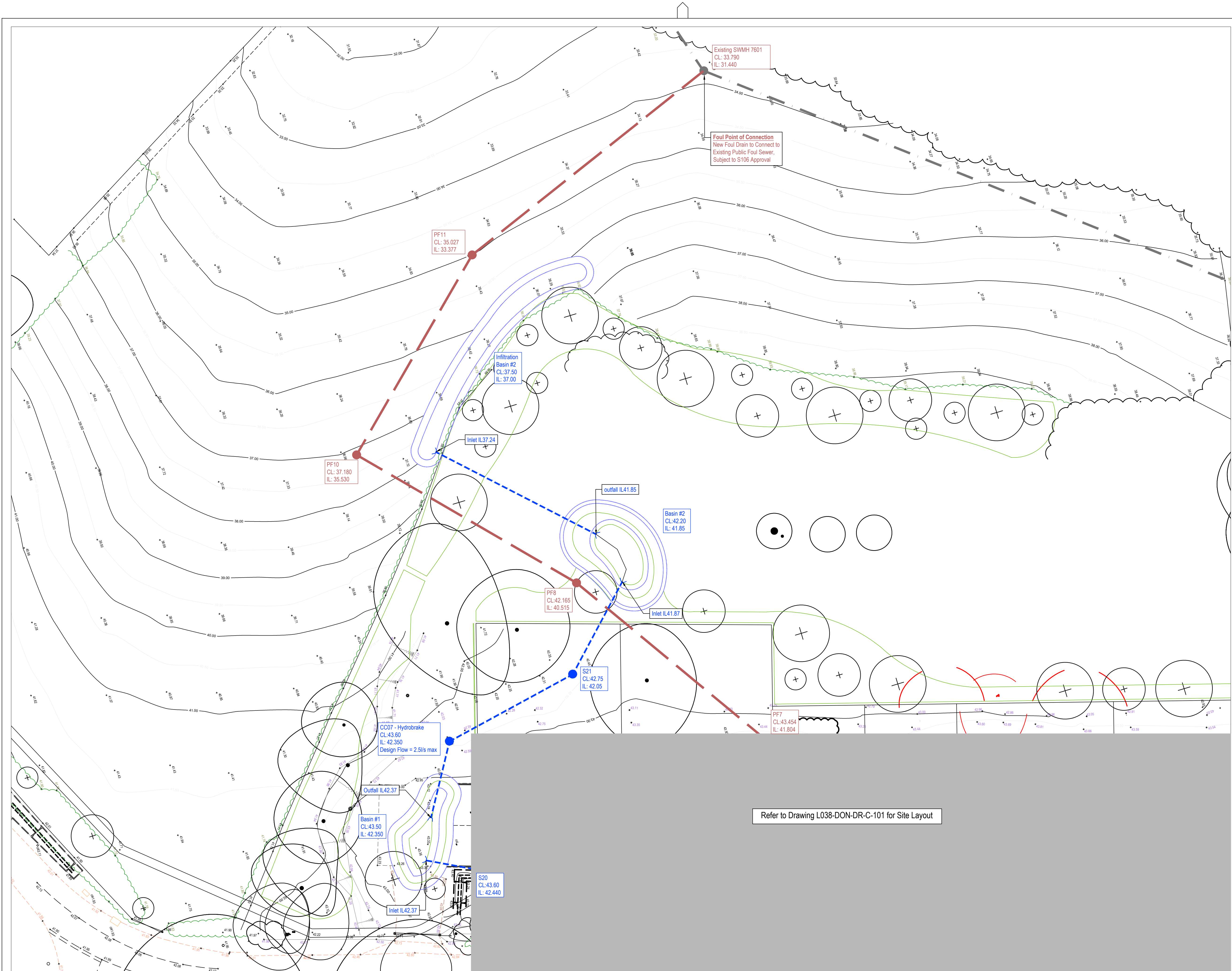
Landscape Plan L01_Rev F.

Calculations Package

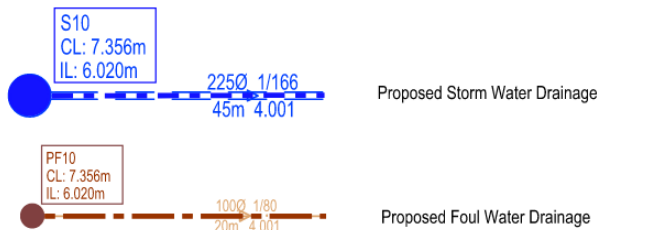
Causeway Flow Calculations Package

REF	TITLE	SITE	SCALE
001	Site Location Plan	Cockpit Farm Barn, Knowle Lane, Fair Oak	1:1250 at A4





- Notes
1. Do not scale from this drawing.
 2. All dimensions are in metres and levels are in mAOD unless otherwise stated.
 3. Any drawing errors or discrepancies should be reported to the Engineer as soon as possible.
 4. All drainage design and installation to be carried out in accordance with the following:
 - BSEN 752: drain and sewer systems outside buildings.
 - BSEN 12056: gravity drainage systems inside buildings.
 - Building Regulations - part H.
 - Sewerage Sector Guidance.
 - BS 8000: pt 14 - workmanship on building sites.
 - Engineering Design Layouts.



P01	FOR APPROVAL	VM	HC	29.05.2026
Rev	Revision Description	By	App	Date
Client				

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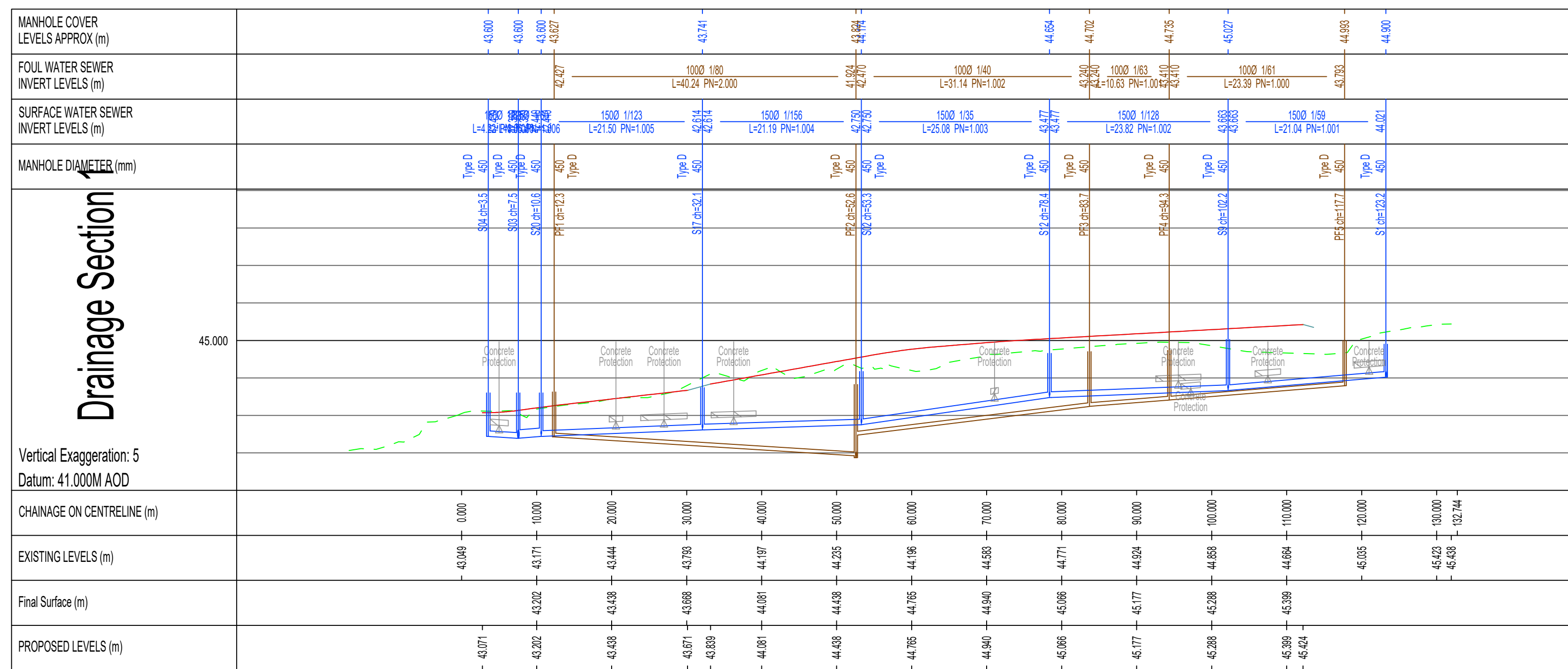
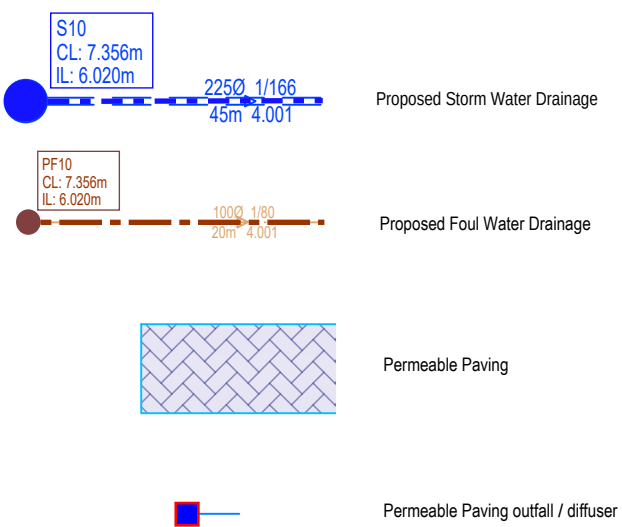
Project
**COCKPITS FARM
FAIROAK**

**OVERALL SITE LAYOUT
FOUL AND STORM WATER DRAINAGE**

Scale at A1	SEE DRAWINGS			
Date	29.05.2026	Designer	VM	Design Checker HC
Drawing Number	L038-DON-DR-C-100.P01			

[illegible]

1. Do not scale from this drawing.
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3. Any drawing errors or discrepancies should be reported to the Engineer as soon as possible.
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 - Building Regulations - part H.
 - Sewerage Sector Guidance
 - BS 8006 pt.14 - workmanship on building sites.
 - Engineering Design Layouts



Longitudinal Section through Front Driveways

01	FOR APPROVAL	VM	HC	29.05.2026
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Client				

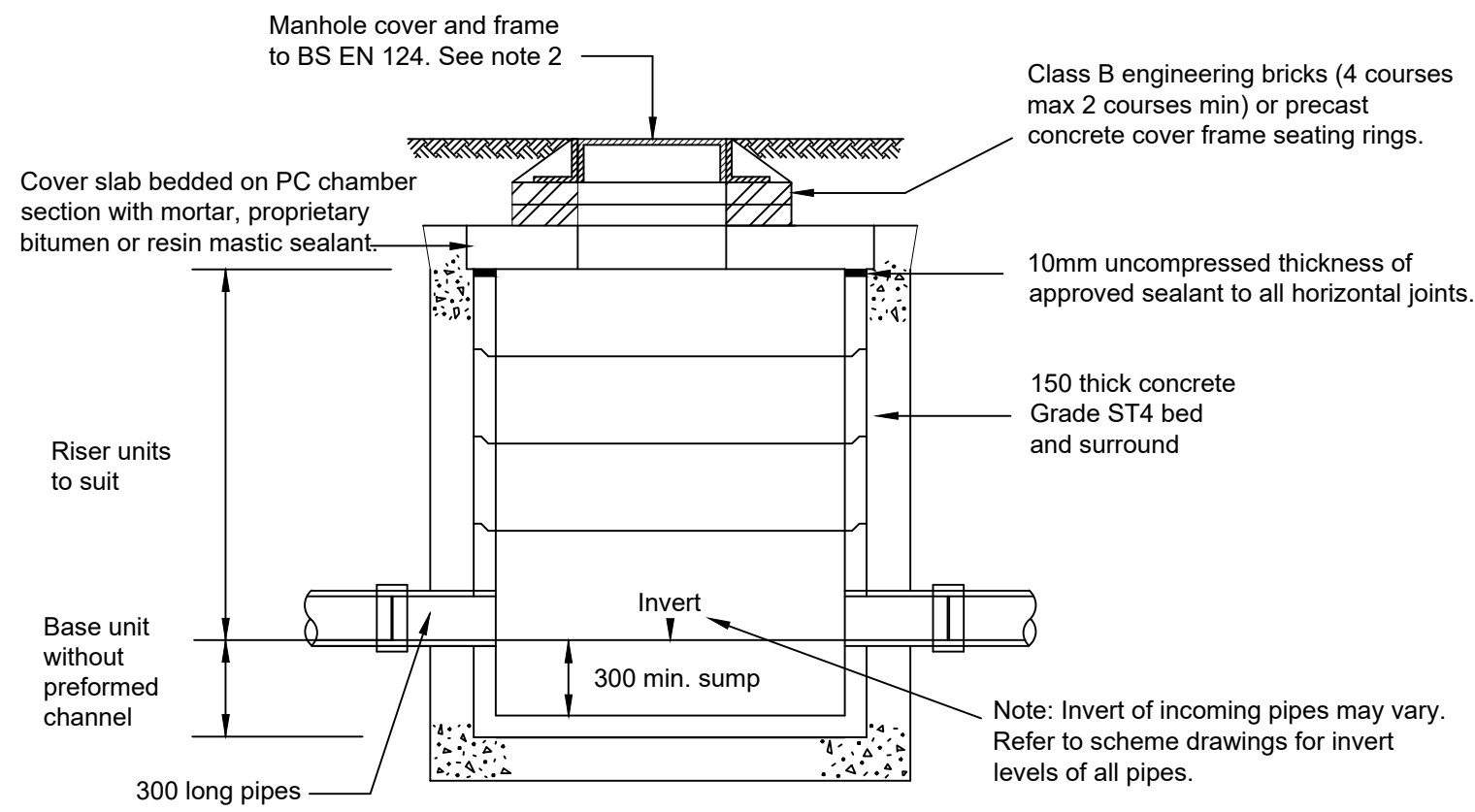
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Project COCKPITS FARM
FAIROAK

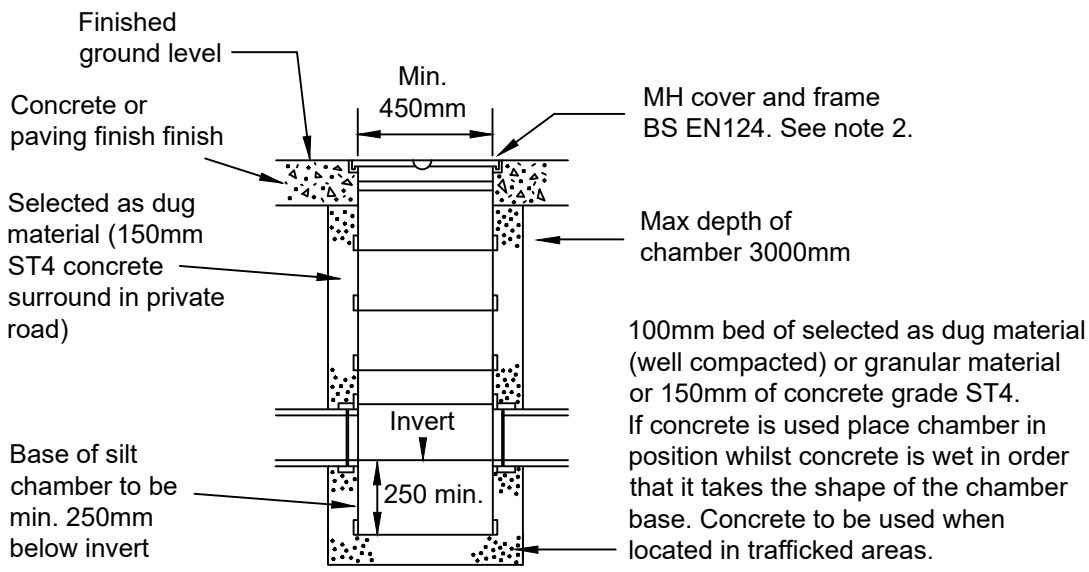
DEVELOPMENT SITE LAYOUT

FOUL AND STORM WATER DRAINAGE

Scale at A1				SEE DRAWINGS			
Date	29.05.2026	Designer	VM	Design Checker	HC		
Drawing Number		L038-DON-DR-C-101.P01					



PRECAST CONCRETE CATCHPIT
Max. depth 3000mm (to base)

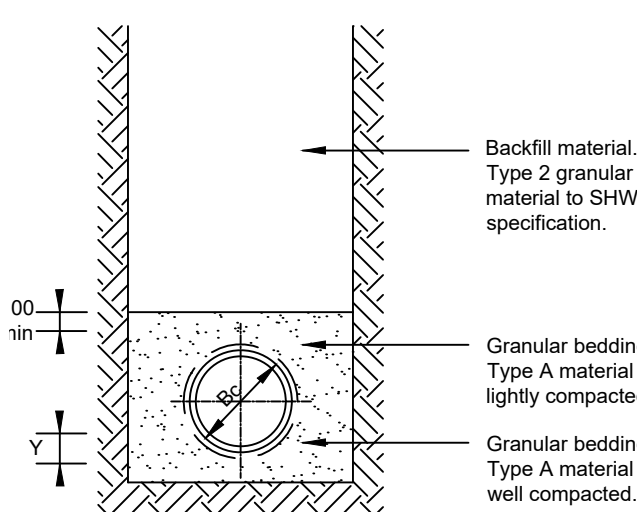


POLYPROPYLENE SILT TRAP CHAMBER
Maximum depth to base 3000mm

NOTE

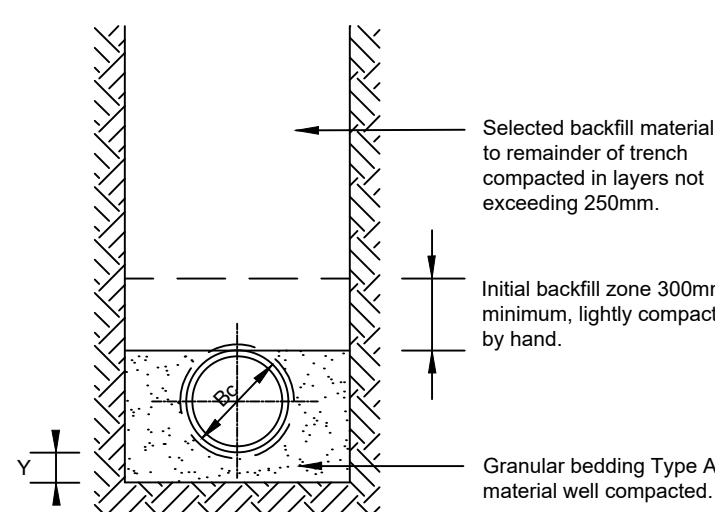
Polypropylene chambers greater than 1200mm deep shall be provided with restricted access not in excess of 350mm diameter.

RIGID PIPES



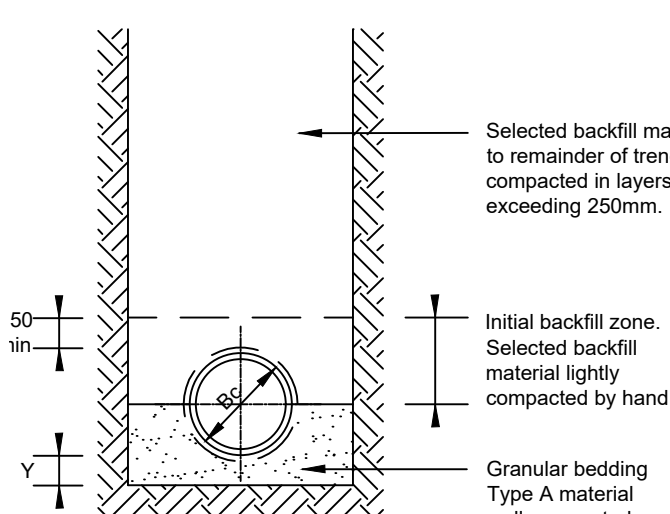
CLASS S BEDDING
(On trafficked areas)

FLEXIBLE PIPES



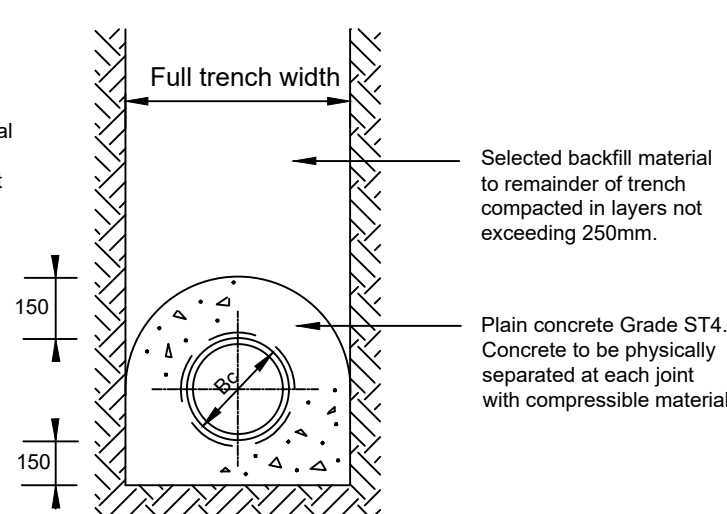
CLASS S BEDDING

RIGID PIPES



CLASS B BEDDING
(Non-trafficked areas)

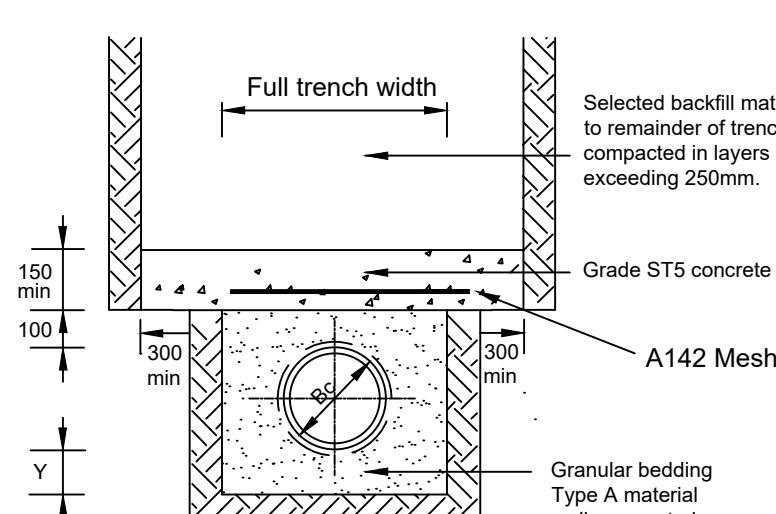
RIGID PIPES



CLASS A BEDDING

For cover to pipes of less than 1.00m in paved areas, and less than 0.45m in open spaces.

FLEXIBLE PIPES

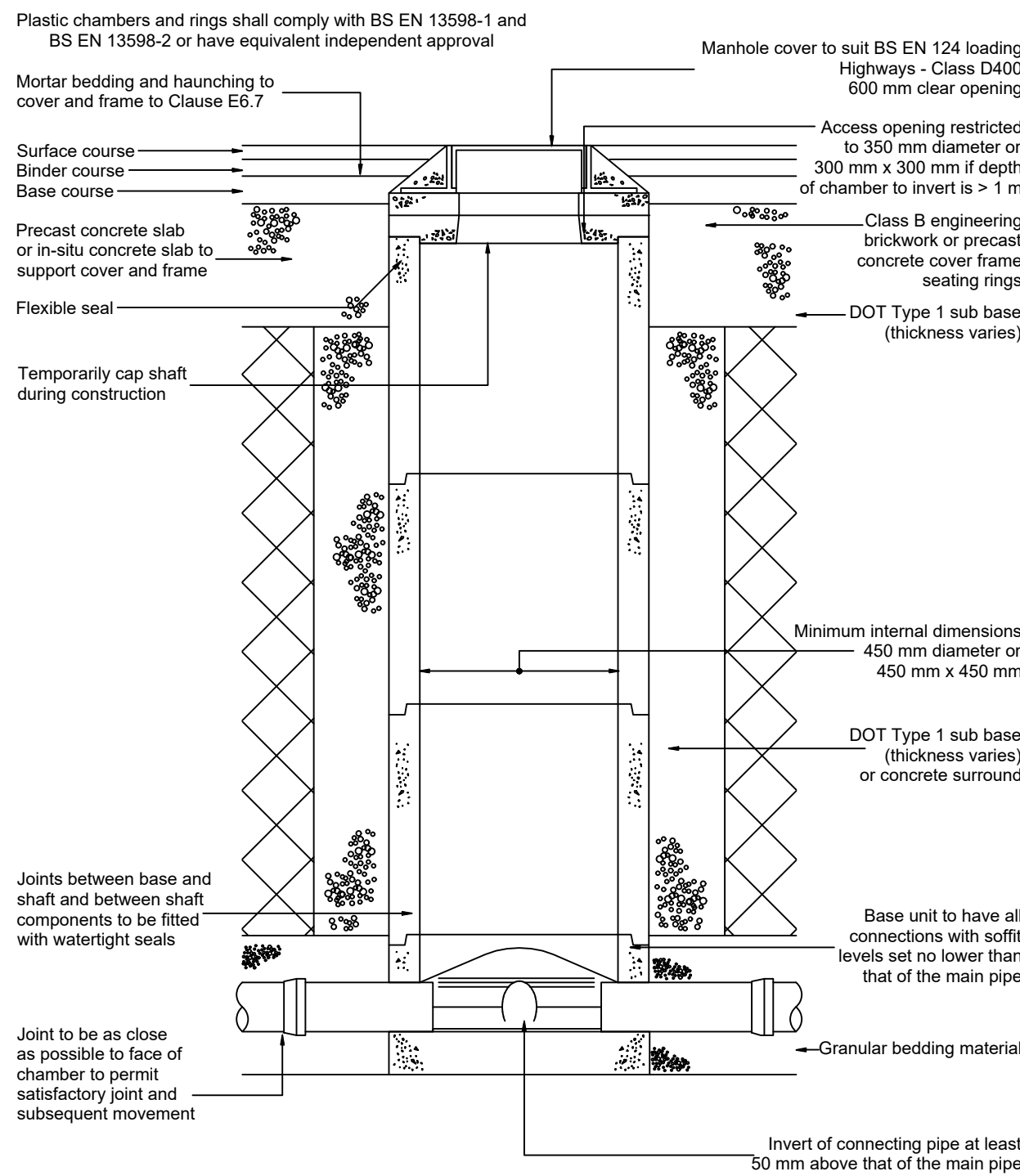


CLASS A BEDDING

For cover to pipes of less than 0.90m in paved areas, and less than 0.60m in open spaces.

TYPICAL INSPECTION CHAMBER DETAIL - TYPE 3 (Flexible material detail)

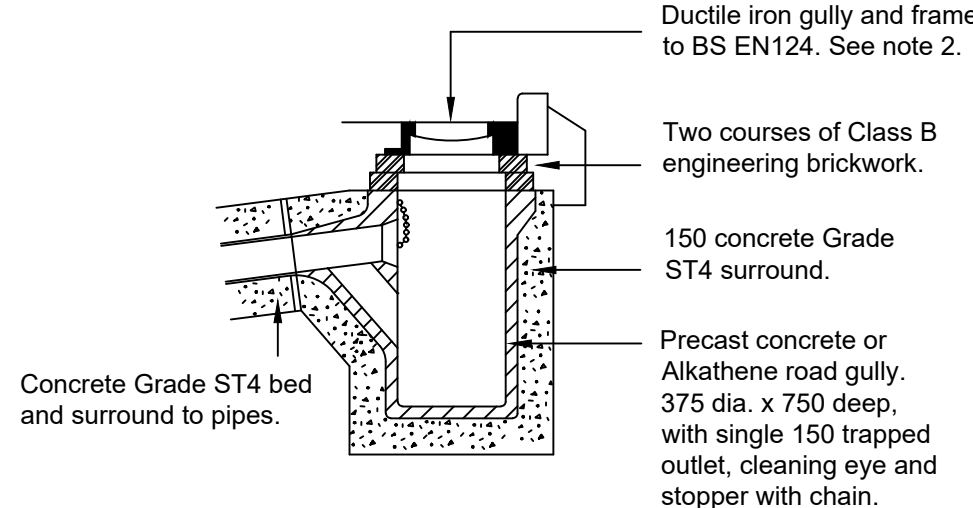
Maximum depth from cover level to soffit of pipe in areas subject to vehicle loading 3 m, non-entry



Note: Where the access chamber is in the highway the Highway Authority can have specific requirements

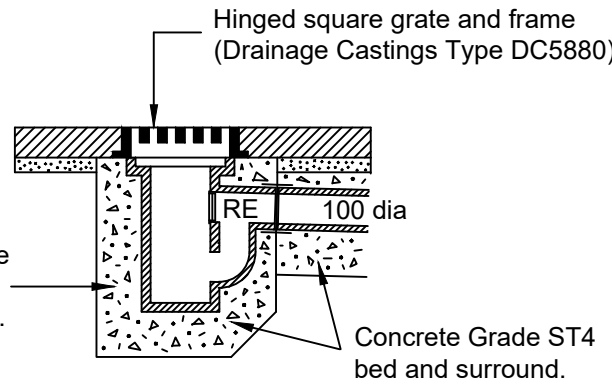
Not to scale

ROAD GULLY



200 internal width square mud gully with integral rodding eye and stopper. (Hepworth type 196)

YARD GULLY



GRANULAR BEDDING

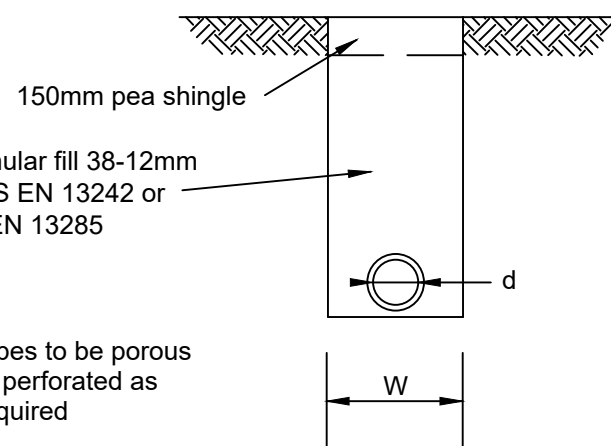
Nominal bore of pipe (mm)	Alternative Aggregate sizes (mm)	
	Single sized	Graded
100	10	14 to 5
150	10 or 14	14 to 5
225-300	10, 14 or 20	14 to 5 or 20 to 5

Granular bedding for pipes and backfilling material for temporary drains (trench sub-drains) shall consist of aggregates from natural sources to BS EN 12620 and BS EN 1744-1 or sintered pulverised fuel ash complying with the relevant provisions of BS 3892; sized in accordance with the above table.

Selected fill material, whether selected from locally excavated material or imported, shall consist of uniform, readily compactible material, free from vegetable matter, building rubbish and frozen material, or materials susceptible to spontaneous combustion, and excluding clay of liquid limit greater than 80 and/or plastic limit greater than 55 and materials of excessively high moisture content. Clay lumps and stones shall be retained on 100mm and 40mm sieves respectively.

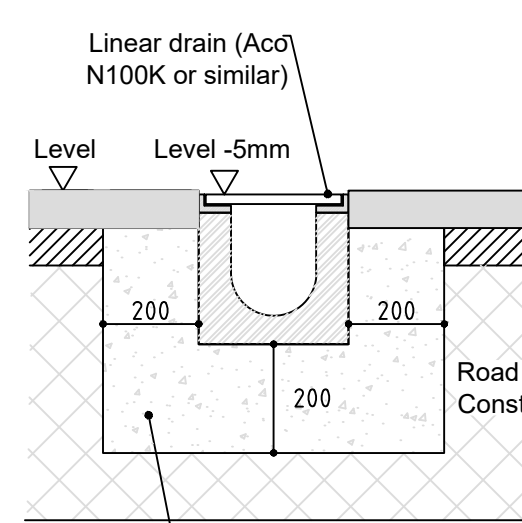
TRENCH WIDTHS

Pipe Dia	Trench width max.	Y
100	600	100
150	600	100
225	700	100
300	750	100

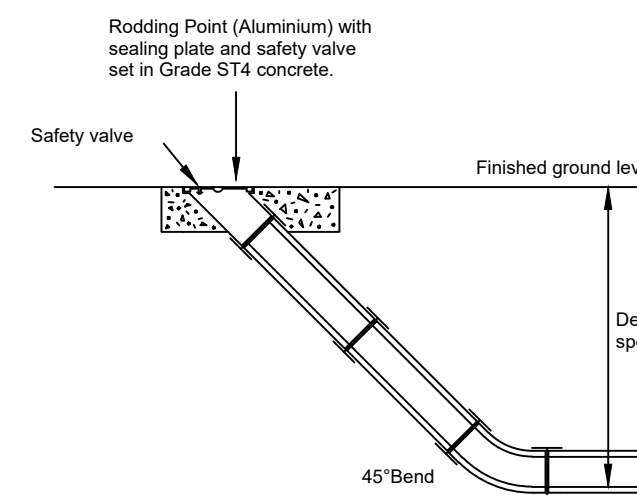


LAND DRAIN

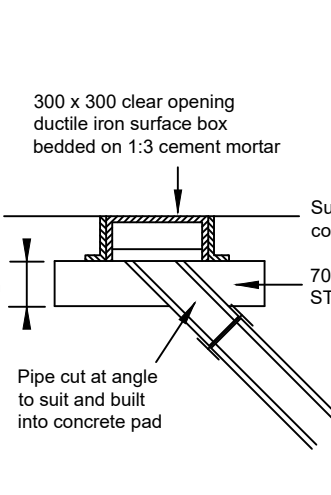
Pipe Dia (d) mm	Trench width W mm
100	300
150	
225	450
300	



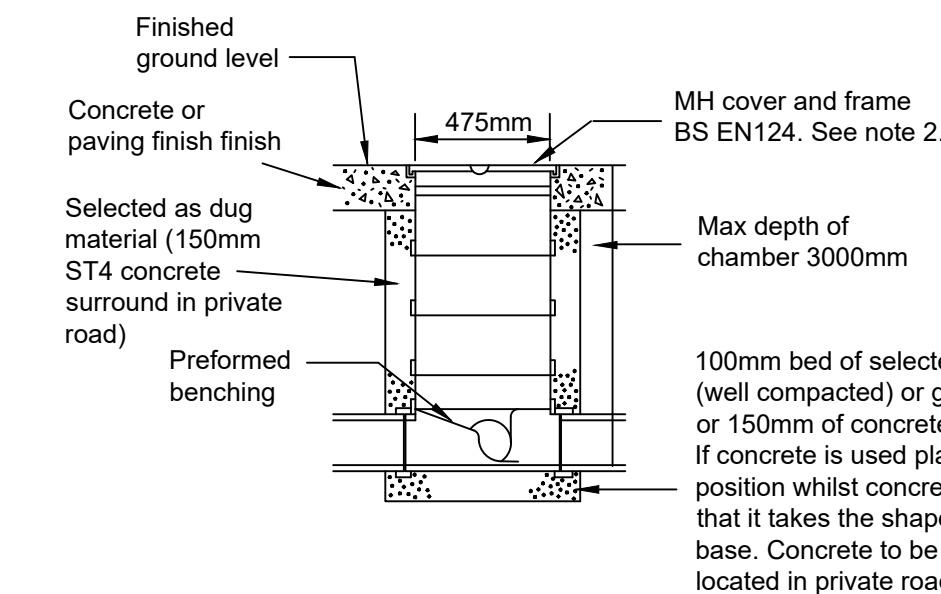
LINEAR DRAIN



RODDING EYE



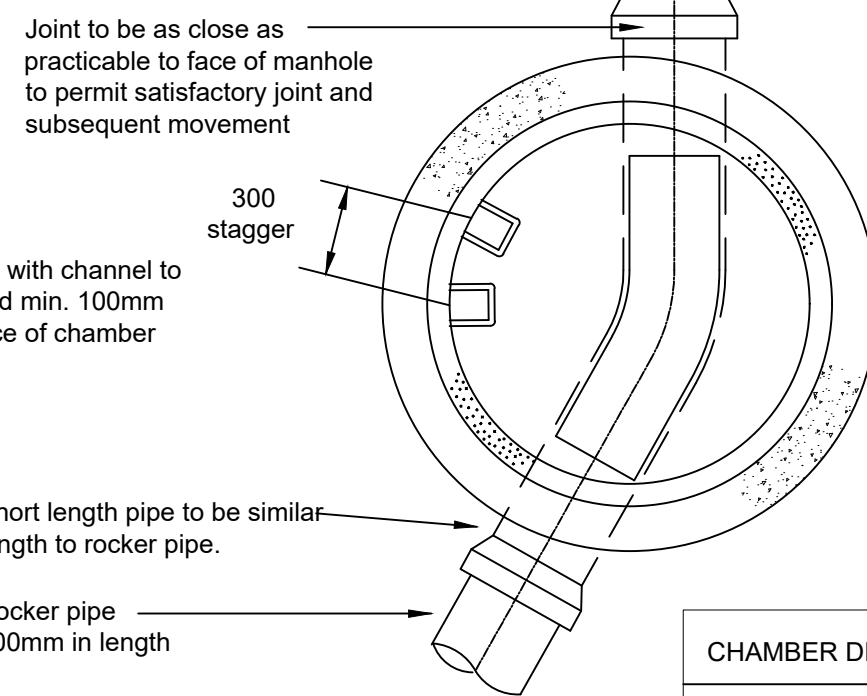
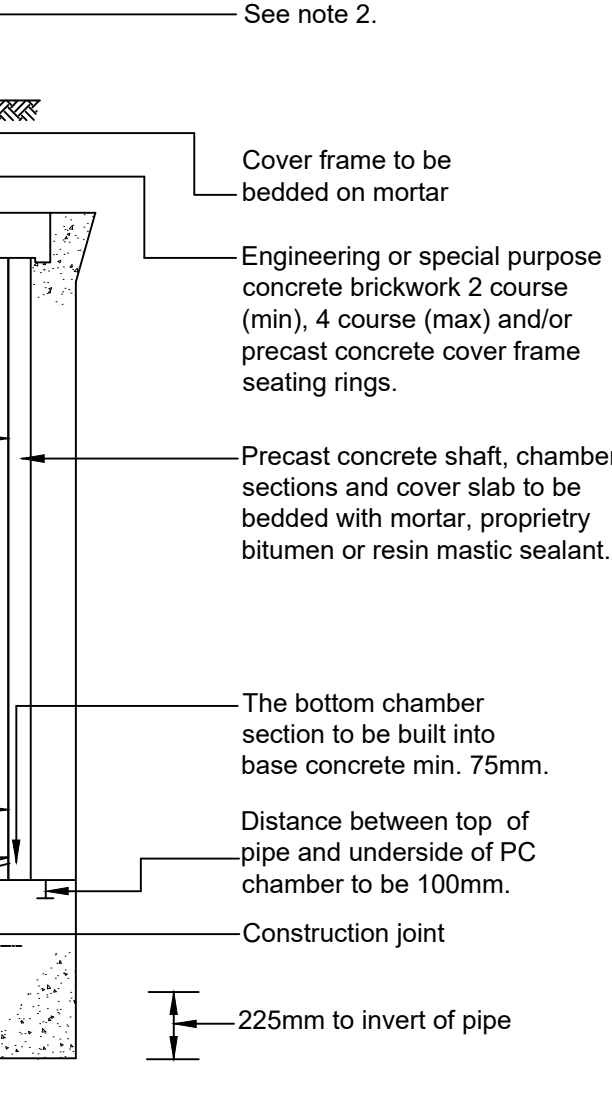
RODDING EYE
Used in areas accessible to vehicles



POLYPROPYLENE INSPECTION CHAMBER
Maximum depth to invert 3000

NOTE

Polypropylene inspection chambers greater than 1200mm deep shall be provided with restricted access not in excess of 350mm diameter.



CHAMBER DIAMETERS TO BE AS FOLLOWS:	
Diameter of largest pipe in manhole.	Chamber section diameter.
mm	mm
Less than 300	1200 (1050 where depth to soffit is less than 1.5m)

Notes

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- All dimensions are in metres and levels are in mAOD unless otherwise stated.
- All drainage works are to be undertaken in accordance with the relevant adoption water authority specifications.
- Any drawing errors or discrepancies should be reported to the Engineer as soon as possible.
- All drainage design and installation to be carried out in accordance with the following:
 - BS EN 752, drain and sewer systems outside buildings.
 - BS EN 12056, gravity drainage systems inside buildings.
 - Building Regulations - part 4.
 - Sewerage Sector Guidance.
 - BS 8000 pt 14 - workmanship on building sites.
 - Engineering Design Layouts.
- Precast Concrete Manholes
 - Precast concrete manhole units shall comply with the relevant provisions of BS EN 1917 and BS 5911-3. Units which bed into bases shall be manufactured so that imposed vertical loads are transmitted directly via the full wall thickness of the unit. The profiles of joints between units and the underside of slabs, shall be capable of withstanding applied loadings from such slabs and adjacent sections shall only be used where the soffit of the slab is recessed to receive them.
 - Precast concrete chamber sections for valves and meters shall be interlocking and comply with BS EN 1917 and BS 5911-3.
 - Manhole covers and frames shall comply with the relevant provisions of BS EN 124, BS 7903 and Highways Agency Guidance Document HA 104/09. They shall be of non-slip design which does not rely on the use of cushion inserts.
 - Manhole covers on foul only sewers shall be of low leakage types in order to prevent excessive surface water ingress.
 - As a minimum, Class D400 covers shall be used in carriageways of roads (including pedestrian streets), hard shoulders and parking areas used by all types of road vehicles.
 - Minimum frame depths for NRSWA road categories 11 IV shall be as Table B.
 - Class B125 shall be used in footways, pedestrian areas and comparable locations.
 - In situations where traffic loading is anticipated to be heavier than would occur on a typical residential estate distributor road (i.e. braking or turning near a junction), a higher specification (B200) shall be used.
 - All manhole covers shall be the non-ventilating type and shall have closed keyways.
- Manhole Steps
 - Steps for manholes and other chambers shall be Type D Class 1, complying with the requirements of BS EN 13101.
 - Galvanized mild steel and plastic encapsulated steps are preferred.
- Ladders
 - Ladders in manholes and similar structures shall comply with the requirements of BS EN 14396, with width of rung 300mm and two stringers, but shall not be made from aluminium.
 - Mild steel ladders for vertical fixing shall be fabricated from steel conforming to BS EN 10225-2. After fabrication, low carbon steel ladders shall not be hot dip galvanized in accordance with BS EN ISO 1461.
 - Stainless steel ladders for fixing shall be fabricated from Grade X5CrNiMo 17-12-2 steel conforming to BS EN 10088-3.
 - GRP ladders shall be manufactured from pultruded sections conforming to BS EN 13706-3. The surface shall be smooth with the fibres embedded and sealed against penetration from dirt and water. The barrel hardness of the sections shall be at least 35 when tested in accordance with BS 2782-10.
- Pipes and Joints Adjacent to Structures
 - Where rigid pipes are used, a flexible joint shall be provided as close as is feasible to the outside face of any structure into which a pipe is built, within 150mm for pipe diameters less than 300mm. The design of the joints shall be compatible with any subsequent movement.
 - The recommended length of the next pipe (rocker pipe) away from the structure shall be as shown in Table C.
- Setting manhole covers and frames
 - Manhole frames shall be set to level, bedded and haunched externally over the base and sides of the frame in mortar, in accordance with the manufacturer's instructions. The frame shall be sealed on at least two courses of Class B engineering bricks, on precast concrete masonry units or on a precast concrete cover frame seating rings to regulate the distance between the top of the cover and the top ring to no greater than 25mm. A mortar fillet shall be provided where the corners to an opening in a slab are chamfered and the brickwork is not flush with the edges of the opening.
 - Frames for manhole covers shall be bedded in a polyester resin bedding mortar in all situations where covers are sited in NRSWA Road Categories i, ii or iii (i.e. all except residential oil-de-sacs).

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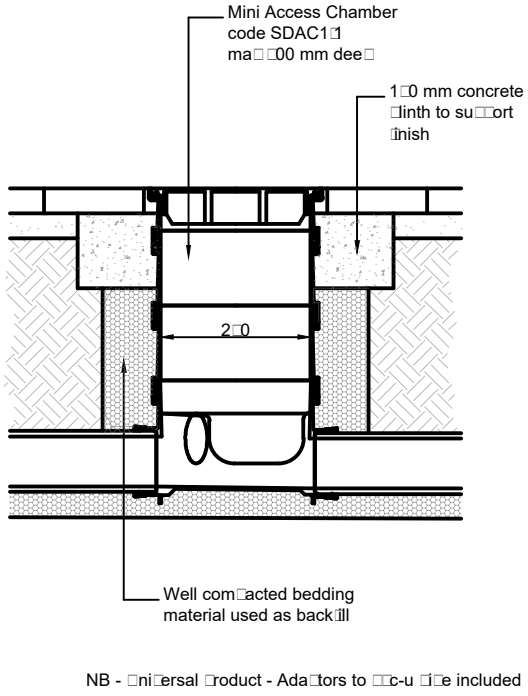
Project: **COCKPITS FARM FAIROAK**

DRAINAGE DETAILS
SHEET 1

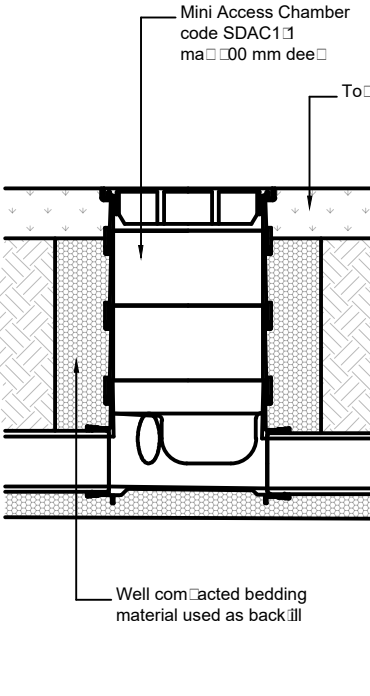
Scale at A1	SEE DRAWINGS			
Date	29.05.2026	Designer	VM	Design Checker HC
Drawing Number	L038-DON-DR-C-200.P01			

250 IC Mini Access Chamber
1000mm depth max

Sited in driveway/road areas

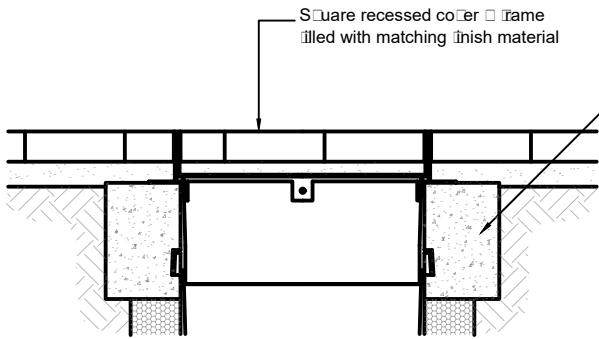


Sited in landscaped areas

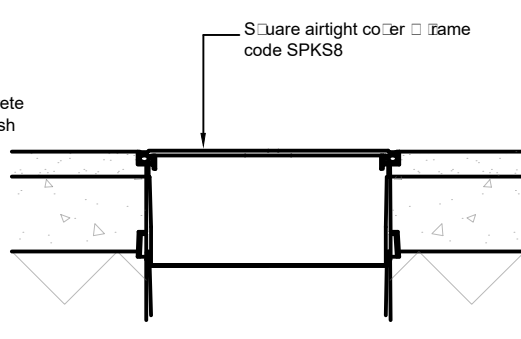


450 IC Polystyrene Inspection Chamber
1.2m depth max

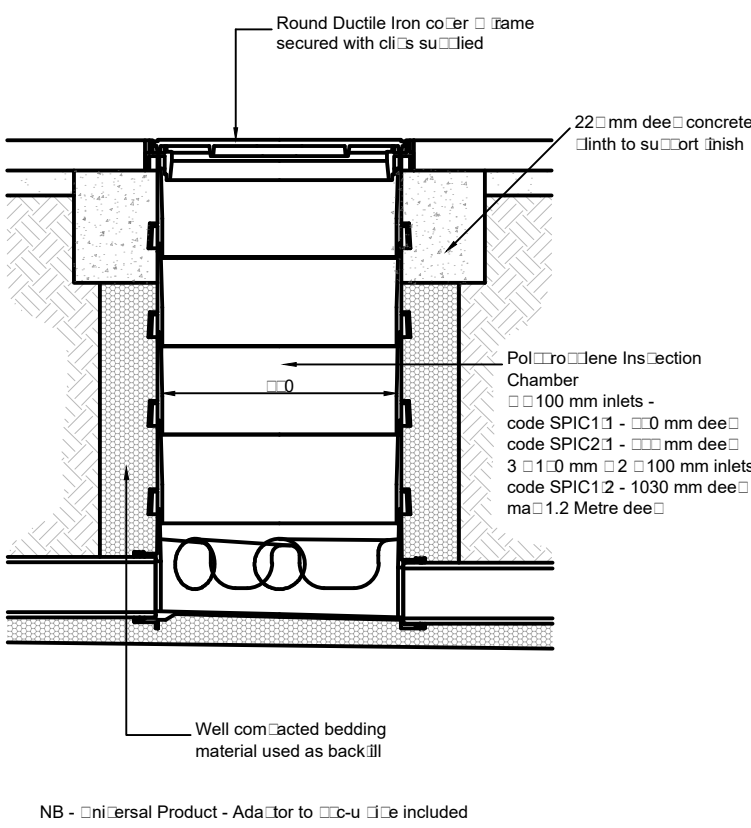
Sited in driveway/hard landscaped areas
With recessed cover



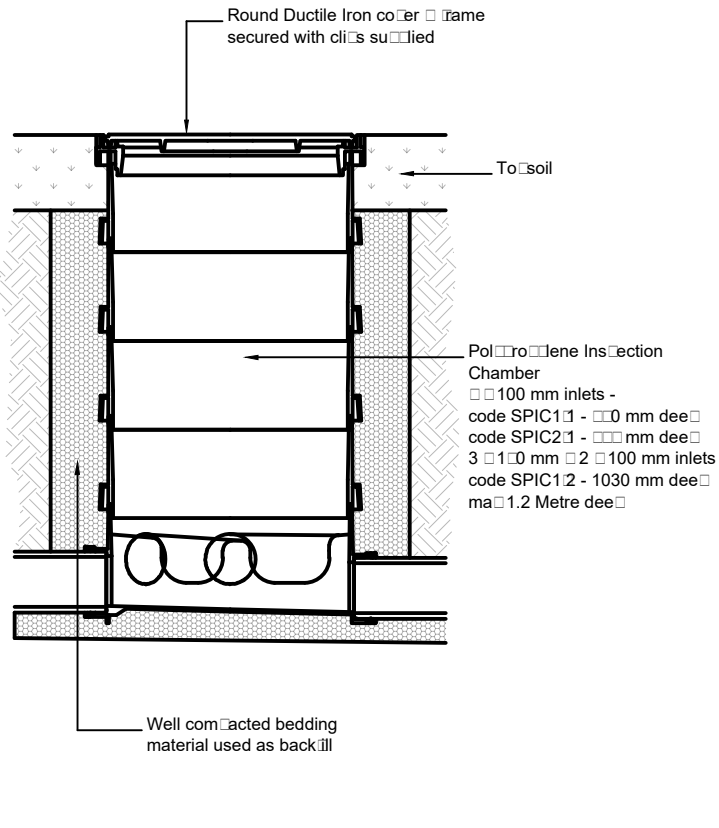
Sited in concrete floor slab
With recessed cover



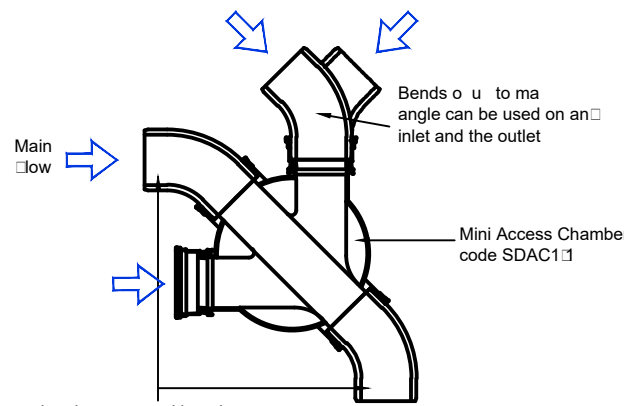
Sited in driveway/hard landscaped areas
With standard round cover



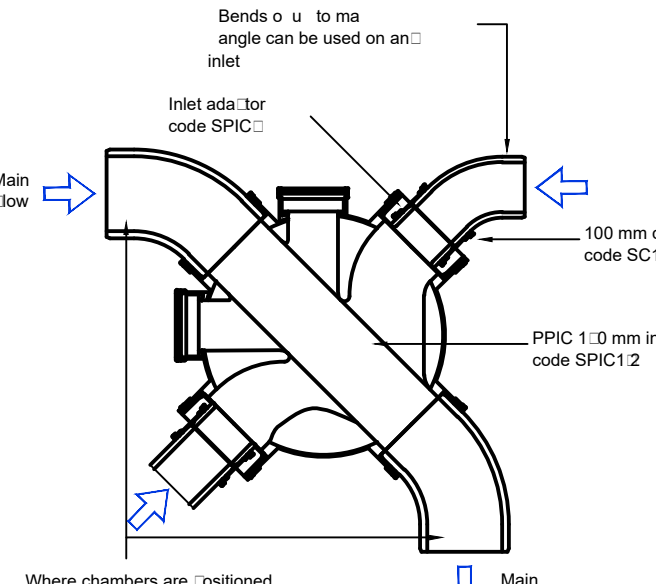
Sited in soft landscaped areas
With standard round cover



250 IC Mini Access Chamber - PPIC -
General Connections Arrangements

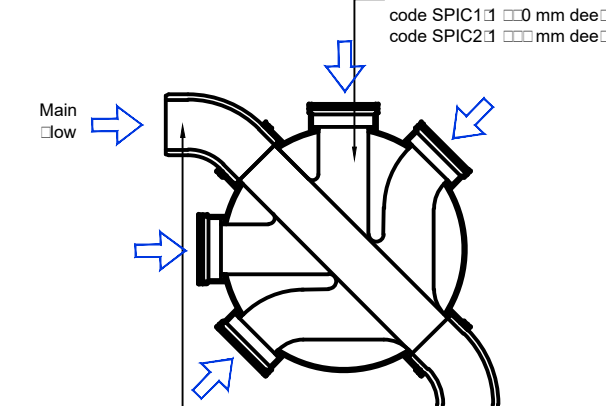


Where chambers are positioned on 0° corners always use the main channel bedding a bend code SB2.1 on inlet and outlet

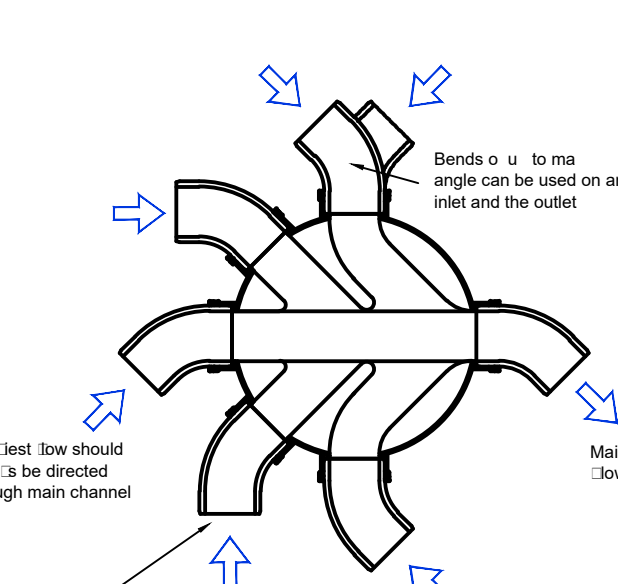


Where chambers are positioned on 0° corners always use the main channel bedding a bend code SB2.2 on inlet and outlet

450 IC Inspection Chamber -
General Connections Arrangements

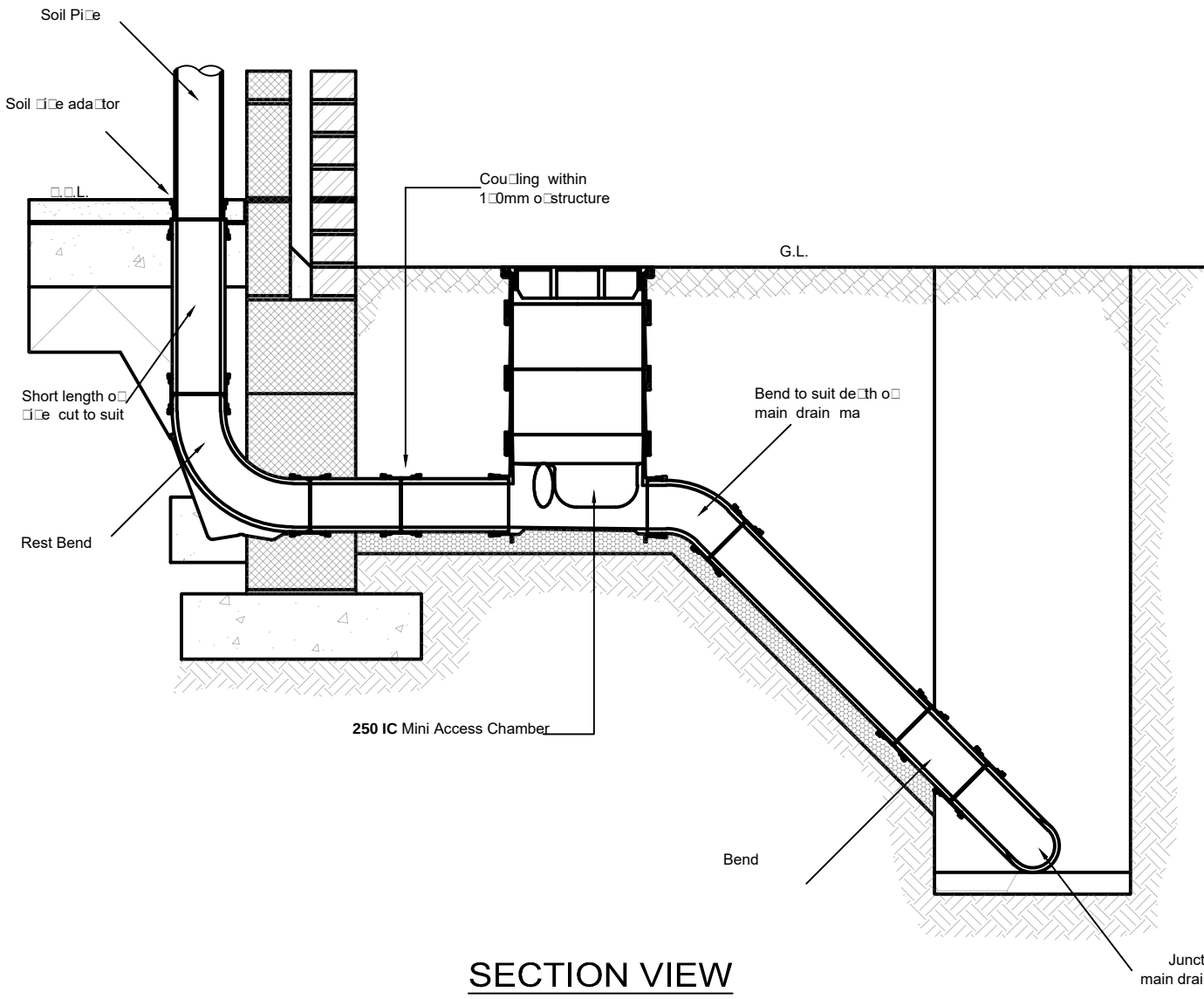


Where chambers are positioned on 0° corners always use the main channel bedding a bend code SB2.1 on inlet and outlet

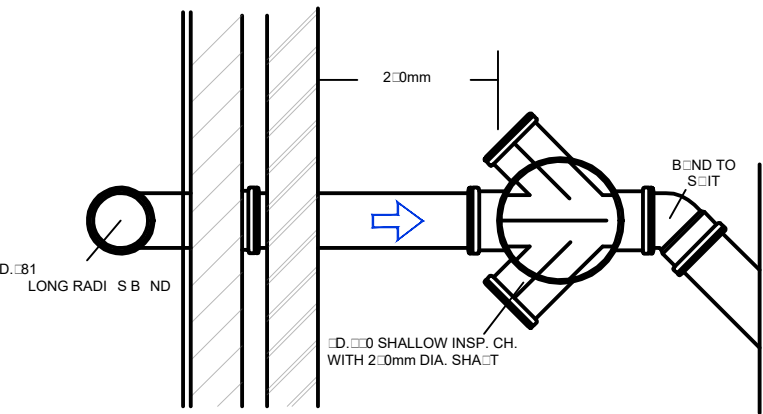


Short sleeve branch connections should 'never' be connected in a inlet using a bend where necessary

250 IC Mini Access Chamber
Positioned on main drain run

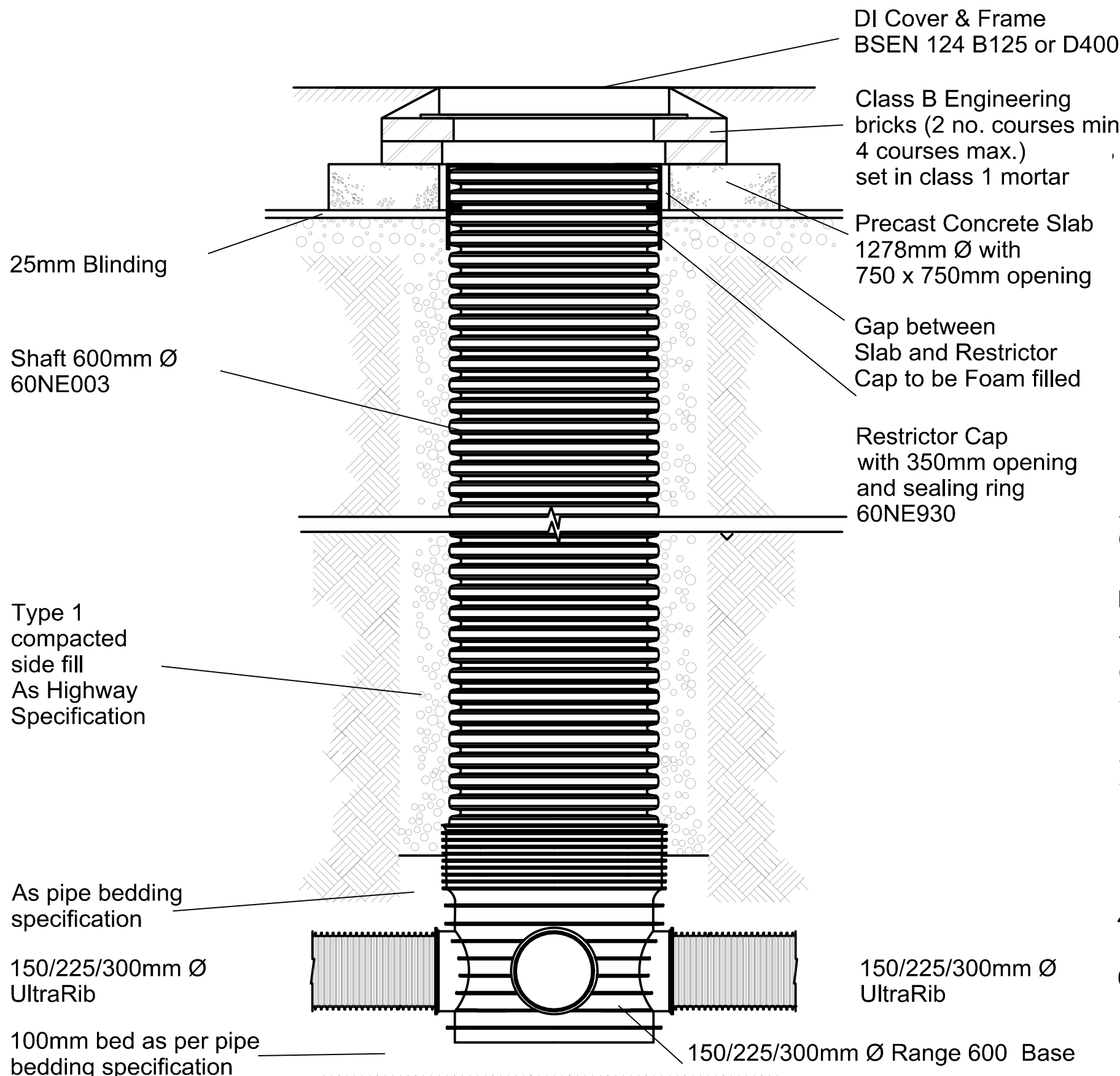


SECTION VIEW

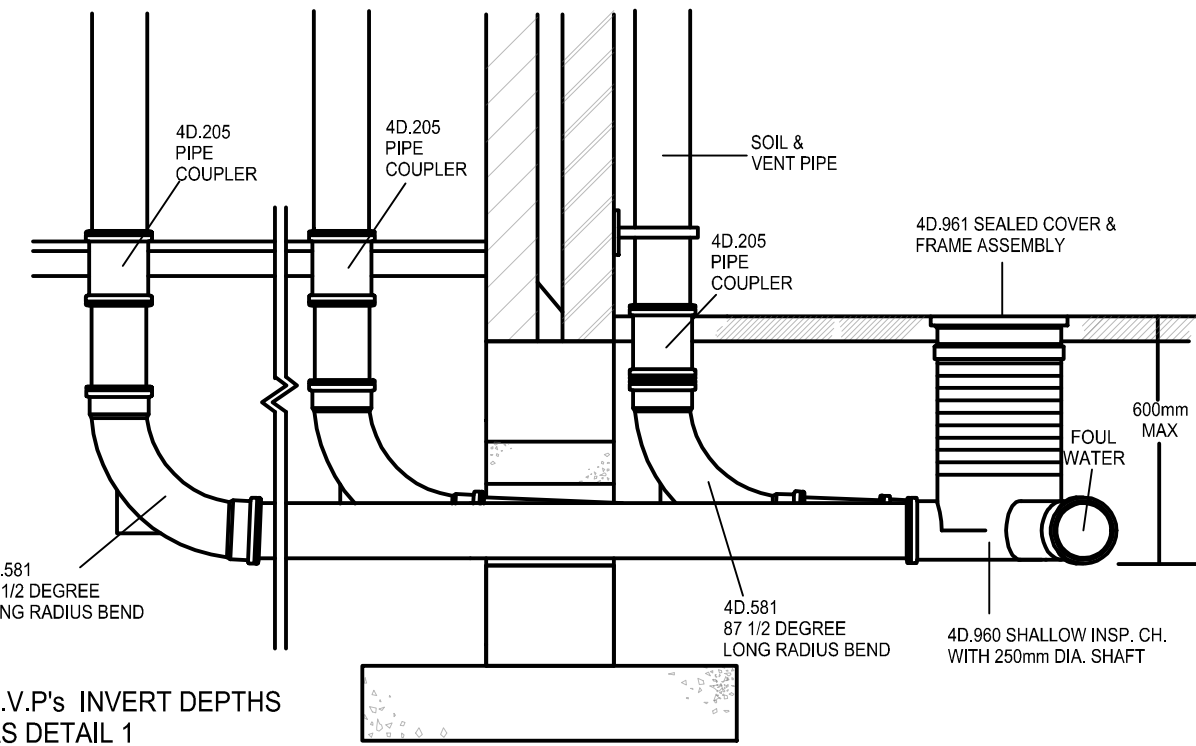


PLAN VIEW

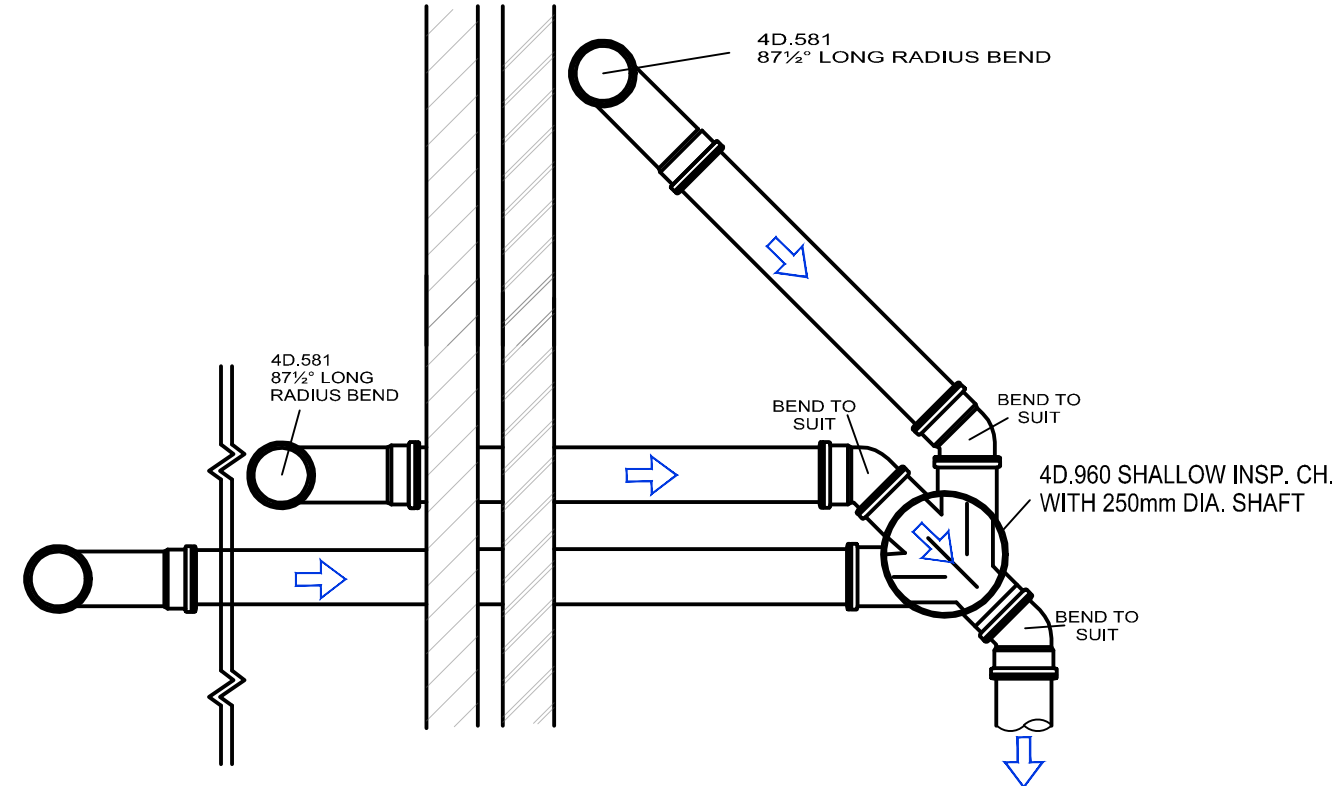
600 IC Non-entry
Inspection Chamber



THROUGH CONNECTIONS TO SHALLOW INSPECTION
CHAMBER MANHOLE WITH 200mm DIA. SHAFT

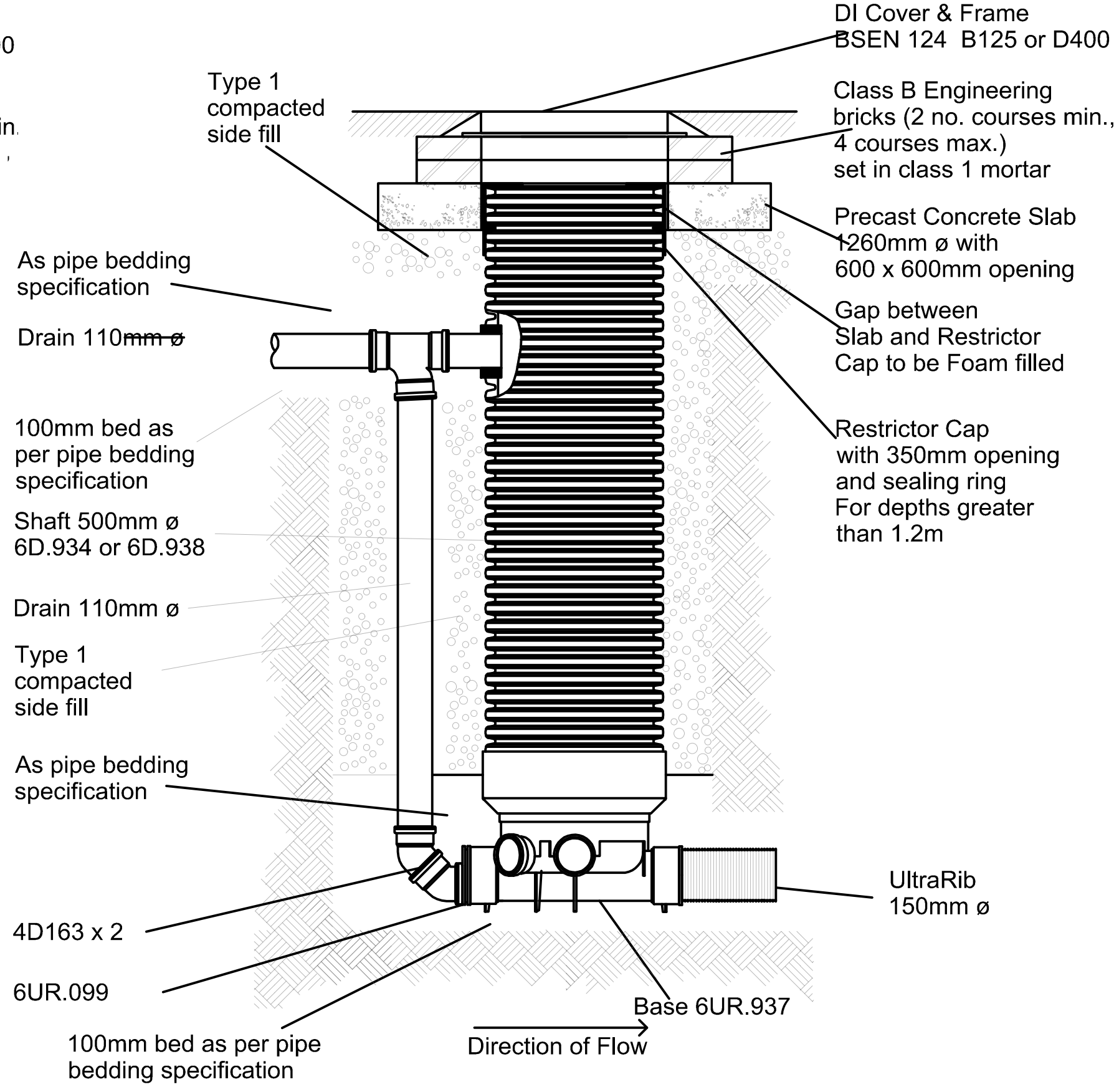


SECTION VIEW



PLAN VIEW

600 IC Non-entry Inspection
Chamber - with 110mm back-drop



Notes

- Do not scale from this drawing.
- All dimensions are in metres and levels are in mAOD unless otherwise stated.
- All drainage works are to be undertaken in accordance with the relevant adoption water authority specifications.
- Any drawing errors or discrepancies should be reported to the Engineer as soon as possible.
- All drainage design and installation to be carried out in accordance with the following:
 - BS EN 752: drain and sewer systems outside buildings.
 - BS EN 12056: gravity drainage systems inside buildings.
 - Building Regulations - Part F
 - Sewerage Sector Guidance
 - BS 8000 pt 14 - workmanship on building sites.
 - Engineering Design Layouts
- Precast Concrete Manholes
- Precast concrete manhole units shall comply with the relevant provisions of BS EN 1917 and BS 5911-3. Units which bed into bases shall be manufactured so that imposed vertical loads are transmitted directly via the full wall thickness of the unit. The profiles of joints between units and the underside of slabs, shall be capable of withstanding applied loadings from such slabs and supported sections shall only be used where the soft of the slab is recessed to receive them.
- Precast concrete chamber sections for valves and meters shall be interlocking and comply with BS EN 1917 and BS 5911-3.
- Manhole Covers and Frames
- Manhole covers and frames shall comply with the relevant provisions of BS EN 124, BS 7903 and Highways Agency Guidance Document HA 104/09. They shall be of non-slip design which does not rely on the use of cushion inserts. Manhole covers on foul only sewers shall be of low leakage types in order to prevent excessive surface water ingress.
- As a minimum, Class D400 covers shall be used in carriageways of roads (including pedestrian streets), hard shoulders and parking areas used by all types of road vehicles.
- Minimum frame depths for NRSWA road categories 11 IV shall be as Table B.
- Class B125 shall be used in footways, pedestrian areas and comparable locations.
- In situations where traffic loading is anticipated to be heavier than would occur on a typical residential estate distributor road (i.e., braking or turning near a junction), a higher specification (B200) shall be used.
- All manhole covers shall be the non-ventilating type and shall have closed keyways.
- Manhole Steps
- Steps for manholes and other chambers shall be Type D Class 1, complying with the requirements of BS EN 13101.
- Galvanized mild steel and plastic encapsulated steps are preferred.
- Ladders
- Ladders in manholes and similar structures shall comply with the requirements of BS EN 14396, with width of rung 300mm and two stringers, but shall not be made from aluminum.
- Mild steel ladders for vertical fixing shall be fabricated from steel conforming to BS EN 10225-2. After fabrication, low carbon steel ladders shall not be hot dip galvanized in accordance with BS EN ISO 1461.
- Stainless steel ladders for fixing shall be fabricated from Grade 304N160 17-12-2 steel conforming to BS EN 10088-3.
- GRP ladders shall be manufactured from pultruded sections conforming to BS EN 13706-3. The surface shall be smooth with the fibres embedded and sealed against penetration from dirt and water. The Barcol hardness of the sections shall be at least 35 when tested in accordance with BS 2782-10.
- Pipes and Joints Adjacent to Structures
- Where rigid pipes are used, a flexible joint shall be provided as close as is feasible to the outside face of any structure into which a pipe is built, within 150mm for pipe diameters less than 300mm. The design of the joints shall be compatible with any subsequent movement.
- The recommended length of the next pipe (rocker pipe) away from the structure shall be as shown in Table C.
- Setting manhole covers and frames
- Manhole frames shall be set to level, bedded and haunched externally over the base and sides of the frame in mortar, in accordance with the manufacturer's instructions. The frame shall be sealed on at least two courses of Class B engineering bricks, on precast concrete masonry units or on a precast concrete cover frame sealing rings to regulate the distance between the top of the cover and the top ring to no greater than 25mm. A mortar fillet shall be provided where the corners to an opening in a slab are chamfered and the brickwork is not flush with the edges of the opening.
- Frames for manhole covers shall be bedded in a polyester resin bedding mortar in all situations where covers are sited in NRSWA Road Categories i, ii or iii (i.e., all except residential cul-de-sacs).

P01	FOR APPROVAL	VM	HC	29.05.2026
Rev	Revision Description	By	App.	Date

Client	
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CIVIL ENGINEERING
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Project
COCKPITS FARM
FAIROAK

DRAINAGE DETAILS
SHEET 2

Scale at A1 SEE DRAWINGS

Date 29.05.2026 Designer VM Design Checker HC

Drawing Number L038-DON-DR-C-201.P01