

KIRKBY – BESS SITE

Operation & Maintenance Manual

Coopers Lane, Kirkby

KIRK-BML-XX-XX-RP-C-0513

Date

04th February 2026

Contents Amendment Record

This report has been issued and amended as follows:

Revision	Description	Issued by	Checked by	Date
P01	Preliminary Issue	IW	NS	04.02.2026

Barnsley Marshall Limited have prepared this report in accordance with the instructions of their client, Pelagic Energy, for their sole and specific use. Any other persons who use any information contained herein do so at their own risk.

Contents

1. Introduction.....	5
1.1 Project Background.....	5
1.2 Scope of O&M Manual.....	5
2. Flow Control Units.....	6
2.1 Location and Description.....	6
2.2 Operation.....	6
2.3 Inspection and Maintenance Regime.....	6
3. Permeable Pavements.....	Error! Bookmark not defined.
3.1 Location and Description.....	Error! Bookmark not defined.
3.2 Operation.....	Error! Bookmark not defined.
3.3 Inspection and Maintenance Regime.....	Error! Bookmark not defined.
4. Geo-cellular Attenuation Tank.....	10
4.1 Location and Description.....	10
4.2 Operation.....	10
4.3 Inspection and Maintenance Regime.....	10
5. Storage Ponds.....	Error! Bookmark not defined.
5.1 Location and Description.....	Error! Bookmark not defined.
5.2 Operation.....	Error! Bookmark not defined.
5.3 Inspection and Maintenance Regime.....	Error! Bookmark not defined.
6. Gatic Slot Drains.....	Error! Bookmark not defined.
6.1 Location and Description.....	Error! Bookmark not defined.
6.2 Operation.....	Error! Bookmark not defined.
6.3 Inspection and Maintenance Regime.....	Error! Bookmark not defined.
7. Syphonic Drainage.....	Error! Bookmark not defined.
7.1 Location and Description.....	Error! Bookmark not defined.
7.2 Operation.....	Error! Bookmark not defined.
7.3 Inspection and Maintenance Regime.....	Error! Bookmark not defined.

Appendices

APPENDIX A : SUDS DRAINAGE PROPOSALS

1. Introduction

1.1 Project Background

Barnsley Marshall Ltd was appointed by Pelagic Energy to provide a Flood Risk Assessment & SuDS Drainage Strategy for the proposed Battery Energy Storage System (BESS) site located on land adjacent to Coopers Lane, Kirkby, L33 7TT.

This report provides recommended maintenance regimes for SuDS assets proposed as part of the surface water drainage for the development based on government and local authority guidance with regard to maintenance.

The report is based on currently available and preliminary discussions.

Proposals contained or forming part of this report represent the design intent and may be subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material deviation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

Where the proposed works to which this report refers are undertaken more than twelve months following the issue of this report, Barnsley Marshall shall reserve the right to re-validate the findings and conclusions by undertaking appropriate further investigations at no cost to Barnsley Marshall.

1.2 Scope of O&M Manual

This manual is intended to give an overview of the operation and maintenance for the range of SuDS features included with the drainage strategy. Where proprietary products are specified the manufacturer's instructions and recommendations should be followed in priority to this document unless specifically noted otherwise due to project constraints.

The recommended maintenance regimes and frequencies are typical only and should be more frequent initially to ensure that there are no unforeseen issues with the operation of the proposed asset, and thereafter adjusted to suit the site requirements.

2. Flow Control Units

2.1 Location and Description

The locations and details of flow control units are shown on the SuDS Drainage Strategy Layout drawings and construction details, refer to **Appendix A**. The main flow control device is specified as Hydro-brake or similar approved and is a proprietary product; therefore, the manufacturer's recommendations should also be taken into consideration.

2.2 Operation

The Hydro-brake is intended to be the main Surface Water Control Device from the site, limiting the outflow from the development to a maximum of 5.0 l/s for all storm events up to and including the 100-year + 40% CC storm event.

2.3 Inspection and Maintenance Regime

Regular inspection and maintenance are important for the effective operation of the flow control unit.

Being part of a private drainage system, the whole life cycle maintenance of the Flow Control Units shall be the responsibility of Constantine Energy Storage LLP. The responsible officer is Scott Williamson whose details are as below:

- ❖ scott@constantineenergystorage.com
- ❖ Constantine Energy Storage LLP, River Court, The Old Mill Office Complex, Mill Lane, Godalming, Surrey, GU7 1EZ.

Table 2.1 gives the recommended maintenance regime for the asset.

Table 2.1: Recommended Maintenance Regime for Flow Control Chamber and Hydro-brake

Regular Maintenance	
Monthly	• Not required.
Six Monthly	• Inspect and identify any areas that are not operating correctly. If required, take remedial actions.
Annually (or as required after heavy rainfall events)	• Remove sediment and debris from flow control chambers
Remedial Actions: Significant storms may cause significant damage to the flow control unit and chamber. As such, a number of actions may be required following such events	
Following all significant storm events	• Inspect and carry out essential recovery works to return the feature to full working order
Monitoring	
Monthly and after large storm events (To be undertaken more regularly within the first year of operation and adjusted as required)	• Inspect and identify any areas that are not operating correctly. If required, take remedial actions.

3. Filter Trench

3.1 Location and Description

The filter trenches are proposed throughout the site to allow water to permeate the filter material before reaching the perforated pipe at the base of the trench ensuring filtration of runoff prior to conveyance to the attenuation tank downstream. Refer to **Appendix A** for the locations of filter trenches. Filter trench will have SHW Type B filter material (20-40mm stone).

3.2 Operation

Filter trenches are shallow excavations filled with rubble or stone (SHW Type B filter material) that create temporary subsurface storage of stormwater runoff. These trenches allow runoff to filter prior to conveying to the main drainage network downstream.

3.3 Inspection and Maintenance Regime

Regular inspection and maintenance are important for the effective operation of the Filter Trenches.

Being part of a private drainage system, the whole life cycle maintenance of the filter trenches shall be the responsibility of Constantine Energy Storage LLP. The responsible officer is Scott Williamson whose details are as below:

- ❖ scott@constantineenergystorage.com
- ❖ Constantine Energy Storage LLP, River Court, The Old Mill Office Complex, Mill Lane, Godalming, Surrey, GU7 1EZ.

Table 3.1 gives the recommended maintenance regime for the asset.

Table 3.1: Recommended Maintenance Regime for Filter Trenches

Regular Maintenance	
Monthly	• Litter and debris removal • Mow grasses (where required to promote lateral runoff inflow) and remove resultant clippings (during growing season only) • Remove nuisance and invasive vegetation (for 12 months following installation) • Inspect/check all inlets, outlets, surface and overflows (where required) to ensure that they are in good condition, free from blockages and operating as designed. Take action where required
Six Monthly	• Not applicable
Annually	• Not applicable
Annually	• Remove nuisance and invasive vegetation • Inspect and document the presence of wildlife
As Required	• Repair erosion or other damage by re-turfing, reseeding or replacing filter material • Re-level uneven surfaces and reinstate design levels (typically every 60-month period) • Remove and replace top 300 – 500mm of gravel, clean and replace where required (typically every 60-month period) • Remove and dispose of oils or petrol residues using safe standard practices
Remedial Actions: Significant storms may cause significant damage to SuDS. As such, a number of actions may be required following such events	
Following all significant storm events	• Inspect and carry out essential recovery works to return the feature to full working order

4. Geo-cellular Attenuation Tank

4.1 Location and Description

The location and details of the Geo-cellular Attenuation Tank is indicated on the SuDS Drainage Strategy Layout drawing and construction details, refer to **Appendix A**. Geo-cellular Attenuation Modules vary in strength and unit sizes, and are therefore a proprietary product therefore the manufacturer's recommendations should also be taken into consideration. The drainage drawing in **Appendix A** indicate that **Polystorm PSM1** units are recommended, but the contractor may be able to find a cheaper supplier of a similar product. The engineer will evaluate the alternative product and approve before it can be used as an alternative.

4.2 Operation

The proposed attenuation tank is intended to be a surface water storage feature to attenuate the discharge from the site up to and including the 100-year plus 40% climate change event. The tank is intended to be empty between large rainfall events.

4.3 Inspection and Maintenance Regime

Regular inspection and maintenance are important for the effective operation of the attenuation tank.

Being part of a private drainage system, the whole life cycle maintenance of the attenuation tank shall be the responsibility of Constantine Energy Storage LLP. The responsible officer is Scott Williamson whose details are as below:

- ❖ scott@constantineenergystorage.com
- ❖ Constantine Energy Storage LLP, River Court, The Old Mill Office Complex, Mill Lane, Godalming, Surrey, GU7 1EZ.

Table 4.1 gives the recommended maintenance regime for the asset.

Table 4.1: Recommended Maintenance Regime for Geo-cellular Attenuation Tanks

Regular Maintenance	
Monthly	- Inspect and identify any areas that are not operating correctly. If required, take remedial action. (for 3 months following installation) - Debris removal from catchment surface (where may cause risks to performance) - Inspect systems as specified by the manufacturer - Where rainfall infiltrates into blocks from above, check surface of filter for blockage by silt, algae or other matter. Remove and replace surface infiltration medium as necessary.
Sixth Monthly	Inspect and identify any areas that are not operating correctly. If required, take remedial action. (following initial 3-month period)
Annually	- Remove sediment from pre-treatment structures (e.g. upstream silt traps or Vortex flow control upstream) and geo-cellular system where required (High pressure water jetting) - Inspect and document the presence of wildlife
Remedial Actions: Significant storms may cause significant damage to SuDS. As such, many actions may be required following such events	
Following all significant storm events	Inspect and carry out essential recovery works to return the feature to full working order

5. Below Ground Drainage Pipes & Catchpits

5.1 Location and Description

The location of the Below Ground Drainage Pipes and Catchpits is shown on the SuDS Drainage Strategy Layout drawings and construction details, refer to **Appendix A**.

5.2 Operation

The Below Ground Drainage Pipes convey surface water between SuDS features and allow it to be discharged into the Knowsley Brook located at the southeast corner of the site. The Catchpits protect features from silt and debris build-ups before runoff reaches Attenuation Tank.

5.3 Inspection and Maintenance Regime

Regular inspection and maintenance are important for the effective operation of the overall pipe network and drainage system. All Catchpits should be maintained in accordance with the manufacture's recommendations.

Being part of a private drainage system, the whole life cycle maintenance of the below ground pipes & catchpits shall be the responsibility of Constantine Energy Storage LLP. The responsible officer is Scott Williamson whose details are as below:

- ❖ scott@constantineenergystorage.com
- ❖ Constantine Energy Storage LLP, River Court, The Old Mill Office Complex, Mill Lane, Godalming, Surrey, GU7 1EZ.

Table 5.1 gives the recommended maintenance regime for the asset.

Table 5.1: Recommended Maintenance Regime for Below Ground Drainage Pipes and Catchpits

Regular Maintenance	
Monthly	- Remove debris from catchment surfaces (where it may cause risks to performance) - Maintain vegetation to designed limits within the vicinity of below ground drainage pipes, inspection chambers, catchpits and tanks to avoid damage to system. - Inspect and identify any areas that are not operating correctly. If required take remedial action.
Annually or As Required	Remove sediment from pre-treatment inlet structures, catchpits and inspection chambers.
Remedial Actions: Significant storms may cause significant damage to SuDS or drainage networks. As such, a number of actions may be required following such events.	
Following all significant storm events or As Required	Repair physical damage as necessary.
Monitoring	
Annually	Inspect all inlets, outlets and vents to ensure that they are in good condition and operating as designed.
Every 5 years or As Required	- Survey inside of pipe runs and drainage network for sediment build-up and remove if necessary. - Survey inside of pipe runs and drainage network for physical damage and repair as necessary.

6.ACO Cutoff Linear Drains (or similar approved)

8.1 Location and Description

The locations of the cutoff linear drains are shown on the SuDS Drainage Strategy Layout drawings and construction details, refer to **Appendix A**.

8.2 Operation

The cutoff linear drains operate as a linear surface drainage system designed to efficiently collect and convey runoff from the pavements. Water flows into the drain through slotted or grated inlets along its length, which direct the runoff into an underlying channel. The system is engineered to handle high volumes of water, with features like built-in gradients to optimize flow toward discharge points.

8.3 Inspection and Maintenance Regime

Regular inspection and maintenance are important for the effective operation of cutoff linear drains.

Being part of a private drainage system, the whole life cycle maintenance of the ACO linear drains (or similar approved) shall be the responsibility of Constantine Energy Storage LLP. The responsible officer is Scott Williamson whose details are as below:

- ❖ scott@constantineenergystorage.com
- ❖ Constantine Energy Storage LLP, River Court, The Old Mill Office Complex, Mill Lane, Godalming, Surrey, GU7 1EZ.

Table 8.1 gives the recommended maintenance regime for the asset.

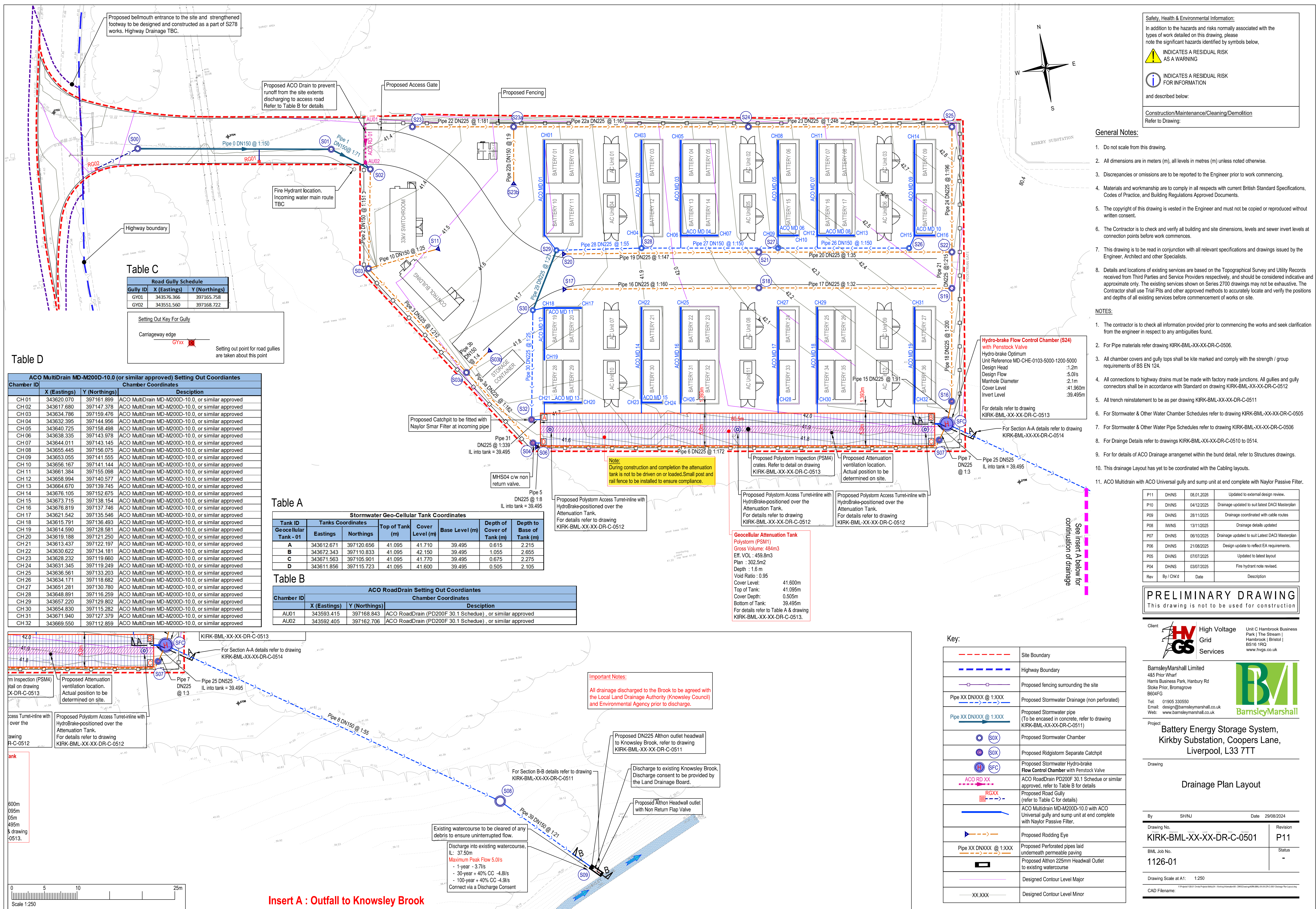
Table 8.1: Recommended Maintenance Regime cutoff linear drains

Regular Inspections	
Quarterly	- Inspect gratings or slots for visible debris, such as leaves, litter, or sediment. - Remove surface debris using a brush or vacuum equipment. - Check for standing water around the drain, which may indicate a blockage. - Inspect for visible damage to gratings, slots, or surrounding surfaces.
Annually	- Conduct a full inspection of the entire drainage system, including channels, gratings, and discharge points. - Check structural integrity, looking for cracks, corrosion, or deformation in the channels or surrounding areas. - Replace damaged or worn components, such as gratings, frames, or seals. - Review the system's capacity and performance against current water flow demands.
Regular Maintenance	
Quarterly	- Perform a deeper cleaning of the channel using high-pressure water jetting to clear sediment and debris. - Inspect joints, connections, and sealing elements for wear or damage. - Clean silt traps or catch pits associated with the drainage system to ensure unimpeded flow. - Test water flow through the system to confirm functionality.
As Required	- Remove blockages or debris promptly. - Conduct emergency repairs to maintain drainage functionality.
Remedial Actions: Significant storms may cause significant damage to SuDS. As such, many actions may be required following such events	
Following all significant storm events	Inspect and carry out essential recovery works to return the feature to full working order

APPENDICES

Appendix A

SuDS Drainage Proposals



Safety, Health & Environmental Information:
In addition to the hazards and risks normally associated with the types of work detailed on this drawing, please note the significant hazards identified by symbols below,

INDICATES A RESIDUAL RISK AS A WARNING

INDICATES A RESIDUAL RISK FOR INFORMATION

and described below:

Construction/Maintenance/Cleaning/Demolition
Refer to Drawing:

General Notes:

1. Do not scale from this drawing.

2. All dimensions are in meters (m), all levels in metres (m) unless noted otherwise.

3. Discrepancies or omissions are to be reported to the Engineer prior to work commencing.

4. Materials and workmanship are to comply in all respects with current British Standard Specifications, Codes of Practice, and Building Regulations Approved Documents.

5. The copyright of this drawing is vested in the Engineer and must not be copied or reproduced without written consent.

6. The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work commences.

7. This drawing is to be read in conjunction with all relevant specifications and drawings issued by the Engineer, Architect and other Specialists.

8. Details and locations of existing services are based on the Topographical Survey and Utility Records received from Third Parties and Service Providers respectively, and should be considered indicative and approximate only. The existing services shown on Series 2700 drawings may not be exhaustive. The Contractor shall use Trial Pits and other approved methods to accurately locate and verify the positions and depths of all existing services before commencement of works on site.

Notes:

1. For Stormwater Drainage refer to drawing KIRK-BML-XX-XX-DR-C-0501

2. For Stormwater Drainage Details refer to drawing KIRK-BML-XX-XX-DR-C-0510 to 0514

4. All proposed manhole covers to be 675mm x 675mm

P05	DHNS	08.01.2026	Updated to external design review.
P04	DHNS	04/12/2025	Schedules updated
P03	DHNS	06/10/2025	Schedules updated
P02	DHNS	11/06/2025	Schedules updated
P01	DHNS	11/11/2024	Preliminary Issue
Rev	By / Chkd	Date	Description

PRELIMINARY DRAWING
This drawing is not to be used for construction

Client

HVGS

High Voltage Grid Services

Unit C Hambrook Business Park | The Stream | Hambrook | Bristol | BS16 1RQ
www.hvgs.co.uk

BarnsleyMarshall Limited
4&5 Prior Wharf
Harris Business Park, Hanbury Rd
Stoke Prior, Bromsgrove
B604FG
Tel: 01905 330650
Email: design@barnsleymarshall.co.uk
Web: www.barnsleymarshall.co.uk

BarnsleyMarshall

Project

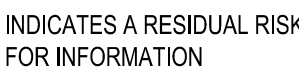
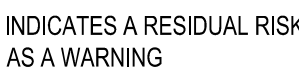
Battery Energy Storage System,
Kirkby Substation, Coopers Lane,
Liverpool, L33 7TT

P05

Stormwater
Chamber Schedule

By	DHNS	Date	08/08/2024
Drawing No.	KIRK-BML-XX-XX-DR-C-0505	Revision	P05
BML Job No.	1126-01	Status	-
Drawing Scale at A1:	n:1s		
CAD Filename:	Y:\Projects\1126-01-Civils\Projects\Kirkby\DWG\Working\Information\BML\BML-XX-XX-DR-C-0505 Stormwater Manhole & Pipe.dwg		

In addition to the hazards and risks normally associated with the types of work detailed on this drawing, please note the significant hazards identified by symbols below,



Construction/Maintenance/Cleaning/Demolition
Refer to Drawing:

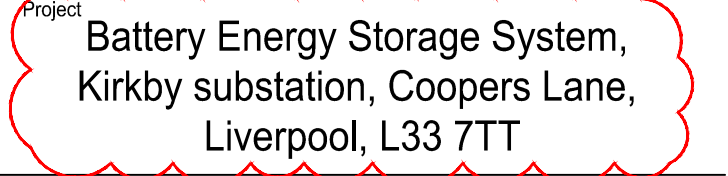
1. Do not scale from this drawing.
2. All dimensions are in meters (m), all levels in metres (m) unless noted otherwise.
3. Discrepancies or omissions are to be reported to the Engineer prior to work commencing.
4. Materials and workmanship are to comply in all respects with current British Standard Specifications, Codes of Practice, and Building Regulations Approved Documents.
5. The copyright of this drawing is vested in the Engineer and must not be copied or reproduced without written consent.
6. The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work commences.
7. This drawing is to be read in conjunction with all relevant specifications and drawings issued by the Engineer, Architect and other Specialists.
8. Details and locations of existing services are based on the Topographical Survey and Utility Records received from Third Parties and Service Providers respectively, and should be considered indicative and approximate only. The existing services shown on Series 2700 drawings may not be exhaustive. The Contractor shall show Trial Pits and other approved methods to accurately locate and verify the positions and depths of all existing services before commencement of works on site.

1. For Stormwater Drainage refer to drawing KIRK-BML-XX-XX-DR-C-0501
2. For Stormwater Drainage Details refer to drawing KIRK-BML-XX-XX-DR-C-0510 to 0514
4. All proposed manhole covers to be 675mm x 675mm

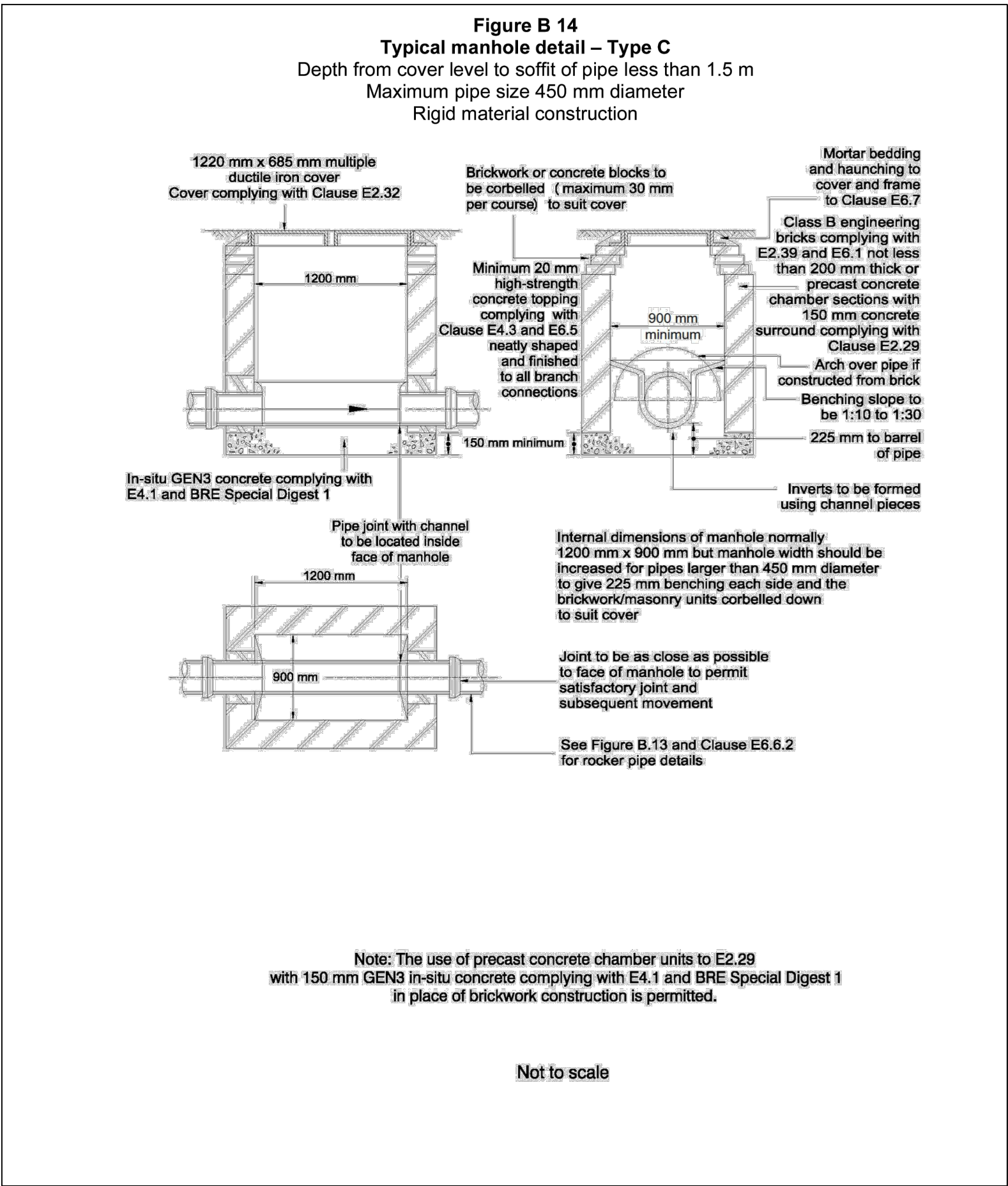
PRELIMINARY DRAWING
This drawing is not to be used for construction

BarnsleyMarshall Limited
4&5 Prior Wharf
Harris Business Park, Hanbury Rd
Stoke Prior, Bromsgrove
B604FG

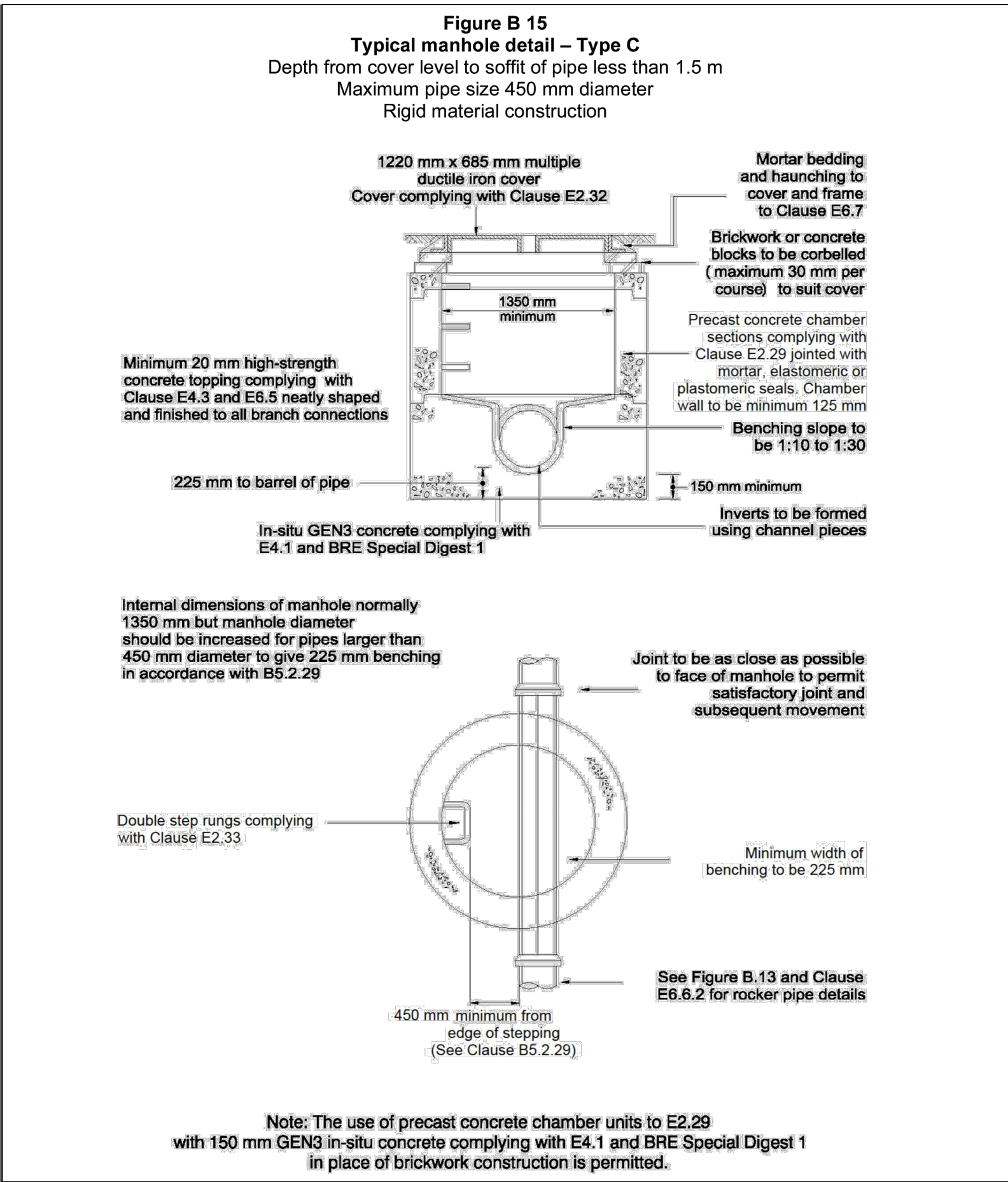
Tel: 01905 330550
Email: design@barnsleymarshall.co.uk
Web: www.barnsleymarshall.co.uk

The logo for BarnsleyMarshall features a large, stylized 'BM' in a light green color. Below the 'BM' is the company name 'BarnsleyMarshall' in a dark green, sans-serif font.

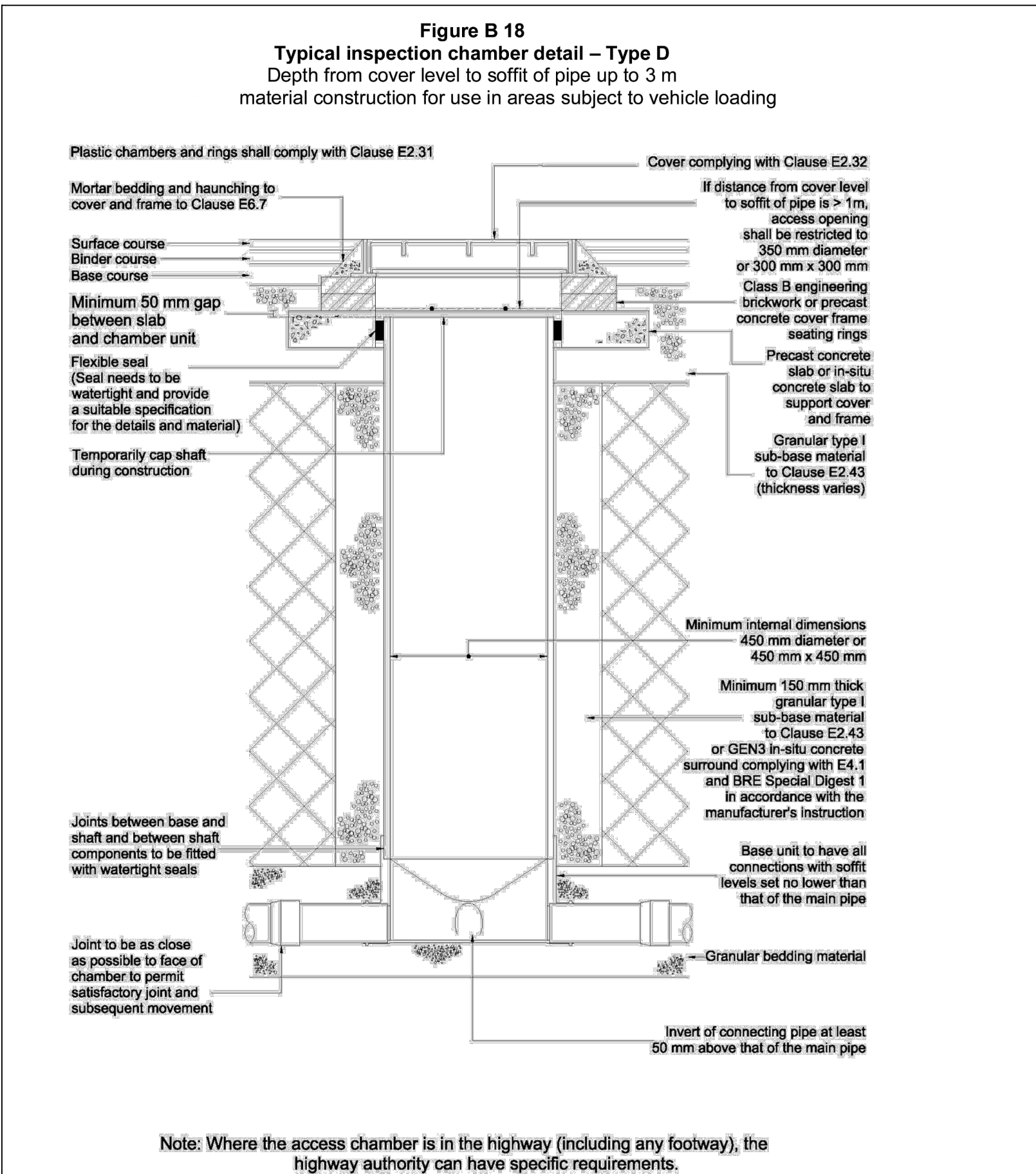
By	DHNS	Date	08/08/2024	
Drawing No.				Revision
KIRK-BML-XX-XX-DR-C-0506	P05			
BML Job No.	Status			
1126-01	-			
Drawing Scale at A1: n.t.s				
CAD Filename:	C:\Users\j126-01\Civil3D Projects\Kirk-XX-XX-DR-C-0506 Stormwater Mainline & Pipe Drawings\KIRK-BML-XX-XX-DR-C-0506 Stormwater Mainline & Pipe.dwg			



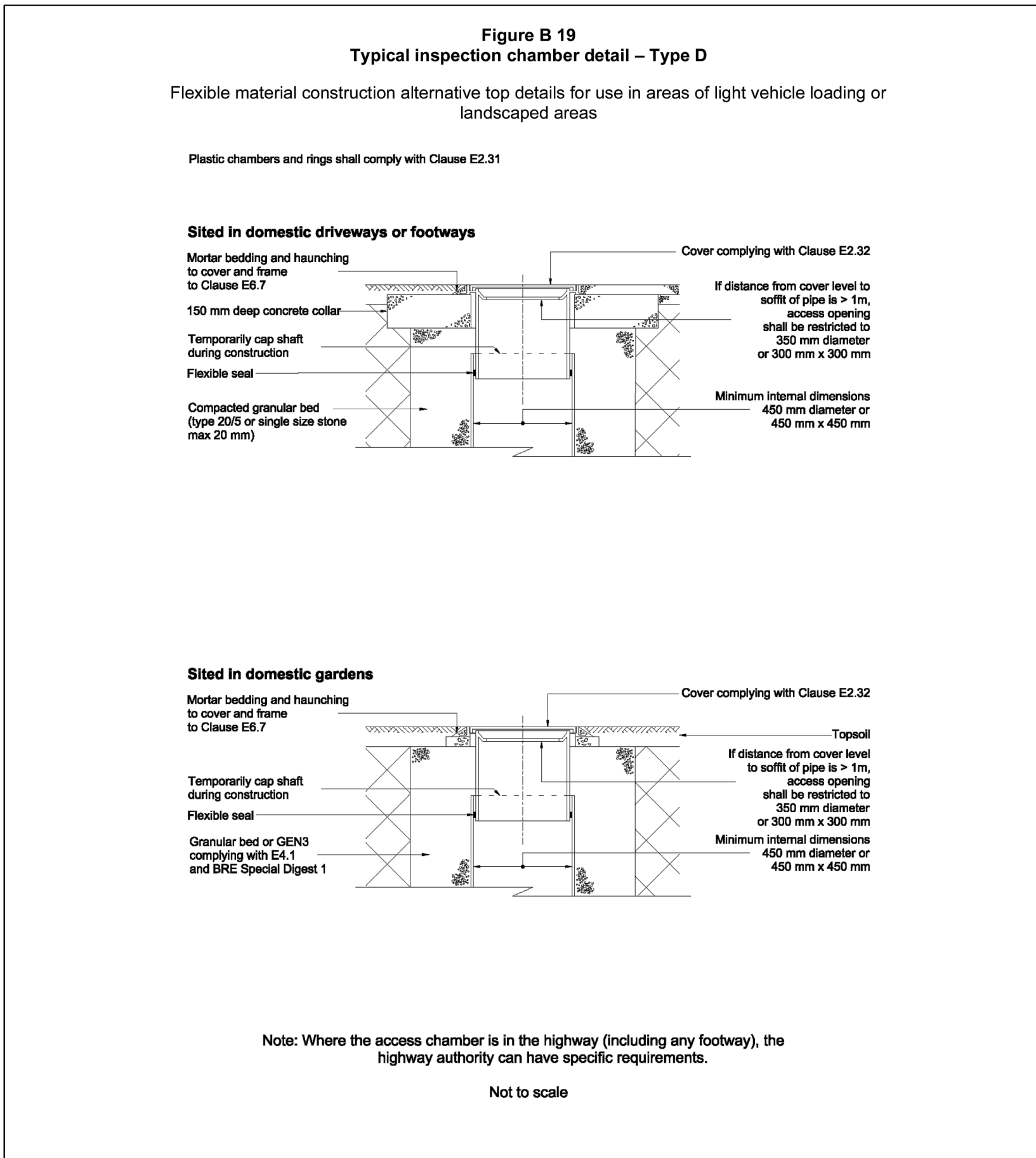
Manhole Type C (Option 1)
Brickwork thick walled manhole, min. 200mm thick, no shaft /
Thin walled manhole with 150mm concrete surround, no shaft
Scale: n.t.s
(Manhole Details from Design and Construction Guidance)



Manhole Type C (Option 2)
Thick walled manhole, no concrete surround, no shaft
Scale: n.t.s
(Manhole Details from Design and Construction Guidance)



Chamber Type D Thick walled Polypropylene Inspection Chamber,
with Concrete surround or 150mm thick Type 1 Sub-Base material, no shaft
(For use in areas subject to heavy vehicle loading)
Scale: n.t.s
(Manhole Details from Design and Construction Guidance)



Chamber Type D Thick walled Polypropylene Inspection Chamber, with Granular surround, no shaft
(For use in areas subject to light vehicle loading or landscaped areas)
Scale: n.t.s
(Manhole Details from Design and Construction Guidance)

Safety, Health & Environmental Information:	
In addition to the hazards and risks normally associated with the types of work detailed on this drawing, please note the significant hazards identified by symbols below,	
	INDICATES A RESIDUAL RISK AS A WARNING
	INDICATES A RESIDUAL RISK FOR INFORMATION
and described below:	
Construction/Maintenance/Cleaning/Demolition	
Refer to Drawing:	

- General Notes:
- Do not scale from this drawing.
 - All dimensions are in meters (m), all levels in metres (m) unless noted otherwise.
 - Discrepancies or omissions are to be reported to the Engineer prior to work commencing.
 - Materials and workmanship are to comply in all respects with current British Standard Specifications, Codes of Practice, and Building Regulations Approved Documents.
 - The copyright of this drawing is vested in the Engineer and must not be copied or reproduced without written consent.
 - The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work commences.
 - This drawing is to be read in conjunction with all relevant specifications and drawings issued by the Engineer, Architect and other Specialists.

P03	DHNS	08.01.2026	Updated to external design review comments.
P02	DHNS	11/06/2025	Drainage details updated
P01	DHNU	13/11/2024	Preliminary issue
Rev	By / Chkd	Date	Description

PRELIMINARY DRAWING
This drawing is not to be used for construction

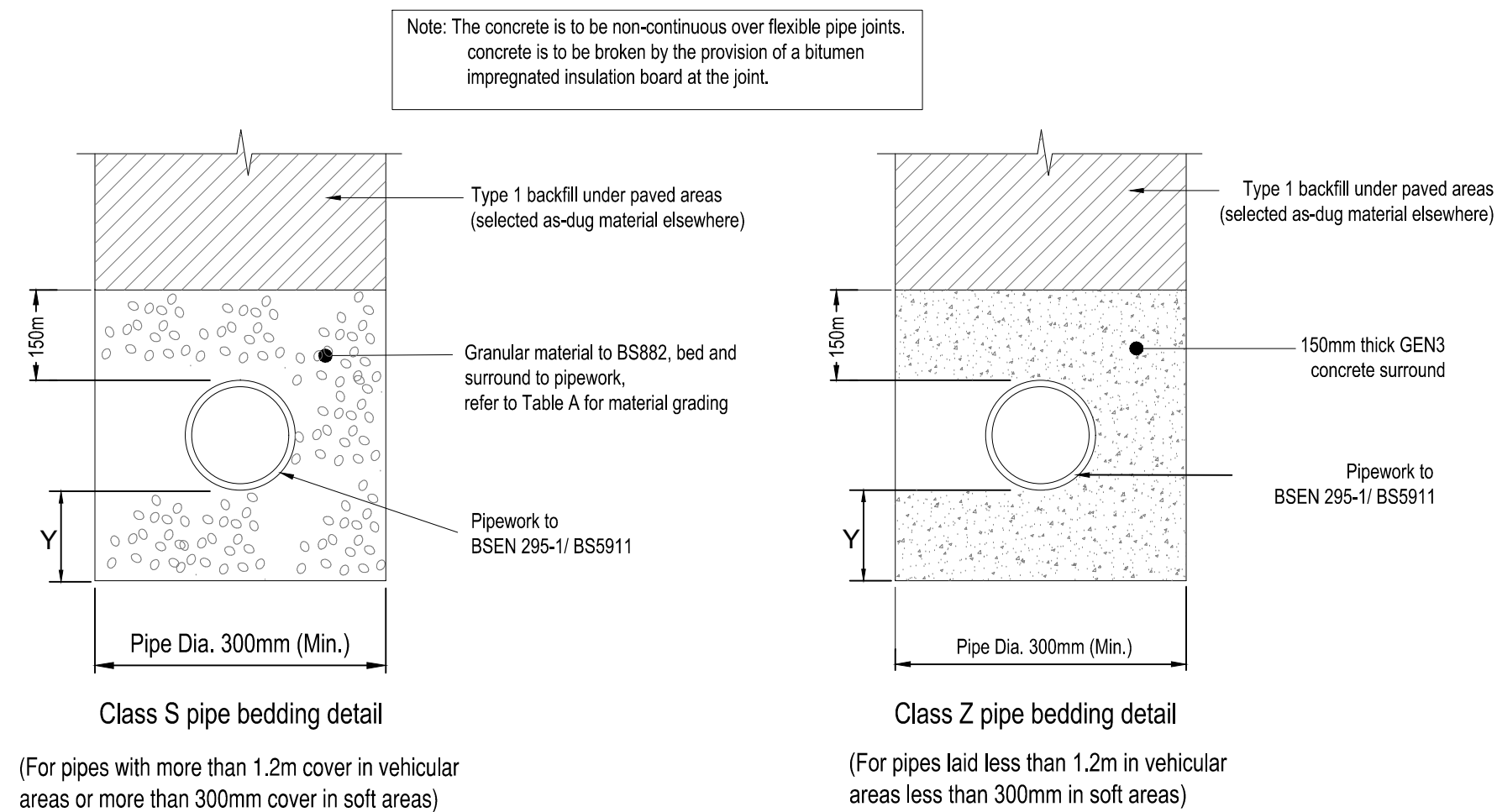
Client	High Voltage Grid Services	Unit C Hambrook Business Park The Stream Hambrook Bristol BS16 1RQ www.hvgs.co.uk
--------	----------------------------	--

BarnsleyMarshall Limited 485 Prior Wharf Harris Business Park, Hanbury Rd Stoke Prior, Bromsgrove B694FG Tel: 01905 330660 Email: design@barnsleymarshall.co.uk Web: www.barnsleymarshall.co.uk	
--	--

Project	275kV Substation, Coopers Lane, Kirkby L33 7TT
---------	--

Drainage Details 01
Chamber Construction Details

By	SLW/JP	Date	08/08/2024
Drawing No.	KIRK-BML-XX-XX-DR-C-0510	Revision	P03
BML Job No.	1126-01	Status	-
Drawing Scale at A1:	n.t.s		
CAD Filename:	Y:\Projects\1126-01 Omnia Projects Kirkby\04 - Working Information\06 - DWG Drawings\KIRK-BML-XX-XX-DR-C-0510-0514 Drainage Details.dwg		



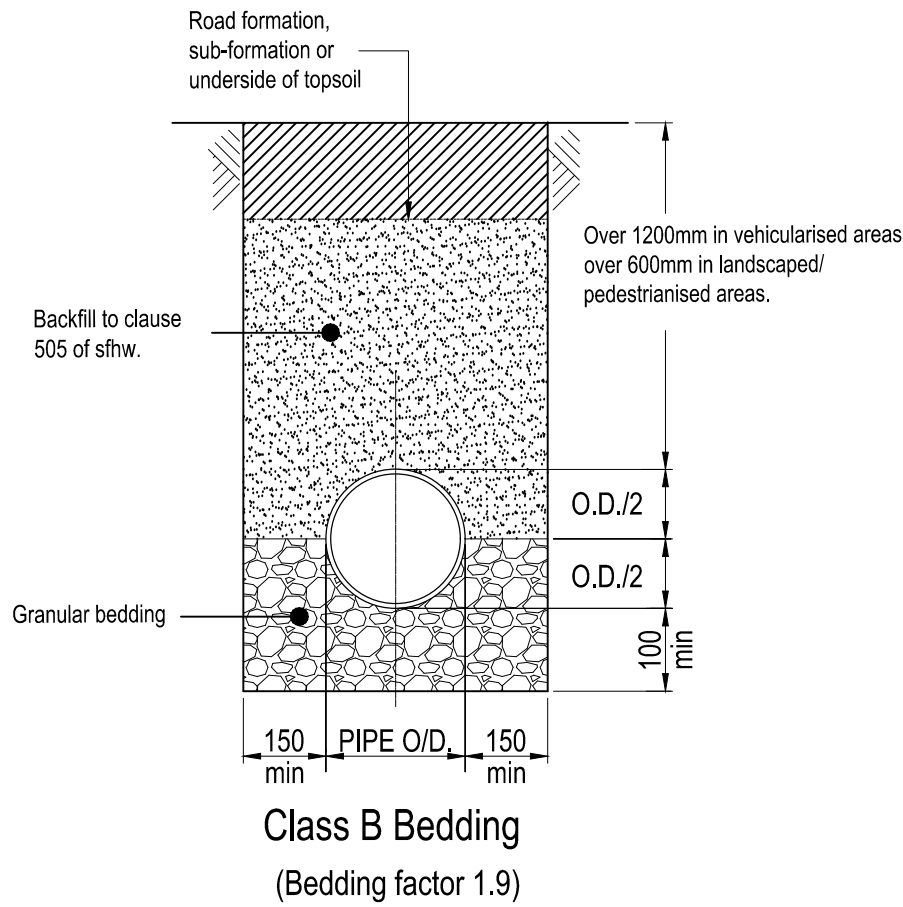
Bedding Details

Table A
granular pipe bedding material Type 'S'

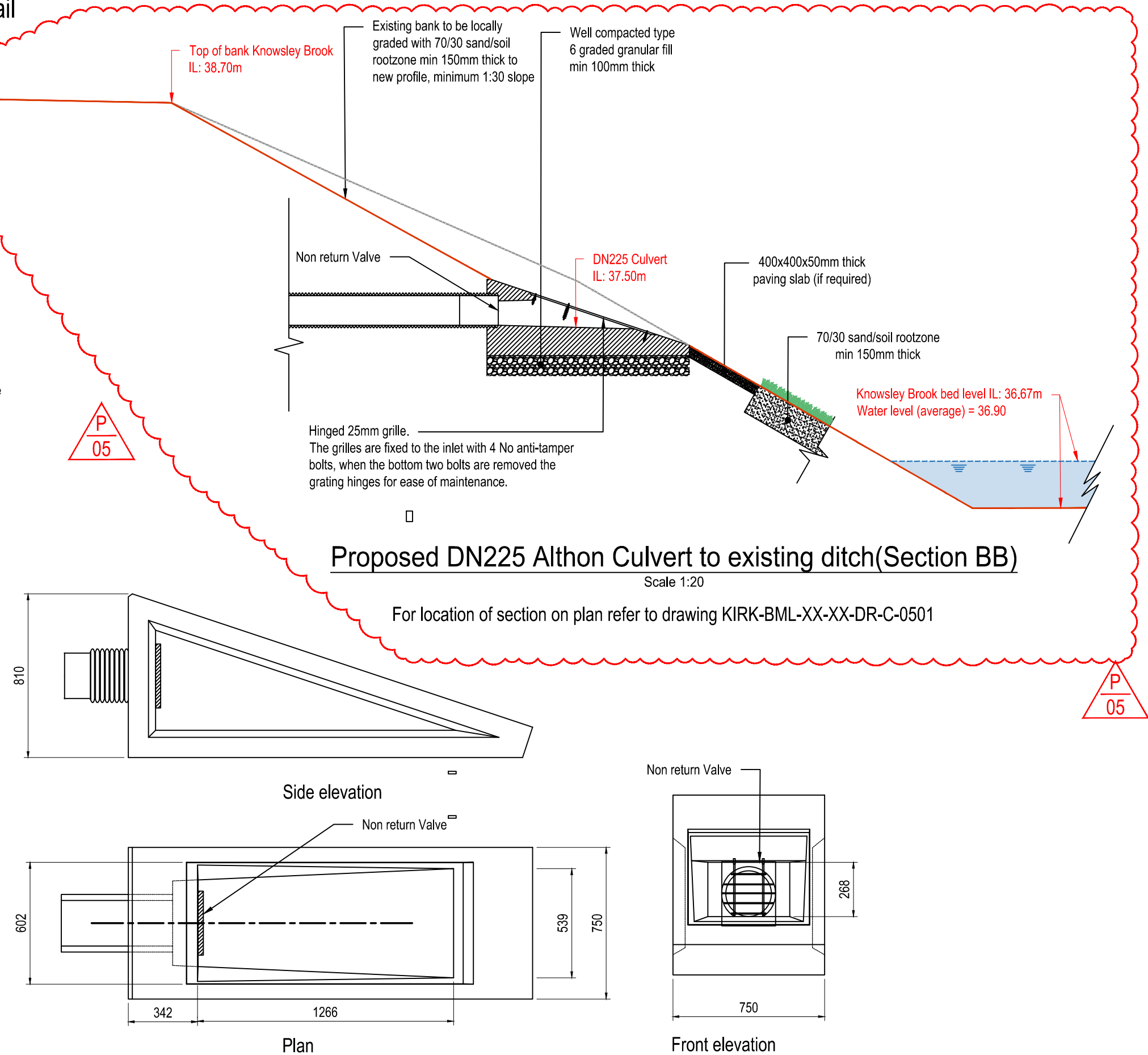
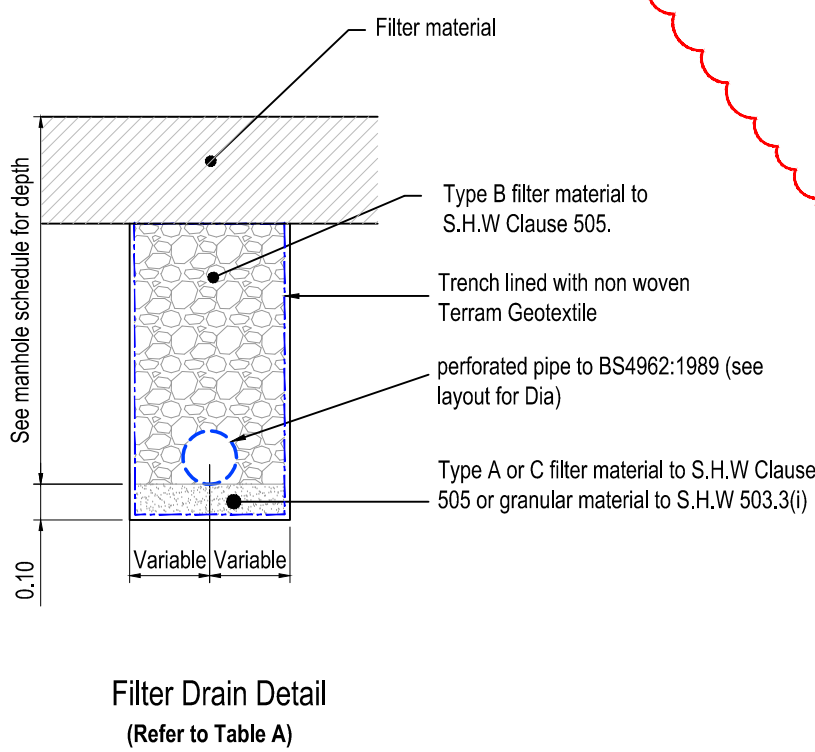
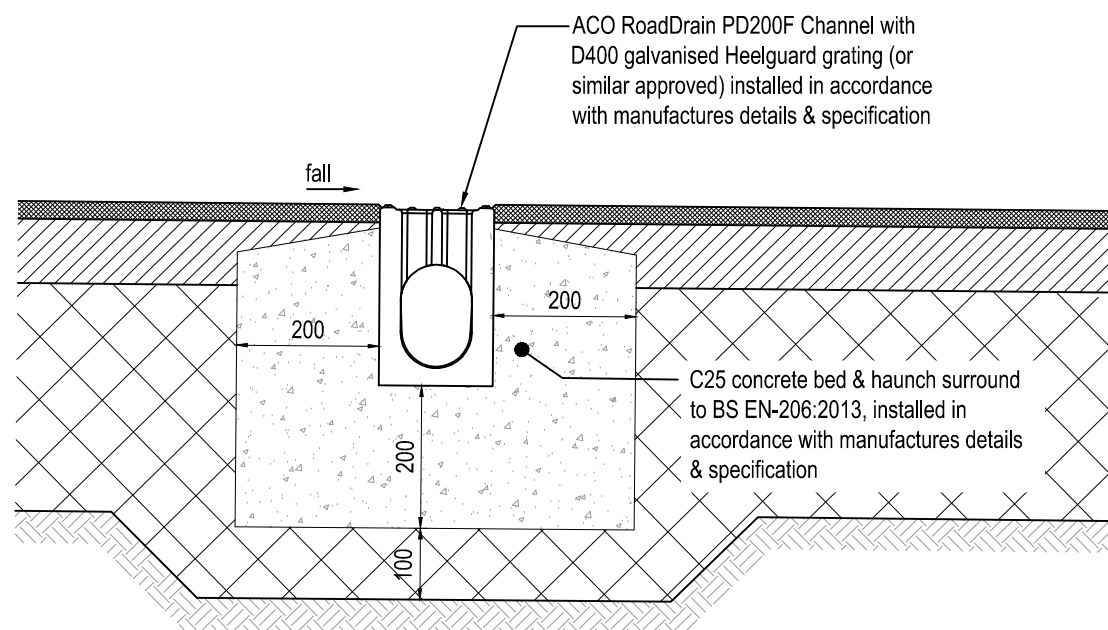
Pipe dia. (mm)	Aggregate size.	
	Graded (mm)	Single sized (mm)
100	-	10
150	14 - 5	10 OR 14
225 - 300	14 - 5 OR 20 - 5	10, 14 OR 20
375 - 525	14 - 5 OR 20 - 5	10, 14 OR 20
EXCEEDING 525	14 - 5 OR 20 - 5 OR 40 - 5	10, 14, 20 OR 40

Table B
(Trench widths and other dimensions)

PIPE DIA.(MM)	WIDTH BC		Y		Z
	MAX.	MIN.	Y1 (UNIFORM SOIL)	Y2 (ROCK) *	MIN.
100	550	450	100	200	100
150	600	490	100	200	100
225	700	580	150	200	100
300	750	680	150	200	100
375	1050	950	150	200	100
450	1150	1030	150	200	150
525	1200	1120	150	200	150
600	1350	1240	150	200	150
675	1450	1330	150	200	225
750	1500	1400	150	200	225
825	1600	1490	150	225	225
900	2100	1900	150	225	225
975	2150	1950	175	250	300
1050	2250	2050	175	275	300
1200	2500	2250	200	300	300
OVER 1200	O.D. + 1000	O.D. + 800	I.D./6	I.D./4	400



Bedding beneath and at the sides of the pipe to be well compacted the first 300mm of fill above the crown of the pipe is to be lightly tamped by hand. Mechanical compaction may be used only above this level. Geotextiles may be used where directed or approved by the engineer to contain bedding material in certain soils e.g. running sand in very wet conditions, where directed or approved by the engineer a temporary land drain may be laid within the granular bed.



Sectional Plan

Rigid pipes built into manhole should have a flexible joint as close as feasible to the external face of the structure and the length of the next rocker pipe should be as shown.

Nominal diameter (mm)	Maximum effective length (m)
150 - 600	0.6
601 - 750	1.00
over 750	1.25

All pipes entering the bottom of the manhole to have soffits level.
Provision of Rocker Pipes at Manhole Locations for Rigid Pipes

Safety, Health & Environmental Information:

In addition to the hazards and risks normally associated with the types of work detailed on this drawing, please note the significant hazards identified by symbols below,

INDICATES A RESIDUAL RISK AS A WARNING

INDICATES A RESIDUAL RISK FOR INFORMATION

and described below:

Construction/Maintenance/Cleaning/Demolition
Refer to Drawing:

General Notes:

- Do not scale from this drawing.
- All dimensions are in meters (m), all levels in metres (m) unless noted otherwise.
- Discrepancies or omissions are to be reported to the Engineer prior to work commencing.
- Materials and workmanship are to comply in all respects with current British Standard Specifications, Codes of Practice, and Building Regulations Approved Documents.
- The copyright of this drawing is vested in the Engineer and must not be copied or reproduced without written consent.
- The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work commences.
- This drawing is to be read in conjunction with all relevant specifications and drawings issued by the Engineer, Architect and other Specialists.

P05	DHNS	08.01.2026	Updated to external design review comments.
P04	DHNS	06/10/2025	Headwall detail updated
P03	DHNS	11/06/2025	Drainage detail updated
P02	NS/AM	17/12/2024	Filter material updated
P01	DHNU	13/11/2024	Preliminary issue
Rev	By / Ch'd	Date	Description

PRELIMINARY DRAWING
This drawing is not to be used for construction

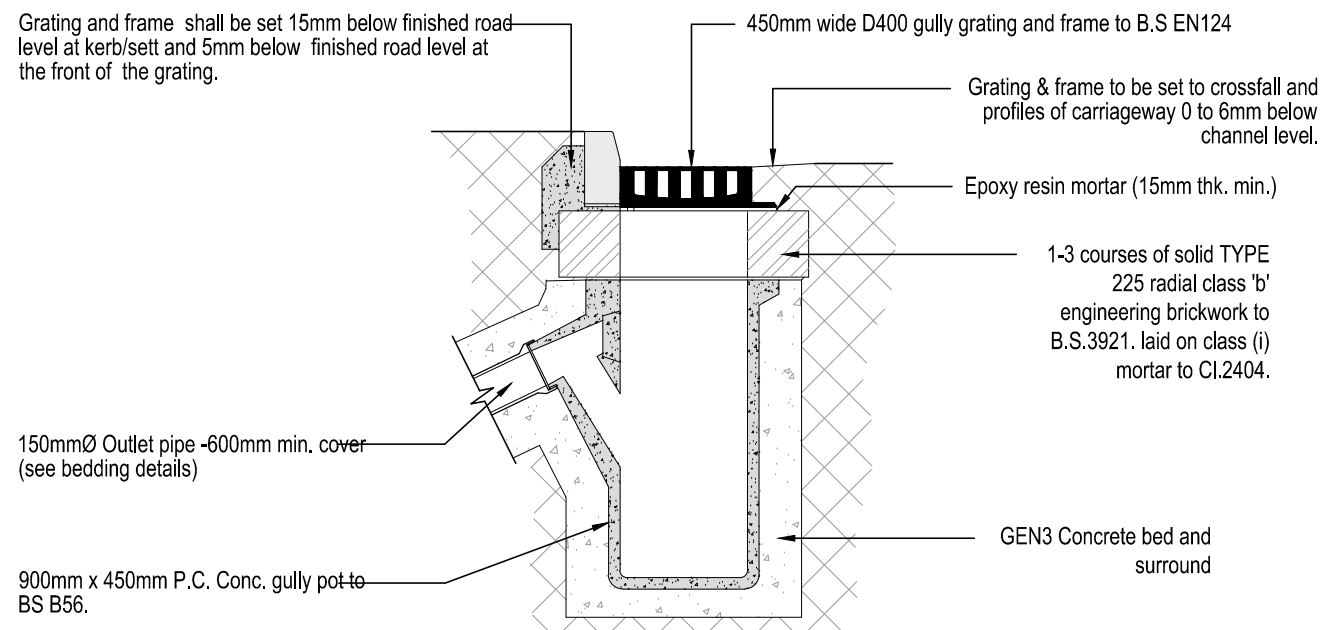
Client: **HVGS** High Voltage Grid Services
Unit C Hambrook Business Park | The Stream | Hambrook | Bristol | BS15 1RQ
www.hvgs.co.uk

BarnsleyMarshall Limited
4&5 Prior Wharf
Harris Business Park, Hanbury Rd
Stoke Prior, Bromsgrove
B604FG
Tel: 01905 330550
Email: design@barnsleymarshall.co.uk
Web: www.barnsleymarshall.co.uk

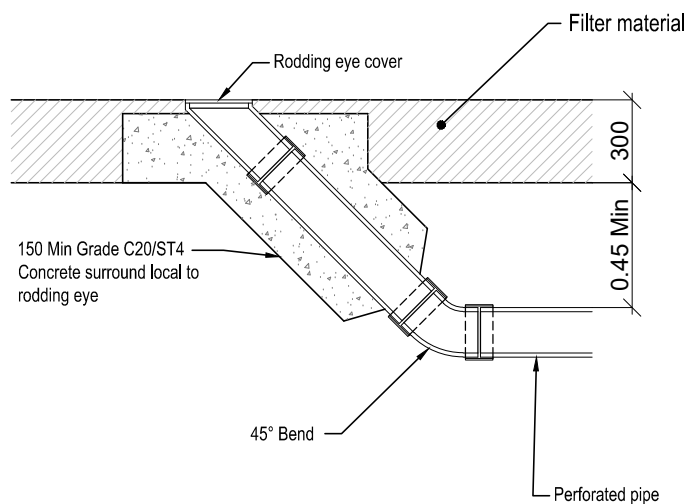
Project: **Battery Energy Storage System, Kirkby Substation, Coopers Lane, Liverpool, L33 7TT**

Drawing: **Drainage Details 02
Pipe Bedding Details**

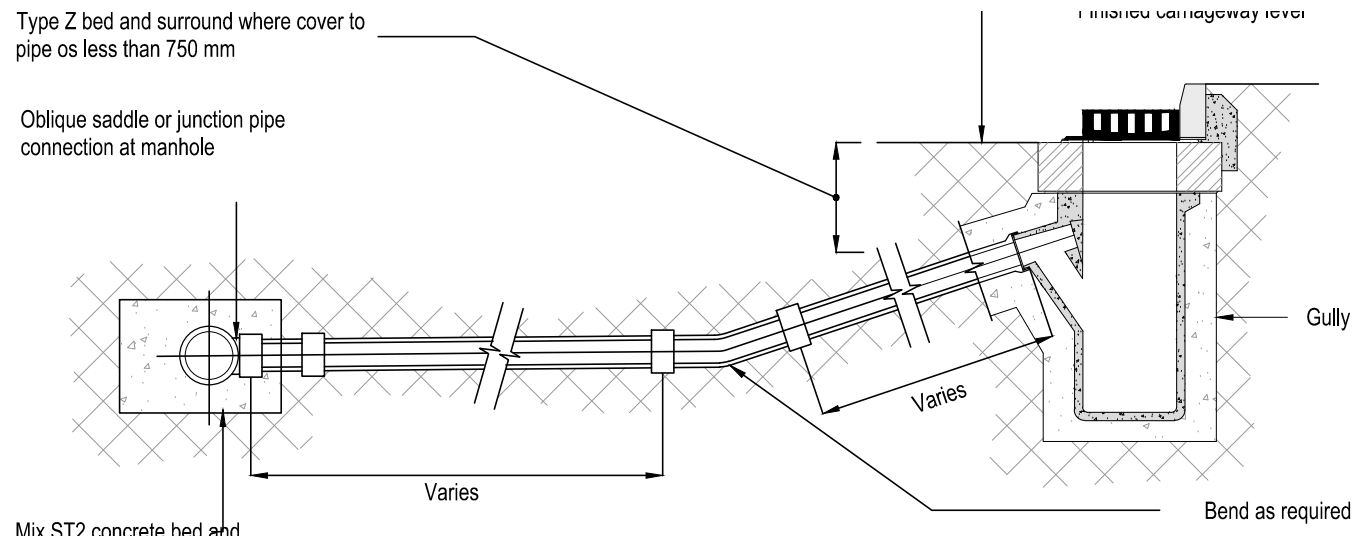
By: SLW/JP	Date: 08/08/2024
Drawing No. KIRK-BML-XX-XX-DR-C-0511	Revision P05
BML Job No. 1126-01	Status -
Drawing Scale at A1: 1:250	
CAD Filename: Y:\Projects\1126-01\Omni Projects\Kirkby04 - Working Information\05 - DWG\Drawings\BML-XX-XX-DR-C-0511-0514 Drainage Details.dwg	



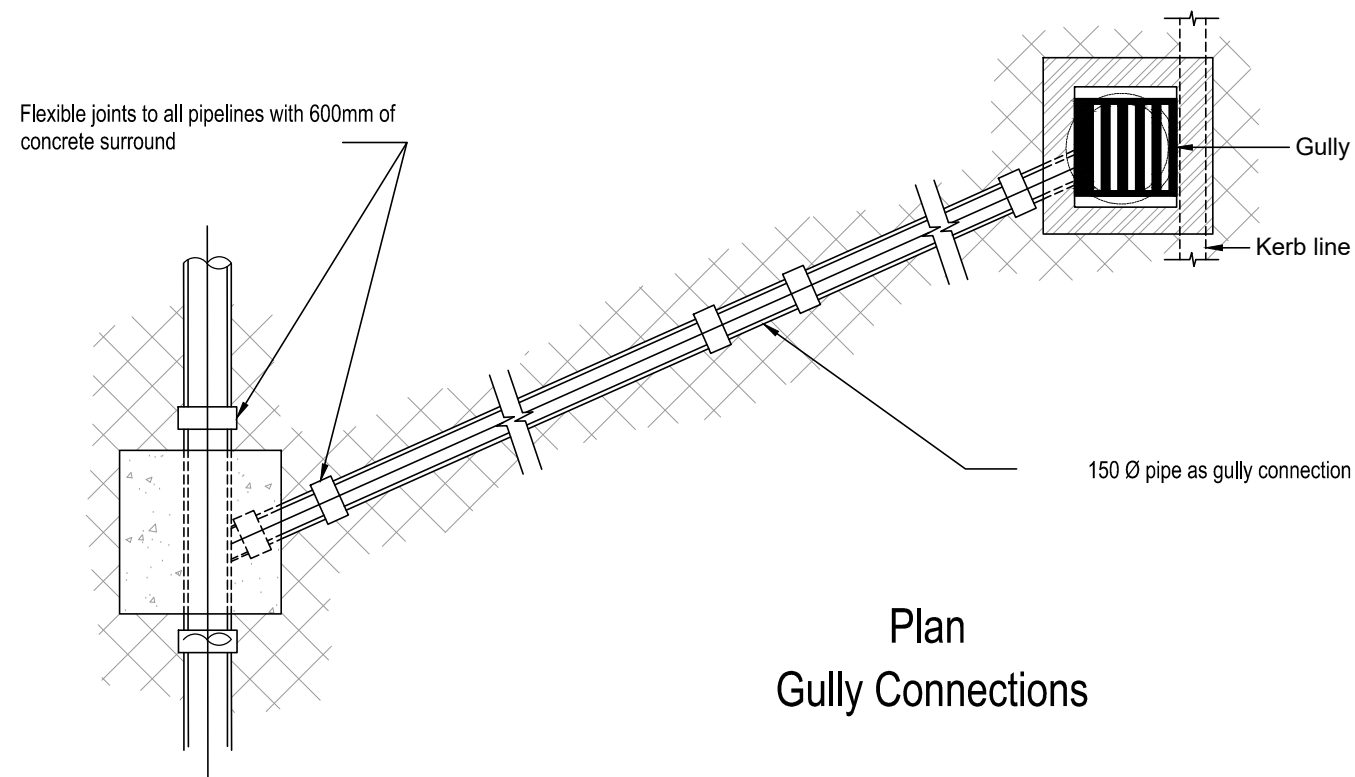
Road Gully Detail



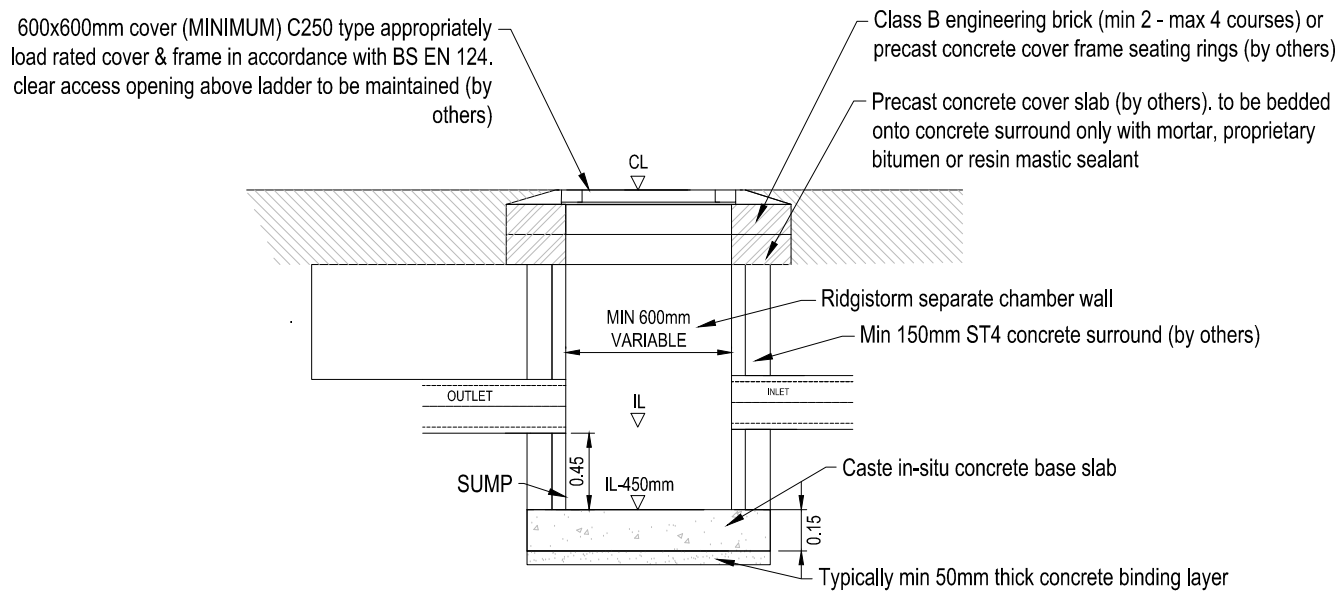
Rodding Eye Detail



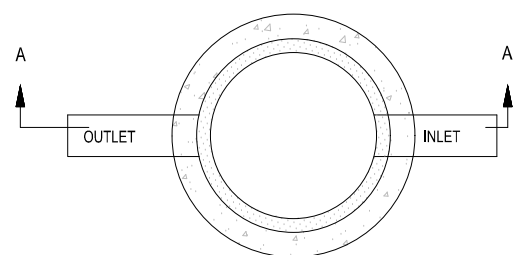
Typical Section



Plan
Gully Connections



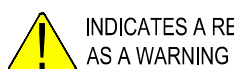
Section A-A



Plan
Ridgistorm Separate Catchpit

Safety, Health & Environmental Information:

In addition to the hazards and risks normally associated with the types of work detailed on this drawing, please note the significant hazards identified by symbols below.



INDICATES A RESIDUAL RISK AS A WARNING

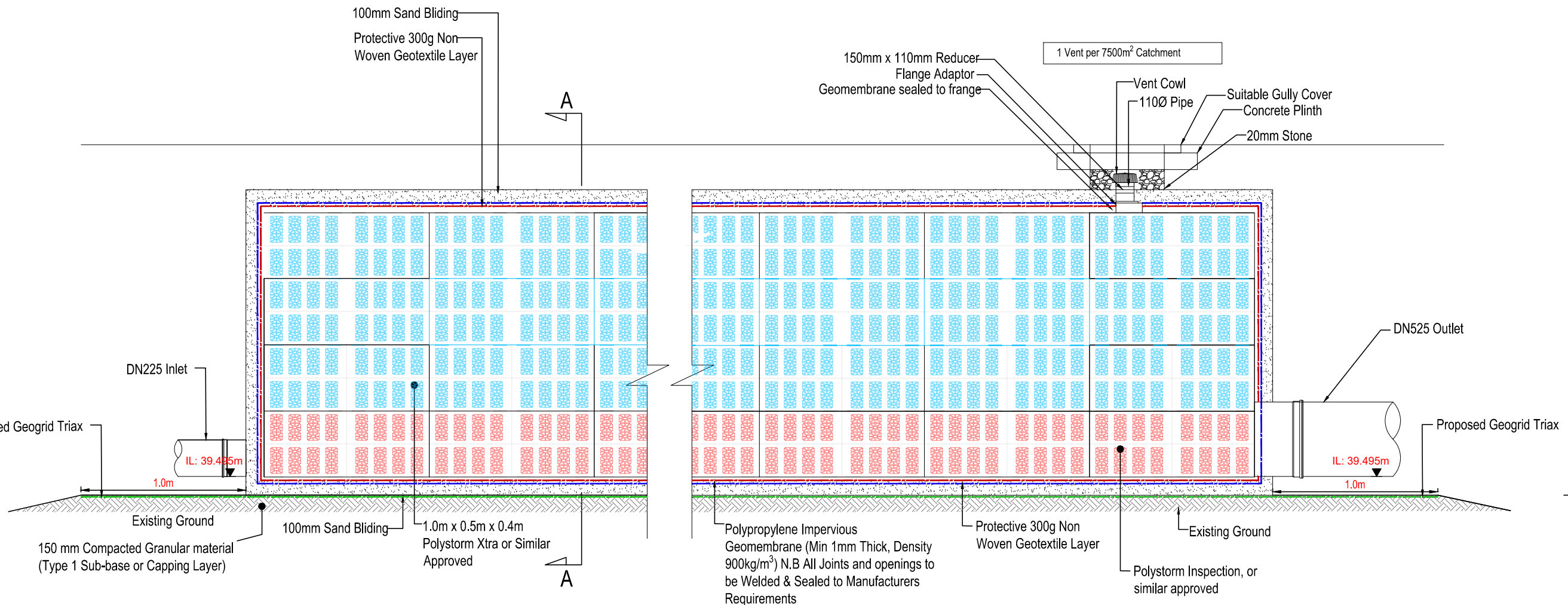
INDICATES A RESIDUAL RISK FOR INFORMATION

and described below:

Construction/Maintenance/Cleaning/Demolition Refer to Drawing:

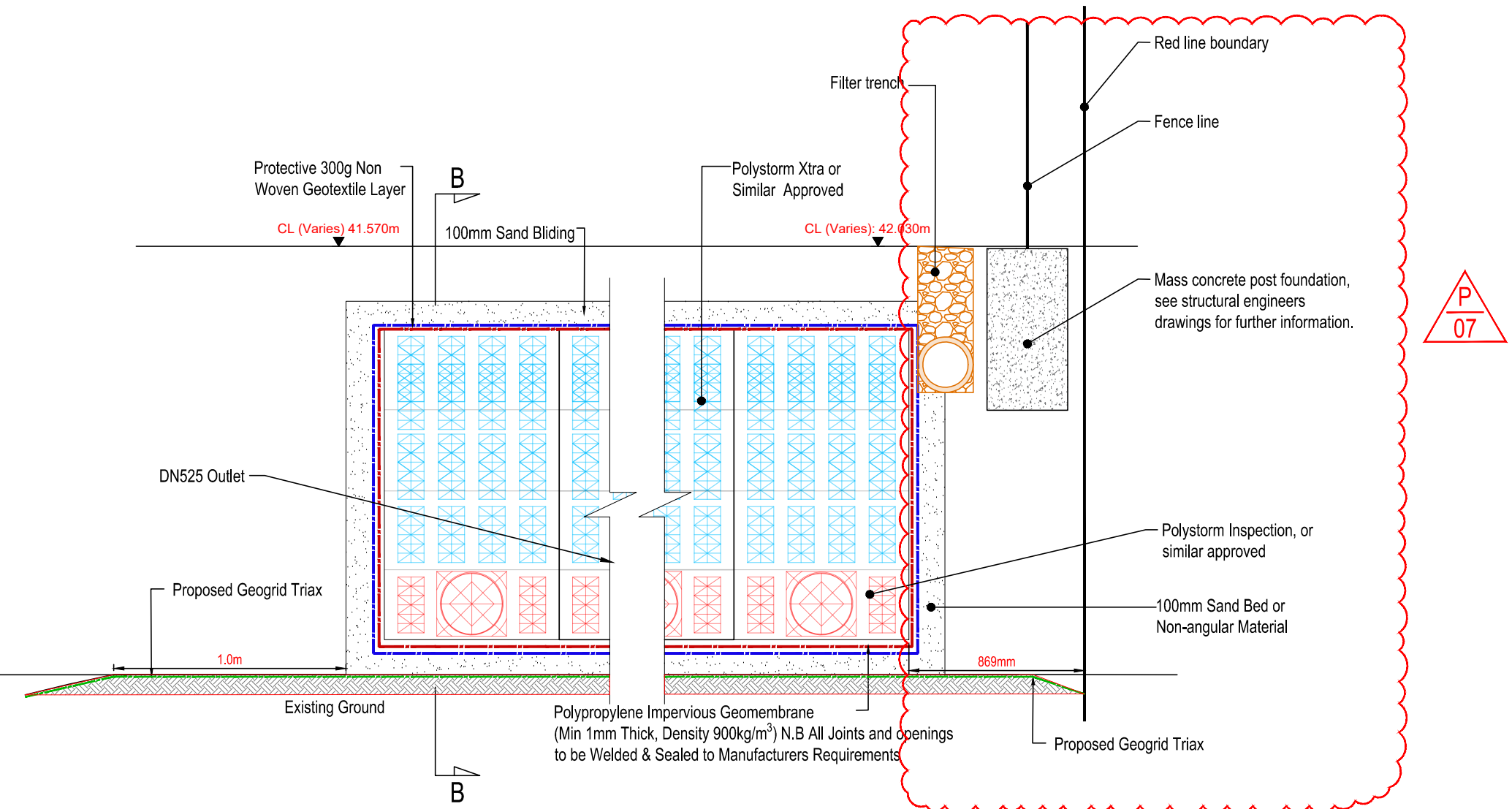
General Notes:

- Do not scale from this drawing.
- All dimensions are in meters (m), all levels in metres (m) unless noted otherwise.
- Discrepancies or omissions are to be reported to the Engineer prior to work commencing.
- Materials and workmanship are to comply in all respects with current British Standard Specifications, Codes of Practice, and Building Regulations Approved Documents.
- The copyright of this drawing is vested in the Engineer and must not be copied or reproduced without written consent.
- The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work commences.
- This drawing is to be read in conjunction with all relevant specifications and drawings issued by the Engineer, Architect and other Specialists.



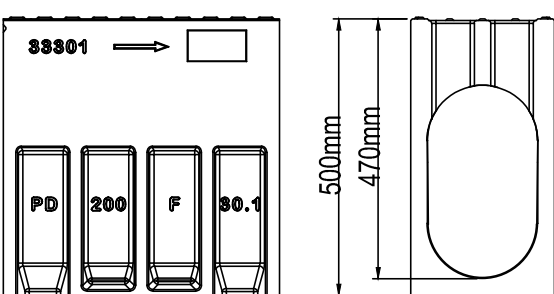
Geocellular Attenuation Tank (Section BB)

Scale 1:25

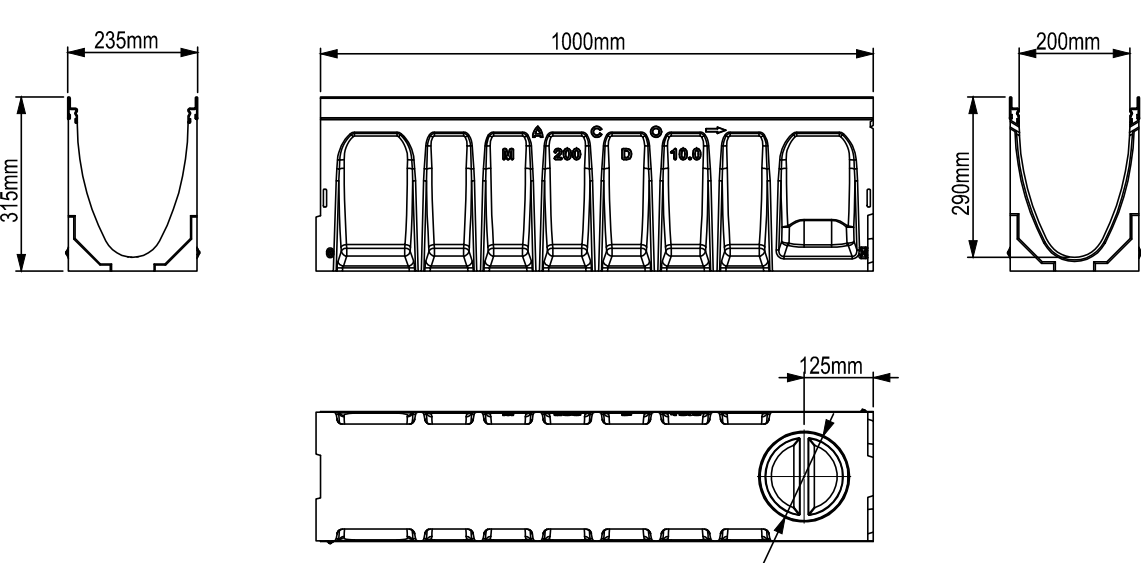


Geocellular Attenuation Tank (Section AA)

Scale 1:25

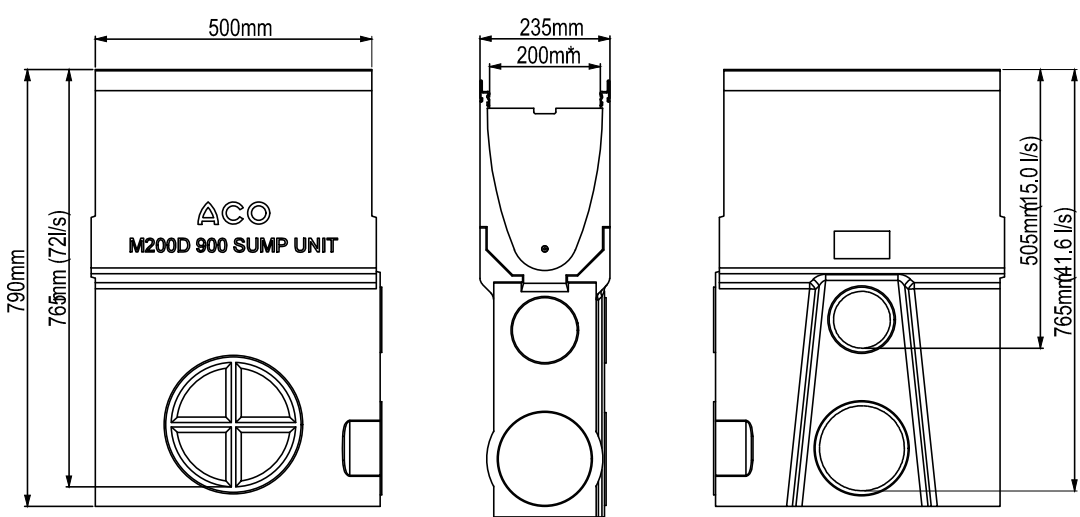


RoadDrain CHANNEL
PD200F 30.1



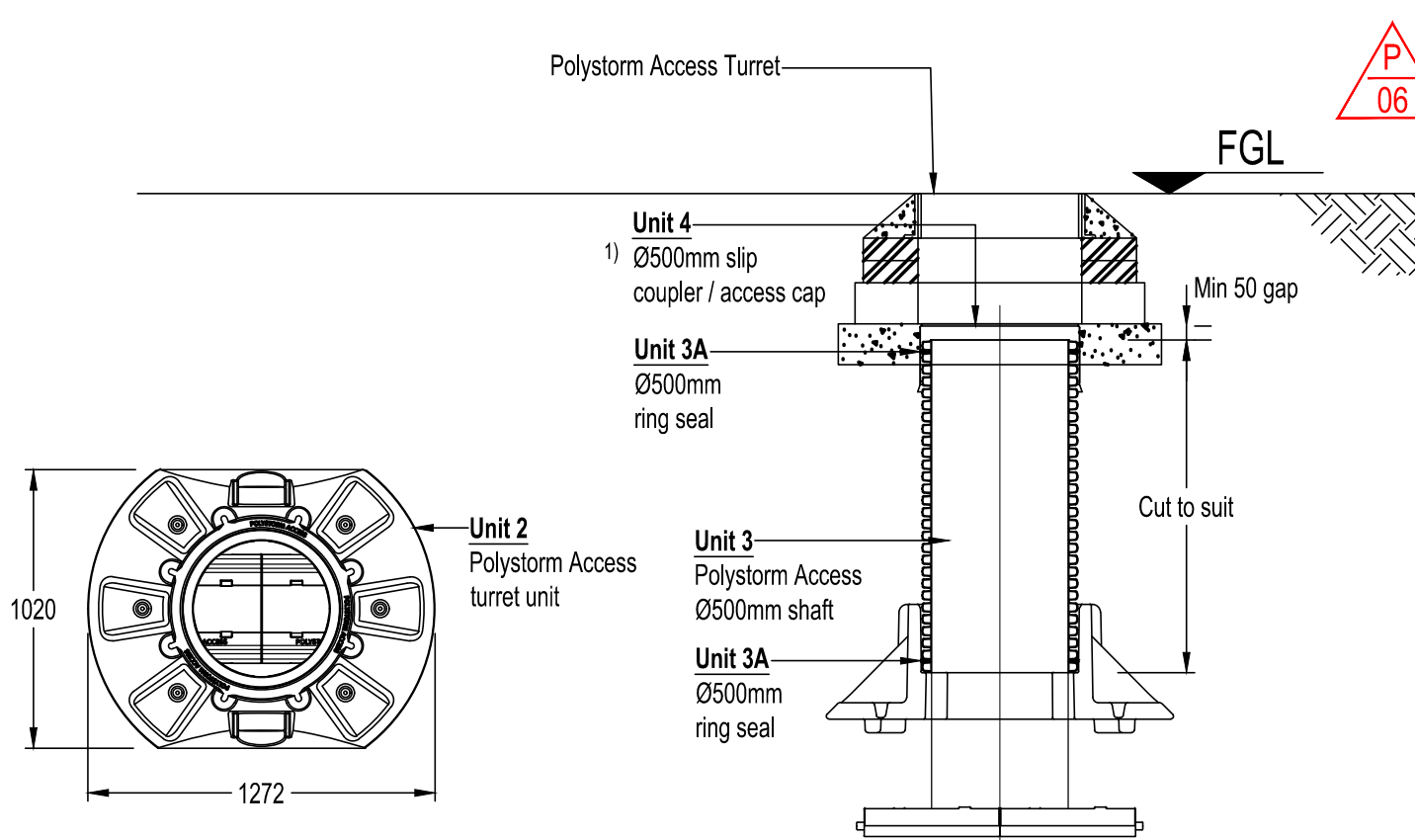
MultiDrain M200D CHANNEL 10.0

PART NUMBER	DESCRIPTION
23211	10.0 - Galvanised Steel Edge Rails



MULTIDRAIN UNIVERSAL SUMP
M200D & M200DS

PART NUMBER	DESCRIPTION
23218	M200D UNIVERSAL SUMP WITH PLASTIC SILT BUCKET
24218	M200DS UNIVERSAL SUMP WITH PLASTIC SILT BUCKET



P07	DHJD	23/01/2026	Fence post foundation reduced
P06	DHNS	08/01/2026	Updated to external design review comments.
P05	DHNS	04/12/2025	Drainage details updated
P04	DHNS	02/11/2025	Drainage details updated
P03	DHNS	11/06/2025	Drainage details updated
P02	NS/AM	17/12/2024	Filter material updated
P01	DHNU	13/11/2024	Preliminary issue
Rev	By / Chk'd	Date	Description

PRELIMINARY DRAWING
This drawing is not to be used for construction

Client **High Voltage Grid Services**
Unit C Hambrook Business Park | The Stream | Hambrook | Bristol | BS16 1RQ
www.hvgs.co.uk

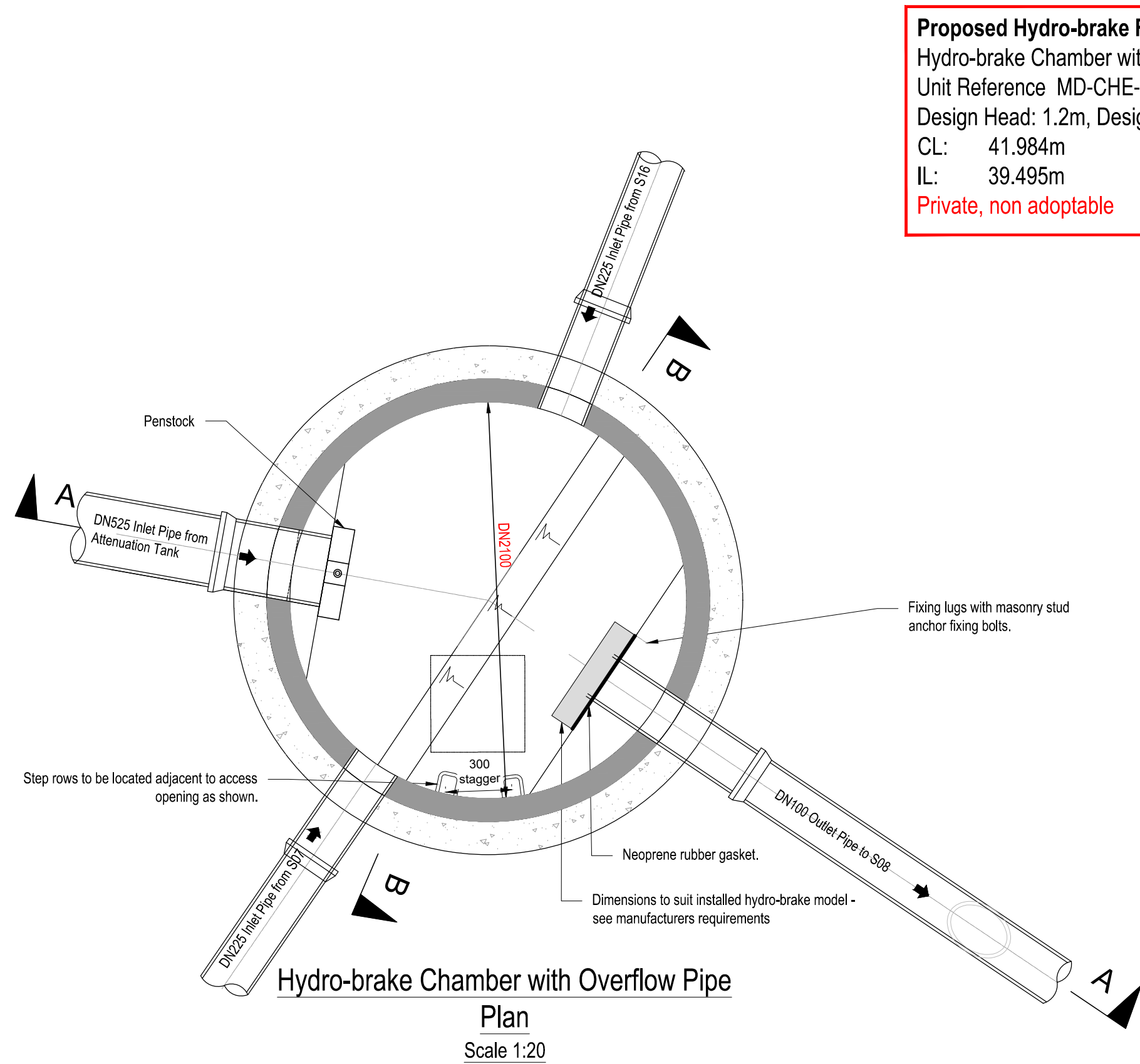
BarnsleyMarshall Limited
485 Prior Wharf
Harris Business Park, Hanbury Rd
Stoke Prior, Bromsgrove
B604FG
Tel: 01905 330550
Email: design@barnsleymarshall.co.uk
Web: www.barnsleymarshall.co.uk

Project **Battery Energy Storage System, Kirkby Substation, Coopers Lane, Liverpool, L33 7TT**

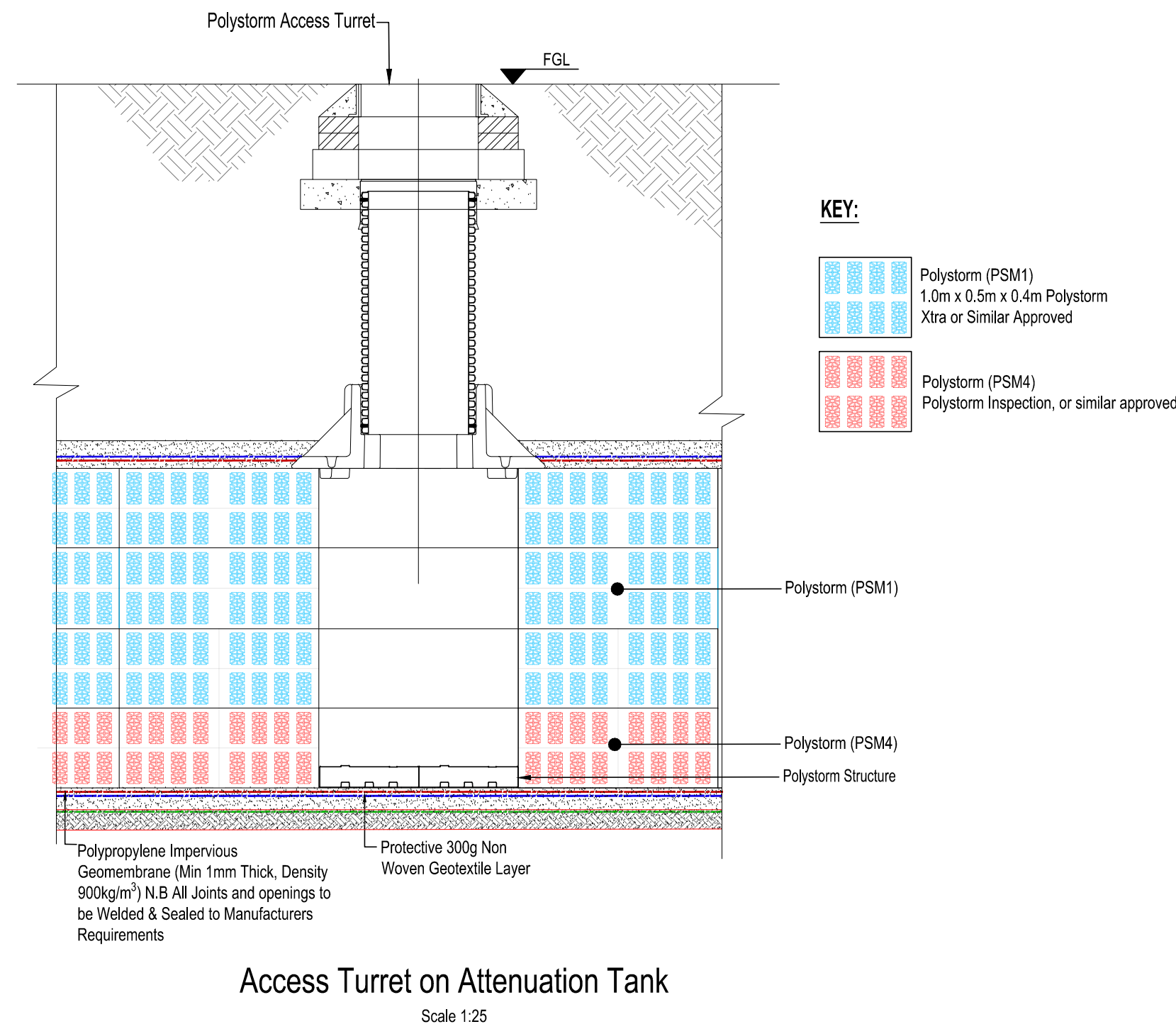
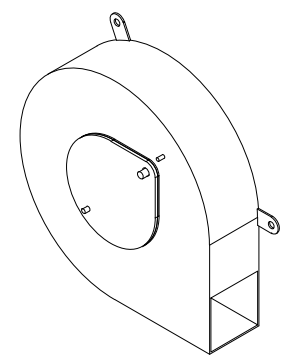
Drawing **Drainage Details 03
Road Gullies, Catchpit and Attenuation Tank**

By	SLW/JP	Date	08/08/2024
Drawing No.	KIRK-BML-XX-XX-DR-C-0512	Revision	P07
BML Job No.	1126-01	Status	-

Drawing Scale at A1: 1:250
CAD Filename: DWG\Drawing\KIRK-BML-XX-XX-DR-C-0512-0514 Drainage Details.dwg

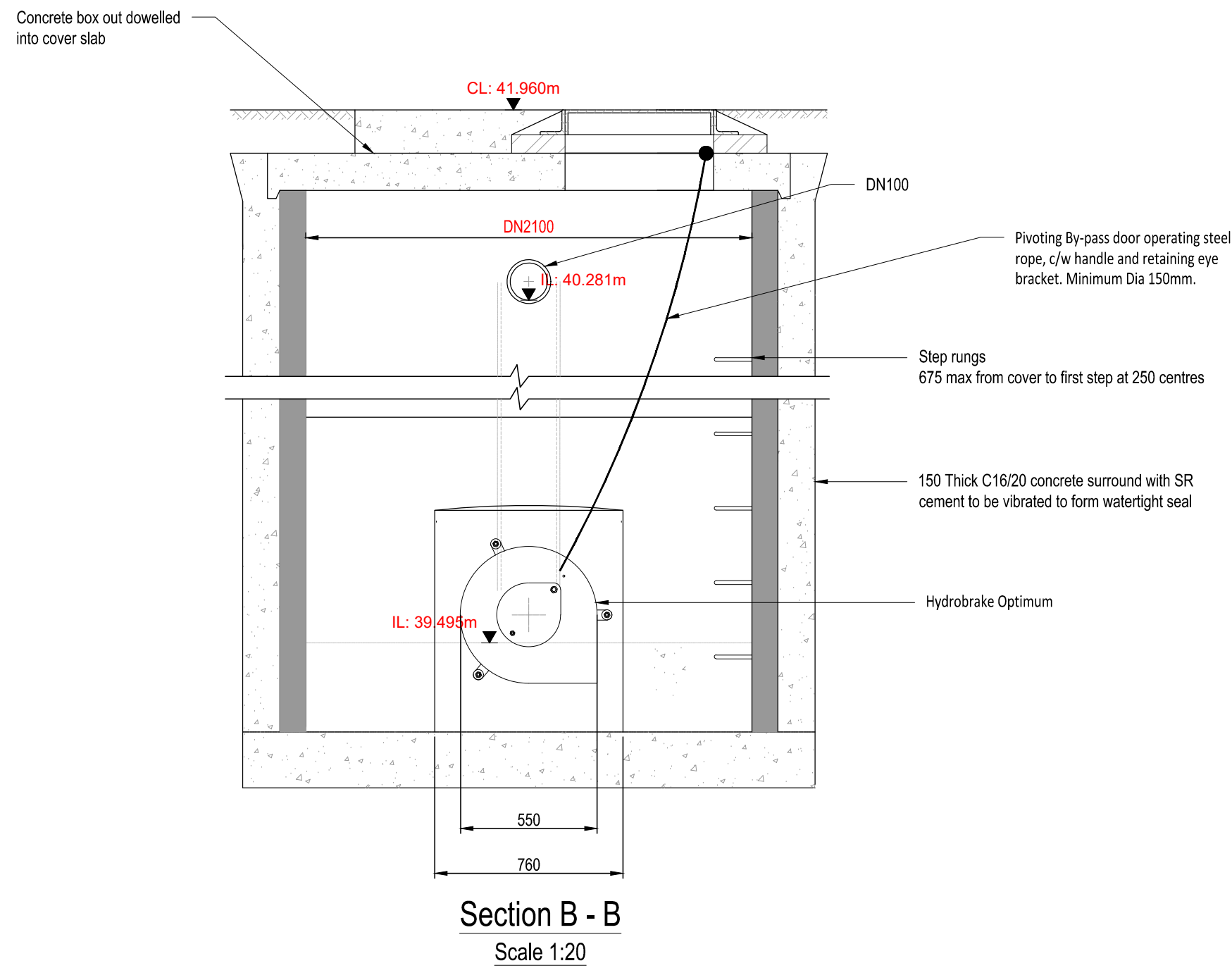
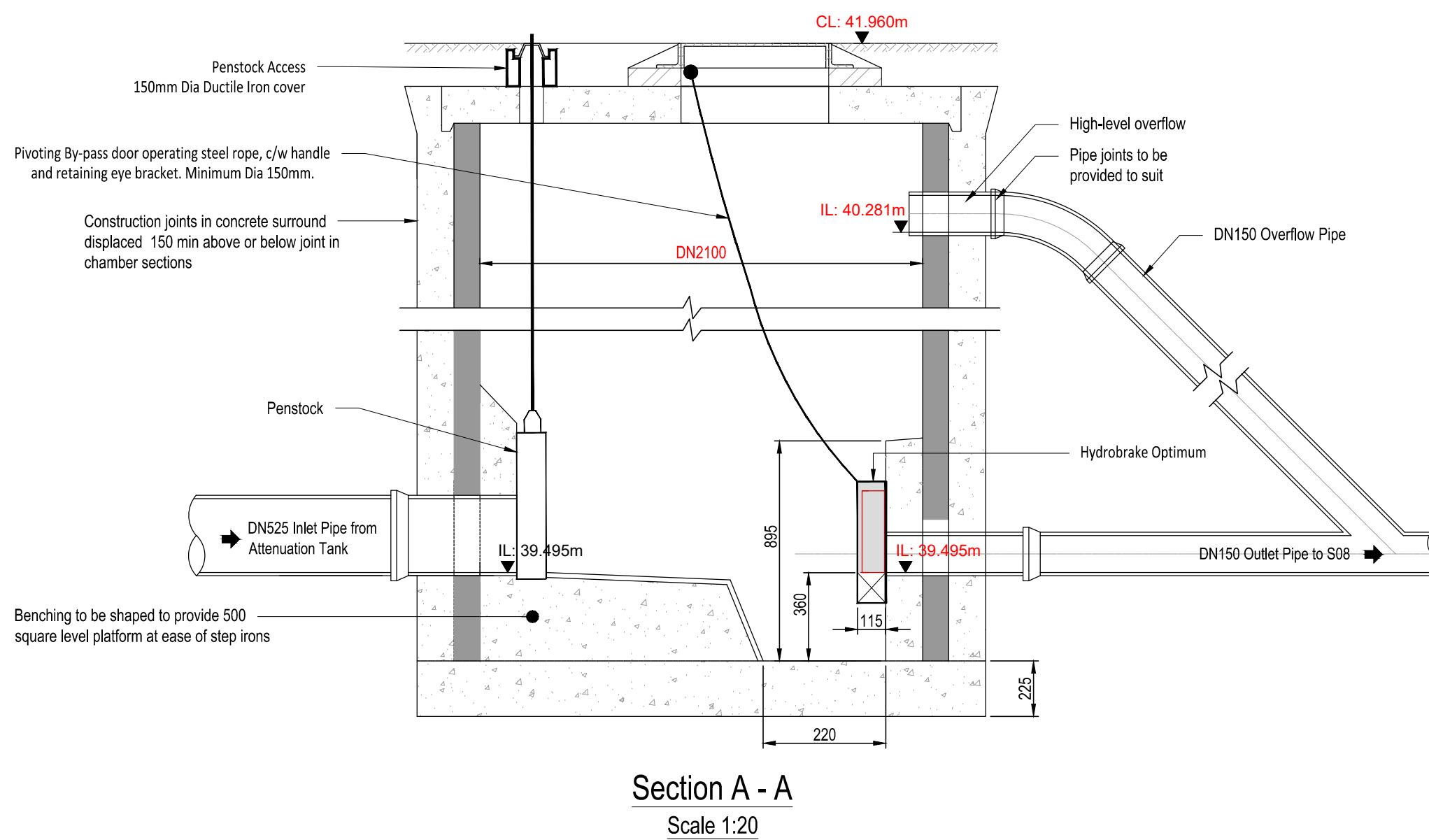


Note - A pre-formed hydro-brake® chamber base is available from hydro international with hydro-brake optimum pre-fitted



Safety, Health & Environmental Information:	
In addition to the hazards and risks normally associated with the types of work detailed on this drawing, please note the significant hazards identified by symbols below,	
	INDICATES A RESIDUAL RISK AS A WARNING
	INDICATES A RESIDUAL RISK FOR INFORMATION
and described below:	
Construction/Maintenance/Cleaning/Demolition Refer to Drawing:	

- General Notes:**
- Do not scale from this drawing.
 - All dimensions are in meters (m), all levels in metres (m) unless noted otherwise.
 - Discrepancies or omissions are to be reported to the Engineer prior to work commencing.
 - Materials and workmanship are to comply in all respects with current British Standard Specifications, Codes of Practice, and Building Regulations Approved Documents.
 - The copyright of this drawing is vested in the Engineer and must not be copied or reproduced without written consent.
 - The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work commences.
 - This drawing is to be read in conjunction with all relevant specifications and drawings issued by the Engineer, Architect and other Specialists.



P05	DHINS	08.01.2026	Updated to external design review comments.
P04	DHINS	04/12/2025	Chamber details updated
P03	DHINS	06/10/2025	Chamber details updated
P02	DHINS	11/06/2025	Chamber details updated
P01	DHINS	13/11/2024	Preliminary issue
Rev	By / Chkd	Date	Description

PRELIMINARY DRAWING
This drawing is not to be used for construction

Client	HVGS High Voltage Grid Services	Unit C Hambrook Business Park The Stream Hambrook Bristol BS16 1RQ www.hvgs.co.uk
--------	--	--

BarnsleyMarshall Limited 485 Prior Wharf Harris Business Park, Hanbury Rd Stoke Prior, Bromsgrove B604FG Tel: 01905 330550 Email: design@barnsleymarshall.co.uk Website: www.barnsleymarshall.co.uk	BarnsleyMarshall
--	-------------------------

Project
**Battery Energy Storage System,
Kirkby Substation, Coopers Lane,
Liverpool, L33 7TT**

**Drainage Details 04
Hydro-brake with Overflow pipe
& Penstock**

By	SLW/JP	Date	08/08/2024
Drawing No.	KIRK-BML-XX-XX-DR-C-0513	Revision	P05
BML Job No.	1126-01	Status	-
Drawing Scale at A1: 1:250			
CAD Filename: ZWG02\Drawings\BML-XX-XX-DR-C-0513\04 Drainage Details.dwg			

Safety, Health & Environmental Information:

In addition to the hazards and risks normally associated with the types of work detailed on this drawing, please note the significant hazards identified by symbols below,

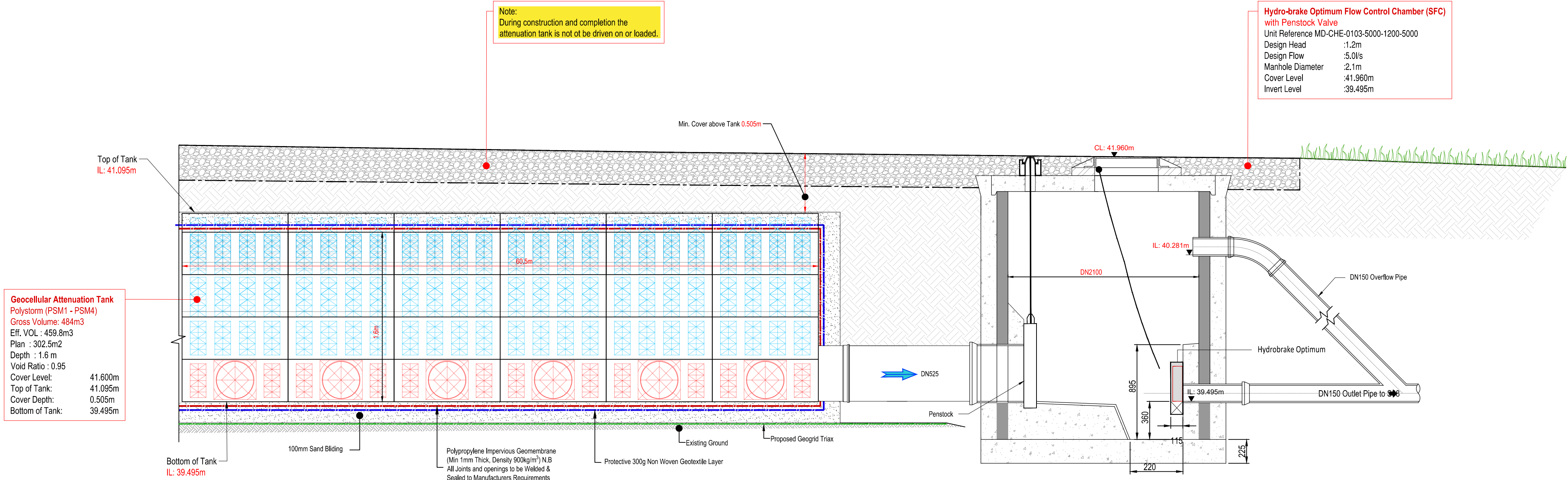
INDICATES A RESIDUAL RISK AS A WARNING

INDICATES A RESIDUAL RISK FOR INFORMATION

and described below:

Construction/Maintenance/Cleaning/Demolition Refer to Drawing:

- General Notes:
- Do not scale from this drawing.
 - All dimensions are in meters (m), all levels in metres (m) unless noted otherwise.
 - Discrepancies or omissions are to be reported to the Engineer prior to work commencing.
 - Materials and workmanship are to comply in all respects with current British Standard Specifications, Codes of Practice, and Building Regulations Approved Documents.
 - The copyright of this drawing is vested in the Engineer and must not be copied or reproduced without written consent.
 - The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at connection points before work commences.
 - This drawing is to be read in conjunction with all relevant specifications and drawings issued by the Engineer, Architect and other Specialists.

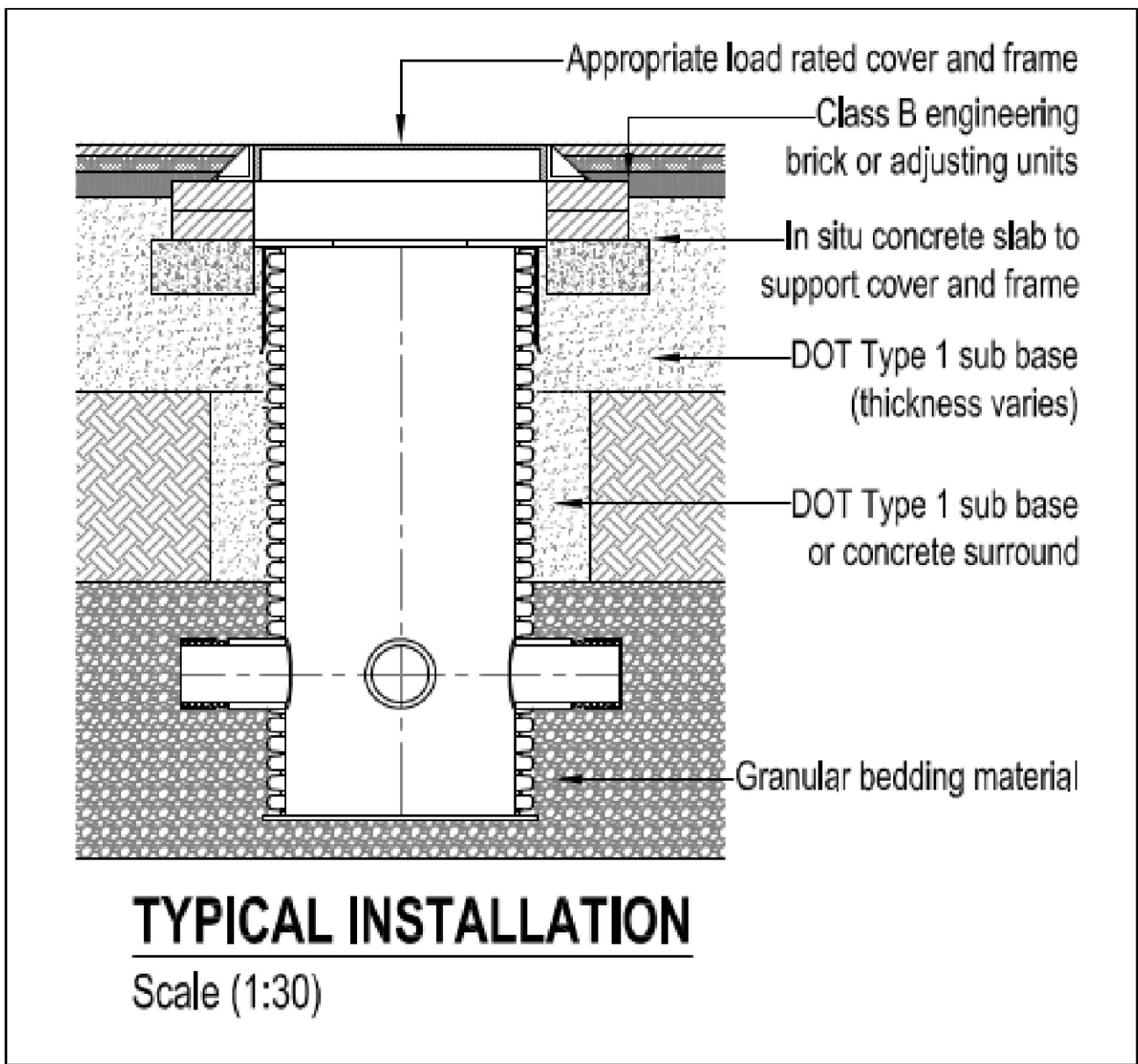


Section A - A

Scale 1:25

For location of section on plan refer to drawing KIRK-BML-XX-XX-DR-C-0501

Ridgestorm Catchpit Details



P05	DHNS	08.01.2026	Updated to external design review comments.
P04	DHNS	02/12/2025	Tank details updated
P03	DHNS	06/10/2025	Tank details updated
P02	DHNS	11/06/2025	Tank details updated
P01	DHNJ	13/11/2024	Preliminary issue
Rev	By / Chk'd	Date	Description

PRELIMINARY DRAWING
This drawing is not to be used for construction

Client **HYGGS** High Voltage Grid Services
Unit C Hambrook Business Park | The Stream | Hambrook | Bristol | BS16 1RQ
www.hvrga.co.uk

BarnsleyMarshall Limited
485 Prior Wharf
Harris Business Park, Hambury Rd
Stoke Prior, Bromsgrove
B604FG
Tel: 01905 330550
Email: design@barnsleymarshall.co.uk
Web: www.barnsleymarshall.co.uk

BarnsleyMarshall

Project **Battery Energy Storage System, Kirkby Substation, Coopers Lane, Liverpool, L33 7TT**

Drawing **Drainage Details 05 Detailed Sections**

By SLW/JP	Date 08/08/2024
Drawing No. KIRK-BML-XX-XX-DR-C-0514	Revision P05
BML Job No. 1126-01	Status -
Drawing Scale at A1: 1:250	
CAD Filename: Y:\Projects\1126-01 Omnis Projects Kirkby\04 - Working Information\05 - DWG\Drawings\KIRK-BML-XX-XX-DR-C-0514-0514 Drainage Details.dwg	