

Detailed Drainage Strategy

Lidl Lampeter



Presented to: Lidl Great Britain Limited

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Report Details

Client	Lidl Great Britain Limited
Report Title	Detailed Drainage Strategy
Site Address	Land south of the A482 and west of the A485, Cwmann, Lampeter, SA48 8JN
Contract Reference	119796.642269
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Quality Assurance

Issue No.	Status	Issue Date	Comments	Author	Technical Review	Authorised
3	Final	11 th September 2026	Foul drainage strategy changed to discharge to public sewer. SW drainage updated.	Alexander Rea Consultant Cameron Leighton Consultant	Toby Bass Senior	Peter Allan Associate Luke Bland Principal

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As part of Lucion's group of companies, we can support you with a broader range of holistic services. Through our pool of multidisciplinary experts, we help you navigate complex regulatory frameworks, saving you time and money.

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If you would like support in understanding your carbon emissions, or those of your supply chain, please get in touch with your Lucion contact above who will be happy to help.

Table of Contents

1.0	INTRODUCTION	1
1.1	Appointment.....	1
1.2	Project Understanding.....	1
1.3	Project Limitations	1
2.0	RELEVANT PLANNING POLICY AND GUIDANCE.....	2
2.1	Introduction	2
2.2	Planning Policy	2
2.3	Local Policy.....	2
2.4	Planning Policy in Site Context.....	3
2.5	Consultation.....	3
3.0	SITE DESCRIPTION.....	5
3.1	Site Plan	5
3.2	Development Description	5
3.3	Permeability and Soil Profile.....	6
3.4	Current Foul and Surface Water Drainage Provision	6
4.0	DRAINAGE STRATEGY	7
4.1	Drainage Hierarchy	7
4.2	Greenfield Runoff Rates.....	8
4.3	Sustainable Drainage Systems	8
4.4	Climate Change	9
4.5	Proposed Surface Water Drainage Strategy	9
4.6	Exceedance Routes	9
4.7	Percentage Impermeability (PIMP).....	9
4.8	Volumetric Runoff Coefficient (Cv)	9
4.9	Surface Water Quality.....	10
4.10	Maintenance	10
4.11	Foul Water Drainage Strategy.....	11
4.12	Management.....	11

Appendices

APPENDIX A – LIMITATIONS
APPENDIX B – TOPOGRAPHIC SURVEY - EMP
APPENDIX C – PROPOSED DEVELOPMENT PLAN
APPENDIX D – EXISTING AND PROPOSED HS AREA DRAWING
APPENDIX E – DRAINAGE DRAWING
APPENDIX F – INFODRAINAGE CALCULATIONS
APPENDIX G – MAINTENANCE SCHEDULES
APPENDIX H – WELSH WATER SEWER PLANS
APPENDIX G – DRAINAGE DETAILS

1.0 Introduction

1.1 Appointment

- 1.1.1 Lucion Delta-Simons Ltd (“Lucion”) was instructed by Lidl Great Britain Limited (the “Client”) to produce a Detailed Drainage Strategy (DDS) for a proposed supermarket situated on the land south of the A482 and west of the A485, Cwmann, Lampeter, SA48 8JN (the “Site”).

1.2 Project Understanding

- 1.2.1 Legislation (introduced with Schedule 3 of the Flood & Water Management Act) in Wales requires new development measuring in excess of 100 m² to have Sustainable Drainage Systems (SuDS) approval by the SuDS Approval Body (SAB) in conjunction with the planning process. Therefore, the client has requested that a Drainage Strategy is produced, which will provide an appropriate consideration of Sustainable Drainage Systems (SuDS) in line with CIRIA SuDS (C753) Guidance to ensure that surface water flood risk is not exacerbated on or off site as a result of the proposed development.
- 1.2.2 The proposed development will increase the Site’s impermeable area, which could increase the risk of flooding to downstream receptors. Therefore, a Drainage Strategy with appropriate consideration for Sustainable Drainage Systems (SuDS) in line with CIRIA SuDS (C753) Guidance is required.
- 1.2.3 Carmarthenshire County Council as Lead Local Flood Authority (LLFA) is a statutory consultee for major planning applications in relation to surface water drainage, requiring that all planning applications are accompanied by a Sustainable Drainage Strategy. The aim of the Sustainable Drainage Strategy is to identify water management measures, including Sustainable Drainage Systems (SuDS), to provide surface water runoff reduction and treatment.
- 1.2.4 Location details of the proposal are detailed below:
- Land south of the A482 and west of the A485, Cwmann, Lampeter, SA48 8JN.
 - National Grid Reference: Eastings 258270 Northings 247350.
- 1.2.5 The purpose of this report is to provide a strategy to manage surface and foul water flows from the Site, in support of the planning application, while fulfilling the requirements of the Local Planning Authority (LPA) and the Lead Local Flood Authority (LLFA).

1.3 Project Limitations

- 1.3.1 The wider Lucion limitations are contained within Appendix A.

2.0 Relevant Planning Policy and Guidance

2.1 Introduction

- 2.1.1 The aim of this section of the report is to discuss the main aspects of the local and national planning policies that are relevant to any proposed development on the Site and relevant guidance and legislation.

2.2 Planning Policy

- 2.2.1 As discussed above, legislation (introduced with Schedule 3 of the Flood & Water Management Act) in Wales requires new development measuring in excess of 100 m² to have Sustainable Drainage Systems (SuDS) approval by the SuDS Approval Body (SAB) in conjunction with the planning process. As such the Site is therefore required to manage surface water generated as a result of the development, sustainably and in line with CIRIA SuDS (C753) Guidance.

2.3 Local Policy

- 2.3.1 The Carmarthenshire County Council Local Development Plan contains the following policies relating to flood risk and drainage.

Strategic Policy – SP 16: Climate Change

Avoid, or where appropriate, minimise the risk of flooding including the incorporation of measures (such as SuDS and flood resilient design);

Development proposals which are located within areas at risk from flooding will not be permitted unless they accord with the provisions of Planning Policy Wales TAN 15.

The potential impact of flood risk forms an important consideration in the assessment of the appropriateness of sites for inclusion within the LDP. In this regard, a precautionary approach will be adopted in the identification of sites for inclusion in the Plan. The consideration of any proposals in respect of flooding have regard to the provisions of PPW and TAN15: Development and Flood Risk which provides guidance on assessing developments at risk from flooding.

Proposals affected by flood risk will be required to submit a Flood Consequences Assessment as part of any planning application and the Council will consult with Natural Resources Wales (NRW). Where a site is in part impacted upon by flood risk, the developer will need to consider the impact of the risk on the developability of the remainder of the site. Where appropriate they should undertake the necessary evidential work (including a flood consequences assessment) to the satisfaction of NRW. Only less vulnerable development will be permitted within Zone C2. Regard should be had to Policy CCH4: Flood Risk Management and Avoidance as contained within this Plan.

CCH4: Water Quality and Protection of Water Resources

- 2.3.2 *Development proposals must make efficient use of water resources and, where appropriate, contribute towards improvements in water quality. Proposals will be permitted where they do not have an adverse effect upon water resources, water quality, fisheries, nature conservation, public access, or water related recreation use in the County.*
- 2.3.3 *Where appropriate, SuDS must be implemented with approval required through the Sustainable Drainage Approval Body (SAB).*
- 2.3.4 *Proposals will be supported if they promote the safeguarding of watercourses through ecological buffer zones or corridors, protecting aspects such as riparian habitats and species, water quality, and providing for flood plain capacity.*

- 2.3.5 *Development will only be permitted if it can be demonstrated that there is no adverse effect on the integrity of phosphorus sensitive riverine Special Areas of Conservation (SACs). In the hydrological catchment area designated for riverine SACs, development creating wastewater discharges will be required to demonstrate there is no increase in phosphorus levels in the SAC. This can be achieved through implementation of mitigation measures and associated supplementary planning guidance. Where evidence demonstrates that adverse effects on the integrity of river SAC can be avoided or offset using mitigation, these must be agreed with the Council on a case-by-case basis, in consultation with NRW.*

2.4 Planning Policy in Site Context

- 2.4.1 The existing Site covers 0.16 ha of brownfield land and is shown to be located within Flood Zone C2 (an area without significant flood defence infrastructure) on the Development Advice Map and Defended Flood Zone 3 (High Probability) on the NRW Flood Map for Planning.

2.5 Consultation

- 2.5.1 A pre-application consultation was submitted to NRW on the 30th of October 2024. A response was received on the 20th of November 2024 and the relevant comments are outlined below;

Foul Drainage

- 2.5.2 *We note the application site is within the catchment of the River Teifi Special Area of Conservation (SAC). In line with our Advice to Planning Authorities for Planning Applications Affecting Nutrient Sensitive River Special Areas of Conservation (28 June 2024), under the Habitats Regulations, Planning Authorities must consider the impact of proposed developments on water quality within SAC river catchments. We therefore advise you to consider whether the proposals, as submitted, would increase the volume of foul discharge from the site in planning terms.*
- 2.5.3 *We note foul water disposal is proposed via the installation of a package treatment plant, rather than connecting to the mains sewer. However, according to our records, the site is within a sewered area.*
- 2.5.4 *The installation of private sewage treatment facilities within publicly sewered areas is not normally considered environmentally acceptable because of the greater risk of failures leading to pollution of the water environment compared to public sewerage systems.*
- 2.5.5 *Section 6.6.21 of Planning Policy Wales (2001) states ‘Any development discharging domestic sewage should connect to the foul sewer where it is reasonable to do so. Development proposing the use of non-mains drainage schemes will only be considered acceptable where connection to the main sewer is not feasible...’*
- 2.5.6 *Government guidance on private sewerage in Welsh Government Circular 008/2018 stresses the first presumption must be to provide a system of foul drainage discharging into a public sewer. Only where having taken into account the cost and/or practicability it can be shown to the satisfaction of the Local Planning Authority that connection to a public sewer is not feasible, should non-mains foul sewage disposal solutions be considered.*
- 2.5.7 *Therefore, we advise proposals are amended to ensure the foul drainage is connected to the mains sewerage system or detailed evidence is provided to demonstrate it is not reasonable to connect.*
- 2.5.8 *You should thoroughly investigate the possibility of connecting to the foul sewer by taking the following steps:*
- *Formally approach the sewerage undertaker regarding a connection under Section 106 or a requisition under Section 98 of the Water Industry Act (WIA) 1991;*
 - *Serve notice for connection under Section 106 of the WIA 1991 if the sewerage undertaker has refused connection;*
 - *Provide details of the reasons given by the sewerage undertaker if it has refused connection under section 98 or section 106 of the WIA 1991 and confirmation they have appealed against this decision;*
 - *Demonstrate it is not reasonable to connect to the public foul sewer;*

- 2.5.9 *Where it is not reasonable to connect to the public foul sewer, demonstrate they have considered requesting that the sewerage undertaker adopt their proposed system.*
- 2.5.10 *You should be aware that should a connection to the mains sewer not be feasible, you will also need to demonstrate the proposal would not pose an unacceptable risk to the water environment. Welsh Government Circular 008/2018 advises a full and detailed consideration be given to the environmental criteria listed under paragraph 2.6 of the Circular, in order to justify the use of private sewerage.*
- 2.5.11 *Furthermore, we refer you to the section in our Advice titled 'What does this mean for development proposals involving connection to public wastewater treatment works'.*
- 2.5.12 Comments were also provided by Welsh Water with the relevant comments outlined below;

Public Sewerage Network

- 2.5.13 *Dŵr Cymru advises that the Waste water Treatment Works (WwTW) has a phosphorus consent in place.*
- 2.5.14 *There is currently suitable hydraulic capacity in the public sewerage system and downstream of the WwTW's to accommodate foul water flows from the development subject of this application.*

Surface Water Drainage

- 2.5.15 *Dŵr Cymru recommends that Ceredigion County Council is consulted in relation to the proposals for SuDS features as they are the SuDS Approval Body (SAB).*

Foul Water Drainage – Sewerage Network

- 2.5.16 *Dŵr Cymru have considered the impact of foul flows generated by the proposed development and concluded that flows can be accommodated within the public sewerage system.*
- 2.5.17 *Dŵr Cymru advises that the flows should be connected to the 150mm combined sewer at manhole SN58472301.*

Sewerage Treatment

- 2.5.18 *The proposed development would drain to Lampeter Waste water Treatment Works which is currently failing to comply with the 95% quartile for its flow passed forward (FPF) performance.*
- 2.5.19 *No buildings on the application site shall be brought into beneficial use earlier than 31st December 2025, unless the scheme at the Waste Water Treatment Works, into which the development shall drain, has been completed and written confirmation of this has been issued by the Local Planning Authority.*

Water Supply

- 2.5.20 *Dŵr Cymru anticipate that the development will require the installation of a new single water connection to serve the new premise. They will rely on the LPA to control the delivery of any required reinforcement or offsite works by way of planning condition at the planning application stage. Capacity is currently available in the water supply system to accommodate the development.*

3.0 Site Description

3.1 Site Plan

- 3.1.1 The Site is located between the towns of Lampeter and Cwmann, approximately 860 m southeast from Lampeter Town Centre. It covers an area of approximately 14,600 m².

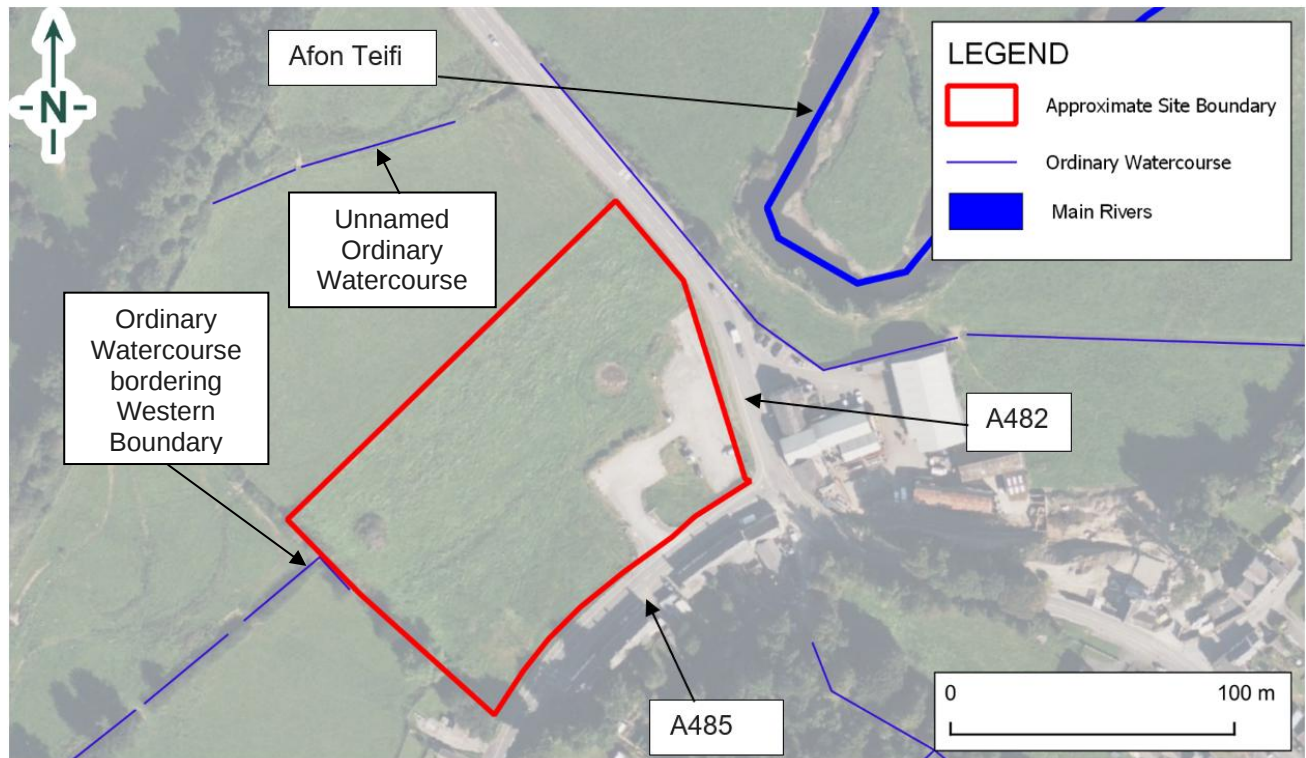


Figure 1: Site Location Plan

- 3.1.2 Online mapping (including Google Maps/Google Streetview imagery, accessed October 2024) shows that the Site is a mix of greenfield land and previously developed brownfield land. Access to the Site is provided from the A485 to the south of the Site. The Site is bordered by:

- Fields of grass to the north, west and southwest;
- The A482 to the east and northeast, beyond which is the Afon Teifi to the northeast and assorted shops, businesses and residential dwellings to the east; and
- The A485, beyond which are residential properties to the south.

- 3.1.3 Hardstanding areas on Site currently occupy 1,684 m² or 12% of the total Site area. The remaining permeable, soft landscaped areas occupy 12,916 m² or 88% of the total Site area. This information has been measured from a topographic survey undertaken by EMP Surveys Ltd in August 2024 which is included in Appendix B.

3.2 Development Description

- 3.2.1 The proposed development is for a supermarket unit in the southeast of the Site with associated access and parking in the north. Proposed development plans are included in Appendix C.
- 3.2.2 The EMP Surveys Ltd topographical survey shows that the Site slopes from 115.92 metres Above Ordnance Datum (m AOD) at the entrance to the Site from the A485 to 113.09 m AOD in the northwestern corner of the Site.

3.2.3 The proposed development hardstanding areas are split as follows:

- Proposed Roof Area is 2,042 m² (14% of the Site);
- Proposed access road and parking areas comprise 5,639 m² (39% of the Site); and
- Greenspaces comprise 6,919 m² (47% of the Site).

3.2.4 Proposed hardstanding areas have been measured from development plans. Existing and proposed hardstanding and soft landscaped areas drawing are included as Appendix D.

3.3 Permeability and Soil Profile

3.3.1 Reference to the British Geological Survey (BGS) online mapping (1:50,000 scale) indicates that the Site is underlain by superficial deposits of Alluvium generally comprising gravel, sand, silt and clay. The superficial deposits are identified as being underlain by Devils Bridge Formation bedrock, consisting of mudstone and sandstone, interbedded.

3.3.2 Soils mapping, accessed October 2024, indicates that the Site is situated upon on freely draining floodplain soils.

3.3.3 According to the NRW's Aquifer Designation data, obtained from MAGIC Map's online mapping, accessed October 2024, the Alluvium is classified as a Secondary A Aquifer. The underlying Devils Bridge Formation is described as a Secondary B Aquifer.

3.4 Current Foul and Surface Water Drainage Provision

Existing watercourses

3.4.1 The closest watercourse is an Ordinary Watercourse located along the western boundary of the Site. The watercourse then discharges into the Afon Teifi approximately 300 m southwest of the Site.

3.4.2 The Afon Teifi is a Main River (jurisdiction of NRW) which meanders around the Site to the northeast, north, northwest and west. At its closest point, the river flows within approximately 30 m of the Site to the northwest. The river flows in a south-westerly direction.

3.4.3 In addition to this, there is an unnamed watercourse which is located approximately 12 m north of the Site. This unnamed watercourse joins the Afon Teifi approximately 210 m northwest of the Site.

Existing sewers

3.4.4 Utilities in the area surrounding the Site have been surveyed and/or located from asset records and are shown on the topographic survey by EMP Surveys Ltd within Appendix B. The sewer plans show that there is a 225 – 300 mm diameter surface water sewer located approximately 2 m northeast of the Site in the raised A482 (compared to the lower northern extent of the Site) which drains in a northwest direction. The invert level of the surface water sewer at the northeast corner of the Site (MH 06 SW) is recorded as having a 114.74 m AOD cover level and an invert level of 113.59 m AOD.

3.4.5 There are also two blocked surface water manholes in the Site entrance to the southeast, bordering the A485. The downstream manhole records an invert level of 113.61 m AOD.

3.4.6 There are a series of highway drains and gullies along the A485, the full extent of which has not been shown on the survey. Due to the limited information, it is not clear what is currently in use or where it drains.

4.0 Drainage Strategy

4.1 Drainage Hierarchy

4.1.1 The aim of the strategy is to provide a design which will avoid, reduce, and delay the discharge of surface water flows into public sewers and watercourses. This will mitigate the effect of increasing the Site's impermeable drained area and ensure that flood Risk on and off-Site is not exacerbated as a result of the development.

4.1.2 Standard S1 of the Welsh Government: 'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems' (2018) (referred to as "the statutory standards" henceforth) sets out the following hierarchy of drainage options:

4.1.3 Hierarchy options:

- Priority Level 1: Surface water runoff is collected for use;
- Priority Level 2: Surface water runoff is infiltrated to ground;
- Priority Level 3: Surface water runoff is discharged to a surface water body;
- Priority Level 4: Surface water runoff is discharged to a surface water sewer, highway drain, or another drainage system; and
- Priority Level 5: Surface water runoff is discharged to a combined sewer.

4.1.4 The drainage strategy for the site is to be developed using Priority level 3: discharge to a surface water body for the following reasons:

Priority Level 1: Surface Water Collected for Use

4.1.5 It must be noted that section G1.6 of the statutory standards states that; *"in most cases, rainwater harvesting alone will not be adequate to deal with the site drainage and provision will be required for an overflow to a Level 2 or lower priority runoff destination."*

4.1.6 As downstream provision of attenuation storage will be required to accommodate for rainwater harvesting system overflows, rainwater harvesting is not considered a cost-effective solution for managing surface water runoff as a whole, beyond basic gardening operations.

4.1.7 In addition to this, there is limited use for rainwater collection at the Site, therefore rainwater collection has not been proposed at the Site.

Priority Level 2: Surface Water Discharge to Soakaway (Infiltration)

4.1.8 BGS online mapping indicates that the Site is underlain by gravel, sand, silt and clay, as well as deposits of mudstone and sandstone, interbedded.

4.1.9 As well as this, given that much of the Site is located within a floodplain and in close proximity to the Afon Teifi, groundwater levels are expected to be nearby the surface. Soilscape mapping records the soils as 'Freely draining floodplain soils' and details 'Groundwater tables are shallow'.

4.1.10 As such, the high groundwater levels are unlikely to be able to support a deep enough dry zone beneath an infiltrating SuDS feature to ensure infiltration remains effective. As such, this development site is not considered suitable for infiltration as the method for the disposal of surface water.

Priority Level 3: Surface Water Discharge to Watercourse

4.1.11 It is proposed to discharge surface water into the ordinary watercourse which forms the western boundary of the Site at the 1 in 1 year greenfield runoff rate of 2.3 l/s. Attenuation will also be provided on Site to accommodate storm events up to the design event (1 in 100 years plus 40 % climate change). The InfoDrainage calculations supporting the drainage strategy are included in Appendix F.

4.2 Greenfield Runoff Rates

- 4.2.1 Greenfield run off rates for the Site have been calculated using the ICP SuDS method and are shown in Table 1 below. The full greenfield runoff calculations, generated by InfoDrainage are located within Appendix F.

Table 1: Greenfield Runoff Rates

Return Period	Greenfield Runoff Rate (l/s)
1 in 1 year	2.3
QBar	2.7
1 in 30 year	5.2
1 in 100 year	6.8

- 4.2.2 It is proposed to limit discharge from the Site to 2.3 l/s, in line with the greenfield 1 in 1 year runoff rate for all events up to and including the design event (1 in 100 + 40% CC).

4.3 Sustainable Drainage Systems

- 4.3.1 Attenuation storage should be provided in the form of Sustainable Drainage Systems (SuDS) where practical. The following SuDS options have been considered:

Rainwater Harvesting

- 4.3.2 Based on the nature and scale of the proposed development, the benefits offered through the use of rainwater harvesting are not considered commensurate.

Green Roofs

- 4.3.3 The development proposals do not include for the provision of green roofs.

Soakaways

- 4.3.4 As described above, based on the low permeability of the underlying geology and the high groundwater levels associated with the floodplain of the nearby Afon Teifi, soakaways are considered unsuitable/impractical at the Site.

Water butts

- 4.3.5 Water butts have not been proposed as grey water will have limited use for the proposed development.

Porous/Permeable Paving

- 4.3.6 Permeable surfacing could be incorporated into the proposed car parking area. Storage would be provided within the sub-grade material prior to controlled released to the receiving watercourse. The amount of storage offered by permeable surfacing is subject to sub-grade depth and Site gradient. Given that some of the external areas may be at risk of fluvial flooding, permeable paving and the potential maintenance associated with any restoration is not considered commensurate to the benefits provided.

Swales, Detention Basins and Ponds/Wetlands

- 4.3.7 Sufficient space is available on Site to utilise a pond, basin or swale as an above ground attenuation feature. In order to facilitate gravity drainage, attenuation features should be located at the lower western extent of the Site. As such a detention basin has been proposed. The proposed drainage plan for the Site is included in Appendix E. The InfoDrainage calculations supporting the drainage strategy are included in Appendix F. Considering the flood risk in the lower areas of the Site, an open basin or pond would be easier to maintain and remediate after a flooding event compared to an underground solution. This makes it a more sustainable option for the Site's conditions.

Filter Drains

- 4.3.8 Filter drains are not considered efficient for the development due to the large extent of impermeable area.

Underground Geocellular Crate System

- 4.3.9 Storage could be provided within an underground geocellular crate system. Sufficient space for an underground tank could be provided under the proposed carparking area in the northeast of the Site. However, given the Site's potential flood risk, remediation of any below ground attenuation crates may be disproportionate to the benefits provided when other alternatives for attenuation are available.

4.4 Climate Change

- 4.4.1 The Welsh Government 2021 'Flood Consequence Assessments: Climate Change Allowances' guidance states that for a development within Wales, it should utilise the upper estimate for peak rainfall intensity if the design life is expected to exceed 50 years. The upper estimate equates to a 40% allowance for climate change.

4.5 Proposed Surface Water Drainage Strategy

- 4.5.1 The proposed Strategy is to discharge surface water from the Site at a restricted rate of 2.3 l/s for all events up to and including the 1 in 100 year + 40% Climate change event into the watercourse which forms the Site's western boundary.
- 4.5.2 In order to achieve this rate, attenuation storage will be provided in the form of a large pond in the western part of the Site. The InfoDrainage network calculations (included in Appendix F) show that the maximum resident volume in the pond is 917.12 m³ in the critical storm. 300 mm of freeboard is included within the design.
- 4.5.3 Surface water from the roof and parking areas will be collected with a network of pipes, manholes and gullies. These will drain via gravity into the pond. The pond will discharge via a Hydrobrake vortex flow control device (unit ref SHE-0066-2300-1450-2300) into a package pump station. There is a short section of rising main to a stilling chamber which discharges into the watercourse by gravity.
- 4.5.4 The proposed drainage plan for the Site is included in Appendix E.
- 4.5.5 Drainage Details are included in Appendix I.

4.6 Exceedance Routes

- 4.6.1 For rainfall events with a return period of more than 100 years, surface flooding of open spaces such as landscaped areas or car parks is acceptable for short periods, but the layout and landscaping of the site should aim to route water away from buildings and avoid creating hazards for access and egress routes.
- 4.6.2 The proposed surface water scheme allows for an exceedance route away from the access and egress road and towards the external landscaped areas and parking areas. Outfall manholes are also to be fitted with high level overflows to mitigate against the risk of surface water emerging onto the surface.

4.7 Percentage Impermeability (PIMP)

- 4.7.1 All impermeable areas are modelled as 100% PIMP. This will allow for sufficient capacity for all hardstanding areas to be positively drained.

4.8 Volumetric Runoff Coefficient (Cv)

- 4.8.1 CV values vary for summer and winter and account for water volumes which do not enter the drainage system i.e., that is lost through infiltration, depression storage, evaporation, initial wetting etc. Values of 1.0 for summer and 1.0 for winter have been utilised as a conservative approach.

4.9 Surface Water Quality

- 4.9.1 In the absence of statutory requirements and prescriptive standards, the simple index approach outlined in CIRIA C753 the SuDS Manual provides best industry practice for assessing the quality of surface water runoff.
- 4.9.2 Table 26.2 from The SuDS Manual has been utilised to determine pollutant hazard indices for the development type, as shown in Table 2.
- 4.9.3 The development is classed as a mix of 'Low' and 'Medium' risk land uses due to the presence of commercial roofs, moderately trafficked roads and delivery yards on Site.

Table 2: Pollution Hazard Indices (Extract from SuDS Manual)

Land Use Classification	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Other Roofs (typically commercial/industrial roofs)	Low	0.5	0.2	0.4
Moderately Trafficked Roads /Delivery Yards	Medium	0.7	0.6	0.7

- 4.9.4 The highest risk elements are the moderately trafficked roads and the delivery yard. Surface water runoff from the Site will be treated by an Klargester Aquatreat full retention GRP surface water separator, (or similar approved product) to ensure efficient removal of pollutants. Mitigation indices for the proposed treatment components have been obtained from Kingspan and are shown in Table 3 below.

Table 3: SuDS Mitigation Indices

Type of SuDS	Mitigation Indices		
	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Pond	0.7	0.7	0.5
Klargester Aquatreat Full Retention GRP Separator SWT014	0.8	0.6	0.9

- 4.9.5 In order to satisfy the simple index approach, the proposed mitigation indices must be equal to or greater than the development's hazard indices. A comparison of the hazard indices in Table 2 and the mitigation indices in Table 3 shows that a pond alongside a retention separator would provide sufficient pollutant removal for the Site.
- 4.9.6 The manufacturers specification sheets for the proprietary treatment systems stated above are located within Appendix G.

4.10 Maintenance

- 4.10.1 All components shall be maintained in accordance with the relevant requirements shown in the SuDS Manual. These intervals should be deemed as a minimum frequency and reference should also be made to the manufacturers guidance to ensure all components are maintained correctly.
- 4.10.2 Maintenance of the separator will be as per the manufacturer's guidance.

Non-Return Valves

- 4.10.3 The non-return valve should be checked on a regular basis to ensure optimum performance. Key checks that should be performed during maintenance include checking that the valve flap opens freely and has not become caught or dislodged. The valve should also be cleaned of any debris that could be affecting the sealing or closing.

4.11 Foul Water Drainage Strategy

- 4.11.1 Foul flows from the Site will be discharged to the Welsh Water public sewer in the A485 marked SN58472203 on the Welsh Water sewer plan (included in Appendix H). In order to make the connection, a private package foul pump will be required.
- 4.11.2 A plan illustrating this is located within the drainage drawing, Appendix E.
- 4.11.3 Drainage Details are included in Appendix I.

4.12 Management

- 4.12.1 All separate surface and foul water drainage systems within the site are proposed to remain private and be maintained by the Site owner.

Appendix A – Limitations

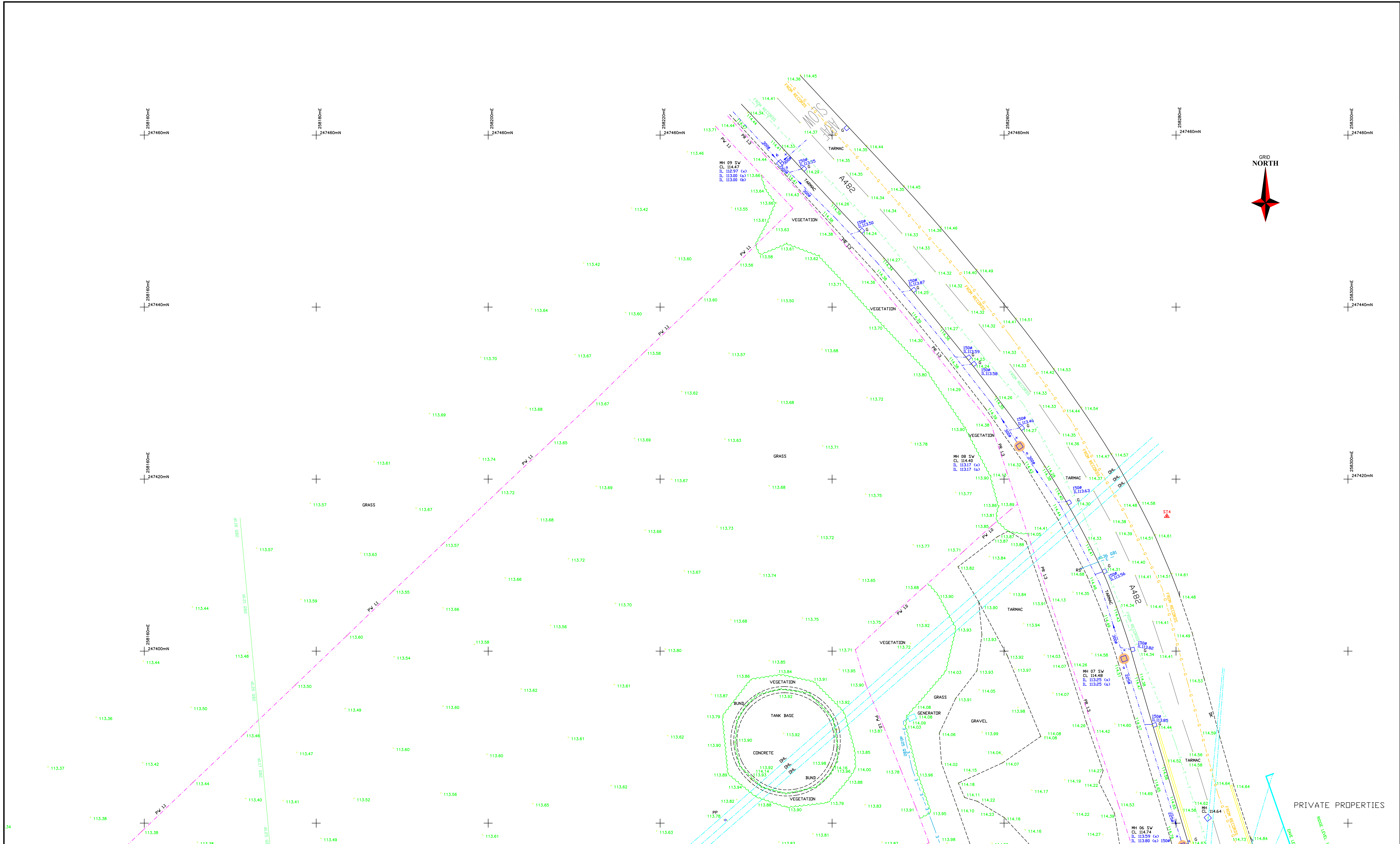
Limitations

The recommendations contained in this Report represent Lucion professional opinions, based upon the information listed in the Report, exercising the duty of care required of an experienced Environmental Consultant. Lucion does not warrant or guarantee that the Site is free of hazardous or potentially hazardous materials or conditions.

Lucion obtained, reviewed and evaluated information in preparing this Report from the Client and others. Lucion conclusions, opinions and recommendations has been determined using this information. Lucion does not warrant the accuracy of the information provided to it and will not be responsible for any opinions which Lucion has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

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Appendix B – Topographic Survey - EMP



Company details:
Address - Unit 4, Dales Court Business Center, 95 Dales Road, Ipswich IP1 4JR
Email- info@empdrainage.co.uk or gina@empdrainage.co.uk
Contact No - 01473 748 704 or 07595 314 790

NOTES:
The accuracy and content of this drawing are dependent on the original specification and EMP should be consulted before use at other scales.
Where underground services are shown, all reasonable care has been taken within the original specification and requirement. Before use of this information the user should satisfy themselves of the completeness and accuracy of such detail and consult EMP before undertaking any works. Due to the nature of this work and limitations imposed by ground conditions and the detection equipment, no guarantee can be given that all services have been recorded. PAS128 Type A Trial holes/excavations should be dug at critical locations.
Our aim is to produce the best possible results for our clients, within the agreed specification and cost constraints. All reasonable care has been taken in the survey detail represented on this drawing. Any discrepancies must be reported immediately to EMP and any other comments or feedback is most welcome.
Levels shown at kerbs are channel level unless stated.

Control: All levels and co-ordinates are related to the datums described.
The horizontal and vertical control of this survey is based on the Ordnance Survey National Grid and level datum via Network RTK GPS.
We have applied no reverse scale factor to this survey.

Original Drawing Size: A1

LEGEND

Features:

- ACD Drainage Channel
- AV Air Valve
- AB Air Brick
- PMI Checkered Line
- BO Blocked
- PP Power Pole
- RE Road Name Plate
- RWP Rain Water Pipe
- CL Cable Duct
- CTV Cable TV Cover
- DK Drop Kerb
- DKC Damp Proof Course
- EOT End of Trace
- ER Earth Road
- FR Fire Hydrant
- GV Gas Valve
- IC Inspection Cover
- JL Junction Box
- KO Kerb Outlet

Surfaces & Finishes:

- BB Brick
- CB Close Boarded
- CL Concrete
- CT Castings
- CPT Concrete Paving Slabs
- CTF Carpet
- LL Linoleum
- PAV Pavement
- SEN Sawn
- PS Paved
- PV Post & Rail
- TBR Timber Road Rail
- WSP Wearing Surface
- WMP Wire Mesh Fence

Boundary Types:

- BW Barbed Wire
- CB Close Boarded
- CH Chainlink
- CP Composite Paving
- IR Iron Fencing
- KEE Kean
- LL Linoleum
- PAL Paved
- PS Paved
- PV Post & Rail
- TBR Timber Road Rail
- WSP Wearing Surface
- WMP Wire Mesh Fence

Services:

- CAV CATV cables
- CC Combined Sewer
- CE Concrete
- CH Chainlink
- CP Composite Paving
- CT Castings
- CTF Carpet
- LL Linoleum
- PAV Pavement
- SEN Sawn
- PS Paved
- PV Post & Rail
- TBR Timber Road Rail
- WSP Wearing Surface
- WMP Wire Mesh Fence

Building Level Details:

- UTL Unable to lift
- UTT Unable to trace
- VV Vent
- EL Eave Level
- FL Floor Level
- FR Flat Roof Level
- HL Head Level
- PL Parapet Level
- RL Ridge Level
- SL Still Level
- SP Spring of Arch
- TA Top of Arch
- W Window
- CC Ceiling/Beam Soffit

Survey Station

Sheet Layout

Sheet 2

Sheet 3

Sheet 4

Job No.	1118	Surveyor	M.Cable	Checked	M.Wood	Date	Aug 2024	Scale	1:200
Drawing No.	1118/T&S/01-04	Revision							
Rev		Job No.		Date	Revision Detail			Surveyor	Checked

PAS 128:2014 Quality Level Guide

Quality Level	Description
Q1	A utility is expected to exist but cannot be detected - (Q1) Assumed route
Q2	Q2P (Post Process)
Q3	Q3P (Post Process)
Q4	Q4P (Post Process)

EMP Surveys Ltd

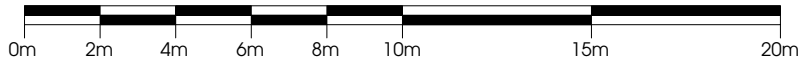
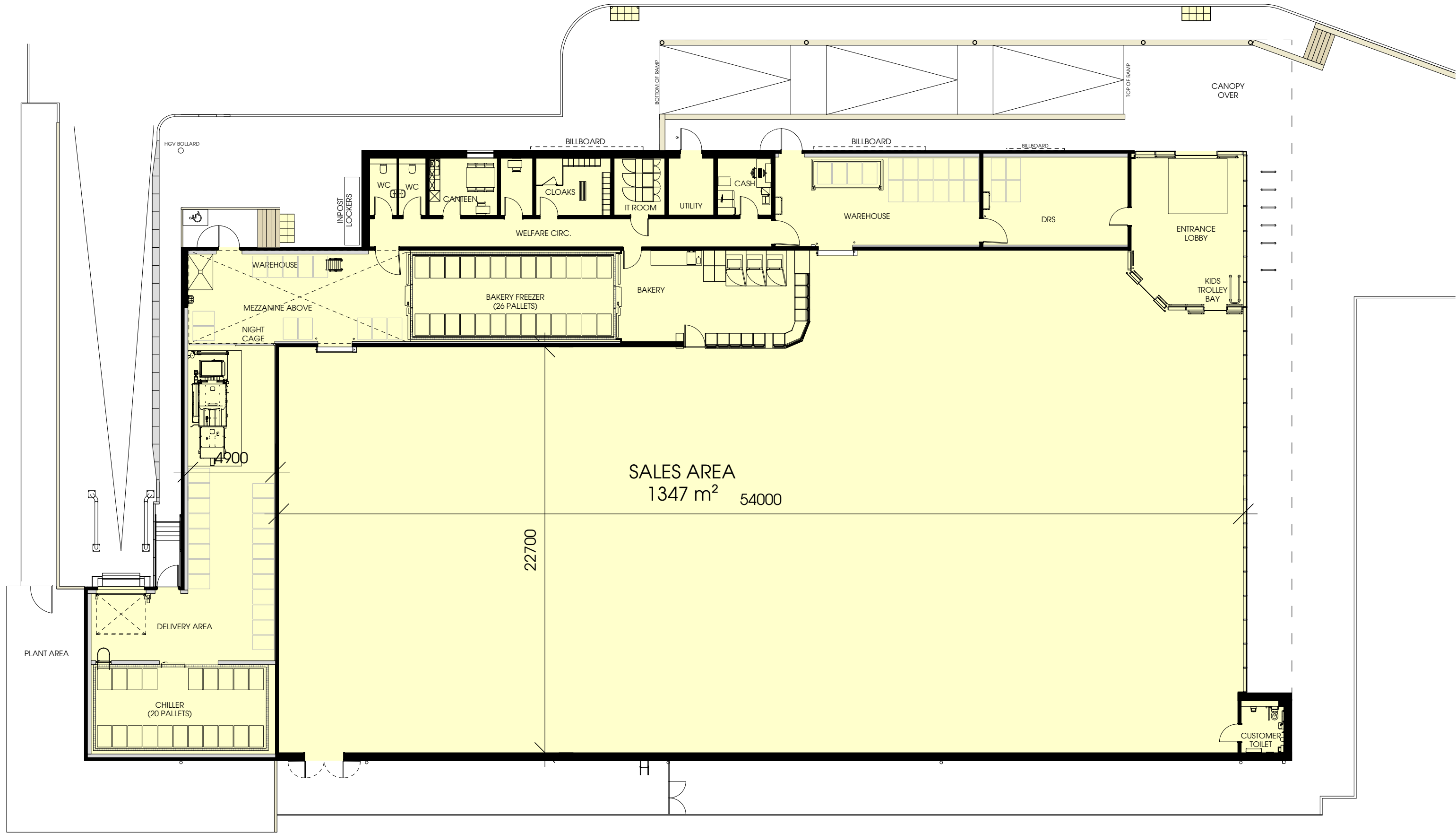
CLIENT DETAILS

Lidl Watlington Industrial Estate
Off Cowbridge Road
Bridgend
CF31 3PH

PROJECT DETAILS

Land off A485
Lampeter
Gwmann
SA48 8JN

Appendix C – Proposed Development Plan



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T: 0113 244 3457

W: www.htcarchitects.co.uk
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client
Lidl GB Ltd.

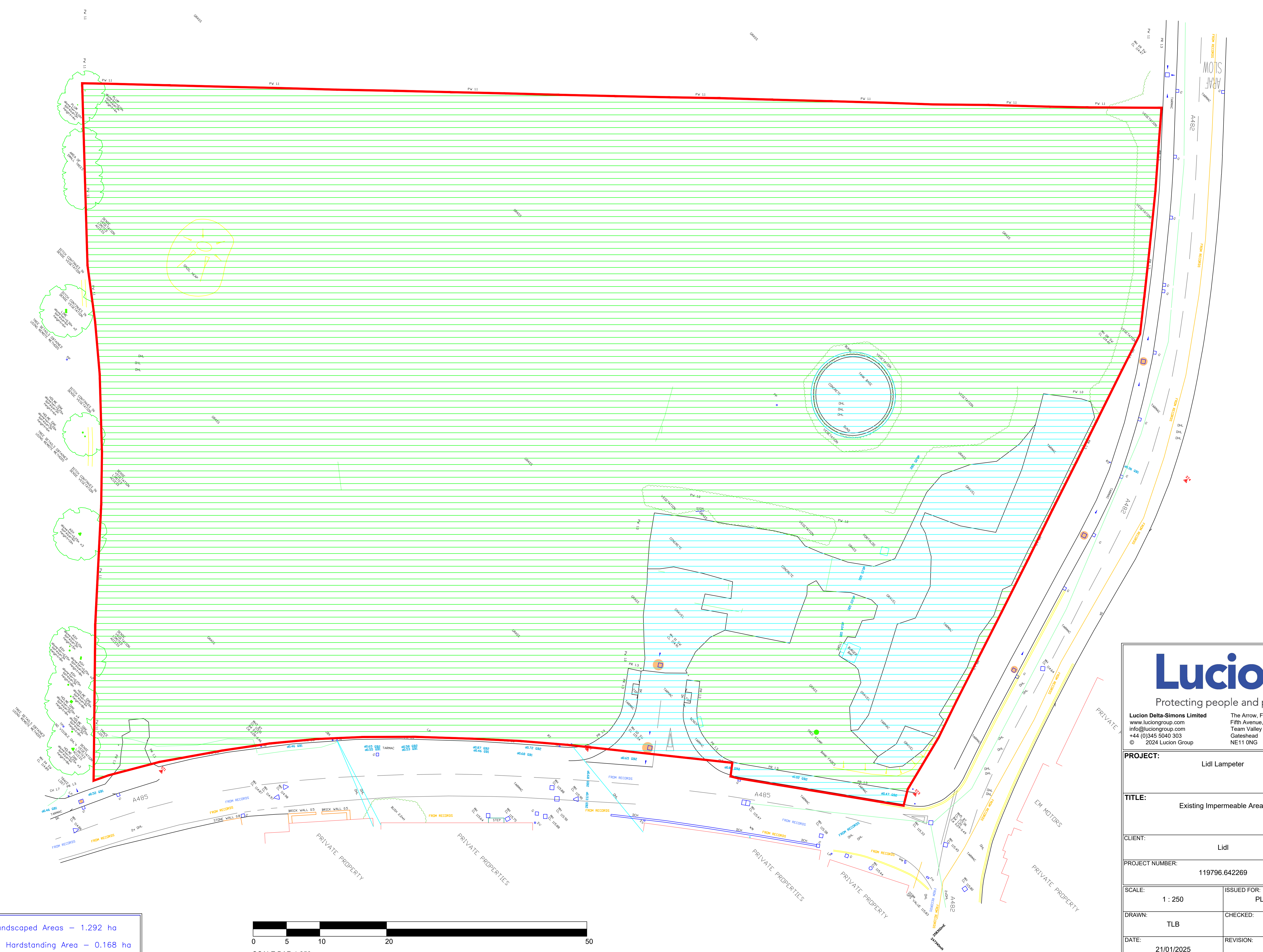
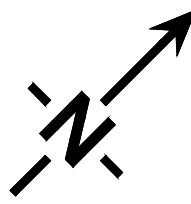


project
Cwmann,
Lampeter
drawing title
Ground Floor Plan

date June 2026
status Planning
scale 1:200 @ A3
drawn NG checked BMS
job no. 3384 dwg no. P1100 rev.

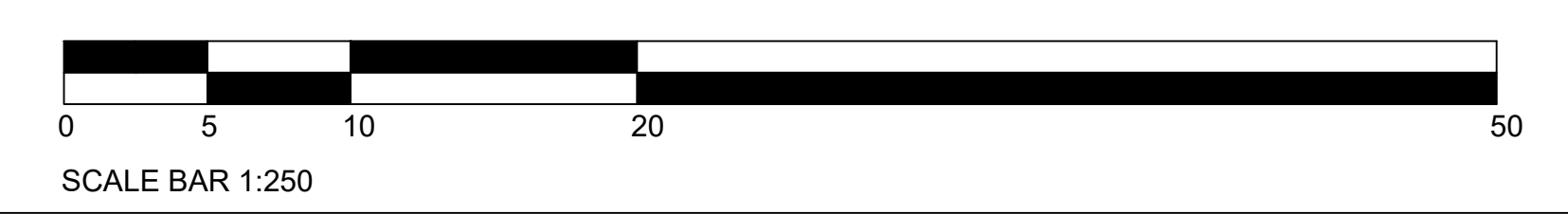
Rev	Date	Description	Drawn
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Appendix D – Existing and Proposed HS Area Drawing



Soft Landscaped Areas – 1.292 ha

Existing Hardstanding Area – 0.168 ha



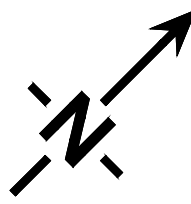
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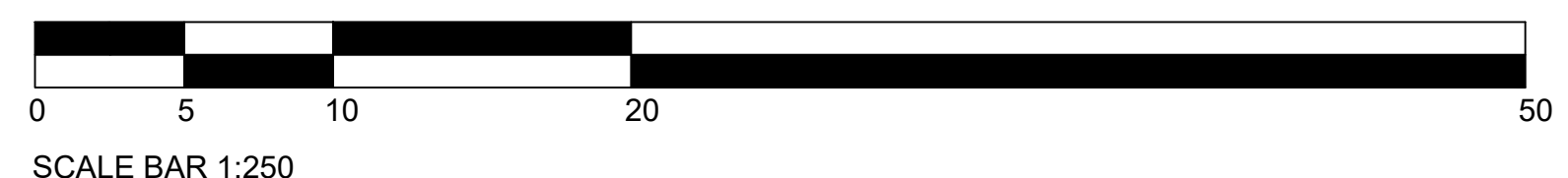
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The Arrow, First Floor (South Wing)
Fifth Avenue,
Team Valley Trading Estate,
Gateshead
NE11 0NG

PROJECT:	Lidl Lampeter	
TITLE:	Existing Impermeable Areas	
CLIENT:	Lidl	
PROJECT NUMBER:	119796.642269	
SCALE:	1 : 250	ISSUED FOR: PLANNING
DRAWN:	TLB	CHECKED: PA
DATE:	21/01/2025	REVISION: 2



- Soft Landscaped Areas – 0.692 ha
- Proposed Impermeable Area – 0.768 ha



SLOW
ARAF

Lucion

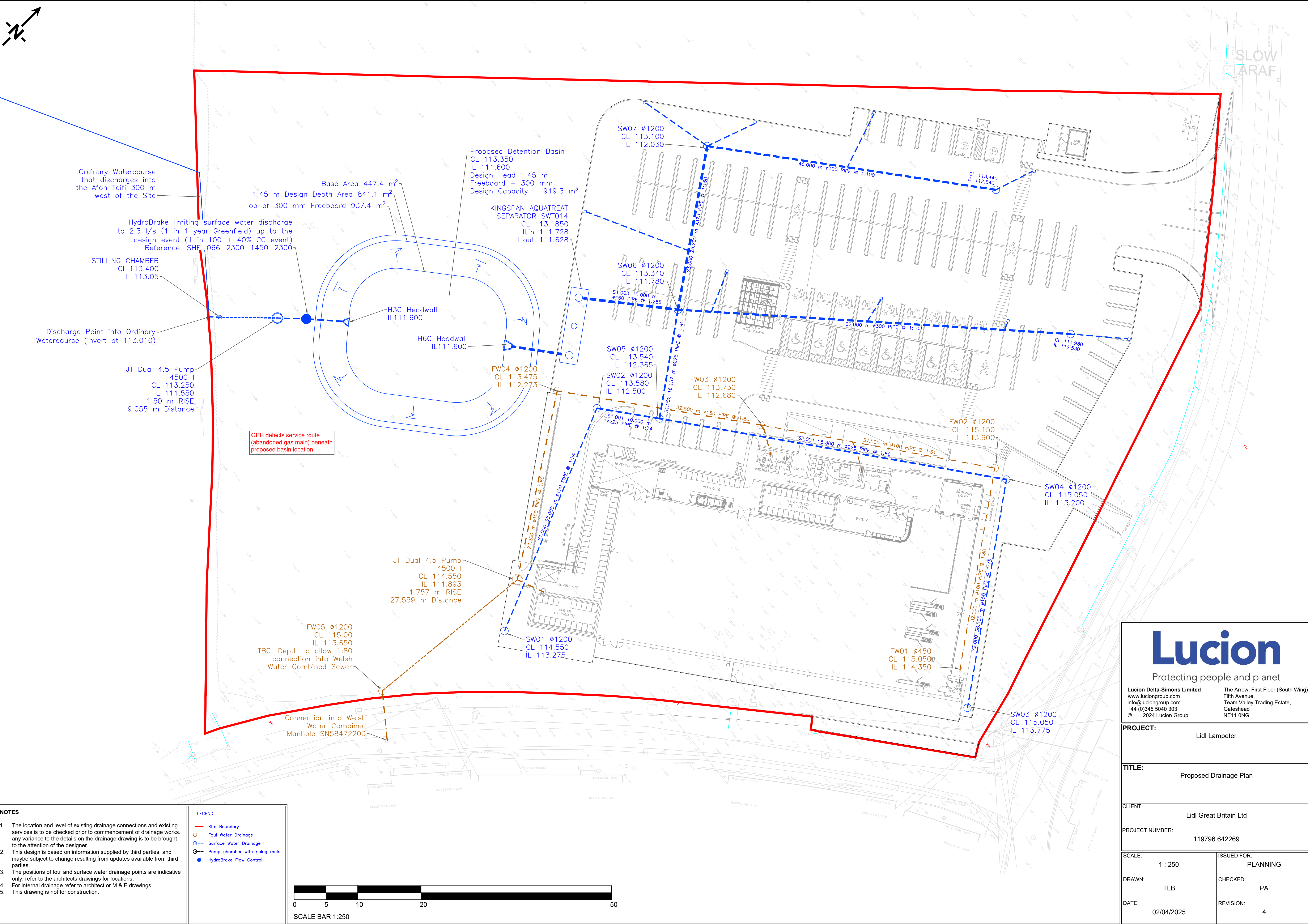
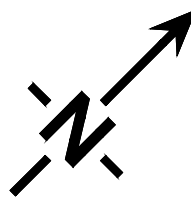
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Team Valley Trading Estate,
Gateshead
NE11 0NG

PROJECT:	Lidl Lampeter	
TITLE:	Proposed Impermeable Areas	
CLIENT:	Lidl	
PROJECT NUMBER:	119796.642269	
SCALE:	1 : 250	ISSUED FOR: PLANNING
DRAWN:	TLB	CHECKED: PA
DATE:	21/01/2025	REVISION: 2

Appendix E – Drainage Drawing



NOTES

- The location and level of existing drainage connections and existing services is to be checked prior to commencement of drainage works. any variance to the details on the drainage drawing is to be brought to the attention of the designer.
- This design is based on information supplied by third parties, and maybe subject to change resulting from updates available from third parties.
- The positions of foul and surface water drainage points are indicative only. refer to the architects drawings for locations.
- For internal drainage refer to architect or M & E drawings.
- This drawing is not for construction.

LEGEND

- Site Boundary
- Foul Water Drainage
- Surface Water Drainage
- Pump chamber with rising main
- HydroBrake Flow Control

SCALE BAR 1:250

05102050

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The Arrow, First Floor (South Wing)
Fifth Avenue,
Team Valley Trading Estate,
Gateshead
NE11 0NG

PROJECT:

Lidl Lampeter

TITLE:

Proposed Drainage Plan

CLIENT:

Lidl Great Britain Ltd

PROJECT NUMBER:

119796.642269

SCALE: 1 : 250	ISSUED FOR: PLANNING
DRAWN: TLB	CHECKED: PA
DATE: 02/04/2025	REVISION: 4

Appendix F – InfoDrainage Calculations

Lidl Lampeter: Detailed Drainage Calculations 1 in 100 year + 40% CC	Date: 25/09/2024		
	Designed by: TLB	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: Phase	Lucion:		



Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
SW01	Manhole	208563.765	601474.581	114.550	1.275	113.275	Circular	1.200
SW02	Manhole	208563.765	601512.581	113.580	1.080	112.500	Circular	1.200
SW03	Manhole	208629.265	601476.147	115.050	1.275	113.775	Circular	1.200
SW04	Manhole	208629.265	601512.647	115.050	1.850	113.200	Circular	1.200
SW06	Manhole	208574.104	601528.800	113.340	1.560	111.780	Circular	1.200
SW05	Manhole	208573.765	601512.647	113.540	1.175	112.365	Circular	1.200
SW07	Manhole	208574.104	601555.000	113.100	1.070	112.030	Circular	1.200

Name	Lock
SW01	None
SW02	None
SW03	None
SW04	None
SW06	None
SW05	None
SW07	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
SW01	Inlet	Roof Area 1	(None)	No Restriction
SW02	Inlet	Roof Area 2 S1.000	(None)	No Restriction
SW03	Inlet	Roof Area 4	(None)	No Restriction
SW04	Inlet	Roof Area 3 S2.000	(None)	No Restriction
SW06	Inlet	Parking Area S1.002	(None)	No Restriction
	Inlet (1)	S3.000	(None)	No Restriction
SW05	Inlet	S1.001 S2.001	(None)	No Restriction
SW07	Inlet	Parking Area (1)	(None)	No Restriction

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
SW01	Outlet	S1.000	Free Discharge
SW02	Outlet	S1.001	Free Discharge
SW03	Outlet	S2.000	Free Discharge
SW04	Outlet	S2.001	Free Discharge
SW06	Outlet	S1.003	Free Discharge
SW05	Outlet	S1.002	Free Discharge
SW07	Outlet	S3.000	Free Discharge

Lidl Lampeter: Detailed Drainage Calculations 1 in 100 year + 40% CC	Date: 25/09/2024		
	Designed by: TLB	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Lucion:		



Pond

Type : Pond

Dimensions

Exceedance Level (m)	113.350
Depth (m)	1.750
Base Level (m)	111.600
Freeboard (mm)	300
Initial Depth (m)	0.000
Porosity (%)	100
Average Slope (1:X)	3.052
Total Volume (m³)	919.271

Depth (m)	Area (m²)	Volume (m³)
0.000	447.40	0.000
1.450	841.10	919.271
1.750	937.40	1185.915

Inlets

Inlet

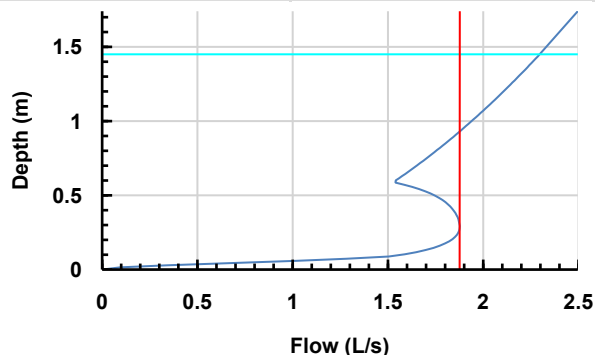
Inlet Type	Point Inflow
Incoming Item(s)	S1.003
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	(None)
Outlet Type	Hydro-Brake®
Invert Level (m)	111.600
Design Depth (m)	1.450
Design Flow (L/s)	2.3
Objective	Minimise Upstream Storage Requirements
Application	Surface Water Only
Sump Available	☒

Unit Reference SHE-0066-2300-1450-2300



Lidl Lampeter: Detailed Drainage Calculations 1 in 100 year + 40% CC	Date: 25/09/2024		
	Designed by: TLB	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Lucion:		



Advanced

Perimeter	Circular
Length (m)	14.319
Friction Scheme	Manning's n
n	0.03

Lidl Lampeter: Detailed Drainage Calculations 1 in 100 year + 40% CC	Date: 25/09/2024		
	Designed by: TLB	Checked by:	Approved By:
Report Details: Type: Connections Storm Phase: Phase	Lucion:		



Name	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)	Upstream Cover Level (m)	Upstream Invert Level (m)
S1.000	38.000	Pipe	54.286		0.6	150	114.550	113.275
S1.001	10.000	Pipe	74.073		0.6	225	113.580	112.500
S2.000	36.500	Pipe	73.000		0.6	150	115.050	113.775
S2.001	55.500	Pipe	66.467		0.6	225	115.050	113.200
S1.002	16.157	Pipe	44.879		0.6	225	113.540	112.365
S1.003	23.008	Pipe	287.596		0.6	450	113.340	111.780
S3.000	26.200	Pipe	149.716		0.6	375	113.100	112.030

Name	Downstream Cover Level (m)	Downstream Invert Level (m)	Part Family	Lock	Culvert Type	Culvert Entrance
S1.000	113.580	112.575		None	(None)	(None)
S1.001	113.540	112.365		None	(None)	(None)
S2.000	115.050	113.275		None	(None)	(None)
S2.001	113.540	112.365		None	(None)	(None)
S1.002	113.340	112.005		None	(None)	(None)
S1.003	113.350	111.700		Levels	(None)	(None)
S3.000	113.340	111.855		None	(None)	(None)

Lidl Lampeter: Detailed Drainage Calculations 1 in 100 year + 40% CC	Date: 25/09/2024		
	Designed by: TLB	Checked by:	Approved By:
Report Details: Type: Inflow Summary Storm Phase: Phase	Lucion:		



Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Parking Area	SW06		Time of Concentration	0.282	100	0	100	0.282
Parking Area (1)	SW07		Time of Concentration	0.282	100	0	100	0.282
Roof Area 1	SW01		Time of Concentration	0.051	100	0	100	0.051
Roof Area 2	SW02		Time of Concentration	0.051	100	0	100	0.051
Roof Area 3	SW04		Time of Concentration	0.051	100	0	100	0.051
Roof Area 4	SW03		Time of Concentration	0.051	100	0	100	0.051
TOTAL		0.0		0.768				0.768

Lidl Lampeter: Detailed Drainage Calculations 1 in 100 year + 40% CC	Date: 25/09/2024		
	Designed by: TLB	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Lucion:		



FEH: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Roof Area 1	FEH: 100 years: +40 %: 15 mins: Summer	0.05	29.5	12.910
Roof Area 2	FEH: 100 years: +40 %: 15 mins: Summer	0.05	29.5	12.910
Roof Area 3	FEH: 100 years: +40 %: 15 mins: Summer	0.05	29.5	12.910
Roof Area 4	FEH: 100 years: +40 %: 15 mins: Summer	0.05	29.5	12.910
Parking Area	FEH: 100 years: +40 %: 15 mins: Summer	0.28	163.1	71.379
Parking Area (1)	FEH: 100 years: +40 %: 15 mins: Summer	0.28	163.1	71.379

Lidl Lampeter: Detailed Drainage Calculations 1 in 100 year + 40% CC	Date: 25/09/2024		
	Designed by: TLB	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Lucion:		



FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Roof Area 1	FEH: 30 years: +0 %: 15 mins: Summer	0.05	17.1	7.455
Roof Area 2	FEH: 30 years: +0 %: 15 mins: Summer	0.05	17.1	7.455
Roof Area 3	FEH: 30 years: +0 %: 15 mins: Summer	0.05	17.1	7.455
Roof Area 4	FEH: 30 years: +0 %: 15 mins: Summer	0.05	17.1	7.455
Parking Area	FEH: 30 years: +0 %: 15 mins: Summer	0.28	94.5	41.237
Parking Area (1)	FEH: 30 years: +0 %: 15 mins: Summer	0.28	94.5	41.237

Lidl Lampeter: Detailed Drainage Calculations 1 in 100 year + 40% CC	Date: 25/09/2024		
	Designed by: TLB	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Lucion:		



FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Roof Area 1	FEH: 2 years: +0 %: 15 mins: Summer	0.05	8.4	3.700
Roof Area 2	FEH: 2 years: +0 %: 15 mins: Summer	0.05	8.4	3.700
Roof Area 3	FEH: 2 years: +0 %: 15 mins: Summer	0.05	8.4	3.700
Roof Area 4	FEH: 2 years: +0 %: 15 mins: Summer	0.05	8.4	3.700
Parking Area	FEH: 2 years: +0 %: 15 mins: Summer	0.28	46.7	20.448
Parking Area (1)	FEH: 2 years: +0 %: 15 mins: Summer	0.28	46.7	20.448

Lidl Lampeter: Detailed Drainage Calculations 1 in 100 year + 40% CC	Date: 25/09/2024		
	Designed by: TLB	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Lucion:		





FEH: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SW01	FEH: 100 years: +40 %: 15 mins: Summer	114.550	113.275	113.801	0.526	29.5	0.594	0.000	21.3	12.745	Surcharged
SW02	FEH: 100 years: +40 %: 15 mins: Summer	113.580	112.500	113.240	0.740	50.8	0.837	0.000	45.9	25.861	Surcharged
SW03	FEH: 100 years: +40 %: 15 mins: Summer	115.050	113.775	114.127	0.352	29.5	0.398	0.000	22.6	12.910	Surcharged
SW04	FEH: 100 years: +40 %: 15 mins: Summer	115.050	113.200	113.519	0.319	52.1	0.361	0.000	41.0	25.774	Surcharged
SW06	FEH: 100 years: +40 %: 1440 mins: Winter	113.340	111.780	113.047	1.267	31.4	1.434	0.000	31.2	1073.639	Flood Risk
SW05	FEH: 100 years: +40 %: 15 mins: Summer	113.540	112.365	113.132	0.767	86.9	0.868	0.000	81.8	51.959	Surcharged
SW07	FEH: 100 years: +40 %: 1440 mins: Winter	113.100	112.030	113.047	1.017	11.6	1.151	0.000	11.6	395.874	Flood Risk

Lidl Lampeter: Detailed Drainage Calculations 1 in 100 year + 40% CC	Date: 25/09/2024		
	Designed by: TLB	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Lucion:		



FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SW01	FEH: 30 years: +0 %: 15 mins: Summer	114.5 50	113.2 75	113.36 8	0.093	17.1	0.105	0.000	15.9	7.446	OK
SW02	FEH: 30 years: +0 %: 15 mins: Summer	113.5 80	112.5 00	112.64 1	0.141	33.0	0.159	0.000	32.4	14.898	OK
SW03	FEH: 30 years: +0 %: 15 mins: Summer	115.0 50	113.7 75	113.87 8	0.103	17.1	0.116	0.000	15.8	7.445	OK
SW04	FEH: 30 years: +0 %: 15 mins: Summer	115.0 50	113.2 00	113.31 2	0.112	32.8	0.127	0.000	31.5	14.899	OK
SW06	FEH: 30 years: +0 %: 1440 mins: Winter	113.3 40	111.78 0	112.48 9	0.709	18.4	0.801	0.000	18.0	626.377	Surcharged
SW05	FEH: 30 years: +0 %: 15 mins: Summer	113.5 40	112.3 65	112.53 7	0.172	63.9	0.194	0.000	59.3	29.769	OK
SW07	FEH: 30 years: +0 %: 1440 mins: Winter	113.1 00	112.0 30	112.48 9	0.459	6.8	0.519	0.000	6.7	230.671	Surcharged

Lidl Lampeter: Detailed Drainage Calculations 1 in 100 year + 40% CC	Date: 25/09/2024		
	Designed by: TLB	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Lucion:		



FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
SW01	FEH: 2 years: +0 %: 15 mins: Summer	114.5 50	113.2 75	113.33 5	0.060	8.4	0.068	0.000	7.8	3.693	OK
SW02	FEH: 2 years: +0 %: 15 mins: Summer	113.5 80	112.5 00	112.58 7	0.087	16.3	0.098	0.000	15.9	7.391	OK
SW03	FEH: 2 years: +0 %: 15 mins: Summer	115.0 50	113.7 75	113.84 0	0.065	8.4	0.074	0.000	7.7	3.692	OK
SW04	FEH: 2 years: +0 %: 15 mins: Summer	115.0 50	113.2 00	113.27 5	0.075	16.2	0.085	0.000	15.4	7.391	OK
SW06	FEH: 2 years: +0 %: 1440 mins: Winter	113.3 40	111.78 0	112.12 7	0.347	11.4	0.392	0.000	11.3	389.824	OK
SW05	FEH: 2 years: +0 %: 15 mins: Summer	113.5 40	112.3 65	112.46 8	0.103	31.3	0.116	0.000	28.9	14.740	OK
SW07	FEH: 2 years: +0 %: 15 mins: Summer	113.1 00	112.0 30	112.17 3	0.143	46.7	0.162	0.000	45.6	20.333	OK

Lidl Lampeter: Detailed Drainage Calculations 1 in 100 year + 40% CC	Date: 25/09/2024		
	Designed by: TLB	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Lucion:		



FEH: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By:
 Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residual Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Pond	FEH: 100 years: +40 %: 1440 mins: Winter	113.047	113.047	1.447	1.447	31.2	917.122	0.000	0.000	2.3	346.843	0.234	OK

Lidl Lampeter: Detailed Drainage Calculations 1 in 100 year + 40% CC	Date: 25/09/2024		
	Designed by: TLB	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Lucion:		





FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Pond	FEH: 30 years: +0 %: 1440 mins: Winter	112.489	112.489	0.889	0.889	18.0	494.808	0.000	0.000	1.9	279.834	46.174	OK

Lidl Lampeter: Detailed Drainage Calculations 1 in 100 year + 40% CC	Date: 25/09/2024		
	Designed by: TLB	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Lucion:		





FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Pond	FEH: 2 years: +0 %: 1440 mins: Winter	112.127	112.127	0.527	0.527	11.3	268.766	0.000	0.000	1.9	279.102	70.763	OK

Lidl Lampeter: Detailed Drainage Calculations 1 in 100 year + 40% CC	Date: 25/09/2024		
	Designed by: TLB	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Lucion:		



FEH: 100 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
S1.000	FEH: 100 years: +40 %: 15 mins: Summer	Pipe	SW01	SW02	114.550	113.801	0.150	12.745	1.3	0.88	21.3	Surcharged
S1.001	FEH: 100 years: +40 %: 15 mins: Summer	Pipe	SW02	SW05	113.580	113.240	0.225	25.861	1.2	0.76	45.9	Surcharged
S2.000	FEH: 100 years: +40 %: 15 mins: Winter	Pipe	SW03	SW04	115.050	114.041	0.150	12.906	1.3	1.09	22.8	Surcharged
S2.001	FEH: 100 years: +40 %: 30 mins: Summer	Pipe	SW04	SW05	115.050	113.336	0.225	36.501	1.1	0.66	42.2	OK
S1.002	FEH: 100 years: +40 %: 30 mins: Summer	Pipe	SW05	SW06	113.540	112.955	0.225	73.005	2.1	1.08	84.1	Surcharged
S1.003	FEH: 100 years: +40 %: 15 mins: Summer	Pipe	SW06	Pond	113.340	112.647	0.450	191.980	2.5	2.11	399.8	Surcharged
S3.000	FEH: 100 years: +40 %: 15 mins: Summer	Pipe	SW07	SW06	113.100	112.869	0.375	71.129	1.4	0.97	158.9	Flood Risk

Lidl Lampeter: Detailed Drainage Calculations 1 in 100 year + 40% CC	Date: 25/09/2024		
	Designed by: TLB	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Lucion:		



FEH: 30 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
S1.000	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	SW01	SW02	114.550	113.368	0.090	7.446	1.4	0.66	15.9	OK
S1.001	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	SW02	SW05	113.580	112.641	0.156	14.898	1.1	0.54	32.4	OK
S2.000	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	SW03	SW04	115.050	113.878	0.100	7.445	1.3	0.76	15.8	OK
S2.001	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	SW04	SW05	115.050	113.312	0.142	14.899	1.2	0.49	31.5	OK
S1.002	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	SW05	SW06	113.540	112.537	0.203	29.769	1.7	0.76	59.3	OK
S1.003	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	SW06	Pond	113.340	112.240	0.398	111.610	1.5	1.21	229.2	Surcharged
S3.000	FEH: 30 years: +0 %: 15 mins: Summer	Pipe	SW07	SW06	113.100	112.276	0.315	41.136	1.0	0.54	88.2	OK

Lidl Lampeter: Detailed Drainage Calculations 1 in 100 year + 40% CC	Date: 25/09/2024		
	Designed by: TLB	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Lucion:		



FEH: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
S1.000	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW01	SW02	114.550	113.335	0.059	3.693	1.2	0.32	7.8	OK
S1.001	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW02	SW05	113.580	112.587	0.095	7.391	1.0	0.26	15.9	OK
S2.000	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW03	SW04	115.050	113.840	0.064	3.692	1.1	0.37	7.7	OK
S2.001	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW04	SW05	115.050	113.275	0.089	7.391	1.1	0.24	15.4	OK
S1.002	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW05	SW06	113.540	112.468	0.099	14.740	1.7	0.37	28.9	OK
S1.003	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW06	Pond	113.340	112.052	0.253	55.560	1.2	0.6	113.3	OK
S3.000	FEH: 2 years: +0 %: 15 mins: Summer	Pipe	SW07	SW06	113.100	112.173	0.170	20.333	0.9	0.28	45.6	OK

Appendix G – Maintenance Schedules

Water Management Solutions

Klargester

AquaTreat Full Retention GRP Surface Water Treatment Separators

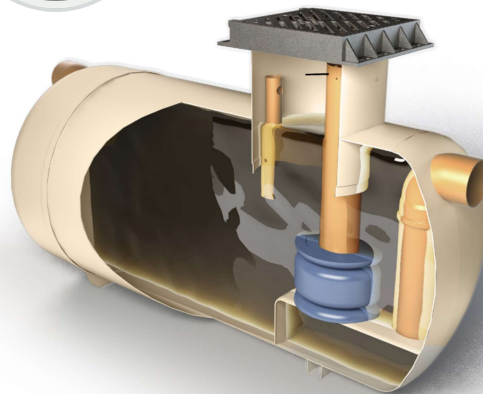
Mitigation Indices

TSS	Metals	Hydrocarbons
0.8%	0.6%	0.9%



Why choose an AquaTreat separator?

- Larger silt storage capacities (compared to vortex separators)
- Our indices cater for high polluted lands (single piece solution)
- Reduced risk of silt build up
- Lesser risk of downstream pollution in SuDS solution due to high capacity silt storage
- Easier servicing, with maintenance from ground level
- SmartServ Pro remote monitoring solution (available as optional extra)



Our range has been tested against full flow

Our units have been tested at their maximum flow rate (10l/s), unlike some products which have been tested based on bypass and therefore only 10% of the flow. This ensures total accuracy of our silt retention results, by replicating the full effect of the silt wash through.

As part of our Planet Passionate programme, Kingspan are dedicated to delivering innovative surface water management technologies, developed on the back of 65 years' experience.

*Terms and conditions apply. View online at <https://www.kingspan.com/gb/en-gb/products/wastewater-management/warranty-terms>



Klargester AquaTreat

Full Retention GRP Surface Water Treatment Separators

Technical Specifications

Model	10 l/s Low Risk		6 l/s Medium Risk			
	Treated Flowrate [l/s]	Connectable Surface Area [m²]	Treated Flowrate [l/s]	Connectable Surface Area [m²]	Length (mm)	Diameter (mm)
SWT001	10	1333	6	800	2610	1225
SWT002	15	2004	9	1202	3910	1225
SWT003	19	2535	11	1524	3230	2010
SWT004	23	3105	14	1863	3960	2010
SWT005	28	3747	17	2248	4750	2010
SWT006	34	4563	21	2738	5970	2010
SWT007	44	5814	26	3489	7365	2010
SWT008	48	6368	29	3821	5744	2820
SWT009	52	6880	31	4128	6200	2820
SWT010	61	8177	37	4906	7365	2820
SWT011	72	9635	43	5781	8675	2820
SWT012	83	11082	50	6649	9975	2820
SWT013	94	12535	56	7521	11280	2820
SWT014	100	13362	60	8017	11994	2820
SWT015	106	14183	64	8510	12766	2820
SWT016	113	15029	68	9017	13528	2820
SWT017	119	15897	72	9538	14300	2820
SWT018	126	16754	75	10053	15071	2820
SWT019	132	17601	79	10560	15833	2820

Low		
CoP at 10 l/s	% Removal	Mitigation Index
Total Suspended Solids (TSS)	75.6%	0.7
Metals*	57%	0.5
Hydrocarbons	99.6%	0.9
* Reduction of heavy metals by collecting and retaining suspended solids is assumed as 7.5%		

Medium		
CoP at 6 l/s	% Removal	Mitigation Index
Total Suspended Solids (TSS)	81.8%	0.8
Metals*	61.4%	0.6
Hydrocarbons	99.6%	0.9
* Reduction of heavy metals by collecting and retaining suspended solids is assumed as 7.5%		

For more information on any of our products: T: +44 (0)1296 633 033
E: accivilsales@kingspan.com or visit kingspan.co.uk/klargester

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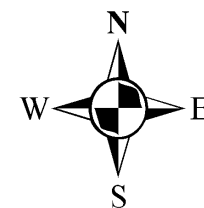
Wetland and Pond Maintenance Schedule

Maintenance Schedule	Required Action	Typical Frequency
Regular maintenance	Remove litter and debris	Monthly (or as required)
	Cut the grass - public areas	Monthly (during growing season), or as required
	Inspect marginal and bankside vegetation and remove nuisance plants (for first 3 years)	Monthly (at start, then as required)
	Inspect inlets, outlets, banksides, structures, pipework etc for evidence of blockage, and / or physical damage.	Monthly
	Inspect water body for signs of poor water quality	Monthly (May - October)
	Inspect silt accumulation rates in any forebay and in main body of the pond and establish appropriate removal frequencies; undertake contamination testing once some build-up has occurred, to inform management and disposal options.	Half yearly
	Check any mechanical devices e.g. penstocks	Half yearly
	Hand cut submerged and emergent aquatic plants (at minimum of 0.1m above pond base; include max 25% of pond surface)	Annually
	Remove 25% of bank vegetation from water's edge to a minimum of 1m above water level	Annually
	Remove sediment from any forebay	Every 1 - 5 years, or as required
	Remove sediment and planting from one quadrant of the main body of ponds without sediment forebays	Every 5 years, or as required
Occasional maintenance	Remove sediment from the main body of big ponds when pool volume is reduced by 20%	With effective pre-treatment, this will only be required rarely, e.g. 25-50 years
Remedial actions	Repair erosion or other damage	As required
	Replant where necessary	As required
	Aerate pond when signs of eutrophication are detected	As required
	Realign rip-rap or repair other damage	As required
	Repair/rehabilitate of Inlets, outlets and overflows	As required

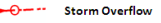
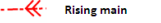
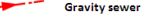
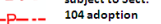
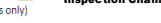
Ref. Table 23.1 CIRIA C753 'The SuDS Manual'

Appendix H – Welsh Water Sewer Plans

Lucion Delta Simons, Cwmann, Ceredigion
SA48 8DR



LEGEND(Representative of most common features)

Waste network:			
			
			
			
			
			
NB: Sewer symbol colour indicates the type.			
RED - Combined			
GREEN - Surface Water			
BROWN - Foul			
Purple - Former S24 sewers (for indicative purposes only)			

Notes:

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

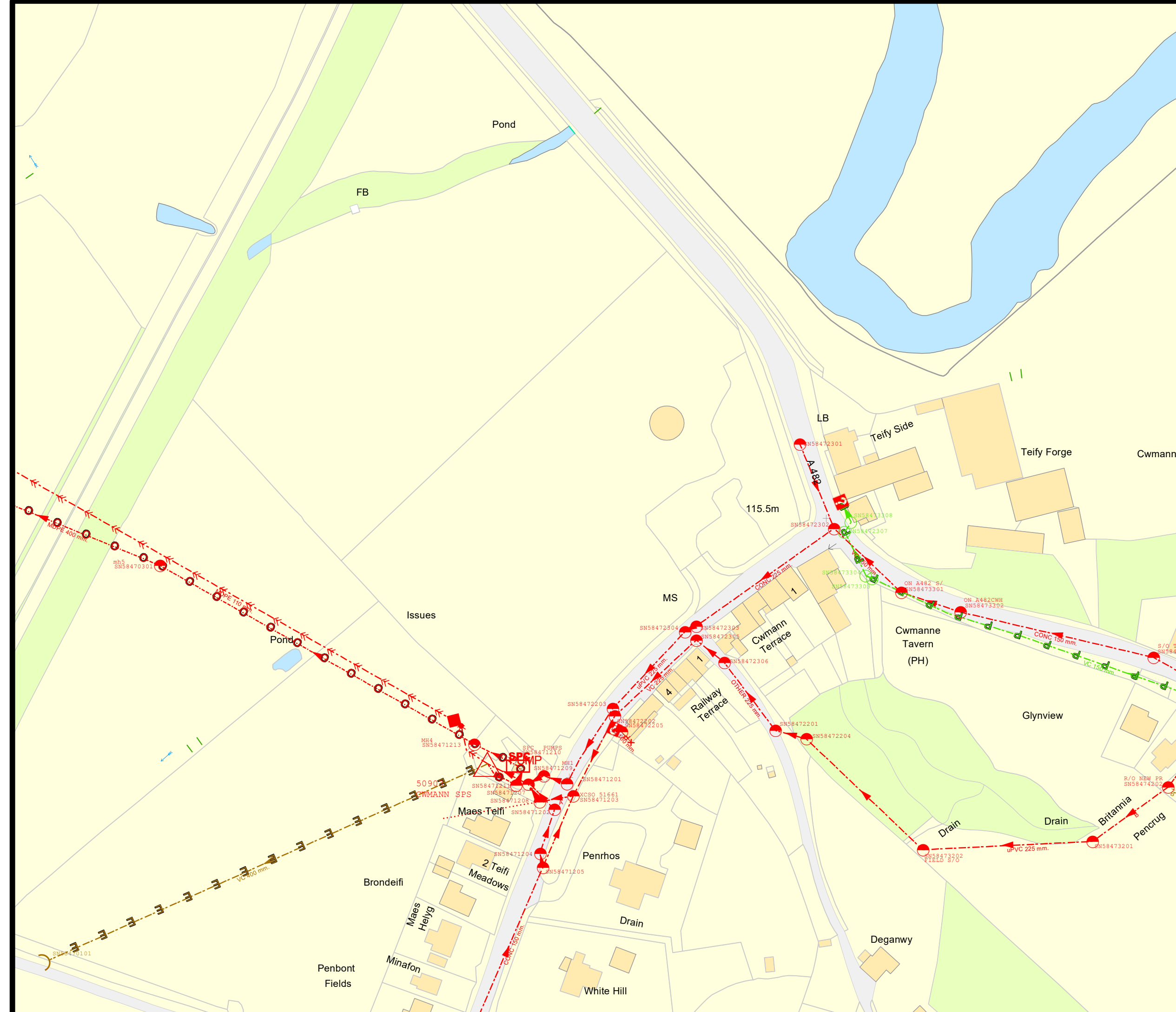
Dŵr Cymru Cyfyngedig ('the Company') gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company, is done so in accordance with statutory requirements of sections 198 and 199 of the Water Industry Act 1991 which is based upon the best information available and, in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a water main, service pipe, sewer, lateral drain or disposal main and any associated apparatus laid before 1 September 1989, or, if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the Company's right to be compensated for any damage to its apparatus.

Service pipes are not generally shown but their presence should be anticipated.

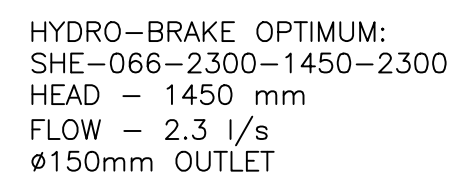
**EXACT LOCATIONS OF ALL APPARATUS
TO BE DETERMINED ON SITE.**

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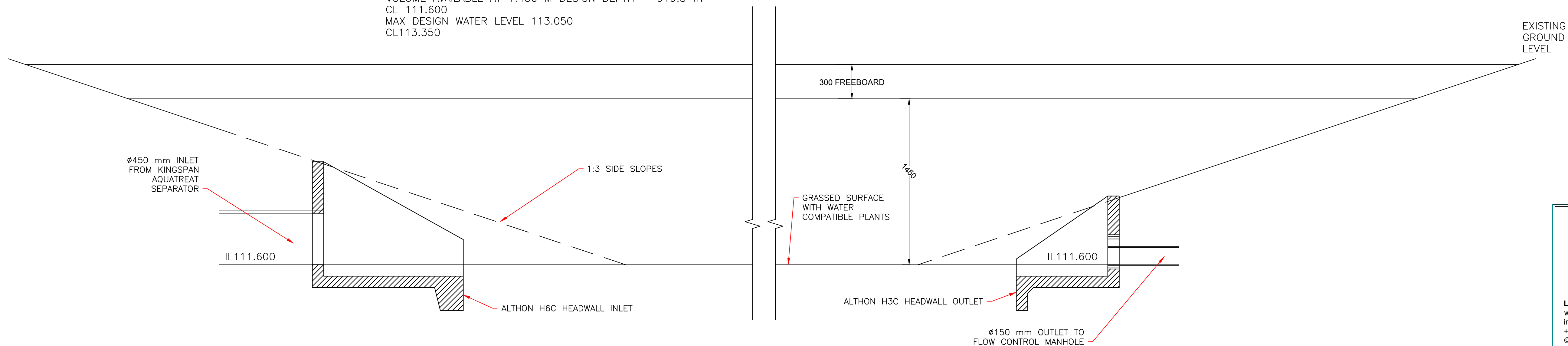
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Map scale: 1:1250
Printed by: Emily Marsden
Printed on: 23 Jan 2025



Appendix I – Drainage Details



FLOW CONTROL MANHOLE PLAN VIEW 1:20



Lucion

Protecting people and planet

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The Arrow, First Floor (South Wing)
Fifth Avenue,
Team Valley Trading Estate,
Gateshead
NE11 0NG

PROJECT:

Lidl Lampeter

TITLE:

Typical SuDS Details

CLIENT:

Lidl Great Britain Ltd

PROJECT NUMBER:

119796.642269

SCALE:

1 : 20

ISSUED FOR:

PLANNING

DRAWN:

TLB

CHECKED: _____

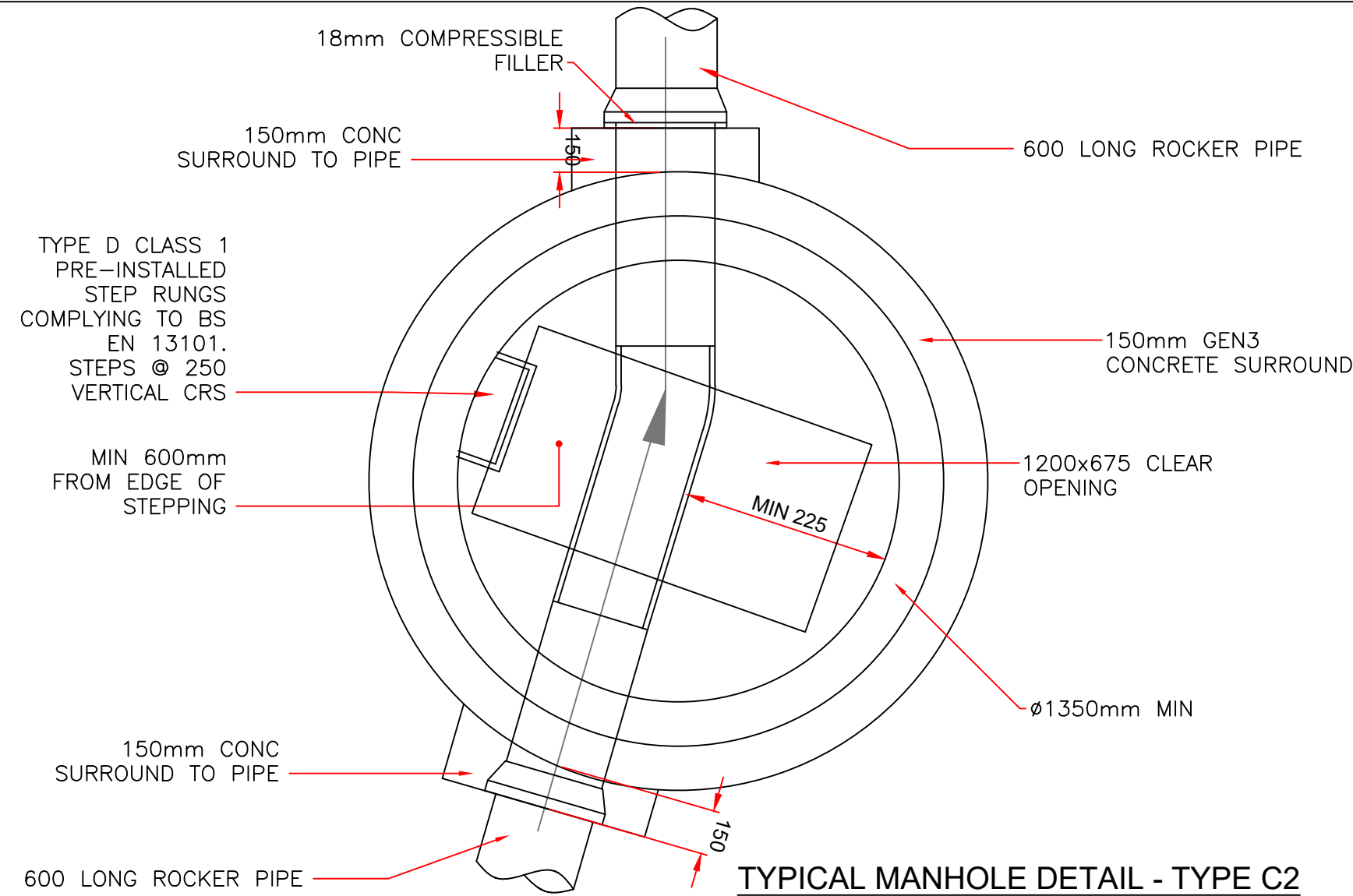
LB

DATE:

02/04/2025

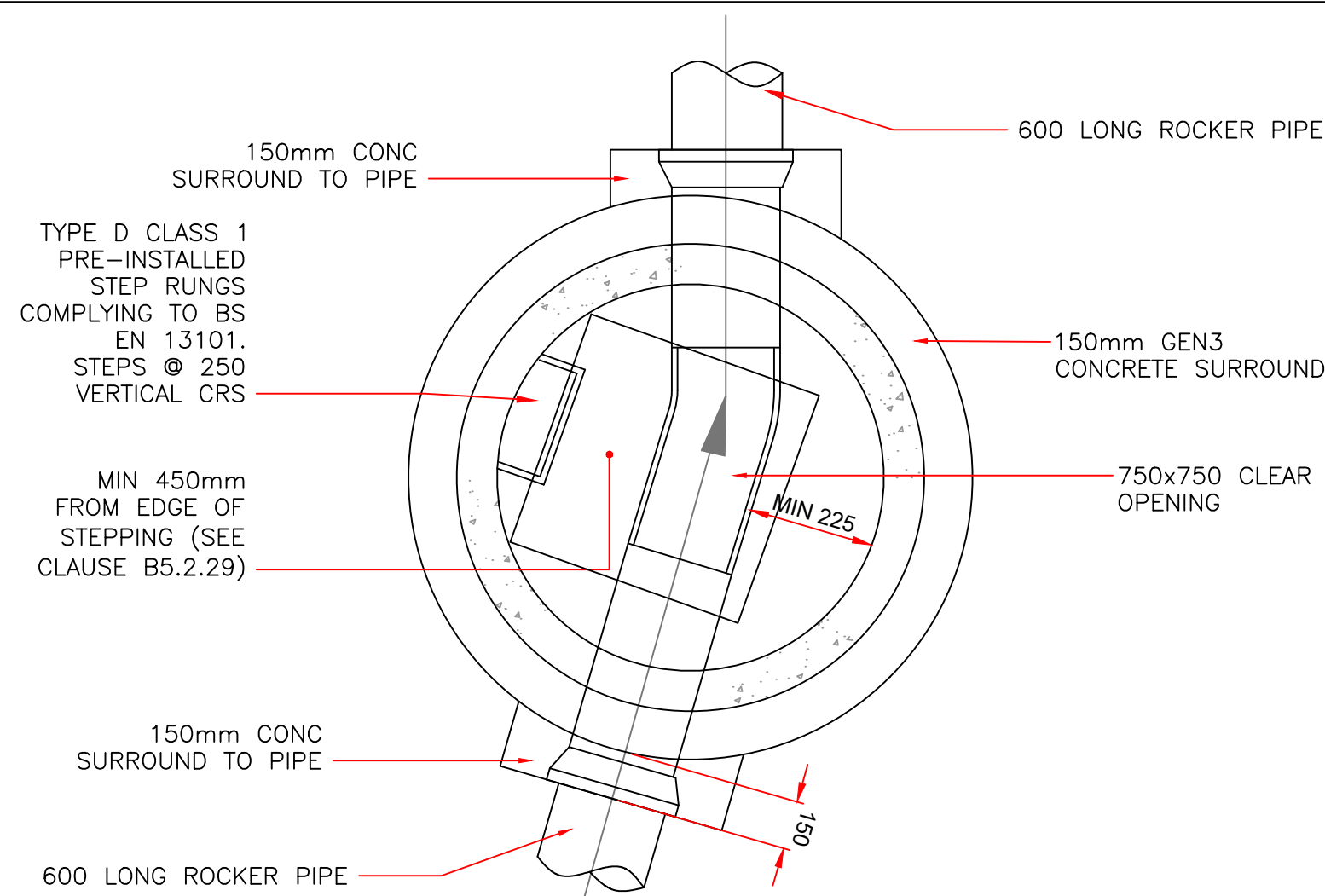
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2



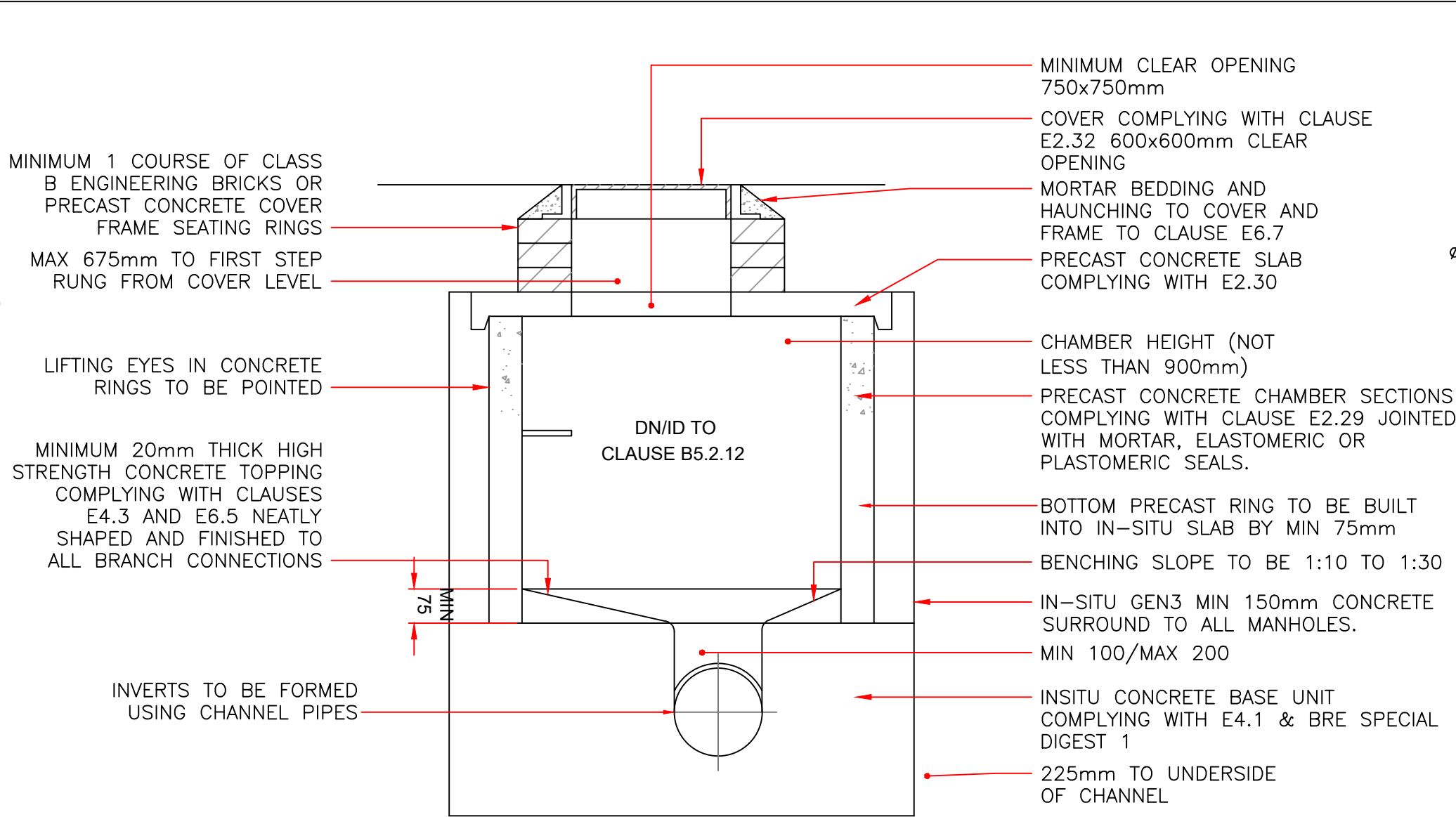
TYPICAL MANHOLE DETAIL - TYPE C2

DEPTH TO PIPE SOFFIT < 1.5m (Ø225mm TO Ø375mm PIPE SIZE)
TYPICAL DETAIL SHOWN IS FOR TYPE C – RIGID CONSTRUCTION
MANHOLE. OTHER CONSTRUCTION METHODS ARE AVAILABLE AS
PER THE DETAILS IN THE SEWERAGE SECTOR GUIDANCE

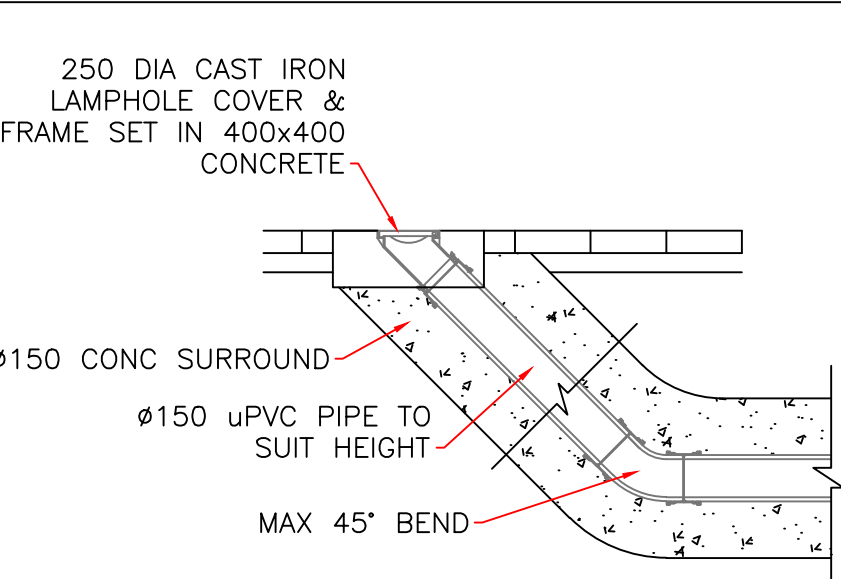


TYPICAL MANHOLE DETAIL - TYPE C1

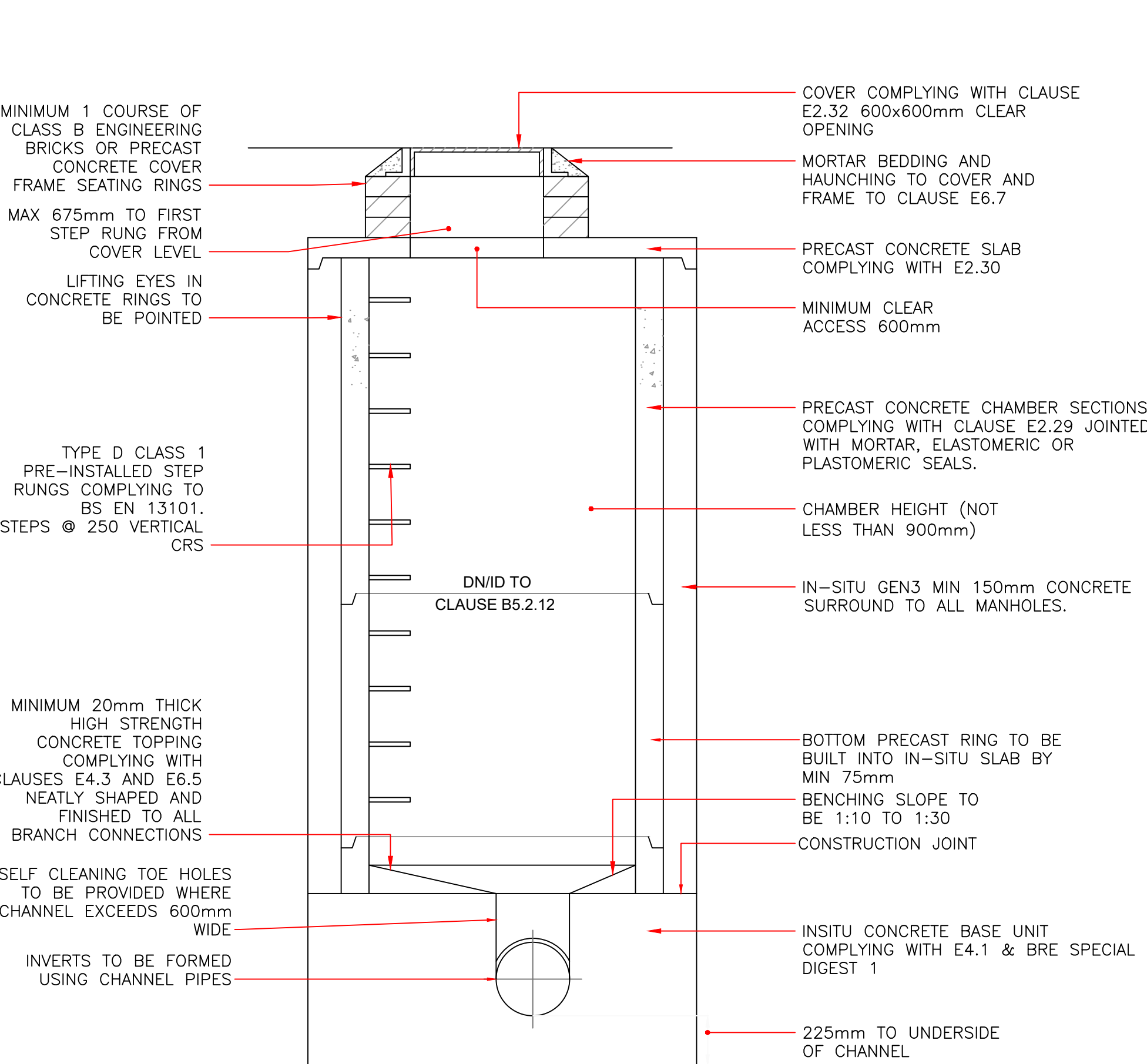
DEPTH TO PIPE SOFFIT < 1.5m (Ø100mm TO Ø150mm PIPE SIZE)
TYPICAL DETAIL SHOWN IS FOR TYPE C – RIGID CONSTRUCTION
MANHOLE. OTHER CONSTRUCTION METHODS ARE AVAILABLE AS
PER THE DETAILS IN THE SEWERAGE SECTOR GUIDANCE



TYPICAL MANHOLE DETAIL - TYPE C1&C2

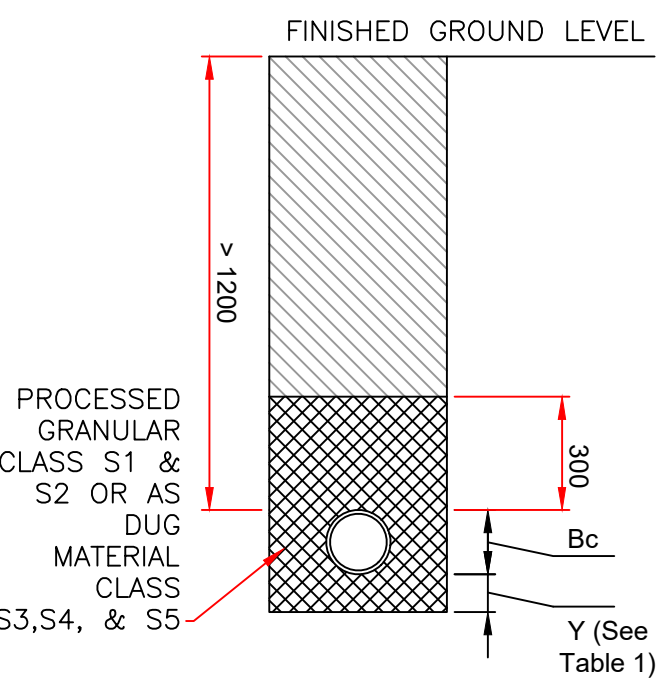


TYPICAL RODDING EYE DETAIL



TYPICAL MANHOLE DETAIL - TYPE B

DEPTH TO PIPE SOFFIT 1.5m TO 3.0m
TYPICAL DETAIL SHOWN IS FOR TYPE B – RIGID CONSTRUCTION
MANHOLE. OTHER CONSTRUCTION METHODS ARE AVAILABLE AS
PER THE DETAILS IN THE SEWERAGE SECTOR GUIDANCE



TYPICAL MANHOLE DETAIL - TYPE A

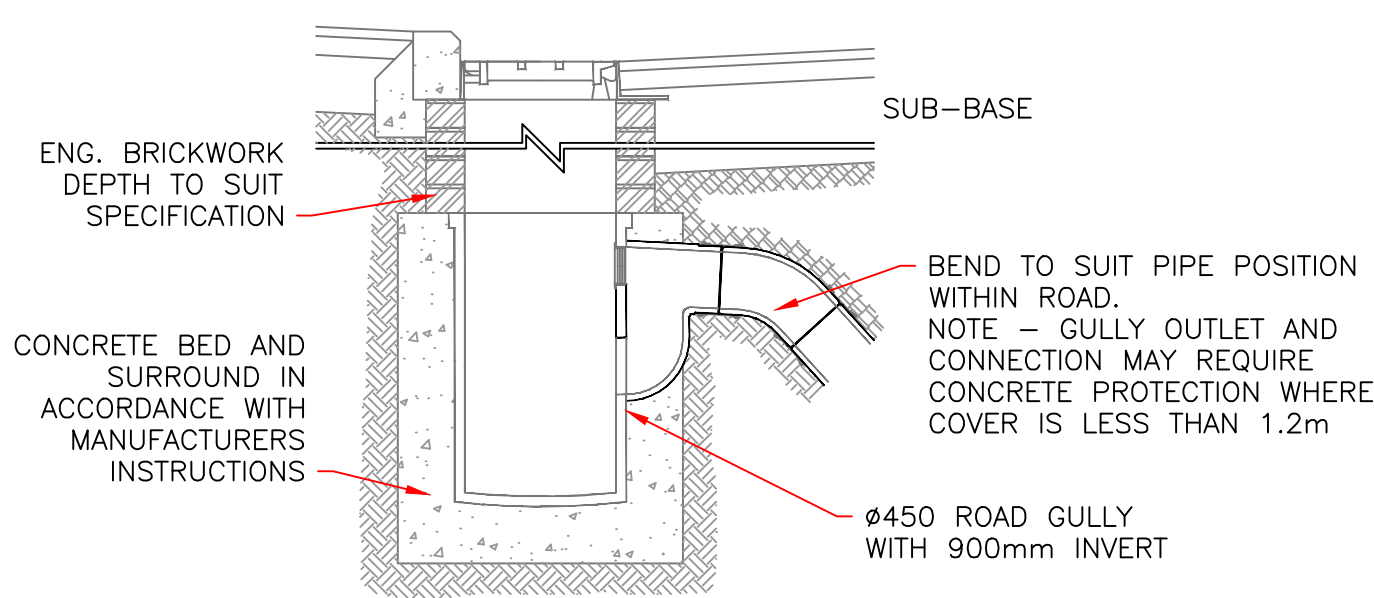
DEPTH TO PIPE SOFFIT < 1.5m (Ø100mm TO Ø150mm PIPE SIZE)
TYPICAL DETAIL SHOWN IS FOR TYPE A – RIGID CONSTRUCTION
MANHOLE. OTHER CONSTRUCTION METHODS ARE AVAILABLE AS
PER THE DETAILS IN THE SEWERAGE SECTOR GUIDANCE

TABLE 1 MINIMUM EFFECTIVE EMBEDMENT DIMENSIONS FOR FLEXIBLE AND SEMI RIGID PIPES			
NOMINAL INT PIPE DIA	DIMENSION Y1 (EVEN TRENCH BOTTOM)	DIMENSION Y2 (ROCK OR UNEVEN TRENCH BOTTOM*)	MINIMUM EFFECTIVE TRENCH WIDTH Bd (SEE NOTE 5)
<400	100	200	Bc +300

*NOTE
THE MINIMUM DEPTH OF PROCESSED GRANULAR MATERIAL UNDER PIPE
SOCKETS SHALL BE 50mm FOR EVEN TRENCH BOTTOM AND 150mm FOR
UNEVEN TRENCH BOTTOM

NOTE

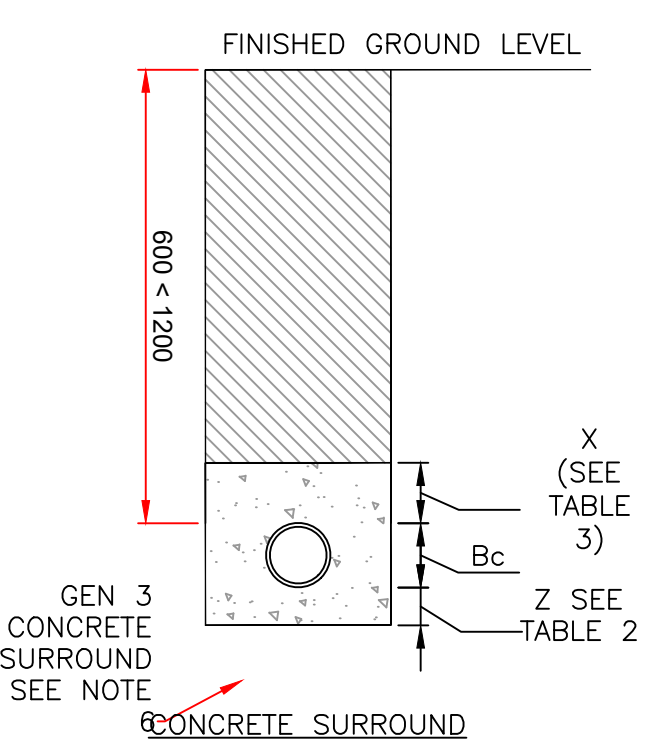
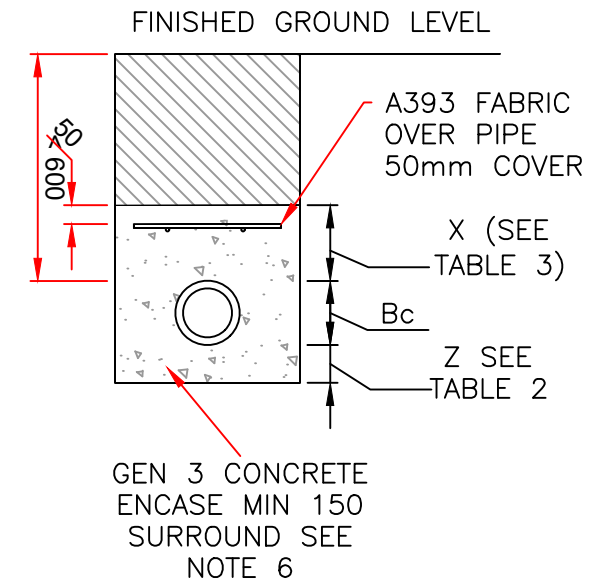
- DRAINAGE TO BE 150 CONCRETE ENCASED WHERE COVER IS LESS THAN 1200mm.
- THE PIPE EMBEDMENTS INDICATE MIN TRENCH DIMENSIONS WHICH SHOULD BE ASSUMED FOR INITIAL DESIGN. THE MIN TRENCH WIDTHS SHOWN WILL USUALLY BE SUFFICIENT TO ALLOW ADEQUATE COMPACTION OF THE EMBEDMENT MATERIAL. ALL PIPE WORK TO BE DESIGNED TO BS EN 1295-1
- GEN3 CONCRETE SHALL BE USED IN NON AGGRESSIVE GROUND ELSEWHERE THE CEMENT TYPE & MIX DESIGN SHOULD BE SELECTED TO SUIT SULPHATE CONTENT & PH OF THE GROUND & GROUND WATER
- GROUND COVER TO ALL PLANT TO BE STRICTLY IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS



TYPICAL GULLY DETAIL

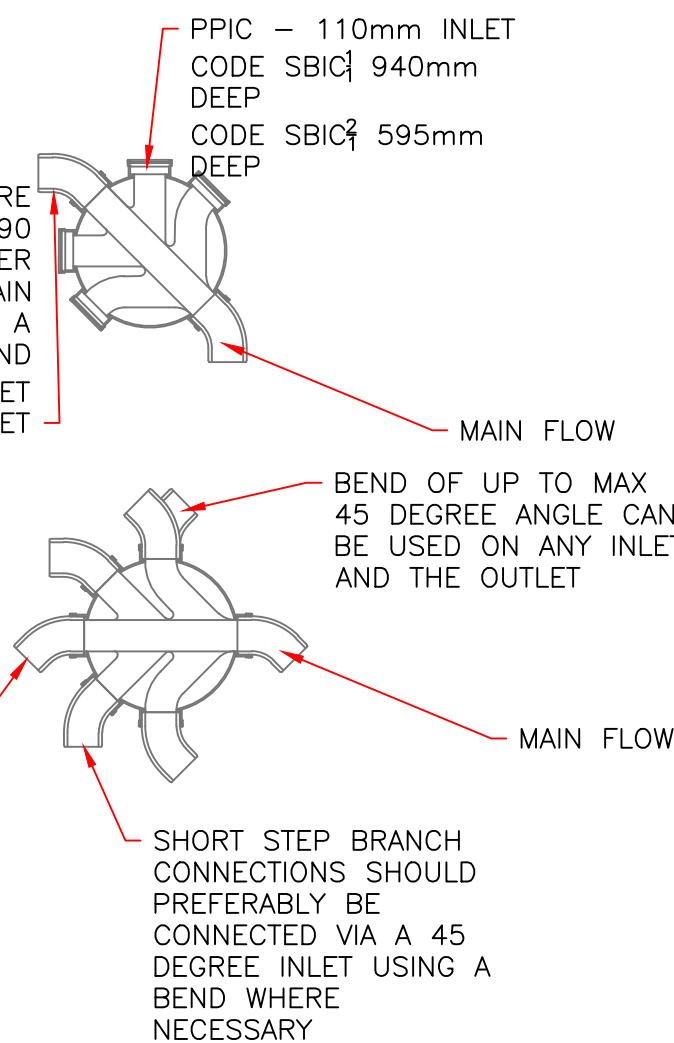
TABLE 2 – EMBEDMENT DIMENSIONS FOR RIGID PIPES					
NOMINAL INT PIPE DIA	DIMENSION Y1 EVEN TRENCH BOTTOM (MIN)	DIMENSION Y2 ROCK OR UNEVEN TRENCH BOTTOM (MIN)	PROCESSED GRANULAR MATERIAL	DIMENSION Z (MIN)	MAX PERMITTED TRENCH WIDTH
150	100	200	10mm single sized or 14mm to 5mm graded	100	750
225	100	200		100	825
300	100	200		100	925

TABLE 3 – THICKNESS OF COMPRESSIBLE FILL (L)		
nominal internal pipe dia	DIM "X"mm	compressible filler Lmm
< 400	160mm	18mm

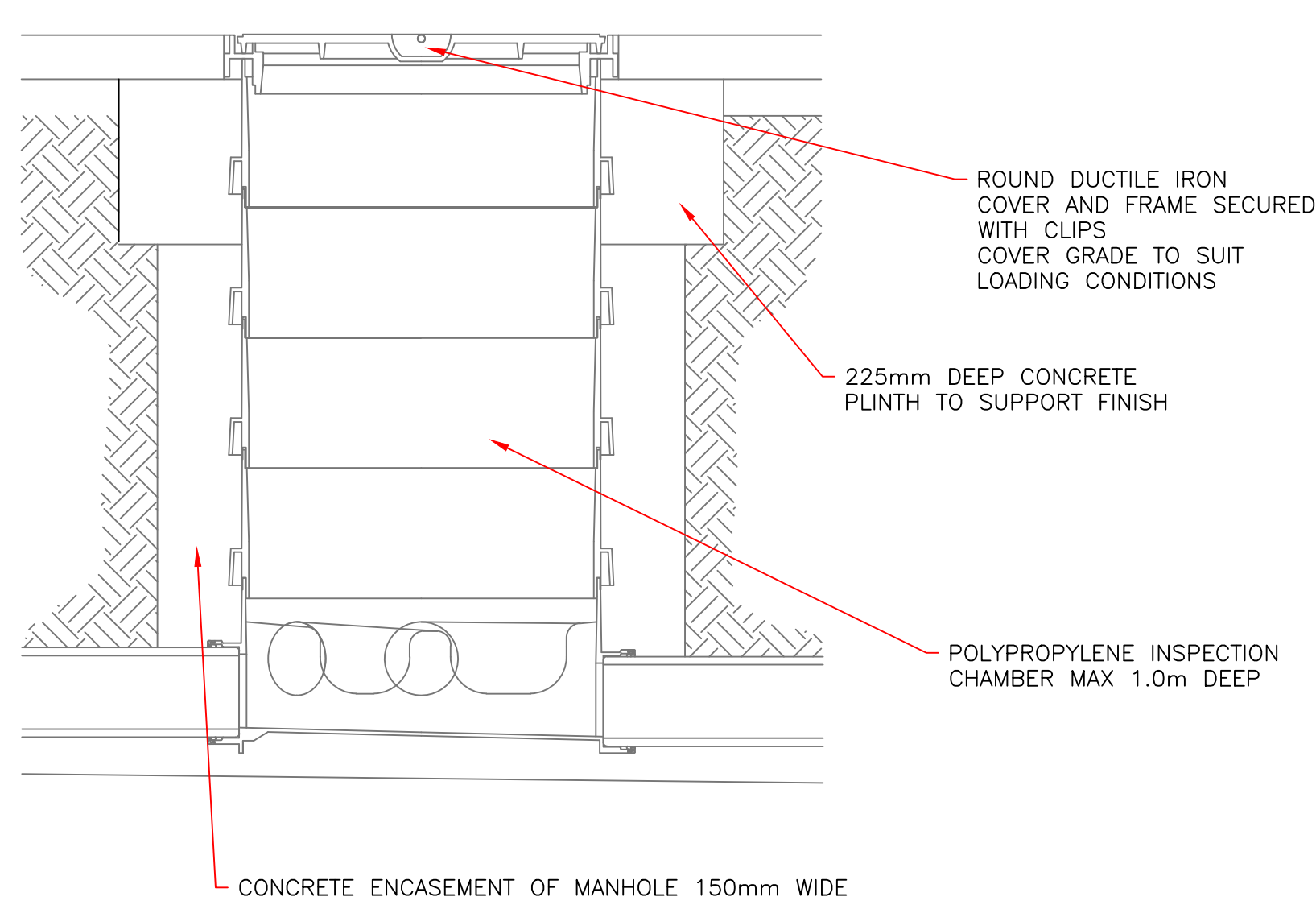


TYPICAL MANHOLE DETAIL - TYPE A

DEPTH TO PIPE SOFFIT < 1.5m (Ø100mm TO Ø150mm PIPE SIZE)
TYPICAL DETAIL SHOWN IS FOR TYPE A – RIGID CONSTRUCTION
MANHOLE. OTHER CONSTRUCTION METHODS ARE AVAILABLE AS
PER THE DETAILS IN THE SEWERAGE SECTOR GUIDANCE



GENERAL PLASTIC INSPECTION CHAMBER (NTS)



TYPE D PPIC MANHOLE WITH STANDARD ROUND COVER (NTS)

Lucion

Protecting people and planet

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Fifth Avenue,
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Gateshead
NE11 0NG

PROJECT:

Lidl Lampeter

TITLE:

Typical Drainage Details

CLIENT:

Lidl Great Britain Ltd

PROJECT NUMBER:

119796.642269

SCALE:

1 : 20

ISSUED FOR:

PLANNING

DRAWN:

TLB

CHECKED:

LB

DATE:

19/03/2025

REVISION:

A