

Land West of Westfield Avenue, Earl Shilton
Drainage Report
October 2026
Our Ref: 30977-FLD-0101

Introduction

MEC Consulting Group Ltd (MEC) has been commissioned by Avant Homes Ltd (hereafter referred to as 'the Client') to undertake a detailed drainage strategy and supporting report for a proposed residential development at Land West of Westfield Avenue, Earl Shilton (hereafter referred to as 'the Site').

Following the submission of the planning application Ref:24/01066/FUL, Leicestershire County Council as the LLFA provided conditions dated 01/04/2025 (**Appendix A**). This report and detailed drainage strategy aims to address Condition 1 from the LLFA. Condition 1 reads as the following;

Condition 1: *No development approved by this planning permission shall take place until such time as a surface water drainage scheme has been submitted to and approved in writing by the Local Planning Authority. The development must be carried out in accordance with these approved details and completed prior to first occupation.*

Sources of Information

A review of relevant information and guidance from a range of sources has been undertaken and includes the following key documents.

- National Planning Policy Framework (NPPF), August 2026
- Planning Practice Guidance (PPG) – September 2025
- National Standards for Sustainable Drainage Systems (SuDS), July 2025
- Water UK, Sewage Sector Guidance, October 2019
- CIRIA, C753 The SuDS Manual, 2015
- HM Government, The Buildings Regulations 2010, Drainage and Water Disposal (Part H), 2015
- Hinckley and Bosworth Local Plan 2006-2026, December 2009
- Hinckley and Bosworth Level 1 Strategic Flood Risk Assessment, January 2025
- Leicestershire County Council Preliminary Flood Risk Assessment, June 2011
- Local Flood Risk Management Strategy for Leicestershire, February 2024

Site Description

The site is located within Earl Shilton, Leicester and is approximately 0.627ha. The site is formed of open greenspace. The site is bound to the north by a larger development Ref:20851/12-14/3703, to the east by Westfield Avenue, the south by residential developments and to the west by allotments.

Figure 1: Site Location Plan



A topographical survey, included as **Appendix B**, indicates that the site generally falls from south to north, with levels ranging from 108.30mAOD to 103.93mAOD.

British Geological Survey (BGS) mapping suggests the Site is underlain by a bedrock geology comprising Gunthorpe Member- consisting of Mudstone. No superficial deposits are recorded within the site.

Sewer records have been obtained from Severn Trent Water (STW), and can be found as **Appendix C**. The records show the presence of an existing 375mm surface water sewer and a 150mm foul water to the east of the site in Westfield Avenue. Both of these sewers are currently undergoing an application for adoption under a Section 104 agreement.

Flood Risk

The Flood Map for Planning shows that the Site is wholly within Flood Zone 1 (Low Probability). Flood Zone 1 is defined as land assessed as having an annual probability of river or sea flooding of less than 0.1%. As such, the risk of fluvial flooding is considered low.

The Environment Agency (EA) Surface Water Spatial Planning datasets, which include climate change for the 2070s epoch, indicate that the entirety of the site is at a low risk of surface water flooding.

Aquifer designations by Defra classify the bedrock geology as Secondary B, which suggests a generally impermeable bedrock geology. The Areas Susceptible to Groundwater Flooding (AStGWF) mapping within Appendix E of the Hinckley and Bosworth Level 1 SFRA suggests a susceptibility to groundwater flooding of less than 50% within the area. As such, the risk of groundwater flooding is considered low.

Sewer Asset Plans, obtained from STW (see **Appendix C**), show a series of Section 104 sewers running to the east of the site along Westfield Avenue.

The Environment Agency Reservoir Flood Risk Map shows that the site is not at risk of reservoir flooding, should the relevant impounding structure fail; as such, the risk of flooding from reservoirs is low.

Due to the distance and intervening topography, the risk of flooding from canals is considered low.

Summary of Flood Risk

Using the appraisal above, the potential risk posed by each source on the Site is presented in Table 1 below:

Table 1: Desk-Based Assessment of Flood Risk

Source	Risk		
	High	Medium	Low
Fluvial			X
Coastal & Tidal			X
Surface Water			X
Groundwater			X
Sewer			X
Canals			X
Reservoirs & Waterbodies			X

Surface Water Drainage Strategy

Surface water arising from developed sites should, as far as practicable be managed in a sustainable manner to mimic the surface water flows arising from the undeveloped site. When considering the surface water discharge, the National Standards for SuDS hierarchy should be adhered to:

Priority 1: Collected for non-potable use

Consideration should be given to the implementation of rainwater harvesting systems, including but not limited to green planters to ensure water re-use.

The first 5mm of rainwater will be captured via the proposed permeable paving. This should provide sufficient SuDS features in accordance with Standard 2 of the National Standards for SuDS.

Priority 2: Infiltrated to ground

British Geological Survey (BGS) mapping suggests the Site is underlain by a bedrock geology comprising Gunthorpe Member-Mudstone. No superficial deposits are recorded within the site. The underlying geology suggests that infiltration is unlikely to be feasible at the proposed development and therefore an alternative outfall should be sought.

Priority 3: Discharged to an above-ground surface water body

A review of OS OpenRivers mapping identifies no suitable main rivers or ordinary watercourses that would provide a suitable discharge location for surface water from the site due to the distance. As such, an alternative method of surface water disposal should be explored.

Priority 4: Discharged to a surface water sewer, or another piped surface water drainage system

Sewer records have been obtained from Severn Trent Water (STW), and can be found as **Appendix C**. The records show the presence of an existing 375mm surface water sewer to the east of the site in Westfield Avenue. This sewer is currently undergoing an application for adoption under a Section 104 agreement. It is proposed that surface water flows discharge via the existing 375mm sewer as part of the wider development.

It is considered that the drainage hierarchy is satisfied with the above.

Discharge Rate

Surface water flows generated on site will discharge at a controlled rate of 2.2l/s as agreed with Leicestershire County Council (**Appendix A**).

In accordance with the National Standards for SuDS, the strategy involves containing surface water flows to two geo-cellular tanks on site before discharging into the existing surface water sewer within Westfield Avenue at 2.2l/s.

Surface water flows for an impermeable area of 0.26ha (including a 10% allowance for urban creep) will be conveyed to two proposed geo-cellular tanks on site. A total storage volume of 189.16m³ is required within the storage features to allow for surface water flows to discharge at 2.2l/s into the surface water sewer and cater for all flows up to and including the 1%AEP40CC.

The calculations for the proposed design have been included as **Appendix D**, and a drainage strategy based on the above principles is shown in drawing 30977_01_230_01 in **Appendix E**.

Full drainage long sections and drainage construction details can be viewed within **Appendix F** and **Appendix G**.

Applicable SuDS Techniques

The National Standards for Sustainable Drainage Systems that deals with SuDS covers a whole range of sustainable approaches to surface water drainage management including;

- Source control measures including rainwater recycling and drainage;
- Filter strips and swales, which are vegetated features that hold and drain water downhill mimicking natural drainage patterns;
- Filter drains and porous pavements to allow rainwater and run-off to infiltrate into permeable material below ground and provide storage if needed; and
- Basins and ponds to hold excess water after rain and allow controlled discharge that avoids flooding.

Each of the SuDS considerations listed above is discussed below in Table 2, with reference to their suitability for the proposed development.

Table 2: Suitability of SuDS Techniques

	COMPONENT	SUITABILITY	REASON
Source Control	Rainwater Harvesting	Yes	Water butts collecting drainage from the roof could be used.
	Green Roofs/Blue Roofs	No	Given the scope and scale of the development blue/green roofs would not be suitable.
	Bio-retention Systems / Rain Gardens	No	The Site is too constrained to contain a feature of sufficient size.
Proprietary Systems	Proprietary bio-retention systems	No	More appropriate SuDS features can be accommodated within the development and are preferred.
Infiltration Devices	Permeable Paving	Yes	Permeable paving has been proposed within the private roads and parking spaces across the site, it will also accommodate the first 5mm flush
	Infiltration trenches / Soakaways	No	Based on the existing geology and made ground, it is unlikely that soakaways will be feasible.
Filtration	Open Swales / Filter Strips / Drains	No	Due to the size and location of the site these features are not considered suitable.
Retention / Detention	Detention Basin, Attenuation Pond / Tanks	Yes	The geo-cellular tanks will provide sufficient storage for the proposed development.

Surface Water Quality

The CIRIA SuDS Manual C753 indicates the minimum treatment indices appropriate for contributing pollution hazards for different land use classifications. To deliver adequate treatment, the selected SuDS components should have a total pollution mitigation index that equals or exceeds the pollution hazard index

Surface water runoff from residential roofs will have a very low pollution hazard level, whilst the residential parking areas will have a low pollution hazards index.

The pollution hazard indices, mitigation indices of each SuDS component and the accompanying calculations are provided in Table 6.5.

Table 6.5: SuDS Mitigation Indices (from CIRIA SuDS Manual)

SuDS Component	Mitigation Indices		
	<i>Total Suspended Solids</i>	<i>Metal</i>	<i>Hydrocarbons</i>
Residential Roofs	0.2	0.2	0.05
Residential Parking Areas and low traffic roads	0.5	0.4	0.4
Permeable Paving	0.7	0.6	0.7
SuDS Mitigation Index	0.7	0.6	0.7
Mitigation Requirement Met?	Yes	Yes	Yes

For the very low to low pollution hazard levels generated at the site, the proposed permeable paving would provide sufficient treatment in accordance with the Simple Index Approach.

Maintenance and Management

An integrated approach to the maintenance and management of SuDS is a requirement of the NPPF and the Flood and Water Management Act 2010. A maintenance and management plan aims to ensure that there is a clear understanding of drainage responsibilities and that a maintenance regime is implemented for all new drainage systems for the lifetime of the development.

All private drainage, including SuDS will be maintained by the landowners, or by an appointed management company. A Maintenance and Management Plan can read within the supporting documents; 30977-FLD-0103.

Foul Water Drainage

According to The Building Regulations (2010), foul water drainage from new developments should be discharged into the following, in order of priority;

- A public sewer;
- A private sewer communicating with a public sewer;
- A septic tank, which has an appropriate form of secondary treatment; or
- A cesspool

Sewer records have been obtained from Severn Trent Water (STW), and can be found as **Appendix C**. The records show the presence of an existing 150mm foul water sewer to the east of the site in Westfield Avenue. This sewer is currently undergoing an application for adoption under a Section 104 agreement.

Foul flows from the site will discharge into the existing 150mm foul water sewer.

The proposed route of connection can be found in the drainage strategy drawing in **Appendix E**.

Summary

- The Flood Map for Planning shows the Site is located wholly within Flood Zone 1 (Low Probability), therefore is considered at low risk of flooding from fluvial sources.
- The Environment Agency (EA) Risk of Flooding from Surface Water (RoFSW) mapping indicates the Site to be at low risk of surface water flooding.
- The risk of flooding from all other sources is considered low.
- Based on generally impermeable geologies, comprising mudstone, the proposed development is unlikely to be a suitable location for infiltration.
- There is an existing 375mm surface water sewer located to the east of the site along Westfield Avenue, surface water flows will be discharged into the sewer.
- In accordance with the National Standards for SuDS, the strategy involves containing surface water flows to two proposed geo-cellular tanks on site before discharging into the existing surface water sewer within Westfield Avenue at 2.2l/s.
- Surface water flows for an impermeable area of 0.26ha (including a 10% allowance for urban creep) will be conveyed to the two proposed geo-cellular tanks on site. A total storage volume of 189.16m³ is required within the storage features to allow for surface water flows to discharge at 2.2l/s into the surface water sewer and cater for all flows up to and including the 1%AEP40CC.
- It is proposed to dispose of foul water to the 150mm foul water sewer within Westfield Avenue.

REGISTRATION OF AMENDMENTS

Date	Rev	Comment	Prepared By	Checked By	Approved By
October 2026	-	First issue	Ben Oyston MSc, BSc (Hons) Assistant Flood Risk Engineer	Jack Harriman BSc (Hons) Flood Risk Engineer	Zoe Foxon BSc (Hons) Flood Risk Engineer

Appendices

- A. LLFA Correspondence
- B. Topographical Survey
- C. Severn Trent Water Correspondence
- D. Attenuation Calculations
- E. Detailed Drainage Strategy
- F. Drainage Long Sections
- G. Drainage Construction Details

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APPENDICES

Appendix A



Application address Land West of Westfield Avenue, Earl Shilton.		Planning ref. 24/01066/FUL	
		Our ref. 2024/1066/04/F/R1	
Description Erection of 18 dwellings with associated access, car parking, landscaping and drainage.		Consultation date 17/03/2025	
		Response date 01/04/2025	
Planning officer Matt Jedruch		Reviewing officer Jack Harriman	
Application type Full		Extension requested ☐	
Refer to standing advice ☐	Conditions ☒	Further consultation required ☐	Concerns ☐

Consultation checklist

No.	Description	Check
1	Location plan	☒
2	Proposed layout plan	☒
3	Evidence that the site can be drained	☒
4	Topographic and ground investigation details	☒
5	The total impermeable area pre and post development	☒
6	All potential flood risk sources have been identified and assessed	☒
7	Existing and proposed peak discharge rates	☒
8	Consideration of sustainable drainage systems	☒
9	Attenuation volume calculations	☒
10	Consideration of the maintenance and management of all drainage elements	☐

LLFA Key Observations and Advice

Leicestershire County Council as Lead Local Flood Authority (LLFA) notes that the 0.69 ha brownfield site is located within Flood Zone 1 being at low risk of fluvial flooding and a low risk of surface water flooding. The proposals seek to discharge at 2.2 l/s via pervious paving and two attenuation tanks to the sewer located in the road to the east of site.

The surface water discharge rate is proposed to be 2.2 l/s. Due to the small control required to discharge at this rate, the design of the flow control chamber must include an overflow mechanism. There is no correspondence from the statutory sewer provider to demonstrate permission in principle to connect to their asset.

There are no details regarding the management and maintenance of the surface water drainage system.

Subsequent to the previous LLFA response the applicant has submitted new information not pertinent to surface water drainage.

Leicestershire County Council as Lead Local Flood Authority (LLFA) advises the Local Planning Authority (LPA) that the proposals are considered acceptable to the LLFA and we advise the following planning conditions be attached to any permission granted.

Advised Conditions

1. No development approved by this planning permission shall take place until such time as a surface water drainage scheme has been submitted to, and approved in writing by the Local Planning Authority. The development must be carried out in accordance with these approved details and completed prior to first occupation.

Reason: To prevent flooding by ensuring the satisfactory storage and disposal of surface water from the site.

2. No development approved by this planning permission shall take place until such time as details in relation to the management of surface water on site during construction of the development has been submitted to, and approved in writing by the Local Planning Authority. The construction of the development must be carried out in accordance with these approved details.

Reason: To prevent an increase in flood risk, maintain the existing surface water runoff quality, and to prevent damage to the final surface water management systems through the entire development construction phase.

3. No occupation of the development approved by this planning permission shall take place until such time as details in relation to the long-term maintenance of the surface water drainage system within the development have been submitted to and approved in writing by the Local Planning Authority. The surface water drainage system shall then be maintained in accordance with these approved details in perpetuity.

Reason: To establish a suitable maintenance regime that may be monitored over time; that will ensure the long-term performance, both in terms of flood risk and water quality, of the surface water drainage system (including sustainable drainage systems) within the proposed development.

Respective Condition Notes

1. The scheme shall include the limitation of surface water run-off to equivalent greenfield rates; the ability to accommodate surface water run-off on-site up to the critical 1 in 100 year return period event plus an appropriate allowance for climate change, based upon the submission of drainage calculations.

Full details for the drainage proposal should be supplied including, but not limited to; construction details, cross sections, long sections, headwall details, pipe protection details

(e.g. trash screens), and full modelled scenarios for event durations up to the 24 hour (or longer where required) for the 1 in 1 year, 1 in 30 year and 1 in 100 year plus climate change return periods with results ideally showing critical details only for each return period.

2. Details should demonstrate how surface water will be managed on site to prevent an increase in flood risk during the various construction stages of development from initial site works through to completion. This shall include temporary attenuation, additional treatment, controls, maintenance and protection. Details regarding the protection of any proposed infiltration areas should also be provided.
 3. Details of the surface water Maintenance Plan should include for routine maintenance, remedial actions and monitoring of the separate elements of the surface water drainage system that will not be adopted by a third party and will remain outside of individual property ownership. For commercial properties (where relevant), this should also include procedures that must be implemented in the event of pollution incidents.
-

Advice to the Local Planning Authority

1. Standing Advice – National Planning Policy Framework

When determining planning applications, the local planning authority should ensure flood risk is not increased elsewhere and only consider development appropriate in areas at risk of flooding where informed by a site specific Flood Risk Assessment (FRA) confirming it will not put the users of the development at risk. Where an FRA is applicable this should be undertaken in accordance with the requirements of the National Planning Policy Framework and accompanying Planning Practice Guidance.

2. Standing Advice – Consent

Where there are any works proposed as part of an application which are likely to affect flows in an ordinary watercourse or ditch, the applicant will require consent under Section 23 of the Land Drainage Act 1991. This is in addition to any planning permission that may be granted. Guidance on this process and a sample application form can be found via the following website: <http://www.leicestershire.gov.uk/flood-risk-management>

Applicants are advised to refer to Leicestershire County Council's culverting policy contained within the Local Flood Risk Management Strategy Appendix document, available at the above link. No development should take place within 5 metres of any watercourse or ditch without first contacting the County Council for advice.

This consent does not consider local watercourse bylaws. It is the responsibility of the applicant to check if the local borough or district council has their own bylaws which the proposals will also need to consider.

3. Standing Advice – Maintenance

Note that it is the responsibility of the Local Planning Authority under the DEFRA/DCLG legislation (April 2015) to ensure that a system to facilitate the future maintenance of SuDS features can be managed and maintained in perpetuity before commencement of the works.

4. Standing Advice – Minor works

If a proposed building/wall or other construction appears to sit astride an indicated surface water flow route, the new build may deflect floodwater onto another person's property or raise flood levels by a significant amount locally. In these circumstances, the planning officer should

contact the County Council to discuss whether consultation is necessary in that particular case.

5. Standing Advice – Brownfield Development Runoff

For brownfield sites, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event must seek to discharge at greenfield runoff rate from the development for the same rainfall event. Where this is clearly demonstrated to not be reasonably practicable, discharge should be restricted as close to greenfield rates as reasonably practicable, but should never exceed the rate of discharge from the site prior to redevelopment.

The runoff volume from the development in the 1 in 100 year, 6 hour rainfall event should be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but should not exceed the runoff volume from the development site prior to redevelopment for that event. Where an increase in discharge volume is unavoidable, the proposals should discharge at QBar or provide alternative mitigation in line with CIRIA C753.

6. Standing Advice – Overland flow routes

Overland flow routes as shown on the 'extent of flooding from surface water' maps should be considered such that buildings are not placed directly at risk of surface water flooding. Such flow routes should be utilised for roads and green infrastructure.

7. Standing Advice – Ditches

Where a drainage ditch adjoins or flows through a development, provision should be made such that the ditch can be made throughout the life of the development. The ownership and responsibility for maintenance of the ditch should also be clearly identified and conveyed to the relevant parties.

Additional information and guidance is available here:

<https://www.leicestershire.gov.uk/environment-and-planning/flooding-and-drainage/>

Note: Response provided by the Lead Local Flood Authority under the delegated authority of the Director of Environment and Transport.



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APPENDICES

Appendix B



[illegible]

The Contractor is to check and verify all building and site dimensions, levels and sewer invert levels at section points before work starts. The Contractor is to comply in all respects with current Building Legislation, British Standard BS5622, Building Regulations, Construction (Design & Management) Regulations, Party Wall Act, etc. whether or not specifically stated on this drawing. This drawing must be read with and checked against any structural, geotechnical or other specialist documentation provided. This drawing is not to be used to check for the presence of, or any conditions or ground contaminants. Each area of ground relied upon to support any structure depicted (including drainage) must be investigated by the Contractor. A suitable programme of foundation to be provided, allowing for existing ground conditions. Any suspected or ground contaminants on or within the ground, should be further investigated by a suitable expert. Any earthwork constructions shown indicate typical slopes for guidance only & should be further investigated by a suitable expert.

Where existing trees are to be retained they should be subject to a full Arboricultural inspection for safety. All trees are to be planted so as to ensure they are a minimum of 5 metres from buildings and 3 metres from drainage and foundations. Where necessary, a suitable programme is to be provided to accommodate the proposed tree planting.

Geoff Perry Associates Limited do not accept any responsibility for any losses (financial or otherwise) to any Client or third party arising out of the Clients (be it Developer or other) reliance on this drawing or non-compliance with area mentioned provisions.

Ⓒ This drawing is the property of Geoff Perry Associates Limited and may not be copied or used for any purpose other than that for which it was prepared. The Client agrees to express written authority of Geoff Perry Associates Limited.

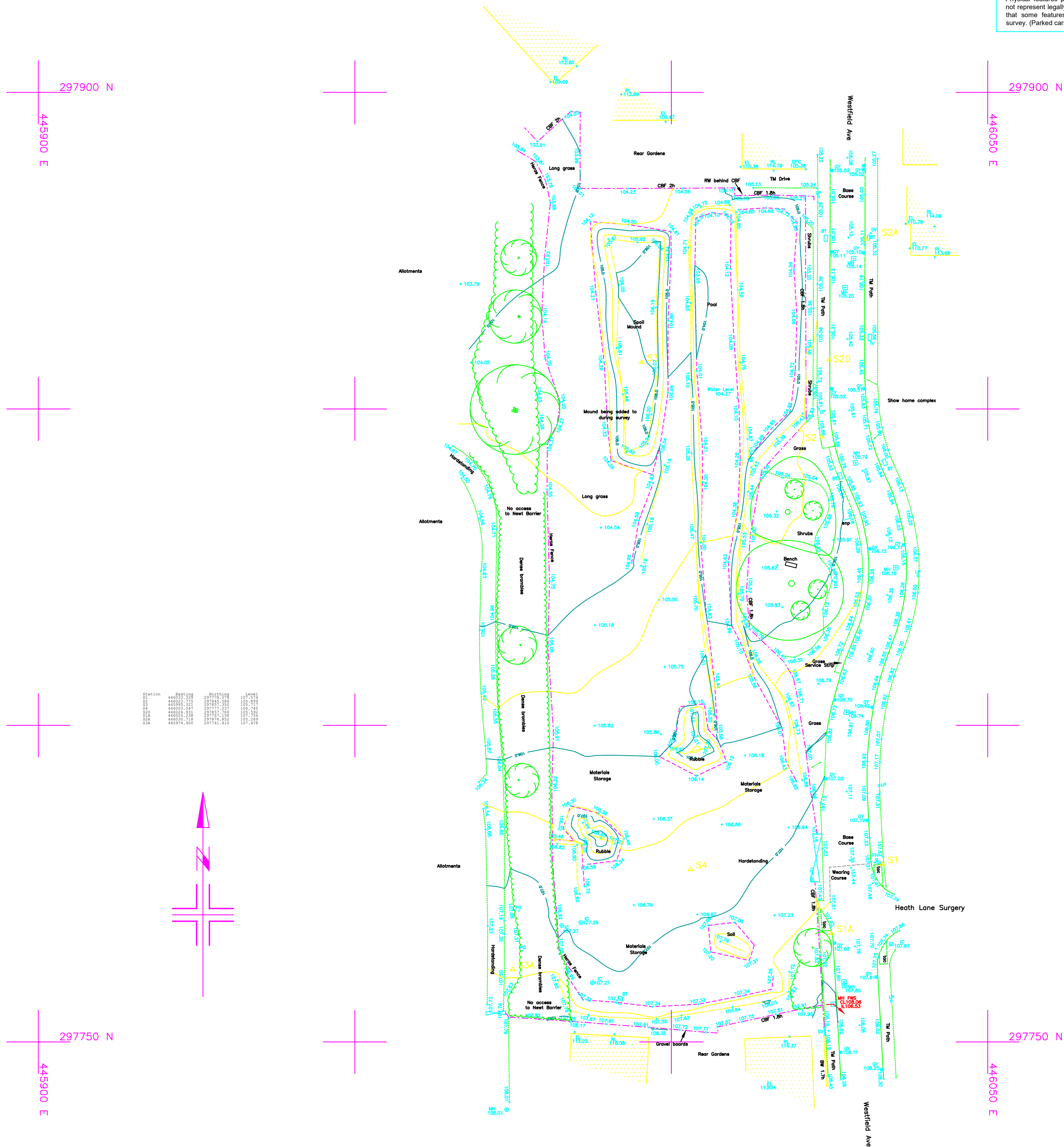
This survey has been oriented to the Ordnance Survey (OS) National Grid (OSGB36) via a Global Positioning System (GPS) and the OS. Active Network (OS Net).

A true OSGB36 coordinate has been established near to the site centre via a transformation using the OSTN15 & OSTN15 coordinates. The coordinates should be correlated to this point and a further one or more OSGB36 points established to create a true OS. bearing for angle orientation.

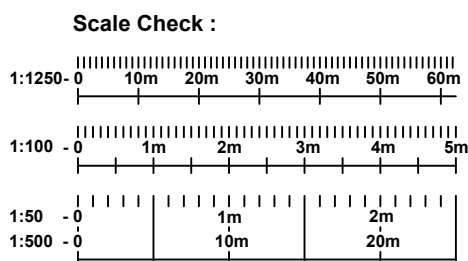
No scale factor has been applied to the survey therefore the scale of the drawing is not true OS. Coordinates which have a scale factor applied.

Please refer to Survey Station Table to enable establishment of the on-site grid.

Physical features present in the vicinity of boundaries may not be shown. The Client's ownership should be noted that some features may have been obscured at time of survey. (Parked cars ECT.)



Revisions :



Client:	Avant Homes (West Mids)
Project:	Material Storage Area, Westfield Ave. Earl Shilton
Title:	Topographical Survey

Date: Sep 23	Scale: 1:500 @ A2	
Drawn by: icp	Checked by: rm	
Job No.	Drg No.	Rev.
S219	1497	

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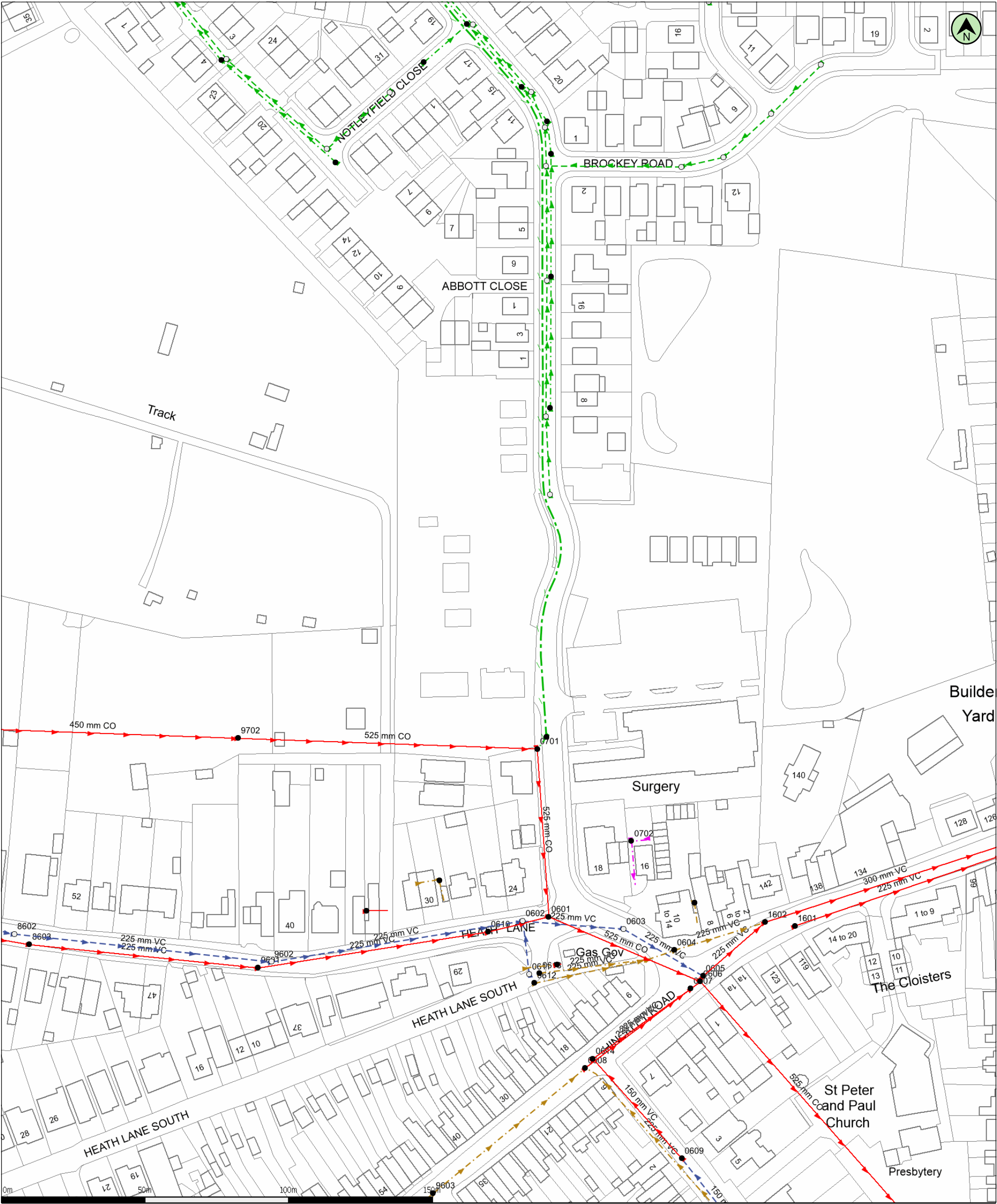


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APPENDICES

Appendix C





(c) Crown copyright and database rights 2026 Ordnance Survey AC0000808122
Data updated: 14/08/26

Scale: 1:1250
Map Centre: 446011,297806

Date: 08/09/26
Our Ref: 2206333 - 1

Wastewater Plan A3
Powered by digdat

Public Foul Gravity/Lateral Drain	—●—●—●—	Highway Drain	—●—●—●—	Manhole Foul	●
Public Combined Gravity/Lateral Drain	—●—●—●—	Overflow Pipe	—●—●—●—	Manhole Surface	○
Public Surface Water Gravity/Lateral Drain	—●—●—●—	Disposal Pipe	—●—●—●—	Abandoned Pipe	—x—x—x—x—
Pressure Foul	—●—●—●—	Culverted Water Course	—●—●—●—	Chamber	■
Pressure Combined	—●—●—●—	Pumping Station	▲▲▲▲		
Pressure Surface Water	—●—●—●—	Fitting	—●—●—●—		
Drainage Nature Based Solution Area (aka SuDS)	▨▨▨▨				

Section 104 sewers are shown in green
Private sewers are shown in magenta

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30977



1. Do not scale off this Map. 2. This plan and any information supplied with it is furnished as a general guide, is only valid at the date of issue and no warranty as to its correctness is given or implied. In particular this plan and any information shown on it must not be relied upon in the event of any development or works (including but not limited to excavations) in the vicinity of SEVERN TRENT WATER assets or for the purposes of determining the suitability of a point of connection to the sewerage or distribution systems. 3. On 1 October 2011 most private sewers and private lateral drains in Severn Trent Water's sewerage area, which were connected to a public sewer as at 1 July 2011, transferred to the ownership of Severn Trent Water and became public sewers and public lateral drains. A further transfer takes place on 1 October 2012. Private pumping stations, which form part of these sewers or lateral drains, will transfer to ownership of Severn Trent Water on or before 1 October 2016. Severn Trent Water does not possess complete records of these assets. These assets may not be displayed on the map. 4. Reproduction by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database rights 2026 OS AC0000808122. All rights reserved. 5. Document users other than SEVERN TRENT WATER business users are advised that this document is provided for reference purpose only and is subject to copyright, therefore, no further copies should be made from it.

GENERAL CONDITIONS AND PRECAUTIONS TO BE TAKEN WHEN CARRYING OUT WORK ADJACENT TO SEVERN TRENT WATER'S APPARATUS

Please ensure that a copy of these conditions is passed to your representative and/or your contractor on site. If any damage is caused to Severn Trent Water Limited (STW) apparatus (defined below), the person, contractor or subcontractor responsible must inform STW immediately on:
0800 783 4444 (24 hours)

- a) These general conditions and precautions apply to the public sewerage, water distribution and cables in ducts including (but not limited to) sewers which are the subject of an Agreement under Section 104 of the Water Industry Act 1991(a legal agreement between a developer and STW, where a developer agrees to build sewers to an agreed standard, which STW will then adopt); mains installed in accordance with an agreement for the self-construction of water mains entered into with STW and the assets described at condition b) of these general conditions and precautions. Such apparatus is referred to as "STW Apparatus" in these general conditions and precautions.
- b) Please be aware that due to The Private Sewers Transfer Regulations June 2011, the number of public sewers has increased, but many of these are not shown on the public sewer record. However, some idea of their positions may be obtained from the position of inspection covers and their existence must be anticipated.
- c) On request, STW will issue a copy of the plan showing the approximate locations of STW Apparatus although in certain instances a charge will be made. The position of private drains, private sewers and water service pipes to properties are not normally shown but their presence must be anticipated. This plan and the information supplied with it is furnished as a general guide only and STW does not guarantee its accuracy.
- d) STW does not update these plans on a regular basis. Therefore the position and depth of STW Apparatus may change and this plan is issued subject to any such change. Before any works are carried out, you should confirm whether any changes to the plan have been made since it was issued.
- e) The plan must not be relied upon in the event of excavations or other works in the vicinity of STW Apparatus. It is your responsibility to ascertain the precise location of any STW Apparatus prior to undertaking any development or other works (including but not limited to excavations).
- f) No person or company shall be relieved from liability for loss and/or damage caused to STW Apparatus by reason of the actual position and/or depths of STW Apparatus being different from those shown on the plan.

In order to achieve safe working conditions adjacent to any STW Apparatus the following should be observed:

1. All STW Apparatus should be located by hand digging prior to the use of mechanical excavators.
2. All information set out in any plans received from us, or given by our staff at the site of the works, about the position and depth of the mains, is approximate. Every possible precaution should be taken to avoid damage to STW Apparatus. You or your contractor must ensure the safety of STW Apparatus and will be responsible for the cost of repairing any loss and/or damage caused (including without limitation replacement parts).
3. Water mains are normally laid at a depth of 900mm. No records are kept of customer service pipes which are normally laid at a depth of 750mm; but some idea of their positions may be obtained from the position of stop tap covers and their existence must be anticipated.
4. During construction work, where heavy plant will cross the line of STW Apparatus, specific crossing points must be agreed with STW and suitably reinforced where required. These crossing points should be clearly marked and crossing of the line of STW Apparatus at other locations must be prevented.
5. Where it is proposed to carry out piling or boring within 20 metres of any STW Apparatus, STW should be consulted to enable any affected STW Apparatus to be surveyed prior to the works commencing.
6. Where excavation of trenches adjacent to any STW Apparatus affects its support, the STW Apparatus must be supported to the satisfaction of STW. Water mains and some sewers are pressurised and can fail if excavation removes support to thrust blocks to bends and other fittings.
7. Where a trench is excavated crossing or parallel to the line of any STW Apparatus, the backfill should be adequately compacted to prevent any settlement which could subsequently cause damage to the STW Apparatus. In special cases, it may be necessary to provide permanent support to STW Apparatus which has been exposed over a length of the excavation before backfilling and reinstatement is carried out. There should be no concrete backfill in contact with the STW Apparatus.
8. No other apparatus should be laid along the line of STW Apparatus irrespective of clearance. Above ground apparatus must not be located within a minimum of 3 metres either side of the centre line of STW Apparatus for smaller sized pipes and 6 metres either side for larger sized pipes without prior approval. No manhole or chamber shall be built over or around any STW Apparatus.
9. A minimum radial clearance of 300 millimetres should be allowed between any plant or equipment being installed and existing STW Apparatus. We reserve the right to increase this distance where strategic assets are affected.
10. Where any STW Apparatus coated with a special wrapping is damaged, even to a minor extent, STW must be notified and the trench left open until the damage has been inspected and the necessary repairs have been carried out. In the case of any material damage to any STW Apparatus causing leakage, weakening of the mechanical strength of the pipe or corrosion-protection damage, the necessary remedial work will be recharged to you.
11. It may be necessary to adjust the finished level of any surface boxes which may fall within your proposed construction. Please ensure that these are not damaged, buried or otherwise rendered inaccessible as a result of the works and that all stop taps, valves, hydrants, etc. remain accessible and operable. Minor reduction in existing levels may result in conflict with STW Apparatus such as valve spindles or tops of hydrants housed under the surface boxes. Checks should be made during site investigations to ascertain the level of such STW Apparatus in order to determine any necessary alterations in advance of the works.
12. With regard to any proposed resurfacing works, you are required to contact STW on the number given above to arrange a site inspection to establish the condition of any STW Apparatus in the nature of surface boxes or manhole covers and frames affected by the works. STW will then advise on any measures to be taken, in the event of this a proportionate charge will be made.
13. You are advised that STW will not agree to either the erection of posts, directly over or within 1.0 metre of valves and hydrants,
14. No explosives are to be used in the vicinity of any STW Apparatus without prior consultation with STW.

TREE PLANTING RESTRICTIONS

There are many problems with the location of trees adjacent to sewers, water mains and other STW Apparatus and these can lead to the loss of trees and hence amenity to the area which many people may have become used to. It is best if the problem is not created in the first place. Set out below are the recommendations for tree planting in close proximity to public sewers, water mains and other STW Apparatus.

15. Please ensure that, in relation to STW Apparatus, the mature root systems and canopies of any tree planted do not and will not encroach within the recommended distances specified in the notes below.
16. Both Poplar and Willow trees have extensive root systems and should not be planted within 12 metres of a sewer, water main or other STW Apparatus.
17. The following trees and those of similar size, be they deciduous or evergreen, should not be planted within 6 metres of a sewer, water main or other STW Apparatus. E.g. Ash, Beech, Birch, most Conifers, Elm, Horse Chestnut, Lime, Oak, Sycamore, Apple and Pear. Asset Protection Statements Updated May2014
18. STW personnel require a clear path to conduct surveys etc. No shrubs or bushes should be planted within 2 metre of the centre line of a sewer, water main or other STW

Apparatus.

19. In certain circumstances, both STW and landowners may wish to plant shrubs/bushes in close proximity to a sewer, water main or other STW Apparatus for screening purposes. The following are shallow rooting and are suitable for this purpose: Blackthorn, Broom, Cotoneaster, Elder, Hazel, Laurel, Privet, Quickthorn, Snowberry, and most ornamental flowering shrubs.

[illegible]



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APPENDICES

Appendix D



Doc. Ref.	30977-CALC-0101
Sheet	1 of 9
Engineer	B. Oyston
Date	02 Oct 26
Revision	-

DESIGN CALCULATIONS FRONT SHEET

SCHEME	Land West of Westfield Avenue, Earl Shilton.
CLIENT	Avant Homes Ltd.
ASPECTS OF SCHEME TO BE DESIGNED	• Greenfield Calculations • Surface Water Sewer Design • 1 in 2, 1 in 30 year, 1 in 30 year +35% climate change, 1 in 100 year and 1 in 100 year +40% climate change design simulations
CODES OF PRACTICE, DESIGN SPECIFICATIONS & BRITISH STANDARDS	• Design and analysis of urban storm drainage. Wallingford Procedure Vol. 1. • Sustainable Drainage Systems – National Standards for Sustainable Drainage Systems • The SuDS Manual – CIRIA C753.
NOTES	• In accordance with the Standards for SuDS, the strategy involves conveying surface water generated on site to two geo-cellular tanks before discharging into an existing surface water sewer at 2.2l/s. • In total, a storage volume of 189.16m³ is required within the two geo-cellular tanks to manage flows up to and including the 1%AEP40CC. • Drainage calculations were carried out within Flow Causeway.

INDEX

Pages	Calculations	Checked by	Date
2-7	Surface water design details and simulation results for 1 in 2, 1 in 30 year, 1 in 30 year +35% climate change, 1 in 100 year and 1 in 100 year +40% climate change events.	JH	02/10/2026
8-9	Foul drainage design details.	JH	02/10/2026

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	100	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	0.700
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	50.0		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.085	5.00	106.521	1350	446007.419	297794.540	1.500
2	0.012	5.00	106.181	1500	446007.251	297807.254	1.500
3	0.064	5.00	105.353	1800	446008.936	297836.730	1.650
4	0.073	5.00	105.500	1800	446011.792	297846.393	1.810
5	0.003	5.00	105.857	2700	446021.954	297847.378	2.230
EXISTING			105.192	1800	446027.465	297869.236	1.790

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	12.715	0.600	105.021	104.681	0.340	37.4	300	5.08	50.0
1.001	2	3	29.524	0.600	104.681	104.153	0.528	55.9	300	5.32	50.0
1.002	3	4	10.076	0.600	103.703	103.690	0.013	775.1	750	5.48	50.0
1.003	4	5	10.210	0.600	103.690	103.627	0.063	162.1	750	5.56	50.0
1.004	5	EXISTING	22.542	0.600	103.627	103.402	0.225	100.2	150	5.94	50.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)
1.000	2.579	182.3	15.4	1.200	1.200	0.085	0.0
1.001	2.107	148.9	17.5	1.200	0.900	0.097	0.0
1.002	0.997	440.5	29.1	0.900	1.060	0.161	0.0
1.003	2.195	969.7	42.3	1.060	1.480	0.234	0.0
1.004	1.004	17.7	42.8	2.080	1.640	0.237	0.0

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	12.715	37.4	300	Circular	106.521	105.021	1.200	106.181	104.681	1.200
1.001	29.524	55.9	300	Circular	106.181	104.681	1.200	105.353	104.153	0.900
1.002	10.076	775.1	750	Circular	105.353	103.703	0.900	105.500	103.690	1.060
1.003	10.210	162.1	750	Circular	105.500	103.690	1.060	105.857	103.627	1.480
1.004	22.542	100.2	150	Circular	105.857	103.627	2.080	105.192	103.402	1.640

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1350	Manhole	Adoptable	2	1500	Manhole	Adoptable
1.001	2	1500	Manhole	Adoptable	3	1800	Manhole	Adoptable
1.002	3	1800	Manhole	Adoptable	4	1800	Manhole	Adoptable
1.003	4	1800	Manhole	Adoptable	5	2700	Manhole	Adoptable
1.004	5	2700	Manhole	Adoptable	EXISTING	1800	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
1	446007.419	297794.540	106.521	1.500	1350				
						0	1.000	105.021	300
2	446007.251	297807.254	106.181	1.500	1500		1	1.000	104.681
						0	1.001	104.681	300
3	446008.936	297836.730	105.353	1.650	1800		1	1.001	104.153
						0	1.002	103.703	750
4	446011.792	297846.393	105.500	1.810	1800		1	1.002	103.690
						0	1.003	103.690	750
5	446021.954	297847.378	105.857	2.230	2700		1	1.003	103.627
						0	1.004	103.627	150
EXISTING	446027.465	297869.236	105.192	1.790	1800		1	1.004	103.402
									150

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	240	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		



Storm Durations
15 | 30 | 60 | 120 | 180 | 240 | 360 | 480 | 600 | 720 | 960 | 1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
2	0	10	0
30	35	10	0
100	40	10	0

Node 5 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	103.627	Product Number	CTL-SHE-0063-2200-1650-2200
Design Depth (m)	1.650	Min Outlet Diameter (m)	0.075
Design Flow (l/s)	2.2	Min Node Diameter (mm)	1200

Node 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	104.681
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	32

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	85.0	0.0	0.800	85.0	0.0	0.801	0.0	0.0

Node 4 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Safety Factor	2.0	Invert Level (m)	103.690
Side Inf Coefficient (m/hr)	0.00000	Porosity	0.95	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	197.8	0.0	0.800	197.8	0.0	0.801	0.0	0.0

Results for 2 year +10% A Critical Storm Duration. Lowest mass balance: 99.87%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	9	105.090	0.068	16.1	0.0980	0.0000	OK
30 minute summer	2	21	104.736	0.055	16.3	4.5220	0.0000	OK
480 minute summer	3	344	103.882	0.179	6.2	0.4549	0.0000	OK
480 minute summer	4	344	103.881	0.191	9.1	36.4483	0.0000	OK
480 minute summer	5	360	103.882	0.255	4.9	1.4625	0.0000	SURCHARGED
480 minute summer	EXISTING	336	103.433	0.031	1.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	16.2	2.044	0.089	0.1142	
30 minute summer	2	1.001	3	10.6	1.219	0.071	0.2557	
480 minute summer	3	1.002	4	6.3	0.318	0.014	0.8499	
480 minute summer	4	1.003	5	4.9	0.158	0.005	1.1241	
480 minute summer	5	1.004	EXISTING	1.7	0.628	0.093	0.0594	55.4

Results for 30 year +35% CC +10% A Critical Storm Duration. Lowest mass balance: 99.95%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	105.145	0.124	53.7	0.1779	0.0000	OK
15 minute summer	2	12	104.803	0.122	61.2	10.0824	0.0000	OK
480 minute winter	3	472	104.382	0.679	11.0	1.7283	0.0000	OK
480 minute winter	4	472	104.382	0.692	15.9	131.8139	0.0000	OK
480 minute winter	5	472	104.382	0.755	5.0	4.3237	0.0000	SURCHARGED
15 minute summer	EXISTING	134	103.433	0.031	1.7	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	53.6	2.419	0.294	0.3266	
15 minute summer	2	1.001	3	47.8	1.838	0.321	0.7674	
480 minute winter	3	1.002	4	10.9	0.434	0.025	4.2518	
480 minute winter	4	1.003	5	4.9	0.210	0.005	4.4142	
480 minute winter	5	1.004	EXISTING	1.7	0.629	0.094	0.0597	58.4

Results for 100 year +40% CC +10% A Critical Storm Duration. Lowest mass balance: 99.72%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	10	105.171	0.150	73.6	0.2143	0.0000	OK
480 minute winter	2	472	105.107	0.426	9.2	35.1255	0.0000	SURCHARGED
480 minute winter	3	472	105.105	1.402	15.5	3.5670	0.0000	FLOOD RISK
480 minute winter	4	472	105.108	1.418	22.3	154.0316	0.0000	SURCHARGED
480 minute winter	5	464	105.106	1.479	8.3	8.4669	0.0000	SURCHARGED
480 minute winter	EXISTING	464	103.437	0.035	2.1	0.0000	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	73.5	2.509	0.403	0.4285	
480 minute winter	2	1.001	3	9.4	1.166	0.063	2.0791	
480 minute winter	3	1.002	4	15.4	0.463	0.035	4.4347	
480 minute winter	4	1.003	5	8.2	0.235	0.008	4.4936	
480 minute winter	5	1.004	EXISTING	2.1	0.670	0.117	0.0697	72.3

Design Settings

Frequency of use (kDU)	1.00	Minimum Velocity (m/s)	0.75
Flow per dwelling per day (l/day)	4000	Connection Type	Level Soffits
Domestic Flow (l/s/ha)	0.0	Minimum Backdrop Height (m)	0.200
Industrial Flow (l/s/ha)	0.0	Preferred Cover Depth (m)	1.200
Additional Flow (%)	0	Include Intermediate Ground	✓

Nodes

Name	Dwellings	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	7	106.526	1200	446005.685	297791.890	1.626
2	5	105.112	1200	446005.083	297837.325	1.709
3	6	105.857	1200	446021.416	297844.123	2.572
F11		105.690	1200	446029.621	297851.079	2.477
F5 EXISTING		105.092	1200	446028.801	297873.745	2.590
F10		105.860	1200	446031.438	297841.604	1.350

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
1.000	1	2	45.439	1.500	104.900	103.403	1.497	30.4	150
1.001	2	3	17.691	1.500	103.403	103.285	0.118	149.9	150
1.002	3	F11	10.757	1.500	103.285	103.213	0.072	149.4	150
1.003	F11	F5 EXISTING	22.681	1.500	103.213	102.502	0.711	31.9	150
2.000	F10	F11	9.648	1.500	104.510	103.213	1.297	7.4	150

Name	Pro Vel @ 1/3 Q (m/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Dwellings (ha)	Σ Units (ha)	Σ Add Inflow (ha)	Pro Depth (mm)	Pro Velocity (m/s)
1.000	0.366	1.594	28.2	0.3	1.476	1.559	0.000	7	0.0	0.0	11	0.507
1.001	0.250	0.714	12.6	0.6	1.559	2.422	0.000	12	0.0	0.0	22	0.354
1.002	0.281	0.716	12.6	0.8	2.422	2.327	0.000	18	0.0	0.0	26	0.397
1.003	0.476	1.555	27.5	0.8	2.327	2.440	0.000	18	0.0	0.0	18	0.690
2.000	0.000	3.225	57.0	0.0	1.200	2.327	0.000	0	0.0	0.0	0	0.000

Pipeline Schedule

Link	Length (m)	Slope (1:X)	Dia (mm)	Link Type	US CL (m)	US IL (m)	US Depth (m)	DS CL (m)	DS IL (m)	DS Depth (m)
1.000	45.439	30.4	150	Circular	106.526	104.900	1.476	105.112	103.403	1.559
1.001	17.691	149.9	150	Circular	105.112	103.403	1.559	105.857	103.285	2.422
1.002	10.757	149.4	150	Circular	105.857	103.285	2.422	105.690	103.213	2.327
1.003	22.681	31.9	150	Circular	105.690	103.213	2.327	105.092	102.502	2.440
2.000	9.648	7.4	150	Circular	105.860	104.510	1.200	105.690	103.213	2.327

Link	US Node	Dia (mm)	Node Type	MH Type	DS Node	Dia (mm)	Node Type	MH Type
1.000	1	1200	Manhole	Adoptable	2	1200	Manhole	Adoptable
1.001	2	1200	Manhole	Adoptable	3	1200	Manhole	Adoptable
1.002	3	1200	Manhole	Adoptable	F11	1200	Manhole	Adoptable
1.003	F11	1200	Manhole	Adoptable	F5 EXISTING	1200	Manhole	Adoptable
2.000	F10	1200	Manhole	Adoptable	F11	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)	
1	446005.685	297791.890	106.526	1.626	1200		0	1.000	104.900	150
2	446005.083	297837.325	105.112	1.709	1200		1	1.000	103.403	150
3	446021.416	297844.123	105.857	2.572	1200		0	1.001	103.403	150
							1	1.001	103.285	150
F11	446029.621	297851.079	105.690	2.477	1200		1	2.000	103.213	150
							2	1.002	103.213	150
							0	1.003	103.213	150
F5 EXISTING	446028.801	297873.745	105.092	2.590	1200		1	1.003	102.502	150
F10	446031.438	297841.604	105.860	1.350	1200		0	2.000	104.510	150

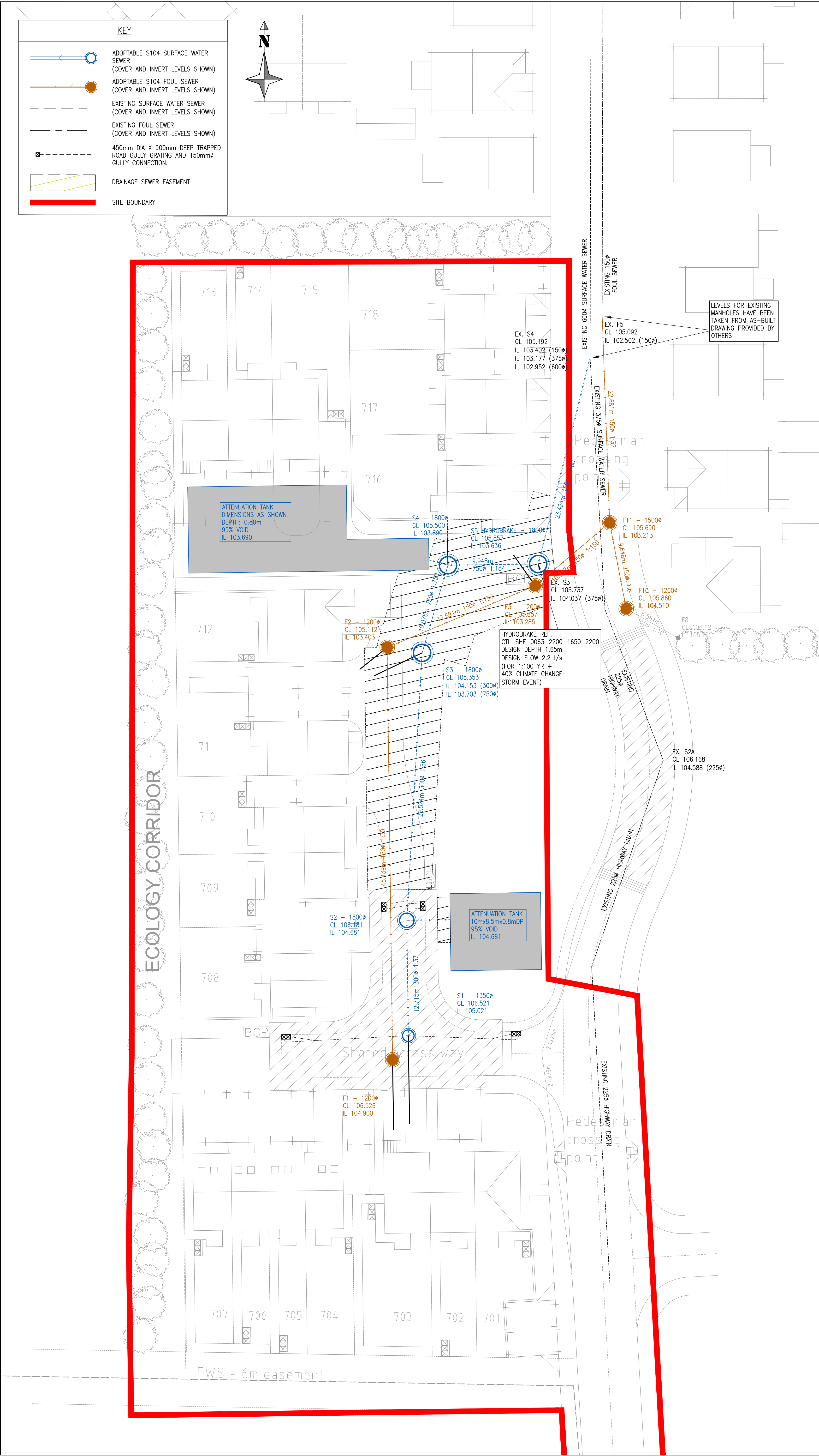


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APPENDICES

Appendix E





NOTES:

- DO NOT SCALE THIS DRAWING.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS, ARCHITECTS AND SPECIALIST DESIGN DRAWINGS AND DETAILS.
- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE. ALL LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
- SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH DESIGN AND CONSTRUCTION GUIDANCE FOR FOUL AND SURFACE WATER SEWERS OFFERED FOR ADOPTION UNDER THE CODE FOR ADOPTION AGREEMENTS FOR WATER AND SEWERAGE COMPANIES OPERATING WHOLLY OR MAINLY IN ENGLAND ("THE CODE") APPROVED VERSION 2.3 NOVEMBER 2023.
- ANY DISCREPANCIES NOTED ON SITE ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.
- THE CONTRACTOR SHALL CHECK ALL TIE-INS FOR LINE AND LEVEL WITH EXISTING BEFORE COMMENCING ANY WORKS. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY IN WRITING, SHOULD ANY ERRORS BE FOUND.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ANY SERVICE APPARATUS IN THE VICINITY OF THE WORKS. THE CLIENT WILL ACCEPT NO CLAIMS WHATSOEVER IN RESPECT OF ANY LOSSES OR DAMAGE CAUSED IN RESPECT OF SUCH APPARATUS, HOWEVER CAUSED.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO EXECUTE THE WORKS AT ALL TIMES IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THE HEALTH AND SAFETY AT WORK ACT 1974, AND THE C.O.M. REGULATIONS 2015. THE CONTRACTOR WILL BE DEEMED TO HAVE ALLOWED FOR FULL COMPLIANCE, WITHIN THEIR RATES.
- THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL WORKS ARE TO THE SATISFACTION OF THE ENGINEER, AND SHALL BE DEEMED TO HAVE INCLUDED WITHIN HIS RATES FOR ANY NECESSARY TESTING.
- THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY DE-WATERING AND TRENCH SUPPORT TO EXECUTE THE WORKS IN A SATISFACTORY MANNER, AND SHALL BE DEEMED TO HAVE ALLOWED FOR THE SAME WITHIN THEIR RATES.
- ALL BURIED CONCRETE PRODUCTS AND MORTAR SHALL BE MADE USING SULPHATE RESISTING CEMENT.
- FULL SETTING OUT REPORTS OF THE ROAD CENTRELINE AND CHANNEL WILL BE PROVIDED TO THE SUCCESSFUL CONTRACTOR.
- ALL MANHOLE COVERS TO BE SET 1m AND MANHOLES TO BE A MINIMUM OF 0.5m FROM THE KERBLINE.
- IMMEDIATELY PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, THE CONTRACTOR SHALL ESTABLISH THE EXACT LINE AND LEVEL OF THE EXISTING CONNECTIONS. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER IMMEDIATELY.
- MANHOLE COVERS AND FRAMES SHALL COMPLY WITH PARAGRAPH E2.32 OF 'SEWERAGE SECTOR GUIDANCE APPENDIX C - DESIGN AND CONSTRUCTION GUIDANCE'

REV:	FIRST ISSUE	BO	JH	RC	02.10.26
REV:	AMENDMENTS:	DRN	CHK	APP	DATE:

PROJECT: LAND WEST OF WESTFIELD AVENUE, EARL SHILTON

DRAWING TITLE: DETAILED DRAINAGE DESIGN

CLIENT: AVANT HOMES LTD

DRAWING NUMBER: 30977_01_230_01

REVISION: -	SHEET SIZE: A1	SCALE: 1:200
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STATUS: FOR INFORMATION / APPROVAL

MEC

Consulting Group

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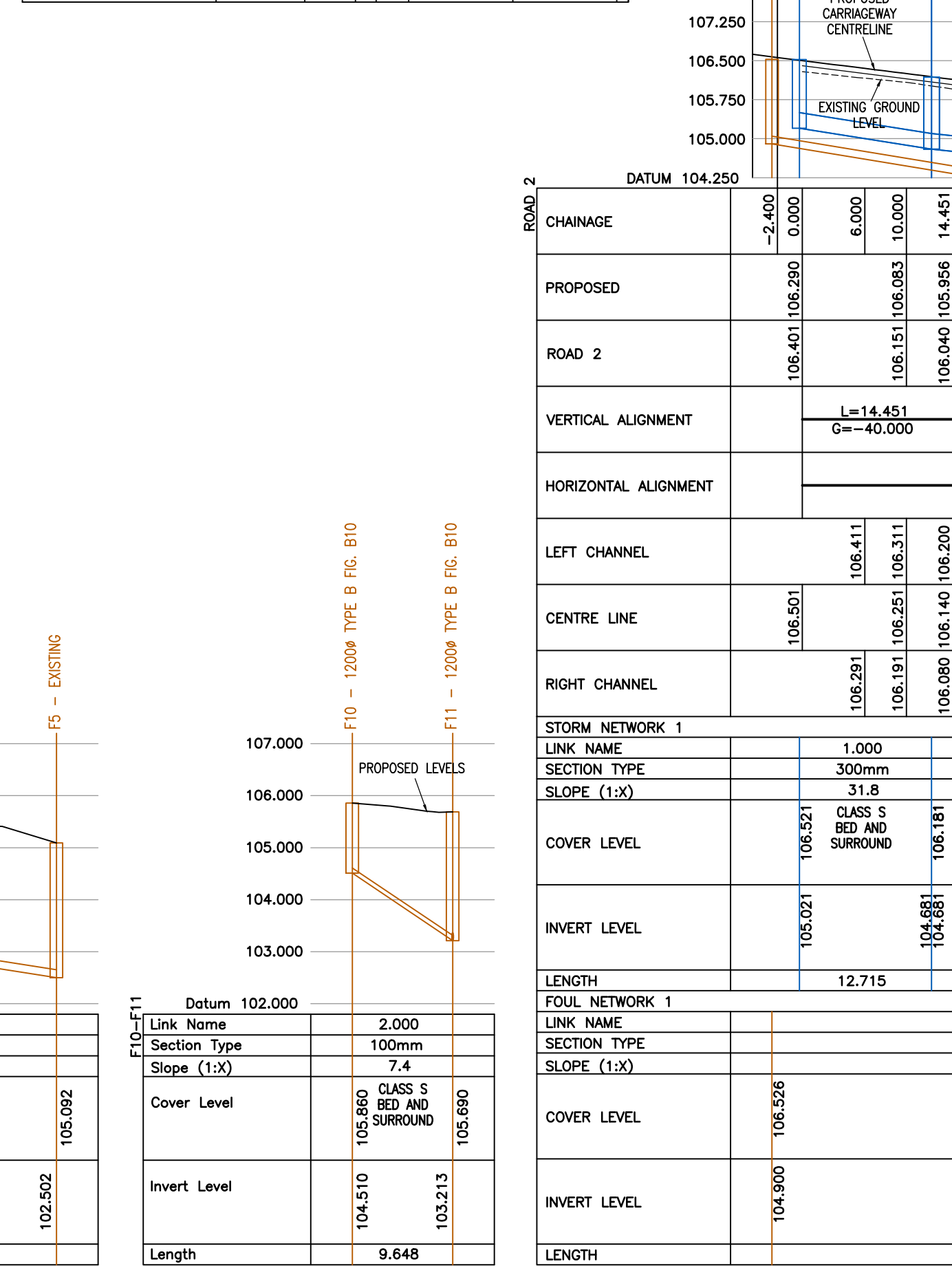
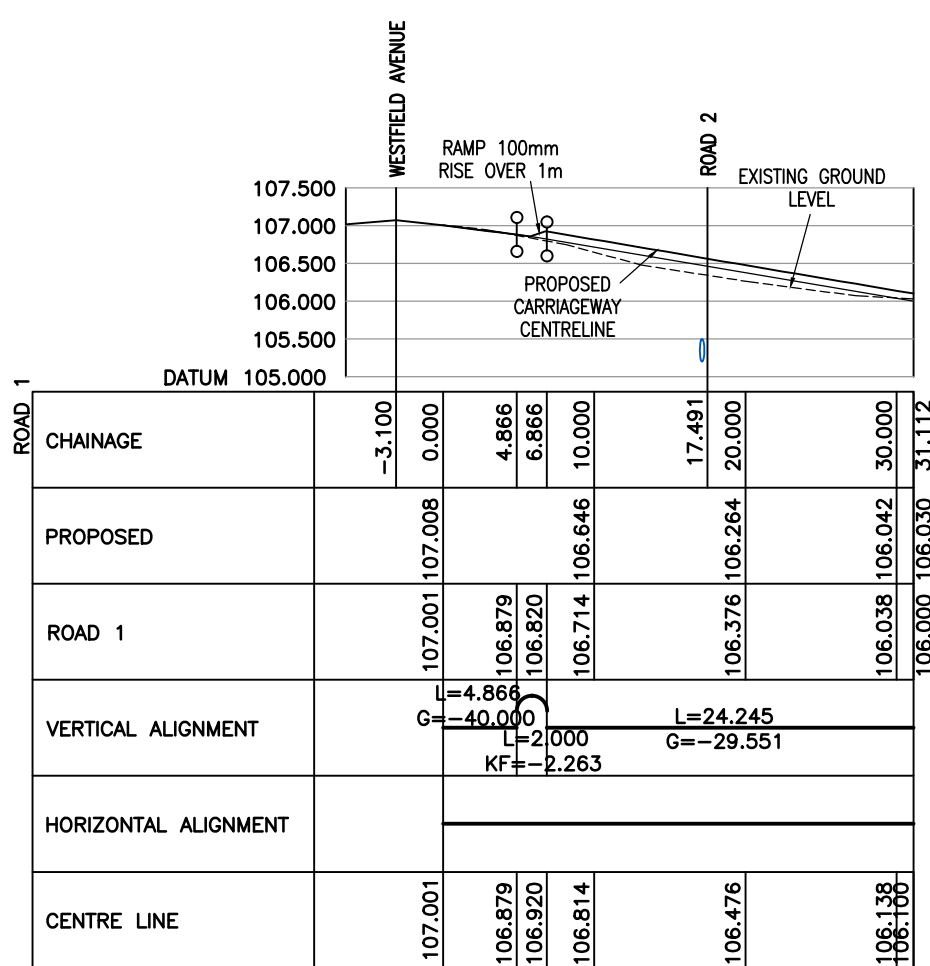
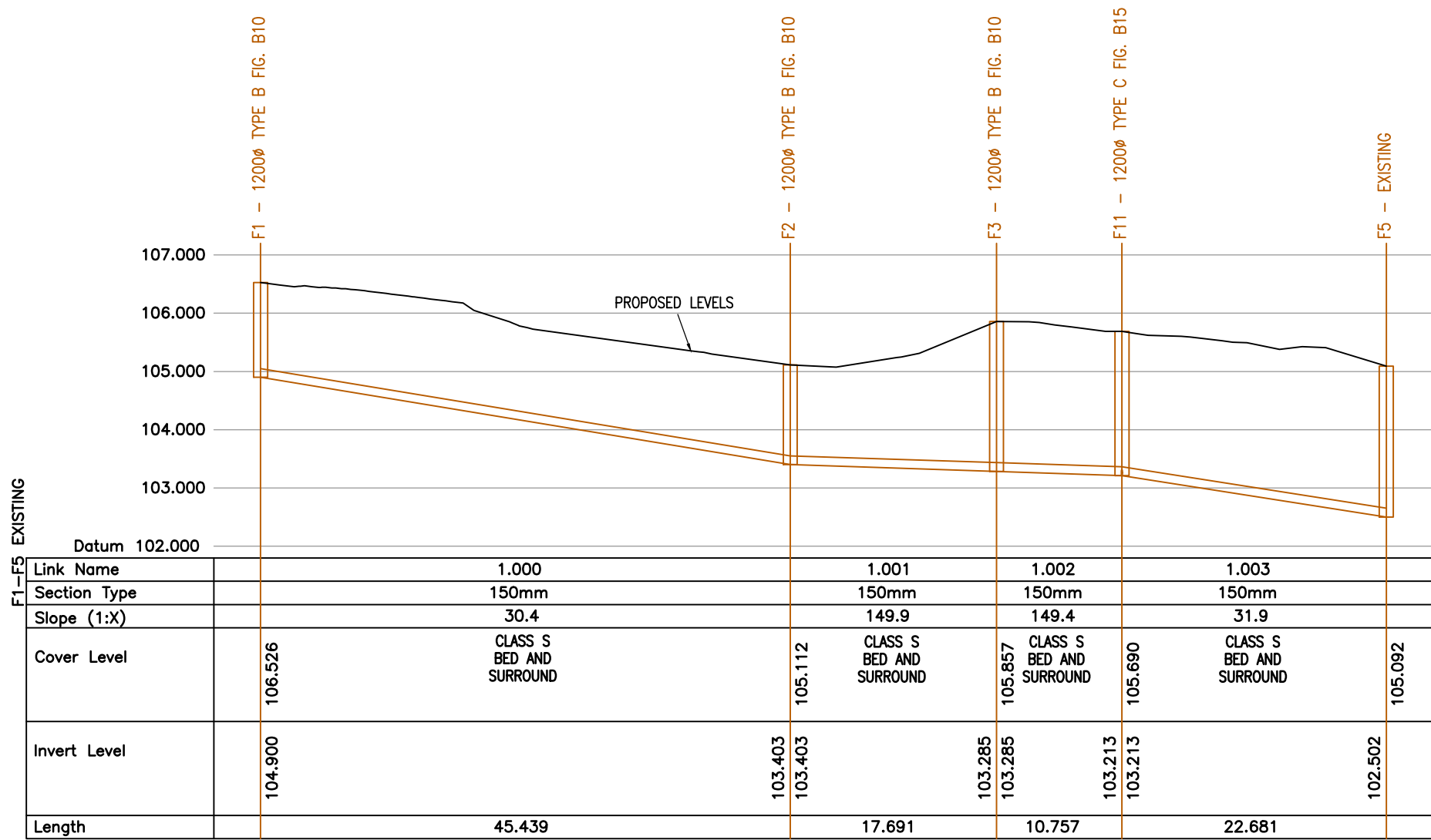
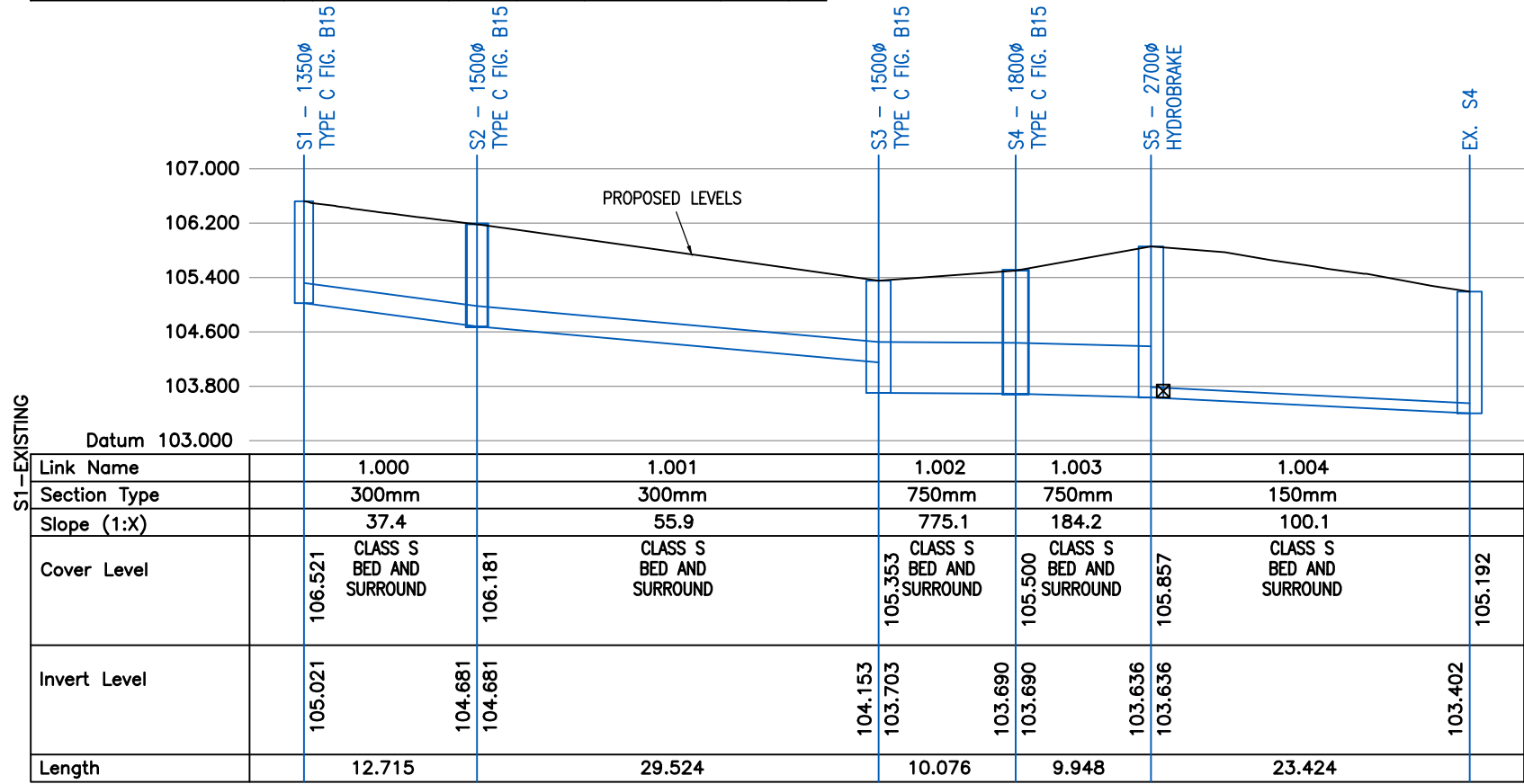
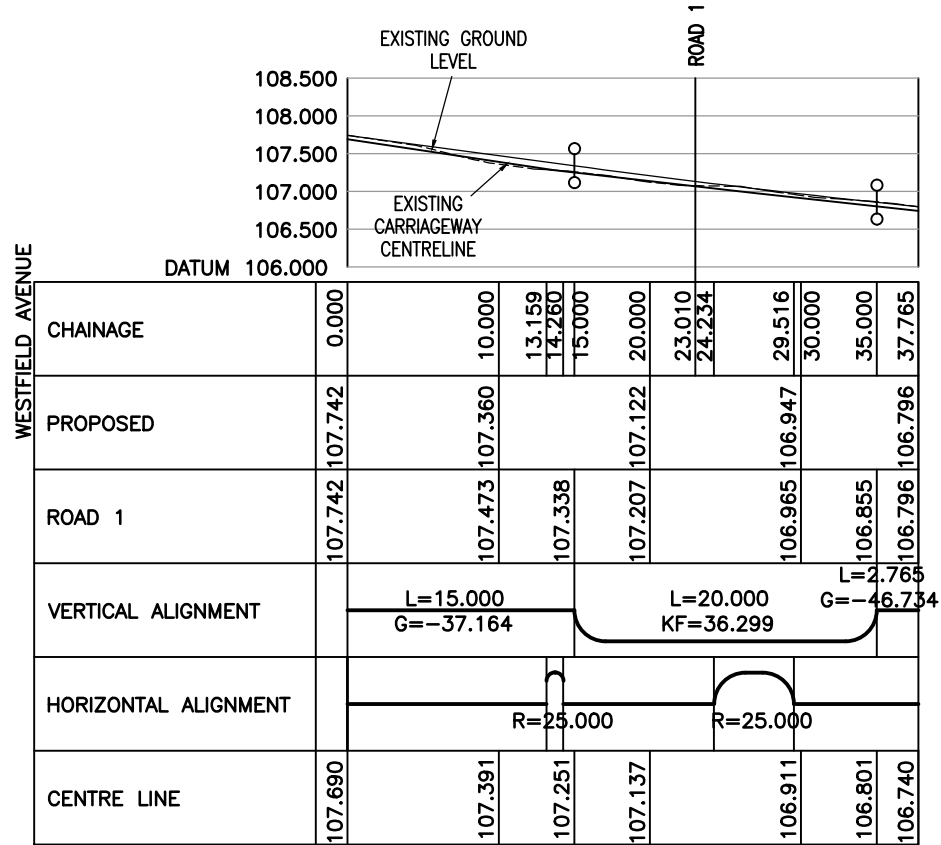


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APPENDICES

Appendix F





NOTES:

- DO NOT SCALE THIS DRAWING.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS, ARCHITECTS AND SPECIALIST DESIGN DRAWINGS AND DETAILS.
- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE. ALL LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
- SEWERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH DESIGN AND CONSTRUCTION GUIDANCE FOR FOUL AND SURFACE WATER SEWERS OFFERED FOR ADOPTION UNDER THE CODE FOR ADOPTION AGREEMENTS FOR WATER AND SEWERAGE COMPANIES OPERATING WHOLLY OR MAINLY IN ENGLAND ("THE CODE") APPROVED VERSION 2.3 NOVEMBER 2023.
- ANY DISCREPANCIES NOTED ON SITE ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.
- THE CONTRACTOR SHALL CHECK ALL TIE-INS FOR LINE AND LEVEL WITH EXISTING BEFORE COMMENCING ANY WORKS. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY IN WRITING, SHOULD ANY ERRORS BE FOUND.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ANY SERVICE APPARATUS IN THE VICINITY OF THE WORKS. THE CLIENT WILL ACCEPT NO CLAIMS WHATSOEVER IN RESPECT OF ANY LOSSES OR DAMAGE CAUSED IN RESPECT OF SUCH APPARATUS, HOWEVER CAUSED.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO EXECUTE THE WORKS AT ALL TIMES IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THE HEALTH AND SAFETY AT WORK ACT 1974, AND THE C.D.M. REGULATIONS 2015. THE CONTRACTOR WILL BE DEEMED TO HAVE ALLOWED FOR FULL COMPLIANCE, WITHIN THEIR RATES.
- THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL WORKS ARE TO THE SATISFACTION OF THE ENGINEER, AND SHALL BE DEEMED TO HAVE INCLUDED WITHIN THEIR RATES FOR ANY NECESSARY TESTING.
- THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY DE-WATERING AND TRENCH SUPPORT TO EXECUTE THE WORKS IN A SATISFACTORY MANNER, AND SHALL BE DEEMED TO HAVE ALLOWED FOR THE SAME WITHIN THEIR RATES.
- ALL BURIED CONCRETE PRODUCTS AND MORTAR SHALL BE MADE USING SULPHATE RESISTING CEMENT.
- FULL SETTING OUT REPORTS OF THE ROAD CENTRELINE AND CHANNEL WILL BE PROVIDED TO THE SUCCESSFUL CONTRACTOR.
- FOR GENERAL ARRANGEMENT REFER TO DRG NO. 30341_02_020_01
- ALL MANHOLE COVERS TO BE SET 1m AND MANHOLES TO BE A MINIMUM OF 0.5m FROM THE KERBLINE.
- IMMEDIATELY PRIOR TO COMMENCEMENT OF ANY DRAINAGE WORKS, THE CONTRACTOR SHALL ESTABLISH THE EXACT LINE AND LEVEL OF THE EXISTING CONNECTIONS. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER IMMEDIATELY.
- MANHOLE COVERS AND FRAMES SHALL COMPLY WITH PARAGRAPH E2.32 OF 'SEWERAGE SECTOR GUIDANCE APPENDIX C - DESIGN AND CONSTRUCTION GUIDANCE'

REV:	FIRST ISSUE	BO	JH	RC	02.10.26
AMENDMENTS:		DRN:	CHK:	APP:	DATE:
PROJECT: LAND WEST OF WESTFIELD AVENUE, EARL SHILTON					
DRAWING TITLE: LONG SECTIONS					
CLIENT: AVANT HOMES LTD					
DRAWING NUMBER: 30977_01_230_02					
REVISION:		SHEET SIZE:	SCALE: H1:500 V1:100		
STATUS: FOR INFORMATION / APPROVAL					
M·EC Consulting Development Engineers		Telephone: 01530 264 753 Email: group@m-ec.co.uk Website: www.m-ec.co.uk ORDNANCE SURVEY © CROWN COPYRIGHT 2015. ALL RIGHTS RESERVED. LICENCE NUMBER 100055865.			

Printed: 02.10.2026
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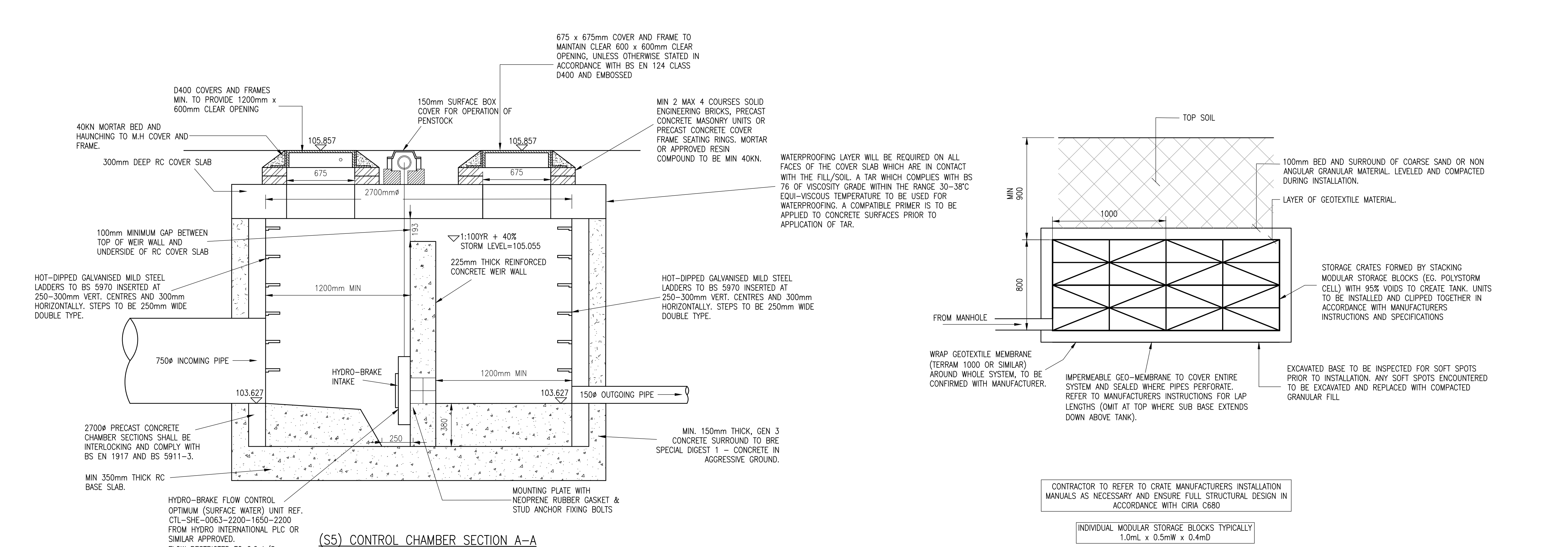


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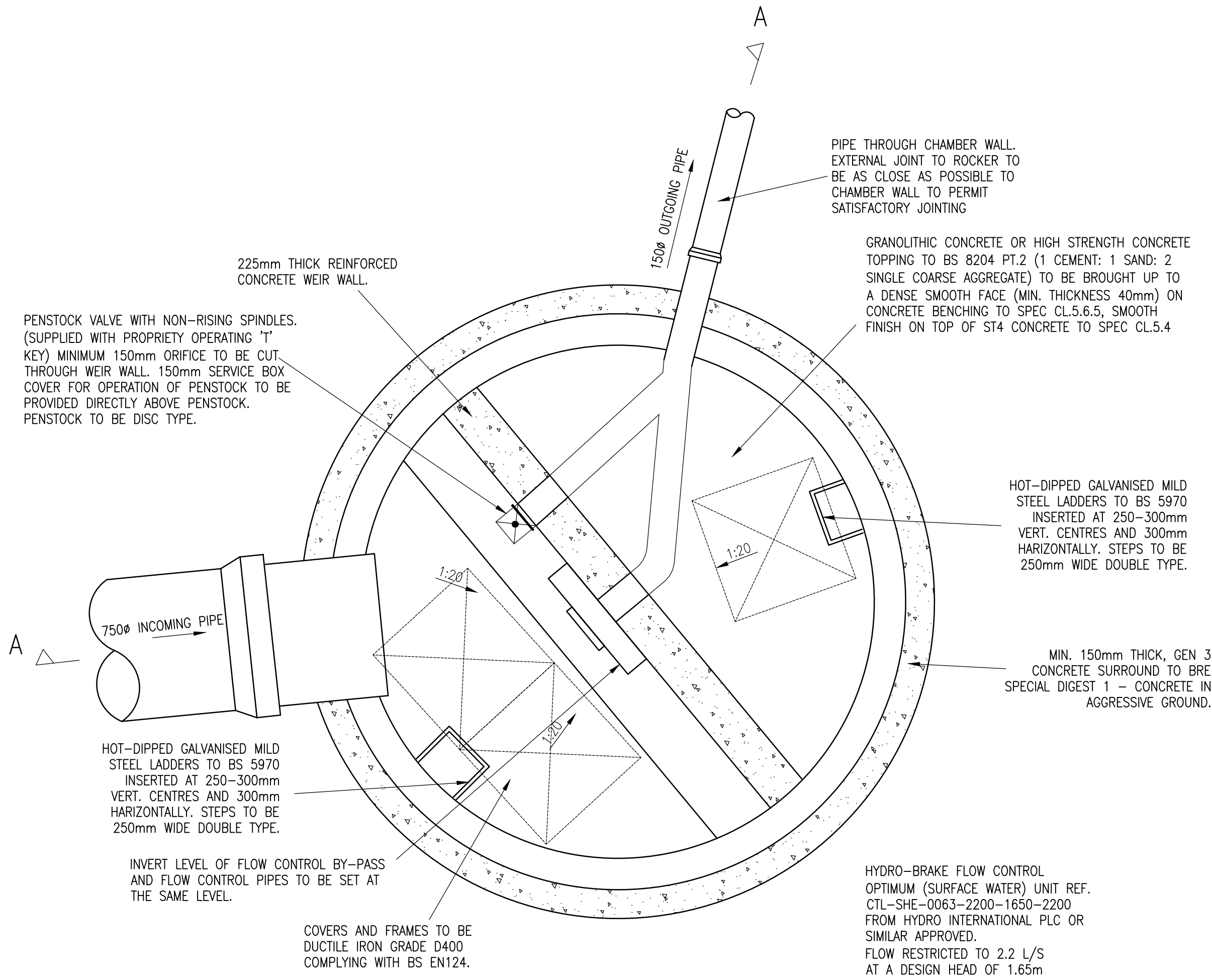
APPENDICES

Appendix G

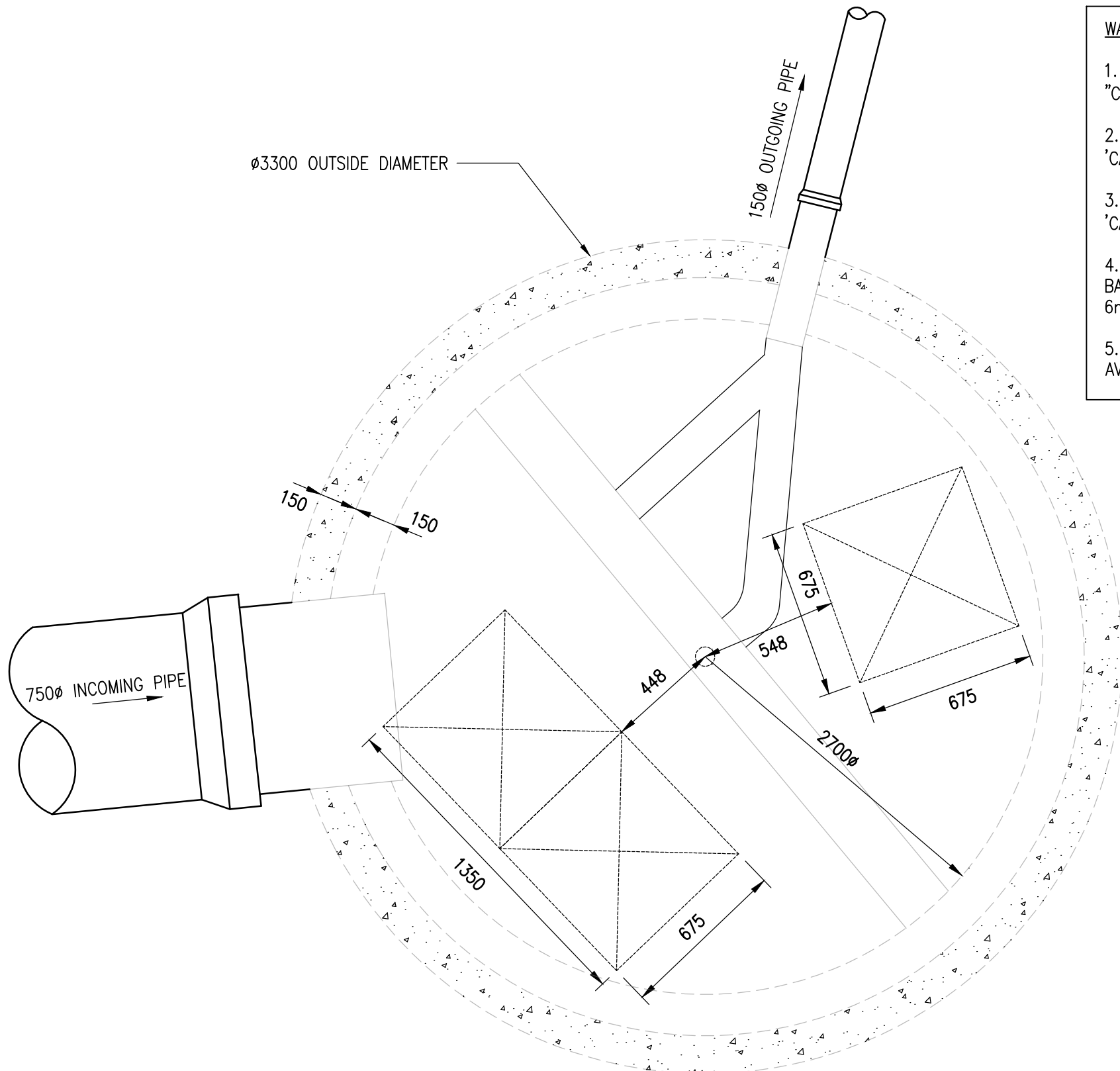




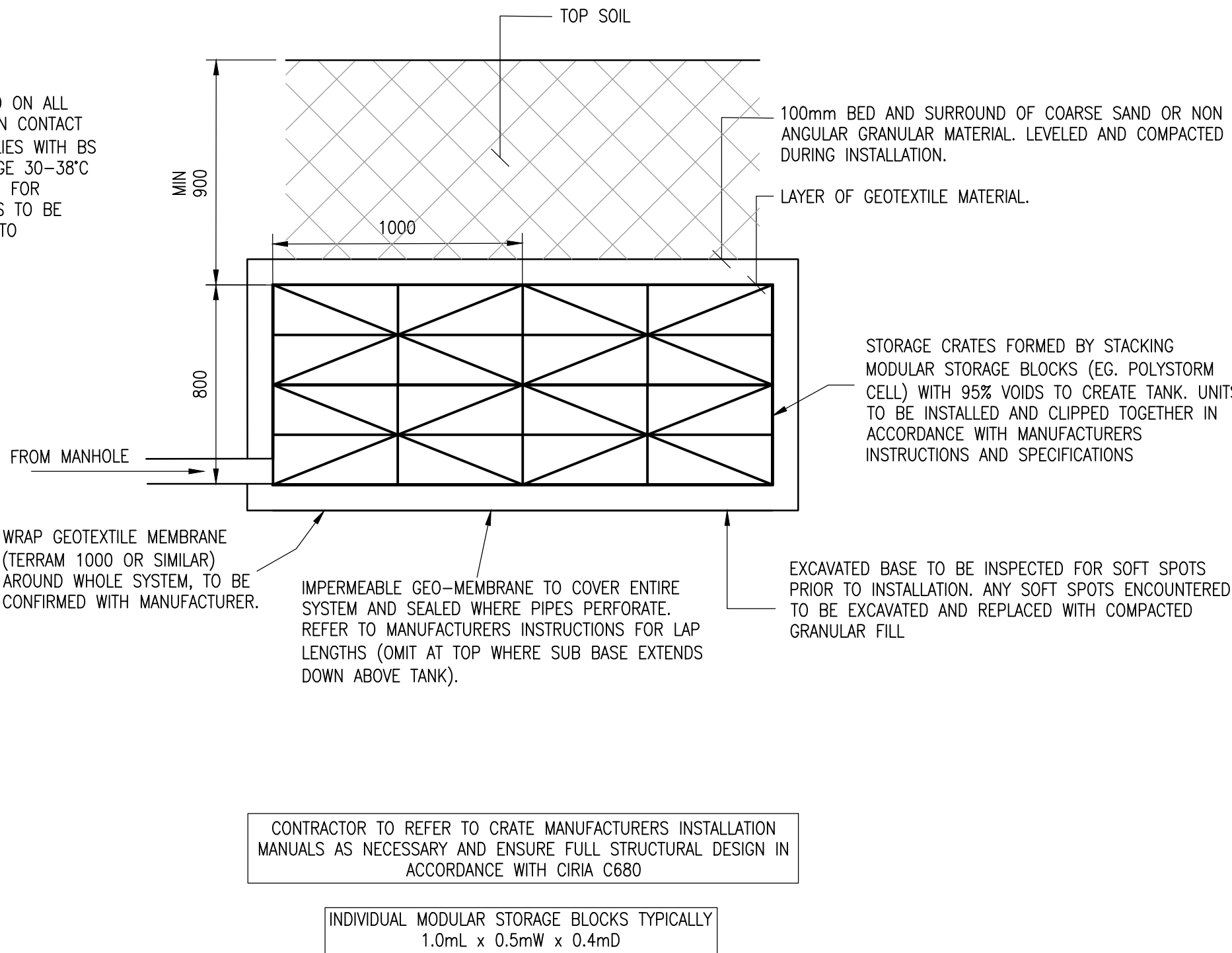
(S5) CONTROL CHAMBER SECTION A-A



(S5) CONTROL CHAMBER PLAN



COVER SLAB PLAN

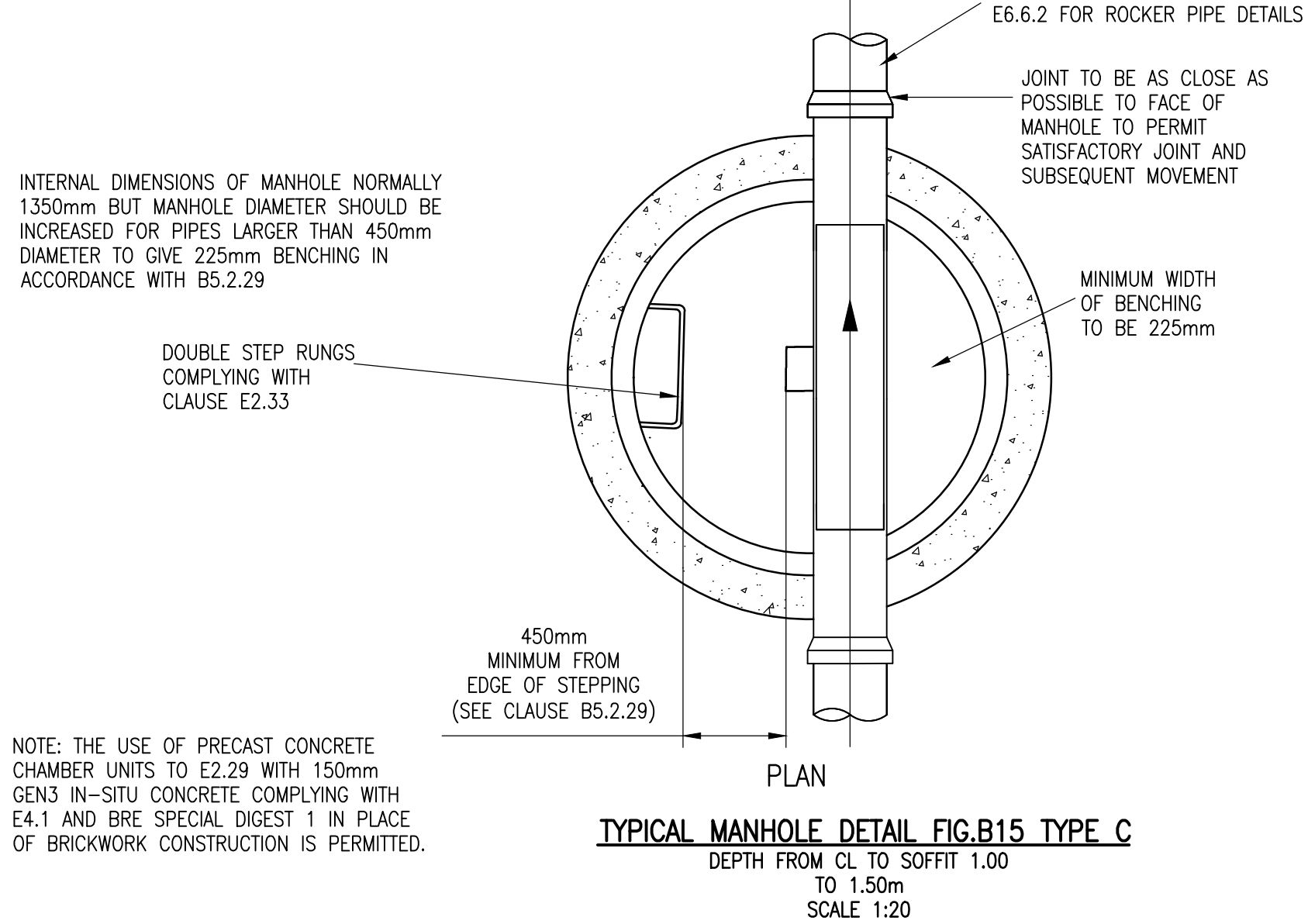
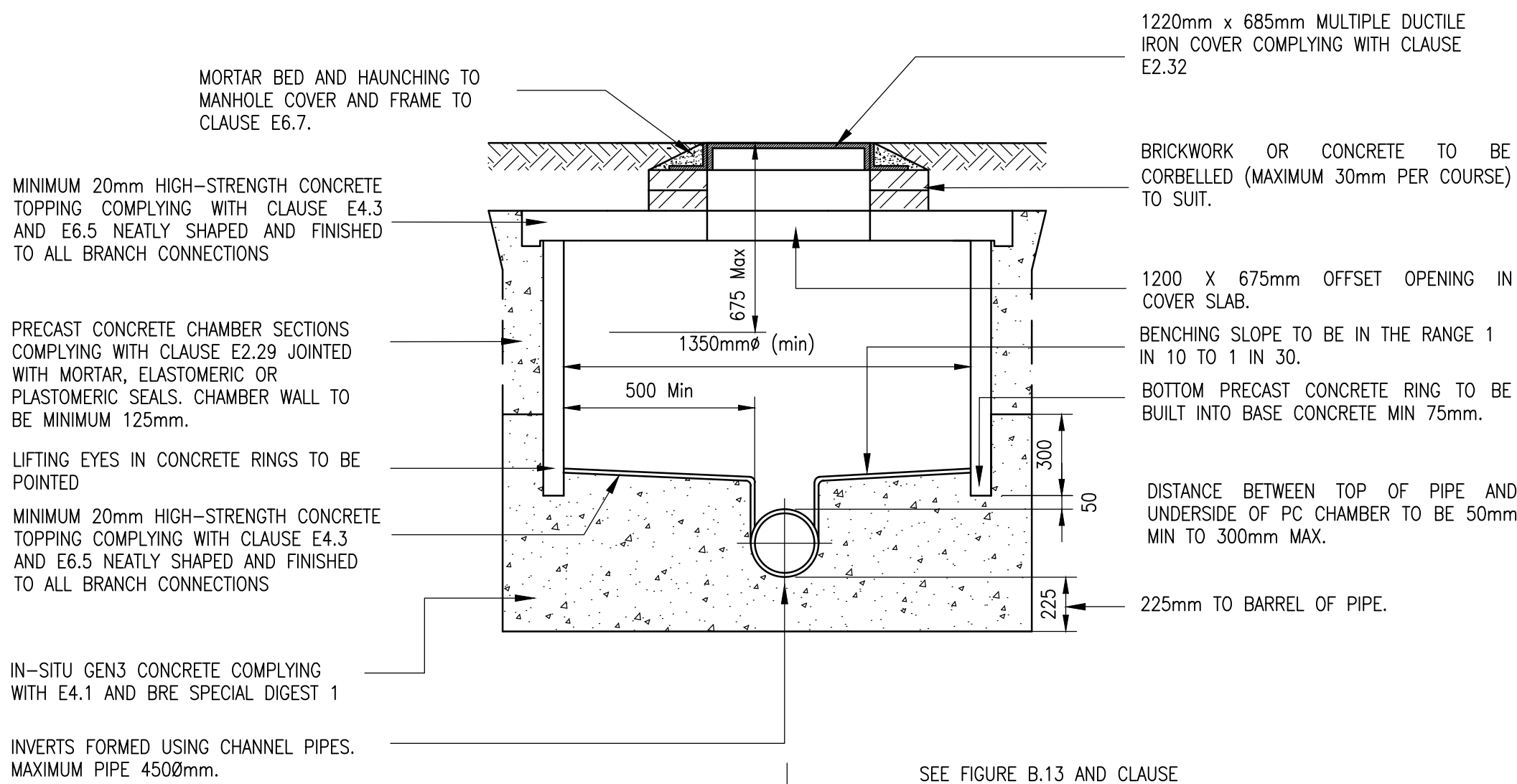


TYPICAL STORAGE TANK CONSTRUCTION DETAIL

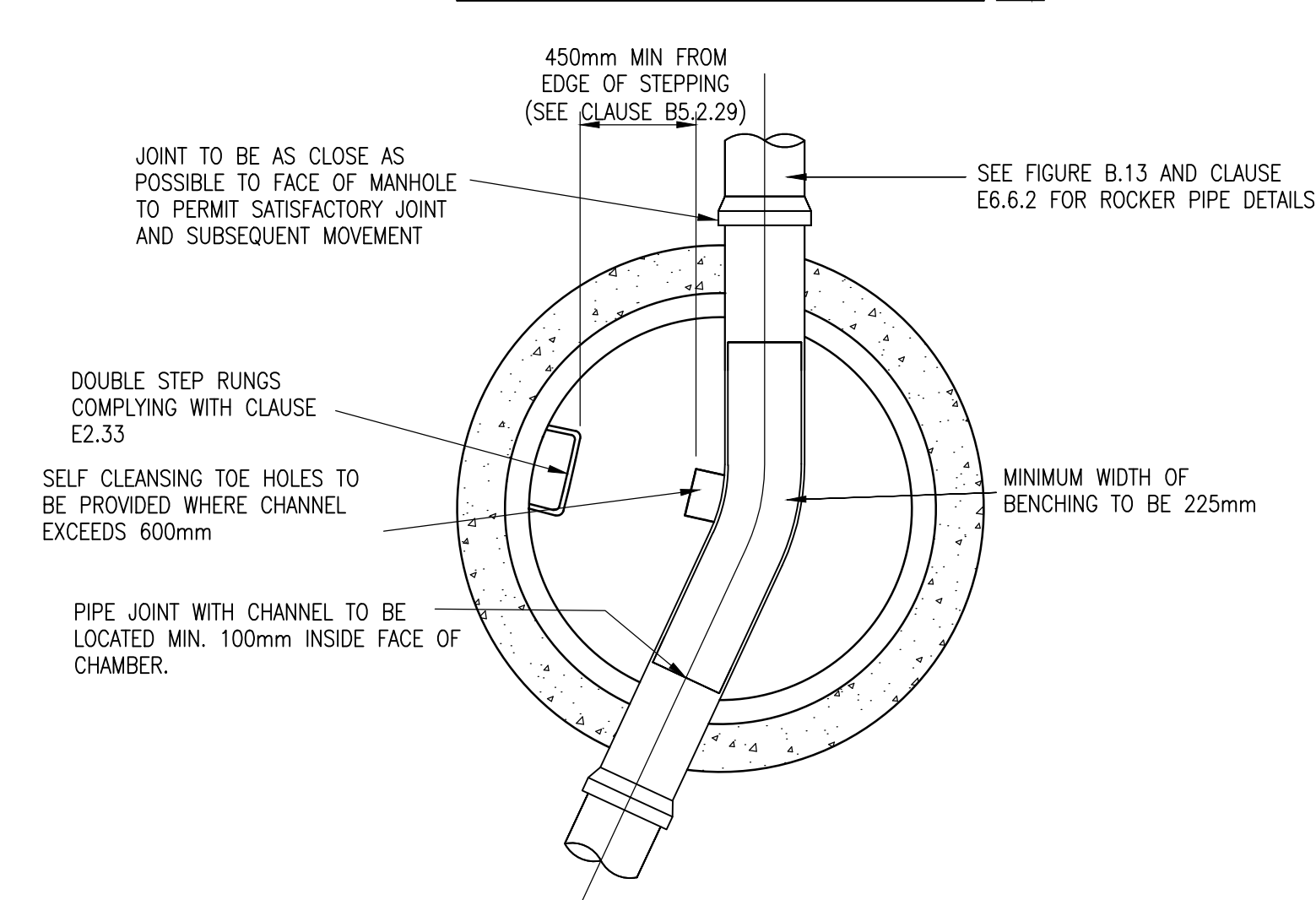
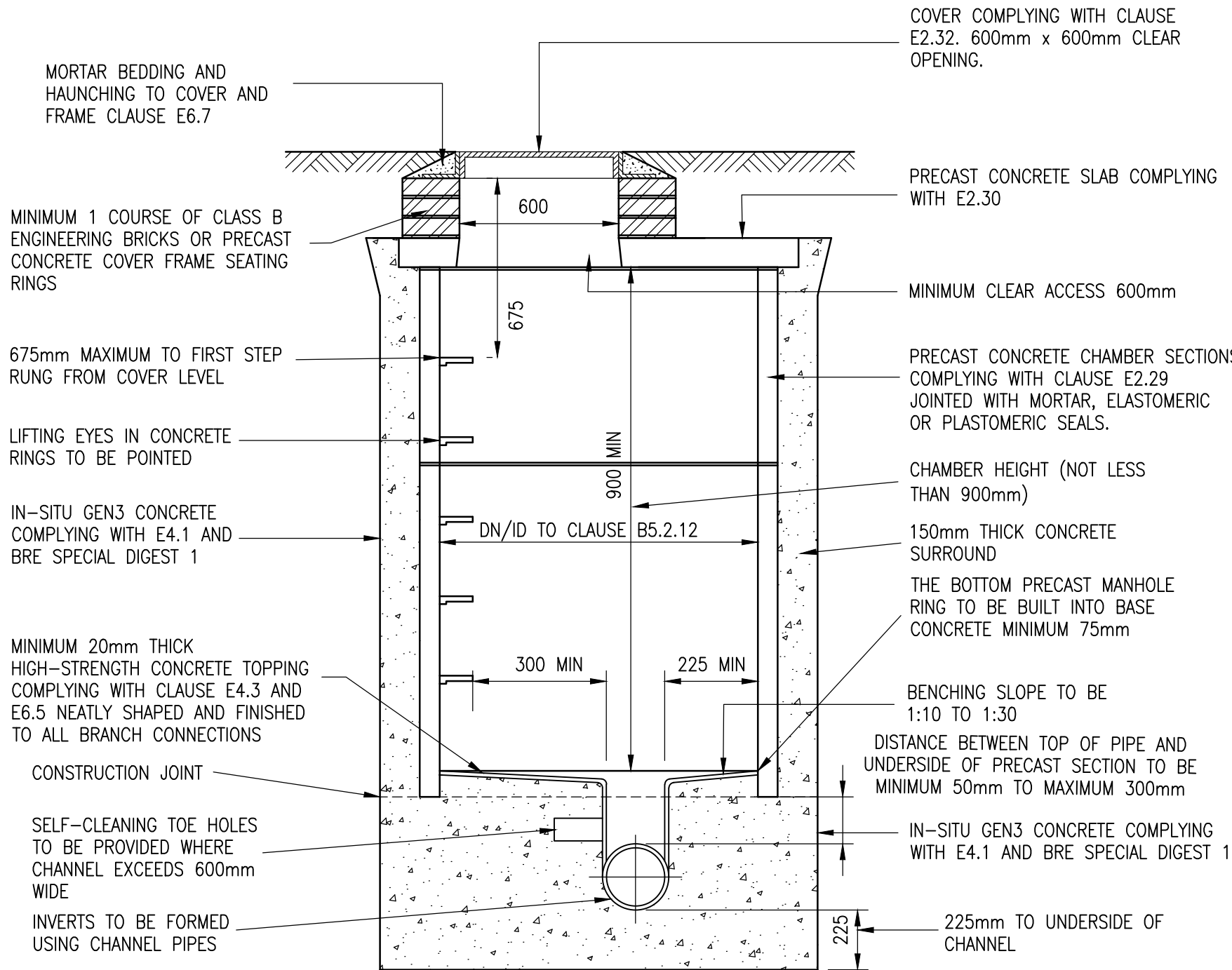
- WARNING SIGN NOTES:**
1. A WARNING SIGN IS TO BE FITTED WITH THE HYDROBRAKE MANHOLE TO READ "CAUTION - HYDROBRAKE LOCATED HERE"
 2. A WARNING SIGN IS TO BE FITTED IN THE UPSTREAM MANHOLE TO READ "CAUTION - HYDROBRAKE DOWN STREAM"
 3. A WARNING SIGN IS TO BE FITTED IN THE DOWNSTREAM MANHOLE TO READ "CAUTION - HYDROBRAKE UP STREAM"
 4. THE WARNING SIGNS ARE TO 40mm HIGH RED LETTERING ON A WHITE PLASTIC BASE. THE PLASTIC BASE DIMENSIONS ARE TO BE APPROX. 300mm x 300mm x 6mm
 5. THE WARNING SIGNS ARE TO BE MOUNTED ON A REMOVABLE SAFETY GRID AVAILABLE FROM COVER MANUFACTURER.

- NOTES:**
1. DO NOT SCALE THIS DRAWING.
 2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.
 3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE. ALL LEVELS ARE IN METRES UNLESS NOTED OTHERWISE.
 4. ANY DISCREPANCIES NOTED ON SITE ARE TO BE REPORTED TO THE ENGINEER IMMEDIATELY.
 5. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL WORKS ARE TO THE SATISFACTION OF THE ENGINEER, AND SHALL BE DEEMED TO HAVE INCLUDED WITHIN THEIR RATES FOR ANY NECESSARY LIAISON WITH STW AND TESTING.
 6. PRECAST MANHOLE RINGS TO NOT BE CUT UNDER ANY CIRCUMSTANCES.
 7. COVER AND FRAMES SHOULD BE KITEMARKED.
 8. FOR MANHOLE SETTING OUT PLEASE SEE DRG. 30341_02_070_01 FOR DETAILS.

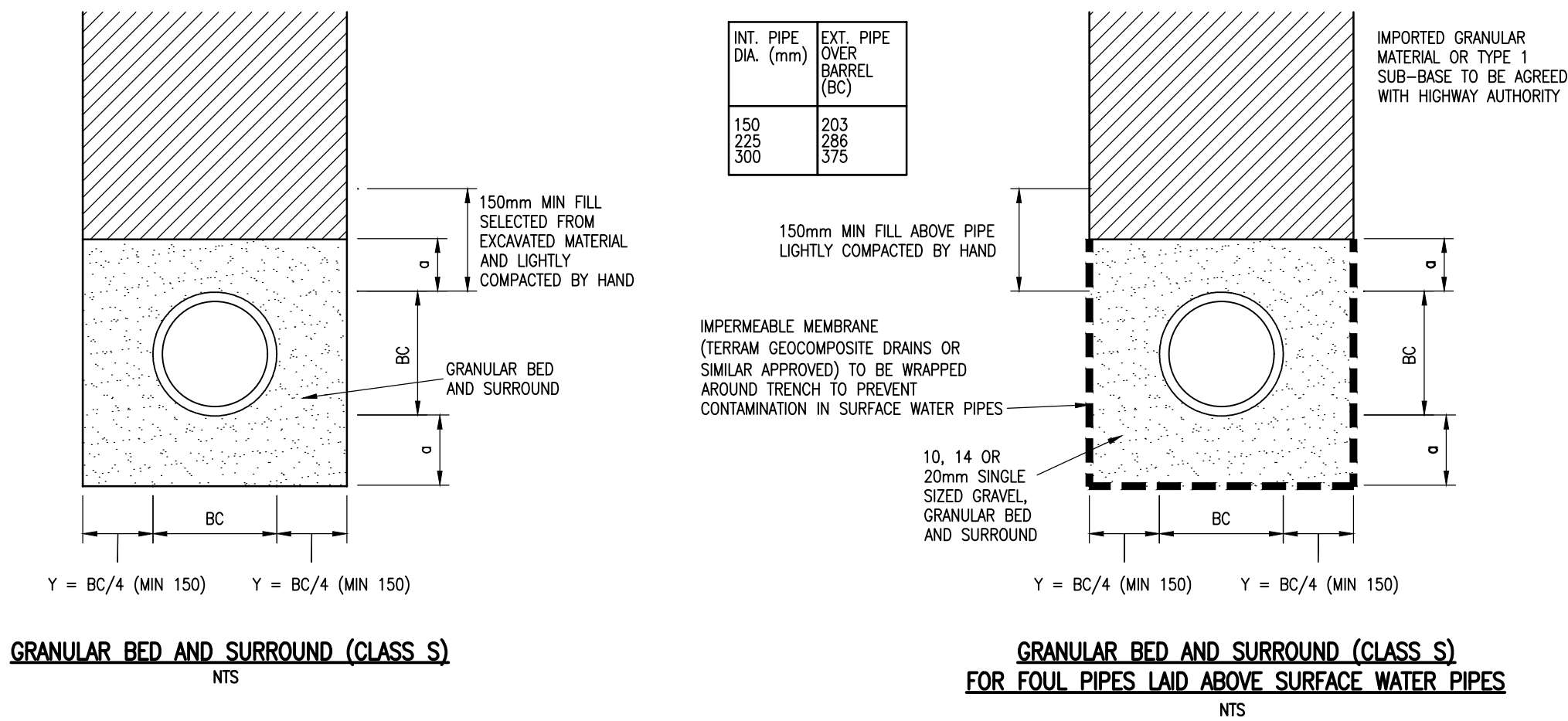
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AVANT HOMES LTD					
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-	A1		1:20		
STATUS:					
FOR INFORMATION / APPROVAL					
			Telephone: 01530 264 753 Email: group@m-ec.co.uk Website: www.m-ec.co.uk		
Consulting Development Engineers			ORDNANCE SURVEY © CROWN COPYRIGHT 2015. ALL RIGHTS RESERVED. LICENCE NUMBER 100055865.		



TYPICAL MANHOLE DETAIL FIG.B15 TYPE C
DEPTH FROM CL TO SOFFIT 1.00 TO 1.50m
SCALE 1:20

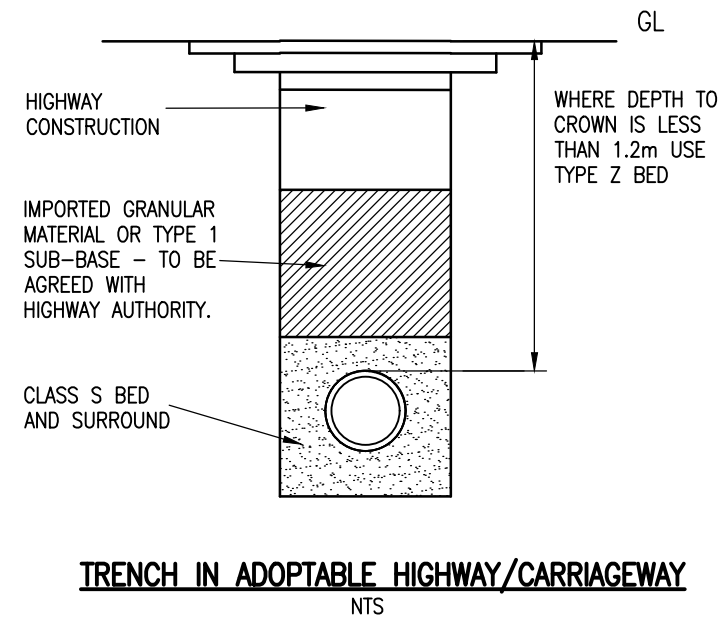


TYPICAL MANHOLE DETAIL FIG.B10 TYPE B
DEPTH TO SOFFIT 1.50 TO 3.0m
SCALE 1:20

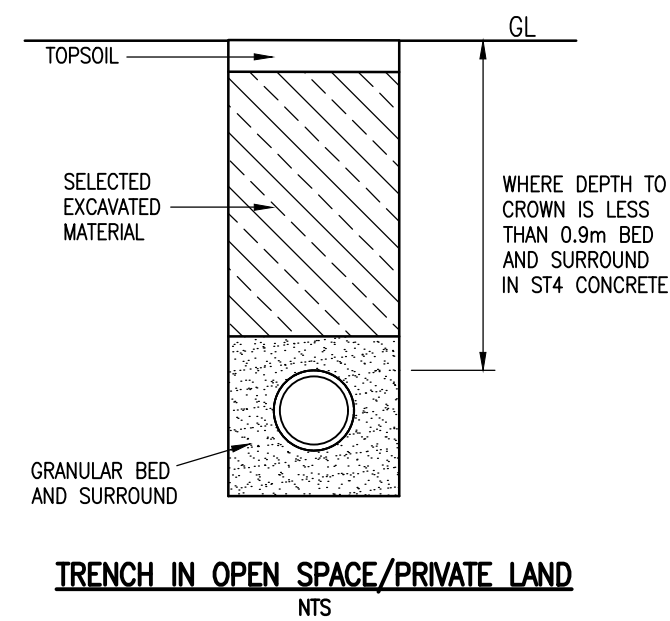


GRANULAR BED AND SURROUND (CLASS S)
NTS

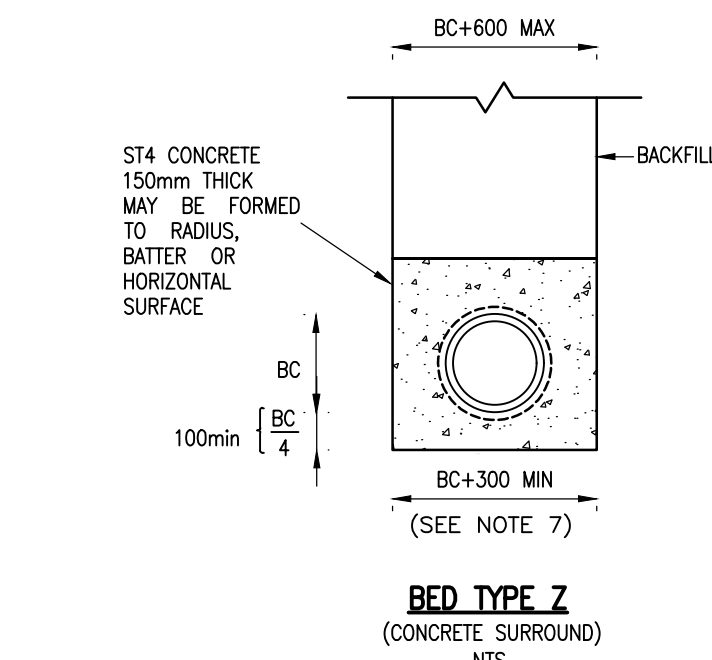
GRANULAR BED AND SURROUND (CLASS S)
FOR FOUL PIPES LAID ABOVE SURFACE WATER PIPES
NTS



TRENCH IN ADOPTABLE HIGHWAY/CARRIAGEWAY
NTS



TRENCH IN OPEN SPACE/PRIVATE LAND
NTS



MANHOLE CHAMBER SIZES	
DIAMETER LARGEST PIPE IN MANHOLE	CHAMBER SECTION DIAMETER REQUIRED
< 375	1200
375-700	1500
750-900	1800

THE SIZES STATED ARE THE MINIMUM ACCEPTABLE. WHERE TWO OR MORE PIPES ENTER THE MANHOLE THE CHAMBER SIZE MUST BE SUFFICIENT TO ACCOMMODATE THE REQUIRED BENCHING SHOWN.

NOTES:
ALL PIPES BUILT INTO MANHOLE INVERT SHALL BE INSTALLED TO SOFFITS LEVEL.

NOMINAL BORE OF PIPE (min)	AGGREGATE SIZE (mm) SINGLE SIZED GRADED	
100	10	-
150	10 OR 14	14 TO 5
225-300	10,14 OR 20	14 TO 5 OR 20 TO 5
375-525	14 OR 20	14 TO 5 OR 20 TO 5
EXCEEDING 525	14,20 OR 40	14 TO 5 OR 20 TO 5 40 TO 5

DIM X > 150mm FOR PIPES < 200mmØ
DIM X > 200mm FOR PIPES TRENCHES IN ROCK

PROTECTION	MIN. COVER	LOCATION
CLASS S BEDDING - 150 GRANULAR BED AND SURROUND.	0.35m	DOMESTIC GARDENS AND PATHWAYS WITHOUT ANY POSSIBILITY OF VEHICULAR ACCESS.
	0.50m	DOMESTIC DRIVEWAYS, PARKING AREAS, AND YARDS WITH HEIGHT RESTRICTIONS TO PREVENT ENTRY BY VEHICLES >7.5 TONNES.
	0.90m	DOMESTIC DRIVEWAYS, PARKING AREAS, AND NARROW STREETS WITHOUT FOOTWAYS WITH LIMITED ACCESS FOR VEHICLES >7.5 TONNES, AND AGRICULTURAL LAND AND PUBLIC OPEN SPACE.
	1.20m	OTHER HIGHWAYS AND PARKING AREAS WITH UNRESTRICTED ACCESS TO VEHICLES >7.5 TONNES
CONCRETE SLAB PROTECTION	LESS THAN	MINIMUM COVER AS SPECIFIED ABOVE

THIS DRAWING IS FOR INFORMATION/ APPROVAL AND SUBJECT TO AMENDMENT. NO RELIANCE SHOULD BE TAKEN UNTIL THE DRAWING STATUS IS CHANGED TO 'FOR CONSTRUCTION'.

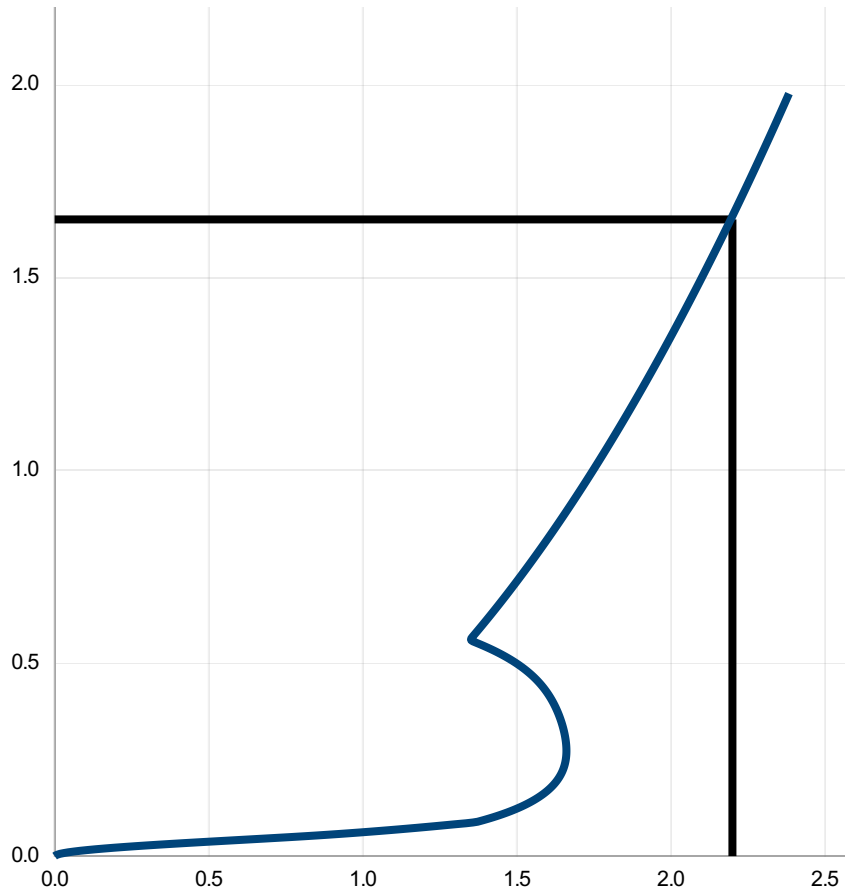
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REVISION:	-	SHEET SIZE:	A1	SCALE:	AS SHOWN
STATUS: FOR INFORMATION / APPROVAL					
M-EC Consulting Development Engineers		Telephone: 01530 264 753 Email: group@mec.co.uk Website: www.mec.co.uk ORDNANCE SURVEY © CROWN COPYRIGHT 2015. ALL RIGHTS RESERVED. LICENCE NUMBER 100055865.			

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.650	2.200
Flush-Flo™	0.273	1.661
Kick-Flo®	0.559	1.346
Mean Flow		1.683



hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.057	0.914
0.114	1.471
0.171	1.601
0.228	1.652
0.284	1.661
0.341	1.647
0.398	1.618
0.455	1.566
0.512	1.474
0.569	1.357
0.626	1.416
0.683	1.472
0.740	1.526
0.797	1.577
0.853	1.627
0.910	1.675
0.967	1.722
1.024	1.767
1.081	1.810
1.138	1.853
1.195	1.894
1.252	1.935
1.309	1.974
1.366	2.013
1.422	2.051
1.479	2.088
1.536	2.124
1.593	2.160
1.650	2.195

DESIGN ADVICE



The head/flow characteristics of this SHE-0063-2200-1650-2200 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	19/01/2026 14:49
Site	Site West of Heath Lane Surgery, Westfield Avenue, Earl Shilton
DESIGNER	Danny Hinds
Ref	30341

SHE-0063-2200-1650-2200
Hydro-Brake® Optimum

Technical Specification

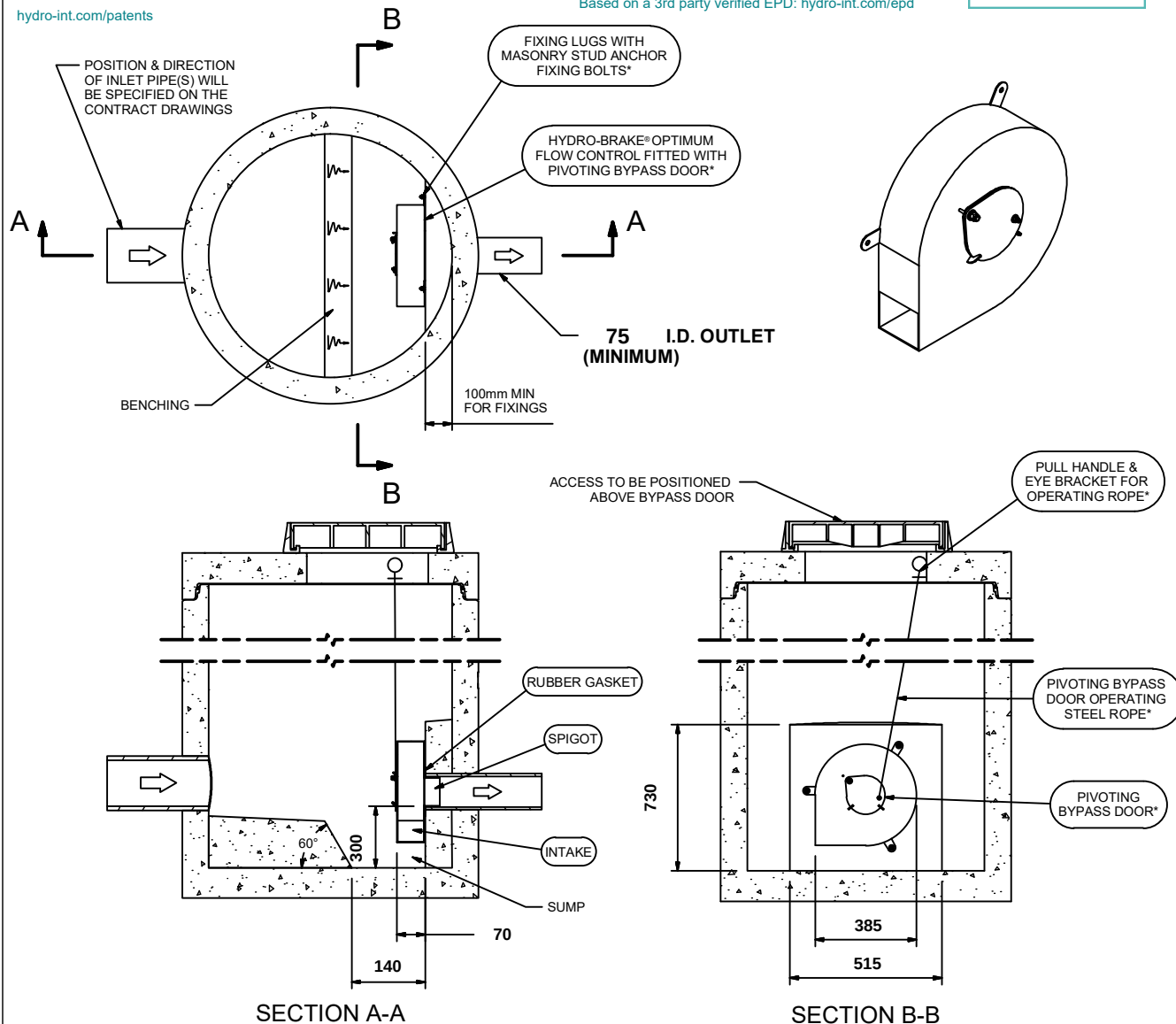
Control Point	Head (m)	Flow (l/s)
Primary Design	1.650	2.200
Flush-Flo™	0.273	1.661
Kick-Flo®	0.559	1.346
Mean Flow		1.683

hydro-int.com/patents

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: 10 kg
- Product Carbon Footprint: 33.16 kgCO2e

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



IMPORTANT: ○ LIMIT OF HYDRO INTERNATIONAL SUPPLY
 THE DEVICE WILL BE HANDLED 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-0063-2200-1650-2200 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**
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DATE	19/01/2026 14:49
SITE	Site West of Heath Lane Surgery, Westfield Avenue, Earl S
DESIGNER	Danny Hinds
REF	30341

SHE-0063-2200-1650-2200
 Hydro-Brake® Optimum



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