Parkmount Road, Manchester

26th September 2025

PV2310-APP-92-XX-RP-C-1002-SuDS-Verification-Report

SuDS Verification Report

Parkmount Road, Manchester

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Document history and status

Revision	Date	Description	Originator	Checked	Approved
P01	26/09/2025	Initial Issue	JSM	ZS	ALS

Contents

1 Introduction 4

1.1 Terms of Reference 4

2 Development Surface Water Drainage 5

3 Inspection & Verification of Site SuDs 6

3.1 General 6
3.2 Hydro Brake 6
3.3 Attenuation Tank 8
3.4 Permeable Paving 10
3.5 Inspection of SuDs Features Post Construction 10

4 Conclusion 12

Appendicies

Appendix A – Contractor Sign-off Letter

Appendix B - Drainage Drawings

Appendix C – Site Inspection Photographs & Specifications

Appendix D – SDS Attenuation Tank Details

Appendix E – SDS LTD Sign off QA Sheets

1 Introduction

1.1 Terms of Reference

1.1.1 Align Property Partners have been commissioned by Mosscare St Vincents to complete a Verification Report for the construction of Sustainable Drainage Systems (SuDS) being incorporated within the drainage design for a residential development on Parkmount Road, Manchester.

1.1.2 The development proposal are for 18 dwellings and 6 apartments, with associated gardens, driveway, parking provisions & landscaping areas.

1.1.3 The production of a Verification Report for SuDS features is a pre-occupation requirement of planning Reserved Matters Condition 10 for the development, which states the following:

"The development hereby approved shall not be occupied until details of the implementation, maintenance and management of a sustainable drainage scheme have been submitted to and approved by the Local Planning Authority. The scheme shall be implemented and thereafter managed and maintained in accordance with the approved details. Those details shall include:

- *A verification report providing photographic evidence of construction as per design drawings.*
- *As-built construction drawings, if different from design construction drawings;*
- *Management and 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 - To prevent the increased risk of flooding, to improve and protect water quality and ensure future maintenance of the surface water drainage system, pursuant to policy EN17 of the Manchester Core Strategy."

1.1.4 This Verification Report has been undertaken in accordance with the guidance provided within Section 31.7 – SuDS Construction Inspections; Part E of CIRIA C752-SuDS Manual, as well as C698.

1.1.5 A separate Drainage Statement (Ref: PV2310-APP-92-XX-RP-C1001 Rev P03) has already been submitted and accepted as part of planning, which outlines the proposed drainage items and guidance on maintenance schedules for each SuDs feature.

1.1.6 Align Property Partners did not supervise the entire construction and installation of the SuDS features and have been reliant on information supplied by the contractor and client to complete this report. Responsibilities to ensure that the SuDS and other drainage features have been installed in line with Align property Partners design and details, and suppliers' guidelines remain the contractor. Please see attached a sign off letter (Appendix A) from the contractor confirming that all drainage items have been installed in line with the Align Property Partners civils drawings.

2 Development Surface Water Drainage

2.1.1 The surface water runoff for the development is collected via gullies, permeable paving, rainwater pipes and channel drains. The runoff is directed to the main surface water infrastructure and attenuation tanks, which is then restricted by two flow control devices at a combined rate of 11.5 l/s. The surface water system discharges via gravity into the existing Combined United Utilities Sewer network.

2.1.2 The parking bays within the site are constructed with permeable paving, which provides surface water treatment. Due to the poor infiltration potential of the local strata, the permeable paving is lined and positively drained.

2.1.3 Catch-pits were to be installed upstream of the incoming pipes of the cellular crates and permeable paving.

2.1.4 In summary, the main SuDS features that require verification are illustrated below:

- Two Hydro-Brakes
- Two Attenuation Tanks
- Permeable Paving Driveways

2.1.5 Plans illustrating the proposed drainage design, construction details, and calculations are shown in Appendix B. Site inspections, photos, and specifications are shown in Appendix C.

3 Inspection & Verification of Site SuDs

3.1 General

3.1.1 All up-to-date drawings, including the drainage plan and construction details, were provided to the construction team/contractor.

3.1.2 Liaison with the site manager was undertaken to help ensure that site inspections would be coordinated at regular periods of the construction phase.

3.1.3 Photos have been provided throughout the construction phase by both the Site Manager and by the APP Engineer. These photos are shown in Appendix B.

3.1.4 The proposed development is divided into two distinct parcels—North and South—each served by an independent stormwater network. These networks converge at a central location on the site, where they connect into the existing United Utilities combined drainage infrastructure.

3.2 Hydro Brake

3.2.1 Two hydro-brakes have been installed for this development, shown in Appendix C as S3 and S8

- S3 has a discharge rate of 5.6l/s and a design head of 1.75m located within the proposed northern parcel discharging into the existing combined sewer network within Parkmount Road. A new manhole chamber was installed along with a new hydro-brake unit. Please see Appendix B, which shows the specification of the Hydro-brake unit.
- S8 has a discharge rate of 5.9 l/s and a design head of 2.0m located within the proposed southern parcel, discharging into the existing combined sewer network within Parkmount Road. A pre-cast concrete flow control chamber was installed for S8, whereby the details can be found on Marshalls drawing ‘ HB/X2462212-1/GA - DN2400 WMS Flow Control Chamber S8 General Arrangement’ which is located within Appendix B.

3.2.2 The Crown Vortex flow control specification for both Hydro-brakes remains unchanged from the original design intent. As such, there is no variation in the discharge rate for the overall development. The proposed Hydro-brake systems continue to operate within the previously agreed hydraulic parameters, ensuring consistency with the approved outflow criteria.

3.2.3 The photos of the hydro-brake was taken during construction. It’s suggested that the hydro-brake is to be cleaned, and any debris removed prior to handover.

3.2.4 Pictures of the installed hydro-brakes and product specification information are provided in Appendix B.



Figure 1 Hydro-Brake Chamber (S3)



Figure 2 Hydro-Brake Chamber (S8)

3.3 Attenuation Tank

3.3.1 Two attenuation storage tanks were installed on the scheme as illustrated on PV2310-APP-92-XX-DR-C-2500 C03. The crates were installed by SDS, with the dimensions of 9x3x1.125m for the northern located tank and 11.5x4x1.125m. The attenuation tank details are shown in Appendix D, and the sign-off documents are shown in Appendix E.

3.3.2 Coordinates were picked up to show the specific location of the attenuation tanks. Please see below the obtained values. The dimensions based on the information below confirm the tank being 9x3x1.125m as designed for the northern side of the site.

Easting	**Northing**
386526.240	402162.172
386529.193	402162.733
386531.056	402152.912
386528.103	402152.351

The dimensions based on the information below confirm the tank being 11.5x4x1.125m as designed for the southern side of the site.

Easting	**Northing**
386043.459	402053.916
386055.037	402049.217
386041.956	402050.212
386053.534	402045.502

3.3.3 The crates were lined with a geomembrane and protected by a geotextile. Appropriate bedding was installed in line with the manufacturer's guidelines. Sign Off T1 & T2 are provided in Appendix E.

3.3.4 No contamination substance was encountered within the excavations, and no seepage of groundwater was recorded during excavation and installation.

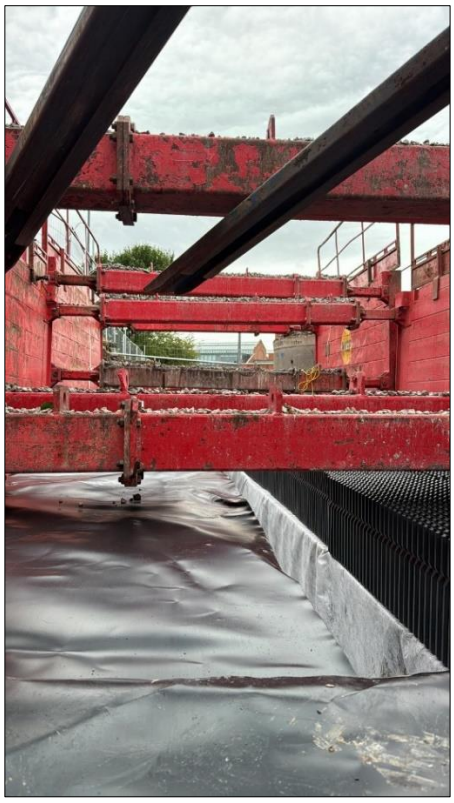


Figure 3 SDS Attenuation Tank (North Tank)



Figure 4 SDS Attenuation Tank (South Tank)

3.4 Permeable Paving

3.4.1 The driveways within the site are constructed with permeable paving, which provides surface water treatment. Due to the poor infiltration rate on the site, the permeable paving sub-base is lined and positively drained by means of a perforated pipe.

3.4.2 The paving and sub-base has been confirmed by site as being constructed as per the construction details illustrated on drawing PV2310-APP-90-XX-DR-C-3300 Rev C01, proved in Appendix B, along with the product certificates and photos in Appendix C.



Figure 5 Permeable Paving

3.4.3 Marshalls Priora Permeable Paved Blocks have been used on the scheme.

3.4.4 The outlet from the permeable paving having been provided is a perforated pipe rather than a fin drains as initially proposed. The permeable sub-base has been lined with 2000 Guage DPM.

3.4.5 Site chambers have been installed downstream of permeable paved drives to prevent blockages.

3.4.6 No Seepage of groundwater was recorded during the construction of the permeable paved drives

3.5 Inspection of SuDs Features Post Construction

3.5.1 Following the completion of the surface water drainage system, a site walkover was undertaken on 13/05/25. No major concerns or comments were raised, and the drainage system adheres to the principle and design of the drainage strategy drawing “PV2310-APP-92-XX-DR-C-2500 P04” that was approved at planning.

3.5.2 A CCTV survey and as-built topographical survey is to be undertaken and will be appended to the health and safety file along with this verification report in due course.

3.5.3 Any debris removal or jetting needed to be carried out for the surface water sewer system will be carried out before handover.

4 Conclusion

4.1.1 The development comprised a surface water drainage system that incorporates the following SuDS features:

- Hydro-Brakes
- Attenuation Tanks
- Permeable Paving

4.1.2 Site inspections were undertaken during the construction phase of the SuDS features used for this development.

4.1.3 From what was visible during the site inspections, as built information, and confirmation from the contractor that the SuDs features of the drainage network were constructed in accordance with the detailed drainage design drawings have been given via a formal response from the contractor, which can be found within Appendix A.

4.1.4 The contractor will ensure that the drainage is fully surveyed by CCTV and any remediation works carried out (if identified) to ensure that the drainage system is in fully working order prior to handover.

4.1.5 The client, Mosscare St Vincents, as housing association will then be responsible post-handover for maintaining the SuDS system as per the Drainage Statement (Ref: PV2310-APP-92-XX-RP-C-1001 Rev P03) approved as part of planning.

4.1.6 Align Property Partners did not supervise the entire construction and installation of the SuDS features and have been reliant on information supplied by the contractor and client to complete this report. Responsibility to ensure that the SuDS ad other drainage features have been installed in line with Align Property Partners design and details, and suppliers' guidelines remain with the contractor. The contractor has provided a formal letter confirming that SuDs features have been installed in line with Align Property Partner's civils drawings.

Appendices

Appendix A

Contractor Sign off letter

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We confirm the entire drainage, including the Attenuation Tanks, Hydro-Brakes, and Permeable Paving, has all been constructed in accordance with the below specified drawings:

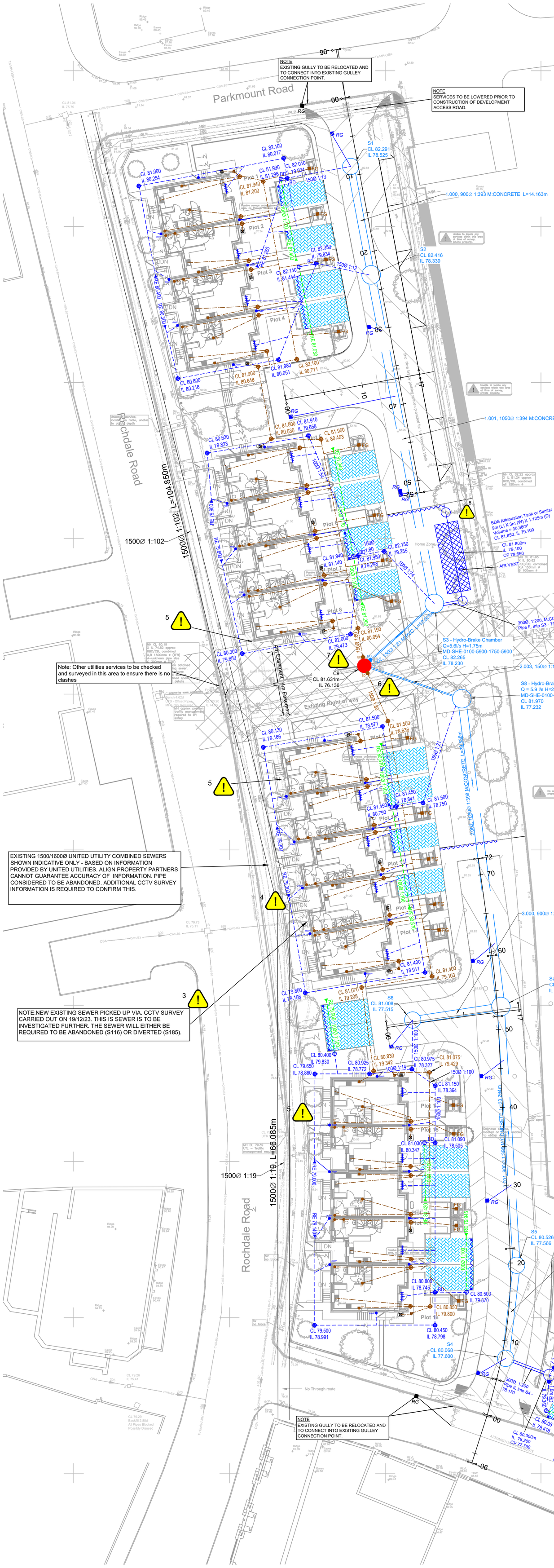
- PV2310-APP-92-XX-DR-C-2500 C03 Drainage Plan.pdf
- PV2310-APP-92-XX-DR-C-3200 C01 S104 Drainage Construction Details - Sheet 1 of 4.pdf
- PV2310-APP-92-XX-DR-C-3201 C01 S104 Drainage Construction Details - Sheet 2 of 4.pdf
- PV2310-APP-92-XX-DR-C-3202 C01 S104 Drainage Construction Details - Sheet 3 of 4.pdf
- PV2310-APP-92-XX-DR-C-3203 C01 S104 Drainage Construction Details - Sheet 4 of 4.pdf
- PV2310-APP-92-XX-DR-C-3204 C01 Manhole Base Details - Sheet 1 of 2.pdf
- PV2310-APP-92-XX-DR-C-3205 C01 Manhole Base Details - Sheet 2 of 2.pdf
- PV2310-APP-92-XX-DR-C-3206 C01 S104 Hydro-Brake Details - Sheet 1 of 2.pdf
- PV2310-APP-92-XX-DR-C-3207 C01 S104 Hydro-Brake Details - Sheet 2 of 2.pdf
- PV2310-APP-92-XX-DR-C-3400 C01 Private Drainage Details.pdf
- E251323_01_B - Parkmount Road - CON-APP
- E251323_02_B - Parkmount Road - CON-APP

PV2310-APP-90-XX-DR-C-3300 C01 Private External Construction Details

[redacted]

Appendix B

Drainage Drawings



DRAINAGE

1. ALL DRAINAGE WORKS TO BE CONSTRUCTED FROM THE OUTFALL TOWARDS THE HEAD OF RUN TO ENSURE THE OUTFALL CAN BE ACHIEVED.
2. ALL EXISTING DRAINS & SERVICES (LINE & LEVELS) TO BE CHECKED & CONFIRMED BY THE CONTRACTOR PRIOR COMMENCEMENT OF ANY ON SITE DRAINAGE WORKS. ANY DISCREPANCY IN LEVELS IS TO BE REPORTED IMMEDIATELY TO APP.
3. ALL DRAINAGE WORK TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS, BS EN 752 & TO THE SATISFACTION OF THE BUILDING INSPECTOR.
4. ALL PROPRIETARY ITEMS TO BE INSTALLED STRICTLY IN ACCORDANCE WITH MANUFACTURER'S DETAILS, INSTRUCTIONS & SPECIFICATIONS.
5. ALL COVER LEVELS ARE APPROXIMATE. EXACT LEVELS TO BE DETERMINED FROM THE EXTERNAL WORKS LAYOUT.
6. INVERT LEVELS QUOTED AT MANHOLES & INSPECTION CHAMBERS ARE THOSE OF THE LARGEST CONNECTED PIPE DIAMETER. PIPES AT CHAMBERS TO BE LAID WITH SOFFITS LEVEL UNLESS NOTED OTHERWISE.
7. PIPE GRADIENTS WHERE STATED ARE APPROXIMATE - LEVELS AT THE CHAMBERS TAKE PRECEDENT.
8. REFER TO ARCHITECT'S DRAWINGS FOR PRECISE LOCATION OF ALL RAINWATER PIPES, INTERNAL CONNECTIONS ETC.
9. ALL INTERNAL CONNECTIONS TO HAVE AN ABOVE-FLOOR ACCESS POINT TO ENABLE FUTURE ACCESS FOR MAINTENANCE.
10. PIPES & FITTINGS TO BE:
    - CONCRETE PIPES & ANCILLARY PRODUCTS TO BS 5911:2022 & BS EN 1916:2002.
    - VITRIFIED CLAY PIPES & FITTINGS TO BS EN 295:2013
    - DUCTILE IRON TO BS EN 598:2007 & BS ISO 4179:2005.
    - PERFORATED VITRIFIED CLAY PIPES FOR LAND DRAINAGE TO BS 1196.
    - PLASTIC PIPES FOR LAND DRAINAGE TO BS 4962:1982.
    - PLASTIC PIPING SYSTEMS FOR NON-PRESSURE UNDERGROUND DRAINAGE & SEWAGE TO BS EN 1401 & BS 4660 – SOLID WALL, STRUCTURED WALL PIPES TO BS EN 13476.
    - PRECAST CONCRETE MANHOLE UNITS TO BS EN 1917:2002.
    - PLASTIC INSPECTION CHAMBERS FOR DRAINS & SEWERS TO BS EN 13598-1:2010.
    - GULLY & MANHOLE TOPS FOR VEHICULAR & PEDESTRIAN AREAS TO BS EN 124:1994.
    - DRAINAGE CHANNELS FOR VEHICULAR & PEDESTRIAN AREAS TO BS EN 1433:2002.
12. ALL MANHOLE COVERS, ROAD GULLY COVERS & FRAMES TO COMPLY WITH BS EN124 NON ROCKING TYPE.

    UNLESS NOTED OTHERWISE USE CLASS:

    A15 FOR USE IN PEDESTRIAN AREAS WHERE VEHICLES HAVE NO ACCESS.

    B125 FOR USE IN CAR PARKS & PEDESTRIAN AREAS WHERE INFREQUENT LIGHT VEHICLE ACCESS IS LIKELY (INCLUDING DRIVEWAYS).

    C250 FOR ACCESS COVERS & GULLY GRATINGS IN AREAS OF SLOW MOVING, HEAVY TRAFFIC; ALSO FOR GULLY GRATINGS IN CARRIAGEWAY WITHIN 500mm OF KERB & UP TO 200mm INTO THE FOOTWAY.

    D400 FOR USE IN CARRIAGEWAYS OF ROADS & PARKING AREAS ACCESSED BY ALL TYPES OF VEHICLES.

    E600 FOR USE IN AREAS WHERE HIGH WHEEL LOADS ARE PRESENT.

    F900 FOR USE IN AREAS WHERE EXTREMELY HIGH WHEEL LOADS ARE PRESENT SUCH AS AIRCRAFT PAVEMENTS, DOCKS, HEAVY INDUSTRIAL SITES.
13. MANHOLES IN INTERNAL AREAS REQUIRE DOUBLE SEALED COVERS WITH LOCKING SCREWS, RECESSED WHERE REQUIRED TO ACCOMMODATE FLOOR FINISHES TO ARCHITECT'S SPECIFICATION.
14. PIPE BEDDING

    USE CLASS S BEDDING UNLESS NOTED OTHERWISE. NB PROTECT AGAINST CONSTRUCTION TRAFFIC AS NECESSARY

    USE CLASS Z CONCRETE BED & SURROUND OR CONCRETE SLAB PROTECTION AS FOLLOWS:
    - CLASS 120 CLAYWARE OR CLASS M CONCRETE (100 - 600Ø PIPES)

      LANDSCAPING - LESS THAN 600mm COVER TO CROWN.

      HARDSTANDING - LESS THAN 1200mm COVER TO CROWN
    - PLASTIC (100 - 300Ø PIPES)

      LANDSCAPING - LESS THAN 600mm COVER TO CROWN.

      HARDSTANDING - LESS THAN 900mm COVER TO CROWN
15. PIPES BELOW CONCRETE GROUND FLOOR SLABS:

    WHERE THE CROWN OF THE PIPE IS WITHIN 300mm OF THE UNDERSIDE OF SLAB, SPECIAL PROTECTION TO BE PROVIDED IN ACCORDANCE WITH BUILDING REGULATIONS H1 2.44 OR 150mm GEN3 CONCRETE BED & SURROUND CAST INTEGRALLY WITH SLAB.

    OTHERWISE USE CLASS S BEDDING.
16. MAIN BACKFILL TO BE WELL COMPACTED IN 150mm LAYERS OF:

    SELECTED BACKFILL MATERIAL IN ALL SOFT LANDSCAPED AREAS

    TYPE 1 GRANULAR MATERIAL IN ALL HARDSTANDING AREAS & PUBLIC HIGHWAYS
17. BACKFILL TO DRAINS NEAR FOUNDATIONS TO BE IN ACCORDANCE WITH BUILDING REGULATIONS H1 DIAGRAMS 8 & 12.
18. CCTV TO BE CARRIED OUT TO VERIFY CONDITION OF ANY DRAINAGE TO BE RE-USED.

GENERAL NOTES

1. THE STRUCTURAL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT CLIENT, ARCHITECT, SERVICES ENGINEER, AND SPECIALIST CONTRACTOR DRAWINGS, REPORTS AND SPECIFICATIONS.
2. FOR SETTING OUT AND LEVELS REFER TO ARCHITECTS DRAWINGS.
3. FOR THE PURPOSE OF CONSTRUCTION ALL DRAWINGS MUST NOT BE SCALED AND ONLY WRITTEN OR CALCULATED DIMENSIONS USED. LEVEL DATUMS TO BE CONFIRMED BY THE ARCHITECT.
4. ANY REVISIONS TO THE LAYOUT DETAILS REQUIRED BY THE CONTRACTOR TO BE AGREED AND APPROVED BY THE ALIGN PROPERTY PARTNERS ENGINEER.
5. FINISHED FLOOR LEVELS TO BE DETERMINED.
6. ALL PROPRIETARY PRODUCTS ARE TO BE USED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S DETAILS AND REQUIREMENTS.
7. GENERALLY, ONLY KNOWN PENETRATIONS, HOLES, POCKETS AND RECESSES ETC. WITH ANY DIMENSIONS GREATER THAN 150 ARE SHOWN ON THE DRAWINGS. FOR CONFIRMATION OF THESE AND FOR DETAILS OF SMALLER HOLES PLUS INSERTS, FIXINGS ETC. REFERENCE SHALL BE MADE TO THE ARCHITECT'S, SERVICES ENGINEER'S OR THE RELEVANT SUBCONTRACTOR'S BUILDERS WORK DRAWINGS.
8. THE CONTRACTOR SHALL ENSURE THAT TEMPORARY LOADS ONTO THE NEW STRUCTURES/DRAINAGE SHALL BE LESS THAN THOSE FOR WHICH IT HAS BEEN DESIGNED.
9. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING AND CHECKING THE SETTING OUT OF GRIDLINES, LEVELS AND DATUMS.
10. ANY DISCREPANCIES BETWEEN THE STRUCTURAL AND ARCHITECTURAL DRAWINGS SHOULD IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE CONTRACT ADMINISTRATOR.
11. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO ENSURE THAT NOISE, VIBRATION AND DUST RESULTING FROM THE WORKS ARE KEPT WITHIN REASONABLE LIMITS.
12. THE CONTRACTOR IS TO ALLOW A MINIMUM OF 10 WORKING DAYS IN THEIR PROGRAMME FOR THE REVIEW OF ANY CONTRACTOR'S DESIGN PORTIONS OF WORK FOR REVIEW BY THE ALIGN PROPERTY PARTNERS ENGINEER.
13. IRRESPECTIVE OF ANY NAMED MANUFACTURERS OF ANY PRODUCT/MATERIAL NOTED ON DRAWINGS, THE CONTRACTOR IS FREE TO PROPOSE AN EQUAL OR APPROVED PRODUCT/MATERIAL PROVIDED THAT ANY SUCH CHANGE TO THE SPECIFICATION MEETS A SIMILAR LEVEL OF PERFORMANCE AND IS NOTED ON ALL M TENDER RETURNS AND DOCUMENTATION FOR ALIGN PROPERTY PARTNERS.

IMPORTANT:

DRAWING PROVIDED FOR INFORMATION ONLY AND IS SUBJECT TO THE FOLLOWING STATUTORY APPROVALS:

- UNITED UTILITIES APPROVAL
- MANCHESTER HIGHWAYS APPROVAL
- PLANNING APPROVAL
- BUILDING CONTROL

ALL CONSTRUCTION WORKS PRIOR TO APPROVALS ABOVE WILL BE UNDERTAKEN AT CLIENTS/CONTRACTORS RISK

ALL SVP/RWP POSITIONS TO BE CHECKED BY CONTRACTOR AGAINST ARCHITECTS 1:50 DRAWINGS AND ANY DISCREPANCIES REPORTED TO ENGINEERS PRIOR TO CONSTRUCTION

DRAINAGE KEY

- NEW ADOPTABLE FOUL INSPECTION CHAMBER (SIZE VARIES), TO BE CONSTRUCTED IN ACCORDANCE WITH SSG APPENDIX C, DCG
- NEW FOUL BACKDROP
- NEW PRIVATE FOUL INSPECTION CHAMBER 450 DIA. POLYPROPYLENE OR VITRIFIED CLAY, UPTO 3000MM DEEP. MAX PIPE DIAMETER 150MM.
- NEW PRIVATE FOUL INSPECTION CHAMBER 225 DIA. POLYPROPYLENE OR VITRIFIED CLAY, UPTO 600MM DEEP. MAX PIPE DIAMETER 100MM.
- NEW PRIVATE FOUL DRAIN
- NEW TRAPPED PRIVATE FOUL GULLEY
- CONDENSATE GULLEY
- NEW SOIL PIPE
- EXISTING ADOPTED FOUL INSPECTION CHAMBER (SIZE VARIES)
- EXISTING ADOPTED FOUL SEWER
- EXISTING DRAINAGE TO BE ABANDONED
- NEW ADOPTABLE STORM INSPECTION CHAMBER (SIZE VARIES), TO BE CONSTRUCTED IN ACCORDANCE WITH SSG APPENDIX C, DCG
- NEW STORM BACKDROP
- NEW ADOPTABLE STORM SEWER
- NEW PRIVATE STORM INSPECTION CHAMBER 450 DIA. POLYPROPYLENE OR VITRIFIED CLAY, UPTO 3000MM DEEP. MAX PIPE DIAMETER 150MM.
- NEW PRIVATE STORM CATCH-PIT INSPECTION CHAMBER 450 DIA.
- NEW PRIVATE STORM INSPECTION CHAMBER 225 DIA. POLYPROPYLENE OR VITRIFIED CLAY, UPTO 600MM DEEP. MAX PIPE DIAMETER 100MM.
- NEW PRIVATE STORM DRAIN
- NEW PRIVATE STORM RODDING EYE
- NEW PRIVATE PREFORATED PIPE WITHIN PERMEABLE DRIVEWAY (PIPE TO BE STANDARD CONSTRUCTION OUTSIDE PERMEABLE DRIVEWAY AREAS)
- ADOPTABLE HIGHWAY GULLEY
- NEW PRIVATE YARD GULLEY
- NEW PRIVATE LINEAR DRAINAGE CHANNEL
- NEW PRIVATE THRESHOLD ACCESS DRAIN
- MINIMUM SUB-BASE LEVEL OF PERMEABLE PAVING WHERE DIFFERENT FROM MINIMUM CONSTRUCTION.
- NEW PRIVATE ATTENUATION TANK
- NEW PRIVATE PERMEABLE PAVING (LINED)

UNLESS NOTED OTHERWISE:
- ALL FOUL & SURFACE WATER WATER DRAINAGE IS 100Ø LAID TO 1:80 MINIMUM FALL UNLESS NOTED OTHERWISE.

ALL ADOPTABLE SEWERS AND MATERIALS TO BE IN COMPLIANCE WITH DESIGN CONSTRUCTION GUIDANCE (DCG)

HAZARD IDENTIFICATION BOX

This table is provided to assist the Principal Contractor to fulfil their obligations under the CDM Regulations 2015

Hazard Ref	Hazard Type (Construction / Maintenance / Use / Demolition)	Hazard Description	Mitigation Measures/ Residual Risk
1	Construction, Maintenance, Use and Demolition	Carrying out work within area of life traffic.	Ensuring the correct Traffic Management Plan is in place.
2	Construction, Maintenance and Use	S185 Diversion approval required for foul drainage	Liaise with United Utilities to determine an agreed solution relating the foul diversion route,
3	Construction, Maintenance and Use	Existing drainage stub running into site and crossing through proposed plot.	Carry out further investigation on existing drainage stub to determine if it requires diverting or it can be terminated.
4	Construction, Maintenance, Use and Demolition	Unable to trace location/depth of existing 1500dia UU sewer, which can have effect on the proposed plot foundations, depending on location/depth of this existing large drain.	APP to highlight major plot construction risk due to unknown location/depth of existing UU sewer. Further Investigation is required prior to construction.
5	Construction, Maintenance and Use	Contact with existing live services on site, which are required to be diverted in some locations. Risk of disruption/injury.	Non intrusive checks for existing services prior to construction.
6	Construction, Maintenance and Use	Existing water main in the middle of the site. Location and depth unknown.	Further investigation to take place to ensure the Utilities Survey has been received.
7	Construction, Maintenance And Use.	Deep drainage excavation > 3m	No excavation to be left overnight. Sufficient covering and monitoring of weather conditions. Training to be required to work in condined spaces. Correct supports to be used for the excavation area.
8	Construction, Maintenance And Use.	Disturbing earthworks outside of site boundary due to deep excavations / foundations.	Sheet piling or similar bracing to support excavated areas during works.

NOTE
PROPOSED TREE POSITIONS TO BE REVIEWED TO ENSURE NO CONFLICT WITH ATTENUATION TANK AND DRAINAGE.

ALL SUB-BASE LEVELS TO FALL TOWARDS LOCALLY LOWERED PERFORATED TRENCH. IF IN DOUBT, PLEASE ASK. PLEASE SEE LINED PERMEABLE PARKING BAY DETAILS IN DRAWING 'PV2310-APP-90-XX-DR-C-PRIVATE EXTERNAL CONSTRUCTION DETAILS'.

Notes

This Drawing is an instrument of service and shall remain the property of Align Property Partners Ltd copyright ©. It may not be reproduced or copied in any form. It shall not be used for the construction, enlargement or alteration of a building or area other than the said project without the authorisation of the issuing office. Contractors shall verify and be responsible for all dimensions and conditions and shall report any discrepancies to the issuing office before proceeding with any work. Drawings shall not be scaled.

Rev	Details	Author & Date	Checked & Date	Approved & Date
C03	UPDATED ATTENUATION TANKS TO SUIT SDS SITE SPECIFIC ATTENUATION TANK DRAWINGS	JSM 25/09/25	ZS 25/09/25	ZS 25/09/25
C02	UPDATED KEY FOR LINEAR DRAINAGE CHANNEL.	ZS 13/01/25	BD 13/01/25	BD 13/01/25
C01	UPDATED DRAWING STATUS & UPDATES SITE LAYOUT (12191-AEW-XX-XX-DR-A-0506-S2 PROPOSED SITE PLAN - GROUND LEVEL) - 20/08/24	JSM 27/08/24	ZS 28/08/24	ZS 28/08/24
P06	Updated foul connection points for sink waste. Updated foul/storm private drainage layout/levels for plots 1-18.	ZS 09/08/24	BD 09/08/24	BD 09/08/24
P05	Amended Pipe 1.003 to 1.002 to correlate with revised calculations. Updated S185 drainage layout.	ZS 06/08/24	ZS 06/08/24	LF 06/08/24
P04	Amended surface water drainage design to suit outfall amendments following UU comments received on 16/02/24.	ZS 07/03/24	BD 07/03/24	BD 07/03/24
P03	Added private drainage and updated surface water drainage strategy to suit revised outfall positions.	ZS 01/02/24	BD 02/02/24	BD 02/02/24
P02	Updated storm drainage to allow for one outfall location at a rate of 5.0 l/s. Updated SW drainage for Road 1 layout updates and amendments to driveways for plots 19 - 24.	ZS 19/09/23	BD 19/09/23	BD 19/09/23
P01	Initial Issue.	ZS 21/07/23	BD 21/07/23	BD 21/07/23

align PROPERTY PARTNERS
White Rose House, Northallerton Business Park, Thurston Road, Northallerton DL6 2NA

Client: MOSSCARE ST VINCENTS

Project Name: PARKMOUNT ROAD, MANCHESTER

Drawing Title: DRAINAGE PLAN

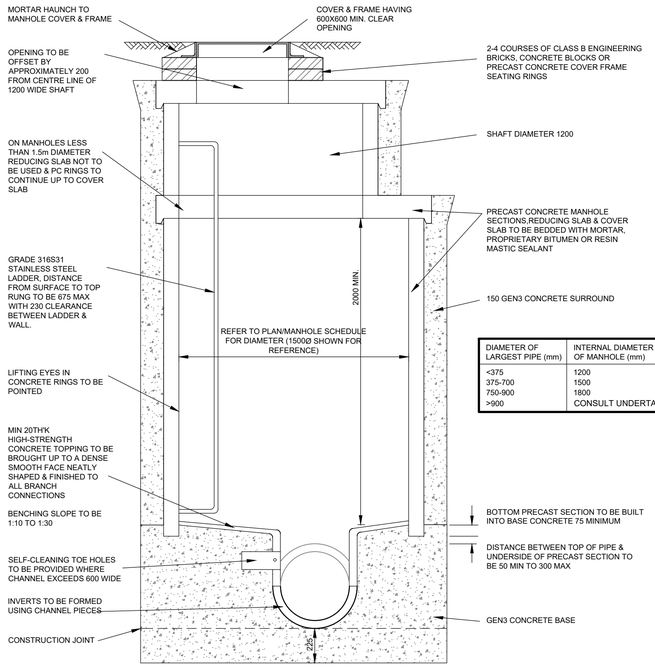
Purpose: CONSTRUCTION

Scale	Drawn	Checked	Approved
1:250	ZS	BD	BD
Original Size	Date	Date	Date
A1	19/07/23	19/07/23	19/07/23

Drawing Number: PV2310-APP-92-XX-DR-C-2500 Rev. C03

PV2310-APP-90-XX-M3-C-2500-C03- Drainage Layout.dwg

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DIAMETER OF LARGEST PIPE (mm)	INTERNAL DIAMETER OF MANHOLE (mm)
<375	1200
375-700	1500
750-900	1800
>900	CONSULT UNDERTAKER

PIPE SIZE (mm)	DIM 'Y' (min) EVEN TRENCH BOTTOM	DIM 'Y' (min) UNEVEN TRENCH BOTTOM*	DIM 'Z' (min)	DIM 'Bd' (MAX TRENCH WIDTH)	GRANULAR MATERIAL
150	100	200	100	750	10mm SINGLE SIZED OR 14mm TO 5mm GRADED
225	100	200	100	825	
300	100	200	100	925	
375	100	200	100	1050	14mm SINGLE SIZED OR 14mm TO 5mm GRADED
450	150	200	150	1150	
525	150	250	150	1200	
600	150	250	150	1350	
675	150	250	225	1450	
750	225	300	225	1500	
825	225	300	225	1600	
900	225	300	225	1900	
975	225	300	300	2000	20mm SINGLE SIZED OR 20mm TO 5mm GRADED
1050	225	300	300	2100	
1125	225	300	300	2200	
1200	250	350	300	2300	
1350	375	450	375	2500	
1500	375	450	375	2700	
1650	375	450	450	2800	
1800	375	500	450	3100	
1950	400	500	525	3200	40mm SINGLE SIZED OR 40mm TO 5mm GRADED
2100	425	650	525	3400	
2400	450	675	600	3700	

* OR ROCK

EMBEDMENT DIMENSIONS FOR RIGID PIPES.

PIPE SIZE (mm)	DIM 'Y' (min) EVEN TRENCH BOTTOM	DIM 'Y' (min) UNEVEN TRENCH BOTTOM*	DIM 'Bd' (MIN TRENCH WIDTH)
<400	100	200	'Bc' + 300
400-700	150	250	'Bc' + 450
725-900	200	300	'Bc' + 600
900-1200	250	350	'Bc' + 800

* OR ROCK

EMBEDMENT DIMENSIONS FOR FLEXIBLE & SEMI-RIGID PIPES.

Minimum Depth Of Granular Fill Under Pipe Socket To Be 50mm For Even Trench Bottom & 150mm For Uneven Or Rock Trench Bottom.

Dim 'Bc' = Outside Diameter Of Pipe
Dim 'Bd' = Effective Trench Width Measured 300mm Above Crown Of Pipe.

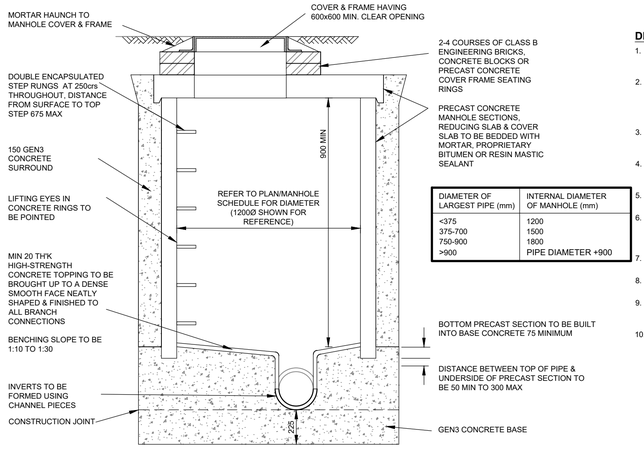
PIPE SIZE (mm)	MAXIMUM NOMINAL PARTICAL SIZE (mm)	GRANULAR MATERIAL FOR RIGID PIPES (BEDDING CLASSES S, B & F) AND FLEXIBLE PIPES	GRANULAR MATERIAL FOR RIGID PIPES (BEDDING CLASS N)
100	10	10mm SINGLE SIZE	COURSE, MEDIUM OR FINE SAND
> 100-150	15	10 OR 14mm SINGLE SIZE 14mm TO 5mm GRADED	COURSE, MEDIUM OR FINE SAND
> 150-300	20	10, 14 OR 20mm SINGLE SIZE 14mm TO 5mm GRADED 20mm TO 5mm GRADED	ALL-IN AGGREGATE COURSE, MEDIUM OR FINE SAND
> 300-550	20	14 OR 20mm SINGLE SIZE 14mm TO 5mm GRADED 20mm TO 5mm GRADED	ALL-IN AGGREGATE COURSE, MEDIUM OR FINE SAND
> 550	40	14, 20 OR 40mm SINGLE SIZE 14mm TO 5mm GRADED 20mm TO 5mm GRADED 40mm TO 5mm GRADED	ALL-IN AGGREGATE COURSE, MEDIUM OR FINE SAND

GRANULAR PIPE BEDDING MATERIAL ALL IN ACCORDANCE WITH UNITED UTILITIES.

MAIN BACKFILL TO BE:

HARDSTANDING AREAS: DETR TYPE 1 GRANULAR MATERIAL

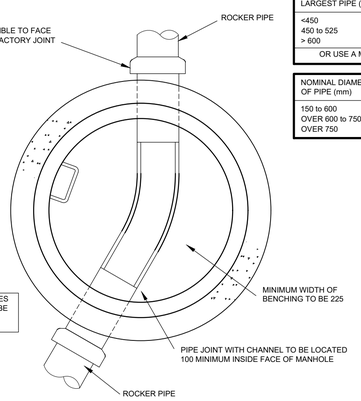
SOFT LANDSCAPE AREAS: SELECTED BACKFILL MATERIAL UP TO UNDERSIDE OF TOP-SOIL



DIAMETER OF LARGEST PIPE (mm)	INTERNAL DIAMETER OF MANHOLE (mm)
<375	1200
375-700	1500
750-900	1800
>900	PIPE DIAMETER +900

DIAMETER OF LARGEST PIPE (mm)	MINIMUM WIDTH OF LANDING BENCHING (mm)
<450	600
450 to 525	750
> 600	1100
OR USE A MANHOLE PLATFORM SYSTEM	

NOMINAL DIAMETER OF PIPE (mm)	ROCKER PIPE EFFECTIVE LENGTH (mm)
150 to 600	600
OVER 600 to 750	1000
OVER 750	1250



MANHOLES WITH OUTGOING PIPES 525 DIAMETER OR GREATER TO BE FITTED WITH STAINLESS STEEL SAFETY CHAINS

REFER TO PLAN/MANHOLE SCHEDULE FOR PIPE SIZES (225Ø SHOWN FOR REFERENCE)

TYPICAL MANHOLE TYPE B
SEWERAGE SECTOR GUIDANCE - FIGURE B10
MAXIMUM DEPTH FROM COVER TO SOFFIT OF PIPE 3.0m
(SCALE 1:20)

DRAINAGE

1. ALL DRAINAGE WORKS TO BE CONSTRUCTED FROM THE OUTFALL TOWARDS THE HEAD OF RUN TO ENSURE THE OUTFALL CAN BE ACHIEVED.
2. ALL EXISTING DRAINS & SERVICES (LINE & LEVELS) TO BE CHECKED & CONFIRMED BY THE CONTRACTOR PRIOR COMMENCEMENT OF ANY ON SITE DRAINAGE WORKS. ANY DISCREPANCY IN LEVELS IS TO BE REPORTED IMMEDIATELY TO APP.
3. ALL DRAINAGE WORK TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS, BS EN 752 & TO THE SATISFACTION OF THE BUILDING INSPECTOR.
4. ALL PROPRIETARY ITEMS TO BE INSTALLED STRICTLY IN ACCORDANCE WITH MANUFACTURER'S DETAILS, INSTRUCTIONS & SPECIFICATIONS.
5. ALL COVER LEVELS ARE APPROXIMATE. EXACT LEVELS TO BE DETERMINED FROM THE EXTERNAL WORKS LAYOUT.
6. INVERT LEVELS QUOTED AT MANHOLES & INSPECTION CHAMBERS ARE THOSE OF THE LARGEST CONNECTED PIPE DIAMETER. PIPES AT CHAMBERS TO BE LAID WITH SOFFITS LEVEL UNLESS NOTED OTHERWISE.
7. PIPE GRADIENTS WHERE STATED ARE APPROXIMATE - LEVELS AT THE CHAMBERS TAKE PRECEDENT.
8. REFER TO ARCHITECT'S DRAWINGS FOR PRECISE LOCATION OF ALL RAINWATER PIPES, INTERNAL CONNECTIONS ETC.
9. ALL INTERNAL CONNECTIONS TO HAVE AN ABOVE-FLOOR ACCESS POINT TO ENABLE FUTURE ACCESS FOR MAINTENANCE.
10. PIPES & FITTINGS TO BE:
    - CONCRETE PIPES & ANCILLARY PRODUCTS TO BS 5911:2022 & BS EN 1916:2002.
    - VITRIFIED CLAY PIPES & FITTINGS TO BS EN 295:2013
    - DUCTILE IRON TO BS EN 598:2007 & BS ISO 4179:2005.
    - PERFORATED VITRIFIED CLAY PIPES FOR LAND DRAINAGE TO BS 1196.
    - PLASTIC PIPES FOR LAND DRAINAGE TO BS 4962:1982.
    - PLASTIC PIPING SYSTEMS FOR NON-PRESSURE UNDERGROUND DRAINAGE & SEWAGE TO BS EN 1401 & BS 4660 – SOLID WALL, STRUCTURED WALL PIPES TO BS EN 13476.
    - PRECAST CONCRETE MANHOLE UNITS TO BS EN 1917:2002.
    - PLASTIC INSPECTION CHAMBERS FOR DRAINS & SEWERS TO BS EN 13598-1:2010.
    - GULLY & MANHOLE TOPS FOR VEHICULAR & PEDESTRIAN AREAS TO BS EN 124:1994.
    - DRAINAGE CHANNELS FOR VEHICULAR & PEDESTRIAN AREAS TO BS EN 1433:2002.
12. ALL MANHOLE COVERS, ROAD GULLY COVERS & FRAMES TO COMPLY WITH BS EN124 NON ROCKING TYPE.

    UNLESS NOTED OTHERWISE USE CLASS:

    A15 FOR USE IN PEDESTRIAN AREAS WHERE VEHICLES HAVE NO ACCESS.

    B125 FOR USE IN CAR PARKS & PEDESTRIAN AREAS WHERE INFREQUENT LIGHT VEHICLE ACCESS IS LIKELY (INCLUDING DRIVEWAYS).

    C250 FOR ACCESS COVERS & GULLY GRATINGS IN AREAS OF SLOW MOVING, HEAVY TRAFFIC; ALSO FOR GULLY GRATINGS IN CARRIAGEWAY WITHIN 500mm OF KERB & UP TO 200mm INTO THE FOOTWAY.

    D400 FOR USE IN CARRIAGEWAYS OF ROADS & PARKING AREAS ACCESSED BY ALL TYPES OF VEHICLES.

    E600 FOR USE IN AREAS WHERE HIGH WHEEL LOADS ARE PRESENT.

    F900 FOR USE IN AREAS WHERE EXTREMELY HIGH WHEEL LOADS ARE PRESENT SUCH AS AIRCRAFT PAVEMENTS, DOCKS, HEAVY INDUSTRIAL SITES.
13. MANHOLES IN INTERNAL AREAS REQUIRE DOUBLE SEALED COVERS WITH LOCKING SCREWS. RECESSED WHERE REQUIRED TO ACCOMMODATE FLOOR FINISHES TO ARCHITECT'S SPECIFICATION.
14. PIPE BEDDING

    USE CLASS S BEDDING UNLESS NOTED OTHERWISE. NB PROTECT AGAINST CONSTRUCTION TRAFFIC AS NECESSARY

    USE CLASS Z CONCRETE BED & SURROUND OR CONCRETE SLAB PROTECTION AS FOLLOWS:
    - CLASS 120 CLAYWARE OR CLASS M CONCRETE (100 - 600Ø PIPES)

      LANDSCAPING - LESS THAN 600mm COVER TO CROWN.

      HARDSTANDING - LESS THAN 1200mm COVER TO CROWN
    - PLASTIC (100 - 300Ø PIPES)

      LANDSCAPING - LESS THAN 600mm COVER TO CROWN.

      HARDSTANDING - LESS THAN 900mm COVER TO CROWN
15. PIPES BELOW CONCRETE GROUND FLOOR SLABS:

    WHERE THE CROWN OF THE PIPE IS WITHIN 300mm OF THE UNDERSIDE OF SLAB, SPECIAL PROTECTION TO BE PROVIDED IN ACCORDANCE WITH BUILDING REGULATIONS H1 2.44 OR 150mm GEN3 CONCRETE BED & SURROUND CAST INTEGRALLY WITH SLAB.

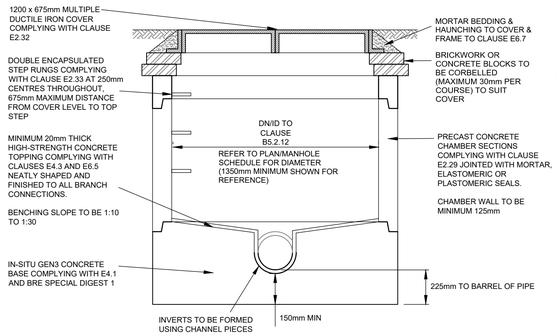
    OTHERWISE USE CLASS S BEDDING.
16. MAIN BACKFILL TO BE WELL COMPACTED IN 150mm LAYERS OF:

    SELECTED BACKFILL MATERIAL IN ALL SOFT LANDSCAPED AREAS

    TYPE 1 GRANULAR MATERIAL IN ALL HARDSTANDING AREAS & PUBLIC HIGHWAYS
17. BACKFILL TO DRAINS NEAR FOUNDATIONS TO BE IN ACCORDANCE WITH BUILDING REGULATIONS H1 DIAGRAMS 8 & 12.
18. CCTV TO BE CARRIED OUT TO VERIFY CONDITION OF ANY DRAINAGE TO BE RE-USED.

GENERAL NOTES

1. THE STRUCTURAL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT CLIENT, ARCHITECT, SERVICES ENGINEER, AND SPECIALIST CONTRACTOR DRAWINGS, REPORTS AND SPECIFICATIONS.
2. FOR SETTING OUT AND LEVELS REFER TO ARCHITECTS DRAWINGS.
3. FOR THE PURPOSE OF CONSTRUCTION ALL DRAWINGS MUST NOT BE SCALED AND ONLY WRITTEN OR CALCULATED DIMENSIONS USED. LEVEL DATUMS TO BE CONFIRMED BY THE ARCHITECT.
4. ANY REVISIONS TO THE LAYOUT DETAILS REQUIRED BY THE CONTRACTOR TO BE AGREED AND APPROVED BY THE ALIGN PROPERTY PARTNERS ENGINEER.
5. FINISHED FLOOR LEVELS TO BE DETERMINED.
6. ALL PROPRIETARY PRODUCTS ARE TO BE USED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S DETAILS AND REQUIREMENTS.
7. GENERALLY, ONLY KNOWN PENETRATIONS, HOLES, POCKETS AND RECESSES ETC. WITH ANY DIMENSIONS GREATER THAN 150 ARE SHOWN ON THE DRAWINGS. FOR CONFIRMATION OF THESE AND FOR DETAILS OF SMALLER HOLES PLUS INSERTS, FIXINGS ETC. REFERENCE SHALL BE MADE TO THE ARCHITECTS, SERVICES ENGINEER'S OR THE RELEVANT SUBCONTRACTOR'S BUILDERS WORK DRAWINGS.
8. THE CONTRACTOR SHALL ENSURE THAT TEMPORARY LOADS ONTO THE NEW STRUCTURES/DRAINAGE SHALL BE LESS THAN THOSE FOR WHICH IT HAS BEEN DESIGNED.
9. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING AND CHECKING THE SETTING OUT OF GRIDLINES, LEVELS AND DATUMS.
10. ANY DISCREPANCIES BETWEEN THE STRUCTURAL AND ARCHITECTURAL DRAWINGS SHOULD IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE CONTRACT ADMINISTRATOR.
11. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO ENSURE THAT NOISE, VIBRATION AND DUST RESULTING FROM THE WORKS ARE KEPT WITHIN REASONABLE LIMITS.
12. THE CONTRACTOR IS TO ALLOW A MINIMUM OF 10 WORKING DAYS IN THEIR PROGRAMME FOR THE REVIEW OF ANY CONTRACTOR'S DESIGN PORTIONS OF WORK FOR REVIEW BY THE ALIGN PROPERTY PARTNERS ENGINEER.
13. IRRESPECTIVE OF ANY NAMED MANUFACTURERS OF ANY PRODUCT/MATERIAL NOTED ON DRAWINGS, THE CONTRACTOR IS FREE TO PROPOSE AN EQUAL OR APPROVED PRODUCT/MATERIAL PROVIDED THAT ANY SUCH CHANGE TO THE SPECIFICATION MEETS A SIMILAR LEVEL OF PERFORMANCE AND IS NOTED ON ALL M TENDER RETURNS AND DOCUMENTATION FOR ALIGN PROPERTY PARTNERS.



MANHOLES WITH OUTGOING PIPES 525 DIAMETER OR GREATER TO BE FITTED WITH STAINLESS STEEL SAFETY CHAINS

REFER TO PLAN/MANHOLE SCHEDULE FOR PIPE SIZES (450Ø SHOWN FOR REFERENCE)

TYPICAL MANHOLE TYPE A1
SEWERAGE SECTOR GUIDANCE - FIGURE B5
DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 3m TO 6m
(SCALE 1:20)

TYPICAL MANHOLE - TYPE C
SEWERAGE SECTOR GUIDANCE FIGURE B15
DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE LESS THAN 1.5m
MAXIMUM PIPE SIZE 450mm DIAMETER
RIGID MATERIAL CONSTRUCTION
(NOT TO SCALE)

		VARIABLE FEATURES								
A	MANHOLE SHAFT AND LADDER/DOUBLE STEP ACCESS	• FOR 1200,1350 & 1500 MANHOLE CHAMBERS (OR WHERE THE DEPTH TO SOFFIT IS < 3m) A FULL HEIGHT (NO ACCESS SHAFT) CONSTRUCTION IS TO BE USED • FOR DEPTHS TO BENCHING FROM COVER LEVEL < 3m DOUBLE STEP ACCESS IS TO BE USED • FOR MANHOLES DEEPER THAN 3m TO BENCHING A LADDER IS REQUIRED • FOR DOUBLE STEP ACCESS MINIMUM INTERNAL MANHOLE ACCESS SHAFT DIAMETER IS TO BE 1050 • FOR LADDER ACCESS MINIMUM INTERNAL SHAFT DIAMETER IS TO 1200								
B	MANHOLE COVER	DEPTH TO SOFFIT FROM COVER LEVEL < 1.5m • MINIMUM CLEAR OPENING SIZES: 750x750 ON 1050 & 1200 CHAMBER/SHAFT 1200x675 ON 1350 OR GREATER CHAMBER/SHAFT • BENEATH ALL MAN-ACCESS COVERS GREATER THAN 600x600 A RETRACTABLE SAFETY HANDHOLD SHALL BE PROVIDED EXTENDING 1200 ABOVE GROUND LEVEL			DEPTH TO SOFFIT FROM COVER LEVEL ≥ 1.5m • MINIMUM CLEAR OPENING SIZES: 600x600 FOR DOUBLE STEP ACCESS 600x600 FOR LADDER ACCESS 750x600 FOR FEATURE LADDER ACCESS					
	COVER SLAB	HOLE SIZE IN COVER SLAB	COVER FRAME SEATING RING ON COVER SLAB DOUBLE STEP ACCESS		HOLE SIZE IN COVER SLAB	COVER FRAME SEATING RING ON COVER SLAB				
						DOUBLE STEP ACCESS	LADDER ACCESS			
	CHAMBER DIA:									
	1050	750x750 c.o.	750x750 c.o.		600x600 e.o.	TYPE 1 - 600x600 e.o.	NOT APPLICABLE			
	1200	750x750 e.o	750x750 e.o		750x600 e.o.	TYPE 1 - 600X600 e.o.	TYPE 1 - 600X600 e.o.			
	1350 - 1500	1200x675 c.o.	1200x675 c.o.		750x600 e.o.	TYPE 1 - 600X600 e.o.	TYPE 1 - 600X600 e.o.			
	1800 & ABOVE	1200x675 e.o.	1200x675 e.o.		750x600 e.o.	TYPE 1 - 600X600 e.o.	TYPE 1 - 600X600 e.o.			
		NOTE: FOR LADDER ACCESS THE ECCENTRIC SEATING RING IS TURNED THROUGH 180° c.o = CENTRAL OPENING e.o = ECCENTRIC OPENING								
	REDUCING SLAB									
	CHAMBER DIA:	HOLE DIAMETER IN REDUCING SLAB:								
	1200 - 1500	REDUCING SLAB NOT USED								
	1800 & ABOVE	1050 FOR DOUBLE STEP ACCESS OR 1200 FOR LADDER ACCESS								
	FEATURES RELATED TO PIPE DIAMETER	DIAMETER OF LARGEST PIPE								
		225	300	375	450	525	600	675	750	825 & ABOVE
C	ROCKER PIPES	EFFECTIVE LENGTH 600						EFFECTIVE LENGTH 1000		EFFECTIVE LENGTH 1250*
D	BENCHING WIDTH	MINIMUM 600			MINIMUM 750			MINIMUM 1100		
E	BENCHING RAILINGS	NOT REQUIRED						REQUIRED		
F	SEWER SAFETY CHAINS	NOT REQUIRED						REQUIRED		
G	INVERT ACCESS STEP	NOT REQUIRED			REQUIRED WITH DOUBLE STEPS					
H	CHANNEL FITTINGS	VITRIFIED CLAY			NOT REQUIRED (CHANNELS FORMED USING GRANOLITHIC CONCRETE)					

MANHOLE ACCESS DETAILS

* ROCKER PIPES TO BE USED UNTIL THE PIPE OUTSIDE DIAMETER EXCEEDS THE EFFECTIVE LENGTH OF THE ROCKER PIPE

Notes

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IMPORTANT:

DRAWING PROVIDED FOR INFORMATION ONLY AND IS SUBJECT TO THE FOLLOWING STATUTORY APPROVALS:

- PLANNING APPROVAL
- BUILDING CONTROL
- UNITED UTILITIES APPROVAL
- HIGHWAYS APPROVAL

ALL CONSTRUCTION WORKS PRIOR TO APPROVALS ABOVE WILL BE UNDERTAKEN AT CLIENTS/CONTRACTORS RISK

ALL MANHOLES TO USE CONCRETE SURROUND AND ROCKERS WHERE APPLICABLE

C01	UPDATED DRAWING STATUS	JSM 28/09/24	ZS 29/08/24	ZS 29/08/24
P04	NOTES ADDED TO SUIT UU COMMENTS (10.03.24)	MD 23/04/24	ZS 23/04/24	ZS 23/04/24
P03	UPDATED DRAWING TITLE	MD 04/04/24	ZS 04/04/24	
P02	ADDED DRAINAGE TABLES	JM 27/09/23	ZS 27/09/23	ZS 27/09/23
P01	INITIAL ISSUE	ZS 19/09/23	LF 19/09/23	LF 19/09/23
Rev	Details	Author & Date	Checked & Date	Approved & Date

Westmorland & Furness Office, Riverside Business Park, Natland Road, Kendal LA9 7SX

Client: MOSSCARE ST VINCENTS

Project Name: PARKMOUNT ROAD, MANCHESTER

Drawing Title: S104 DRAINAGE CONSTRUCTION DETAILS (SHEET 1 OF 4)

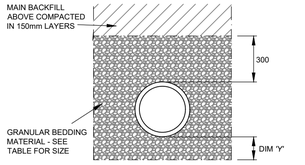
Purpose: FOR CONSTRUCTION

Scale	Drawn	Checked	Approved
AS SHOWN	ZS	LF	LF
Original Size	Date	Date	Date
A1	19/09/23	19/09/23	19/09/23

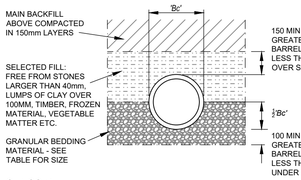
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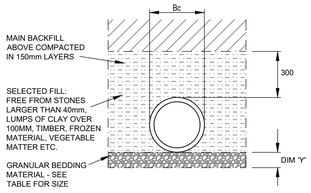
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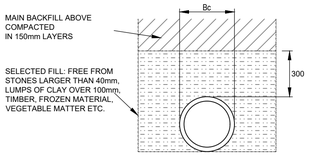
CLASS S
(BEDDING FACTOR 2.5) GENERALLY SUITABLE FOR ALL SOIL CONDITIONS



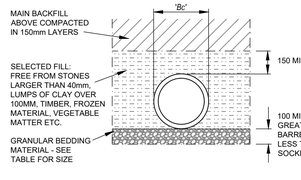
CLASS B
(BEDDING FACTOR 2.5) GENERALLY SUITABLE FOR ALL SOIL CONDITIONS



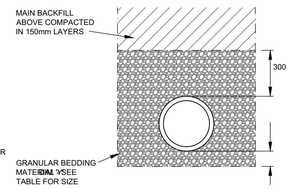
CLASS F
(BEDDING FACTOR 1.9) GENERALLY SUITABLE FOR ALL SOIL CONDITIONS



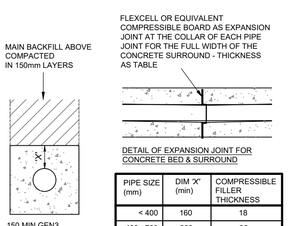
CLASS D
EMBEDMENT TYPE 4
HIGH STANDARD OF WORKMANSHIP REQUIRED
NOT TO BE USED UNLESS ACCURATE HAND TRIMMING BY SHOVEL IS POSSIBLE



CLASS N
(BEDDING FACTOR 1.1) ALTERNATIVE TO CLASS D WHERE ACCURATE HAND TRIMMING BY SHOVEL IS **NOT** POSSIBLE

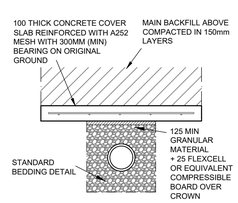


BEDDING FOR PLASTIC PIPES
FOR ALL OTHER INSTANCES REFER TO PIPE MANUFACTURERS DETAILS

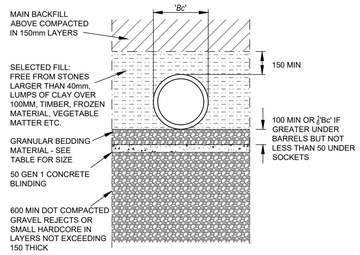


PIPE SIZE (mm)	DIM 'X' (min)	COMPRESSIBLE FILLER THICKNESS
< 400	160	18
400 - 700	200	36
725 - 1200	300	36
>1200	300	54

CLASS Z
CONCRETE BEDDING & SURROUND
REQUIRED WHERE COVER TO PIPEWORK IS LESS THAN 1.2m
GENERALLY SUITABLE FOR ALL SOIL CONDITIONS



CONCRETE SLAB PROTECTION
(ALTERNATIVE TO CONCRETE BEDDING & SURROUND)



PIPE BEDDING IN POOR GROUND
(BS 9295:2010)

PIPE BEDDING MATERIAL DETAILS
MATERIAL DESIGNATED TYPE A SHALL CONSIST OF ANGULAR GRAVEL OR CRUSHED ROCK GRADED IN ACCORDANCE WITH BS 882 OR AIR COOLED BLAST FURNACE SLAG TO BS 1047 OR SINTERED PULVERISED FUEL ASH TO BS 3797 SELECTED ACCORDING TO PIPE SIZE AS FOLLOWS:-

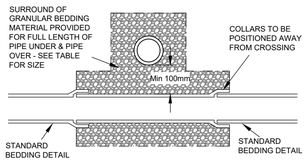
NOMINAL SIZE OF PIPES (mm)	MAXIMUM PARTICAL SIZE (mm)	IMPORTED GRANULAR MATERIALS
100-125	10	10mm NOMINAL SINGLE SIZE
150-200	15	10 OR 14mm SINGLE SIZE 14mm TO 5mm GRADED
225-300	20	10, 14 OR 20mm SINGLE SIZE 14mm TO 5mm GRADED 20mm TO 5mm GRADED
375-500	20	14 OR 20mm SINGLE SIZE 14mm TO 5mm GRADED 20mm TO 5mm GRADED
OVER 500	40	14, 20 OR 40mm SINGLE SIZE 14mm TO 5mm GRADED 20mm TO 5mm GRADED 40mm TO 5mm GRADED

MATERIAL DESIGNATED TYPE B: USED UNDER GARDENS AND VERGES SHALL CONSIST OF UNIFORM READILY COMPACTABLE MATERIAL, FREE FROM TREE ROOTS, VEGETABLE MATTER, RUBBISH AND FROZEN SOIL, AND EXCLUDING CLAY LUMPS RETAINED ON A 75mm SIEVE AND STONES LARGER THAN 37mm. BEDDING TO BE COMPACTED IN 225mm LAYERS.

MATERIAL DESIGNATED TYPE B: USED UNDER ROADS AND FOOTPATHS SHALL CONSIST OF GRANULAR MATERIAL AS USED FOR CARRIAGEWAY SUB-BASE CONSTRUCTION.

STRAIGHT BAR END HINGED
GULLY GRATE C250/D400
GRADE AS APPROPRIATE

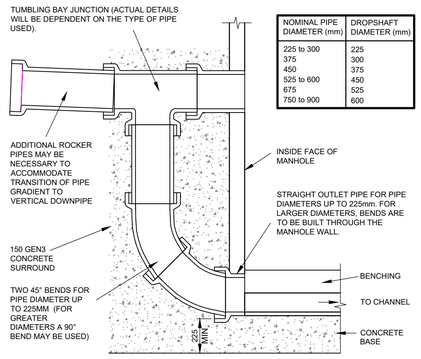
Drawn 1:20



PIPE CROSSINGS
(SCALE 1:20)

COMPRESSIBLE FILLER AND PACKING FOR PIPELINES
AT EACH FLEXIBLE PIPE JOINT A JOINT FILLER (EG. FIBREBOARD OR POLYSTYRENE) SHALL BE USED (SEE TABLE BELOW), AND SHALL EXTEND THROUGH THE FULL THICKNESS OF ANY CONCRETE IN CONTACT WITH THE PIPE. THE CONCRETE BED SHALL BE CUT AWAY AT EACH JOINT TO GIVE A CLEARANVE OF AT LEAST 50mm, SO THAT THE JOINT DOES NOT BEAR ON THE BED

NOMINAL DIAMETER OF PIPE (mm)	THICKNESS OF COMPRESSIBLE FILLER (mm)
LESS THAN 450	18
450 - 1200	36
GREATER THAN 1200	54



NOMINAL PIPE DIAMETER (mm)	DROPSHAFT DIAMETER (mm)
225 to 300	225
375	300
450	375
525 to 600	450
675	525
750 to 900	600

ADOPTABLE MANHOLE
TYPICAL EXTERNAL VERTICAL BACKDROP DETAIL
(WHERE TUMBLING BAY IS NOT MORE THAN 1.5m ABOVE BENCHING)
(SCALE 1:20)

Notes

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DRAINAGE

1. ALL DRAINAGE WORKS TO BE CONSTRUCTED FROM THE OUTFALL TOWARDS THE HEAD OF RUN TO ENSURE THE OUTFALL CAN BE ACHIEVED.
2. ALL EXISTING DRAINS & SERVICES (LINE & LEVELS) TO BE CHECKED & CONFIRMED BY THE CONTRACTOR PRIOR COMMENCEMENT OF ANY ON SITE DRAINAGE WORKS. ANY DISCREPANCY IN LEVELS IS TO BE REPORTED IMMEDIATELY TO APP.
3. ALL DRAINAGE WORK TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS, BS EN 752 & TO THE SATISFACTION OF THE BUILDING INSPECTOR.
4. ALL PROPRIETARY ITEMS TO BE INSTALLED STRICTLY IN ACCORDANCE WITH MANUFACTURER'S DETAILS, INSTRUCTIONS & SPECIFICATIONS.
5. ALL COVER LEVELS ARE APPROXIMATE. EXACT LEVELS TO BE DETERMINED FROM THE EXTERNAL WORKS LAYOUT.
6. INVERT LEVELS QUOTED AT MANHOLES & INSPECTION CHAMBERS ARE THOSE OF THE LARGEST CONNECTED PIPE DIAMETER. PIPES AT CHAMBERS TO BE LAID WITH SOFFITS LEVEL UNLESS NOTED OTHERWISE.
7. PIPE GRADIENTS WHERE STATED ARE APPROXIMATE - LEVELS AT THE CHAMBERS TAKE PRECEDENT.
8. REFER TO ARCHITECT'S DRAWINGS FOR PRECISE LOCATION OF ALL RAINWATER PIPES, INTERNAL CONNECTIONS ETC.
9. ALL INTERNAL CONNECTIONS TO HAVE AN ABOVE-FLOOR ACCESS POINT TO ENABLE FUTURE ACCESS FOR MAINTENANCE.
10. PIPES & FITTINGS TO BE:
    - CONCRETE PIPES & ANCILLARY PRODUCTS TO BS 5911:2022 & BS EN 1916:2002.
    - VITRIFIED CLAY PIPES & FITTINGS TO BS EN 295:2013
    - DUCTILE IRON TO BS EN 598:2007 & BS ISO 4179:2005.
    - PERFORATED VITRIFIED CLAY PIPES FOR LAND DRAINAGE TO BS 1196.
    - PLASTIC PIPES FOR LAND DRAINAGE TO BS 4962:1982.
    - PLASTIC PIPING SYSTEMS FOR NON-PRESSURE UNDERGROUND DRAINAGE & SEWAGE TO BS EN 1401 & BS 4660 – SOLID WALL, STRUCTURED WALL PIPES TO BS EN 13476.
    - PRECAST CONCRETE MANHOLE UNITS TO BS EN 1917:2002.
    - PLASTIC INSPECTION CHAMBERS FOR DRAINS & SEWERS TO BS EN 13598-1:2010.
    - GULLY & MANHOLE TOPS FOR VEHICULAR & PEDESTRIAN AREAS TO BS EN 124:1994.
    - DRAINAGE CHANNELS FOR VEHICULAR & PEDESTRIAN AREAS TO BS EN 1433:2002.
12. ALL MANHOLE COVERS, ROAD GULLY COVERS & FRAMES TO COMPLY WITH BS EN124 NON ROCKING TYPE.

    UNLESS NOTED OTHERWISE USE CLASS:

    A15 FOR USE IN PEDESTRIAN AREAS WHERE VEHICLES HAVE NO ACCESS.

    B125 FOR USE IN CAR PARKS & PEDESTRIAN AREAS WHERE INFREQUENT LIGHT VEHICLE ACCESS IS LIKELY (INCLUDING DRIVEWAYS).

    C250 FOR ACCESS COVERS & GULLY GRATINGS IN AREAS OF SLOW MOVING, HEAVY TRAFFIC; ALSO FOR GULLY GRATINGS IN CARRIAGEWAY WITHIN 500mm OF KERB & UP TO 200mm INTO THE FOOTWAY.

    D400 FOR USE IN CARRIAGEWAYS OF ROADS & PARKING AREAS ACCESSED BY ALL TYPES OF VEHICLES.

    E600 FOR USE IN AREAS WHERE HIGH WHEEL LOADS ARE PRESENT.

    F900 FOR USE IN AREAS WHERE EXTREMELY HIGH WHEEL LOADS ARE PRESENT SUCH AS AIRCRAFT PAVEMENTS, DOCKS, HEAVY INDUSTRIAL SITES.
13. MANHOLES IN INTERNAL AREAS REQUIRE DOUBLE SEALED COVERS WITH LOCKING SCREWS, RECESSED WHERE REQUIRED TO ACCOMMODATE FLOOR FINISHES TO ARCHITECT'S SPECIFICATION.
14. PIPE BEDDING

    USE CLASS S BEDDING UNLESS NOTED OTHERWISE. NB PROTECT AGAINST CONSTRUCTION TRAFFIC AS NECESSARY

    USE CLASS Z CONCRETE BED & SURROUND OR CONCRETE SLAB PROTECTION AS FOLLOWS:
    - CLASS 120 CLAYWARE OR CLASS M CONCRETE (100 - 600Ø PIPES)

      LANDSCAPING - LESS THAN 600mm COVER TO CROWN.

      HARDSTANDING - LESS THAN 1200mm COVER TO CROWN
    - PLASTIC (100 - 300Ø PIPES)

      LANDSCAPING - LESS THAN 600mm COVER TO CROWN.

      HARDSTANDING - LESS THAN 900mm COVER TO CROWN
15. PIPES BELOW CONCRETE GROUND FLOOR SLABS:

    WHERE THE CROWN OF THE PIPE IS WITHIN 300mm OF THE UNDERSIDE OF SLAB, SPECIAL PROTECTION TO BE PROVIDED IN ACCORDANCE WITH BUILDING REGULATIONS H1 2.44 OR 150mm GEN3 CONCRETE BED & SURROUND CAST INTEGRALLY WITH SLAB.

    OTHERWISE USE CLASS S BEDDING.
16. MAIN BACKFILL TO BE WELL COMPACTED IN 150mm LAYERS OF:

    SELECTED BACKFILL MATERIAL IN ALL SOFT LANDSCAPED AREAS

    TYPE 1 GRANULAR MATERIAL IN ALL HARDSTANDING AREAS & PUBLIC HIGHWAYS
17. BACKFILL TO DRAINS NEAR FOUNDATIONS TO BE IN ACCORDANCE WITH BUILDING REGULATIONS H1 DIAGRAMS 8 & 12.
18. CCTV TO BE CARRIED OUT TO VERIFY CONDITION OF ANY DRAINAGE TO BE RE-USED.

GENERAL NOTES

1. THE STRUCTURAL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT CLIENT, ARCHITECT, SERVICES ENGINEER, AND SPECIALIST CONTRACTOR DRAWINGS, REPORTS AND SPECIFICATIONS.
2. FOR SETTING OUT AND LEVELS REFER TO ARCHITECTS DRAWINGS.
3. FOR THE PURPOSE OF CONSTRUCTION ALL DRAWINGS MUST NOT BE SCALED AND ONLY WRITTEN OR CALCULATED DIMENSIONS USED. LEVEL DATUMS TO BE CONFIRMED BY THE ARCHITECT.
4. ANY REVISIONS TO THE LAYOUT DETAILS REQUIRED BY THE CONTRACTOR TO BE AGREED AND APPROVED BY THE ALIGN PROPERTY PARTNERS ENGINEER.
5. FINISHED FLOOR LEVELS TO BE DETERMINED.
6. ALL PROPRIETARY PRODUCTS ARE TO BE USED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S DETAILS AND REQUIREMENTS.
7. GENERALLY, ONLY KNOWN PENETRATIONS, HOLES, POCKETS AND RECESSES ETC. WITH ANY DIMENSIONS GREATER THAN 150 ARE SHOWN ON THE DRAWINGS. FOR CONFIRMATION OF THESE AND FOR DETAILS OF SMALLER HOLES PLUS INSERTS, FIXINGS ETC. REFERENCE SHALL BE MADE TO THE ARCHITECTS, SERVICES ENGINEER'S OR THE RELEVANT SUBCONTRACTOR'S BUILDERS WORK DRAWINGS.
8. THE CONTRACTOR SHALL ENSURE THAT TEMPORARY LOADS ONTO THE NEW STRUCTURES/DRAINAGE SHALL BE LESS THAN THOSE FOR WHICH IT HAS BEEN DESIGNED.
9. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING AND CHECKING THE SETTING OUT OF GRIDLINES, LEVELS AND DATUMS.
10. ANY DISCREPANCIES BETWEEN THE STRUCTURAL AND ARCHITECTURAL DRAWINGS SHOULD IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE CONTRACT ADMINISTRATOR.
11. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO ENSURE THAT NOISE, VIBRATION AND DUST RESULTING FROM THE WORKS ARE KEPT WITHIN REASONABLE LIMITS.
12. THE CONTRACTOR IS TO ALLOW A MINIMUM OF 10 WORKING DAYS IN THEIR PROGRAMME FOR THE REVIEW OF ANY CONTRACTOR'S DESIGN PORTIONS OF WORK FOR REVIEW BY THE ALIGN PROPERTY PARTNERS ENGINEER.
13. IRRESPECTIVE OF ANY NAMED MANUFACTURERS OF ANY PRODUCT/MATERIAL NOTED ON DRAWINGS, THE CONTRACTOR IS FREE TO PROPOSE AN EQUAL OR APPROVED PRODUCT/MATERIAL PROVIDED THAT ANY SUCH CHANGE TO THE SPECIFICATION MEETS A SIMILAR LEVEL OF PERFORMANCE AND IS NOTED ON ALL M TENDER RETURNS AND DOCUMENTATION FOR ALIGN PROPERTY PARTNERS.

IMPORTANT:

DRAWING PROVIDED FOR INFORMATION ONLY AND IS SUBJECT TO THE FOLLOWING STATUTORY APPROVALS:

- PLANNING APPROVAL
- BUILDING CONTROL
- UNITED UTILITIES APPROVAL
- HIGHWAYS APPROVAL

ALL CONSTRUCTION WORKS PRIOR TO APPROVALS ABOVE WILL BE UNDERTAKEN AT CLIENTS/CONTRACTORS RISK

ALL MANHOLES TO USE CONCRETE SURROUND AND ROCKERS WHERE APPLICABLE

Rev	Details	Author & Date	Checked & Date	Approved & Date
C01	UPDATED DRAWING STATUS	JSM 28/08/24	ZS 28/08/24	ZS 28/08/24
P07	NOTES ADDED TO SUIT UU COMMENTS (10.03.24)	MD 23/04/24	ZS 23/04/24	ZS 23/04/24
P06	MANHOLE DETAILS REMOVED TO SEPARATE DRAWING AS PER UU COMMENTS	MD 12/04/24	ZS 12/04/24	
P05	UPDATED DRAWING TITLE AND STATUS, MANHOLES S3 AND S8 AMENDED	MD 04/04/24	ZS 04/04/24	ZS 04/04/24
P04	UPDATED HYDRO-BRAKE DETAILS TO SUIT LATEST SURFACE WATER DRAINAGE DESIGN	ZS 07/03/24	BD 07/03/24	BD 07/03/24
P03	UPATED HYDRO-BRAKE DETAIL, BACKDROP DETAIL ADDED	JSM 31/01/24	ZS 31/01/24	BD 31/01/24
P02	UPDATED HYDRO-BRAKE DETAIL TO REFLECT THE LASTED DRAINAGE LAYOUT PLAN	JSM 25/01/24	ZS 25/01/24	ZS 25/01/24
P01	INITIAL ISSUE	ZS 19/09/23	LF 19/09/23	LF 19/09/23

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Westmorland & Furness Office, Riverside Business Park, Natland Road, Kendal LA9 7SX

Client
MOSSCARE ST VINCENTS

Project Name
PARKMOUNT ROAD, MANCHESTER

Drawing Title
S104 DRAINAGE CONSTRUCTION DETAILS SHEET 2 OF 4

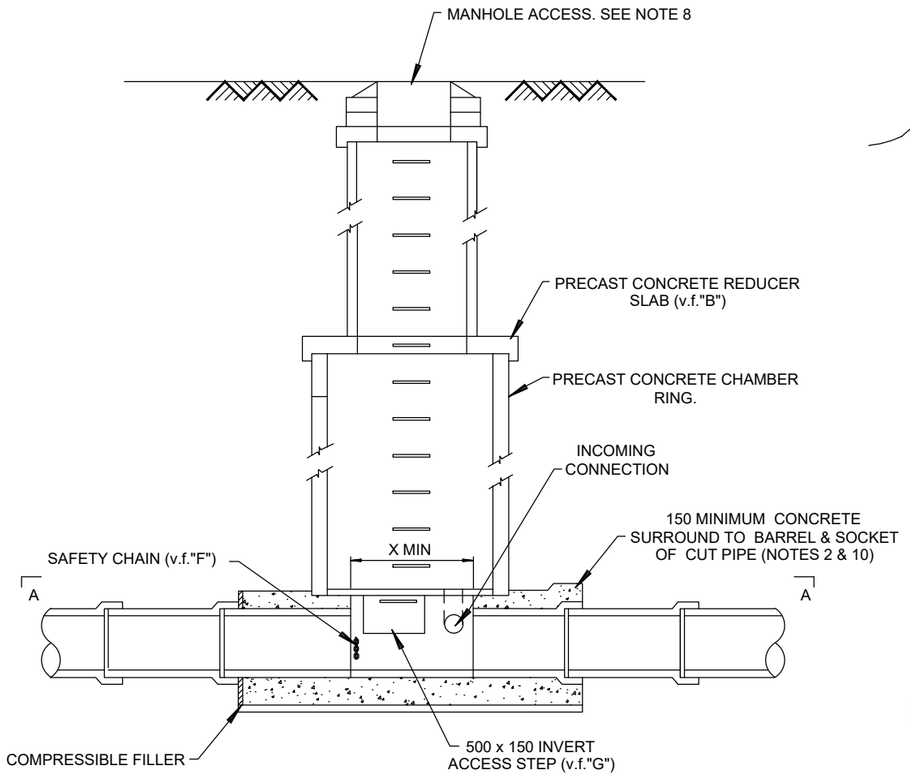
Purpose
CONSTRUCTION

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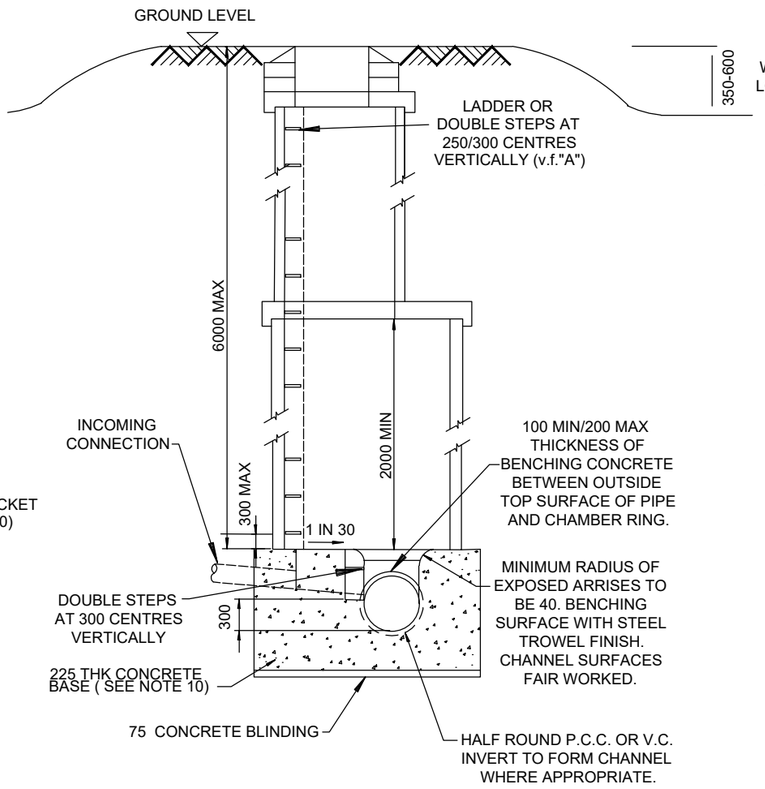
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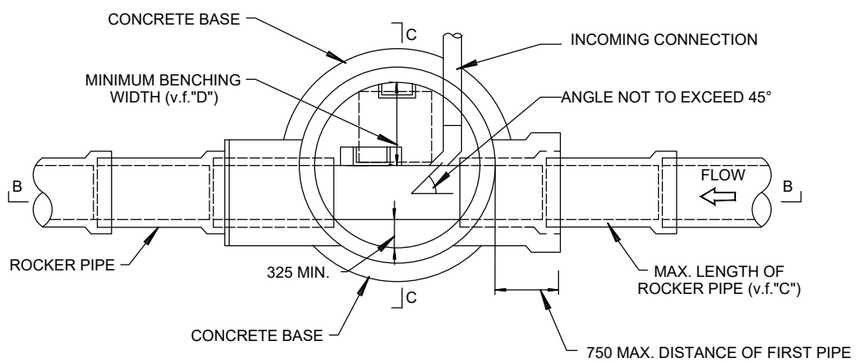
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SECTION B-B



SECTION C-C



SECTION A-A

MANHOLE TYPE 1 - PIPES NOT EXCEEDING 525 DIAMETER (DEPTH TO BENCHING NOT EXCEEDING 6000)

Notes

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NOTES

1.ALL DIMENSIONS ARE IN MILLIMETRES

2.CONCRETE BENCHING AND PIPE SURROUND

SHALL BE PLACED IN SINGLE CONTINUOUS OPERATION FROM TOP OF BASE SLAB TO TOP OF BENCHING AND PIPE SURROUND

3.CONNECTION INTO MANHOLES

SHALL BE CONSTRUCTED WITH THE SOFFITS LEVEL UNLESS DETAILED DIFFERENTLY ON CONTRACT DRAWINGS

4.METALWORK

LADDERS, HANDRAILING AND SAFETY CHAIN SHALL BE AS SHOWN ON DEVELOPER SERVICES DETAIL 9 (STND/19/009)

5.CONCRETE SURROUND TO MANHOLES

A CONCRETE SURROUND IS NOT NORMALLY REQUIRED TO MANHOLES UNLESS INSTALLED IN AREAS OF UNSTABLE GROUND, UNDER CONDITIONS OF FLOTATION OR WHERE SUBJECTED TO EXCEPTIONAL OR ECCENTRIC LOADS. IN WHICH CASES A 150 SURROUND OF AT LEAST 20 N/mm CONCRETE SHALL BE PROVIDED. ANY JOINTS SHOULD BE STAGGERED WITH PRECAST CONCRETE JOINTS

6. MINIMUM LENGTH OF CHANNEL (X Min)

CHAMBER DIA	"X" MIN
1050	800
1200	950
1350	1000
1500	1050
1800	1150
2100	1300
2400	1450
2700	1550
3000	1700

7.CUT ENDS OF REINFORCED CONCRETE PIPES

SHALL BE TREATED WITH EPOXY RESIN PAINT/MORTAR

8.MANHOLE ACCESSES FOR MANHOLE ACCESS

OPTIONS AND DETAILS SEE DEVELOPER SERVICES DETAIL 10 (STND/19/010)

DOUBLE STEPS SHALL BE PLASTIC ENCAPSULATED CARBON STEEL TO BS EN 1247-2. DOUBLE STEPS SHALL NOT BE USED WHERE COVER-TO-SOFFIT DIMENSION IS >3.0m

9.COVER AND FRAME

150 DEEP COVERS ARE TO BE USED IN CATEGORY 1, 2, 3 ROADS. 100 DEEP COVERS ARE TO BE USED IN CATEGORY 4 ROADS. DOUBLE TRIANGULAR COVERS ARE TO BE USED IN CARRIAGEWAY. ROAD CATEGORY TO BE DESIGNATED BY THE HIGHWAY AUTHORITY. FRAME TO BE SET AS PER SPECIFICATION

10.CONCRETE

ALL IN-SITU CONCRETE TO BE DC - 3 OR FND3

11.VARIABLE FEATURES (V.F.)

WHERE V.F. APPEARS IN ANNOTATION REFER TO VARIABLE FEATURES AS SHOWN ON DEVELOPER SERVICES DETAIL 10 (STND/19/010)

Rev	Details	Author & Date	Checked & Date	Approved & Date
C01	UPDATED DRAWING STATUS	JSM 28/08/24	ZS 28/08/24	ZS 28/08/24
P01	INITIAL ISSUE	MD 04/04/24	ZS 04/04/24	****

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Client: MOSSCARE ST VINCENTS

Project Name: PARKMOUNT ROAD, MANCHESTER

Drawing Title: S104 DRAINAGE CONSTRUCTION DETAILS SHEET 3 OF 4

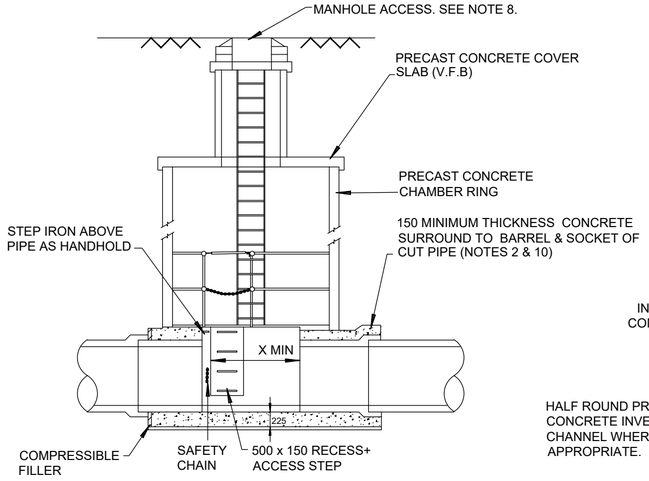
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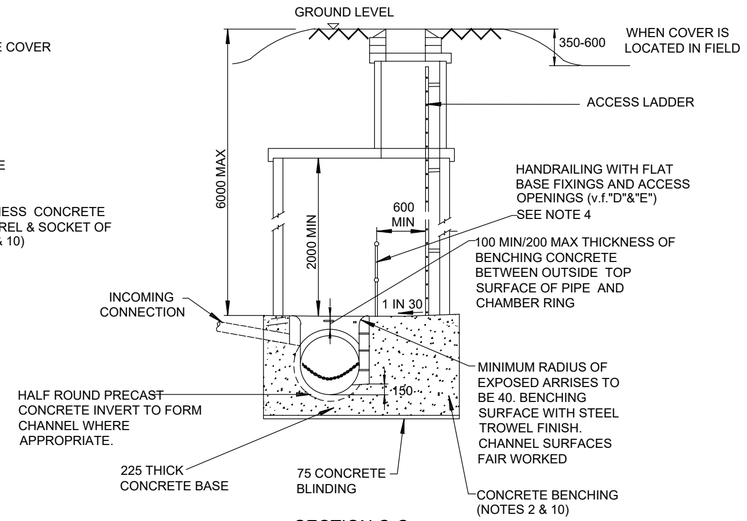
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PV2310-APP-94-XX-M2-C-7300-C01 Manhole Type 1 Details.dwg

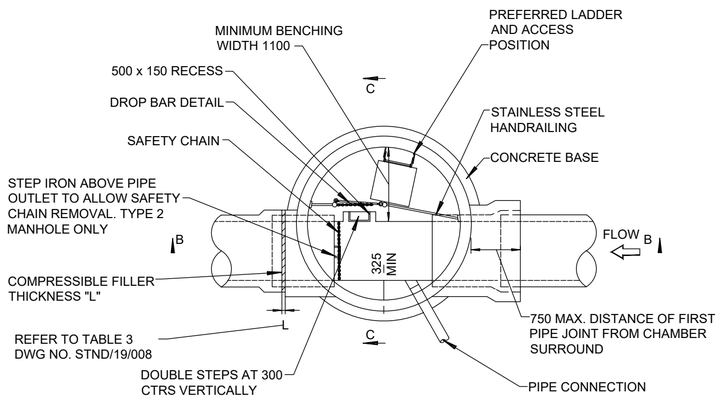
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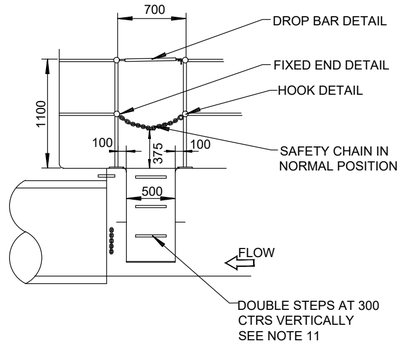
SECTION B-B



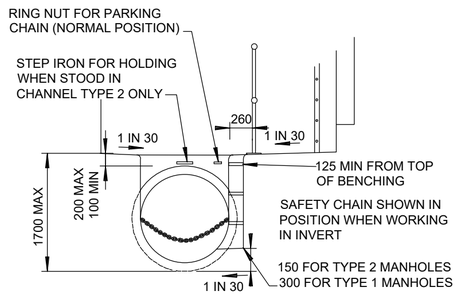
SECTION C-C



PLAN



FRONT ELEVATION



SIDE ELEVATION
(LOOKING DOWNSTREAM)

MANHOLE TYPE 2
PIPES 600 - 1500 DIAMETER
(DEPTH TO BENCHING NOT EXCEEDING 6000)

Notes

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NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES
2. CONCRETE BENCHING AND PIPE SURROUND SHALL BE PLACED IN SINGLE CONTINUOUS OPERATION FROM TOP OF BASE SLAB TO TOP OF BENCHING AND PIPE SURROUND
3. CONNECTION INTO MANHOLES SHALL BE CONSTRUCTED WITH THE SOFFITS LEVEL UNLESS DETAILED DIFFERENTLY ON CONTRACT DRAWINGS
4. METALWORK :-
   LADDERS, HANDRAILING AND SAFETY CHAIN SHALL BE AS SHOWN ON DEVELOPER SERVICES DETAIL 9 (STND/19/009)
5. CONCRETE SURROUND TO MANHOLES A CONCRETE SURROUND IS NOT NORMALLY REQUIRED TO MANHOLES UNLESS INSTALLED IN AREAS OF UNSTABLE GROUND, UNDER CONDITIONS OF FLOTATION OR WHERE SUBJECTED TO EXCEPTIONAL OR ECCENTRIC LOADS. IN WHICH CASES A 150 SURROUND OF AT LEAST 20 N/mm CONCRETE SHALL BE PROVIDED. ANY JOINTS SHOULD BE STAGGERED WITH PRECAST CONCRETE JOINTS
6. MINIMUM LENGTH OF CHANNEL (X Min)

CHAMBER DIA	"X" MIN
1050	800
1200	950
1350	1000
1500	1050
1800	1150
2100	1300
2400	1450
2700	1550
3000	1700

7. CUT ENDS OF REINFORCED CONCRETE PIPES SHALL BE TREATED WITH EPOXY RESIN PAINT/MORTAR
8. MANHOLE ACCESSES FOR MANHOLE ACCESS OPTIONS AND DETAILS SEE DEVELOPER SERVICES DETAIL 10 (STND/19/010). DOUBLE STEPS SHALL BE PLASTIC ENCAPSULATED CARBON STEEL. DOUBLE STEPS SHALL NOT BE USED WHERE COVER-TO-SOFFIT DIMENSION IS >3.0m
9. COVER AND FRAME 150 DEEP COVERS ARE TO BE USED IN CATEGORY 1, 2, 3 ROADS. 100 DEEP COVERS ARE TO BE USED IN CATEGORY 4 ROADS. DOUBLE TRIANGULAR COVERS ARE TO BE USED IN CARRIAGEWAY. ROAD CATEGORY TO BE DESIGNATED BY THE HIGHWAY AUTHORITY. FRAME TO BE SET AS PER SPECIFICATION
10. CONCRETE ALL IN-SITU CONCRETE TO BE DC - 3 OR FND3
11. VARIABLE FEATURES (V.F.) WHERE V.F. APPEARS IN ANNOTATION REFER TO VARIABLE FEATURES AS SHOWN ON DEVELOPER SERVICES DETAIL 10 (STND/19/010)

Rev	Details	Author & Date	Checked & Date	Approved & Date
C01	UPDATED DRAWING STATUS	JSM 28/08/24	ZS 28/08/24	ZS 28/08/24
P01	INITIAL ISSUE	MD 04/04/24	ZS 04/04/24	****

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Client: MOSSCARE ST VINCENTS

Project Name: PARKMOUNT ROAD, MANCHESTER

Drawing Title: S104 DRAINAGE CONSTRUCTION DETAILS SHEET 4 OF 4

Purpose: FOR CONSTRUCTION

Scale	Drawn	Checked	Approved
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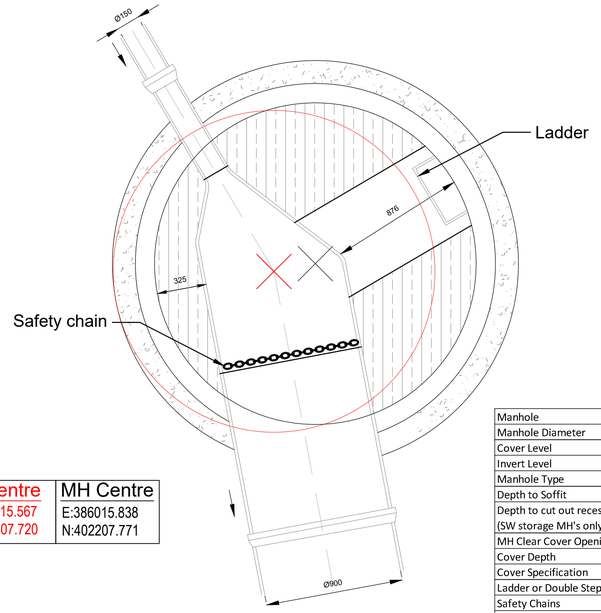
PV2310-APP-94-XX-M2-C-7300-C01 Manhole Type 1 Details.dwg

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Notes

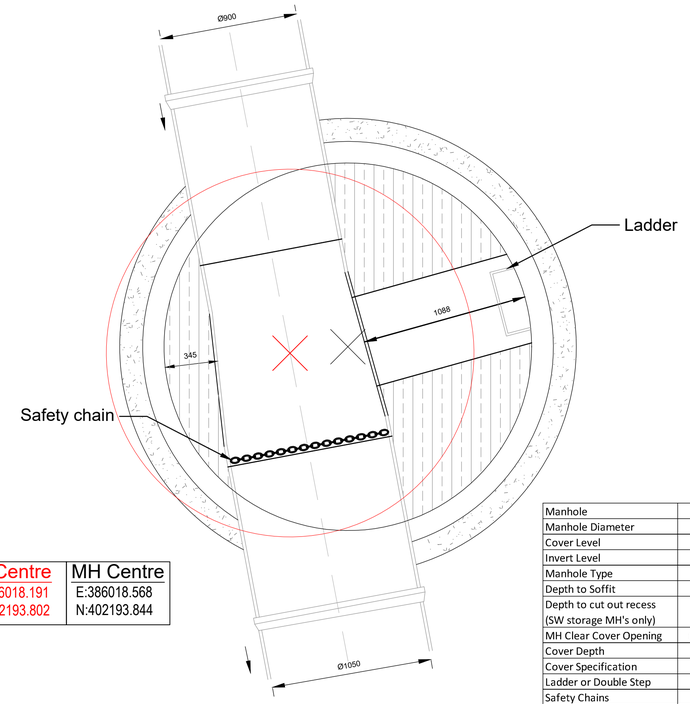
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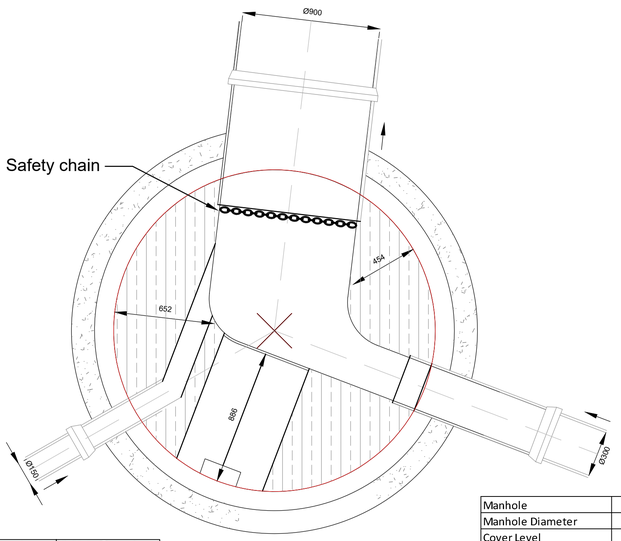
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Manhole	S1
Manhole Diameter	2100
Cover Level	82.291
Invert Level	78.525
Manhole Type	2
Depth to Soffit	2.866
Depth to cut out recess (SW storage MH's only)	N/A
MH Clear Cover Opening	600 X 600
Cover Depth	150mm
Cover Specification	D400
Ladder or Double Step	Ladder
Safety Chains	NO
Safety Rails	NO
Invert Access Steps	NO
Hole Size in Cover Slab	750x600



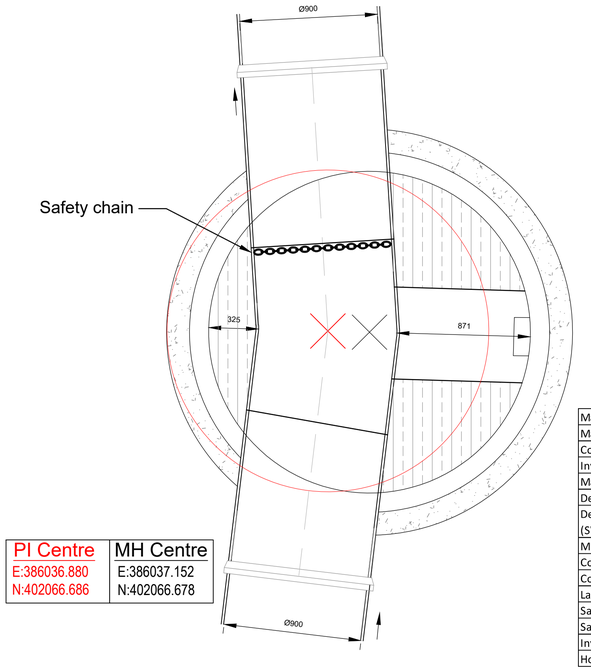
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Manhole	S2
Manhole Diameter	2400
Cover Level	82.416
Invert Level	78.339
Manhole Type	2
Depth to Soffit	3.027
Depth to cut out recess (SW storage MH's only)	N/A
MH Clear Cover Opening	600 X 600
Cover Depth	150mm
Cover Specification	D400
Ladder or Double Step	Ladder
Safety Chains	NO
Safety Rails	NO
Invert Access Steps	NO
Hole Size in Cover Slab	750x600



PI Centre	MH Centre
E:386035.463	E:386035.463
N:402054.736	N:402054.736

Manhole	S4
Manhole Diameter	2100
Cover Level	80.068
Invert Level	77.600
Manhole Type	2
Depth to Soffit	1.568
Depth to cut out recess (SW storage MH's only)	N/A
MH Clear Cover Opening	600 X 600
Cover Depth	150mm
Cover Specification	D400
Ladder or Double Step	Double Step
Safety Chains	NO
Safety Rails	NO
Invert Access Steps	NO
Hole Size in Cover Slab	750x600



PI Centre	MH Centre
E:386036.880	E:386037.152
N:402066.686	N:402066.678

Manhole	S5
Manhole Diameter	2100
Cover Level	80.528
Invert Level	77.566
Manhole Type	2
Depth to Soffit	2.062
Depth to cut out recess (SW storage MH's only)	N/A
MH Clear Cover Opening	600 X 600
Cover Depth	150mm
Cover Specification	D400
Ladder or Double Step	Double Step
Safety Chains	NO
Safety Rails	NO
Invert Access Steps	NO
Hole Size in Cover Slab	750x600

1:20 0 0.5m 1m 1.5m 2m

1:1 0 10 20 30 40 50 60 70 80 90 100

SCALEBAR
(INDICATIVE ONLY)

NOTE

ALL MANHOLES TO USE CONCRETE SURROUND AND ROCKERS WHERE APPLICABLE

Key

Build-out benching

NOTES

i) CONCRETE SURROUND TO BE USED ON ALL MANHOLES
ii) ROCKER PIPES TO BE USED

Rev	Details	Author & Date	Checked & Date	Approved & Date
C01	UPDATED DRAWING STATUS	JSM 28/08/24	ZS 28/08/24	ZS 28/08/24
P03	MANHOLE BENCHING AMENDED TO SUIT UU COMMENTS (AMPS REMOVED)	MD 02.05.2024	ZS 02.05.2024	ZS 02.05.2024
P02	MANHOLE BENCHING AMENDED TO SUIT UU COMMENTS (10.04.24)	MD 15.04.2024	ZS 23.04.2024	ZS 23.04.2024
P01	FIRST ISSUE	MD 04.04.2024	ZS 04.04.2024	

align PROPERTY PARTNERS
White Rose House (2nd Floor), Northallerton Business Park, Thurston Road, Northallerton DL6 2NA

Client: MOSSCARE ST VINCENTS

Project Name: PARKMOUNT ROAD, MANCHESTER

Drawing Title: S104 MANHOLE BASE DETAILS - SHEET 1 of 2

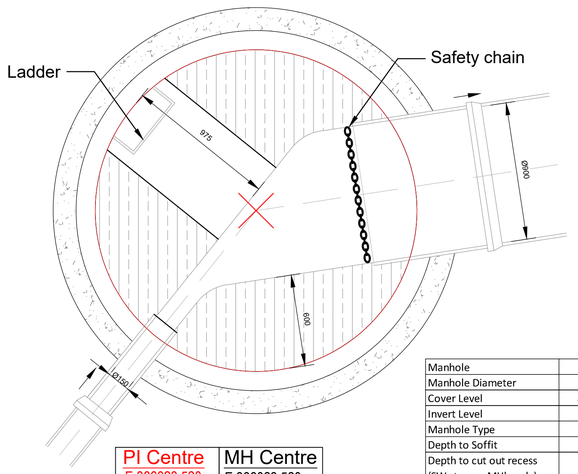
Purpose: FOR CONSTRUCTION

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Original Size	Date	Date	Date
A1	APR 2024	APR 2024	

Drawing Number: PV2310-APP-92-XX-DR-C-3204 Rev: C01

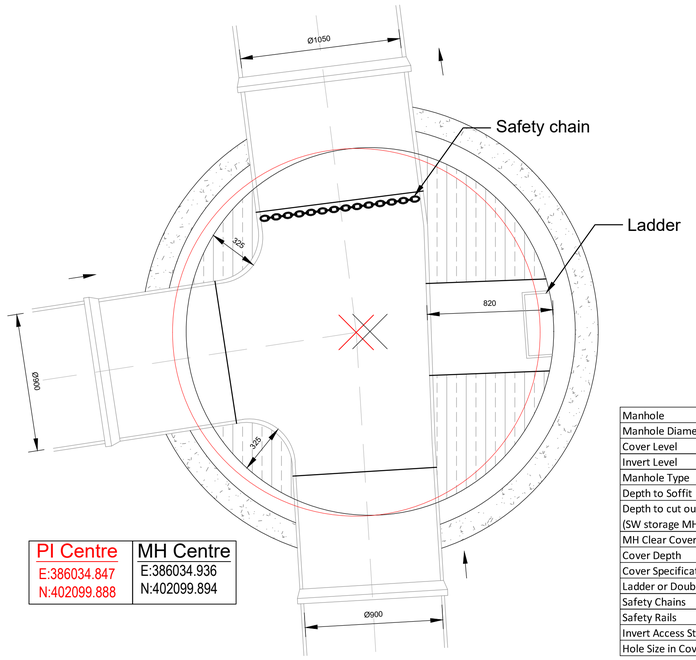
PV2310-APP-92-XX-DR-C-3204 C01 Manhole Benching.dwg

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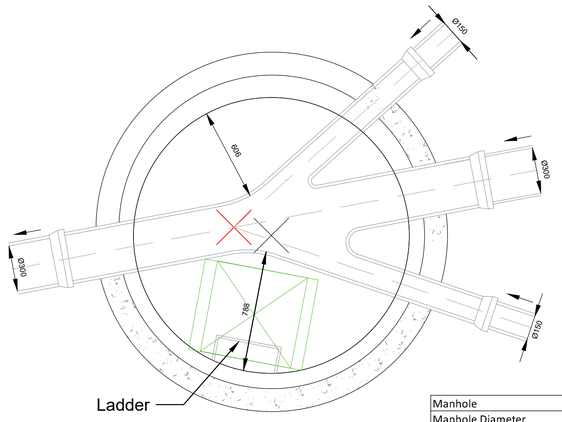
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N:402098.162	N:402098.162

Manhole	S6
Manhole Diameter	2100
Cover Level	81.002
Invert Level	77.515
Manhole Type	2
Depth to Soffit	2.587
Depth to cut out recess (SW storage MH's only)	N/A
MH Clear Cover Opening	600 X 600
Cover Depth	150mm
Cover Specification	D400
Ladder or Double Step	Ladder
Safety Chains	NO
Safety Rails	NO
Invert Access Steps	NO
Hole Size in Cover Slab	750x600



PI Centre	MH Centre
E:386034.847	E:386034.936
N:402099.888	N:402099.894

Manhole	S7
Manhole Diameter	2400
Cover Level	81.43
Invert Level	77.332
Manhole Type	2
Depth to Soffit	3.048
Depth to cut out recess (SW storage MH's only)	N/A
MH Clear Cover Opening	600 X 600
Cover Depth	150mm
Cover Specification	D400
Ladder or Double Step	Ladder
Safety Chains	NO
Safety Rails	NO
Invert Access Steps	NO
Hole Size in Cover Slab	750x600



PI Centre	MH Centre
E:386017.312	E:386017.556
N:402143.636	N:402143.584

Manhole	C9
Manhole Diameter	1800
Cover Level	81.631
Invert Level	76.136
Manhole Type	1
Depth to Soffit	5.195
Depth to cut out recess (SW storage MH's only)	N/A
MH Clear Cover Opening	600 X 600
Cover Depth	150mm
Cover Specification	D400
Ladder or Double Step	Double Step
Safety Chains	NO
Safety Rails	NO
Invert Access Steps	NO
Hole Size in Cover Slab	750x600

Key

Build-out benching

NOTE

ALL MANHOLES TO USE CONCRETE SURROUND AND ROCKERS WHERE APPLICABLE

1:20 0 0.5m 1m 1.5m 2m

1:1 0 10 20 30 40 50 60 70 80 90 100

SCALEBAR
(INDICATIVE ONLY)

NOTES

i) CONCRETE SURROUND TO BE USED ON ALL MANHOLES
ii) ROCKER PIPES TO BE USED

Notes

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Rev	Details	Author & Date	Checked & Date	Approved & Date
C01	UPDATED DRAWING STATUS	JSM 28.08.2024	ZS 28.08.2024	ZS 28.08.2024
P03	MANHOLE BENCHING AMENDED TO SUIT UU COMMENTS (AMPS REMOVED)	MD 02.05.2024	ZS 02.05.2024	ZS 02.05.2024
P02	MANHOLE BENCHING AMENDED TO SUIT UU COMMENTS (10.04.24)	MD 22.04.2024	ZS 22.04.2024	ZS 23.04.2024
P01	FIRST ISSUE	MD 04.04.2024	ZS 04.04.2024	

White Rose House (2nd Floor), Northallerton Business Park, Thurston Road, Northallerton DL6 2NA

Client: MOSSCARE ST VINCENTS

Project Name: PARKMOUNT ROAD, MANCHESTER

Drawing Title: S104 MANHOLE BASE DETAILS - SHEET 2 of 2

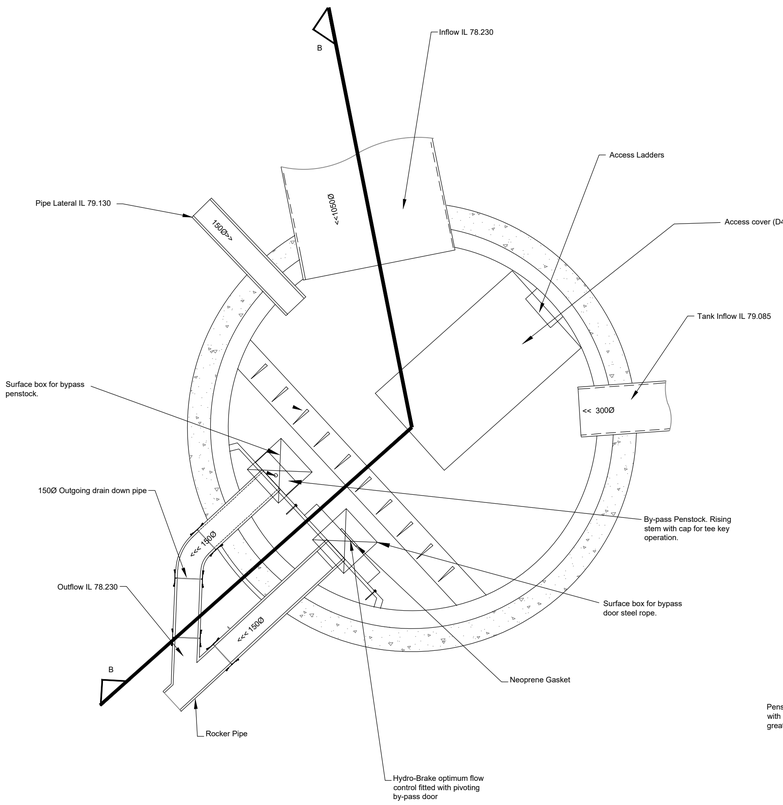
Purpose: FOR CONSTRUCTION

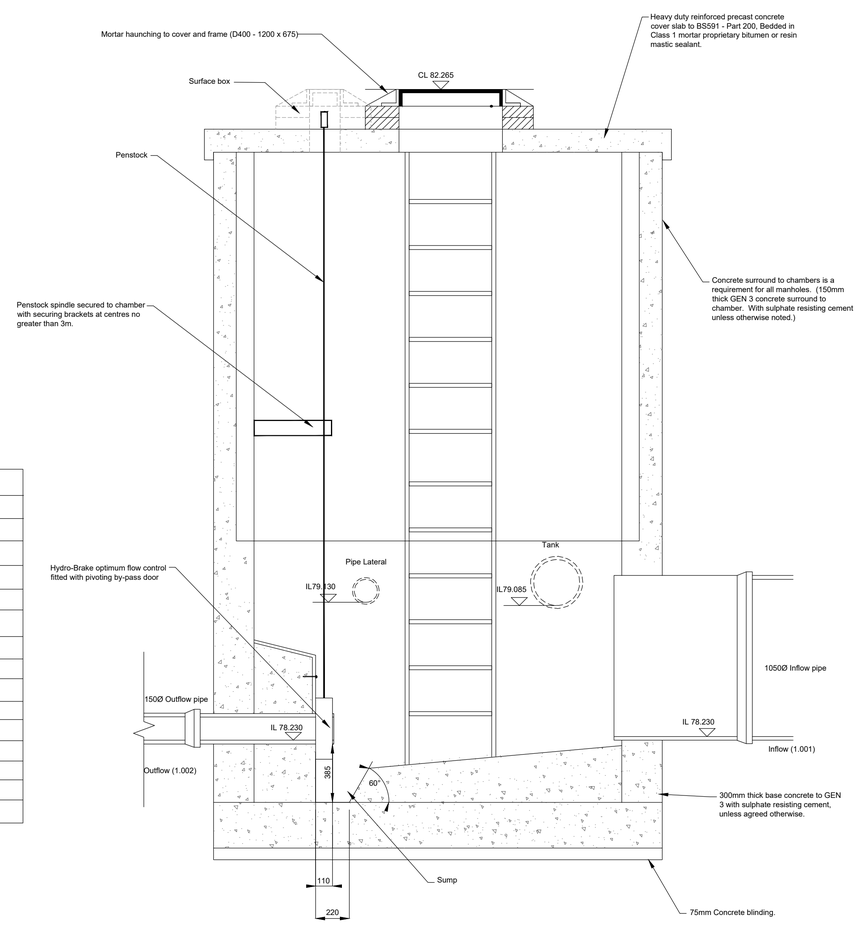
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Drawing Number: PV2310-APP-92-XX-DR-C-3205 Rev: C01

PV2310-APP-92-XX-DR-C-3204 C01 Manhole Benching.dwg

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SECTION B-B

DRAINAGE

1. ALL DRAINAGE WORKS TO BE CONSTRUCTED FROM THE OUTFALL TOWARDS THE HEAD OF RUN TO ENSURE THE OUTFALL CAN BE ACHIEVED..
2. ALL EXISTING DRAINS & SERVICES (LINE & LEVELS) TO BE CHECKED & CONFIRMED BY THE CONTRACTOR PRIOR COMMENCEMENT OF ANY ON SITE DRAINAGE WORKS. ANY DISCREPANCY IN LEVELS IS TO BE REPORTED IMMEDIATELY TO APP.
3. ALL DRAINAGE WORK TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS, BS EN 752 & TO THE SATISFACTION OF THE BUILDING INSPECTOR.
4. ALL PROPRIETARY ITEMS TO BE INSTALLED STRICTLY IN ACCORDANCE WITH MANUFACTURER'S DETAILS, INSTRUCTIONS & SPECIFICATIONS.
5. ALL COVER LEVELS ARE APPROXIMATE. EXACT LEVELS TO BE DETERMINED FROM THE EXTERNAL WORKS LAYOUT.
6. INVERT LEVELS QUOTED AT MANHOLES & INSPECTION CHAMBERS ARE THOSE OF THE LARGEST CONNECTED PIPE DIAMETER. PIPES AT CHAMBERS TO BE LAID WITH SOFFITS LEVEL UNLESS NOTED OTHERWISE.
7. PIPE GRADIENTS WHERE STATED ARE APPROXIMATE - LEVELS AT THE CHAMBERS TAKE PRECEDENT.
8. REFER TO ARCHITECT'S DRAWINGS FOR PRECISE LOCATION OF ALL RAINWATER PIPES, INTERNAL CONNECTIONS ETC.
9. ALL INTERNAL CONNECTIONS TO HAVE AN ABOVE-FLOOR ACCESS POINT TO ENABLE FUTURE ACCESS FOR MAINTENANCE.
10. PIPES & FITTINGS TO BE:
    - CONCRETE PIPES & ANCILLARY PRODUCTS TO BS 5911:2022 & BS EN 1916:2002.
    - VITRIFIED CLAY PIPES & FITTINGS TO BS EN 295:2013
    - DUCTILE IRON TO BS EN 598:2007 & BS ISO 4179:2005.
    - PERFORATED VITRIFIED CLAY PIPES FOR LAND DRAINAGE TO BS 1196.
    - PLASTIC PIPES FOR LAND DRAINAGE TO BS 4962:1982.
    - PLASTIC PIPING SYSTEMS FOR NON-PRESSURE UNDERGROUND DRAINAGE & SEWAGE TO BS EN 1401 & BS 4660 – SOLID WALL, STRUCTURED WALL PIPES TO BS EN 13476.
    - PRECAST CONCRETE MANHOLE UNITS TO BS EN 1917:2002.
    - PLASTIC INSPECTION CHAMBERS FOR DRAINS & SEWERS TO BS EN 13598-1:2010.
    - GULLY & MANHOLE TOPS FOR VEHICULAR & PEDESTRIAN AREAS TO BS EN 124:1994.
    - DRAINAGE CHANNELS FOR VEHICULAR & PEDESTRIAN AREAS TO BS EN 1433:2002.
12. ALL MANHOLE COVERS, ROAD GULLY COVERS & FRAMES TO COMPLY WITH BS EN124 NON ROCKING TYPE.

UNLESS NOTED OTHERWISE USE CLASS:

A15 FOR USE IN PEDESTRIAN AREAS WHERE VEHICLES HAVE NO ACCESS.

B125 FOR USE IN CAR PARKS & PEDESTRIAN AREAS WHERE INFREQUENT LIGHT VEHICLE ACCESS IS LIKELY (INCLUDING DRIVEWAYS).

C250 FOR ACCESS COVERS & GULLY GRATINGS IN AREAS OF SLOW MOVING, HEAVY TRAFFIC, ALSO FOR GULLY GRATINGS IN CARRIAGEWAY WITHIN 500mm OF KERB & UP TO 200mm INTO THE FOOTWAY.

D400 FOR USE IN CARRIAGEWAYS OF ROADS & PARKING AREAS ACCESSED BY ALL TYPES OF VEHICLES.

E600 FOR USE IN AREAS WHERE HIGH WHEEL LOADS ARE PRESENT.

F900 FOR USE IN AREAS WHERE EXTREMELY HIGH WHEEL LOADS ARE PRESENT SUCH AS AIRCRAFT PAVEMENTS, DOCKS, HEAVY INDUSTRIAL SITES.

13. MANHOLES IN INTERNAL AREAS REQUIRE DOUBLE SEALED COVERS WITH LOCKING SCREWS. RECESSED WHERE REQUIRED TO ACCOMMODATE FLOOR FINISHES TO ARCHITECT'S SPECIFICATION.
14. PIPE BEDDING

    USE CLASS S BEDDING UNLESS NOTED OTHERWISE. NB PROTECT AGAINST CONSTRUCTION TRAFFIC AS NECESSARY

    USE CLASS Z CONCRETE BED & SURROUND OR CONCRETE SLAB PROTECTION AS FOLLOWS:
    - CLASS 120 CLAYWARE OR CLASS M CONCRETE (100 - 600Ø PIPES)

      LANDSCAPING - LESS THAN 600mm COVER TO CROWN.

      HARDSTANDING - LESS THAN 1200mm COVER TO CROWN
    - PLASTIC (100 - 300Ø PIPES)

      LANDSCAPING - LESS THAN 600mm COVER TO CROWN.

      HARDSTANDING - LESS THAN 900mm COVER TO CROWN
15. PIPES BELOW CONCRETE GROUND FLOOR SLABS:

    WHERE THE CROWN OF THE PIPE IS WITHIN 300mm OF THE UNDERSIDE OF SLAB, SPECIAL PROTECTION TO BE PROVIDED IN ACCORDANCE WITH BUILDING REGULATIONS H1 2.44 OR 150mm GEN3 CONCRETE BED & SURROUND CAST INTEGRALLY WITH SLAB.

    OTHERWISE USE CLASS S BEDDING.
16. MAIN BACKFILL TO BE WELL COMPACTED IN 150mm LAYERS OF:

    SELECTED BACKFILL MATERIAL IN ALL SOFT LANDSCAPED AREAS

    TYPE 1 GRANULAR MATERIAL IN ALL HARDSTANDING AREAS & PUBLIC HIGHWAYS
17. BACKFILL TO DRAINS NEAR FOUNDATIONS TO BE IN ACCORDANCE WITH BUILDING REGULATIONS H1 DIAGRAMS 8 & 12.
18. CCTV TO BE CARRIED OUT TO VERIFY CONDITION OF ANY DRAINAGE TO BE RE-USED.

NOMINAL PIPE DIAMETER (mm)	DROP SHAFT DIAMETER (mm)
225 to 300	225
375	300
450	375
525 to 600	450
675	525
750 to 900	600

MANHOLE DETAILS	DETAIL
MANHOLE REF	S3
MH DIAMETER (m)	2.400
COVER LEVEL (AOSDm)	82.265
INVERT LEVEL (AOSDm)	78.230
MH TYPE (UU TYPE/ SSG TYPE)	UU HYDRO-BRAKE
DEPTH TO SOFFIT (m)	2.985
CONNECTIONS (SIZE mm)	150x2, 300 & 1050
COVER SIZE(s) (mm)	1200x675
COVER DEPTH (mm)	150
COVER SPEC	D400
ACCESS LADDER OR DOUBLE STEPS ACCESS LADDER	ACCESS LADDERS
SAFETY CHAIN	NO
SAFETY RAIL	NO
INVERT ACCESS STEPS	YES (FROM TOP)
HOLE SIZE IN COVER SLAB (mm)	1200x675

HYDRO-BRAKE OPTIMUM SHE-0100-5600-1750-5600 LIMITING DISCHARGE TO 5.6 l/s BASED ON A DESIGN HEAD OF 1.75m.

NOTE: IF AN ALTERNATIVE PRODUCT IS USED THIS WILL AFFECT THE STORAGE REQUIREMENTS & SUMP CONFIGURATION

MH S3 HYDRO-BRAKE OPTIMUM
SHE-0100-5600-1750-5600 FLOW CONTROL CHAMBER
(SCALE 1:50)

Notes

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GENERAL NOTES

1. THE STRUCTURAL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT CLIENT, ARCHITECT, SERVICES ENGINEER, AND SPECIALIST CONTRACTOR DRAWINGS, REPORTS AND SPECIFICATIONS.
2. FOR SETTING OUT AND LEVELS REFER TO ARCHITECTS DRAWINGS.
3. FOR THE PURPOSE OF CONSTRUCTION ALL DRAWINGS MUST NOT BE SCALED AND ONLY WRITTEN OR CALCULATED DIMENSIONS USED. LEVEL DATUMS TO BE CONFIRMED BY THE ARCHITECT.
4. ANY REVISIONS TO THE LAYOUT DETAILS REQUIRED BY THE CONTRACTOR TO BE AGREED AND APPROVED BY THE ALIGN PROPERTY PARTNERS ENGINEER.
5. FINISHED FLOOR LEVELS TO BE DETERMINED.
6. ALL PROPRIETARY PRODUCTS ARE TO BE USED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S DETAILS AND REQUIREMENTS.
7. GENERALLY, ONLY KNOWN PENETRATIONS, HOLES, POCKETS AND RECESSES ETC. WITH ANY DIMENSIONS GREATER THAN 150 ARE SHOWN ON THE DRAWINGS. FOR CONFIRMATION OF THESE AND FOR DETAILS OF SMALLER HOLES PLUS INSERTS, FIXINGS ETC. REFERENCE SHALL BE MADE TO THE ARCHITECTS, SERVICES ENGINEER'S OR THE RELEVANT SUBCONTRACTOR'S BUILDERS WORK DRAWINGS.
8. THE CONTRACTOR SHALL ENSURE THAT TEMPORARY LOADS ONTO THE NEW STRUCTURES/DRAINAGE SHALL BE LESS THAN THOSE FOR WHICH IT HAS BEEN DESIGNED.
9. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING AND CHECKING THE SETTING OUT OF GRIDLINES, LEVELS AND DATUMS.
10. ANY DISCREPANCIES BETWEEN THE STRUCTURAL AND ARCHITECTURAL DRAWINGS SHOULD IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE CONTRACT ADMINISTRATOR.
11. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO ENSURE THAT NOISE, VIBRATION AND DUST RESULTING FROM THE WORKS ARE KEPT WITHIN REASONABLE LIMITS.
12. THE CONTRACTOR IS TO ALLOW A MINIMUM OF 10 WORKING DAYS IN THEIR PROGRAMME FOR THE REVIEW OF ANY CONTRACTORS DESIGN PORTIONS OF WORK FOR REVIEW BY THE ALIGN PROPERTY PARTNERS ENGINEER.
13. IRRESPECTIVE OF ANY NAMED MANUFACTURERS OF ANY PRODUCT/MATERIAL NOTED ON DRAWINGS, THE CONTRACTOR IS FREE TO PROPOSE AN EQUAL OR APPROVED PRODUCT/MATERIAL PROVIDED THAT ANY SUCH CHANGE TO THE SPECIFICATION MEETS A SIMILAR LEVEL OF PERFORMANCE AND IS NOTED ON ALL M TENDER RETURNS AND DOCUMENTATION FOR ALIGN PROPERTY PARTNERS.
14. MANHOLE TO COMPLY WITH UU DEVELOPER SERVICES DETAIL 5 - FLOW CONTROL MANHOLE DETAIL, DRAWING No. STND/19/05 REV A

IMPORTANT:

DRAWING PROVIDED FOR INFORMATION ONLY AND IS SUBJECT TO THE FOLLOWING STATUTORY APPROVALS:

- PLANNING APPROVAL
- BUILDING CONTROL
- UNITED UTILITIES APPROVAL
- HIGHWAYS APPROVAL

ALL CONSTRUCTION WORKS PRIOR TO APPROVALS ABOVE WILL BE UNDERTAKEN AT CLIENTS/CONTRACTORS RISK

ALL MANHOLES TO USE CONCRETE SURROUND AND ROCKERS WHERE APPLICABLE

NOTE

FLOW CONTROLS TO BE CONSTRUCTED AS PER UNITED UTILITIES STANDARD DETAIL.

Rev	Details	Author & Date	Checked & Date	Approved & Date
C01	UPDATED DRAWING STATUS	JSM 28/06/24	ZS 28/06/24	ZS 28/06/24
P05	ADDED NOTE TO DRAWING AND ALTERED COVER SLAB LAYOUT IN SECTION VIEW IN ACCORDANCE WITH UU COMMENTS (17.05.24)	ZS 17/05/24	ZS 17/05/24	ZS 17/05/24
P04	UPDATED HYDRO-BRAKE COVER SIZE AND SHOWN COVER SLAB ON SECTION VIEW TO SUIT UU COMMENTS (16.05.24). REVISED DRAWING STATUS.	ZS 16/05/24	ZS 16/05/24	ZS 16/05/24
P03	UPDATED HYDRO-BRAKE DETAILS TO SUIT UU COMMENTS (30.04.24)	ZS 02/05/24	ZS 02/05/24	ZS 02/05/24
P02	NOTES ADDED TO SUIT UU COMMENTS (10.04.24)	MD 23/04/24	ZS 23/04/24	
P01	INITIAL ISSUE	MD 16/04/24	LF 16/04/24	ZS 16/04/24

Westmorland & Furness Office, Riverside Business Park, Natland Road, Kendal LA9 7SX

Client: MOSSCARE ST VINCENTS

Project Name: PARKMOUNT ROAD, MANCHESTER

Drawing Title: S104 HYDROBRAKE MANHOLE DETAILS (SHEET 1 OF 2)

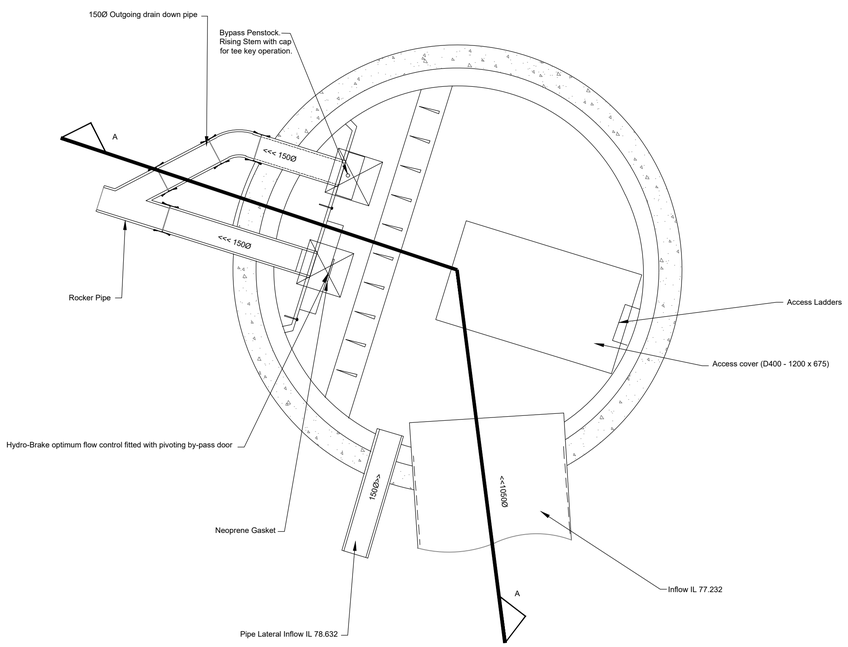
Purpose: CONSTRUCTION

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Original Size	Date	Date	Date
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Drawing Number: PV2310-APP-92-XX-DR-C-3206 Rev. C01

PV2310-APP-92-XX-M2-C-3206-3207 S104 C01 Hydro-Brake Manhole Details.dwg

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MANHOLE DETAILS	DETAIL
MANHOLE REF	S8
MH DIAMETER (m)	2.400
COVER LEVEL (AOSDm)	81.970
INVERT LEVEL (AOSDm)	77.232
MH TYPE (UU TYPE/ SSG TYPE)	UU HYDRO-BRAKE
DEPTH TO SOFFIT (m)	3.688
CONNECTIONS (SIZE mm)	150x2, 1050
COVER SIZE(s) (mm)	1200x675
COVER DEPTH (mm)	150
COVER SPEC	D400
ACCESS LADDER OR DOUBLE STEPS	ACCESS LADDER
SAFETY CHAIN	NO
SAFETY RAIL	NO
INVERT ACCESS STEPS	YES (FROM TOP)
HOLE SIZE IN COVER SLAB (mm)	1200x675

HYDRO-BRAKE OPTIMUM SHE-0100-5900-2000-5900 LIMITING DISCHARGE TO 5.9 l/s BASED ON A DESIGN HEAD OF 2.0m.

NOTE: IF AN ALTERNATIVE PRODUCT IS USED THIS WILL AFFECT THE STORAGE REQUIREMENTS & SUMP CONFIGURATION

MH S8 HYDRO-BRAKE OPTIMUM
SHE-0100-5900-2000-5900 FLOW CONTROL CHAMBER

(SCALE 1:20)

DRAINAGE

1. ALL DRAINAGE WORKS TO BE CONSTRUCTED FROM THE OUTFALL TOWARDS THE HEAD OF RUN TO ENSURE THE OUTFALL CAN BE ACHIEVED..
2. ALL EXISTING DRAINS & SERVICES (LINE & LEVELS) TO BE CHECKED & CONFIRMED BY THE CONTRACTOR PRIOR COMMENCEMENT OF ANY ON SITE DRAINAGE WORKS. ANY DISCREPANCY IN LEVELS IS TO BE REPORTED IMMEDIATELY TO APP.
3. ALL DRAINAGE WORK TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS, BS EN 752 & TO THE SATISFACTION OF THE BUILDING INSPECTOR.
4. ALL PROPRIETARY ITEMS TO BE INSTALLED STRICTLY IN ACCORDANCE WITH MANUFACTURER'S DETAILS, INSTRUCTIONS & SPECIFICATIONS.
5. ALL COVER LEVELS ARE APPROXIMATE. EXACT LEVELS TO BE DETERMINED FROM THE EXTERNAL WORKS LAYOUT.
6. INVERT LEVELS QUOTED AT MANHOLES & INSPECTION CHAMBERS ARE THOSE OF THE LARGEST CONNECTED PIPE DIAMETER. PIPES AT CHAMBERS TO BE LAID WITH SOFFITS LEVEL UNLESS NOTED OTHERWISE.
7. PIPE GRADIENTS WHERE STATED ARE APPROXIMATE - LEVELS AT THE CHAMBERS TAKE PRECEDENT.
8. REFER TO ARCHITECT'S DRAWINGS FOR PRECISE LOCATION OF ALL RAINWATER PIPES, INTERNAL CONNECTIONS ETC.
9. ALL INTERNAL CONNECTIONS TO HAVE AN ABOVE-FLOOR ACCESS POINT TO ENABLE FUTURE ACCESS FOR MAINTENANCE.
10. PIPES & FITTINGS TO BE:
    - CONCRETE PIPES & ANCILLARY PRODUCTS TO BS 5911:2022 & BS EN 1916:2002.
    - VITRIFIED CLAY PIPES & FITTINGS TO BS EN 295:2013
    - DUCTILE IRON TO BS EN 598:2007 & BS ISO 4179:2005.
    - PERFORATED VITRIFIED CLAY PIPES FOR LAND DRAINAGE TO BS 1196.
    - PLASTIC PIPES FOR LAND DRAINAGE TO BS 4962:1982.
    - PLASTIC PIPING SYSTEMS FOR NON-PRESSURE UNDERGROUND DRAINAGE & SEWAGE TO BS EN 1401 & BS 4660 – SOLID WALL, STRUCTURED WALL PIPES TO BS EN 13476.
    - PRECAST CONCRETE MANHOLE UNITS TO BS EN 1917:2002.
    - PLASTIC INSPECTION CHAMBERS FOR DRAINS & SEWERS TO BS EN 13598-1:2010.
    - GULLY & MANHOLE TOPS FOR VEHICULAR & PEDESTRIAN AREAS TO BS EN 124:1994.
    - DRAINAGE CHANNELS FOR VEHICULAR & PEDESTRIAN AREAS TO BS EN 1433:2002.
12. ALL MANHOLE COVERS, ROAD GULLY COVERS & FRAMES TO COMPLY WITH BS EN124 NON ROCKING TYPE.

UNLESS NOTED OTHERWISE USE CLASS:

- A15 FOR USE IN PEDESTRIAN AREAS WHERE VEHICLES HAVE NO ACCESS.
- B125 FOR USE IN CAR PARKS & PEDESTRIAN AREAS WHERE INFREQUENT LIGHT VEHICLE ACCESS IS LIKELY (INCLUDING DRIVEWAYS).
- C250 FOR ACCESS COVERS & GULLY GRATINGS IN AREAS OF SLOW MOVING, HEAVY TRAFFIC, ALSO FOR GULLY GRATINGS IN CARRIAGEWAY WITHIN 500mm OF KERB & UP TO 200mm INTO THE FOOTWAY.
- D400 FOR USE IN CARRIAGEWAYS OF ROADS & PARKING AREAS ACCESSED BY ALL TYPES OF VEHICLES.
- E600 FOR USE IN AREAS WHERE HIGH WHEEL LOADS ARE PRESENT.
- F900 FOR USE IN AREAS WHERE EXTREMELY HIGH WHEEL LOADS ARE PRESENT SUCH AS AIRCRAFT PAVEMENTS, DOCKS, HEAVY INDUSTRIAL SITES.

13. MANHOLES IN INTERNAL AREAS REQUIRE DOUBLE SEALED COVERS WITH LOCKING SCREWS. RECESSED WHERE REQUIRED TO ACCOMMODATE FLOOR FINISHES TO ARCHITECT'S SPECIFICATION.
14. PIPE BEDDING

    USE CLASS S BEDDING UNLESS NOTED OTHERWISE. NB PROTECT AGAINST CONSTRUCTION TRAFFIC AS NECESSARY

    USE CLASS Z CONCRETE BED & SURROUND OR CONCRETE SLAB PROTECTION AS FOLLOWS:
    - CLASS 120 CLAYWARE OR CLASS M CONCRETE (100 - 600Ø PIPES)

      LANDSCAPING - LESS THAN 600mm COVER TO CROWN.

      HARDSTANDING - LESS THAN 1200mm COVER TO CROWN
    - PLASTIC (100 - 300Ø PIPES)

      LANDSCAPING - LESS THAN 600mm COVER TO CROWN.

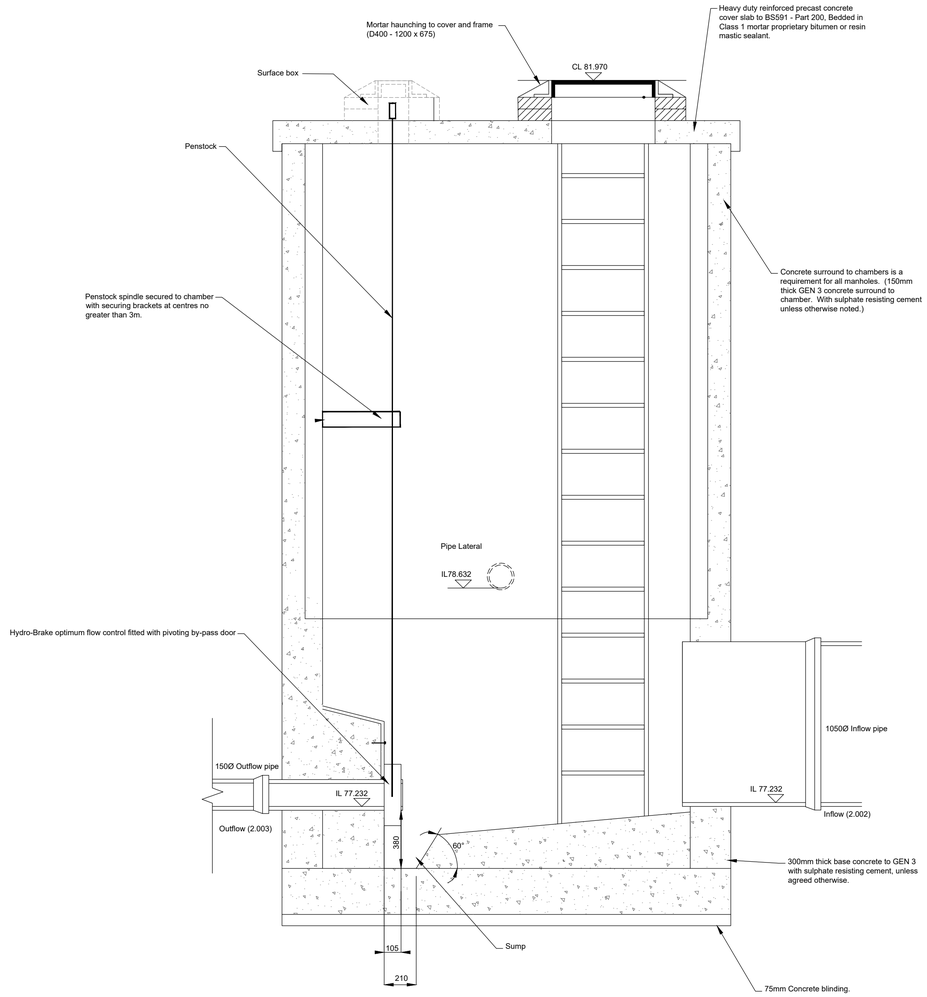
      HARDSTANDING - LESS THAN 900mm COVER TO CROWN
15. PIPES BELOW CONCRETE GROUND FLOOR SLABS:

    WHERE THE CROWN OF THE PIPE IS WITHIN 300mm OF THE UNDERSIDE OF SLAB, SPECIAL PROTECTION TO BE PROVIDED IN ACCORDANCE WITH BUILDING REGULATIONS H1 2.44 OR 150mm GEN3 CONCRETE BED & SURROUND CAST INTEGRALLY WITH SLAB.

    OTHERWISE USE CLASS S BEDDING.
16. MAIN BACKFILL TO BE WELL COMPACTED IN 150mm LAYERS OF:

    SELECTED BACKFILL MATERIAL IN ALL SOFT LANDSCAPED AREAS

    TYPE 1 GRANULAR MATERIAL IN ALL HARDSTANDING AREAS & PUBLIC HIGHWAYS
17. BACKFILL TO DRAINS NEAR FOUNDATIONS TO BE IN ACCORDANCE WITH BUILDING REGULATIONS H1 DIAGRAMS 8 & 12.
18. CCTV TO BE CARRIED OUT TO VERIFY CONDITION OF ANY DRAINAGE TO BE RE-USED.



SECTION A-A

Notes

This Drawing is an instrument of service and shall remain the property of Align Property Partners Ltd copyright ©. It may not be reproduced or copied in any form. It shall not be used for the construction, enlargement or alteration of a building or area other than the said project without the authorisation of the issuing office. Contractors shall verify and be responsible for all dimensions and conditions and shall report any discrepancies to the issuing office before proceeding with any work. Drawings shall not be scaled.

GENERAL NOTES

1. THE STRUCTURAL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT CLIENT, ARCHITECT, SERVICES ENGINEER, AND SPECIALIST CONTRACTOR DRAWINGS, REPORTS AND SPECIFICATIONS.
2. FOR SETTING OUT AND LEVELS REFER TO ARCHITECTS DRAWINGS.
3. FOR THE PURPOSE OF CONSTRUCTION ALL DRAWINGS MUST NOT BE SCALED AND ONLY WRITTEN OR CALCULATED DIMENSIONS USED. LEVEL DATUMS TO BE CONFIRMED BY THE ARCHITECT.
4. ANY REVISIONS TO THE LAYOUT DETAILS REQUIRED BY THE CONTRACTOR TO BE AGREED AND APPROVED BY THE ALIGN PROPERTY PARTNERS ENGINEER.
5. FINISHED FLOOR LEVELS TO BE DETERMINED.
6. ALL PROPRIETARY PRODUCTS ARE TO BE USED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S DETAILS AND REQUIREMENTS.
7. GENERALLY, ONLY KNOWN PENETRATIONS, HOLES, POCKETS AND RECESSES ETC. WITH ANY DIMENSIONS GREATER THAN 150 ARE SHOWN ON THE DRAWINGS. FOR CONFIRMATION OF THESE AND FOR DETAILS OF SMALLER HOLES PLUS INSERTS, FIXINGS ETC. REFERENCE SHALL BE MADE TO THE ARCHITECTS, SERVICES ENGINEER'S OR THE RELEVANT SUBCONTRACTOR'S BUILDERS WORK DRAWINGS.
8. THE CONTRACTOR SHALL ENSURE THAT TEMPORARY LOADS ONTO THE NEW STRUCTURES/DRAINAGE SHALL BE LESS THAN THOSE FOR WHICH IT HAS BEEN DESIGNED.
9. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING AND CHECKING THE SETTING OUT OF GRIDLINES, LEVELS AND DATUMS.
10. ANY DISCREPANCIES BETWEEN THE STRUCTURAL AND ARCHITECTURAL DRAWINGS SHOULD IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE CONTRACT ADMINISTRATOR.
11. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO ENSURE THAT NOISE, VIBRATION AND DUST RESULTING FROM THE WORKS ARE KEPT WITHIN REASONABLE LIMITS.
12. THE CONTRACTOR IS TO ALLOW A MINIMUM OF 10 WORKING DAYS IN THEIR PROGRAMME FOR THE REVIEW OF ANY CONTRACTOR'S DESIGN PORTIONS OF WORK FOR REVIEW BY THE ALIGN PROPERTY PARTNERS ENGINEER.
13. IRRESPECTIVE OF ANY NAMED MANUFACTURERS OF ANY PRODUCT/MATERIAL NOTED ON DRAWINGS, THE CONTRACTOR IS FREE TO PROPOSE AN EQUAL OR APPROVED PRODUCT/MATERIAL PROVIDED THAT ANY SUCH CHANGE TO THE SPECIFICATION MEETS A SIMILAR LEVEL OF PERFORMANCE AND IS NOTED ON ALL M TENDER RETURNS AND DOCUMENTATION FOR ALIGN PROPERTY PARTNERS.
14. MANHOLE TO COMPLY WITH UU DEVELOPER SERVICES DETAIL 5 - FLOW CONTROL MANHOLE DETAIL, DRAWING No. STND/19/05 REV A

IMPORTANT:

DRAWING PROVIDED FOR INFORMATION ONLY AND IS SUBJECT TO THE FOLLOWING STATUTORY APPROVALS:

- PLANNING APPROVAL
- BUILDING CONTROL
- UNITED UTILITIES APPROVAL
- HIGHWAYS APPROVAL

ALL CONSTRUCTION WORKS PRIOR TO APPROVALS ABOVE WILL BE UNDERTAKEN AT CLIENTS/CONTRACTORS RISK

ALL MANHOLES TO USE CONCRETE SURROUND AND ROCKERS WHERE APPLICABLE

NOTE

FLOW CONTROLS TO BE CONSTRUCTED AS PER UNITED UTILITIES STANDARD DETAIL.

Rev	Details	Author & Date	Checked & Date	Approved & Date
C01	UPDATED DRAWING STATUS	JSM 28/08/24	ZS 28/08/24	ZS 28/08/24
P05	ADDED NOTE TO DRAWING AND ALTERED COVER SLAB LAYOUT IN SECTION VIEW IN ACCORDANCE WITH UU COMMENTS (17.05.24)	ZS 17/05/24	ZS 17/05/24	ZS 17/05/24
P04	UPDATED HYDRO-BRAKE COVER SIZE AND SHOWN COVER SLAB ON SECTION VIEW TO SUIT UU COMMENTS (16.05.24),REVISED DRAWING STATUS.	ZS 16/05/24	ZS 16/05/24	ZS 16/05/24
P03	UPDATED HYDRO-BRAKE DETAILS TO SUIT UU COMMENTS (30.04.24)	ZS 02/05/24	ZS 02/05/24	ZS 02/05/24
P02	NOTES ADDED TO SUIT UU COMMENTS (10.04.24)	MD 23/04/24	ZS 23/04/24	ZS 23/04/24
P01	INITIAL ISSUE	MD 11/04/24	LF 11/04/24	ZS 11/04/24

Westmorland & Furness Office, Riverside Business Park, Natland Road, Kendal LA9 7SX

Client: MOSSCARE ST VINCENTS

Project Name: PARKMOUNT ROAD, MANCHESTER

Drawing Title: S104 HYDROBRAKE MANHOLE DETAILS (SHEET 2 OF 2)

Purpose: CONSTRUCTION

Scale	Drawn	Checked	Approved
1:20	MD	LF	ZS
Original Size	Date	Date	Date
A1	11/04/24	11/04/24	11/04/24

Drawing Number: PV2310-APP-92-XX-DR-C-3207 Rev. C01

PV2310-APP-92-XX-M2-C-3206-3207 S104 C01 Hydro-Brake Manhole Details.dwg

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MATERIAL DESIGNATED TYPE A TO BE ANGULAR GRAVEL OR CRUSHED ROCK GRADED IN ACCORDANCE WITH BS 882 OR AIR COOLED BLAST FURNACE SLAG TO BS 1047 OR SINTERED PULVERISED FUEL ASH TO BS 3797 SELECTED ACCORDING TO PIPE SIZE AS FOLLOWS:-

NOMINAL SIZE OF PIPES (mm)	MAXIMUM PARTICAL SIZE (mm)	IMPORTED GRANULAR MATERIALS
100-125	10	10mm NOMINAL SINGLE SIZE
150-200	15	10 or 14mm SINGLE SIZE 14mm to 5mm GRADED
225-300	20	10, 14 or 20mm SINGLE SIZE 14mm to 5mm GRADED 20mm to 5mm GRADED
375-500	20	14 or 20mm SINGLE SIZE 14mm to 5mm GRADED 20mm to 5mm GRADED
> 500	40	14, 20 or 40mm SINGLE SIZE 14mm to 5mm GRADED 20mm to 5mm GRADED 40mm to 5mm GRADED

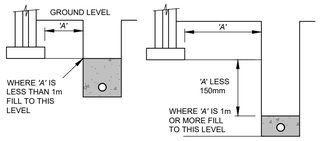
MATERIAL DESIGNATED TYPE B: USED UNDER GARDENS AND VERGES TO BE UNIFORM READILY COMPACTABLE MATERIAL, FREE FROM TREE ROOTS, VEGETABLE MATTER, RUBBISH AND FROZEN SOIL, AND EXCLUDING CLAY LUMPS RETAINED ON A 75mm SIEVE AND STONES LARGER THAN 37mm. BEDDING TO BE COMPACTED IN 225mm LAYERS.

MATERIAL DESIGNATED TYPE B: USED UNDER ROADS and FOOTPATHS TO BE GRANULAR MATERIAL AS USED FOR CARRIAGEWAY SUB-BASE CONSTRUCTION.

PIPE BEDDING MATERIAL DETAILS

NOMINAL SIZE OF PIPES (mm)	AVERAGE TRENCH WIDTH (m)
100	0.55
150	0.60
225	0.70
300	0.85
375	1.05
450	1.15
525	1.20
600	1.35
675	1.45
750	1.50
825	1.60
900	1.90
975	2.00
1050	2.10
1125	2.20
1200	2.30
1350	2.50
1500	2.70

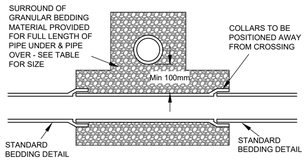
TRENCH WIDTHS



MINIMUM 150mm GEN3 CONCRETE SURROUND/TRENCH FILL WITH 13 th'k COMPRESSIBLE BOARD MOVEMENT JOINTS PROVIDED AT EACH SOCKET/SLEEVE JOINT FACE OR AT NOT MORE THAN 5m INTERVALS

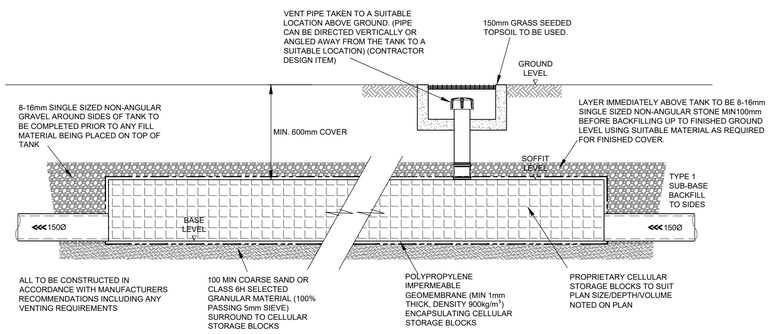
PIPE RUNS NEAR BUILDINGS

BASED ON BUILDING REGULATIONS H1 DIAGRAMS 8 & 12
(NOT TO SCALE)



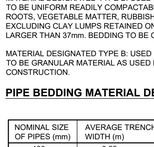
PIPE CROSSINGS

(SCALE 1:20)



INDICATIVE ATTENUATION TANK

(SCALE 1:20)



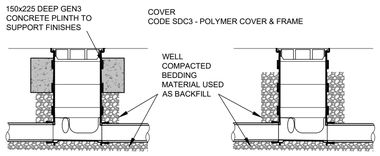
WHERE CHAMBERS ARE POSITIONED ON 90° CORNERS ALWAYS USE THE MAIN CHANNELS BY FITTING A 45° BEND ON INLET & OUTLET

BENDS OF UP TO MAX 45° CAN BE USED ON ANY INLET OR THE OUTLET

SHORT STEEP BRANCH CONNECTIONS TO BE CONNECTED VIA A 45° INLET USING A BEND WHERE NECESSARY

INLET STOPPERS TO REMAIN WHERE CONNECTION NOT REQUIRED

TYPICAL PLAN



SITED IN DRIVEWAYS/HARD LANDSCAPED AREAS — SITED IN SOFT LANDSCAPED AREAS

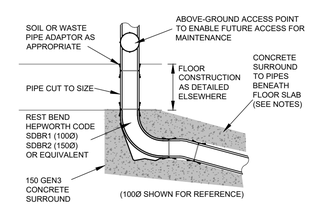
HEPWORTH MINI ACCESS CHAMBER WITH 100Ø MAIN FLOW & 2No 100Ø CONNECTIONS AT 45°

CODE SDC5 (215 DEEP) WITH CODE SDC4 RAISING PIECES (@150 DEEP) TO SUIT DEPTH
OR
CODE SDAC1/1 (600 DEEP) CUT TO SUIT DEPTH

OR EQUIVALENT

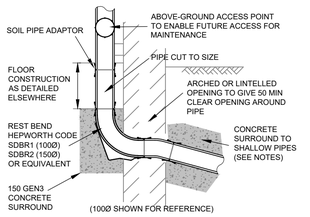
MINI ACCESS CHAMBER (MAC)

MAX DEPTH TO INVERT 0.6m
(SCALE 1:20)



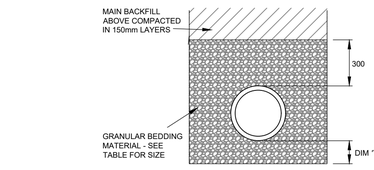
INTERNAL SOIL PIPE CONNECTION

(PIPE RUN BENEATH GROUND FLOOR SLAB)
(SCALE 1:20)



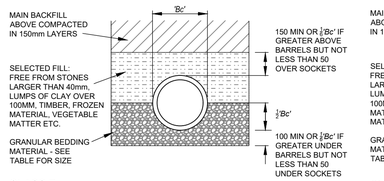
INTERNAL SOIL PIPE CONNECTION ADJACENT TO EXTERNAL WALL

(SCALE 1:20)



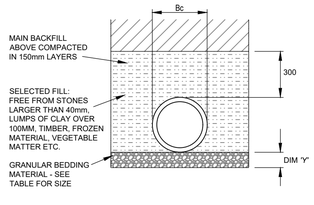
CLASS S

(BEDDING FACTOR 2.5) GENERALLY SUITABLE FOR ALL SOIL CONDITIONS



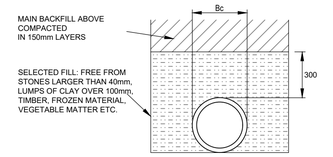
CLASS B

(BEDDING FACTOR 2.5) GENERALLY SUITABLE FOR ALL SOIL CONDITIONS



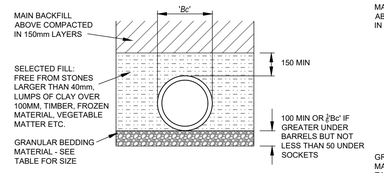
CLASS F

(BEDDING FACTOR 1.9) GENERALLY SUITABLE FOR ALL SOIL CONDITIONS



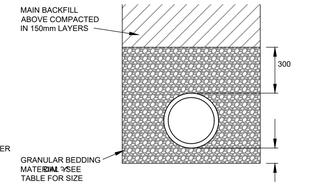
CLASS D

EMBEDMENT TYPE 4
HIGH STANDARD OF WORKMANSHIP REQUIRED
NOT TO BE USED UNLESS ACCURATE HAND TRIMMING BY SHOVEL IS POSSIBLE



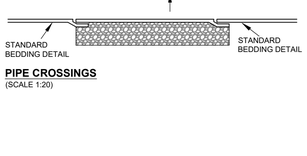
CLASS N

(BEDDING FACTOR 1.1) ALTERNATIVE TO CLASS D WHERE ACCURATE HAND TRIMMING BY SHOVEL IS **NOT** POSSIBLE



BEDDING FOR PLASTIC PIPES

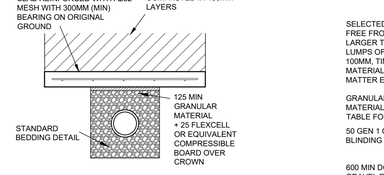
FOR ALL OTHER INSTANCES REFER TO PIPE MANUFACTURERS DETAILS



PIPE SIZE (mm)	DIM 'X' (min)	COMPRESSIBLE FILLER THICKNESS
< 400	160	18
400 - 700	200	36
725 - 1200	300	36
>1200	300	54

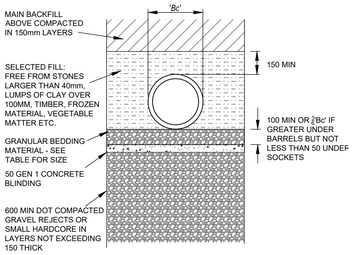
CLASS Z
CONCRETE BEDDING & SURROUND

REQUIRED WHERE COVER TO PIPEWORK IS LESS THAN 1.2m
GENERALLY SUITABLE FOR ALL SOIL CONDITIONS



CONCRETE SLAB PROTECTION

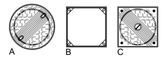
(ALTERNATIVE TO CONCRETE BEDDING & SURROUND)



PIPE BEDDING IN POOR GROUND

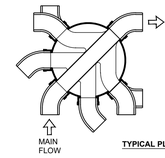
(BS 9295:2010)

Drawn 1:20



COVER/ LID OPTIONS PLAN
(NTS)

COVERS
A) CODE SPK8 - ROUND DUCTILE IRON COVER & FRAME SECURED WITH CLIPS SUPPLIED
OR
B) CODE SPCR8 - SQUARE RECESSED COVER & FRAME FILLED WITH MATCHING FINISH MATERIAL
OR
C) CODE SPKS8 SQUARE AIRTIGHT COVER & FRAME IF INTERNAL



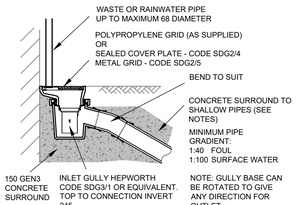
TYPICAL PLAN

WHERE CHAMBERS ARE POSITIONED ON 90° CORNERS ALWAYS USE THE MAIN CHANNELS BY FITTING A 45° BEND ON INLET & OUTLET

BENDS OF UP TO MAX 45° CAN BE USED ON ANY INLET OR THE OUTLET

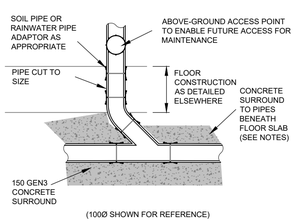
SHORT STEEP BRANCH CONNECTIONS TO BE CONNECTED VIA A 45° INLET USING A BEND WHERE NECESSARY

INLET STOPPERS TO REMAIN WHERE CONNECTION NOT REQUIRED



ACCESS GULLY

(SCALE 1:20)



INTERNAL IN-LINE SOIL PIPE CONNECTION

(PIPE RUN BENEATH GROUND FLOOR)
(SCALE 1:20)

EXTERNAL PIPE CONNECTIONS SIMILAR

COVER/ LID OPTIONS PLAN
(NTS)

COVERS
A) CODE SPK8 - ROUND DUCTILE IRON COVER & FRAME SECURED WITH CLIPS SUPPLIED
OR
B) CODE SPCR8 - SQUARE RECESSED COVER & FRAME FILLED WITH MATCHING FINISH MATERIAL
OR
C) CODE SPKS8 SQUARE AIRTIGHT COVER & FRAME IF INTERNAL

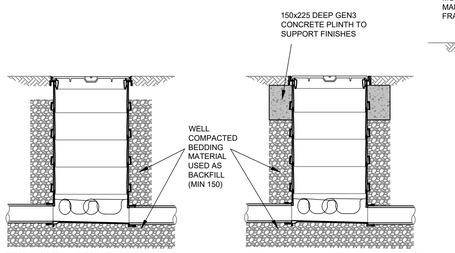
TYPICAL PLAN

WHERE CHAMBERS ARE POSITIONED ON 90° CORNERS ALWAYS USE THE MAIN CHANNELS BY FITTING A 45° BEND ON INLET & OUTLET

BENDS OF UP TO MAX 45° CAN BE USED ON ANY INLET OR THE OUTLET

SHORT STEEP BRANCH CONNECTIONS TO BE CONNECTED VIA A 45° INLET USING A BEND WHERE NECESSARY

INLET STOPPERS TO REMAIN WHERE CONNECTION NOT REQUIRED



SITED IN SOFT LANDSCAPED AREAS — SITED IN DRIVEWAYS/HARD LANDSCAPED AREAS — SITED IN COMMUNAL PARKING AREAS

HEPWORTH PPIC (475Ø) WITH 100Ø MAIN FLOW & 4NO 100Ø CONNECTIONS

CODE SPIC6/1 (245 DEEP) WITH CODE SPIC4 RAISING PIECES (@175 DEEP) TO SUIT DEPTH
OR
CODE SPIC1/1 (940 DEEP) CUT TO SUIT DEPTH
CODE SPIC2/1 (595 DEEP) CUT TO SUIT DEPTH

OR EQUIVALENT

475Ø POLYPROPYLENE INSPECTION CHAMBER (PPIC)

MAX DEPTH TO INVERT 1.2m
(SCALE 1:20)

HEPWORTH PPIC (475Ø) WITH 150Ø MAIN FLOW, 2NO 150Ø CONNECTIONS AT 90° & 2NO 100Ø CONNECTIONS AT 45°

CODE SPIC6/2 (335 DEEP) WITH CODE SPIC4 RAISING PIECES (@175 DEEP) TO SUIT DEPTH
OR
CODE SPIC1/2 (1030 DEEP) CUT TO SUIT DEPTH

OR EQUIVALENT

DRAINAGE

1. ALL DRAINAGE WORKS TO BE CONSTRUCTED FROM THE OUTFALL TOWARDS THE HEAD OF RUN TO ENSURE THE OUTFALL CAN BE ACHIEVED.
2. ALL EXISTING DRAINS & SERVICES (LINE & LEVELS) TO BE CHECKED & CONFIRMED BY THE CONTRACTOR PRIOR COMMENCEMENT OF ANY ON SITE DRAINAGE WORKS. ANY DISCREPANCY IN LEVELS IS TO BE REPORTED IMMEDIATELY TO APP.
3. ALL DRAINAGE WORK TO BE IN ACCORDANCE WITH THE BUILDING REGULATIONS, BS EN 752 & TO THE SATISFACTION OF THE BUILDING INSPECTOR.
4. ALL PROPRIETARY ITEMS TO BE INSTALLED STRICTLY IN ACCORDANCE WITH MANUFACTURER'S DETAILS, INSTRUCTIONS & SPECIFICATIONS.
5. ALL COVER LEVELS ARE APPROXIMATE. EXACT LEVELS TO BE DETERMINED FROM THE EXTERNAL WORKS LAYOUT.
6. INVERT LEVELS QUOTED AT MANHOLES & INSPECTION CHAMBERS ARE THOSE OF THE LARGEST CONNECTED PIPE DIAMETER. PIPES AT CHAMBERS TO BE LAID WITH SOFFITS LEVEL UNLESS NOTED OTHERWISE.
7. PIPE GRADIENTS WHERE STATED ARE APPROXIMATE - LEVELS AT THE CHAMBERS TAKE PRECEDENT.
8. REFER TO ARCHITECT'S DRAWINGS FOR PRECISE LOCATION OF ALL RAINWATER PIPES, INTERNAL CONNECTIONS ETC.
9. ALL INTERNAL CONNECTIONS TO HAVE AN ABOVE-FLOOR ACCESS POINT TO ENABLE FUTURE ACCESS FOR MAINTENANCE.
10. PIPES & FITTINGS TO BE:
    - CONCRETE PIPES & ANCILLARY PRODUCTS TO BS 5911:2022 & BS EN 1916:2002.
    - VITRIFIED CLAY PIPES & FITTINGS TO BS EN 295:2013
    - DUCTILE IRON TO BS EN 598:2007 & BS ISO 4179:2005.
    - PERFORATED VITRIFIED CLAY PIPES FOR LAND DRAINAGE TO BS 1196.
    - PLASTIC PIPES FOR LAND DRAINAGE TO BS 4962:1982.
    - PLASTIC PIPING SYSTEMS FOR NON-PRESSURE UNDERGROUND DRAINAGE & SEWAGE TO BS EN 1401 & BS 4660 – SOLID WALL, STRUCTURED WALL PIPES TO BS EN 13476.
    - PRECAST CONCRETE MANHOLE UNITS TO BS EN 1917:2002.
    - PLASTIC INSPECTION CHAMBERS FOR DRAINS & SEWERS TO BS EN 13598-1:2010.
    - GULLY & MANHOLE TOPS FOR VEHICULAR & PEDESTRIAN AREAS TO BS EN 124:1994.
    - DRAINAGE CHANNELS FOR VEHICULAR & PEDESTRIAN AREAS TO BS EN 1433:2002.
12. ALL MANHOLE COVERS, ROAD GULLY COVERS & FRAMES TO COMPLY WITH BS EN124 NON ROCKING TYPE.

    UNLESS NOTED OTHERWISE USE CLASS:

    A15 FOR USE IN PEDESTRIAN AREAS WHERE VEHICLES HAVE NO ACCESS.

    B125 FOR USE IN CAR PARKS & PEDESTRIAN AREAS WHERE INFREQUENT LIGHT VEHICLE ACCESS IS LIKELY (INCLUDING DRIVEWAYS).

    C250 FOR ACCESS COVERS & GULLY GRATINGS IN AREAS OF SLOW MOVING, HEAVY TRAFFIC. ALSO FOR GULLY GRATINGS IN CARRIAGEWAY WITHIN 500mm OF KERB & UP TO 200mm INTO THE FOOTWAY.

    D400 FOR USE IN CARRIAGEWAYS OF ROADS & PARKING AREAS ACCESSED BY ALL TYPES OF VEHICLES.

    E600 FOR USE IN AREAS WHERE HIGH WHEEL LOADS ARE PRESENT.

    F900 FOR USE IN AREAS WHERE EXTREMELY HIGH WHEEL LOADS ARE PRESENT SUCH AS AIRCRAFT PAVEMENTS, DOCKS, HEAVY INDUSTRIAL SITES.
13. MANHOLES IN INTERNAL AREAS REQUIRE DOUBLE SEALED COVERS WITH LOCKING SCREWS, RECESSED WHERE REQUIRED TO ACCOMMODATE FLOOR FINISHES TO ARCHITECT'S SPECIFICATION.
14. PIPE BEDDING

    USE CLASS S BEDDING UNLESS NOTED OTHERWISE. NB PROTECT AGAINST CONSTRUCTION TRAFFIC AS NECESSARY

    USE CLASS Z CONCRETE BED & SURROUND OR CONCRETE SLAB PROTECTION AS FOLLOWS:
    - CLASS 120 CLAYWARE OR CLASS M CONCRETE (100 - 600Ø PIPES)

      LANDSCAPING - LESS THAN 600mm COVER TO CROWN.

      HARDSTANDING - LESS THAN 1200mm COVER TO CROWN
    - PLASTIC (100 - 300Ø PIPES)

      LANDSCAPING - LESS THAN 600mm COVER TO CROWN.

      HARDSTANDING - LESS THAN 900mm COVER TO CROWN
15. PIPES BELOW CONCRETE GROUND FLOOR SLABS:

    WHERE THE CROWN OF THE PIPE IS WITHIN 300mm OF THE UNDERSIDE OF SLAB, SPECIAL PROTECTION TO BE PROVIDED IN ACCORDANCE WITH BUILDING REGULATIONS H1 2.44 OR 150mm GEN3 CONCRETE BED & SURROUND CAST INTEGRALLY WITH SLAB.

    OTHERWISE USE CLASS S BEDDING.
16. MAIN BACKFILL TO BE WELL COMPACTED IN 150mm LAYERS OF:

    SELECTED BACKFILL MATERIAL IN ALL SOFT LANDSCAPED AREAS

    TYPE 1 GRANULAR MATERIAL IN ALL HARDSTANDING AREAS & PUBLIC HIGHWAYS
17. BACKFILL TO DRAINS NEAR FOUNDATIONS TO BE IN ACCORDANCE WITH BUILDING REGULATIONS H1 DIAGRAMS 8 & 12.
18. CCTV TO BE CARRIED OUT TO VERIFY CONDITION OF ANY DRAINAGE TO BE RE-USED.

GENERAL NOTES

1. THE STRUCTURAL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT CLIENT, ARCHITECT, SERVICES ENGINEER, AND SPECIALIST CONTRACTOR DRAWINGS, REPORTS AND SPECIFICATIONS.
2. FOR SETTING OUT AND LEVELS REFER TO ARCHITECTS DRAWINGS.
3. FOR THE PURPOSE OF CONSTRUCTION ALL DRAWINGS MUST NOT BE SCALED AND ONLY WRITTEN OR CALCULATED DIMENSIONS USED. LEVEL DATUMS TO BE CONFIRMED BY THE ARCHITECT.
4. ANY REVISIONS TO THE LAYOUT DETAILS REQUIRED BY THE CONTRACTOR TO BE AGREED AND APPROVED BY THE ALIGN PROPERTY PARTNERS ENGINEER.
5. FINISHED FLOOR LEVELS TO BE DETERMINED.
6. ALL PROPRIETARY PRODUCTS ARE TO BE USED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S DETAILS AND REQUIREMENTS.
7. GENERALLY, ONLY KNOWN PENETRATIONS, HOLES, POCKETS AND RECESSES ETC. WITH ANY DIMENSIONS GREATER THAN 150 ARE SHOWN ON THE DRAWINGS. FOR CONFIRMATION OF THESE AND FOR DETAILS OF SMALLER HOLES PLUS INSERTS, FIXINGS ETC. REFERENCE SHALL BE MADE TO THE ARCHITECT'S, SERVICES ENGINEER'S OR THE RELEVANT SUBCONTRACTOR'S BUILDERS WORK DRAWINGS.
8. THE CONTRACTOR SHALL ENSURE THAT TEMPORARY LOADS ONTO THE NEW STRUCTURES/DRAINAGE SHALL BE LESS THAN THOSE FOR WHICH IT HAS BEEN DESIGNED.
9. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING AND CHECKING THE SETTING OUT OF GRIDLINES, LEVELS AND DATUMS.
10. ANY DISCREPANCIES BETWEEN THE STRUCTURAL AND ARCHITECTURAL DRAWINGS SHOULD IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE CONTRACT ADMINISTRATOR.
11. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO ENSURE THAT NOISE, VIBRATION AND DUST RESULTING FROM THE WORKS ARE KEPT WITHIN REASONABLE LIMITS.
12. THE CONTRACTOR IS TO ALLOW A MINIMUM OF 10 WORKING DAYS IN THEIR PROGRAMME FOR THE REVIEW OF ANY CONTRACTOR'S DESIGN PORTIONS OF WORK FOR REVIEW BY THE ALIGN PROPERTY PARTNERS ENGINEER.
13. IRRESPECTIVE OF ANY NAMED MANUFACTURERS OF ANY PRODUCT/MATERIAL NOTED ON DRAWINGS, THE CONTRACTOR IS FREE TO PROPOSE AN EQUAL OR APPROVED PRODUCT/MATERIAL PROVIDED THAT ANY SUCH CHANGE TO THE SPECIFICATION MEETS A SIMILAR LEVEL OF PERFORMANCE AND IS NOTED ON ALL M TENDER RETURNS AND DOCUMENTATION FOR ALIGN PROPERTY PARTNERS.

DRAWING REFERENCES THAT THIS IS BASED ON:
- ALIGN PROPERTY PARTNERS - 'DRAINAGE LAYOUT', 'PV2309-APP-00-90-DR-C- 2001-P01'.

Notes

This Drawing is an instrument of service and shall remain the property of Align Property Partners Ltd copyright ©. It may not be reproduced or copied in any form. It shall not be used for the construction, enlargement or alteration of a building or area other than the said project without the authorisation of the issuing office. Contractors shall verify and be responsible for all dimensions and conditions and shall report any discrepancies to the issuing office before proceeding with any work. Drawings shall not be scaled.

Rev	Details	Author & Date	Checked & Date	Approved & Date
C01	Updated Drawing Status	JSM 28/06/24	ZS 28/06/24	ZS 28/06/24
P02	MAC detail added	JAS 29/01/2024	ZS 29/01/2024	ZS 29/01/2024
P01	Initial Issue	ZS 19/09/2023	BD 19/09/2023	BD 19/09/2023

align PROPERTY PARTNERS
White Rose House, Northallerton Business Park, Thurston Road, Northallerton DL6 2NA

Client: Mosscare St Vincents

Project Name: Parkmount Road, Manchester

Drawing Title: Private Drainage Construction Details

Purpose: Construction

Scale	Drawn	Checked	Approved
1:20	ZS	BD	BD
Original Size	Date	Date	Date
A1	19/07/2023	21/07/2023	21/07/2023

Drawing Number: PV2309-APP-92-XX-DR-C-3400 Rev. C01

PV2310-APP-92-XX-DR-C-3400 C01 Private Drainage Details.dwg

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Appendix C

Site Inspection Photographs & Specifications

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.750	5.600
Flush-Flo™	0.437	5.151
Kick-Flo®	0.896	4.099
Mean Flow		4.662

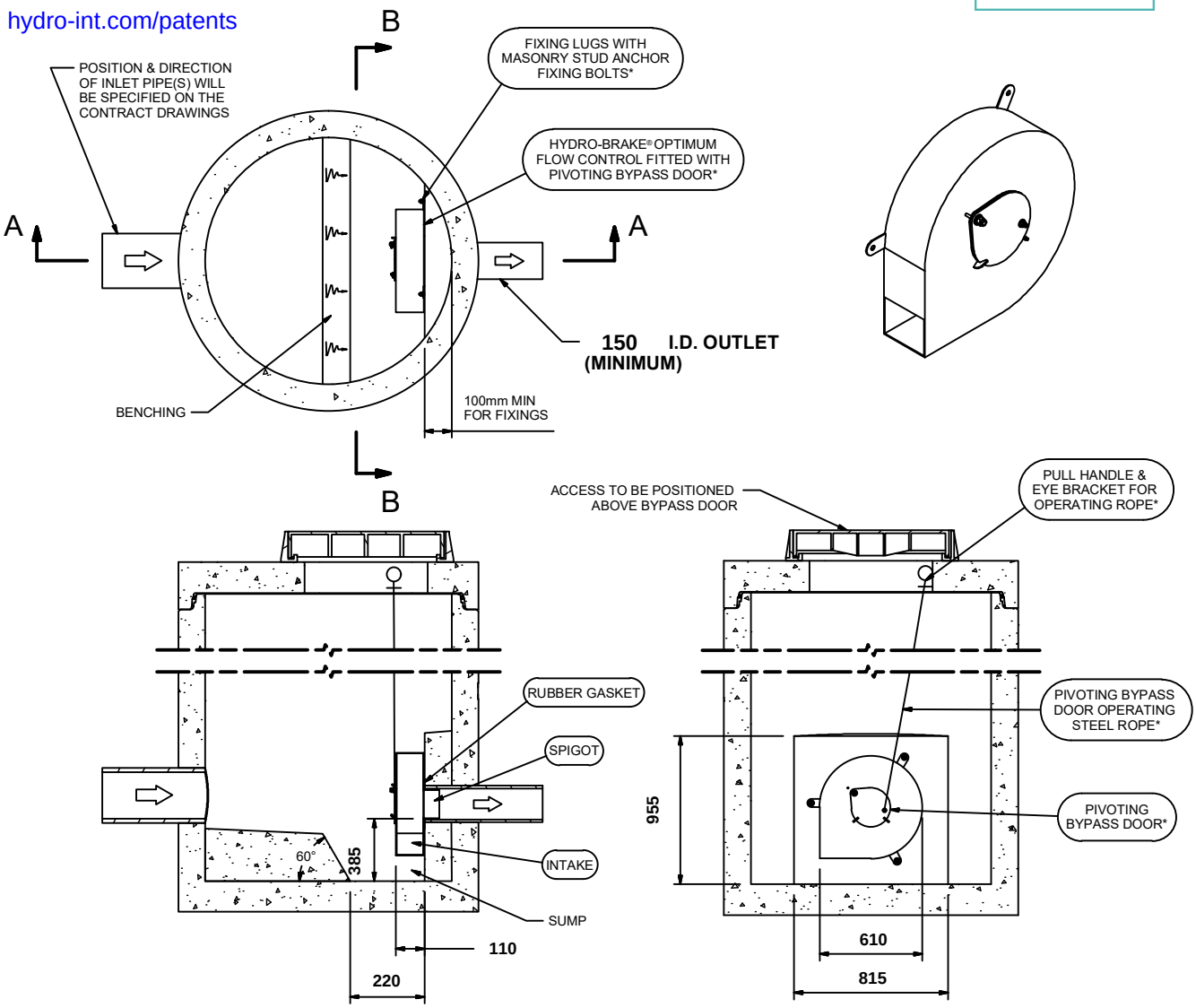
Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet
- Indicative Weight: 20 kg

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE 08/4596

wrc approved PT/503/0422 Valid: 01/04/2022 - 31/03/2027

hydro-int.com/patents



SECTION A-A

SECTION B-B

IMPORTANT: ⬭ LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE

The head/flow characteristics of this SHE-0100-5600-1750-5600 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International
A CRH COMPANY

DATE	25/01/2024 14:49
SITE	Parkmount Road
DESIGNER	Zaffar Sultan
REF	PV2310 - MH S3

SHE-0100-5600-1750-5600
Hydro-Brake® Optimum

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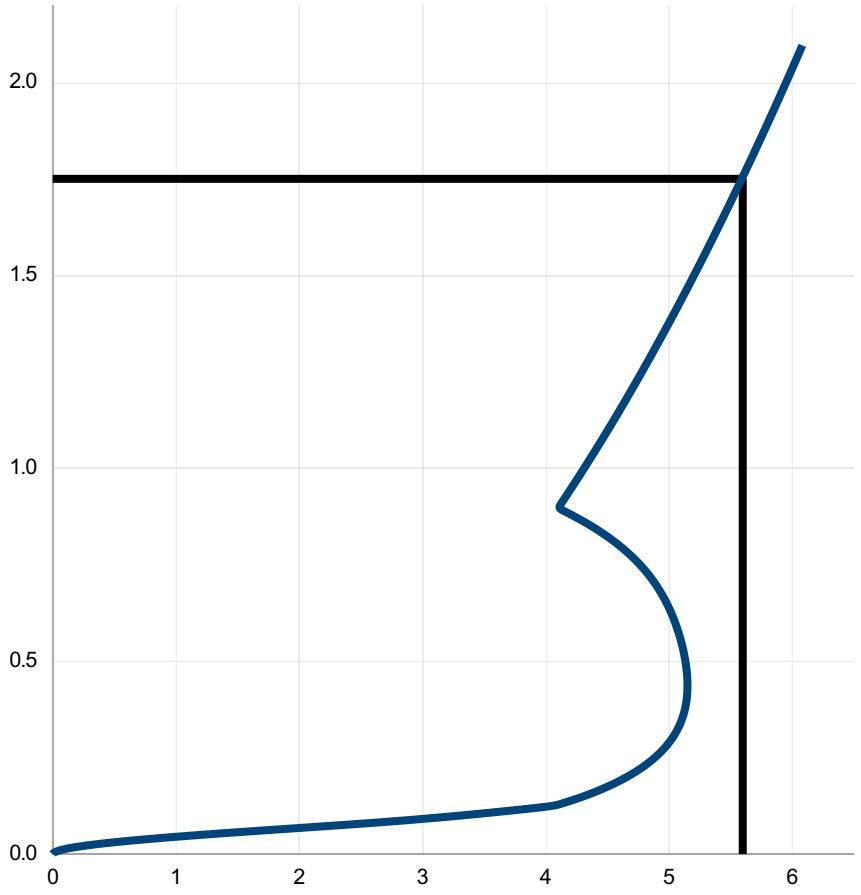
zaffar.sultan@jnpgroup.co.uk

Technical Specification		
Control Point	Head (m)	Flow (l/s)
Primary Design	1.750	5.600
Flush-Flo™	0.437	5.151
Kick-Flo®	0.896	4.099
Mean Flow		4.662

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Valid: 01/04/2022 - 31/03/2027

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Head (m)	Flow (l/s)
0.000	0.000
0.060	1.661
0.121	3.947
0.181	4.545
0.241	4.854
0.302	5.031
0.362	5.120
0.422	5.150
0.483	5.142
0.543	5.106
0.603	5.047
0.664	4.960
0.724	4.835
0.784	4.655
0.845	4.399
0.905	4.119
0.966	4.244
1.026	4.364
1.086	4.481
1.147	4.595
1.207	4.705
1.267	4.813
1.328	4.918
1.388	5.020
1.448	5.120
1.509	5.219
1.569	5.315
1.629	5.409
1.690	5.501
1.750	5.592

DESIGN ADVICE

The head/flow characteristics of this SHE-0100-5600-1750-5600 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

Hydro International
A CRH COMPANY

DATE	25/01/2024 14:49
Site	Parkmount Road
DESIGNER	Zaffar Sultan
Ref	PV2310 - MH S3

SHE-0100-5600-1750-5600

Hydro-Brake® Optimum

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Kitemark™ Certificate

This is to certify that:

Marshalls Mono Limited
T/A Marshalls Civils & Drainage
Mells Works
Mells
Frome
BA11 3PD
United Kingdom

Holds Certificate Number: KM 06910

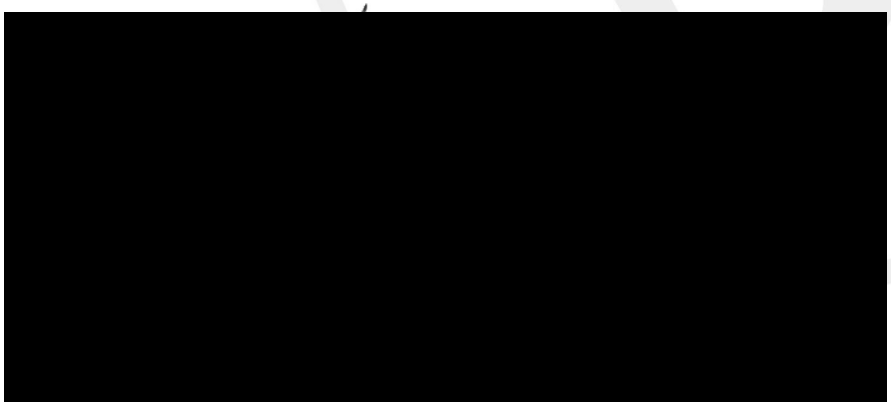
In respect of:

BSEN 1916 BS5911-1, BSEN 1917 BS5911-3/4
Concrete pipes, manholes, inspection chambers, fittings and ancillary products

This issues the right and licence to use the Kitemark in accordance with the Kitemark Terms and Conditions governing the use of the Kitemark, as may be updated from time to time by BSI Assurance UK Ltd (the "Conditions"). All defined terms in this Certificate shall have the same meaning as in the Conditions.

The use of the Kitemark is authorized in respect of the Product(s) detailed on this Certificate provided at or from the above address.

For and on behalf of BSI:



First Issued: 2019-08-09
Latest Issue: 2022-09-21

This certificate has been issued by and remains the property of BSI Assurance UK Ltd, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP, United Kingdom and should be returned immediately upon request.
To check its validity telephone +44 (0) 345 080 9000. An electronic certificate can be authenticated online.

BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.
A member of BSI Group of Companies.

Kitemark™ Certificate

No. KM 06910

BS EN 1916: 2002 - **Concrete pipes and fittings, unreinforced, steel fibre and reinforced.**

BS 5911-1: 2002+A1: 2010 - **Concrete pipes and ancillary concrete products. Unreinforced and reinforced concrete pipes (including jacking pipes) and fittings with flexible joints.**

The scope of this Certificate covers the following products:

Circular concrete pipes

DN 225 – DN 1800

Ovoid concrete pipes

WN 400 x HN 600

WN 600 x HN 900

WN 800 x HN 1200

First Issued: 2019-08-09

Latest Issue: 2022-09-21

Effective Date: 2022-09-21

Expiry Date: 2025-05-19

This certificate has been issued by and remains the property of BSI Assurance UK Ltd, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP, United Kingdom and should be returned immediately upon request.
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BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.
A member of BSI Group of Companies.

Kitemark™ Certificate

No. KM 06910

BS EN 1917: 2002 -	**Concrete manholes and inspection chambers, unreinforced, steel fibre and reinforced.**
BS 5911-3: 2010+A1: 2014 -	**Concrete pipes and ancillary concrete products. Specification for unreinforced and reinforced concrete manholes and soakaways (complimentary to BS EN 1917: 2002)**

Chamber or shaft units

DN 900 – DN 1800

LN/WN 1200/750

Concrete cover slabs

DN900 – DN 3000

LN/WN 1200/750

Reducing slabs

DN 1200 – DN 3000

Landing slabs

DN 1500 – DN 3000

Base units

DN 1200 – DN 1800

Adjusting units and Corbel Slabs

First Issued: 2019-08-09

Latest Issue: 2022-09-21

Effective Date: 2022-09-21

Expiry Date: 2025-05-19

This certificate has been issued by and remains the property of BSI Assurance UK Ltd, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP, United Kingdom and should be returned immediately upon request.
To check its validity telephone +44 (0) 345 080 9000. An electronic certificate can be authenticated online.

BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.
A member of BSI Group of Companies.

Kitemark™ Certificate

No. KM 06910

BS EN 1917: 2002 -	**Concrete manholes and inspection chambers, unreinforced, steel fibre and reinforced.**
BS 5911-4: 2002+A2: 2010 -	**Concrete pipes and ancillary concrete products. Unreinforced and reinforced concrete inspection chambers.**

Chamber units

DN/LN 450 – DN/LN 1000

Cover slabs

Type 1 or Type 2

First Issued: 2019-08-09
Latest Issue: 2022-09-21

Effective Date: 2022-09-21
Expiry Date: 2025-05-19

This certificate has been issued by and remains the property of BSI Assurance UK Ltd, Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP, United Kingdom and should be returned immediately upon request.
To check its validity telephone +44 (0) 345 080 9000. An electronic certificate can be authenticated online.

BSI Assurance UK Limited, registered in England under number 7805321 at 389 Chiswick High Road, London W4 4AL, UK.
A member of BSI Group of Companies.


Galaxy A52s 5G
05 August 2024 8:57 am


Galaxy A52s 5G
15 July 2024 12:53 pm

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	2.000	5.900
Flush-Flo™	0.435	5.071
Kick-Flo®	0.890	4.047
Mean Flow		4.744

This Hydro-Brake® Optimum includes:

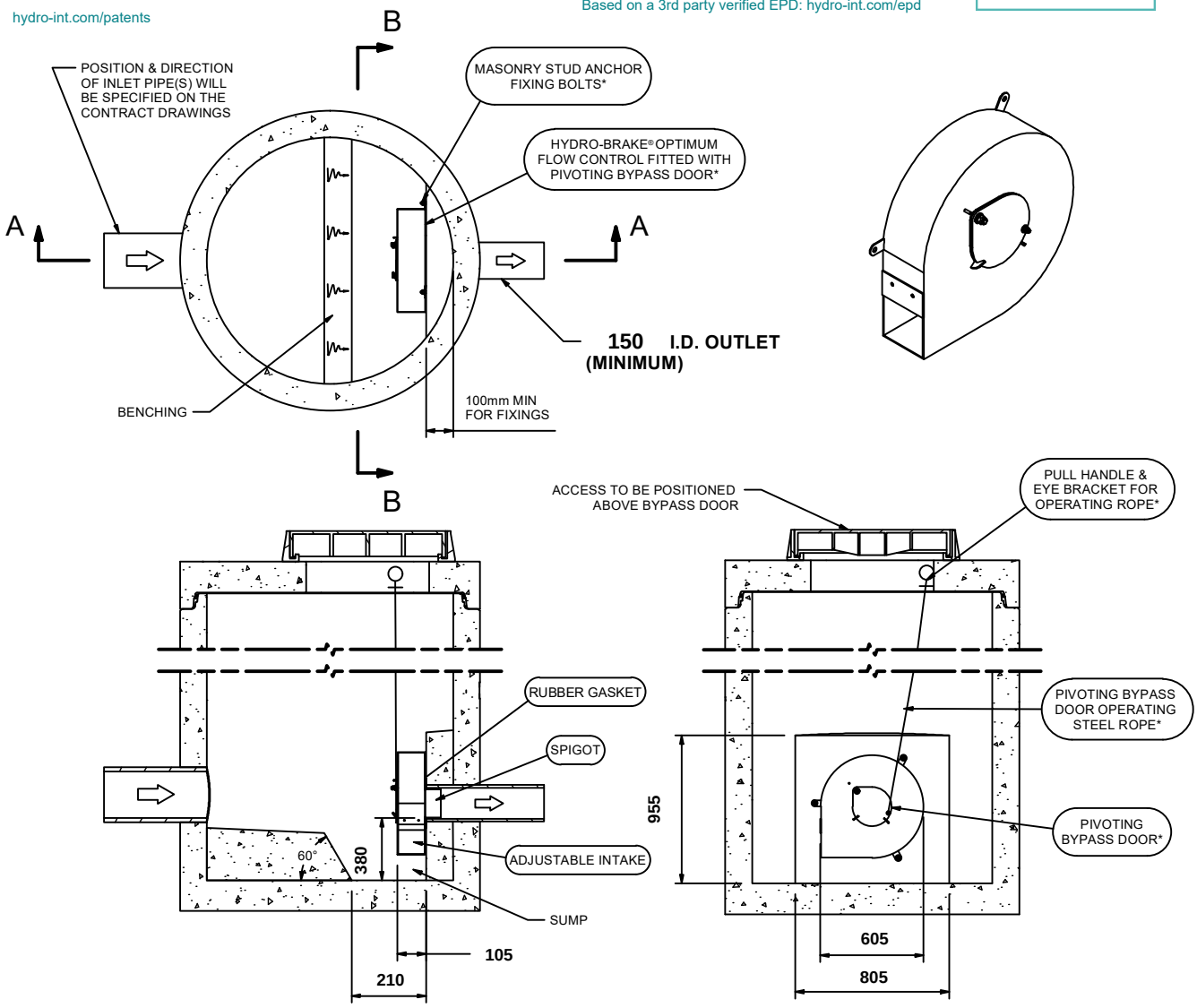
- •All in 3 mm Grade 304L stainless steel
- • Integral pivoting by-pass door allowing clear line of sight through to outlet, c/w operating rope
- • Media blasted for corrosion resistance
- • Variable flow rate post installation via adjustable inlet (if necessary)
- • Indicative Weight: 20 kg
- • Product Carbon Footprint: 84.39 kgCO2e

Based on a 3rd party verified EPD: hydro-int.com/epd

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE 08/4596

wrc approved PT/503/0422 Valid: 01/04/2022 - 31/03/2027

hydro-int.com/patents



SECTION A-A

SECTION B-B

IMPORTANT:

LIMIT OF HYDRO INTERNATIONAL SUPPLY
THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
ALL CIVIL AND INSTALLATION WORK BY OTHERS
* WHERE SUPPLIED
HYDRO-BRAKE® IS A REGISTERED TRADEMARK FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE

The head/flow characteristics of this SHE-0100-5900-2000-5900 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International A CRH COMPANY

DATE	25/09/2025 14:43
SITE	Parkmount Rd, Manchester
DESIGNER	Jacob Moore
REF	PV2310

SHE-0100-5900-2000-5900

Hydro-Brake® Optimum

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jacob.moore@alignpropertypartners.co.uk

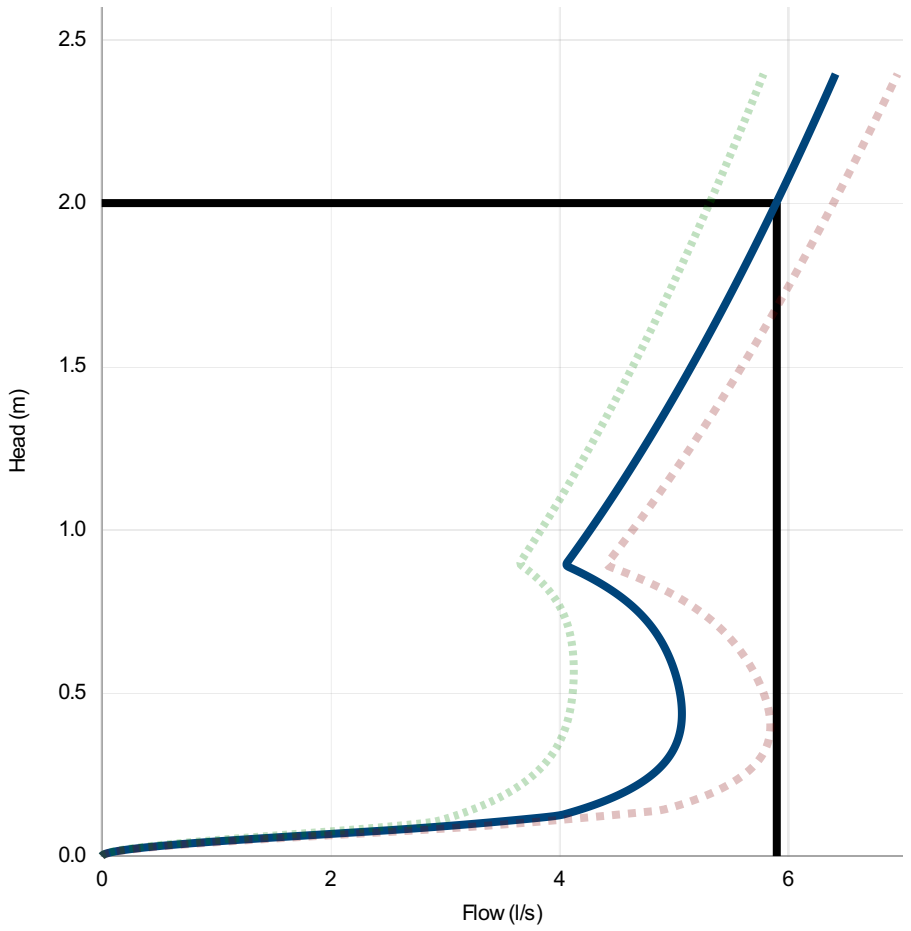
Technical Specification

	Original Setting		Minimum Setting		Maximum Setting	
Control Point	**Head (m)**	**Flow (l/s)**	**Head (m)**	**Flow (l/s)**	**Head (m)**	**Flow (l/s)**
Primary Design	2.000	5.900	2.000	5.313	2.000	6.395
Flush-Flo™	0.435	5.071	0.566	4.126	0.399	5.844
Kick-Flo®	0.890	4.047	0.894	3.646	0.890	4.401
Mean Flow		4.744		4.120		5.254

BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE No 08/4596

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Valid: 01/04/2022 - 31/03/2027

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Head (m)	Flow (l/s)
0.000	0.000
0.069	2.046
0.138	4.139
0.207	4.627
0.276	4.892
0.345	5.022
0.414	5.068
0.483	5.062
0.552	5.019
0.621	4.946
0.690	4.832
0.759	4.659
0.828	4.396
0.897	4.062
0.966	4.203
1.034	4.339
1.103	4.471
1.172	4.598
1.241	4.721
1.310	4.841
1.379	4.958
1.448	5.071
1.517	5.182
1.586	5.290
1.655	5.396
1.724	5.500
1.793	5.602
1.862	5.701
1.931	5.799
2.000	5.895

DESIGN ADVICE

The head/flow characteristics of this SHE-0100-5900-2000-5900 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

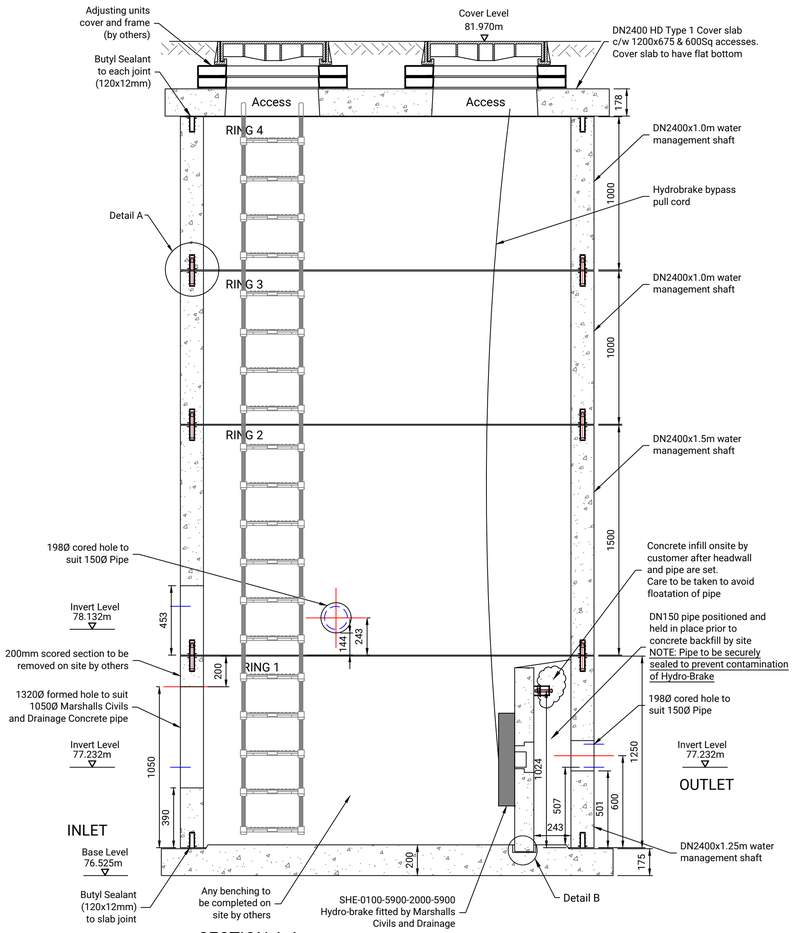
Hydro International
A CRH COMPANY

DATE	25/09/2025 14:43
Site	Parkmount Rd, Manchester
DESIGNER	Jacob Moore
Ref	PV2310

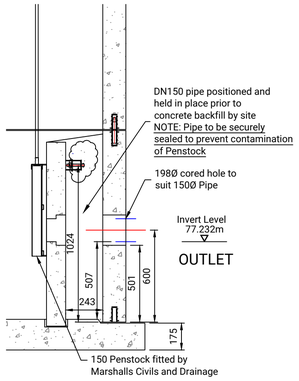
SHE-0100-5900-2000-5900

Hydro-Brake® Optimum

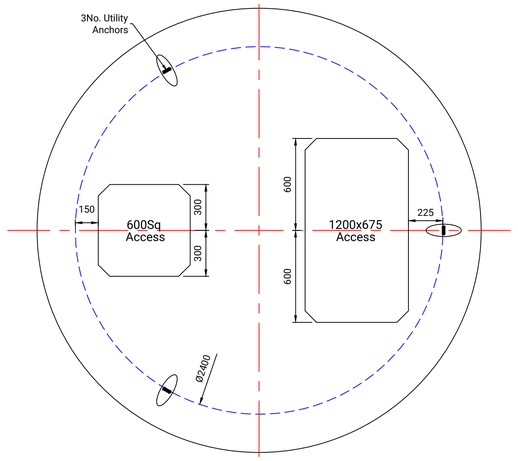
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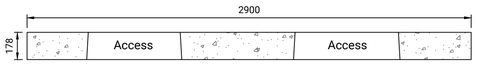
SECTION A-A



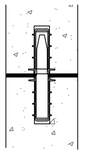
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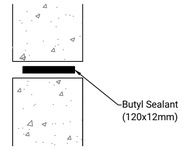
PLAN ON COVER SLAB



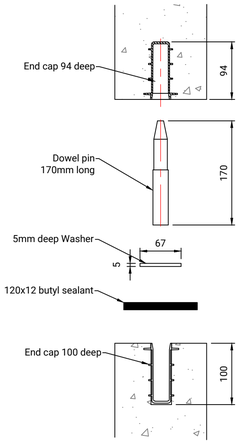
SECTION THROUGH COVER SLAB
Cover slab to have flat bottom



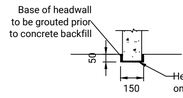
DETAIL A: ASSEMBLY (NTS)



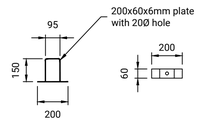
SLAB JOINT DETAIL
SITE JOINT DETAIL (NTS)



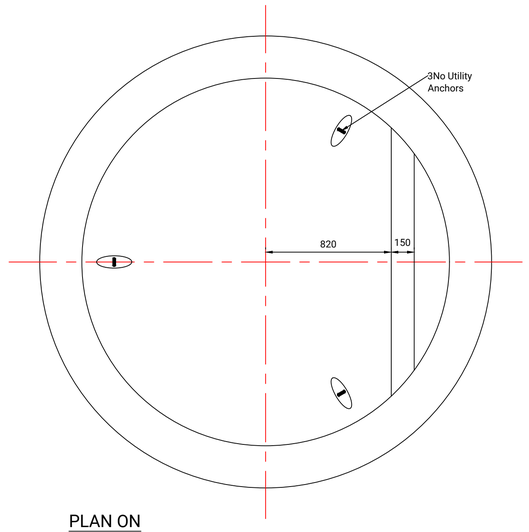
DETAIL A: COMPONENTS (NTS)



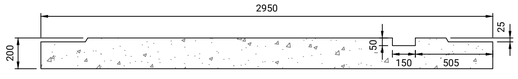
DETAIL B
BASE REBATE



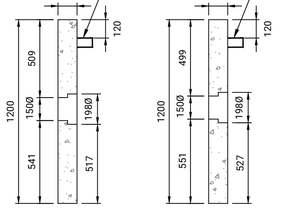
BRACKET DETAIL



PLAN ON BASE SLAB

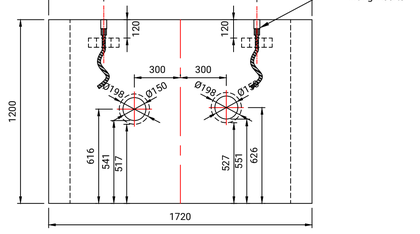


SECTION OF BASE SLAB

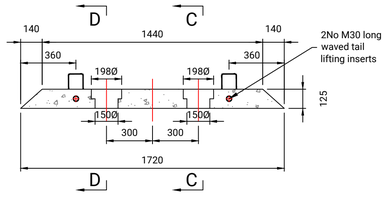


SECTION D-D

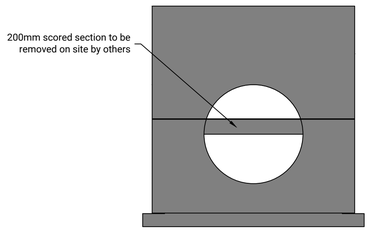
SECTION C-C



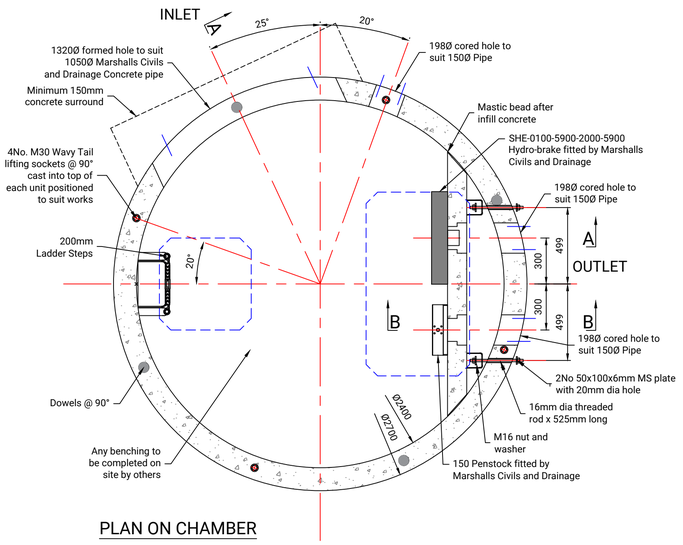
ELEVATION ON HEADWALL



PLAN ON HEADWALL



ELEVATION ON LARGE HOLE (nts)



PLAN ON CHAMBER

Ring number to be stencilled on outside face of each ring.

An external alignment line down the outside of each ring to be marked on the middle of the inlet hole

APPROX PRODUCT WEIGHTS

DN2400 Base Slab = 3.4t
DN2400x1.0m WMS = 3.0t
DN2400x1.25m WMS = 3.75t
DN2400x1.5m WMS = 4.5t
Headwall = 0.8t
DN2400 T1 Cover Slab = 2.5t

GENERAL NOTES.
This drawing is not to be scaled, figured dimensions only to be used. Any descrepancy to be reported to Marshalls Civils and Drainage.
All dimensions shown in millimetres
All levels shown in metres
Customer to confirm cover and invert levels and any inlet and outlet positions.
Hydrobrake & Penstock to be fitted to headwall at works.
Customer to confirm access sizes to cover slab

IN-SITU BASE:
Chamber unit to be installed on either:
Min. 200mm pipe granular bedding material being 5-20 graded 14, 20, 40mm single size suitably compacted to provide a level base. Alternatively a Class 6N or 6L material can be used.
or
200mm GEN 1 (C8/10) concrete. Base unit should be placed whilst concrete is wet so it can be set level otherwise a leveling screed of 15-20mm sand cement will be required to prevent point loading on the base unit.

SEQUENCE OF BUILD:

Install base slab in correct orientation onto prepared foundation (as above).
Orientate and lower first chamber ring onto butyl sealant.
Fit butyl sealant to top of ring, insert dowels and fit washer.
Orientate and lower remaining ring onto dowels.
Orientate and lower headwall onto butyl sealant in base groove and secure in place utilising 16dia rod and nuts and washers provided.
Sides of head wall to be pointed up using non shrink cementitious grout, such as Conbextra GP, at a trowelable consistency.
Grout up around all pipework apertures and allow to 'set' prior to any benching or infill.
Orientate and lower cover slab into position on butyl sealant.
Any benching to be completed on site.

LIFTING

ALL lifting operations should comply with the Lifting Operations and Lifting Regulations 1998, and the Provision and Use of Work Equipment Regulations 1998. The client/contractor will assume ALL responsibility for site lifting operations involving Marshalls Civils and Drainage products, including safe use and return of any lifting equipment supplied by Marshalls Civils and Drainage. Where available, the use of manufacturer installed lifting facilities is recommended.

DN2400 base slab weighs approx. 3.4 tonne max.
3No. utility anchors are cast into unit to facilitate safe lifting of unit (via lifting hooks).

DN2400x1.0m c/ring = 3.0 TONNES. 4No. M30 wavy tail sockets are cast into the top chamber section to facilitate safe lifting of unit (via M30 lifting hoops)

DN2400x1.25m c/ring = 3.75 TONNES. 4No. M30 wavy tail sockets are cast into the top chamber section to facilitate safe lifting of unit (via M30 lifting hoops)

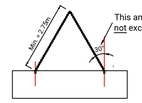
DN2400x1.5m c/ring = 4.5 TONNES. 4No. M30 wavy tail sockets are cast into the top chamber section to facilitate safe lifting of unit (via M30 lifting hoops)

DN2400 HD Type 1 Cover Slab c/w 1200x675 & 600Sq access access weighs approx. 2.5 tonne max.
3No. utility anchors are cast into unit to facilitate safe lifting of unit (via lifting hooks).

Headwall approx. weight 0.8 tonnes.
M30 lifting sockets are cast into the top of each wall section to facilitate safe lifting of units (via M30 articulated lifting loops).

Recommended lifting equipment is 4 legged hook and chain set (minimum chain length of 2.75m) appropriately SWL rated to lift maximum lift weight at 60 degrees.

LIFTING DIAGRAM:



Lift points are for lifting purposes only NOT for transport across site.

MINIMUM CONCRETE STRENGTH IS TO BE 25N/mm² AT TIME OF LIFTING

Rev	Revision Note	By	CHK	DATE

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Civils & Drainage
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Halifax HX5 9HT
03332 202735
www.marshalls.co.uk

Project & Project No: Parkmount Road, Manchester - 5944729
Client: Scott Parnell
Drawing Title: DN2400 WMS Flow Control Chamber S8 General Arrangement
Status: Approval

Drawn	Checked	Scale	Date
AF	-	1:20 @ A1	02.07.24

Drg. No. HB/X2462212-1/GA
Rev. -

A1 Size Border




2.4/1.0M WMS
RDC4 S-S-24
3-0T

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Creating Better Spaces

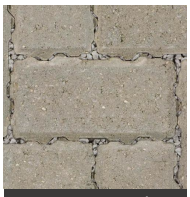
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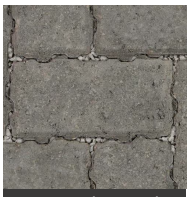
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F: 01422 312943
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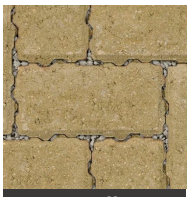
Priora 200 x 100 x 60

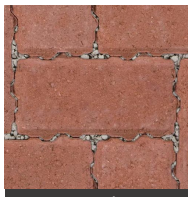
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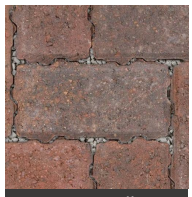


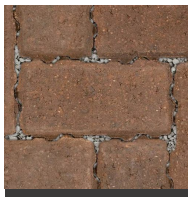

Priora - Natural

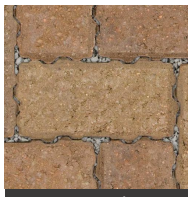

Priora - Charcoal

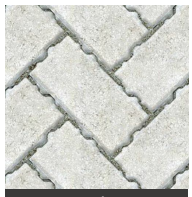

Priora - Buff


Priora - Red


Priora - Brindle


Priora - Burnt Ochre


Priora - Bracken


Priora - White Colour Top

Priora is Marshalls original Concrete Block Permeable Paving (CBPP) system, and the best selling system of its type in the UK. Combining the ever popular aesthetics of Keyblok block paving with a source-control SuDS solution, Priora not only looks great but also mitigates flood risk, removes surface water and improves water quality - without the need for additional linear drainage systems.

The Priora system has been proven over 10 years of successfully installed projects. The patented nib on the edge of the Priora blocks creates voids through which water falls into a specially prepared sub-base. The nibs also interlock to enhance surface stability.

Priora is available in 9 different colours and colour top marker blocks are available. A variety of laying patterns can be acheived using the 200x100 blocks.

As long as the sub-base is installed to Marshalls specification, Priora is suitable for all loading requirements.

DESCRIPTION	
Governing Manufacturing Standards	All data where relevant to be established in accordance with BS EN 1338 : 2003
CE Marking/DOP	https://www.marshalls.co.uk/dop
NBS Specification	Q24 115

UK Supplychain Supplier Qualification Scheme 2018
UN Global Compact WE SUPPORT
bsi. ISO 45001 Occupational Health and Safety Management
bsi. ISO 14001 Environmental Management
bsi. ISO 9001 Quality Management
The Global Compact
Ethical Trading Initiative Member Respect for workers worldwide
Made in Britain
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Living Wage Foundation
Fair Tax
Business in the Community
We're supporting mind for better mental health

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Priora 200 x 100 x 60

Date Created: 07/02/19

PHYSICAL PROPERTIES

Tolerances	Minimum (mm)	Maximum (mm)
Length	198	202
Width	98	102
Thickness	57	63
Work Dimensions (mm)	200 x 100 x 60	
Nominal Dimensions (mm)	200 x 100 x 60	
Tolerances on Work Dimensions (mm)	Length ±2mm, width ±2mm, thickness ±3mm	
Abrasion Resistance (mm)	≤ 23mm (Wide Wheel Abrasion Test)	
Durability (Freeze-thaw)	≤ 1.0 kg/m² as a mean with no individual value > 1.5 kg/m²	
Tensile Splitting Strength	Characteristic tensile splitting strength not less than 3.6 MPa. None of the individual results shall be less than 2.9 MPa, nor have a failure load less than 250N/mm of splitting length	

SPECIFICATION

Approx unit weight (kg)	3.5
Reaction to fire	Class A1, see commission decision 2000/605/EC

SUSTAINABILITY

Breeam	These units can achieve an "A" rated system when used in conjunction with the correct sub-base components
Carbon Footprint	
Priora 200 x 100 x 60 Natural	15 kg CO2 m²
Priora 200 x 100 x 60 Charcoal	15 kg CO2 m²
Priora 200 x 100 x 60 Buff	15 kg CO2 m²
Priora 200 x 100 x 60 Red	15 kg CO2 m²
Priora 200 x 100 x 60 Brindle	15 kg CO2 m²
Priora 200 x 100 x 60 Burnt Ochre	15 kg CO2 m²
Priora 200 x 100 x 60 Bracken	15 kg CO2 m²
Priora 200 x 100 x 60 Colour Top White	18 kg CO2 m²

APPLICATION

Loading Classification	Category 5 - 1 large goods vehicle per week (0.015 msa)

SITE WORKS

Coverage	50 no per m²

SUPPLY

Av. pack size (m2)	8.1
Av. pack weight (kg)	1080
Packaging	All packs are shrinkwrapped onto pallets for fork off-load or crane off-load if necessary

FURTHER INFORMATION

Contact Us	For technical information on the design, specification and construction when utilising the product, contact the Technical Advisory Services Department on 0370 411 2233

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bsi. ISO 14001 Environmental Management
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We're supporting mind for better mental health

Types of Permeable Paved Systems

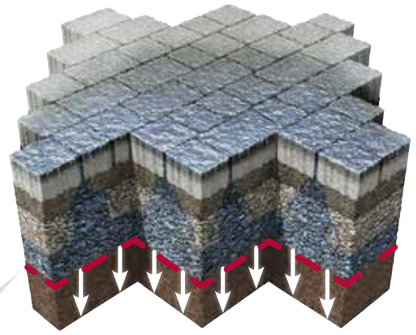
A Priora permeable system can be installed onto the vast majority of ground types in the UK. However, there are three different types of permeable system, which differ largely in the way that the attenuated water is released.

Type A

In this type of system the rain water percolates through the joints between the blocks, then through the bedding layer and into the sub-base material where it is temporarily stored within the voids between the individual stones. The water then slowly infiltrates into the underlying ground and will eventually find its way through the bedrock into the river systems. This means that 100% of the surface water run-off is dealt with on site.

Type A systems can only be used where the underlying ground conditions have sufficient permeability (infiltration rate) and where adding water to the subgrade will not adversely affect the bearing capacity of the ground.

Zero Discharge

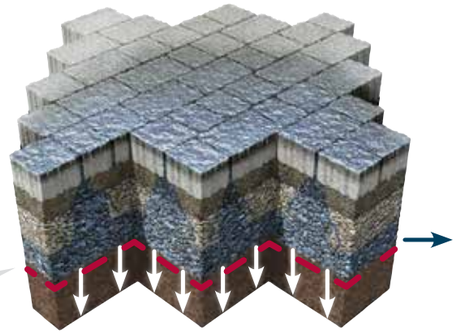


New Marshalls MT120 Filtration Textile
– see page 48 for details

Type B

This type of system is more suited to ground conditions where some permeability exists, but the infiltration rate is so slow that the calculated depth of the sub-base becomes very deep and therefore prohibitively expensive. In a Type B system the water enters the pavement as in Type A, and some of the water will infiltrate into the underlying ground, but some will exit the system by means of a restricted outfall pipe into a storm water sewer or further attenuation system.

Some Discharge

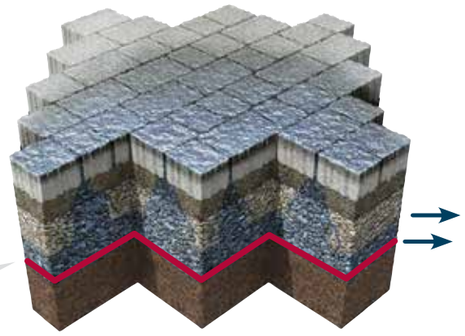


New Marshalls MT120 Filtration Textile
– see page 48 for details

Type C

This type of system is suited to ground conditions where the infiltration rate is very low. It is likely in these cases that the subgrade material would be weakened by the addition of rainwater and should be protected by **Marshalls MM380 Tanking Membrane**. In a Type C system the water enters the pavement as in Type A and B systems but will exit by means of a restricted outfall pipe (or flow control device) into a storm water sewer or further attenuation system.

Total Discharge



New Marshalls MM380 Tanking Membrane
– see page 47 for details

Which type of system is right for me?

The type of system which is suitable for your site will be dependent on a number of factors, such as ground conditions and Environment Agency or local authority planning restrictions.

Type A systems are the ideal SuDS solution because they offer the designer 'Zero Discharge'. This type of system is suited to silt or sand based soils with reasonably high infiltration rates.

However, in some cases the ground conditions will dictate that no infiltration will be possible and therefore a Type C system will be the only option for the designer. The ground may be:

i. Mainly clay which would form an impervious barrier.

ii. Sealed, contaminated ground.

iii. Above a known protected aquifer.

Type B systems are the middle ground for infiltration rates that are quite low (ie the half drain time is between 24 and 48 hours). In these cases the rain water from a previous storm may still be clearing through the system as the next storm begins and so an outfall is added to the system to reduce the drain time.

As a guide to selection of the correct type of system the table, below is an extract from Interpave's *Guide to the Design, Construction and Maintenance of Concrete Block Permeable Pavements*.

Table I

		System A Total Infiltration	**System B** Partial Infiltration	**System C** No Infiltration
Permeability of subgrade (m/s)	better than 10^{-6}	✔	✔	✔
	between 10^{-6} & 10^{-8}	✘	✔	✔
	worse than 10^{-8}	✘	✘	✔
High ground water table (within 1000mm of finished formation)		✘	✘	✔
Pollutants present in subgrade		✘	✘	✔

What type of soil do I have?

The two soil related variables within a permeable paving design are the permeablility and the bearing capacity. In some cases this information can be obtained from the soil investigation which is carried out on a site prior to development.

In the case of permeability the report would usually state an infiltration rate in metres per second. For example, silty clay soils would normally provide an infiltration rate of approximately 10-9 or 10-8 m/s.

A BRE Digest 365 soil test will determine the permeability of the soil.

The measurement of the grounds bearing capacity (ie the ground's ability to withstand loads without displacement) can also be found within the soil report. It would usually be stated as either a CBR (California Bearing Ratio) or as an undrained shear strength, Cu.

Structural Design for Priora Pavements

Permeable Paving Structural Design Philosophy

Priora pavements contravene many of the traditionally accepted principles of pavement design. In particular, one of the objectives of a conventional pavement is to create an impermeable surface so that moisture ingress cannot weaken components of the pavement or the underlying subgrade. Many highway pavement specifications are predicated upon the requirement to keep the specified materials dry.

The deliberate cascading of water through highway construction materials requires a radical approach to the selection of material thickness and properties. This impacts two areas of design. Firstly, an alternative approach is required for the assessment of loading. Secondly, material properties need to be selected taking into account the flow of water vertically downwards and the retention of water within the material. This means that the traditional structurally beneficial effects of fine materials will have to be foregone and an alternative methodology will be required to ensure stability, strength and durability.

Traditionally, highway pavement loading has been assessed in terms of the number of 8000kg Equivalent Standard Axles (ESAs) that a pavement will be required to withstand throughout its life. The loads applied to a pavement usually differ significantly from 8000kg, but research has shown that axles of other load values can be equivalenced to standard ones. The Fourth Power Law is often used to equivalence a given axle load to a standard axle. In the case of permeable pavements, an alternative approach is required: one that assesses loading in terms of the maximum load that a pavement can be expected to withstand.

The reason for this alternative approach is that Priora pavements are designed on the basis of ultimate limit state analysis up to the standard axle load, and thereafter by serviceability limit state analysis.

The research work carried out by Marshalls at NUROLF (Newcastle University's Rolling Load Facility) was used as the basis for this design approach. A paper detailing this work is available from Marshalls Technical Department.



Finite element analysis desktop study



Full scale testing at NUROLF

How to Design a Priora Sub-Base

Worked example on page 58

1. Calculate sub-base composition based on **loading** requirements

Establish traffic loading from Table II, page 54

Determine Priora sub-base depths and specification from Table III, page 54

Determine subgrade strength and requirement for subgrade improvement via a capping layer from Table V, page 56

Consider site traffic

2. Calculate sub-base composition based on **hydraulic** requirements

Determine site location and storm return period

Establish what Type of Priora pavement (Type A, B or C) from soil infiltration data Table I, page 50

Determine hydraulic design parameters for site location and storm return period allowing for the effects of climate change

Determine depth of Priora sub-base from Table VI, page 57

3. Having calculated two different designs for both structural and hydraulic requirements, your final Priora Design will be the higher of the two results.

Structural Design for Priora Pavements

Stage One – Determination of Traffic Loading Category

Levels of traffic loading need to be assessed so that the pavement can be placed into one of nine load categories as shown in the table below:

Table II

Load Category	Traffic Type	Anticipated Axle Load (kg)
1	Domestic (GVW=2,000kg)	1000
2	Cars & Light Vans (GVW=3,500kg)	2000
3	Light Commercial (GVW 7,500 kg)	2000
4	Emergency large goods vehicles only (100 Standard axles)	8000
5	One large goods vehicle per week (0.015msa)	8000
6	Ten large goods vehicle per week (0.15msa)	8000
7	100 large goods vehicles per week (1.5msa)	8000
8	1.5 to 4 msa	8000
9	4 to 8 msa	8000
10	1,000 large goods vehicles per week (15msa)	8000
11	Heavy Duty Pavements for Ports or similar	DOA

Stage Two – Determination of Sub-Base Depth

The structural depth and specification of the sub-base is then determined from the table below:

Table III

Load Category	DBM Thickness (mm)	Alternative HBM Thickness (mm)	OGCR Sub-base Thickness (mm)
1	--	--	150
2	--	--	200
3	--	--	275
4	--	--	300
5	70	100	150
6	90	125	150
7	115	175	150
8	200	275	150
9	200	275	150
10	200	275	150
11	DOA	DOA	150

Structural Design for Priora Pavements

Stage Three - Determination of Subgrade Strength and the Requirement for a Capping Layer

The specification of a permeable pavement depends upon the properties of the subgrade, the ground directly beneath a pavement. Strength and permeability of the subgrade are interrelated - a wet subgrade is usually a weak subgrade.

The following tests are recommended on the soil samples, especially if the soil has clay content. These assist in evaluating the soil's suitability for supporting traffic in a saturated condition while exfiltrating.

1. Soil classification
2. Moisture content in percent.
3. Soaked CBR

The table below, using the Unified Soil Classification System (USCS), shows typical ranges of Californian Bearing Ratio (CBR) that can be expected although CBR values should be established using soil investigation techniques.

Table IV

USCS – Soil Classification	Shearing strength when compacted	Compress-ibility	Typical CBR range
GW-well graded gravels	Excellent	Negligible	30 to 80
GP-poorly graded gravels	Good	Negligible	20 to 60
GM-silty gravels	Good	Negligible	20 to 60
GC-clayey gravels	Good to fair	Very low	20 to 40
SW-well graded sands	Excellent	Negligible	10 to 40
SP-poorly graded sands	Good	Very low	10 to 40
SM-silty sands	Good	Low	10 to 40
SC-clayey sands	Good to fair	Low	5 to 20
ML-inorganic silts of low plasticity	Fair	Medium	2 to 15
CL-inorganic clays of low plasticity	Fair	Medium	2 to 5
OL-organic silts of low plasticity	Poor	Medium	2 to 5
MH-inorganic silts of high plasticity	Fair to poor	High	2 to 10
CH-inorganic clays of high plasticity	Poor	High	2 to 5

If the subgrade CBR is 5% or greater, the sub-base can be installed without any capping layers. In poorer ground conditions, a capping layer should be used as shown in the table on the following page. A distinction is made between Types A, B or C systems when considering the capping layer depth, as the material used for the capping layer will be different.

Structural Design for Priora Pavements

Table of Capping Layer Thickness

Table V

Subgrade CBR Value	Capping Layer Thickness Type A & B Systems (mm)		Capping Layer Thickness Type C Systems (mm)			
	Open Graded Crushed Rock		Open Graded Crushed Rock or MOT Type 1		Capping Material	
	Without MG15 Grid	With MG15 Grid	Without MG15 Grid	With MG15 Grid	Without MG15 Grid	With MG15 Grid
5%	--	--	--	--	--	--
4%	100	--	100	--	150	--
3%	125	100	125	100	225	150
2%	175	125	175	125	350	225
1%	300	175	300	175	600	350

The choice of capping layer material will vary with the type of Priora pavement. For Type C systems, the capping layer is often but not always placed below the impermeable membrane. Guidance on the choice of material is given on page 59.

Marshalls MG15 Grid confines individual elements of Priora aggregate, which stabilises the pavement structure. Placing the MG15 Grid at the interface of the subgrade and the capping layer has the effect of improving the CBR by 1%. This can reduce the depth of the structure which either provides a financial saving, or in places where excavation depths are limited, can make a permeable pavement a viable option where it wasn't previously. Note that hydraulic considerations should still be taken into account.

Stage Four - Consideration of the Impact of Site Construction Traffic

Where a Priora pavement is required to carry site or construction traffic prior to completion, consideration must be given to avoiding contamination of the sub-base. Measures should be taken to avoid this such as:

- Consider the construction process during design and identify areas and routes for construction traffic that avoid the Priora sub-base areas.
- Where this is not possible, construct the Priora sub-base and then cover it with a sacrificial layer of geotextile and hardcore (100mm thick). This can be removed prior to the installation of the laying course and blocks.
- For a Type C system, construct a normal capping layer and use this as the temporary road surface. Construct the permeable pavement over it towards the end of construction.
- Construct the permeable sub-base and then cover it with an impermeable layer of a minimum of 80mm Dense Bitumen Macadam (DBM). Use this as the temporary road surface. Guidance on the specification of this material is given on page 61.

Hydraulic Design for Priora Pavements

Hydraulic requirements are frequently calculated using modelling software such as Micro Drainage's Win*Des*® (www.microdrainage.co.uk). These packages will take into account a wide range of rainfall frequencies and intensities as well as the topography of the site. The following provides the methodology behind arriving at a hydraulic calculation.

The volume of water entering a Priora pavement is often greater than the water percolating into the subgrade or being slowly discharged to a secondary system. As such a degree of surface water storage will be required. The volume of water storage within a Priora pavement sub-base is calculated on the basis of:

Water In – Water Out = Storage Volume Required

The volume of water storage can be calculated using the Wallingford procedure and software packages are available to quickly and efficiently calculate for a variety of storm durations. The following tables can be used as a guide only to the sizing of the sub-base; they are conservative indications and more accurate (shallower) solutions can be calculated. The following is assumed in these tables:

1. **The Priora sub-base has a void ratio of 32%**
2. **Discharge rate for types B and C systems are limited to 5 l/s/ha**
3. **The Priora pavement has no impermeable area draining into it**
4. **The site is level with no falls within the pavement**

Table VI

Sub-base Depth (mm)				
M5-60	r	1 in 30 year storm	1 in 100 year storm	1 in 100 year storm + 30%
20	0.4	120	160	210
20	0.3	140	190	250
20	0.2	180	250	330
19	0.4	110	150	200
19	0.3	130	180	230
19	0.2	170	240	310
18	0.4	100	140	180
18	0.3	120	170	220
18	0.2	160	220	290
17	0.4	100	130	170
17	0.3	110	160	210
17	0.2	150	210	270
16	0.4	100	120	160
16	0.3	100	150	200
16	0.2	140	200	260
15	0.4	100	110	140
15	0.3	100	140	180
15	0.2	120	180	230
14	0.4	100	100	130
14	0.3	100	130	170
14	0.2	110	170	220

M5-60 is the anticipated rainfall for a storm of 60-minute duration that is likely to occur once in 5 years.
"r" is the ration of a 60-minute to a 2 day rainfall depth for a 1 in 5 year storm return period.

Worked Design Example

In this example, we will assume that the project is an estate access road which will be subject to occasional, infrequent heavy loading from vehicles such as dust carts or delivery wagons. The subgrade has a CBR value of 3%.

1. Calculate sub-base composition based on loading requirements	2. Calculate sub-base composition based on hydraulic requirements
Traffic loading is assumed as one HGV (dust cart) per week which is loading category 5. See Table II, page 54	Storm return period -- 1 in 100 years (plus 30% for climate change). Site location – Greater Manchester
The DBM and OGCR thicknesses are: 70mm DBM, 150mm Open Graded Crushed Rock And the proposed construction is: 80mm Priora, 50mm Bedding Layer, 70mm DBM, 150mm Open Graded Crushed Rock	Subgrade permeability – 1.0 x 10-9 m/s A Type C system will be chosen as the soil permeability is low; MM380 Tanking Membrane will be located below the pavement
A capping layer depth of 225mm is taken from Table V, page 56	From the Wallingford Procedure document for a site in Manchester M5-60 = 18mm, r = 0.4
Due to ground conditions, the site trafficking on top of the DBM layer will be an acceptable option and will avoid contamination of the sub-base and capping layers	Refer to Table VI, page 57 Select 180mm

The depth of the Priora system will be 180mm, as this is the higher of the two models.

As we have a Type C system, the capping layer would generally be located below the impermeable membrane and a "type 1" material used. If however, the hydraulic requirement called for a greater depth than the 150mm open graded crushed rock sub-base, the same open graded crushed rock material would be used as the capping layer and it would be located above the impermeable membrane.

Assuming that the 150mm sub-base is not sufficient from hydraulic considerations and the storage depth needs to be increased, say to 170mm, the construction now becomes:

80mm Priora

50mm Bedding Layer

70mm DBM

170mm Open Graded Crushed Rock (150mm + 20mm)

Impermeable Membrane

330mm Type 1 Capping Layer (350mm – 20mm)

Subgrade

Materials

Subgrade Improvement/Capping layer

A subgrade improvement (capping layer) will be required to improve the bearing capacity of weak ground. Consideration towards the use of sub-base reinforcement such as geogrids or confinement systems to reduce capping depths should be given; they may also prevent migration of the capping layer in to the formation. Alternatively subgrade improvement techniques, such as lime or cement stabilisation, can be used.

Capping Layer Material

Where the CBR for the subgrade is less than 5% then a capping layer will be required. The material should be of a suitable quality to create a firm working surface so that the overlying materials can be installed correctly. The capping materials should, as a minimum, meet the requirements of 6F5 of Table 6/5 of Highways Agency *Specification for Highways Works – Series 600 – Earthworks*. On site recycled material can be used provided that it meets the specification for 6F5. Our guideline capping layer depths have been calculated by using the same material as the sub-base.

MM380 Tanking Membrane

Marshalls MM380 Tanking Membraneis manufactured from a unique polymer blend to create the ideal material for tanking a non-infiltration ("Type C") permeable pavement. It is stronger than the market leading impermeable membrane. It is also thinner and lighter, making it easier to transport, handle and roll out. It comes double folded to minimise storage requirements.

Should you require specialist advice regarding, for example, gas permeability or radon barriers, please speak to you local Marshalls engineer who will work up an appropriate solution according to your specific requirements.

nb: Marshalls has not tested any other impermeable membrane option within its sub-base designs. Using an alternative impermeable membrane will invalidate the Marshalls design warranty.

MG15 Grid

Marshalls MG15 Gridhas been developed with the UK's market leader to provide optimal performance within a Priora sub-base. The apertures on the grid are the optimal size for 20mm Priora aggregate to interlock with, and the rectangular profile of the ribs maximise interlock with the broken faces of the Priora aggregate.

The Marshalls team will be happy to provide designs both with and without MG15 Grid, and discuss options with you to ensure that you receive the best installation advice for your project.

nb: Marshalls has not tested any other geogrid option within its sub-base designs. Using an alternative geogrid will invalidate the Marshalls design warranty.

MT120 Filtration Textile

Marshalls MT120 Filtration Textile has been developed to both maximise the cleansing properties of the Priora system and to provide a separation layer preventing aggregate migration between sub-base components. It should be installed directly above the subgrade in all Type A (infiltration) and & Type B (partial infiltration) systems, and when specified it can also be included directly below the laying course in all system types in order to improve the quality of water that flows through it.

nb: Marshalls has not tested any other geotextile option within its sub-base designs. Using an alternative geotextile will invalidate the Marshalls Design Warranty.

Priora Aggregate Specification
Sub-base Material

Open graded materials are required to allow storage of the surface water within the pavement construction.

The Open Graded Crushed Rock (OGCR) or Open Graded Crushed Gravel (OGCG) sub-base should have a porosity of at least 0.32 to allow void space for water storage. The structural strength of the materials should be adequate for the loads to which it will be subjected. The OGCR or OGCG sub-base should be in accordance with BS 7533-13:2009, *Pavements constructed with clay, natural stone or concrete pavers – Guide for the design of permeable pavements constructed with concrete paving blocks and flags, natural stone slabs and setts and clay pavers.*

In the case of natural aggregate, the OGCR or OGCG sub-base should comprise coarse graded crushed rock or gravel meeting the following requirements:

The flakiness index, shell content and mechanical properties should be as set out in BS EN13242: 2002 for coarse graded crushed rock or gravel.

Materials

Providing the above criteria are met, the OGCR or OGCG sub-base material will have a porosity of at least 0.32 and offer a storage capacity in its voids typically of 30% to 40%. A 40% void space means that the volume of the OGCR or OGCG sub-base will need to be 2.5 times the volume of the water stored. The infiltration rate through 20mm graded crushed rock sub-base is over 70,000 litres/hectare/sec and this should be compared with the required value of 180 litres/hectare/sec.

In addition, the material should meet the grading requirements as shown in Table VII.

Due to the relationship between the grading curve of the OGCR or OGCG sub-base material and the laying course material, a geotextile between these layers may not necessarily be required.

As the OGCR is also a structural element of the pavement the stone itself must be able to withstand the loadings over the life of the pavement, to enable this there are minimum physical properties the aggregates should reach (Table VIII).

OGCR and OGCG Sub-base Gradings

Table VII

Grading Requirements	
Recommended BS EN 12620 aggregate grading (mm)	4/20
Recommended BS EN 12620 grading / tolerance category	Gc80/20 GTc20/15

Table VIII

Grading Details	
Sieve size (mm)	Percentage by mass passing ISO 565 sieve
31.5	98 to 100
20	90 to 99
14	
10	25 to 70
6.3	
4	0 to15
3.15	
2	0 to 5

OGCR and OGCG Physical Properties

Table IX

Properties	Category to BS EN 13242 or BS 12620
Grading	4/20 (preferred) or 4/40, Gc 85-15, GTc 20/17.5
Fines Content	f4
Shape	FI_{20}
Resistance to Fragmentation	LA_{30}
Internal Angle of Friction	40˚
Durability: Water absorption to BS EN 1097-6:2000+A1:2005, Clause 7 – for WA>2% - Magnesium sulphate soundness.	$WA_{24}2$ MS_{18}
Resistance to wear	$M_{DE}20$
Acid Soluble sulphate content: -aggregates other than air cooled blast furnace slag and -air cooled blast furnace slag	$AS_{0.2}$ $AS_{0.1}$
Total Sulphur: -aggregates other than air cooled blast furnace slag and -air cooled blast furnace slag	≤1% by mass ≤2% by mass
Volume stability of blast furnace and steel slags: air cooled blast furnace slag -steel slag	Free from dicalcium silicate and iron disintegration in accordance with BS EN 13242:2002+A1:2007, 6.4.2.2. V_5
Leaching of contaminants	Blast furnace slag and other recycled materials should meet the requirements of the Environment Agency "Waste Acceptance Criteria" A) for inert waste when tested in accordance with BS EN 12457-3
A) Guidance on waste acceptance criteria for inert waste is given in the Environment Agency's Guidance for waste destined for disposal in landfills	

Should an alternative sub-base material be proposed, the material should at least achieve if not exceed the performance requirements of the OGCR or OGCG discussed above and any restrictions imposed by the Environment Agency or relevant party. It will be the responsibility of the proposer to prove the suitability of the alternative material and provide any necessary confirmations.

Cement Stabilised Open Graded Crushed Rock

Open-graded road base material may be stabilised with cement prior to placing. The use of cement will reduce the storage capacity of the road base, but stabilisation may be necessary to increase its structural capacity. This will allow the Priora pavement to receive more heavily trafficked pavements and use within heavy-duty applications.

The bound material should comply with the requirements given in BSEN 14227-1:2004. *Hydraulically bound mixtures – Specifications – Part 1: Cement bound granular mixtures*.

To maintain high void space, only enough cement to coat the aggregate is required and care should be taken not to fill the voids with excess paste. The minimum amount of Portland cement required is 3% by mass. The water-cement ratio should be controlled to make a paste to coat the aggregate.

Aggregates shall be naturally occurring crushed rock material with an absorption value no greater than 2%. The materials shall retain all of their strength when saturated and the grading shall fall within the following range:

Table X

Sieve size (mm)	Percentage Passing %
40	100
31.5	98-100
20	90-99
10	25-70
4	0-15
2	0-5

Material strength should meet Strength Class C5/6 (As defined in Table 2 of BS EN 14227-1:2004.)

The material permeability should be in the region of 20,000mm/hr and the Elastic Modulus should be in the region of 10,000N mm^2.

DBM

The DBM (Dense Base Macadam) can be installed within the design where additional structural support or temporary running surface is required for site traffic over the recently laid 20mm Priora sub-base aggregate.

The material should be a 0/32mm size dense base as given in BS4987-1:2005, *Coated macadam (asphalt concrete) for roads and other paved areas – Part 1: Specification for constituent materials and for mixtures,* clause 5.2. Typically the binder will be a 50 pen according to clause 4.7 of BS4987-1:2005 but can vary dependent on loading conditions.

Priora Laying Course Aggregate Specification

The large size of sub-base material aggregate creates an uneven surface when compacted and has an open textured surface. The laying course material provides a flatter platform onto which the blocks are laid, to prevent any rocking or instability of the blocks in-situ.

The Priora Laying Course should be graded as below:

Table XI

Laying Course Grading	
Recommended BS EN 12620 aggregate grading (mm)	2/6.3
Recommended BS EN 12620 grading / tolerance category	Gc80/20

Table XII

Grading Details	
Sieve size (mm)	Percentage by mass passing ISO 565 sieve
31.5	
20	
14	100
10	98 to 100
6.3	80 to 99
4	
2	0 to 20
1	0 to 5
0.063	0 to 2

BS 7533-13:2009 states that only the grading of the laying course should be tested, as it is not possible to test to the same physical properties of the sub-base aggregate but the source material of the 2-6.3mm should achieve the same values.

Priora Permeable Pavement Installation

Guidelines for the flexible installation of Marshalls Priora Concrete Block Paving

Scope

These guidelines cover the construction of modular permeable pavements using Marshalls Priora, Tegula Priora, Mistral Priora and Olde Priora concrete block paving and are in accordance with Interpave's (The Precast Concrete Paving and Kerb Association) document *Permeable Pavements; Guide to the Design, Construction and Maintenance of Concrete Block Permeable Pavements (Edition Five, Dec 2007)*.

Products Included

Marshalls Priora, Tegula Priora, Mistral Priora, Olde Priora, Pencil Edge Priora, La Linia Priora, Myriad Priora, Conservation Priora and Priora Flag concrete block or flag paving of 60mm, 65mm and 80mm nominal thickness, are manufactured in accordance with BS EN1338: 2003 *Concrete paving blocks – Requirements and test methods*.

Health and Safety Information

All relevant health and safety information, including COSHH data sheets can be obtained from Marshalls Advisory Services. For more information please email:
advisory.services@marshalls.co.uk
Or telephone: **0845 30 20 606**

Marshalls recommend that all installers produce site specific health and safety Risk Assessment and Method Statement for all projects.

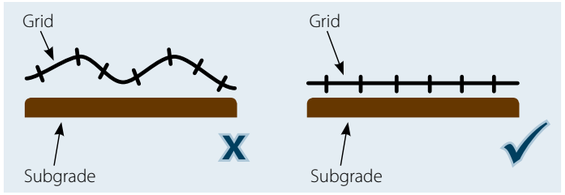
Installation

1. Excavation

Once the area for the CBPP has been cleared it will require excavation down to the invert of the pavement design.

2. MG15 GridInstallation (if required)

Roll out Marshalls MG15 Grid onto the subgrade, overlapping ends and edges by 30cm. Care should be taken to ensure that the Grid is NOT UNDER COMPRESSION when laid. If possible, put the Grid UNDER TENSION (peg it out and pull it taught) as it is laid.It



may be useful to weigh down ends and edges of MG15 Gridto prevent it from rolling back up. Cut away excess with a sharp knife or scissors.

MG15 Grid Maintenance: It may occasionally be necessary to perform repairs to MG15 Grid, or remove a section to access services etc. In these instances:

Excavate the sub-base material to an area of 50cm around the edge of the area to be removed. Cut away the required area of MG15 Grid, following the line of the ribs. Replace the subgrade to the correct level beneath the cutaway section. Apply a section of MG15 Grid large enough to cover the removed section and also provide a 30cm overlap all the way around. Ensure that the replacement section is not under compression. Carefully replace the sub-base aggregate



3. Lay Capping Layer (if required)

If the site has a CBR of 5% or less then you will require a capping layer. There are two options for this:

Non-Infiltration: If you are constructing a non-infiltration system then you can use an impermeable capping layer like MOT Type 1. This will reduce construction depth marginally but mainly decrease cost. You can use permeable sub-base as a capping layer and this will increase the storage capacity of the system. If using a permeable sub-base the MM380 Tanking Membraneshould be placed at the invert of the capping layer.

Marshalls MM380 Membrane: As a rule of thumb, order a quantity of MM380 Tanking Membraneequivalent to the surface area of the job plus 30% (to account for overlaps, wastage and cuts). Rolls of MM380 should be rolled out and unfolded over the required area, overlapped by 30cm, and jointed using Marshalls Jointing Tape. In situations where leakage is unacceptable (for example, on contaminated ground), welding of the joints can be arranged. Please speak to your Marshalls engineer who can put you in touch with a local welding crew. One piece "top hat" units should be installed around outfalls to prevent leakages – installation instructions are provided with each unit.



Infiltration: If you are constructing an infiltration system the capping layer should be the same as the 20mm OGCR permeable sub-base as detailed in the materials section.

All materials should be compacted in layers not exceeding 150mm in thickness or twice the nominal maximum aggregate size. All conventional rollers can be used for compaction but these should not be vibrating. This avoids over compaction as it is important to retain a void ratio of 32%. As all sites and materials differ it is recommended that a trial be conducted. Installers should aim to achieve a tolerance of +20mm to -30mm from specified levels when installing the capping layer.

For example, create a 1m^2 150mm deep excavation lined with an impermeable membrane, fill with sub-base aggregate and compact. The filled cavity should now take 48 litres of water.

Priora Permeable Pavement Installation



4. Construct any edge restraints and baffles

Edge restraints should be sufficiently robust to resist the lateral displacement from imposed loadings placed upon the pavement. The edge restraint may take the form of associated fittings, walls or buildings or be formed from precast concrete, clay or natural stone kerb systems, either existing or newly constructed features. The restraint must provide a consistent vertical face to a level below the laying course material.

Where an impermeable membrane is being used the surface of any concrete haunching must be smoothed off to prevent any puncturing of the membrane

Modular edge restraints systems should be laid onto a suitable base of sufficient strength to withstand vehicular over-run. Units may be mortared to the suitable base and incorporate either a mortar joint, or narrow gap of trowel width.

The surface course of the pavement should not be vibrated until such time as the edge restraint has gained sufficient strength to resist the lateral imposed loads.

Where mortar bedding and jointing is adopted, consideration should be given to the provision of movement joints at regular intervals.

Where an intermittent restraint may be required, the edge restraint's base material may be laid directly onto the open-graded sub-base material. Should any concern exist about the restraint bedding material compromising the voidage of the open-graded sub-base material, a suitable lining material can be used, separating the two materials.

There are several examples of edge restraint construction within the standard construction details which can be found at the end of this section.

Baffles are constructed when there is a significant surface fall across the CBPP. These should be constructed in concrete and in non-infiltration systems, a pipe should be placed at the invert of the sub-base through the concrete to allow the water to flow towards the outfall. A standard construction detail can be found at the end of this section (TS-0525).

Due to certain ground conditions, infiltration may not always be an option therefore an impermeable membrane is required. The water within the sub-base should be removed via a fin drain or a network of perforated pipes laid to falls.

The water should then flow through a suitable outflow pipe. The size of the pipe will be dependent on the site topography and the volume to be drained. Directly beneath the impermeable membrane, dependent on the site conditions, a sand blinding layer may be included to achieve greater flatness and reduce any potential puncturing of the membrane. Any sharp or protruding features at formation level that may promote the puncturing of the membrane should be removed and the remaining area made good.

5. Construct Outfall (if required)

There are a number outfalls that can be installed into a permeable pavement; these should be positioned at the low point of the sub-base construction. Some examples of outfall constructions can be found in the standard details section.



6. Install Sub-base Material

The sub-base will consist of 20mm OGCR as detailed in the materials section and will be laid in the same manner as the capping layer section. Installers should aim to achieve a tolerance of +/- 20mm from specified levels when installing the sub-base layer.



7. Install DBM Layer (if required)

A DBM (Dense Bitumen Macadam) layer is sometimes included in the pavement design to provide additional structural support. This is usually wet poured on site, and once set, punctured or drilled at regular intervals to ensure that water can permeate the layer.

The DBM (Dense Base Macadam) can be installed within the design where additional structural support or temporary running surface is required for site traffic over the recently laid 20mm Priora sub-base aggregate.

The material should be a 0/32mm size dense base as given in BS4987-1:2005 *Coated macadam (asphalt concrete) for roads and other paved areas – Part 1: Specification for constituent materials and for mixtures,* clause 5.2. The binder penetration will be specified in our design documents.

Installation considerations

It is important to ensure the site tipped DBM is correctly protected and sheeted from adverse weather, to guarantee correct material laying temperature is maintained.

On larger areas, generally machine laid by tracked mini (7 tonne) or midi (14 tonne) paving machine, subject to laying width or output requirement, material normally supplied to paving machine hopper by 9 tonne front tip dumpers.

Disturbance to the 20mm aggregate can be kept to a minimum by ensuring both paving machine and dumper keep to one laying track. Dumpers must avoid crossing this laying path or excessive wheel turning, which can cause aggregate rutting.

Any disturbance to the 20mm stone can easily be raked and re-levelled by labour or rake hands as the surfacing progresses.

Installers should aim to achieve a tolerance of +/- 20mm from specified levels when installing the DBM layer.

See page 61 for puncturing specification.

Surface Preparation

After the DBM has served its use as a temporary site access or storage area and site access has finished, the DBM surface must be thoroughly cleaned of all contamination by sweeper or pressure cleaning.

Once this has been completed and the existing surface is clean, connection between the 6mm bedding aggregate and the Priora 20mm sub-base is achieved by either core cutting or drilling 75mm diameter holes at 750mm centres through the compacted DBM layer, these are then carefully filled with the Priora 6mm bedding stone.

In the event of any delay between the holes being cut through the DBM and being filled with 6mm aggregate a temporary stopper or bung should be inserted to prevent any possibility of debris entering or clogging the new connections.

8. Install MT120 Filtration Textile (if required)

Independent testing at Coventry University demonstrates that Marshalls MT120 Filtration Textile maximises the water cleansing properties of a Priora system, improving water quality by in excess of 7%. On sites where water quality is paramount the inclusion of MT120 will provide maximum cleansing.

To install, roll out the textile on top of the previous subgrade layer (either DBM or sub-base aggregate) prior to installing the laying course aggregate. Edges should be overlapped by 300mm. No jointing is required. Care should be taken to remove wrinkles from the laid textile, and to ensure that the laid textile is not under tension when the laying course aggregate is installed.

Priora Permeable Pavement Installation

9. Screed Laying Course

The large size of sub-base material aggregate creates an uneven surface when compacted and has an open textured surface. The laying course material provides a flatter platform onto which the blocks are laid, to prevent any rocking or instability of the blocks in-situ.

Final compacted target thickness for the laying course should be 50mm.

Tolerances for laying course material are +/- 20mm. However, due to the nature of the open-graded material, it will not compact and reduce in thickness in the same manner as a sharp sand laying course. Therefore, it is important to ensure the initial placing and screeding of the open-graded laying course is as accurate as possible.

It may prove advantageous to trial a small area of open-graded material to ascertain the characteristics of the material under compaction to ensure accurate levels are achieved.

Should any disturbance of the screeded laying course material occur prior to the placement of the blocks, the affected area should be rescreeded to ensure consistency between the affected area and the surrounding laying course. When screeding rails are removed on completion of the installation of the laying course, the affected area should be filled and rescreeded with corresponding laying course material and manually compacted. Care should be taken as not to disturb adjacent prepared laying course material.





10.1 Install Priora Blocks

Laying

Paving units should be laid on the laying course material so that the final level is within the permitted surface tolerance.

String lines should be utilised as often as required. This is necessary to ensure the bond pattern is maintained and straight lines are achieved in the finished paving. The manufacturing tolerances of the paving units, profile of the site, and frequency of string lines used should be taken into consideration during laying. These factors may have a bearing on the straightness of line achievable.

Paving units should be laid such that the joint profile interlocks with its neighbouring units. Joint widths may be varied slightly in order to achieve straight lines or maintain bond.

When hand laying block paving, the blocks should be mixed simultaneously from a minimum of three packs, taking vertically from each slice offered by the pack. This is necessary to ensure an even distribution of both the colours and any manufacturing tolerances offered by the blocks.

Lay whole paving units first, followed by cut units around obstacles or at edges. No paving unit should be cut down to less than one quarter of its original size to prevent looseness or dislodgement at a later date.

Where it appears that only a small section of block will fit, the "inboard cutting" technique should be adopted. The use of a larger or full unit against the edge restraint, allows a smaller unit to be placed in the resulting space.

Where slopes, gradients or ramps are being constructed, placement of the paving units should commence at the lowest point (ie - the bottom of the slope, working upwards).

Where there is a risk of lateral movement of the paving units due to the gradient encountered, the provision of additional intermediate restraint should be considered.



Compaction

Compaction should be undertaken with a plate vibrator, conforming to the requirements of Annex F of BS 7533-3:2005+A1:2009.

Prior to final compaction of the surface, joints should be filled with the same grading of material as that used for the laying course. All joints should remain full of jointing material at all times, with periodic checking and replacing carried out where necessary.

Cutting

Cutting may be carried out using a diamond tipped power saw, a block-splitting guillotine, or hammer and bolster. It must however be noted that the aesthetic finish achieved will depend greatly upon the choice of cutting mechanism and the skill of the installer.

Cut blocks should be inserted prior to completion of the working period.

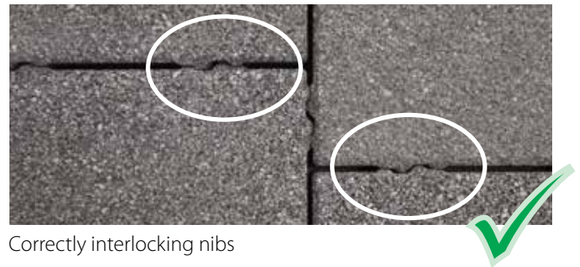
Blocks should be cut such that the resultant joint width remains within the 2 – 6mm tolerance. When laying to tight curves it may not always be possible to maintain a maximum 6mm joint, in which case, cut or special shaped units may have to be considered.

10.2 Install Conservation Priora or Priora Flag

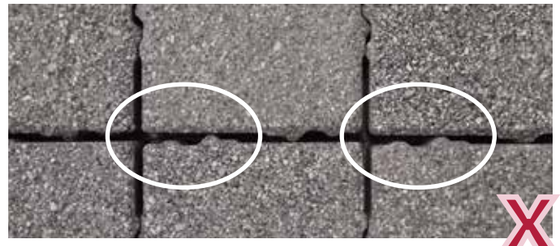
Laying flag sized Priora units largely follows the same process as laying Priora blocks. However, there are three key points which the installer must consider:

1. **Lifting:** the large (600x400mm) flags weigh over 35kg, as with all manual handling a specific risk assessment should be conducted prior to any lifting. Vacuum lifters can be used with this product should their requirement be identified by the risk assessment. Advice on these can be sought from lifting equipment specialists.
2. **Nib placement:** It is ESSENTIAL that the nibs on Priora flags are aligned. If they're not, the surface may not perform and the correct laying pattern will not be achieved.

Note that correct nib placement will always result in a staggered edge to the paving design.



Correctly interlocking nibs



No interlock between some nibs - incorrectly laid

3. **Medium (400x400mm) Flag alignment:**
   the medium (square) flag can be laid in two orientations. To ensure correct placement:

   a. In RANDOM COURSE surfaces: always start an installation with a SMALL or LARGE unit. As long as the installer ensures that the Priora nibs interlock on all subsequent flags, the correct orientation of the medium flags will be obvious.

   b. In SINGLE MEDIUM PLAN SIZE surfaces: lay two medium size flags next to each other and examine the nib placement. Ensure that both flags are oriented in the same way, and then butt the flags together ensuring that the nibs achieve full interlock. Ensure that the straight edge is in the required direction.




TB2150R


302.7D

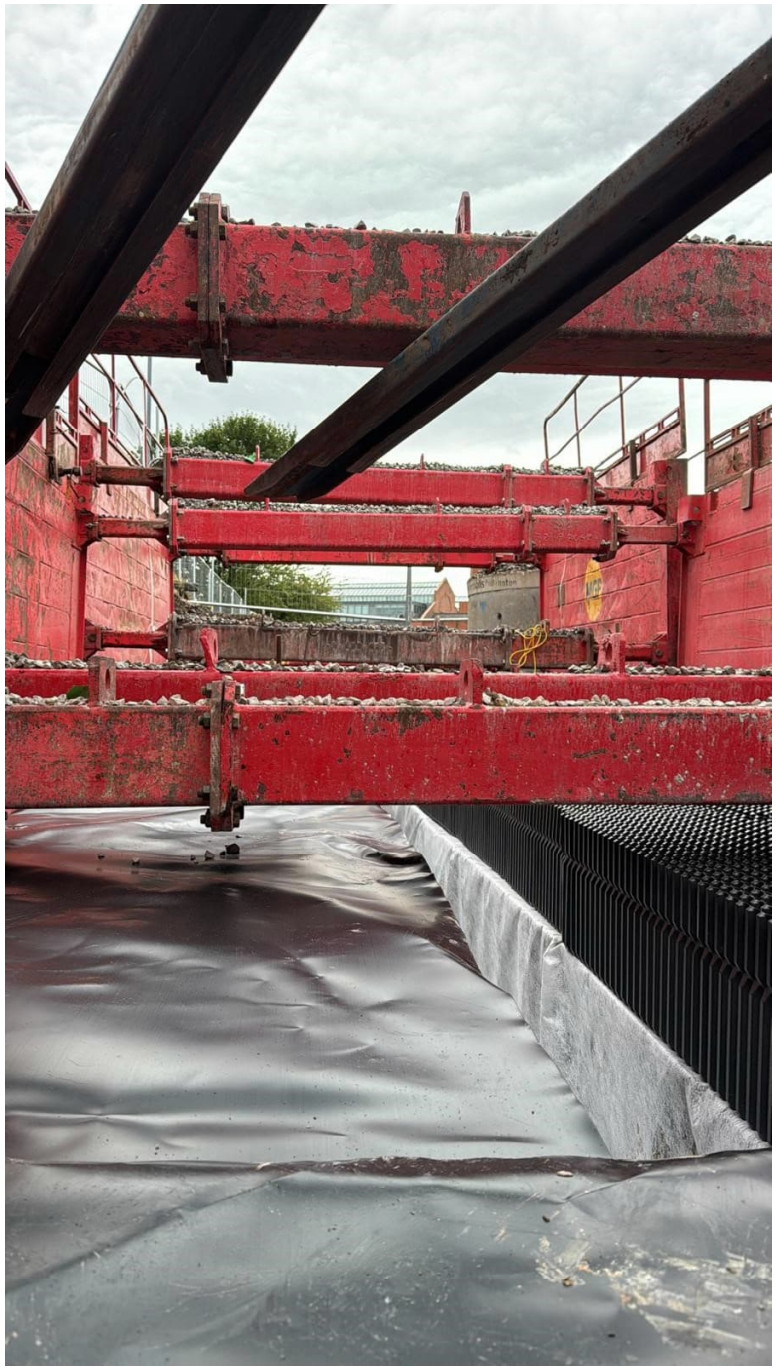







STIHL





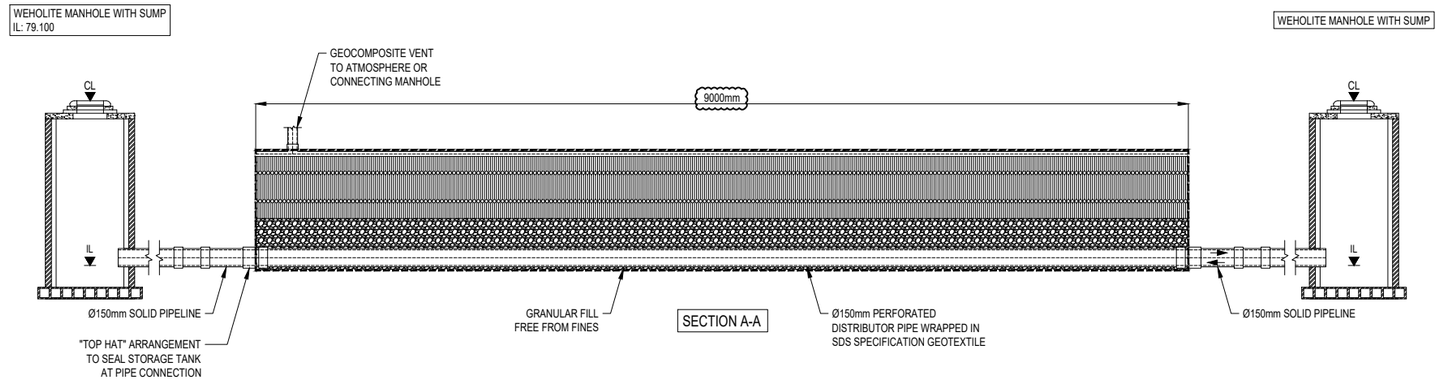

Galaxy A52s 5G
08 August 2024 11:55 am


WEHOLITE

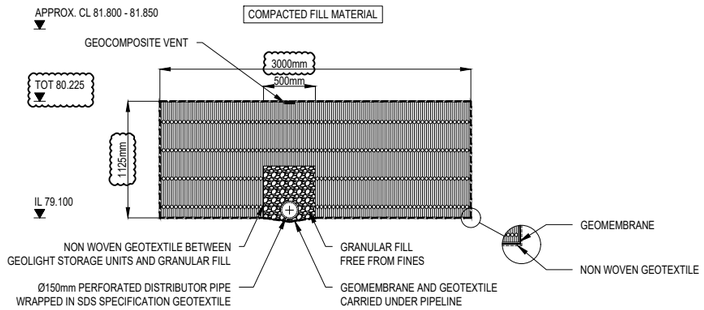

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Appendix D

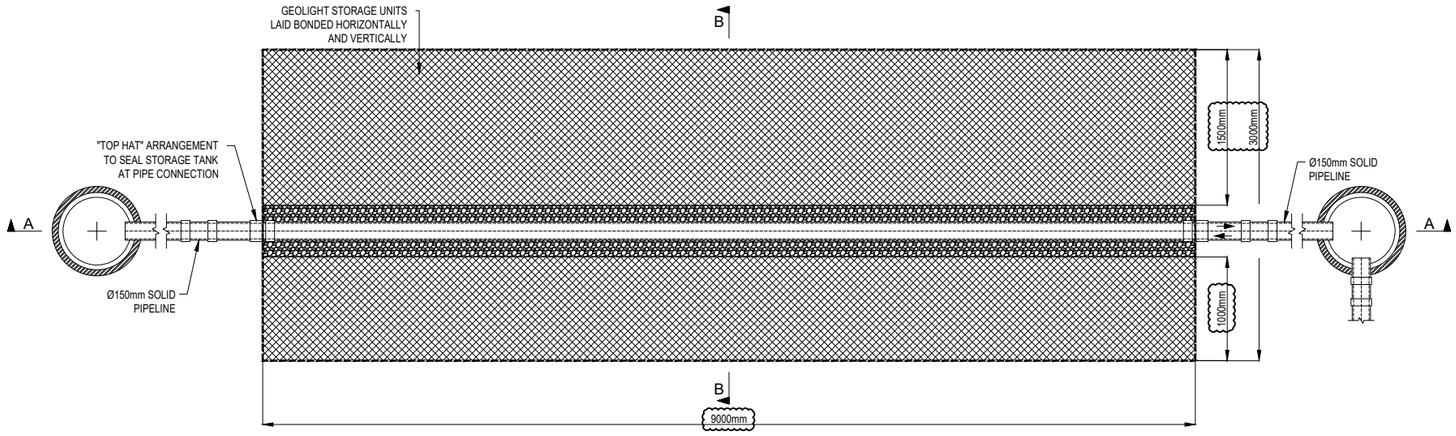
SDS Attenuation Tank Details



SECTION A-A



SECTION B-B



REFERENCE DRAWINGS:

Drawing Number	Revision	Drawing Title	Date
PV2310-APP-92-XX-DR-C-2500	P04	DRAINAGE PLAN	07.03.24

Notes:

This Drawing is to be read in conjunction with all relevant Architect's Engineer's and specialists' drawings and specifications.

Do not scale from this drawing in either paper or digital form. Use written dimensions only.

SDS to leave solid stub only, exiting tank for connection by others.

All external Manholes, Access Points, Junctions & Pipe are shown for guidance only and not part of the SDS program unless otherwise agreed.

Rev	Comments	Date	
		DRW	CHK
B	DIMENSIONAL UPDATE	30.07.24	
	ISSUED FOR CONSTRUCTION / APP	CG	RJ
-	ISSUED FOR CONSTRUCTION	19.07.24	
		CG	SP
A	REDESIGN AS PER LATEST DWG	16.07.24	
	ISSUED FOR APPROVAL	CG	SP
-	ISSUED FOR APPROVAL	07.11.23	
		CG	SP

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Somerset
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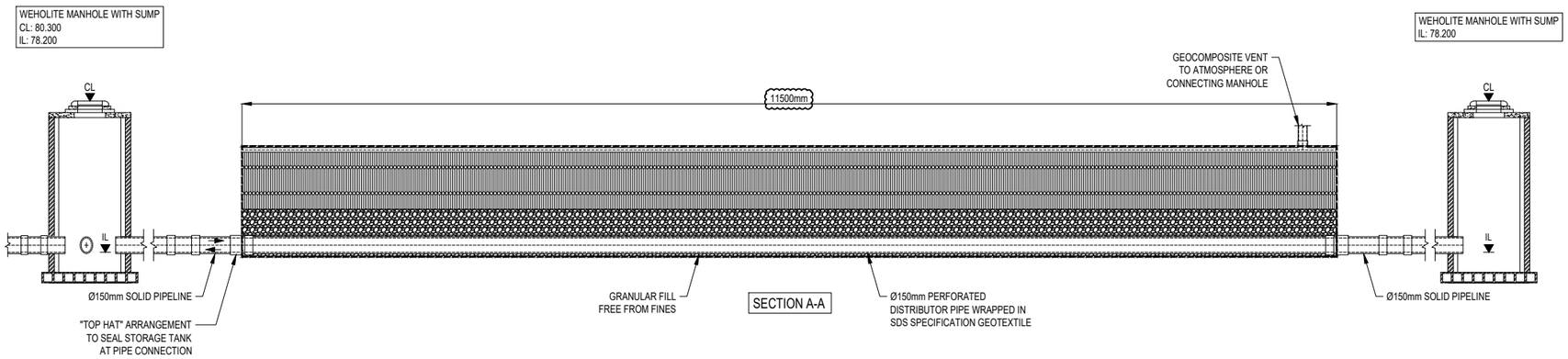
Project: PARKMOUNT ROAD
MANCHESTER

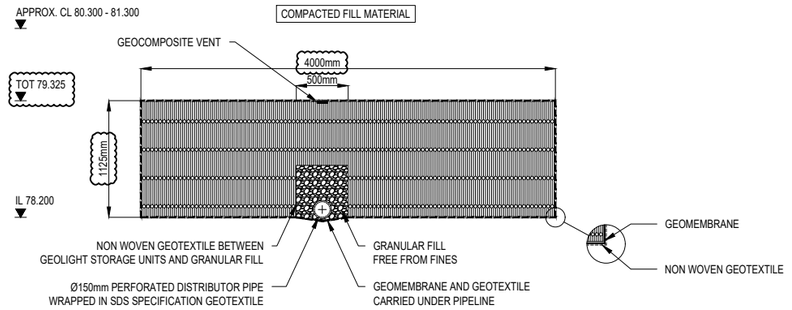
Client: JOHN SUTCLIFFE (ALIGN)

Title: ATTENUATION TANK 1 DETAIL

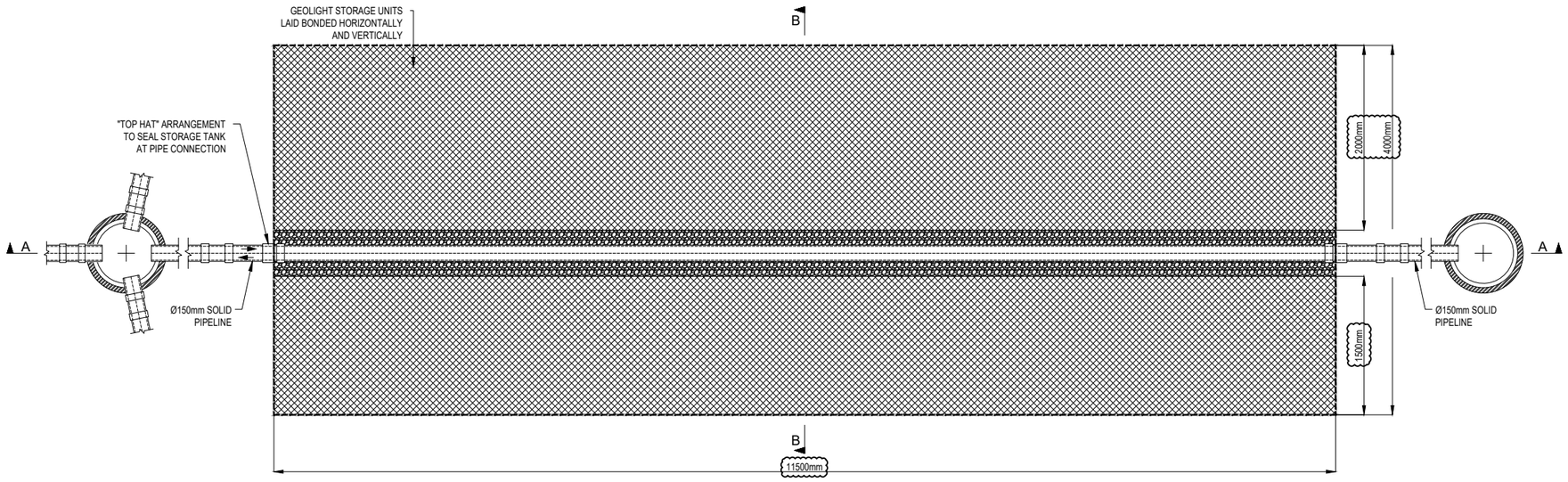
Scale: NTS | Date: 07.11.23

Drawing No: E251323_01 | Rev: B





SECTION B-B



REFERENCE DRAWINGS:			
Drawing Number	**Revision**	**Drawing Title**	**Date**
PV2310-APP-92-XX-DR-C-2500	P04	DRAINAGE PLAN	07.03.24

Notes:

This Drawing is to be read in conjunction with all relevant Architect's Engineer's and specialists' drawings and specifications.

Do not scale from this drawing in either paper or digital form. Use written dimensions only.

SDS to leave solid stub only, exiting tank for connection by others.

All external Manholes, Access Points, Junctions & Pipe are shown for guidance only and not part of the SDS program unless otherwise agreed.

Rev	Comments	Date	DRW	CHK
B	DIMENSIONAL UPDATE ISSUED FOR CONSTRUCTION / APP	30.07.24 CG		RJ
-	ISSUED FOR CONSTRUCTION	19.07.24 CG		SP
A	REDESIGN AS PER LATEST DWG ISSUED FOR APPROVAL	16.07.24 CG		SP
-	ISSUED FOR APPROVAL	07.11.23 CG		SP

Water Infrastructure Systems

Clearwater House
Castlemills
Biddisham
Somerset
BS26 2RE
+44 (0)1934 751303

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Project: PARKMOUNT ROAD MANCHESTER

Client: JOHN SUTCLIFFE (ALIGN)

Title: ATTENUATION TANK 2 DETAIL

Scale: NTS | Date: 07.11.23

Drawing No: E251323_02 | Rev: B

Appendix E

SDS LTD Sign off QA Sheets

SDS Ltd Sign off QA Sheet

ATTENUATION TANK	**ATT:**	1	**DATE:**	16/8/24	
SITE:	PARKMOUNT RD		**TANK VOLUME:**	30.38m³	
LOCATION:	MANCHESTER		**DIMENSIONS:**	9 x 3 x 1.125m³	
DRAINAGE:	**ATTENUATION**		**JOB NO:**	648 - 24	

SECTION 1 AND 7 TO BE SIGNED BY CLIENTS ENGINEER

CHECK	DATE	COMMENT	SDS
1. SETTING OUT and FORMATION		**Engineer to sign and date prior to laying of materials**	
2. TANK BASE		Installed as per manufacturers recommendations	
3. EXTERNAL PROTECTIVE COVERINGS:		Installed as per manufacturers recommendations	
a. Base of Tank		Installed as per manufacturers recommendations	
b. Vertical sides		Installed as per manufacturers recommendations	
c. Top of tank		Installed as per manufacturers recommendations	
4. WELDED GEOMEMBRANE		Installed as per manufacturers recommendations	
a. Welded joint	16/8/24	Installed as per manufacturers recommendations	
b. Base of Tank		Installed as per manufacturers recommendations	
c. Vertical sides		Installed as per manufacturers recommendations	
d. Top of Tank		Installed as per manufacturers recommendations	
5. GEOLIGHT UNITS	16	Installed as per manufacturers recommendations	
6. GEOTEXTILE PIPE TRENCH		Installed as per manufacturers recommendations	
7. PIPEWORK: mm		Installed as per manufacturers recommendations	
a. Invert levels		**Engineer to sign and date prior to laying of materials**	**N/A**
b. position		**Engineer to sign and date prior to laying of materials**	**N/A**
c. diameter		**Engineer to sign and date prior to laying of materials**	**N/A**
d. penetrations sealed		Installed as per manufacturers recommendations	
8. VENT SYSTEM		Installed as per manufacturers recommendations	
9. BACKFILLING			

PLEASE NOTE: Only back fill around pipe after the connection between tank and manhole is complete so that the pipe is not compromised in any way with an open end. Failure to comply may result in the pipe being damaged. It may be necessary to put stone over pipe when filling pipe trench but make sure enough pipe is protruding so that stone is not directly on open end. SDS will not accept responsibility.

In signing this document, you are in agreement that the above work meets your specifications. Please note that changes to any project elements after sign-off may be subject to additional charges.

SUB CONTRACTOR	**SUSTAINABLE DRAINAGE SYSTEMS LTD**	**Signed**	[redacted]
		Printed	
MAIN CONTRACTOR	AG Coles & Groundworks	**Signed**	
		Printed	

SDS Ltd Sign off QA Sheet

ATTENUATION TANK	**ATT:** 2	**DATE:**	16/8/24
SITE:	Paramount Rd	**TANK VOLUME:**	51.75 m3
LOCATION:	Manchester	**DIMENSIONS:**	11.5 x 4 x 1.125m
DRAINAGE:	**ATTENUATION**	**JOB NO:**	648-24

SECTION 1 AND 7 TO BE SIGNED BY CLIENTS ENGINEER

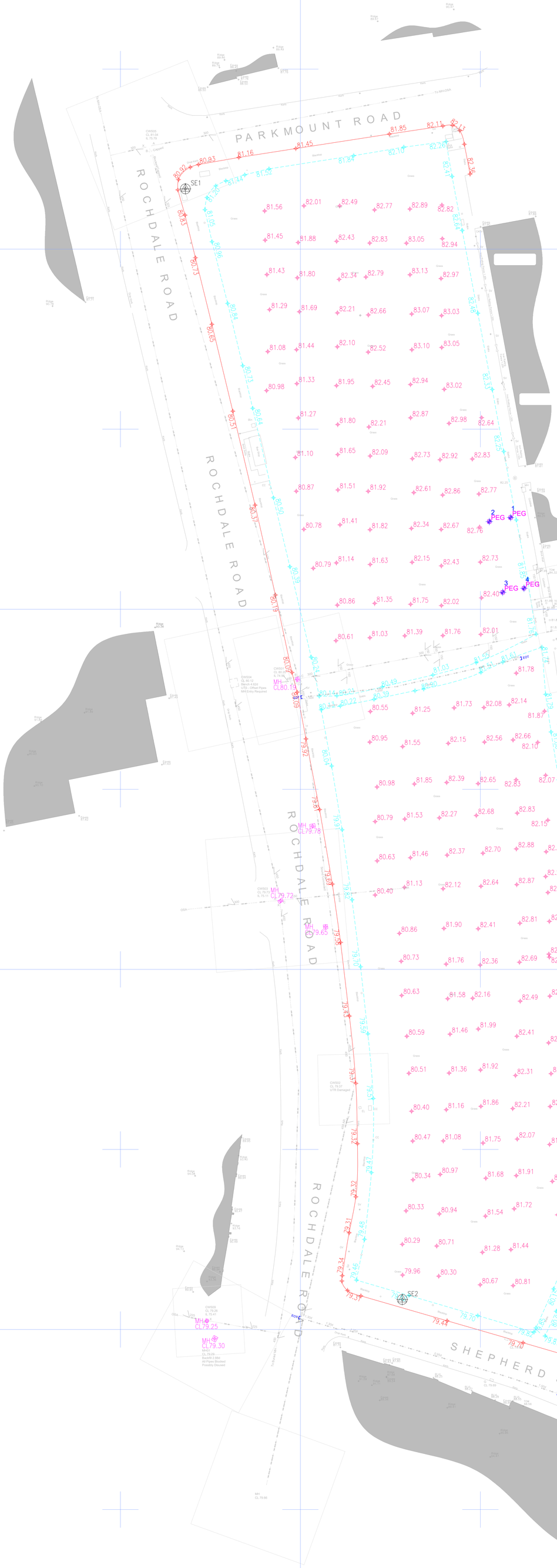
CHECK	DATE	COMMENT	SDS	
1. SETTING OUT and FORMATION		**Engineer to sign and date prior to laying of materials**		
2. TANK BASE		Installed as per manufacturers recommendations		
3. EXTERNAL PROTECTIVE COVERINGS:		Installed as per manufacturers recommendations		
a. Base of Tank		Installed as per manufacturers recommendations		
b. Vertical sides		Installed as per manufacturers recommendations		
c. Top of tank		Installed as per manufacturers recommendations		
4. WELDED GEOMEMBRANE		Installed as per manufacturers recommendations		
a. Welded joint	16/8/24	Installed as per manufacturers recommendations		
b. Base of Tank		Installed as per manufacturers recommendations		
c. Vertical sides	16/8	Installed as per manufacturers recommendations		
d. Top of Tank		Installed as per manufacturers recommendations		
5. GEOLIGHT UNITS	16/8	Installed as per manufacturers recommendations		
6. GEOTEXTILE PIPE TRENCH		Installed as per manufacturers recommendations		
7. PIPEWORK: mm		Installed as per manufacturers recommendations		
a. Invert levels		**Engineer to sign and date prio laying of materials**		
b. position		**Engineer to sign and date prio laying of materials**	N/A	
c. diameter		**Engineer to sign and date prior to laying of materials**	**N/A**	
d. penetrations sealed		Installed as per manufacturers recommendations		
8. VENT SYSTEM		Installed as per manufacturers recommendations		
9. BACKFILLING				

PLEASE NOTE: Only back fill around pipe after the connection between tank and manhole is complete so that the pipe is not compromised in any way with an open end. Failure to comply may result in the pipe being damaged. It may be necessary to put stone over pipe when filling pipe trench but make sure enough pipe is protruding so that stone is not directly on open end. SDS will not accept responsibility.

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SUB CONTRACTOR	**SUSTAINABLE DRAINAGE SYSTEMS LTD**	**Signed**	[redacted]
		Printed	
MAIN CONTRACTOR	AB Civils + Groundworks	**Signed**	
		Printed	

1	E=386029.193	N=402162.733
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7	E=386041.956	N=402050.212
8	E=386053.534	N=402045.502



NORTH
WEST EAST
SOUTH
SURVEY ORIENTATED TO OS GRID (OSGB36-15)

SURVEY NOTES

ALL LEVELS ARE RELATED TO O.S DATUM (OSGB36-15)
ESTABLISHED AT SE1 USING THE LEICA SMARTNET GPS NETWORK

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SURVEY LEGEND

FEATURES

TOP OF BANK
BOTTOM OF BANK
SURVEY STATION
TREE
HEDGE
TREE CANOPY
BUSHES
VEGETATION

BOUNDARY ANNOTATIONS

BARB WIRE FENCE	BW.F	SECURITY FENCE	SEC.F
CHAIN LINK FENCE	CL.F	TIMBER FENCE	T.F
CONC POST AND PANEL	CP&P.F	BRICK WALL	B.W
CONC POST TIMB PANEL	CP&TP.F	BLOCK WALL	BL.W
ELECTRIC FENCE	EL.F	CONCRETE WALL	C.W
HERAS FENCE	HER.F	GABIEN WALL	G.W
IRON RAIL FENCE	IR.F	MISCELLANEOUS WALL	MISC.W
KNEE RAIL FENCE	KR.F	RETAINING WALL	R.W
MISCELLANEOUS FENCE	MISC.F	RETAINING LOG WALL	RL.W
POST AND WIRE FENCE	P&W.F	STONE WALL	S.W
RANCH STYLE FENCE	RS.F		

LEVEL PREFIX ANNOTATIONS

ASL	ARCH SPRING LEVEL	IL	INVERT LEVEL		
BL	BED LEVEL	PL	PARAPET LEVEL	TRH	TREE HEIGHT
BD	BACK DROP	RL	ROOF/RIDGE LEVEL	THR	THRESHOLD LEVEL
CL	COVER LEVEL	SL	SOFFIT LEVEL	WL	WATER LEVEL
DH	TOP OF DOOR	TOF	TOP OF FENCE	WS	WINDOW SILL
DTC	DEPTH TO CROWN	TOP	TOP OF PIPE	WSF	WINDOW SOFFIT
FFL	FINISHED FLOOR LEVEL	TOW	TOP OF WALL		

GEOTECHNICAL INFORMATION

TRIAL HOLE / PIT — TH
BORE HOLE — BH
WINDOW SAMPLE — WS
MONITORING POINT — MP

SURVEY ANNOTATIONS

AV	AIR VALVE	OHC	OVERHEAD CABLES
B	BOLLARD	PB	POST BOX
BS	BUS STOP	PM	PARKING METER
BT	BRITISH TELECOM IC	PS	POST
CPS	CONCRETE PAVING SLABS	PYL	ELECTRICITY PYLON
CP	CATCH PIT	RE	RODDING EYE
DR	DRAIN	RS	ROAD SIGN
EB	ELECTRIC CONTROL BOX	RWP	RAIN WATER PIPE
EL	ELECTRICAL IC	ST	STOP TAP
EP	ELECTRICITY POLE	SM	SERVICE MARKER
ER	EARTH ROD	SP	SIGN POST
FH	FIRE HYDRANT	SV	STOP VALVE / SLUICE VALVE
FP	FLAG POLE	SVP	SOIL VENT PIPE
G	GULLY	TB	TELEPHONE BOX
GH	GREENHOUSE	TL	TRAFFIC LIGHTS
GP	GATE POST	TM	TELEPHONE MAST
GV	GAS VALVE	TP	TELEGRAPH POLE
IC	INSPECTION COVER	TPS	TACTILE PAVING SLABS
JB	JUNCTION BOX	VP	VENT PIPE
JKW	JAPANESE KNOT WEED	WM	WATER METER
KO	KERB OUTLET	WO	WASH OUT
LH	LAMP HOLE	UTL	UNABLE TO LIFT
LP	LAMP POST/LIGHT COLUMN	UTS	UNABLE TO SURVEY
MH	MANHOLE		
MP	MONITOR POINT		
NP	NAME PLATE		

SURVEY STATIONS

Name	Easting	Northing	Height
SE3	386069.899	402035.918	80.750
SE1	385984.020	402208.372	81.032
SE2	386014.150	402054.157	79.475

CLIENT
AB CIVILS

PROJECT ENGINEER: AG
DRAWN: LM
DATE: 12.04.2024
SCALE: 1:250@A0

PROJECT TITLE
PARKMOUNT ROAD, MANCHESTER

DRAWING DETAIL
TOPOGRAPHICAL LAND SURVEY

DRAWING NUMBER: AB.TS.02
REVISION: A

DESCRIPTION	REV	DATE	DRWN	APPR
TANK SETTING OUT ADDED	A	26.09.25	DH	-

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BL5 3GE
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info@surveyeng.co.uk