

ADVISORY

Richborough
Land at Pendle Road
Clitheroe
Sustainable Drainage Statement

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Sustainable Drainage Statement

Birmingham
Livery Place, 35 Livery Street, Colmore Business District, Birmingham, B3 2PB
T: 0121 233 3322

Leeds
Whitehall Waterfront, 2 Riverside Way, Leeds
LS1 4EH
T: 0113 233 8000

London
11 Borough High Street
London, SE1 9SE
T: 0207 407 3879

Manchester
11 Portland Street, Manchester, M1 3HU
0161 233 4260

Nottingham
Waterfront House, Station Street, Nottingham NG2 3DQ
T: 0115 924 1100

February 2026

DOCUMENT ISSUE RECORD

Document Number:	255496-BWB-ZZ-XX-T-W-0002_SDS
BWB Reference:	255496_SDS

Revision	Date of Issue	Status	Author:	Checked:	Approved:
P01	15/12/2025	S2	Ariya Shademani BEng (Hons)	Rowan Jobling BEng (Hons)	Graham Littlewood BEng (Hons)
P02	16/12/2025	S2	Rowan Jobling BEng (Hons)	Rowan Jobling BEng (Hons)	Rowan Jobling BEng (Hons)
P03	18/02/2026	S2	Ariya Shademani BEng (Hons)	Rowan Jobling BEng (Hons)	Rowan Jobling BEng (Hons)

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1. INTRODUCTION

- 1.1 A Sustainable Drainage Statement (SDS) sets out the principles of drainage design for a development and summarises the reasoning behind the chosen design. This includes consideration of national and local guidance, justification of specific flow rates, volumes of attenuation storage, as well as the appropriate level of treatment to be provided to surface water runoff.
- 1.2 This SDS has been produced by BWB Consulting on behalf of Richborough. The proposed scheme comprises an outline planning application for the erection of up to 200 dwellings with associated landscaping, children's play areas, sustainable urban drainage, and other infrastructure with all matters reserved except access. Access will be made from Pendle Road to the south. An Illustrative Development Framework Plan is available as **Appendix 1**.
- 1.3 A Flood Risk Assessment has been produced for the site (reference: 255496-BWB-ZZ-XX-T-W-0001_FRA) and this SDS accompanies this overarching document.
- 1.4 This SDS is intended to support an outline planning application and as such, the level of detail included is commensurate and subject to the nature of the proposal.
- 1.5 This revision (P03) of the SDS has been prepared in response to the Lead Local Flood Authority's (LLFA's) planning consultee comments on 22/01/2026 (ref: 3/2025/1006).
- 1.6 Section 3 of the report has been updated to address the LLFA's comments.
- 1.7 A site summary is provided within **Table 1.1**, with the location of the site illustrated within **Figure 1.1**.

Table 1.1: Site Summary

Site Name	Land at Pendle Road
Location	Clitheroe
Easting & Northing	375344, 441089
Application Site Area (ha)	8.92 (approx.)
Development Area, including SuDS Footprint (ha)	5.46 (approx.) (refer to section 3 for breakdown of areas)
Development Type	Residential
Lead Local Flood Authority	Lancashire County Council
Sewerage Undertaker	United Utilities

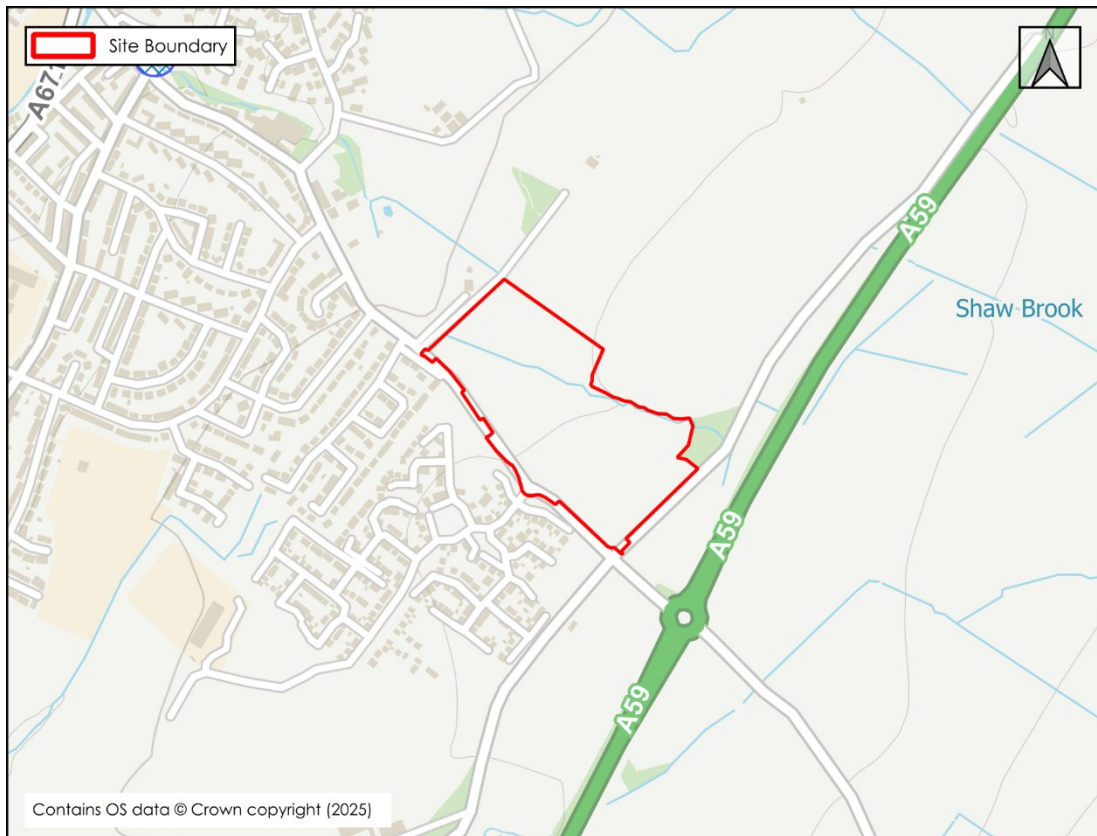


Figure 1.1: Site Location

Sustainable Drainage Guidance

- 1.8 Sustainable Drainage Systems (SuDS) aim to reduce the impact of development by replicating the natural runoff regime in a sustainable manner whilst protecting water quality and reducing pollution. The four key objectives of SuDS design are to achieve improvements in water quantity, water quality, amenity provision and biodiversity.
- 1.9 Lancashire County Council in their role as LLFA have published a 'Lancashire Sustainable Drainage Systems (SuDS)- Pro-forma'¹ which sets out their requirements for the design and assessment of surface water drainage for new development. The guidance notes:
- For greenfield development sites, the peak surface water runoff rate from the development must never exceed the equivalent peak greenfield runoff rate for both the 1 in 1 year and 1 in 100 year rainfall events.
 - Contributing drainage area used in design calculations must include all areas that drain into the proposed drainage system, whether permeable or impermeable. The same contributing area must be applied consistently throughout the drainage modelling process.
 - A 10% allowance for urban creep is required as part of the surface water drainage proposals for new developments.

¹ Lancashire Sustainable Drainage Systems (SuDS) Pro-forma (Lancashire County Council, 2022)

- A Cv (Volumetric Run-off Coefficient) value of 1 should be used within the drainage design where only the impermeable area is collected within the surface water system.
- SuDS should be considered within a management train approach utilising source control, appropriate above ground conveyance and strategic, multi-functional attenuation.
- An 8m easement is required from the top of bank of any watercourse.

1.10 The proforma has been completed and is attached as **Appendix 2**.

1.11 Predicted future changes in peak rainfall intensity caused by climate change are provided by the Environment Agency (EA). Table 2 from the EA's 'Flood risk assessments: climate change allowances'² included as shows the anticipated changes in peak rainfall intensity.

Table 1.2: Ribble Management Catchment Peak Rainfall Allowances

Ribble Catchment Allowance	Total Potential Change Anticipated for the '2050s' (Lifetime up to 2060)	Total Potential Change Anticipated for the '2070s' (2061 to 2125)
1 in 30 Year Rainfall Event		
Upper End	35%	40%
Central	25%	30%
1 in 100 Year Rainfall Event		
Upper End	40%	50%
Central	25%	35%

1.12 The EA's guidance on peak rainfall intensity climate change allowances states that residential development should be considered to have a minimum lifetime of 100 years. This requires the Central allowance for the '2070s' epoch to be considered, and a 50% climate change allowance will be applied to the calculation for the 1 in 100 years events. It should be noted that the 1 in 30 years event plus 40% climate change events will need to be considered at a detailed design stage.

1.13 The National Standards for Sustainable Drainage Systems³, CIRIA SuDS Manual⁴ and the Sewerage Sector Guidance 'Design and Construction Guidance (DCG)'⁵ have also been used to inform the production of this drainage strategy.

² <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

³ 2025, DEFRA, National Standards for Sustainable Drainage Systems

⁴ The SuDS Manual (C753), CIRIA 2015

⁵ 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") (November 2023)

2. EXISTING CONDITIONS

- 2.1 The existing site comprises greenfield land, currently in use for grazing sheep. A forested area is present in the eastern corner of the site. The site lies to the north of Pendle Road and on the eastern extent of the town of Clitheroe. The southern boundary is formed by Pendle Road with existing residential development located beyond. Access to the site is currently made via Pendle Road. Worston Road forms the eastern boundary, and open agricultural land is located to the north, west and east of the site.
- 2.2 A topographical survey of the site has been undertaken and is included as **Appendix 3**. The survey shows the site generally falls from east to west. Levels in the site fall from a high point of approximately 117.0m AOD at the eastern boundary to a low point of approximately 101.1m AOD in the western corner. The watercourse survey is also included in **Appendix 3**.
- 2.3 United Utilities (UU) have provided a plan of their sewer records within the vicinity of the site. This is included as **Appendix 4**. The records do not identify any public sewers to be located within the site. The nearest public sewers are a 225mm diameter foul and surface water network located in Pendle Road which flows in a westerly direction past the site.
- 2.4 The nearest foul manhole to the site is MH1103 and has a depth to invert of 1.42m. the nearest surface water manhole to the site is MH1101, however invert levels are not recorded.
- 2.5 The Shaw Brook originates to the northeast of the site and flows beneath the A59 via a culvert. The watercourse then follows the edge of the adjacent Worston Road before bisecting and flowing through the site as illustrated in **Figure 2.1**.
- 2.6 British Geological Survey (BGS) mapping shows the site to be underlain bedrock of Clitheroe Limestone Formation and Hodder Mudstone Formation (Undifferentiated). Superficial deposits of Till (Devensian-Diamicton) are expected to be present across the entirety of the site.
- 2.7 Therefore, considering the topography and the underlying ground conditions, the existing drainage regime is thought to predominately consist of limited and localised infiltration followed by surface water runoff to the Shaw Brook.

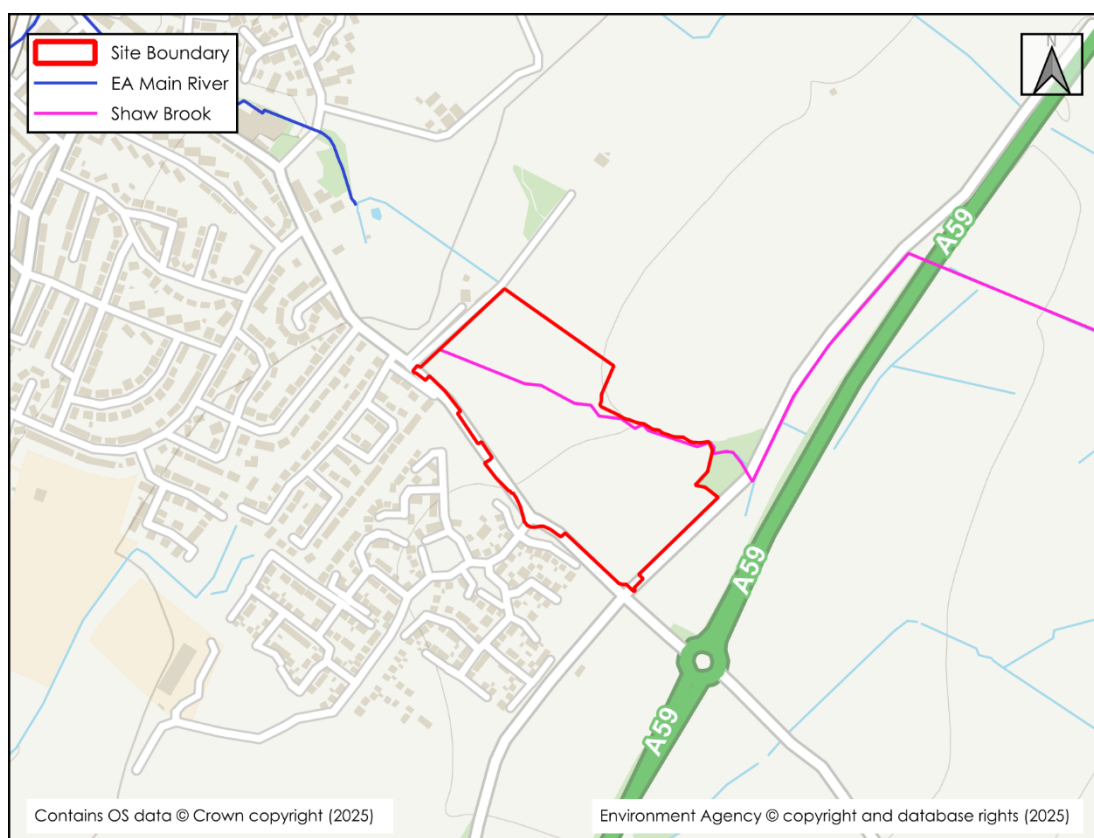


Figure 2.1: Local Watercourse Network

Existing Runoff Rates

- 2.8 An assessment of the existing surface water runoff per hectare has been undertaken and is summarised within **Table 2.1**. Calculations are included within **Appendix 5**.
- 2.9 The runoff rates have been estimated using the IH124 method, with appropriate prorated adjustments for a site of less than 50ha, as recommended in Interim Code of Practice for Sustainable Drainage⁶. This was undertaken HR Wallingford Greenfield Runoff Estimation Tool⁷, which makes the necessary adjustments for small sites automatically.

Table 2.1: Existing Runoff Rate from the Site

Return Period (Yrs.)	Runoff Rate (l/s/ha)
1	8.2
Mean Annual Flow Rate (QBAR)	9.4
30	16.0
100	19.6

⁶ The National SUDS Working Group (2004), Interim Code of Practice for Sustainable Drainage

⁷ <https://www.uksuds.com/tools/greenfield-runoff-rate-estimation>

Existing Runoff Volume

- 2.10 An assessment of the existing surface water runoff volume from the area proposed for development (5.46ha) has been made for a 1 in 100 year, 6 hour storm.
- 2.11 As the existing site is permeable, the runoff volume has been calculated using Causeway 'Flow' to be **1,825m³**, results are included within **Appendix 6**.

3. SURFACE WATER DRAINAGE STRATEGY

3.1 The site has a total area of 8.92ha and an approximate total development area of 5.46ha (comprising of the development parcels and the proposed SuDS basins) has been measured from the proposed Illustrative Development Framework Plan included as **Appendix 1**. The total impermeable area has been estimated to be 4.07ha. The following percentages have been taken to assess the impermeable areas across the development:

- Residential: 65% + 10% urban creep
- Proposed Attenuation Basin: 100%

3.2 The site has been split into three drainage catchments based on the topography, locations of watercourses and development aspirations. The three catchments are hereafter referred to as follows:

- Catchment 1
- Catchment 2
- Catchment 3

3.3 Details of the proposed drainage catchments are provided within **Table 3.1**.

Table 3.1: Catchment Details

Catchment	Development Area (ha)	Total Impermeable Area (ha)	Proposed Outfall Location
Catchment 1	1.36	1.01	Shaw Brook
Catchment 2	1.17	0.90	
Catchment 3	2.93	2.16	
Total	5.46	4.07	

Drainage Hierarchy

- 3.4 The National standards for sustainable drainage systems identifies that surface water runoff from a development should be disposed of as high up the following hierarchy as reasonably practicable:
- i. Collected for non-potable use
 - ii. infiltrated to ground;
 - iii. discharged to an above ground surface water body;
 - iv. discharged to a surface water sewer, or another piped surface water drainage system;
 - v. discharged to a combined sewer.
- 3.5 The aim of this approach is to manage surface water runoff close to where it falls and mimic natural drainage as closely as possible.
- 3.6 Each runoff destination has been considered in order of priority.
- 3.7 At this stage, it is assumed that residential properties would make use of water butts to support non-potable use (e.g garden irrigation). The viability and use of further rainwater harvesting techniques could be considered through detailed design; however, it should be noted that such techniques will not impact on the proposed drainage strategy in terms of the discharge rate and attenuation requirements and hence has not been factored into the overarching strategy.
- 3.8 The site is underlain by mudstone which is unlikely to support an infiltration only drainage solution for the development. Ground Investigation and infiltration testing in accordance with BRE 365 guidance should be undertaken at the site at the detailed design stage to confirm this assumption. It is assumed that open SuDS features would provide residual infiltration, as per the existing greenfield conditions of the site.
- 3.9 The proposed outfall for the developed site is the existing watercourse called the Shaw Brook which cuts through the middle of the site.

Peak Flow Control

- 3.10 In order to comply with the National Standards for Sustainable Drainage Systems, runoff from greenfield developments should not exceed the equivalent greenfield rates.
- 3.11 It is therefore proposed to restrict flows for all events up to the 1 in 100 years plus climate change scenario to the existing greenfield QBAR rate, as summarised within **Table 3.2**.
- 3.12 The rate per hectare should be prorated in accordance with the total developable area. In this instance, the peak runoff rate leaving the site should not exceed 51.3l/s, based on a total developable area of 5.46ha (Developable area + SuDS Basins).

Table 3.2: Existing & Proposed Runoff Rates

Return Period (Yr.)	Existing Runoff Rate (l/s)	Proposed Discharge Rate (l/s)
1	44.8	44.8
QBAR	51.3	51.3
30	87.4	
100	107.0	
100 + 50%	-	

Table 3.3: Proposed Runoff Rates per Catchment

Catchment	Existing QBAR Discharge Rate (l/s)	Proposed Discharge Rate (l/s)
Catchment 1	12.8	12.8
Catchment 2	11.0	11.0
Catchment 3	27.5	27.5
Total	51.3	51.3

- 3.13 This approach fulfils the necessary peak runoff control criteria.

Attenuation Storage

- 3.14 As the development proposals require a restricted runoff rate, it will be necessary to provide attenuation storage to balance the excess volume in a safe manner within the site.
- 3.15 The surface water storage should be located within the site in a position where it can receive runoff from the development and discharge from the site by gravity and also in a position where it is hydraulically isolated from any fluvial floodplain or external surface water floodplain/ overland flow route that may be present in the site.
- 3.16 Sufficient storage for events up to the 1 in 100 years storm with an allowance for climate change should be provided, and a 10% allowance should be applied to the current proposed development area to allow for urban creep over the life time of the development.
- 3.17 After considering the site constraints and development aspirations it is suggested that the necessary surface water storage volume is found within three detention basins with one for each catchment. The detention basins have been proposed between the outfall and the development.
- 3.18 For the purpose of this outline assessment, it has been assumed that the basins will accommodate all the necessary storage, but it may be possible to redistribute a portion of the storage within other drainage components during the detailed design of the development (e.g.: in the pipe network, swales, filter drains, etc).
- 3.19 A simulation has been run using Causeway 'Flow' to identify the necessary storage provision. Using the discharge rate as detailed in **Table 3.3**, the volume of attenuated storage required for the development has been calculated for storm events up to the 100 year + 50% storms. The results are summarised in **Table 3.4** and calculations are included as **Appendix 6**.

Table 3.4: Outline Attenuated Storage Requirements

Catchment	Critical Storm	Maximum Volume (m³)
Catchment 1	600 min Winter	865
Catchment 2	600 min Winter	770
Catchment 3	960 min Winter	1,900
Total	-	3,535

- 3.20 At this outline design stage, it is expected that a minimum of 3,535m³ of attenuated storage will be provided to cater for the maximum anticipated runoff volume for all storm durations up to the 1 in 100 year return period storm, including a 50% climate change allowance and future urban creep.

- 3.21 It is envisaged that the final required attenuated storage volume will be determined during the detailed design stage, once the development layout and drainage areas are fixed.

Runoff Volume Control

- 3.22 The National Standards for Sustainable Drainage Systems states that where reasonably practical the runoff volume from a development for the 1 in 100 year 6 hour rainfall event should not exceed the runoff volume prior to development or redevelopment. Additionally, if practicable on previously developed sites, the runoff volume should not exceed the equivalent greenfield runoff volume. Where it is not reasonably practicable to constrain the volume of runoff from a development at or below the existing volume, then the runoff must be discharged in a manner that does not adversely affect flood risk, i.e.:
- i. The additional runoff volume resulting from the development (the 'long term storage volume') should be discharged separately from the site at a rate of 2l/s/ha or less. Or,
 - ii. All the runoff volume from the development should be discharged at a rate equivalent to the mean annual flow rate (QBAR) rate under greenfield conditions or less. Or,
 - iii. All the runoff volume from the development should be discharged at a rate of 2l/s/ha or less.
- 3.23 The 1 in 100 year 6 hour storm runoff volume from the site will increase as a result of the proposed development. However, as the runoff volume from the development will be discharged at a rate equivalent to the mean annual flow rate (QBAR) rate under greenfield conditions, the volume control criteria will be met, and long term storage is not required.

Sustainable Drainage Systems

- 3.24 An Illustrative Drainage Strategy plan for the proposed development is included as **Appendix 7** (drawing reference: 255496-BWB-ZZ-XX-D-W-0001).
- 3.25 A catchment based approach has been applied which will treat and attenuate runoff close to source. Surface water runoff from each development catchment will be stored within above ground detentions basin which have been designed to be 1.4m deep with a 400mm freeboard and a maximum water depth of 1.0m in the 1 in 100 year + 50% climate change storm.
- 3.26 Surface water will be discharged from the development at a restricted rate, in accordance with the rates provided within **Table 3.3**, into the existing Shaw Brook that cuts through the middle of the site at different points along the reach. Vortex flow control chambers will limit the discharge rate from the basins.
- 3.27 The attenuation basins should be appropriately planted to provide a primary level of treatment through filtration. It is recommended that further levels of treatment are provided in the form of swales, permeable paving, rain gardens, tree pits or similar. It is

envisaged that the treatment stages will be determined during the detailed design stage once the development layout and drainage areas are fixed.

- 3.28 Where possible, the attenuation basins should be landscaped into the development plans to provide amenity and biodiversity benefits. Forebays, low flow channels and variable depths should be designed to enhance the treatment and biodiversity benefits of the basins.
- 3.29 Further levels of treatment could be provided via swales, tree pits, permeable paving and rain gardens located throughout the proposed development which will provide water quality, amenity and biodiversity value. Permeable paving should be considered for private or shared driveways. These features have been proposed in accordance with the proposed site layout, however, their use and location will be subject to detailed design once the scheme layout is fixed.

Management of Everyday Rainfall (Interception)

- 3.30 The National standards for sustainable drainage systems state that a SuDS approach should be applied to intercept the first 5mm of rainfall for the majority of rainfall events.
- 3.31 Infiltration testing has not yet been undertaken. BGS Data indicates that the ground is unlikely to support a full infiltration based drainage strategy. However, some nominal and residual infiltration is anticipated across the site, which will contribute to the infiltration of the first 5mm rainfall volume.
- 3.32 Given the outline nature of the proposals, the detailed layout is not fixed, however, further on plot SuDS features are encouraged in the form swales, tree pits, permeable paving, rain gardens and water butts. These measures will further contribute to the interception of the first 5mm of rainfall.
- 3.33 The detention basins could be designed with their base set approximately 100mm below the outfall invert level. This additional depth would contain the volume generated by the first 5mm of rainfall. The basin base will comprise engineered soil to promote infiltration and water quality treatment of the first flush (5mm), as per the existing greenfield conditions of the site.
- 3.34 This has been modelled and the interception mechanisms have been assessed using Causeway Flow. The calculations in **Appendix 8** demonstrate that no flow reaches the outfall node in the first 5mm of rainfall. This confirms that the interception requirement is achieved within the proposed drainage design.

Residual Risk and Designing for Exceedance

- 3.35 It is recommended that the final layout uses the proposed road infrastructure to provide drainage exceedance (overland flood flow) routes through the development and towards the positively drained areas.
- 3.36 In addition to the volume of storage provided within the main attenuation, there will be capacity within the upstream pipes and manholes which has not been accounted for at this stage and a further level of redundancy to the network will therefore be provided.
- 3.37 A 400mm freeboard has been provided in the 100 year + 50% scenario.
- 3.38 An illustrative swale has been proposed on the development edge of Catchment 2 to capture surface water flows towards the Shaw Brook.
- 3.39 In the event of exceedance or blockage, water would overtop the attenuation and enter Shaw Brook as per the existing scenario.
- 3.40 Exceedance flow route arrows can be seen in the drainage strategy in **Appendix 7**.

Water Quality

- 3.41 In accordance with the SuDS Manual, a simple index approach to water quality risk management should be undertaken for the proposed development. This will be compiled to provide a comprehensive account of the water quality treatment provided by the proposed surface water drainage system.
- 3.42 The SuDS Manual mitigation index will be used to assess the treatment levels proposed in relation to the pollution hazard posed from the proposed land use(s). This methodology is adopted to ensure that surface water flows receive adequate treatment through all areas of the site prior to final outfall.
- 3.43 **Table 3.5** shows the pollution hazard indices for the land use classifications that are relevant to the proposed development, as described within table 26.2 in the SuDS Manual.

Table 3.5: Pollution Hazard Indices for Different Land Use Classifications

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential roofs	Very low	0.2	0.2	0.05
Driveways, residential car parks and low traffic roads	Low	0.5	0.5	0.4

- 3.44 The SuDS mitigation indices that are relevant to the proposed development, as described within table 26.3 of the SuDS Manual, are outlined in **Table 3.6**.

Table 3.6: SuDS Mitigation Indices

Type of SuDS Component	Mitigation Indices		
	TSS	Metals	Hydrocarbons
Detention Basin	0.5	0.5	0.6

- 3.45 The pollution hazard rating and proposed SuDS mitigation index for each drainage Catchment is compared within **Table 3.7**. Where more than one SuDS component is proposed, a factor of 0.5 has been applied to the downstream (i.e., secondary and/or tertiary) treatment stages to account for the reduced performance due to reduced inflow concentrations.

Table 3.7: Comparison of Pollution Hazard Rating against Proposed Mitigation Index

Pollution Type	Pollution Hazard Rating*	Proposed Mitigation Index	Sufficient Treatment Provided?
All Catchments – Detention Basin			
TSS	0.5	0.5	✓
Metals	0.5	0.5	✓
Hydrocarbons	0.4	0.6	✓

- 3.46 Based on the above assessment, the proposed drainage strategy is considered to provide an appropriate level of treatment to surface water prior to discharge from the site. The use of additional source control features will provide further treatment, thus providing some redundancy in terms of water quality across the drainage network.

4. MAINTENANCE

- 4.1 The drainage network should be constructed in accordance with the Design and Construction Guidance⁸ and be offered up for adoption to United Utilities. If any parts of the drainage network remain unadopted, or until the point that they are, an appropriate maintenance company should be appointed. Any drainage features within the private curtilage will be the responsibility of the homeowner.
- 4.2 Requirements for ongoing maintenance of the drainage network should form part of the Operation and Maintenance manual for the site and should be undertaken by the site management. Any specialist or proprietary products that are specified at detailed design should have a manufacturer specific maintenance regime which should be included within the document.
- 4.3 It is envisaged that the Operation and Maintenance manual will be developed at the detailed design stage, but some examples are included below.
- 4.4 The SuDS Manual maintenance schedule for detention basins is shown in **Table 4.1**.
- 4.5 The SuDS Manual maintenance schedule for swales is shown in **Table 4.2**.

⁸ Design and Construction Guidance (May 2021)

Table 4.1: The SuDS Manual Typical Maintenance Schedule for Detention Basins

Maintenance Schedule	Typical Frequency	Required Action
Regular Maintenance	Monthly	- Remove litter and debris. - Inspect inlets, outlets and overflows for blockages, and clear if required; and - Inspect banksides, structures, pipework etc for evidence of physical damage.
	Monthly (during growing season, or as required)	Cut grass – for spillways and access routes.
	Monthly for first year, then annually or as required	Inspect inlets and facility surface for silt accumulation. Establish appropriate silt removal frequencies.
	Monthly at start, then as required	Manage other vegetation and remove nuisance plants.
	Half yearly (spring – before nesting season, and autumn)	Cut grass – meadow grass in and around basin.
	Annually	- Check any penstocks and other mechanical devices. - Tidy all dead growth before start of growing season; and - Manage wetland plants in outlet pool – where provided.
	Annually or as required	Remove sediment from inlets, outlet and forebay.
Occasional Maintenance	As required	Reseed areas of poor vegetation growth.
	Every 2 years, or as required	Prune and trim any trees and remove cuttings.
	Every 5 years, or as required	Remove sediment from inlets, outlets, forebay and main basin when required.
Remedial Action	As required	- Repair/rehabilitation of inlets, outlets and overflows; and - Relevel uneven surfaces and reinstate design levels.

Table 4.2: The SuDS Manual Typical Maintenance Schedule for Swales

Maintenance Schedule	Typical Frequency	Required Action
Regular Maintenance	Monthly	Inspect inlets, outlets and overflows for blockages, and clear if required.
	Monthly (or as required)	- Remove litter and debris; and - Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for > 48 hours.
	Monthly (during growing season), or as required	Cut grass – to retain grass height within specified design range.
	Monthly for first year then as required	Manage other vegetation and remove nuisance plants.
	Monthly for 6 months, quarterly for 2 years, then half yearly	Inspect vegetation coverage.
	Half yearly	Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies.
Occasional Maintenance	As required or if bare soil is exposed over > 10% of the swale treatment area	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required.
Remedial Action	As required	- Repair erosion or other damage by re turfing or reseeded. - Relevel uneven surfaces and reinstate design levels. - Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface. - Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip; and - Remove and dispose of oils or petrol residues using safe standard practices.

5. FOUL WATER DRAINAGE

- 5.1 As the existing site is currently undeveloped, a new foul water outfall will be required. It is proposed to drain foul water separately from surface water.
- 5.2 Given the levels of the site and location of the nearest potential receiving public foul sewer, a sewerage pumping station will be required to convey the foul water to a public sewer.
- 5.3 A pre-development enquiry has been sent to United Utilities for a preferred connection point; however, a response is yet to be received.
- 5.4 The location of the sewers are shown on UU asset records provided in **Appendix 4**. The drainage strategy proposes a new manhole connection upstream of Manhole 1201 within Pendle Road, to the west of the site.
- 5.5 The sewerage pumping station should be designed in accordance with the Design and Construction Guidance. It is expected that a Type 3 pumping station will be required, this includes a 15m offset from the centre of the wet well to any habitable dwellings or third party land.
- 5.6 The proposed foul connection points, including the proposed pumping station and associated rising main, are illustrated in the illustrative drainage strategy in **Appendix 7**.

6. SUMMARY

- 6.1 This statement and supporting appendices demonstrate that the drainage design for the development will comply with the relevant local and national standards, specifically the hierarchy of discharge, runoff rate and volume criterion.
- 6.2 This SDS is intended to support an outline planning application and as such the level of detail included is commensurate and subject to the nature of the proposals.

Table 6.1: Sustainable Drainage Statement Summary

		Existing Site	Proposed Development
Site Area (Ha)		8.92	
Impermeable Area (Ha)		-	4.07
Outfall Location		Watercourse	Watercourse
Peak Runoff Rate (l/s)	QBAR	51.3	51.3
	1 in 30 Year	87.4	
	1 in 100 Year	107.0	
	1 in 100 Year + CC	-	
Volume Control		-	Discharge rate limited to QBAR
Proposed Storage Volume		-	3,535m ³
Flow Control Type		-	Vortex Flow Control
SuDS Features		-	Detention Basins Swales
Maintenance Responsibility		-	Management Company/Sewerage Company/ Home Owners

- 6.3 It is envisaged that the final drainage strategy will be determined during the detailed design stage, as the development layout is finalised.

APPENDICES

Appendix 1: Illustrative Development Plan



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KEY

- SITE BOUNDARY
- SITE ACCESS VIA PENDLE ROAD
- RESIDENTIAL DEVELOPMENT
- PUBLIC OPEN SPACE
- PRIMARY STREET
- SECONDARY STREET
- TERTIARY STREET
- PRIVATE LANES
- ACTIVE TRAVEL ROUTES
- EXISTING PUBLIC RIGHTS OF WAY
- PEDESTRIAN ACCESS POINT TO WIDER MOVEMENT INFRASTRUCTURE
- EMERGENCY VEHICLE, PEDESTRIAN, AND CYCLIST ACCESS
- PLAY SPACES
- EXISTING VEGETATION
- TREE PLANTING
- SUSTAINABLE DRAINAGE
- EXISTING WATERCOURSE

KEY PRINCIPLES

- PRIMARY ACCESS POINT VIA PENDLE ROAD;
- PRIMARY MOVEMENT ROUTES;
- SECONDARY STREET;
- TERTIARY STREET;
- FOCAL SQUARES ALONG PRIMARY AND SECONDARY MOVEMENT ROUTES;
- ACTIVE TRAVEL ROUTES;
- MAXIMUM OUTWARD FACING DEVELOPMENT OVER NEWLY CREATED PUBLIC OPEN SPACE;
- RETAINED WATERCOURSE ROUTE;
- MAXIMUM RETENTION OF EXISTING VEGETATION;
- AREA OF PLAY;
- RETAINED CONTEXTUAL VIEWS THROUGH SITE;
- DEVELOPMENT SET BACK TO RETAIN VIEWS OF THE PENDLE HILL; AND
- SITE LOW POINTS UTILISED FOR SUSTAINABLE DRAINAGE SOLUTIONS.

PENDLE ROAD, CLITHEROE – ILLUSTRATIVE DEVELOPMENT FRAMEWORK PLAN

Appendix 2: LLFA Proforma

Lancashire County Council

Sustainable Drainage Systems (SuDS)

Pro-Forma

This Pro-forma is endorsed by the North West Regional Flood and Coastal Committee (RFCC), including representatives from Lancashire County Council, as the Lead Local Flood Authority and Highway Authority, and by United Utilities and the Environment Agency

When to use this pro-forma

The pro-forma may be a requirement of Local Planning Policy or the planning validation checklist for any planning application for major development.

The Lead Local Flood Authority expect the pro-forma to be submitted with all planning applications for major development with surface water drainage.

It supports applicants in summarising and confirming how surface water from a development will be managed sustainably under current and future conditions.

Your Local Planning Authority may have their own version of the pro-forma within policy, supplementary planning documents or validation checklists. Where such lists include alternative or additional requirements, both sets should be adhered to.

Your sustainable drainage system should be designed in accordance with [CIRIA The SuDS Manual C753](#) and any necessary adoption standards.

How to complete the pro-forma

Blue Box	Instructs or asks you to provide information
Grey Box	States the evidence required which you will need to submit
White Box	These are the boxes the applicant needs to complete in full

1. Complete ALL white boxes

2. Submit this pro-forma to the Local Planning Authority, along with:

- Sustainable Drainage Strategy
- Site Specific Flood Risk Assessment (if required)
- Minimum supporting evidence, as indicated in grey boxes of this pro-forma.

Guidance to support you

The pro-forma should be completed in conjunction with 'Completing your SuDS Pro Forma Guide', found on our website.

The pro-forma can be completed using freely available tools such as [Tools for Sustainable Drainage Systems](#) or appropriate industry standard surface water management design software.



Section 1. Your Application and Development Details

a) Planning Application

Planning Application Reference <i>(if available)</i>	Click or tap here to enter text.
Select the type of planning application you will be submitting	Pre-application ☐ Outline ☒ Full ☐ Hybrid ☐ Reserved matters ☐

b) Development Site

Developer(s) Name	Richborough	
Consultant(s) Name	BWB Consulting Ltd	
Development Address <i>(including postcode)</i>	BB7 1LN, Pendle Road, Clitheroe, Pendleton	
Development Grid Reference <i>(Eastings/Northings)</i>	375276 , 441183	
Total Development Site Area (Ha)	8.9	
Contributing Area (Ha) of Development <i>Note: Consideration should be given to manage surface water from both impermeable and permeable surfaces (including gardens and verges) likely to enter the drainage system.</i>	5.46	

Development Type		State Proposed Number of Units
Greenfield Site <i>Site is wholly undeveloped, and a new drainage system will be installed</i>	☒	200
Previously Developed / Brownfield Site <i>Site is already developed, and the <u>entirety</u> of the existing surface water drainage system will be used to serve the new development (evidence must be provided to prove existing surface water drainage system is reusable)</i>	☐	Click or tap here to enter text.

c) Details about Flood Risk and Sustainable Drainage Design

Please indicate the flood zone that your development is in. Select all that apply. <i>Based on the Flood Map for Planning and the relevant Local Authority Strategic Flood Risk Assessment (to identify Flood Zones 3a/3b).</i>	Flood Zone 1 ☒ Flood Zone 2 ☒ Flood Zone 3a ☒ Flood Zone 3b ☐
What is the surface water risk of the site? Select all that apply. <i>Based on the Risk of Surface Water Flooding Map.</i>	High ☒ Medium ☒ Low ☒ Very Low ☐



Have you submitted a Site-Specific Flood Risk Assessment (FRA)? <i>See separate guidance notes for clarification on when a FRA is required</i>	Yes ☒ No ☐
Have you submitted a Sustainable Drainage Strategy?	Yes ☒ No ☐
Select the minimum expected lifetime of development (years) <i>Refer to Planning Practice Guidance 'Flood Risk and Coastal Change' Paragraph 006</i>	100 years ☒ 75 years ☐ Other ☐

d) Multi-functional Benefits and Natural Flood Management

Select the benefits your sustainable drainage proposal will provide	Water quantity ☒ Water quality ☒ Amenity ☒ Biodiversity ☒
Summarise how your sustainable drainage system will provide the above benefits	Detention basins should be appropriately planted and designed with forebays, low flow channels to enhance the treatment and bio diversity benefits.

Does your sustainable drainage proposal provide multi-functional benefits via SuDS? <i>Refer to Paragraphs 055 and 059 of the Planning Practice Guidance</i>	Yes ☒ No ☐
Does your sustainable drainage proposal include measures to reduce the causes and impacts of flooding? <i>Refer to Paragraphs 059 and 063 of the Planning Practice Guidance</i>	Yes ☒ No ☐
Has the proposed sustainable drainage system been integrated with other aspects of the development such as open space or green infrastructure?	Yes ☒ No ☐

Do you propose to use natural flood management opportunities on your development? Select all that apply. <i>Refer to Paragraph 067 of the Planning Practice Guidance</i>	On-site ☐ Off-site ☐ No ☒
Have you assessed the impact of the proposed natural flood management within the site-specific flood risk assessment?	Yes ☒ No ☐ N/A ☐



Section 2: Impermeable Area and Existing Drainage

	Existing (E)	Proposed (P)	Change (P – E)
State Impermeable Area (Ha)	0	4.04	4.04
Evidence Required: Plans showing development layout, with existing and proposed impermeable areas.			☒

Are there existing sewers, watercourses, water bodies, flow paths, highway drains, soakaways, filter drains and/or other drainage features on the site?	Yes ☒ No ☐ Don't know ☐
Evidence Required: Plan(s) showing the existing site layout, to include all: - Natural catchments - Watercourses, both open and culverted - Water bodies – e.g. ponds, swales, wetlands etc. - Overland flow routes - Areas at risk of flooding from any source - Infiltration features – e.g. soakaways, filter drains, areas of sand/gravel etc. - Sewers, manholes and outfall locations (where known) - Highway drains, manholes and gullies (where known) Plans should be appropriately labelled with pipe sizes, dimensions and design levels	☒

Drainage Design

Outline planning applications should be able to demonstrate that a suitable drainage system is achievable.

All other type of planning application should provide full details or reference to previous planning application where drainage details have been submitted or approved.

Select which design approach you are taking to manage water quantity (refer to Section 3.3 of The SuDS Manual C753)

Approach 1 – Volume control / Long Term Storage (Technical Standards S2/3, S4/5)

- The attenuated runoff volume for the 1 in 100 year 6 hour event (plus climate change allowance) is limited to the greenfield runoff volume for the 1 in 100 year 6 hour event, with any additional runoff volume utilising long term storage and either infiltrated or released at 2 l/s/ha or less
- The discharge rate for the critical duration 1 in 1 year event is restricted to the 1 in 1 year greenfield runoff rate
- The discharge rate for the critical duration 1 in 100 year event (plus climate change allowance) is restricted to the 1 in 100 year greenfield runoff rate

☐

Approach 2 – Qbar (Technical Standards S6)

- Justification has been provided that the provision of volume control/long term storage is not appropriate and an attenuation only approach is proposed. All events up to the

☒

critical duration 1 in 100 year event (plus climate change allowance) are limited to Q_{bar} (1 in 2 year greenfield rate) or 2 l/s/ha, whichever is the greater.		
Select the hydraulic method used in your calculations <i>Refer to Table 24.1 of The SuDS Manual</i>	FEH ReFH2 ☐ FEH Statistical Method ☒ Other (please state) ☐ Click or tap here to enter text.	
Evidence Required: Plan(s) showing: - Existing flow routes, catchments, and flood risks - Modified flow routes, catchments, and flood risks - Contributing and impermeable areas - Current (if any) and proposed 'source control' and 'management train' locations of sustainable drainage components (C753 Chapter 7) - Details of drainage ownership - Details of exceedance routes (Technical Standards S9) - Topographic survey - Locations and number of existing and proposed discharge points Note: Consideration should be given to manage surface water from both impermeable and permeable surfaces (including gardens and verges) likely to enter the drainage system.		☒

Section 3: Peak Runoff RATES

Technical Standards S2, S3 and S6 (unless S1 applies)

Rainfall Event	Existing Rate (l/s)	Greenfield Rate (l/s)	Proposed Rate (l/s)
Qbar (Approach 2)	Click or tap here to enter text.	51.3	51.3
1 in 1 Year Event (Approach 1)	Click or tap here to enter text.	44.8	Click or tap here to enter text.
1 in 30 Year Event	Click or tap here to enter text.	87.4	51.3
1 in 100 Year Event* (Approach 1)	Click or tap here to enter text.	107.0	51.3
* Total discharge at the 1 in 100 year rate should be restricted to the greenfield runoff volume for the 1 in 100 Year 6 hour event with additional volumes (long-term storage volume) released at a rate no greater than 2 l/s/ha where infiltration is not possible. Climate change allowance should only be applied to the proposed rate and not the existing or greenfield rate.			
Evidence Required: Methodology used to calculate peak runoff rate clearly stated and justified. Impermeable areas plan, supported by topographical survey confirming positive drainage. Hydraulic calculations and details of software used.			☒ ☒ ☒

Section 4: Discharge VOLUME

Technical Standards S4, S5 and S6 (unless S1 applies)

Rainfall Event	Existing Volume (m³)	Greenfield Volume (m³)	Proposed Volume (m³)
1 in 100 Year 6 Hour Event (Approach 1)	1,825	1,825	3,101
Does the below statement apply to your development proposal? Long term storage is not achievable on this site and, in accordance with S6 of the Non Statutory Technical Standards for SuDS, the surface water discharge rates for events up to and including the 1 in 100 year critical event are limited to Qbar (Approach 2)			Yes ☒ No ☐
Evidence Required: Approach to managing the quantity of surface water leaving the site clearly stated and justified Methodology used to calculate discharge volume clearly stated and justified. Hydraulic calculations and details of software used.			☒ ☒ ☒



Section 5: Storage

Technical Standards S7 and S8

State climate change allowance used (%) <i>Allowances must be applied when designing SuDS for both the 3.3% (1 in 30-year) and 1% (1 in 100-year) annual exceedance probability events</i>	3.3% AEP	40
	1% AEP	50
Have you applied a 10% urban creep allowance in accordance with British Standard BS 8582 / 2013.	Yes ☒ No ☐ N/A ☐	
Evidence Required: State / used in appropriate industry standard surface water management design software.	☒	

State storage volume required (m³) (excluding non-void spaces) <i>Must include an allowance for climate change and urban creep. Must be consistent with the contributing area used to calculate the runoff rates and volumes.</i>	3,240
Have you incorporated interception into your design? <i>(Refer to Chapter 24 of The SuDS Manual C753)</i> <i>Where possible, infiltration or other techniques are to be used to try and achieve zero discharge to receiving waters for rainfall depths up to 5mm.</i>	Yes ☒ No ☐
Evidence Required: Drainage plans showing location of attenuation and all flow control devices and supporting calculations.	☒

Summarise how storage will be provided for the 1 in 30 year event on site (plus climate change and urban creep allowances). <i>Storage must be designed to ensure that no flooding occurs onsite in a 1 in 30 year event (plus climate change and urban creep allowances) except in areas designated to hold and/or convey water as part of the design <u>and</u> no flooding occurs offsite in a 1 in 100 year (plus climate change and urban creep allowances) event.</i>	Same as below
Summarise how storage will be provided for the 1 in 100 year event on site (plus climate change and urban creep allowances). <i>Where storage above the 1 in 30 year event (plus climate change and urban creep allowances) is provided in designated areas designed to accommodate excess surface water volumes, plans showing storage locations and surface water depths and supported by calculations used in appropriate industry standard surface water management design software. It is important to run a range of duration events to ensure the worst case condition is found for each drainage element on the site</i>	Surface water will be captured via gullies and conveyed to the detention basins. 3 detention basins will attenuate water and discharge at the equivalent 1 in 100 year greenfield run off rate



Evidence Required:

Plans showing size and location of storage and supporting calculations.
Where there is controlled flooding, extents and depths must be indicated.



Section 6: Water Quality Protection

Contaminated surface water run-off can have negative impacts on the quality of receiving water bodies. The potential level of contamination will influence final the design of an appropriate treatment train as part of your sustainable drainage system.

Is the proposal site known to be or potentially contaminated?

Yes ☐

No ☒

If the site is contaminated, it should be demonstrated that the sustainable drainage system will not increase the risk of pollution to controlled waters through the mobilisation of contaminants and/or creation of new pollution pathways.

Confirm the *Pollution Hazard Level* of the proposed development - Select ALL that apply

Refer to Pollution Hazard Indices for different Land Use Classifications in Table 26.2 of The SuDS Manual C753 for further guidance.

Pollution Hazard Level <i>Tick <u>ALL</u> that apply</i>		Surface water run-off from the proposed development will drain from:
VERY LOW	☒	Residential roofs
LOW	☒	- Other roofs (typically commercial/industrial roofs) - Individual property driveways, residential car parks, low traffic roads (e.g. cul de sacs, home-zones and general access roads) - Non-residential car parking with infrequent change (e.g. schools, offices) i.e. < 300 traffic movements/day
MEDIUM	☐	- Commercial yard and delivery areas - Non-residential car parking with frequent change (e.g. hospitals, retail) - All roads except low traffic roads and trunk roads/motorways¹
HIGH	☐	- Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites) - Sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured - Industrial sites - Trunk roads and motorways¹

If the development's Pollution Hazard Level is 'Very Low' or 'Low', has the sustainable drainage design been risk assessed and appropriate mitigation measures included?

Yes ☒

No ☐

If the proposed development has a very low or low polluting potential, you should design your sustainable drainage system to include an appropriate treatment train in accordance with The SuDS Manual C753

If the development's Pollution Hazard Level is 'Medium' or 'High', is the application supported by a detailed water quality risk assessment?

Yes ☐

No ☐

¹ Motorways and trunk roads should follow the guidance and risk assessment process set out in Highways Agency (2009).



		N/A ☒
<i>If the proposed development has a high polluting potential, a detailed risk assessment <u>will</u> be required to identify an appropriate SuDS treatment train and ensure compliance with Paragraph 180 of the National Planning Policy Framework.</i> <i>If the proposed development has a medium polluting potential, a detailed risk assessment <u>may</u> be required depending on the nature, scale and location of the development.</i>		

Has pre-application advice on water quality been obtained from the Environment Agency?		Yes ☐ No ☒
If YES, please provide details:	Click or tap here to enter text.	

Section 7: Details of your sustainable drainage system

a) Function of your Sustainable Drainage System

Do your proposals store rainwater for later use (as a resource) using rainwater harvesting?	Yes ☐ No ☒
Evidence Required: Please provide a brief sentence in the adjacent white box to describe how this function has been achieved.	Click or tap here to enter text.

Do your proposals promote source control to manage rainfall close to where it falls? e.g. promoting natural losses through soakage, infiltration and evapotranspiration	Yes ☒ No ☐
Evidence Required: Please provide a brief sentence in the adjacent white box to describe how this function has been achieved.	A swale has been provided to aid in interception. It is proposed that further SuDS are incorporated within detailed design.

b) Hierarchy of Drainage Options – Planning Practice Guidance

Method of discharge are set out in order of priority. Generally, the aim should be to discharge surface run off as high up the following hierarchy of drainage options as reasonably practicable, using as many options as possible as high up the hierarchy as you can.

i) Into the ground (infiltration)

Proposed method of surface water discharge		Is this proposed?	
Hierarchy Level 1: Into the ground (via infiltration)		Yes ☐ No ☒	
For full / reserved matters applications or outline applications where layout is <u>not</u> a reserved matter			
If YES – Evidence Required		If NO – Evidence Required	
☐	On-site ground investigation to demonstrate that the ground <u>is</u> free draining. Including infiltration test results in accordance with the methodology within BRE 365 (2016)	☐	On-site ground investigation to demonstrate that the ground <u>is not</u> free draining. Including infiltration test results in accordance with the methodology within BRE 365 (2016)
	AND		OR
☐	Completed Infiltration Checklist from The SuDS Manual (C753) Appendix B <i>An editable version of this form is available on Susdrain website.</i>	☐	Evidence to confirm that infiltration to ground would result in a risk of deterioration to ground water quality (e.g. a ground water source protection zone). OR



		☐ Geotechnical advice from a competent person* which determines that infiltration of water to ground would pose an unacceptable risk of geohazards to the site and/or local area. <i>*Note: Competent person may include a Chartered Engineer, Chartered Geologists, Registered Ground Engineering Professionals (RoGEP).</i>
For outline applications where layout is a reserved matter or <u>where an applicant is unable to access a site</u> to conduct site investigations		
If YES – Evidence Required		If NO – Evidence Required
☐ Thorough desk-based ground investigation e.g. a SuDS GeoReport or similar, making the best use of available resources including historical borehole logs and data available from the British Geological Survey AND ☐ 'Plan B' sustainable drainage plan and statement of approach with an alternative discharge method, in case infiltration proposals are proven not feasible upon further site-specific ground investigation e.g. to consider seasonal variations to groundwater.	☒ Thorough desk-based ground investigation e.g. a SuDS GeoReport or similar, making the best use of available resources including historical borehole logs and data available from the British Geological Survey	

ii) To a surface water body

Proposed method of surface water discharge	Is this proposed?
Hierarchy Level 2: To a surface water body (select type) NOTE: Consent from LLFA or Permit from Environment Agency may be required – refer to guidance	Yes ☒ No ☐ N/A ☐ Main River ☐ Ordinary Watercourse ☒ Canal ☐ Other water body ☐
If YES - Evidence Required	If NO – Evidence Required
☒ Surface water body / watercourse survey and report AND ☐ (If the waterbody is off site or privately owned e.g. canal) – evidence of an agreement with the appropriate landowner(s) to connect to the waterbody, OR , for outline applications, a 'plan b' sustainable drainage plan and statement of approach with an alternative discharge point	☐ Plan showing nearby watercourses and waterbodies AND ☐ Statement providing justification in your Sustainable Drainage Strategy Note: Where discharge of any element in the hierarchy is discounted, an applicant should provide justification. If the reasoning for discounting a discharge of surface water to watercourse relates to issues associated



			<i>with third party land or the securing of any other required consent, it may be necessary for the applicant to provide evidence to the local planning authority to support their proposed approach.</i>
--	--	--	---

iii) To a surface water sewer or highway drain

Proposed method of surface water discharge		Is this proposed?	
Hierarchy Level 3: To a surface water sewer or highway drain (<i>select type</i>)		Yes ☐ No ☒ N/A ☐	
		Surface water sewer ☐	
		Highway drain ☐	
If YES - Evidence Required		If NO – Evidence Required	
☐	Written correspondence from the Water and Sewerage Company / Highway Authority regarding proposed connection.	☐	Plan showing nearby sewers and highway drains
	AND		AND
☐	(<i>If the sewer is off site</i>) – evidence of an agreement with the appropriate landowner(s) to connect to the sewer, OR , for outline applications, a 'plan b' sustainable drainage plan and statement of approach with an alternative discharge point	☐	Statement providing justification in your Sustainable Drainage Strategy

vi) To a Combined Sewer

Proposed method of surface water discharge		Is this proposed?	
Hierarchy Level 4: To combined sewer		Yes ☐ No ☒ N/A ☐	
If YES - Evidence Required		If NO – Evidence Required	
☐	Written correspondence from the Water and Sewerage Company	N/A	
	AND		
☐	(<i>If the sewer is off site</i>) – evidence of an agreement with the appropriate landowner(s) to connect to the sewer		



c) Proposed SuDS Component Types

	Tick ALL that apply					
Within property boundary	☐ Rainwater harvesting	☐ Green/ blue roofs	☒ Pervious pavements [Type: A ☐ B ☐ C ☐	☐ Soakaway	☐ Bio retention systems	☐ Water Butt

	Tick ALL that apply				
Within development site boundary (not property)	☐ Wetlands	☐ Infiltration basins	☐ Rain gardens	☐ Bio retention system	☒ Detention basins
	☐ Retention ponds	☒ Swales	☐ Filter strips, channels and rills	☐ Infiltration trenches	☐ Other (state below)
	If 'Other' please state: Further SuDS features to be investigated in detailed design				

Off site (not within the boundary of the proposed development)	Please state: Click or tap here to enter text.
--	--

I confirm that the above selected components have been designed in accordance with The SuDS Manual (C753).	I confirm ☒
I confirm that the management of flows resulting from rainfall in excess of a 1 in 100 year (plus climate change and urban creep allowances) rainfall event, and their exceedance route(s), has been fully considered in order to minimise the risks to people, property (new and existing) and infrastructure.	I confirm ☒



Maintenance and Management Arrangements	Information Provided?
Evidence Required: Evidence of formal agreement with the party responsible for undertaking maintenance. Please select any of the adopting bodies that you will be offering your sustainable drainage components for adoption. Tick all that apply. ☒ Water and Sewerage Company Section 104 agreement (Water Industry Act 1991) ☐ Highway Authority Section 278/38 agreement (Highways Act 1980) ☐ Local Authority Public Open Space [Refer to Local Authority Policy] Please select the arrangement(s) for all non-adopted sustainable drainage components. Tick all that apply. ☒ Management Company ☐ Property Owner (for SuDS components within property boundary only) ☐ Other (please state) Click or tap here to enter text.	Yes ☒ No ☐ ☒

Your Evidence

Please list any relevant documents and or drawing numbers (including revision reference) to support your answers in this pro-forma.

Sustainable Drainage Statement: 255496-BWB-ZZ-XX-T-W-0002_SDS

Flood Risk Assessment: 255496-BWB-ZZ-XX-T-W-0001_FRA

Drainage Strategy: 255469-BWB-ZZ-XX-D-NBS-0001

Illustrative drainage strategy (also as Appendix 7 in the SDS): 255496-BWB-ZZ-XX-D-W-0001



Declaration and Submission

This pro-forma has been completed using evidence from information which has been submitted with the planning application.

The information submitted in the Sustainable Drainage Strategy and site-specific Flood Risk Assessment (FRA), where submitted, is proportionate to the site conditions, flood risks and magnitude of development and I agree that this information can be used as evidence to this sustainable drainage approach.

Submitter Details

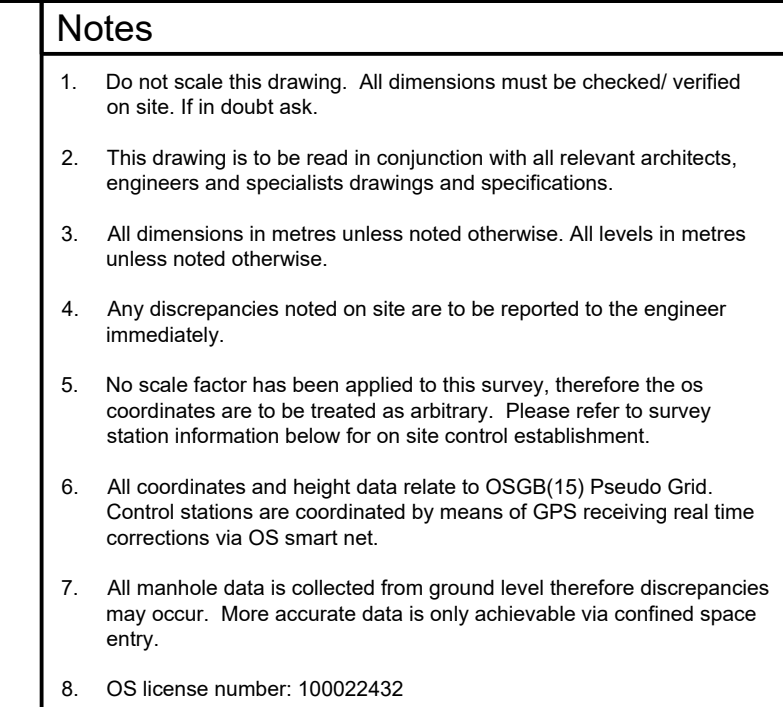
<u>Completed by</u>	Ariya Shademani		
<u>Authorised by</u>	Rowan Jobling		
Date (dd/mm/yyyy)	15/12/2025	Company Name	BWB Consulting Ltd

Client Details

Name	Harry Jackson	Company Name	Richborough
-------------	---------------	---------------------	-------------



Appendix 3: Topographical Survey



OS Buildings		Contour Lines	
Surveyed Buildings Building ± 0.20 Top of Wall Top of Channel Line Bottom of Bank Bottom of Channel Line Marking		Intersection Chamber Water and pipe diagram Station and Name Time / Bush / Sipping Area of Vegetation / Extent of Tree Canopy Hedge Body of Water	
Centine Line Watercourse Bar Barrier 50.00 Gate Overhead Powerline Overhead Utilities		Body of Water from OS Spot Level Assumed Surface Water Drainage Line Surface Water Drainage Line	
CC/Security Camera Back Gate Drainage Down Pipe Gate Electric Fire Earth Road FL		LB MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR MR	

P1	21.08.25	First Issue	BH	PQ
Rev	Date	Details of issue / revision	Drw	Rev

BWB
A CAF GROUP COMPANY

☐ Birmingham | 0121 233 3322
☐ Leeds | 0113 233 8000
☐ London | 020 7407 3879
☐ Manchester | 0161 233 4260
☒ Nottingham | 0115 924 1100

www.bwbconsulting.com

Richborough Estates Ltd

**Land at Pendle Road,
Clitheroe**

Existing Site Plan
Sheet 1 of 3

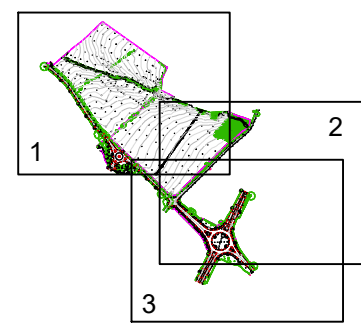
For Information		
Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
255496-BWB-01-ZZ-DR-G-0001	S2	P1



Notes

1. Do not scale this drawing. All dimensions must be checked/verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.
5. No scale factor has been applied to this survey, therefore the coordinates are to be treated as arbitrary. Please refer to survey station information below for on site control establishment.
6. All coordinates and height data relate to OSGB16/19 Newlyn Grid. Control stations are coordinated by means of GPS receiving grid correction via US Smartnet.
7. All marsh/dune data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via correlative space entry.
8. OS license number: 100022432

Key Plan



Legend

- | OS Buildings | | Contour Lines | |
|----------------------|--|-----------------------------|--|
| Surreyed Buildings | | Contour Interval | |
| Building | | Flow direction and pipe | |
| Wall | | Water drainage line | |
| Edge of Surface Line | | Station and name | |
| Top of Bank | | Monitoring Borehole | |
| Bottom of Bank | | North / South / Bearing | |
| Concrete / Overhang | | Area of Vegetation / | |
| Bottom of Trench | | Extent of Trench | |
| Centre Line | | Body of Water | |
| Watercourse | | Spot Level | |
| Barrie | | Assured Surface | |
| Fence | | Water drainage line | |
| Overhead Powerline | | Surface Water Drainage Line | |
| Overhead Utilities | | | |

Station Coordinates			
Station Name	Eastings (m)	Northings (m)	Height (m)
BWB01	375292.568	440940.227	111.446
BWB02	375301.422	440979.386	111.053
BWB03	375455.736	440852.290	116.392
BWB04	375527.725	440790.522	117.429
BWB05	375381.454	440925.349	113.006

P1	21.08.25	First Issue	BH	PN
Rev	Date	Details of issue / revision	Drw	Re

Issues & Revisions



Client

Richborough Estates Ltd

Project Title:

Land at Pendle Road, Clitheroe

Drawing Title

Existing Site Plan

Sheet 2 of 3

Drawn:	B Hepburn		Reviewed:	P Quelch	
BWB Ref:	255496	Date:	21.08.25	Scale@A0:	1:500

For Information

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
255496-BWB-02-ZZ-DR-G-0001	S2	P1

- | Legend | |
|--------|----------------------------------|
| | OS Buildings |
| | Surveyed Buildings |
| | Building |
| | Kerb Channel Line |
| | Top of Kerb |
| | Edge of Surface |
| | Top of Bank |
| | Bottom of Bank |
| | Canopy / Overhanging |
| | Overhanging |
| | Centre Line |
| | Watercourse |
| | Centre Line |
| | Barrier |
| | Fence |
| | Gate |
| | Overhead Powerline |
| | Overhead Utilities |
| | Contour Lines |
| | Inspection Chamber |
| | Flow direction and pipe diameter |
| | Station and Name |
| | Monitoring Borehole |
| | Tree / Bush / Sapling |
| | Area of Vegetation / |
| | Extent of Tree Canopy |
| | Hedge |
| | Body of Water |
| | Body of Water from |
| | Spot Level |
| | Assumed Surface |
| | Water Drainage Line |
| | Surface Water Drain |

P1	08.12.25	First Issue	JL	S
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BWB
A CAF GROUP COMPANY

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☐ Leeds | 0113 233 8000
☐ London | 020 7407 3879
☐ Manchester | 0161 233 4260
☐ Nottingham | 0115 924 1100
www.bwbconsulting.com

Project Title

**LAND AT PENDLE ROAD,
CLITHEROE**

Drawn:	J.LODGE		Reviewed:	S.SHREEVES	
BWB Ref:	255496	Date:	08.12.25	Scale@A0:	1:1000

Project - Originator - Zone - Level - Type - Role - Number	Status	Responsible
255496-BWB-01-01-DB-G-0060	S2	P

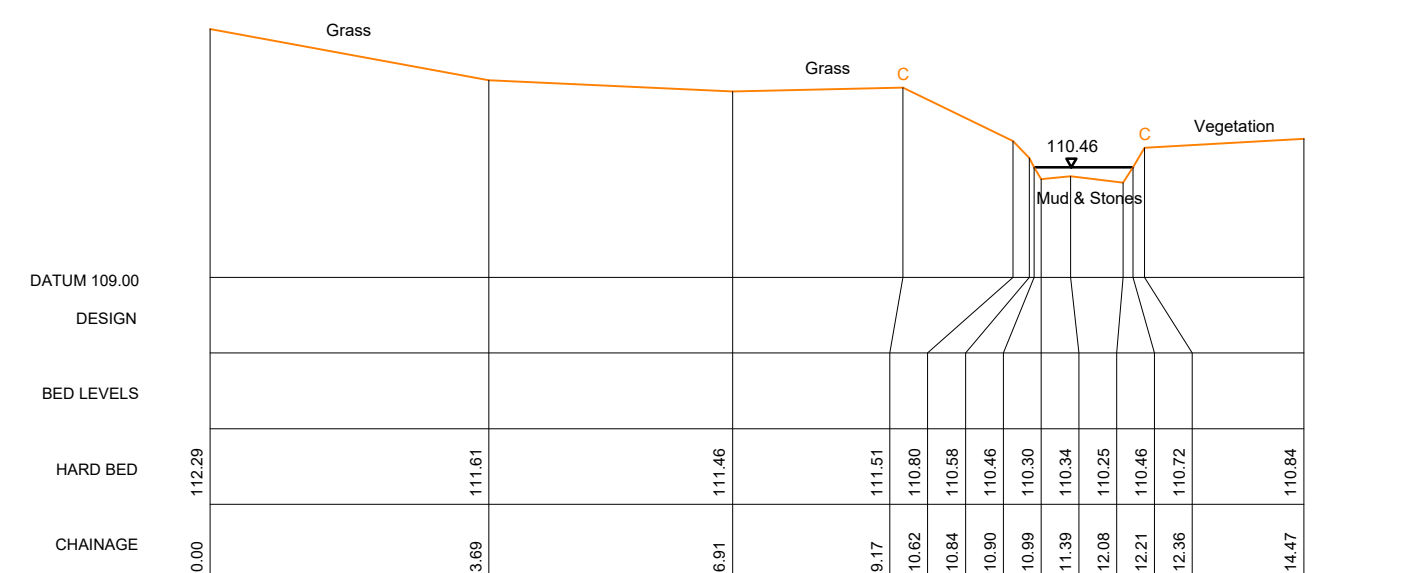
Notes

1. Do not scale this drawing. All dimensions must be checked/verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.
5. No scale factor has been applied to this survey, therefore the as coordinates are to be treated as arbitrary. Please refer to survey station information below for on site control establishment.
6. All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via OS smart net.
7. All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space entry.
8. OS licence number: 100022432

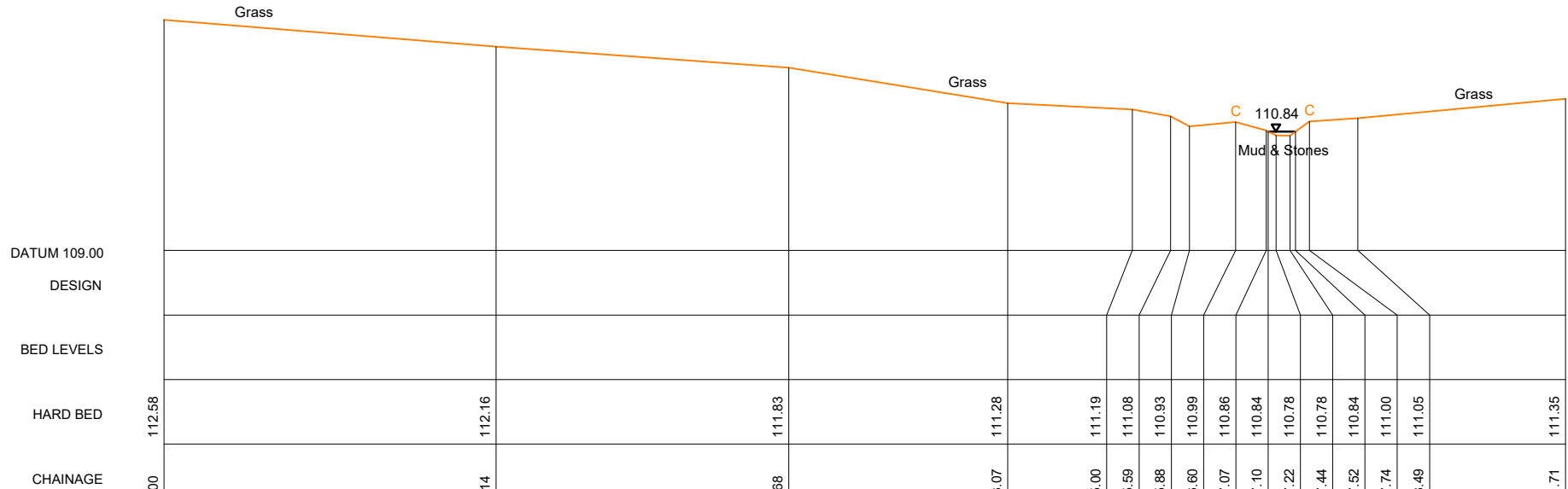
Legend

	OS Buildings		Contour Lines
	Surveyed Buildings		Inspection Chamber
	Building		Flow direction and pipe diameter
	Wall		Station and Name
	Kerb Channel Line		Monitoring Borehole
	Top of Kerb		Tree / Bush / Sapling
	Edge of Surface		Area of Vegetation/Extent of Tree Canopy
	Top of Bank		Hedge
	Bottom of Bank		Body of Water
	Canopy / Overhang		Watercourse
	Line Marking		Centre Line
	Fence		Barrier
	Gate		Spot Level
	Overhead Powerline		Assumed Surface
	Overhead Utilities		Surface Water Drainage Line

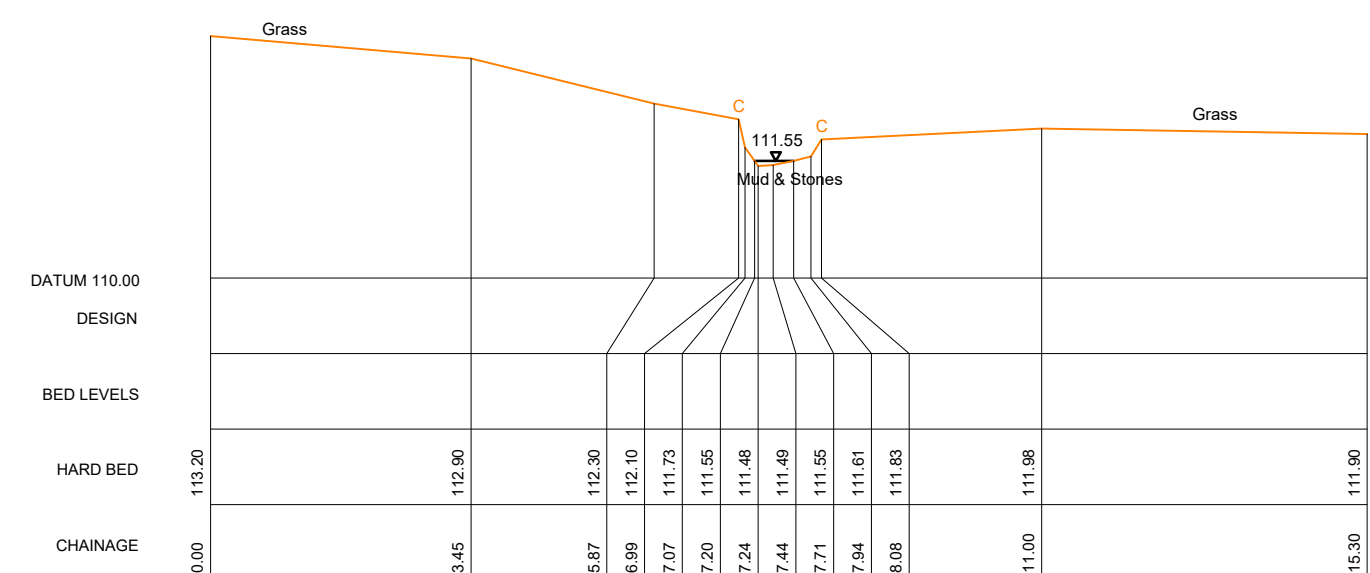
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BS	Bank Gully	FCL	Fence Closed Board	LFP	Lamp Post
BD	Bollard	FCL	Fence Chain Link	MH	Manhole
BS	Bus Stop	FEL	Fence Electric	MM	Service Marker
BT	British Telecom	FMP	Fence Metal Panel	PS	Post Box
C	Crest	FMR	Fence Metal Railing	PT	Post
CL	Cover Level	FOS	Fence Open Board	RE	Roading Eye
CMP	Cable Marker	FPW	Fence Post & Wire	SP	Sign Post
CTV	Cable TV	FSP	Fence Steel Palisade	ST	Stop Tap
CCTV/Security Camera	Post	FVM	Fence Wire Mesh	SV	Stop Valve
DC	Drainage	FP	Flagpole	TGB	Telephone
Channel	Gas	Gas	Gas	TL	Threshold Level
DK	Drop Kerb	GV	Gas Valve	TL	Traffic Light
DP	Down Pipe	GY	Gully	TP	Telegraph Post
Elec	Electric	H	Height	TS	Traffic Signal
EP	Electricity Post	IC	Inspection Chamber	UTS	Unable to Survey
ER	Earth Road	IFL	Internal Floor Level	WL	Water Level
FH	Fire Hydrant	IL	Invert Level	WM	Water Meter
FL	Floodlight			WQ	Wash Out



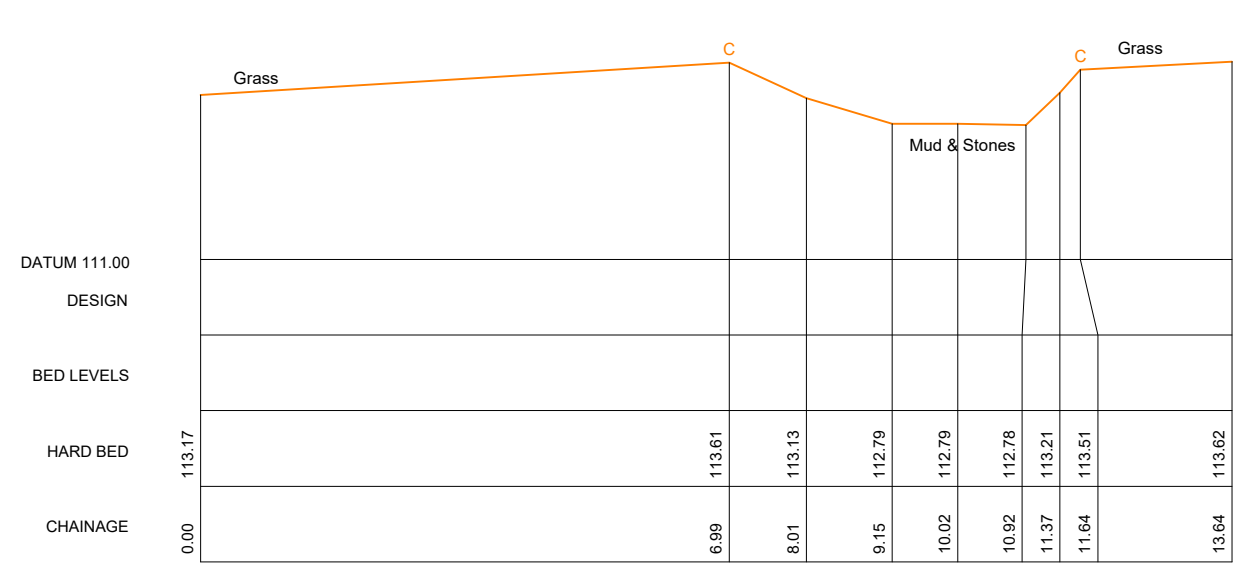
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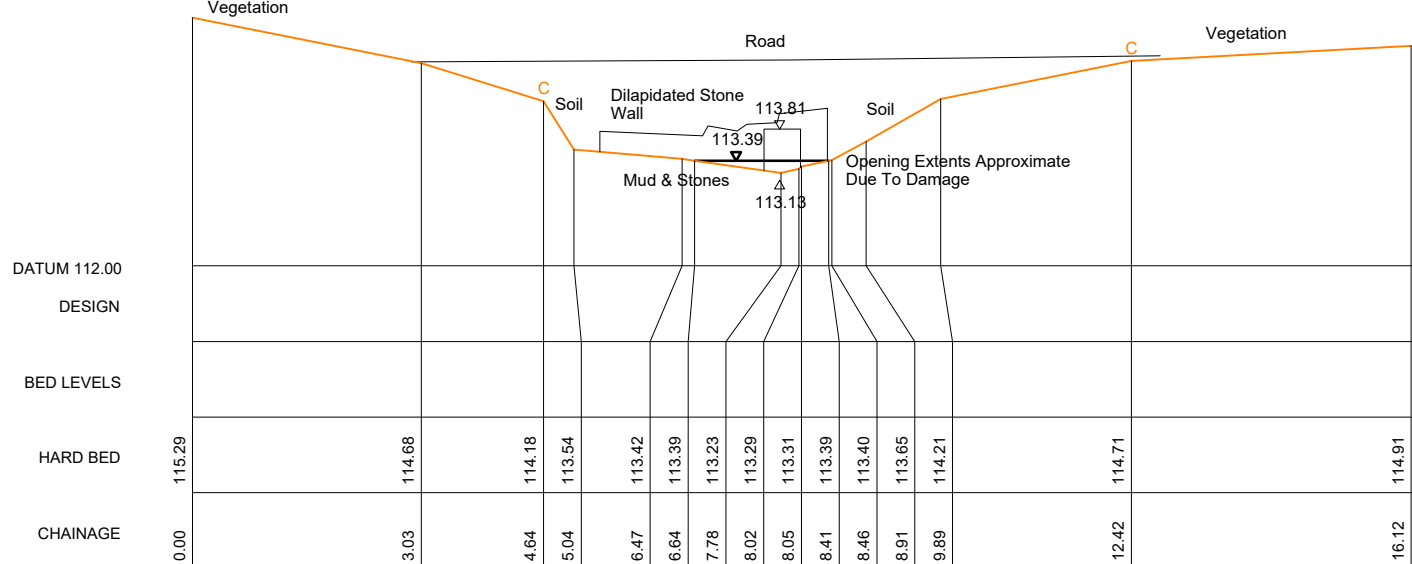
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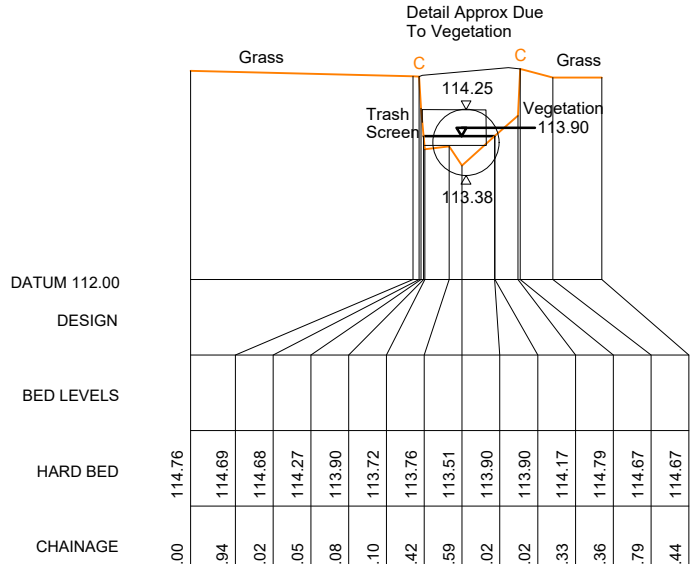
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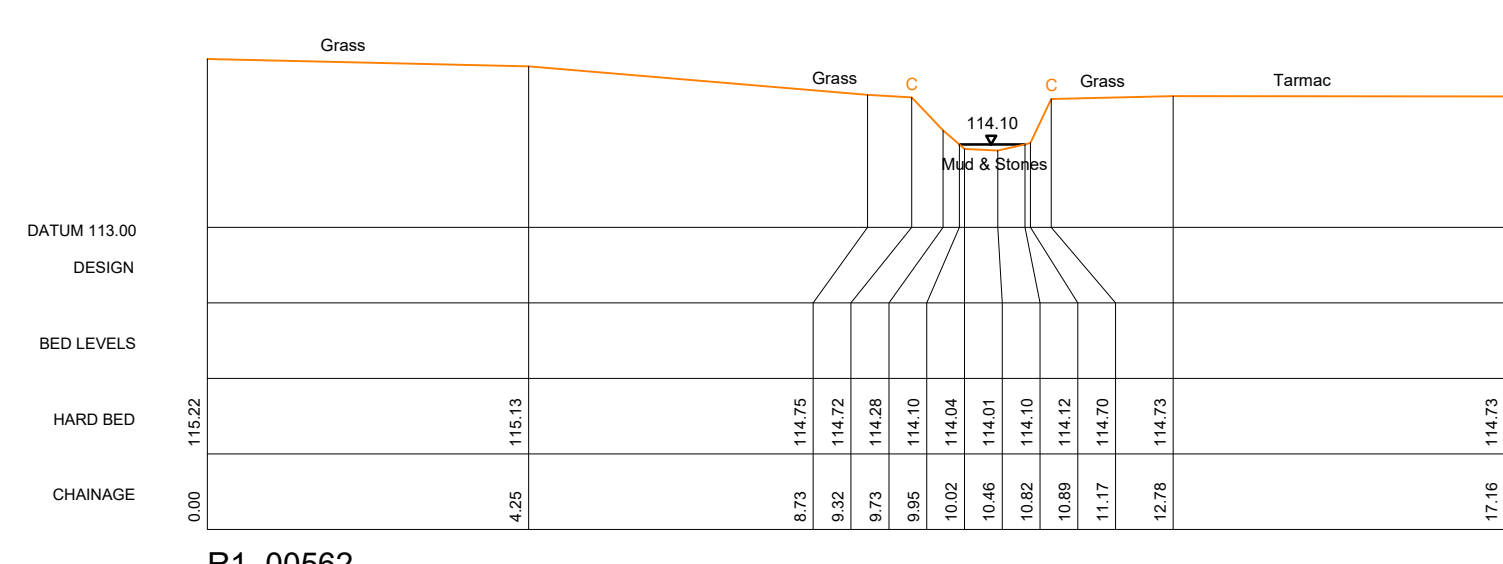
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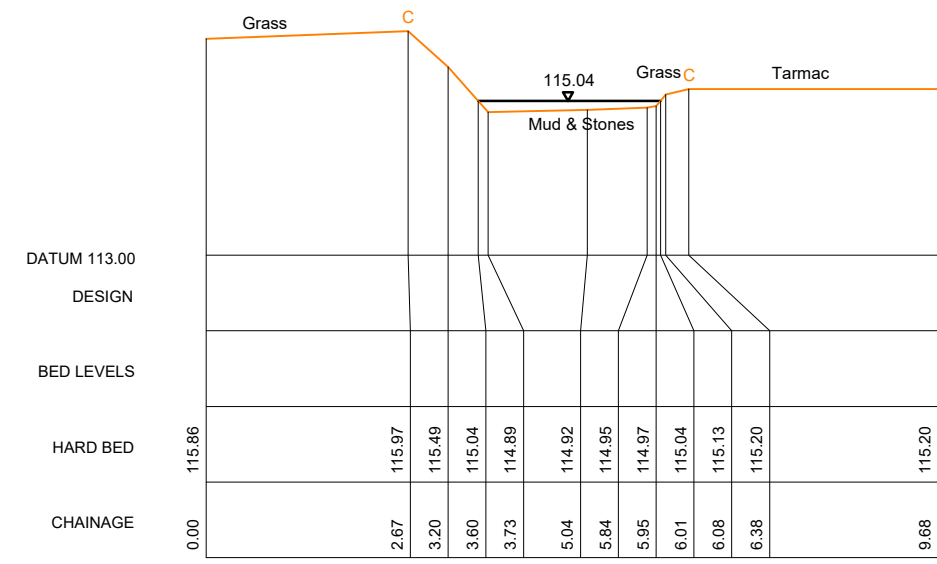
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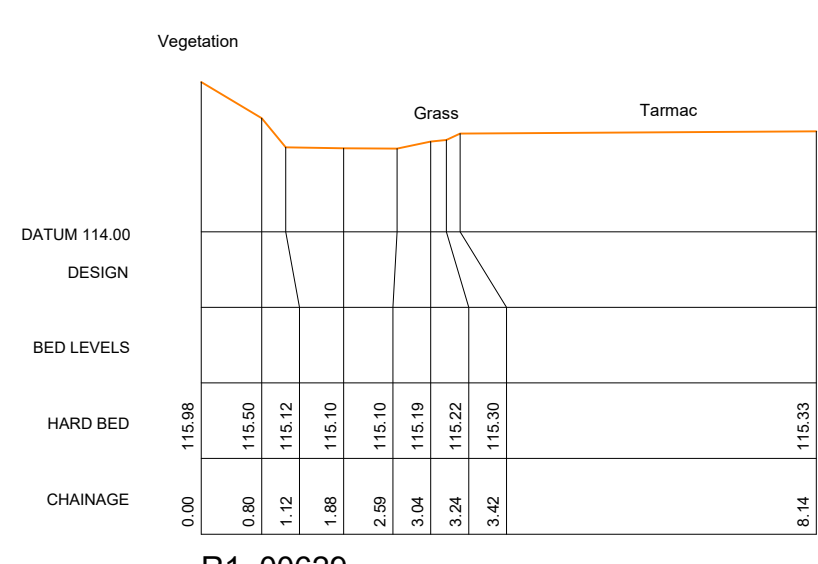
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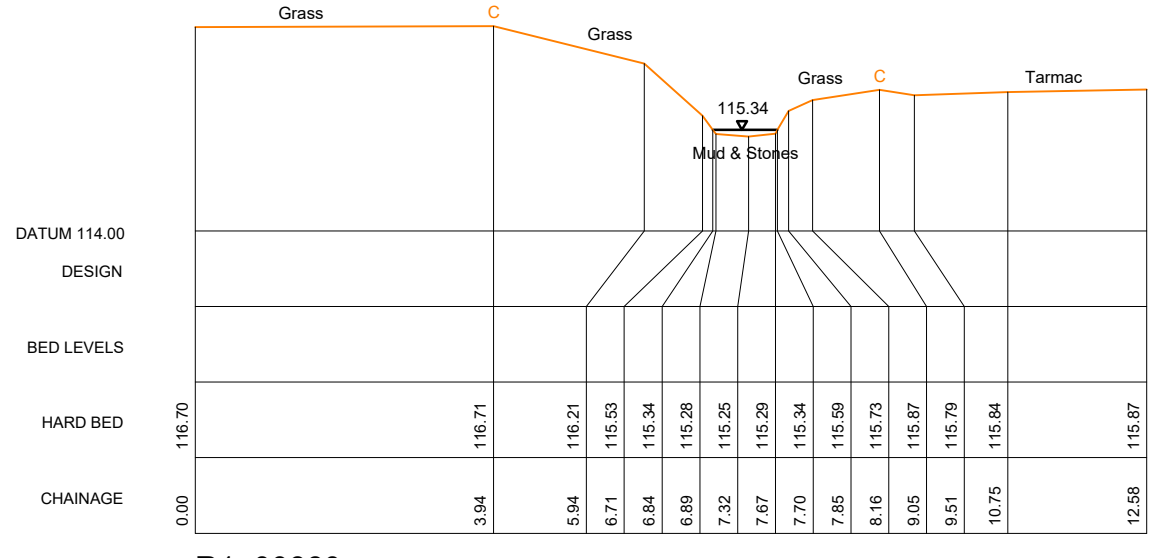
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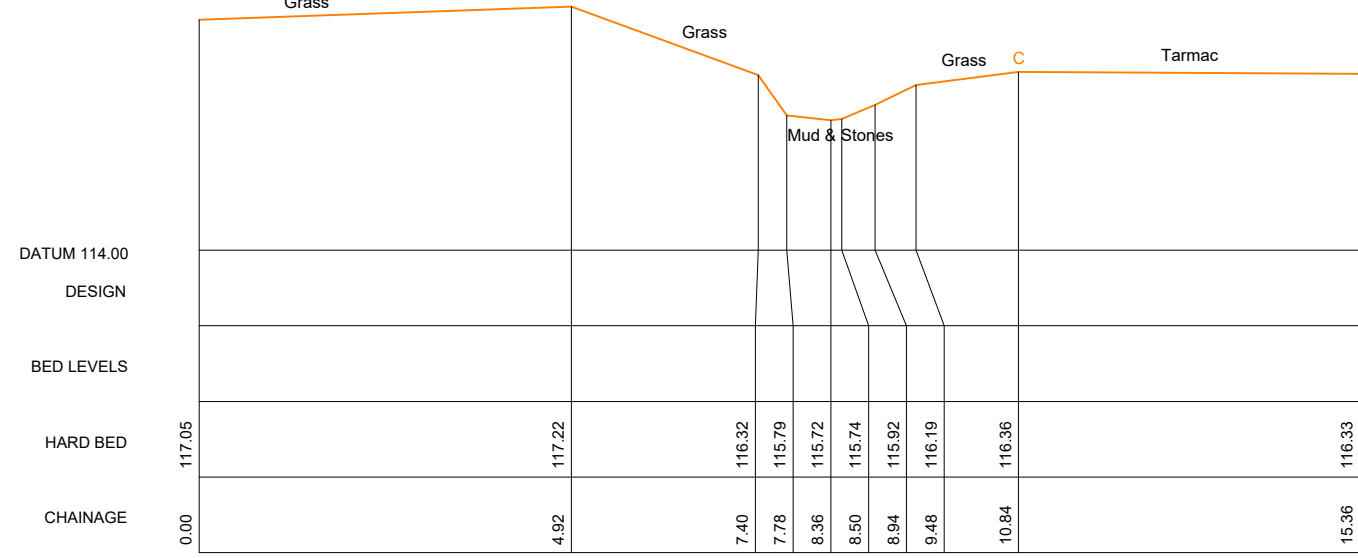
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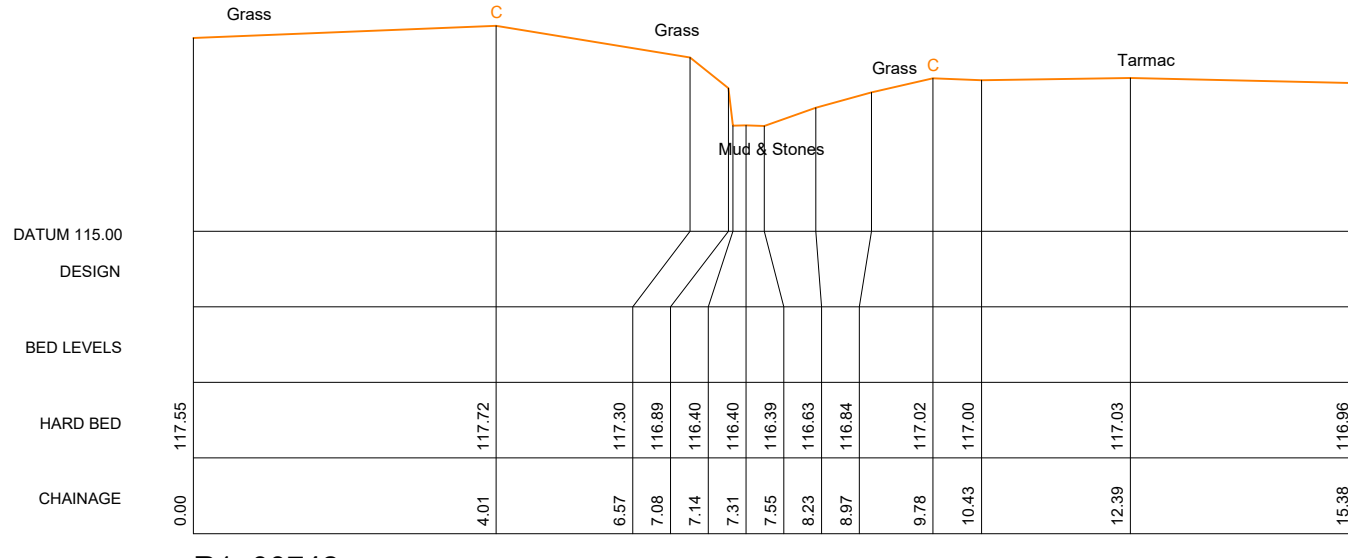
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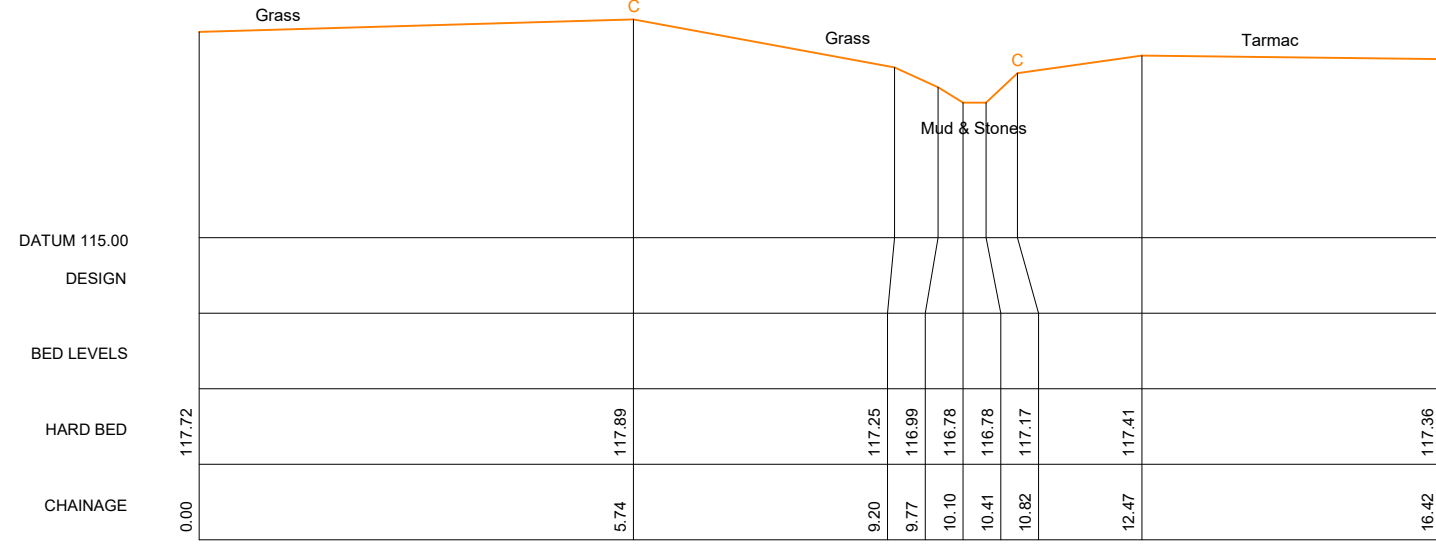
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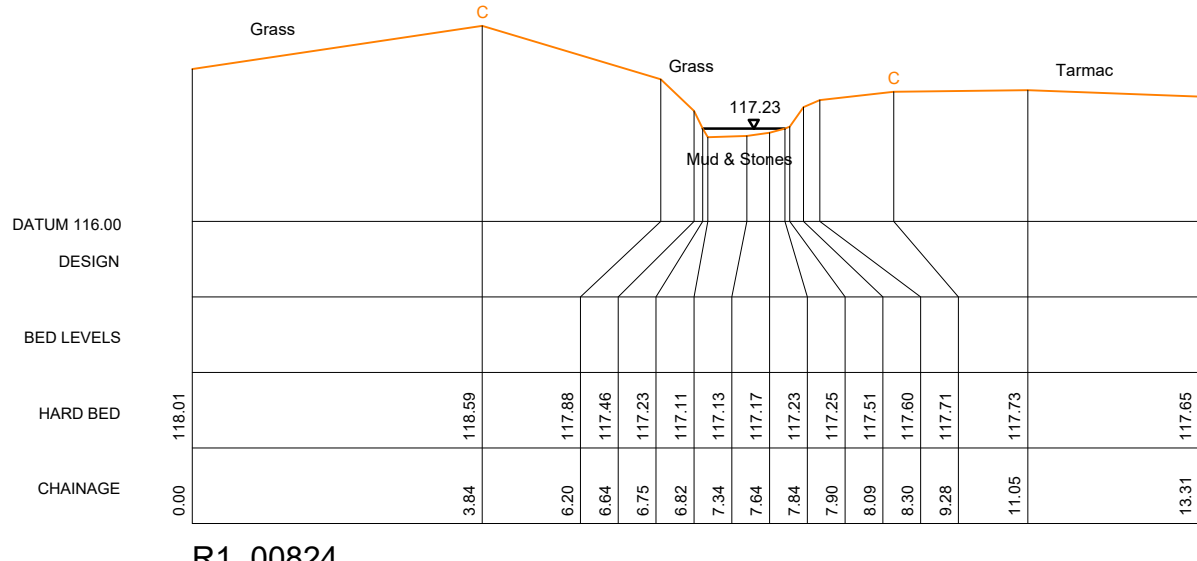
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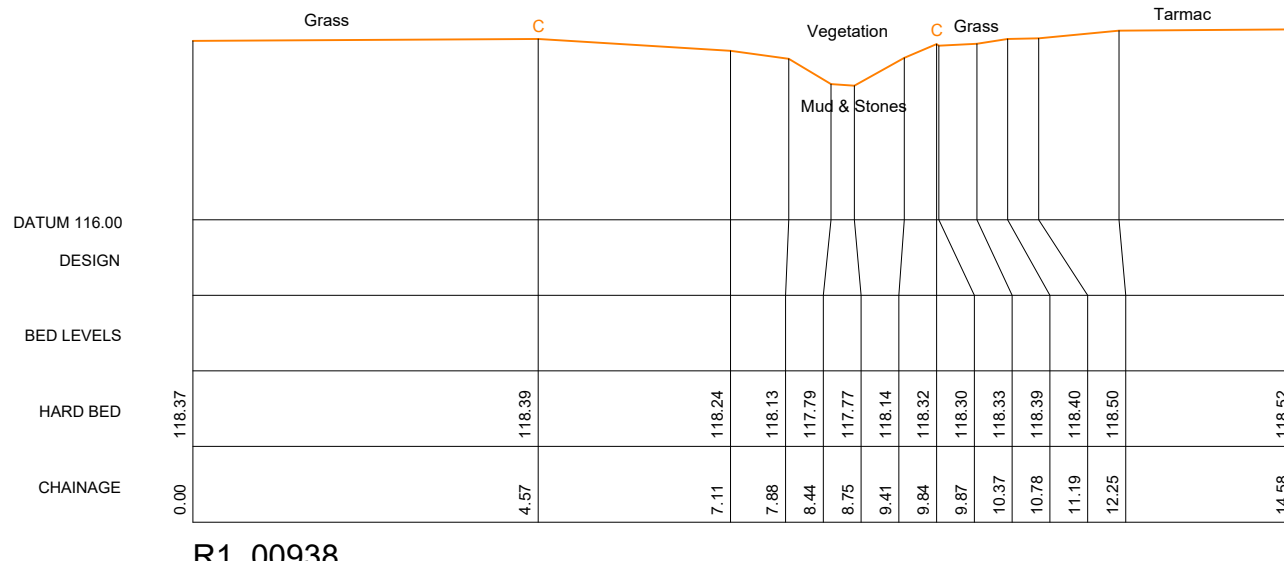
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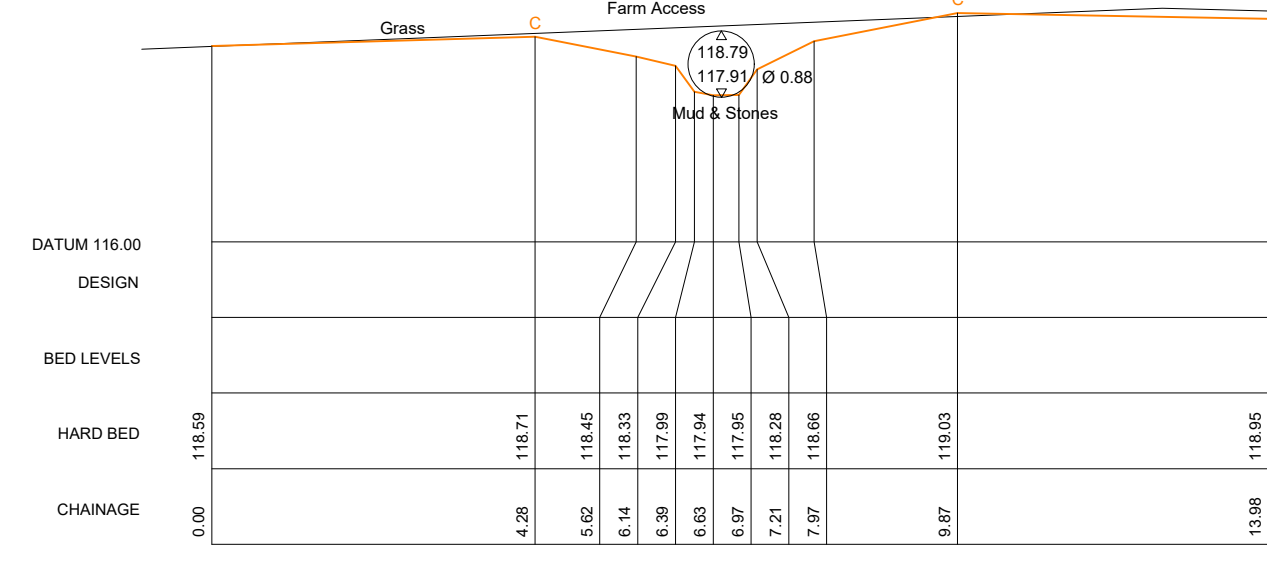
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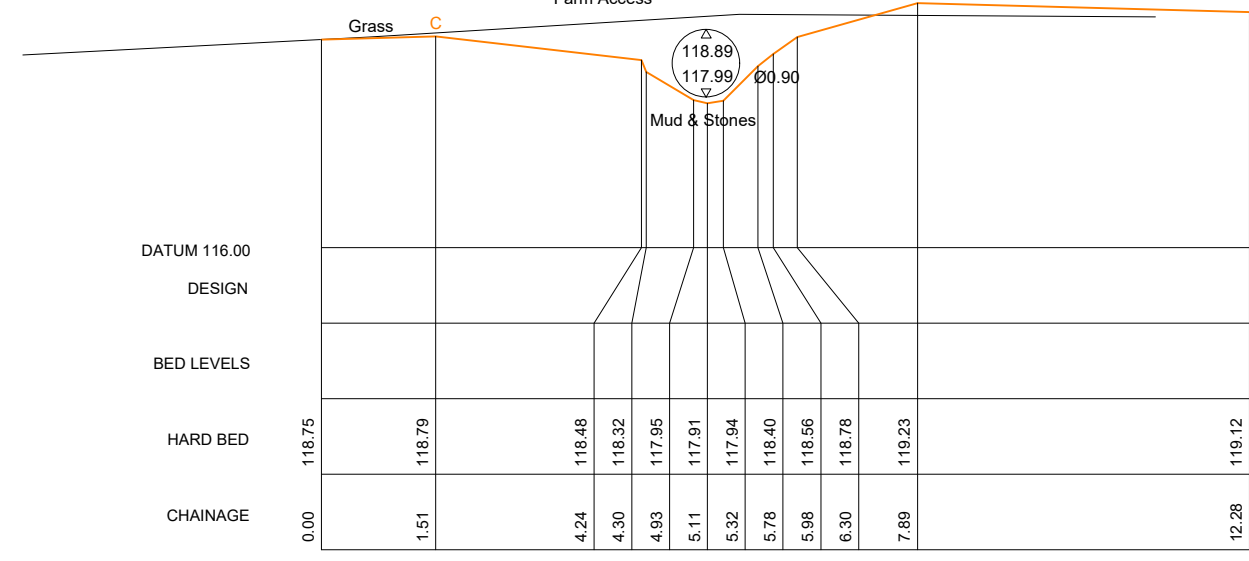
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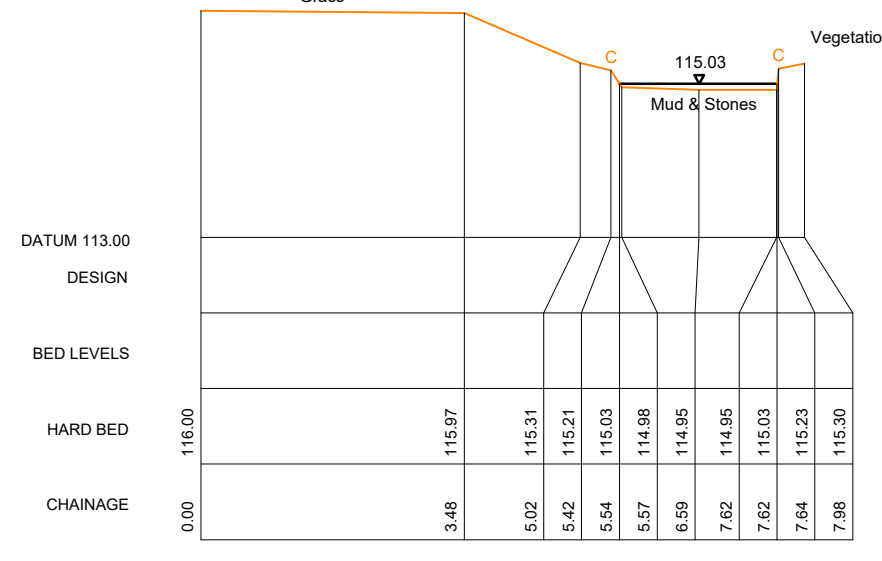
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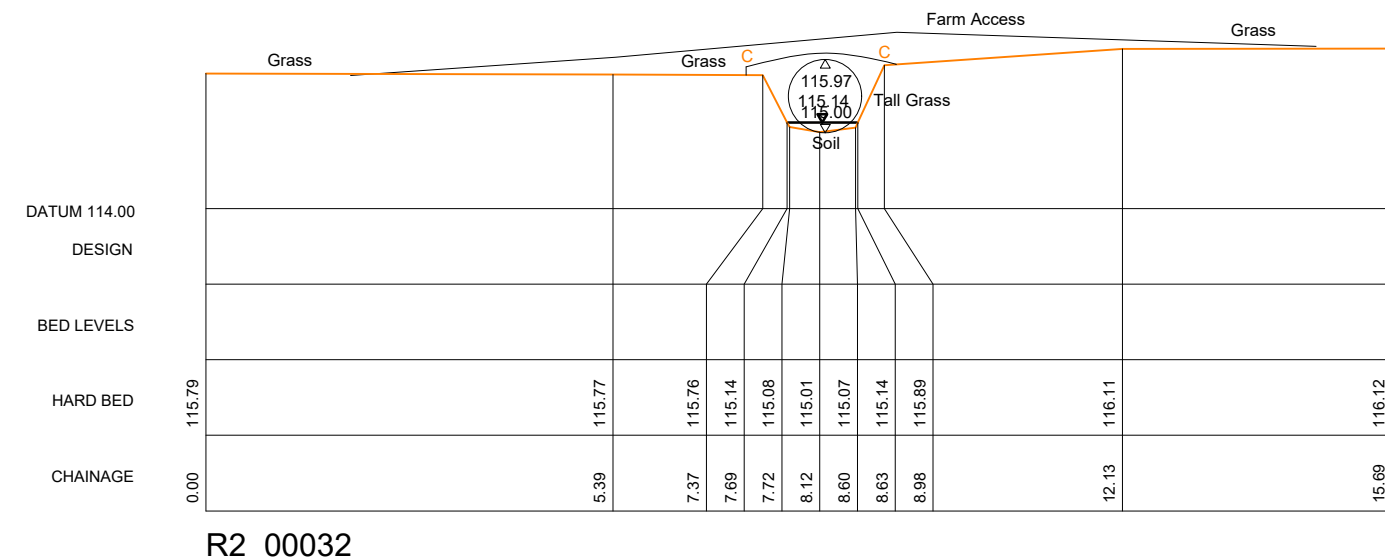
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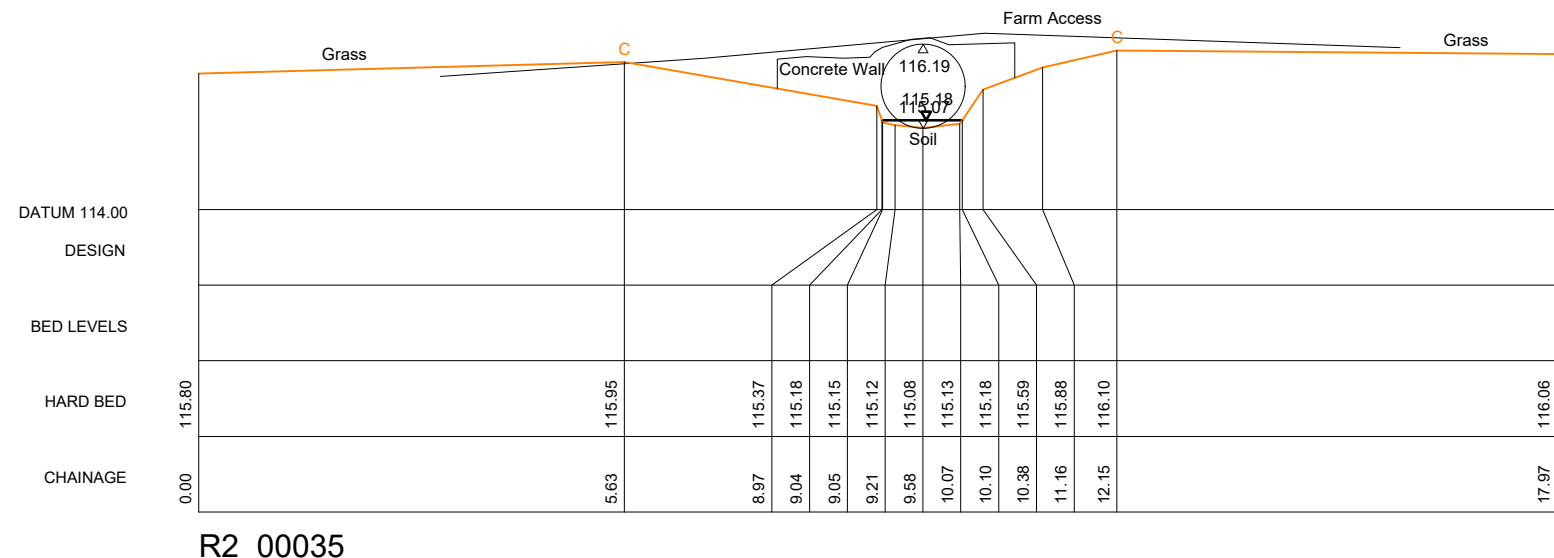
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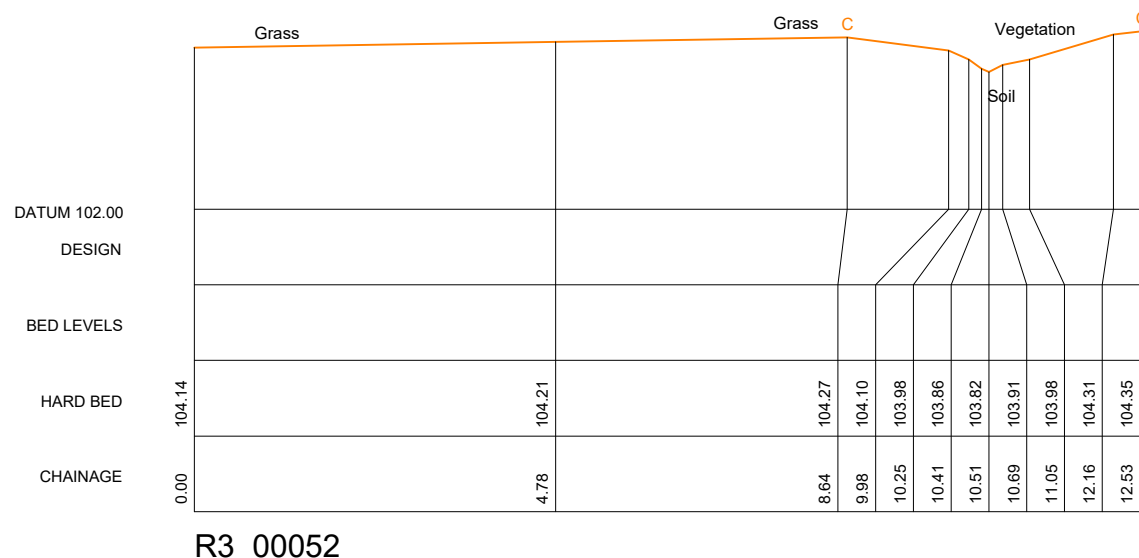
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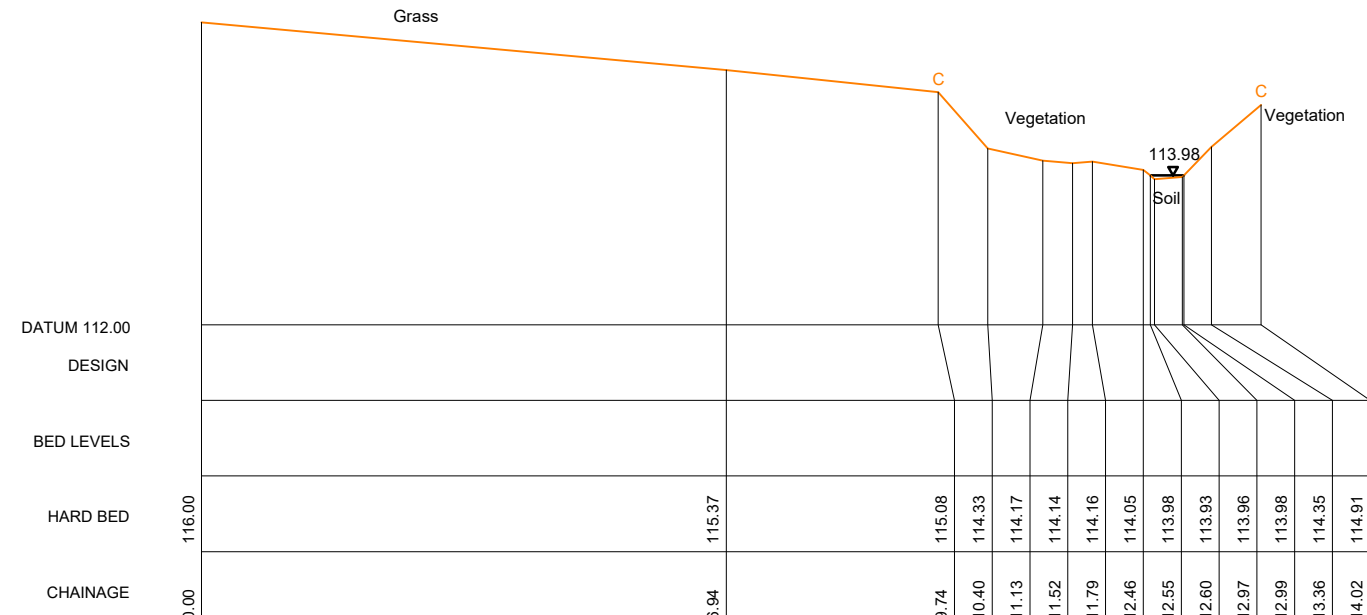
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Culvert Entrance



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BEARING 037
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P1	08.12.25	First Issue		JL	BS
Rev	Date	Details of Issue / Revision		Draw	Rev
Issues & Revisions					
Birmingham 0121 233 3322 Leeds 0113 233 8000 London 020 7407 3879 Manchester 0161 233 4260 Nottingham 0115 924 1100 www.bwbconsulting.com					

Client
RICHBOROUGH ESTATES LTD

Project Title
LAND AT PENDLE ROAD, CLITHEROE

Drawing Title
WATERCOURSE SURVEY EXISTING SECTIONS SHEET 2 OF 3

Drawn:	J.LODGE	Reviewed:	S.SHREEVES
BWB Ref:	255496	Date:	08.12.25
Scale/A0:	1:100	Status:	Rev
Information			
Project - Originator - Zone - Level - Type - Role - Number			
255464-BWB-01-01-DR-G-0060 S2 P1			

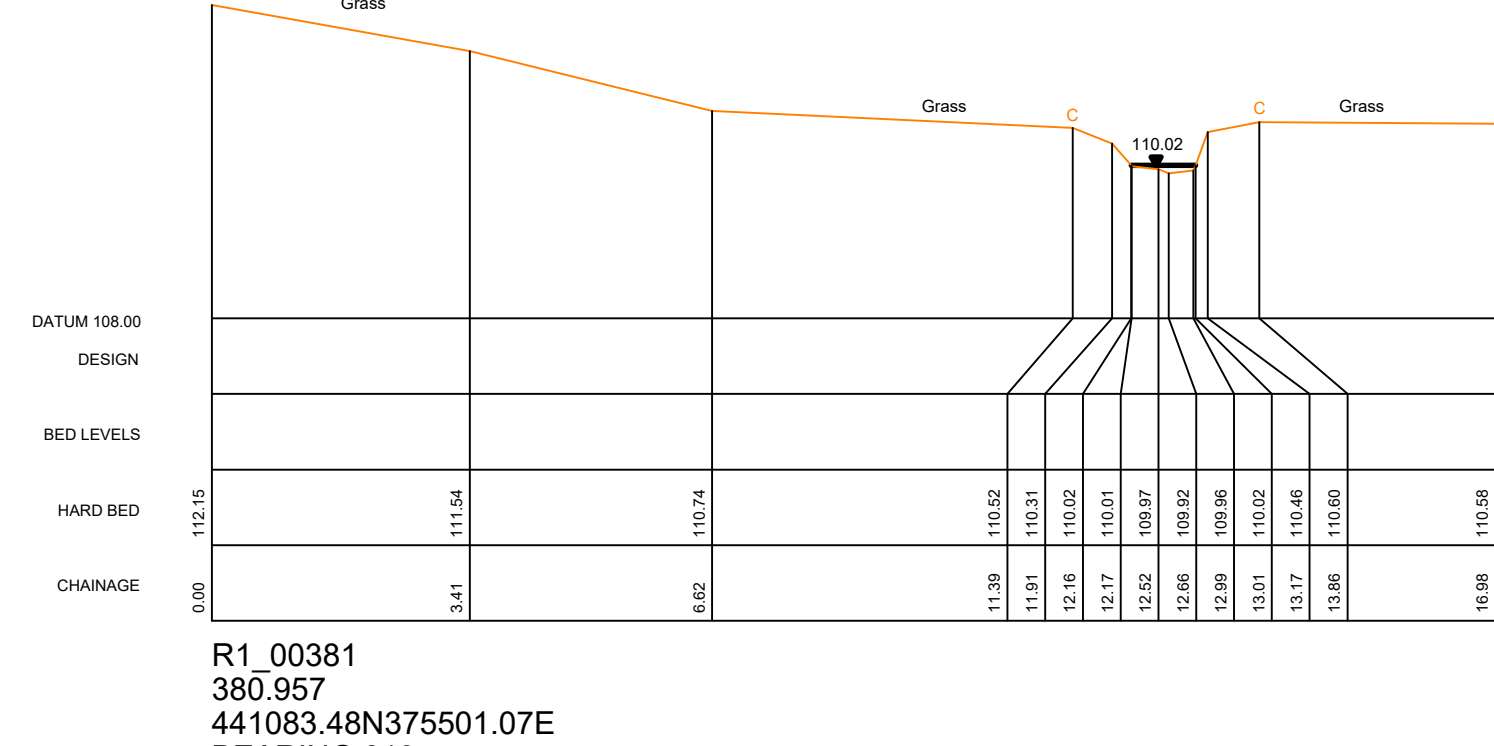
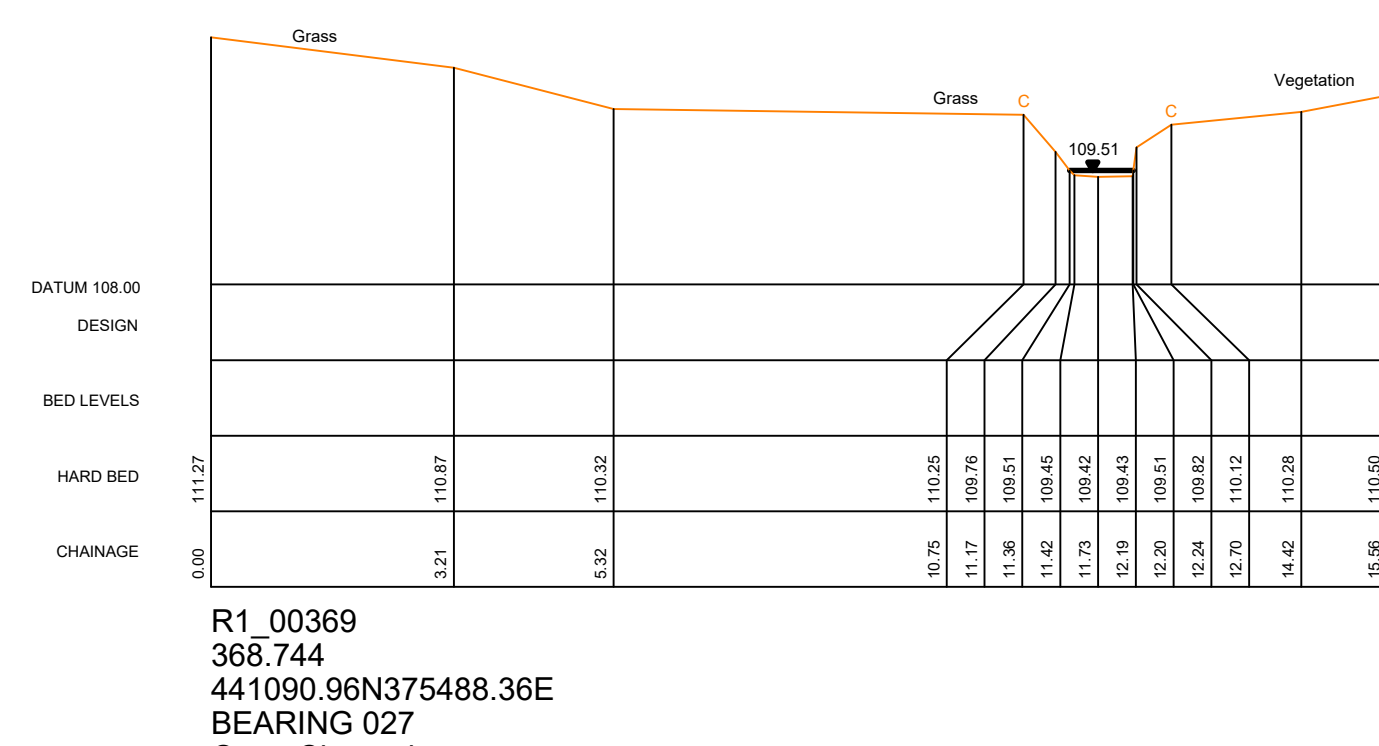
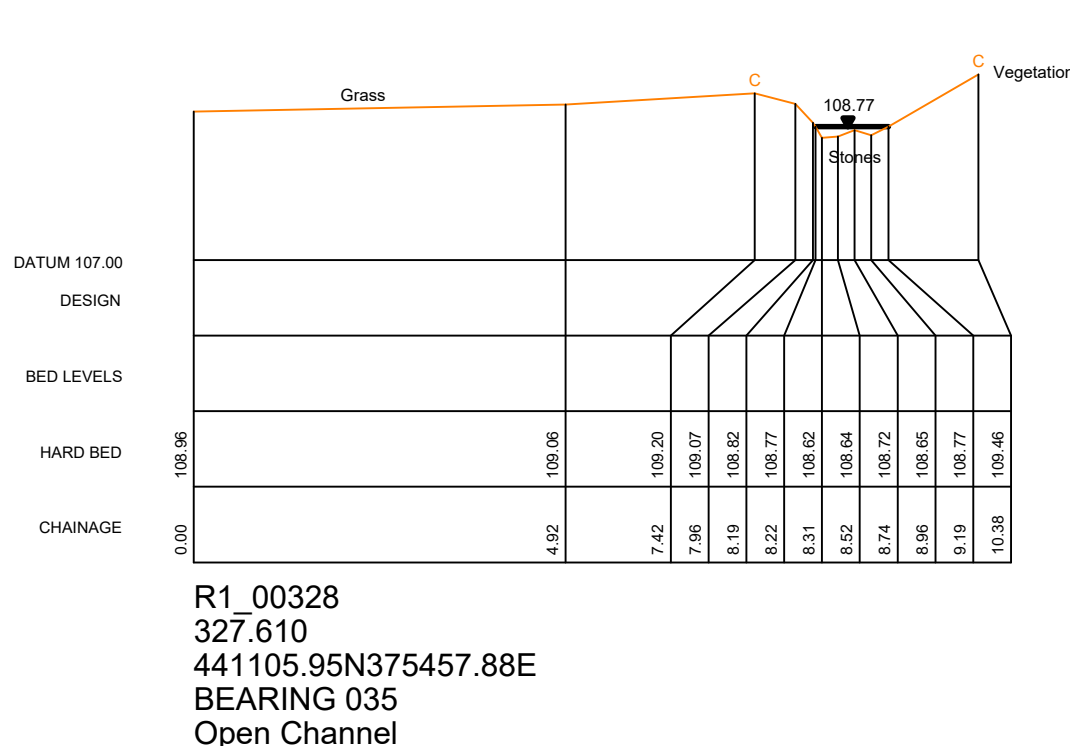
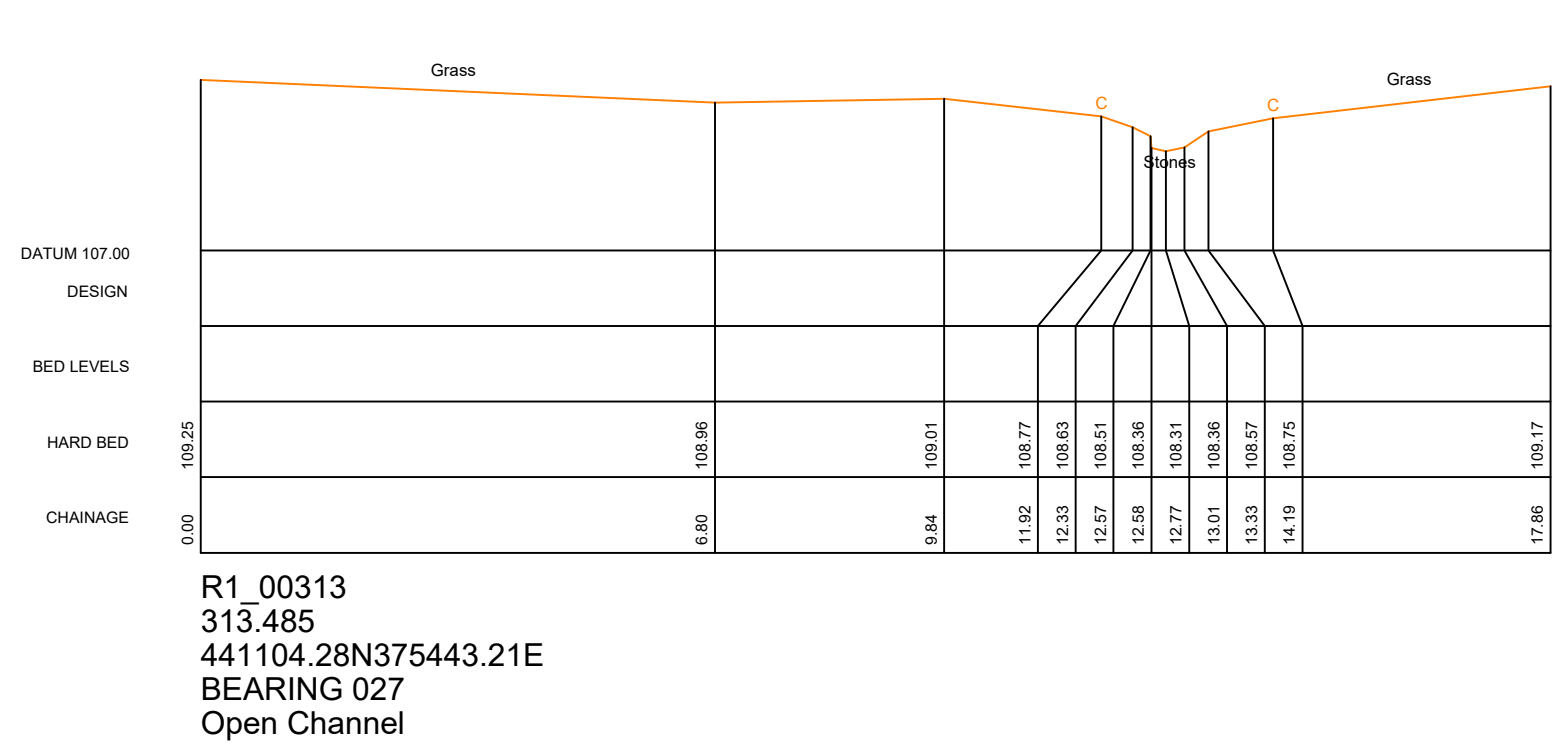
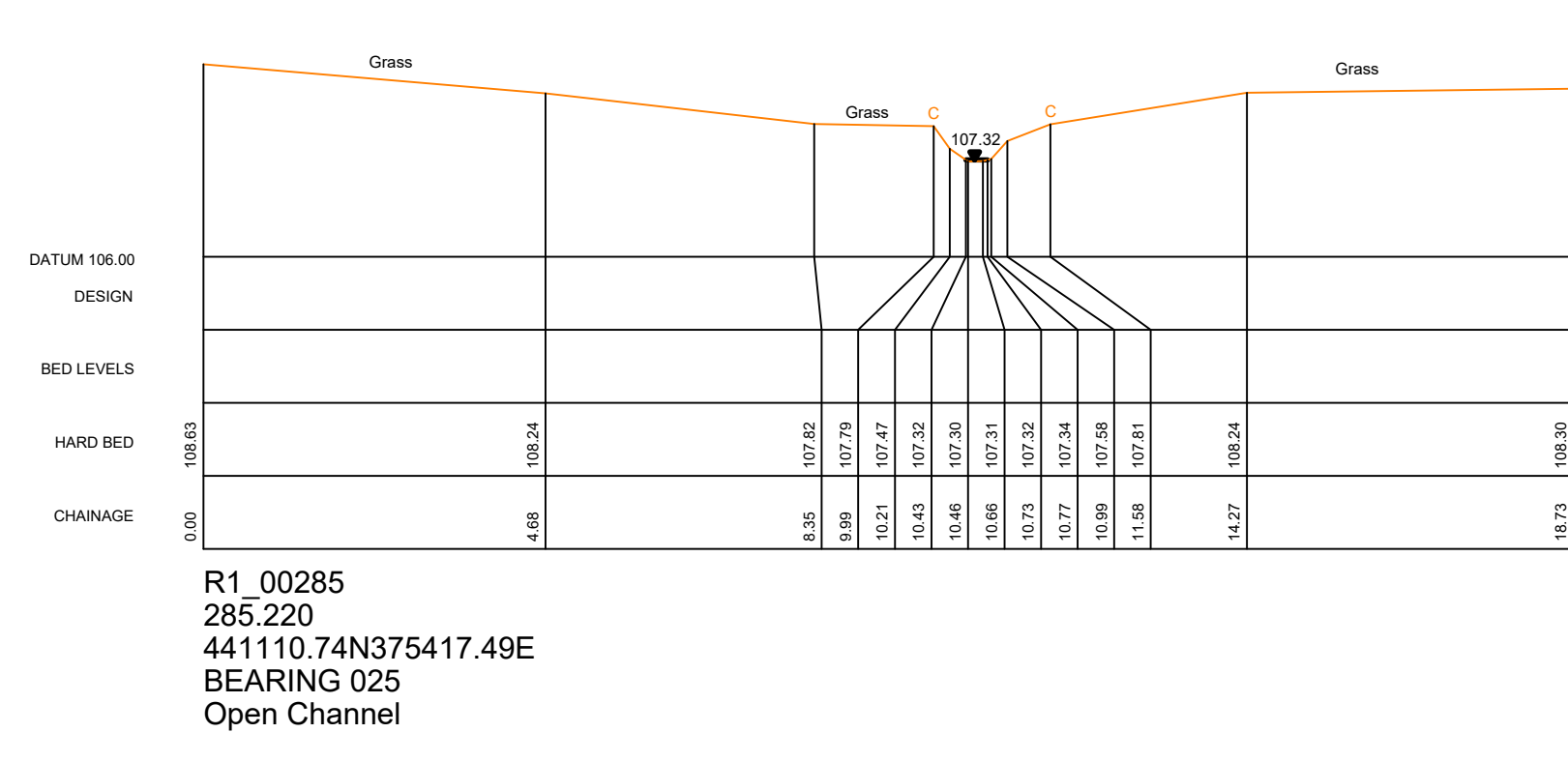
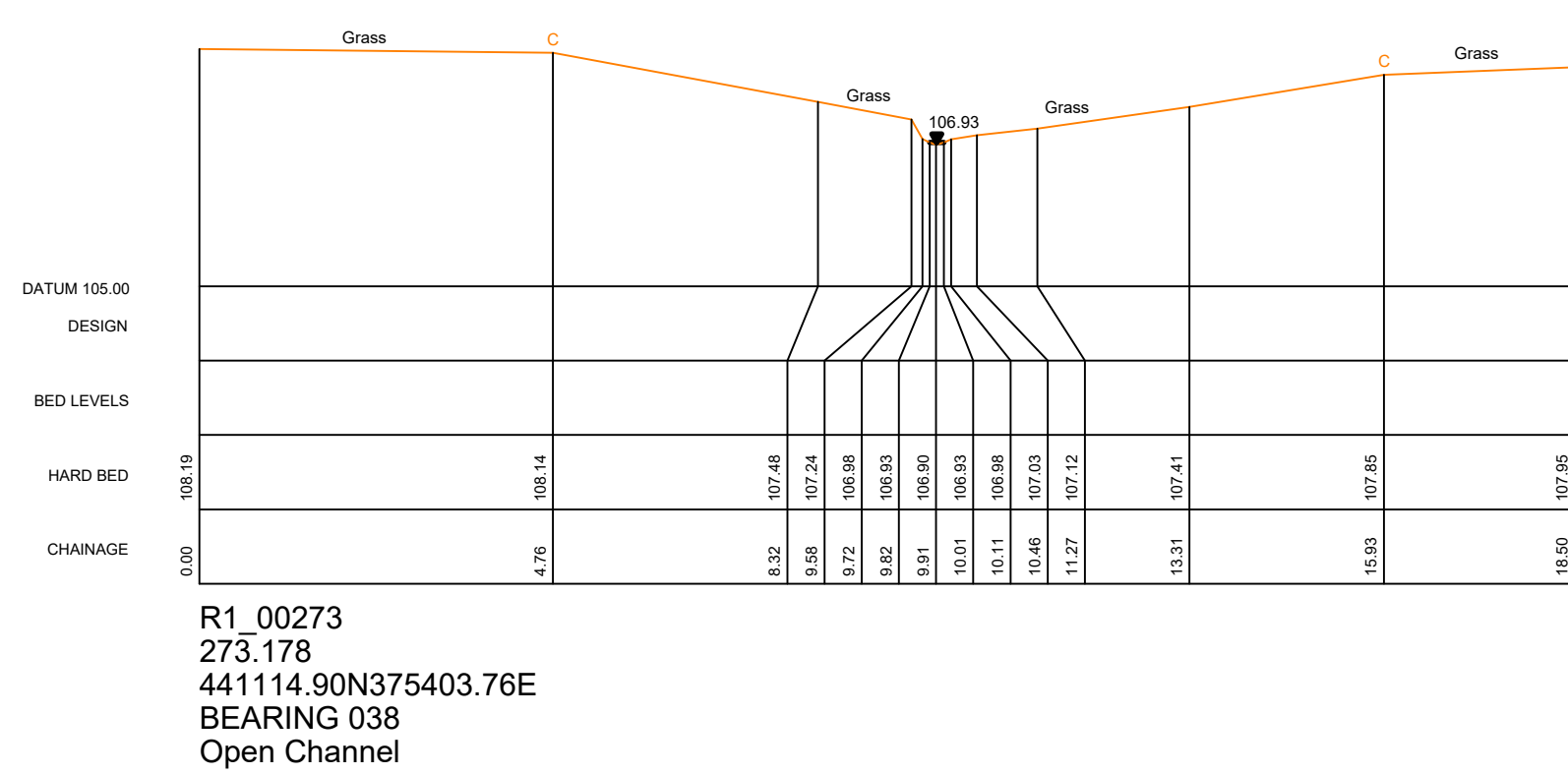
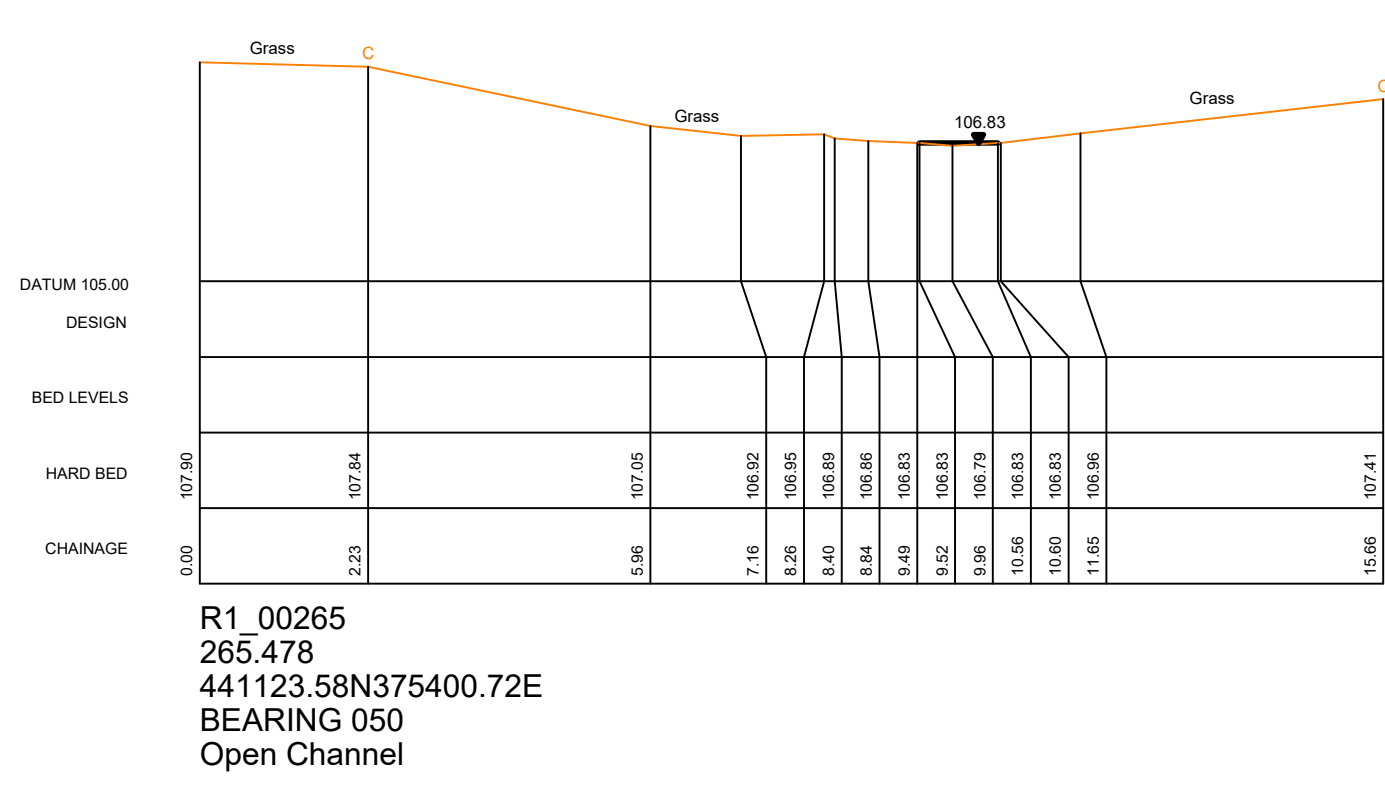
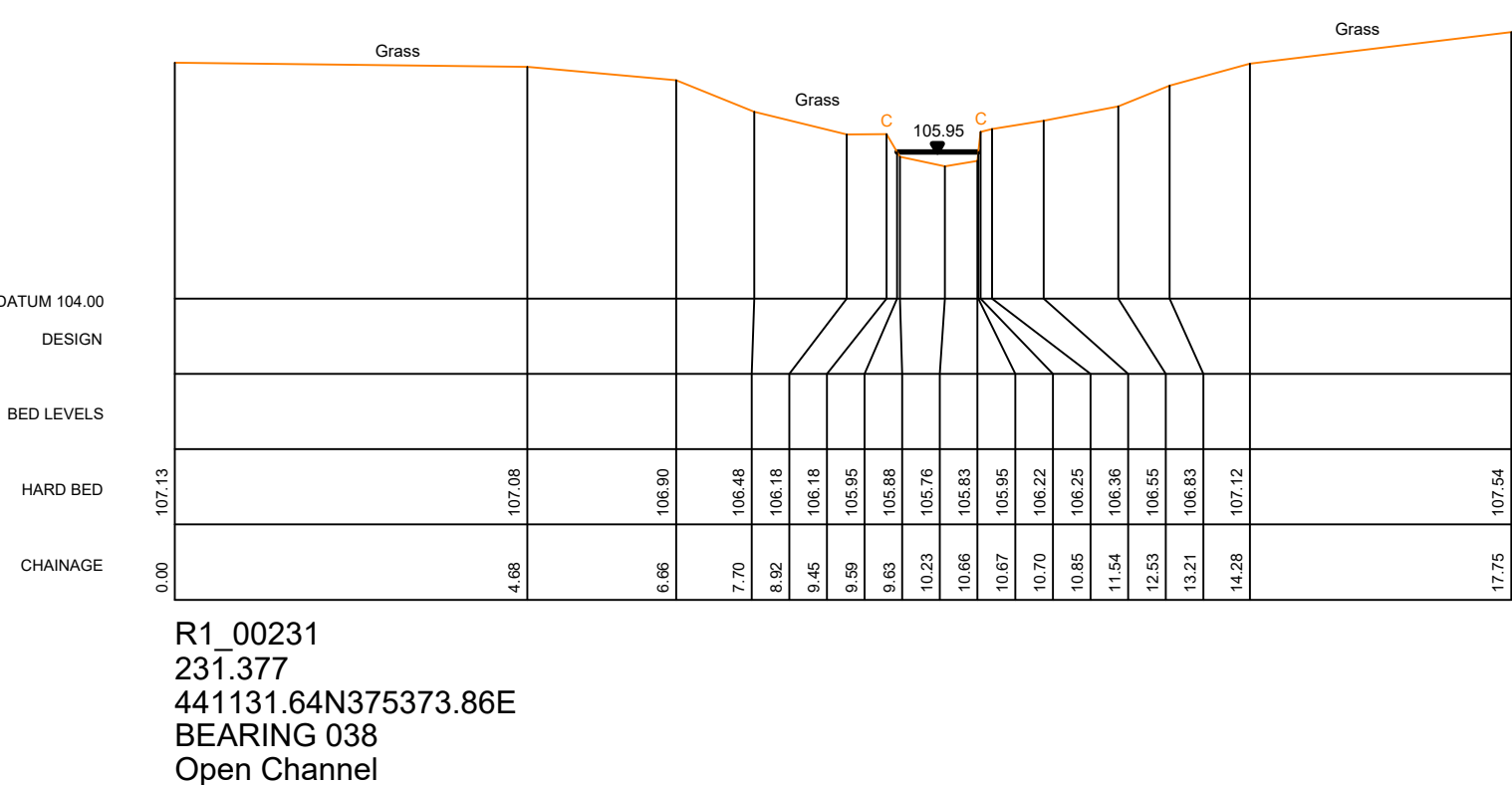
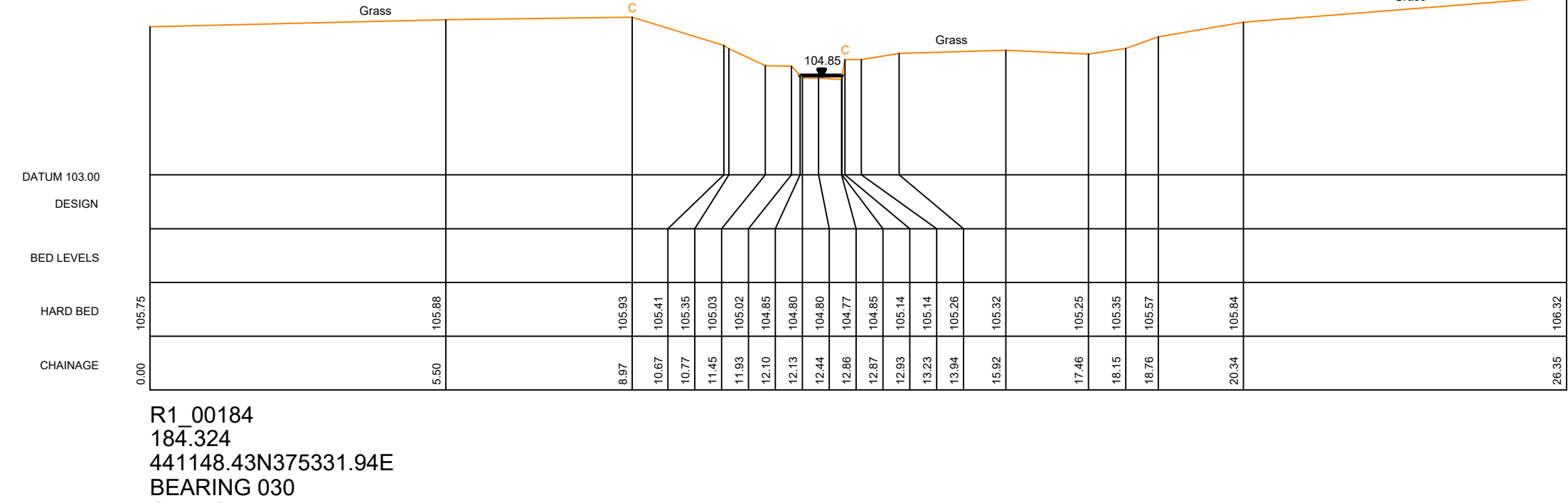
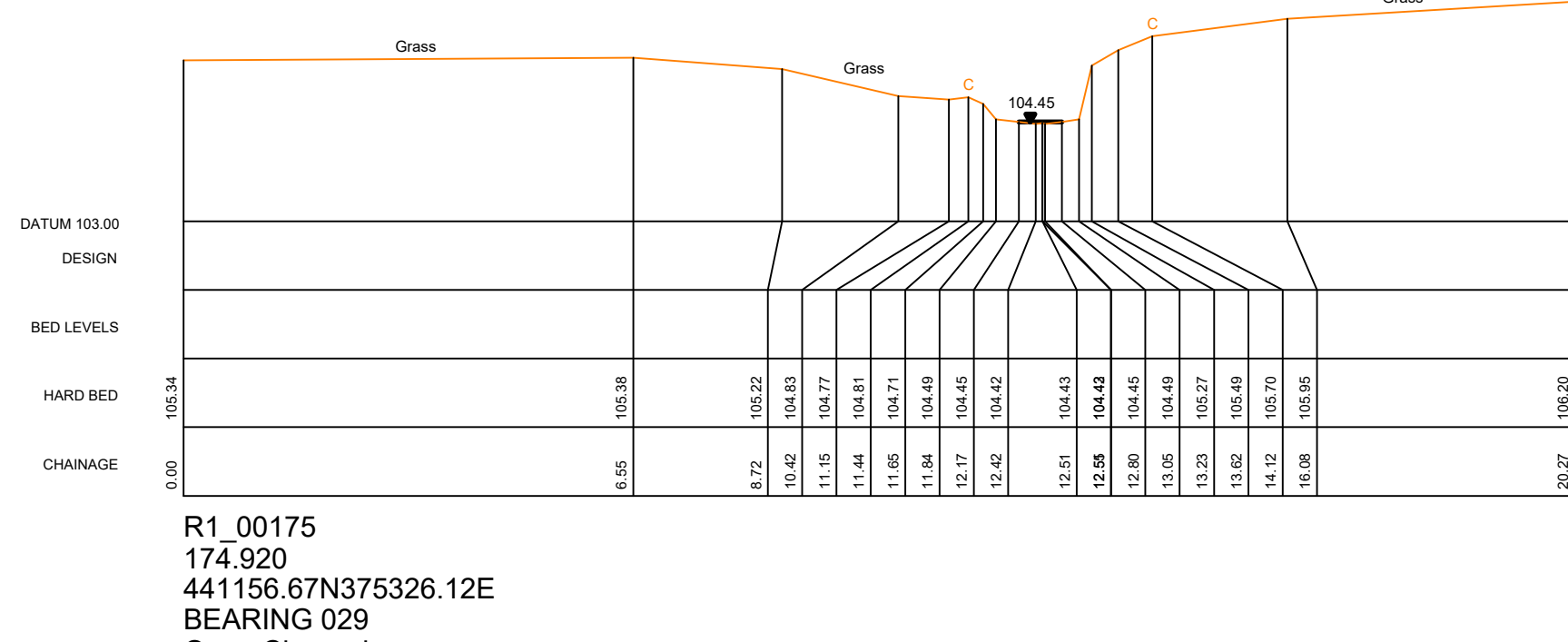
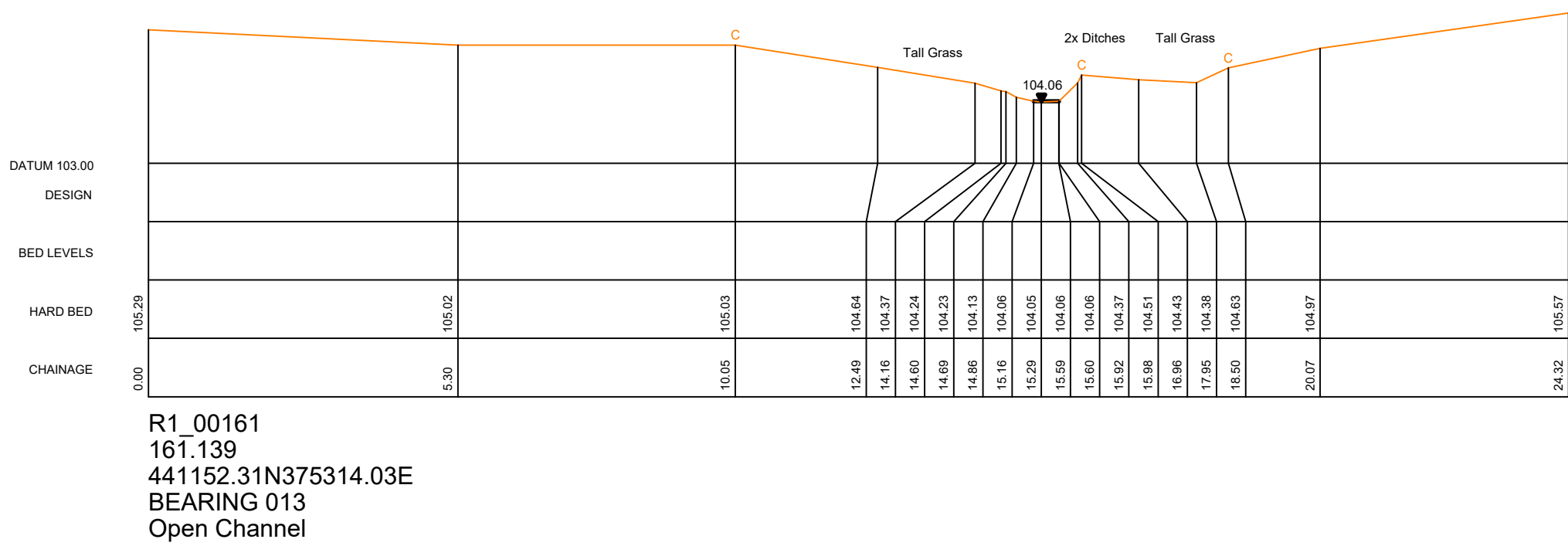
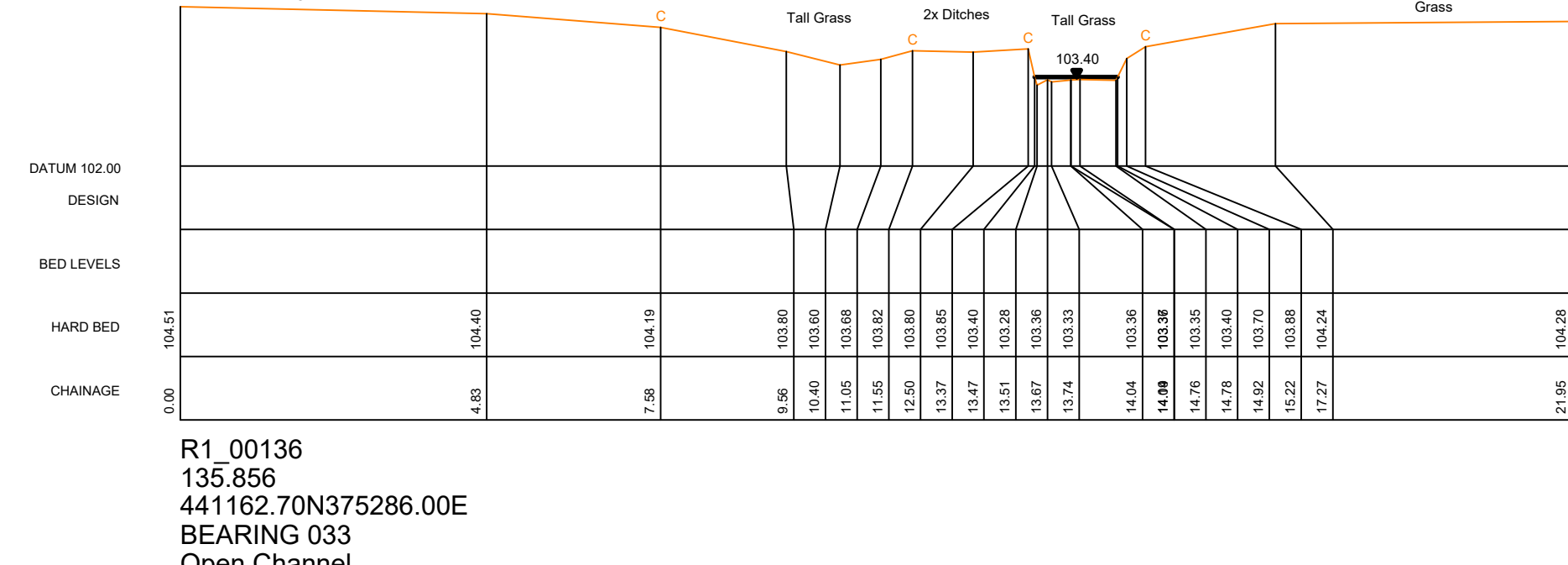
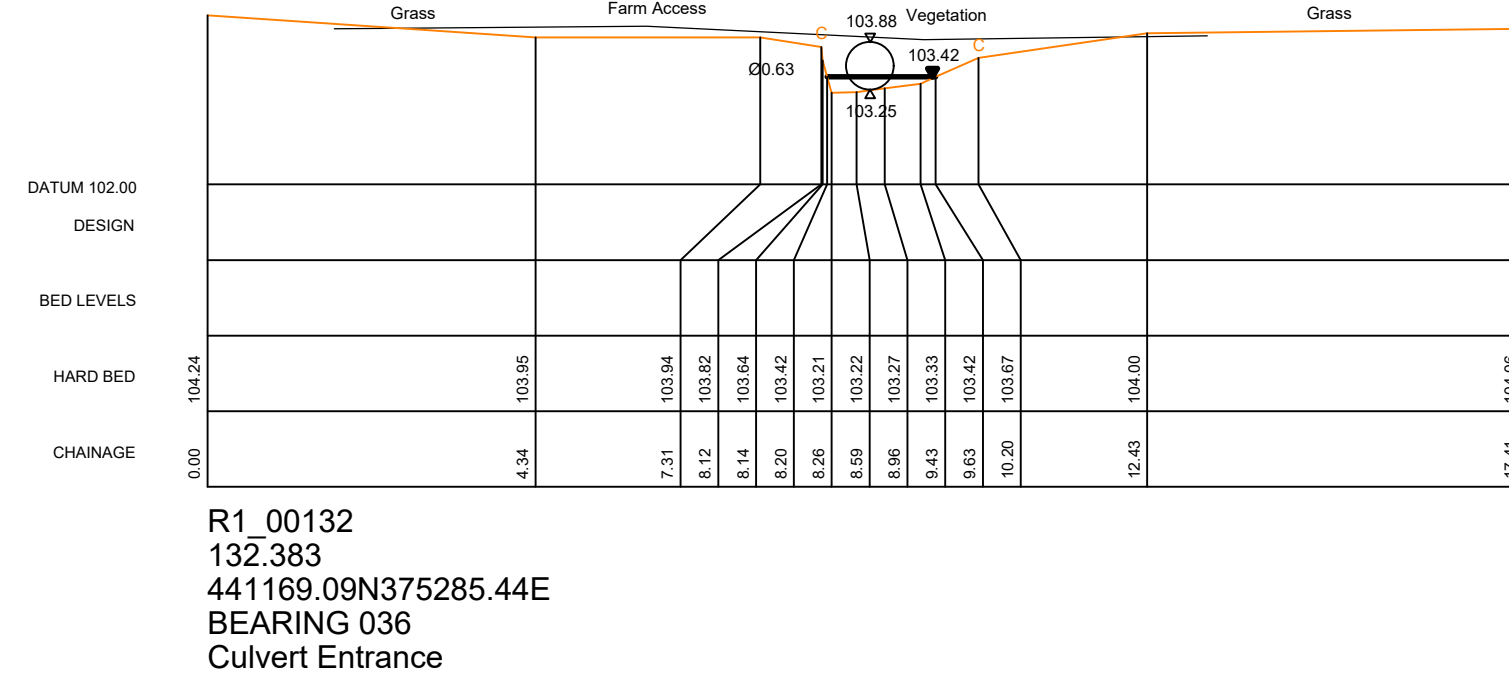
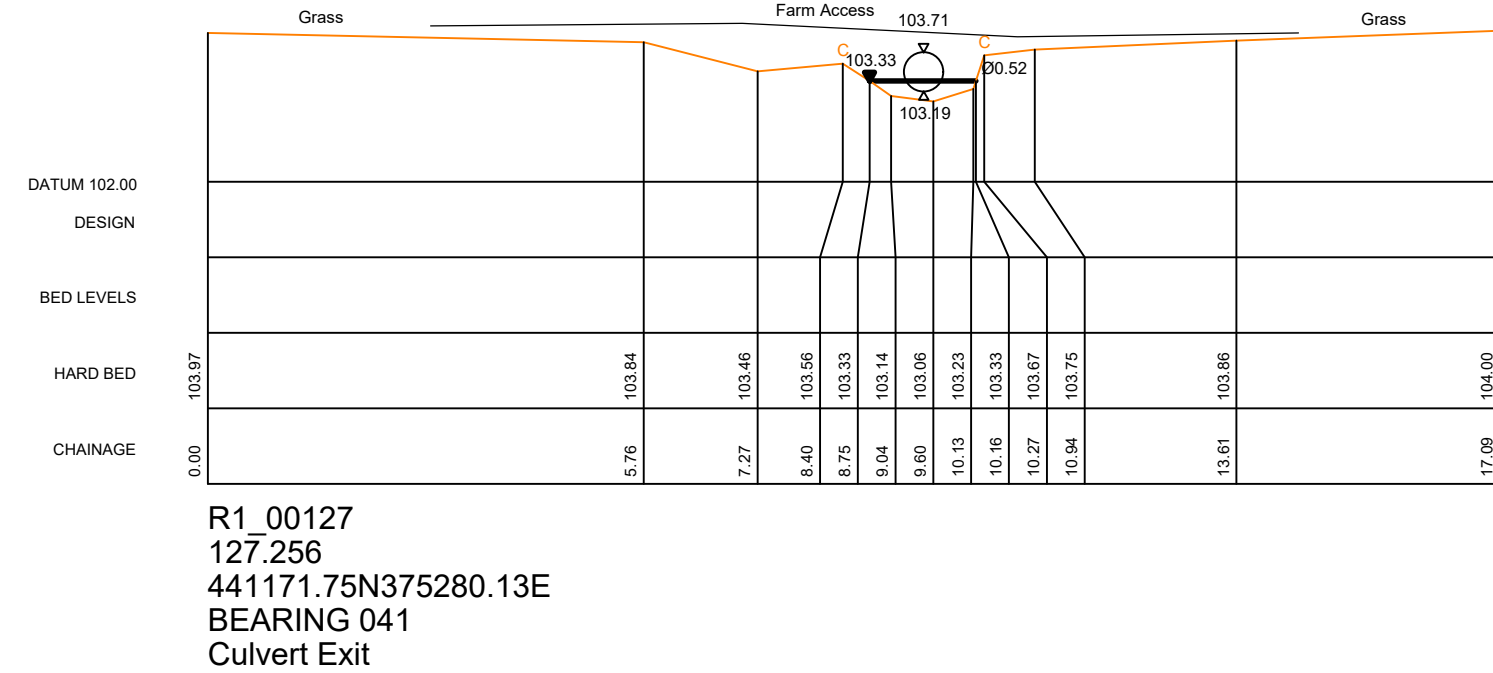
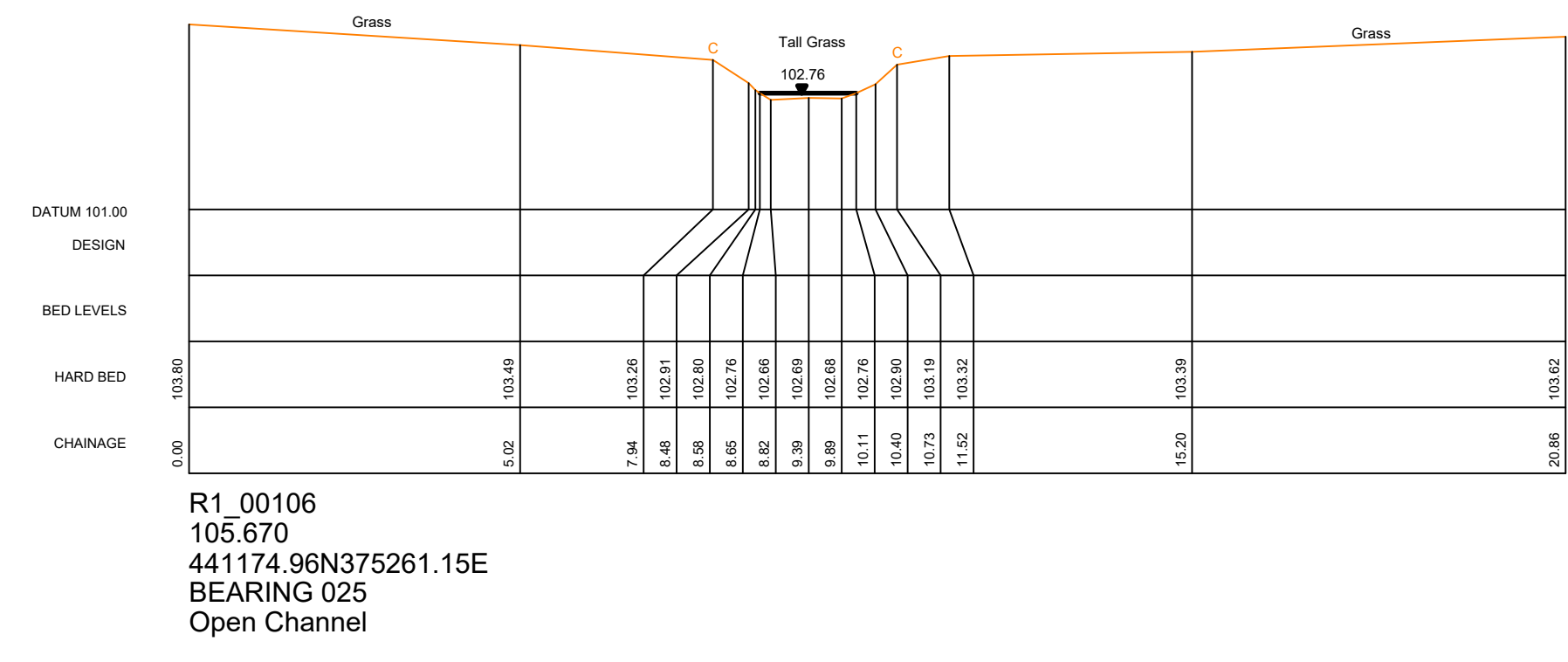
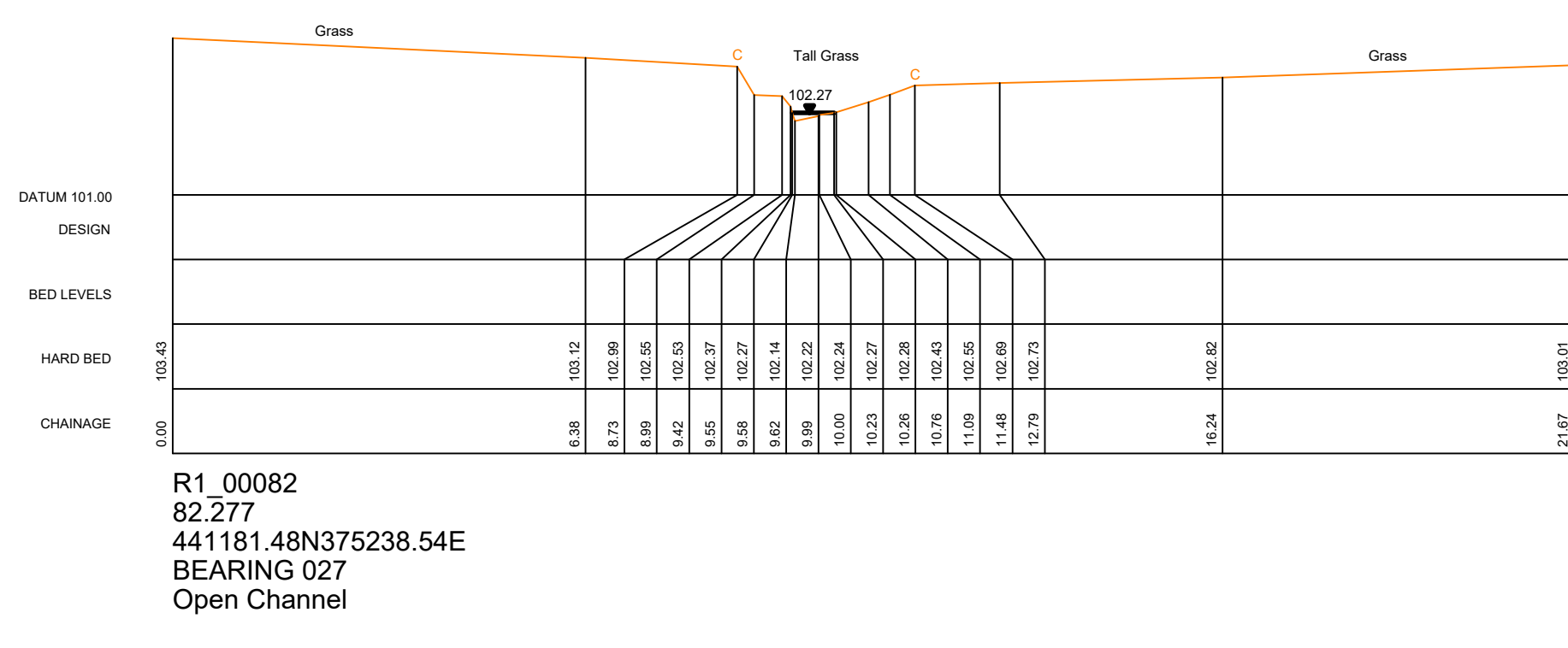
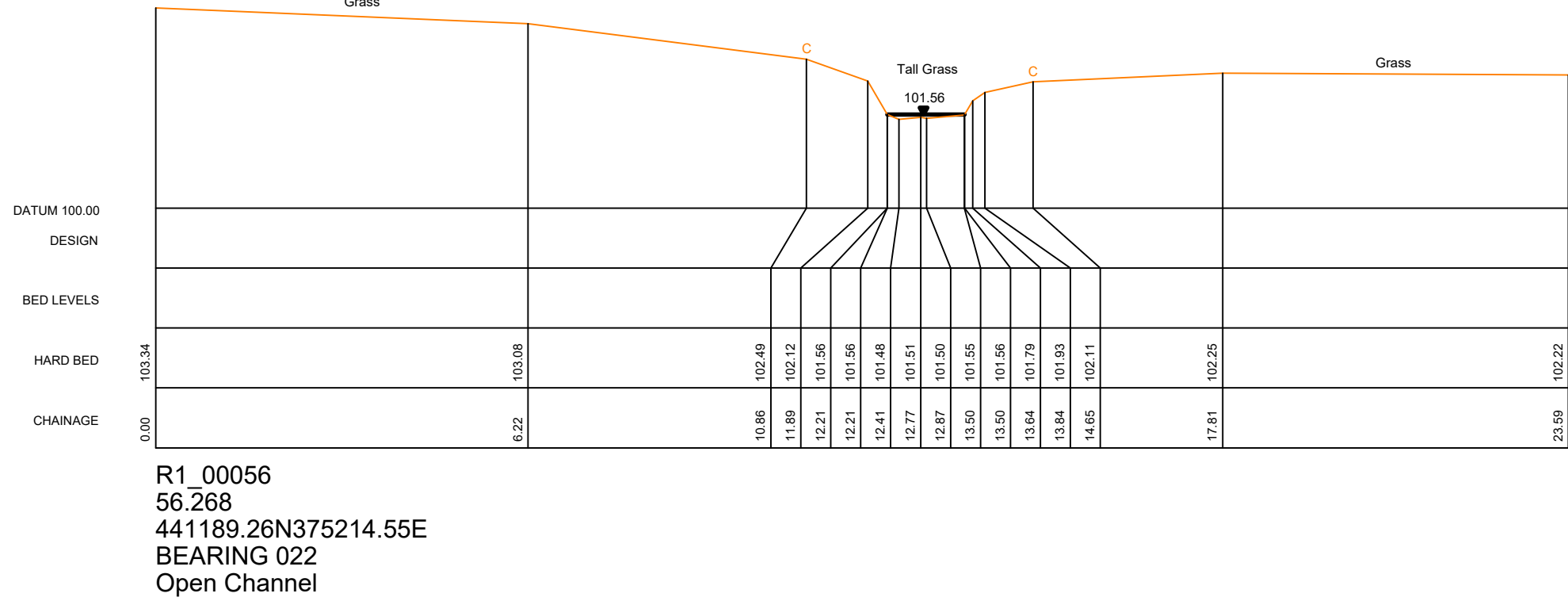
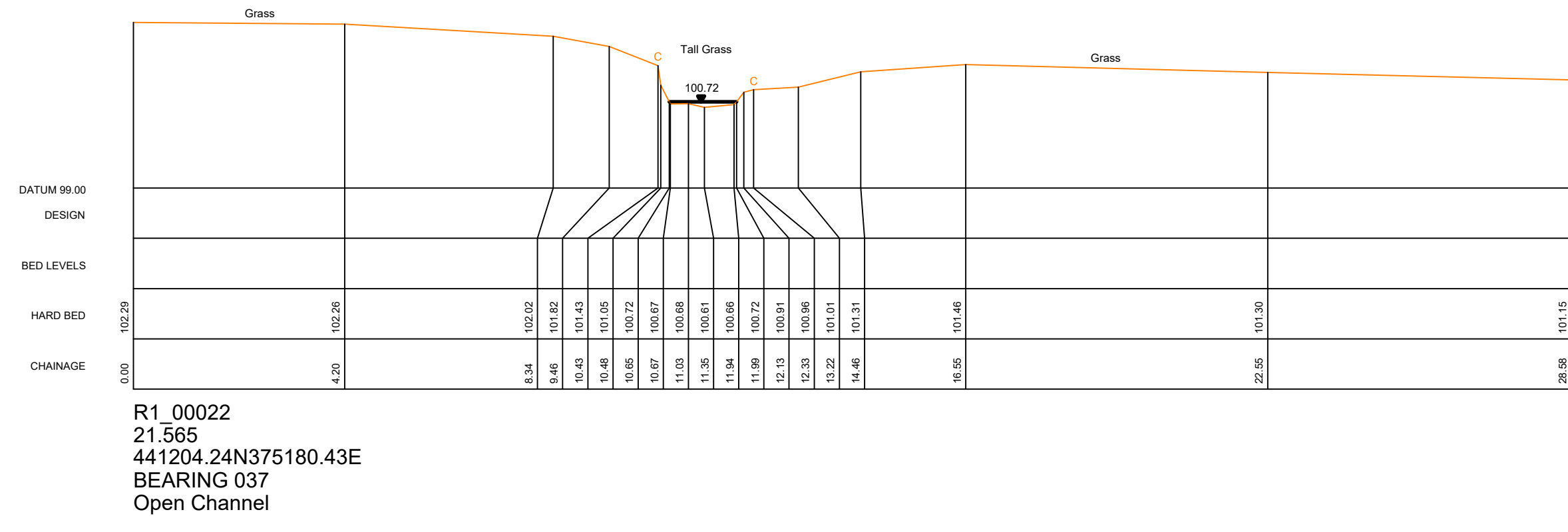
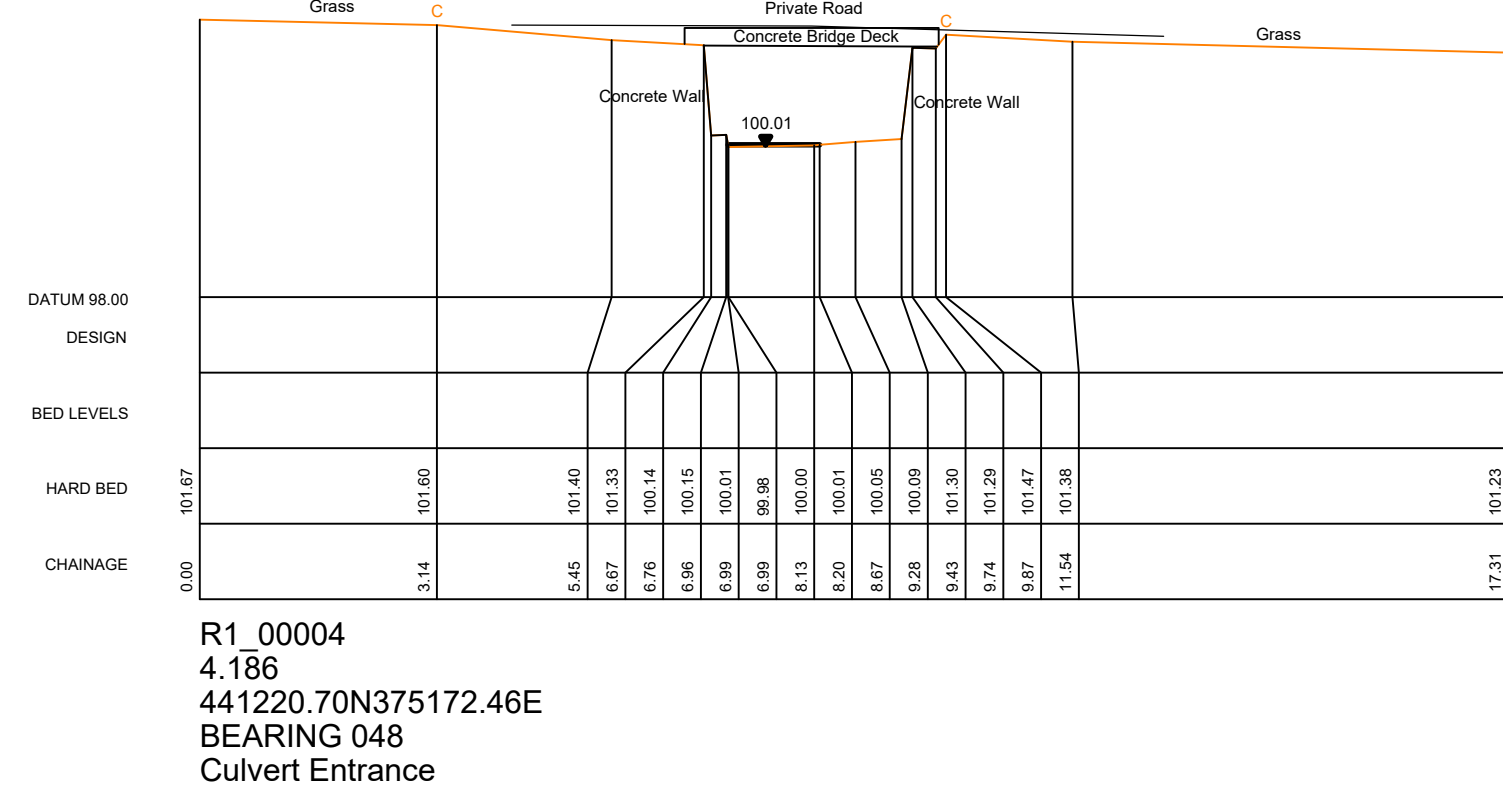
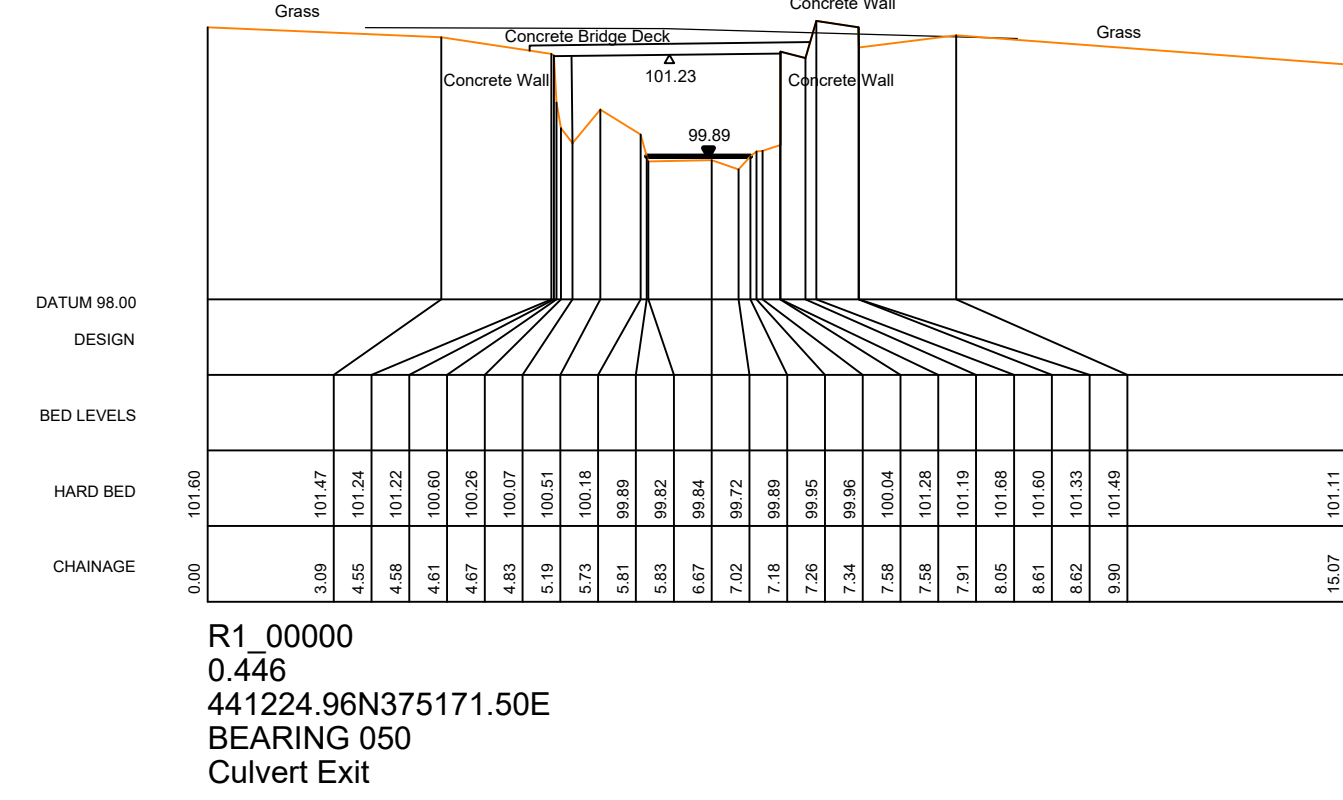
Notes

1. Do not scale this drawing. All dimensions must be checked/verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.
5. No scale factor has been applied to this survey, therefore the as coordinates are to be treated as arbitrary. Please refer to survey station information below for on site control establishment.
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7. All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space entry.
8. OS license number: 100022432

Legend

	OS Buildings		Contour Lines
	Building		Flow direction and pipe damper
	Wall		Station and Name
	Kerb Channel Line		Monitoring Borehole
	Top of Kerb		Tree / Bush / Sapling
	Edge of Surface		Area of Vegetation/ Extent of Tree Canopy
	Top of Bank		Hedge
	Bottom of Bank		Body of Water
	Canopy / Overhang		Body of Water from OS
	Line Marking		Spot Level
	Centre Line		Assumed Surface Water Drainage Line
	Watercourse		Surface Water Drainage Line
	Centre Line		
	Barrier		
	Fence		
	Gate		
	Overhead Powerline		
	Overhead Utilities		

AP	Anchor Point	FBW	Fence Barbed Wire	LB	Litter Bin
BS	Back Gully	FCD	Fence Closed Board	LFP	Lamp Post
BD	Bollard	FCL	Fence Chain Link	MH	Manhole
BS	Box Stop	FEL	Fence Electric	MW	Service Marker
BT	British Telecom	FMP	Fence Metal Panel	PS	Post Box
C	Crest	FMR	Fence Metal Rolling	PT	Post
CL	Cover Level	FOS	Fence Open Board	RE	Roading Eye
CMP	Cable Marker	FPW	Fence Post & Wire	SP	Sign Post
Post	Post	FSP	Fence Steel Palisade	ST	Stop Tap
CCTV/Security Camera	FVM	Fence Wire Mesh	SV	Stop Valve	
CTV	Cable TV	FFL	Finished Floor Level	TGB	Telephone
DK	Drainage	FP	Flagpole		Call Box
Channel	Gas	GV	Gas Valve	TL	Threshold Light
DC	Drop Kerb	GV	Gas Valve	TL	Traffic Light
DP	Down Pipe	GV	Gully	TP	Telegraph Post
ELC	Electric	HT	Height	TS	Traffic Signal
EP	Electricity Post	IC	Inspection Chamber	UTS	Unable to Survey
ER	Earth Road	IFL	Internal Floor Level	WL	Water Level
FH	Fire Hydrant	IL	Invert Level	WM	Water Meter
FL	Floodlight		(as a reduced level)	WQ	Wash Out



P1	08.12.25	First Issue	AL	BS
Rev	Date	Details of Issue / Revision	Drawn	Rev
Issues & Revisions				
Birmingham Lewisham London Manchester Nottingham 0121 233 3322 0113 233 8000 020 7407 3879 0161 233 4280 0115 924 1100 www.bwbconsulting.com				

Client
RICHBOROUGH ESTATES LTD

Project Title
LAND AT PENDLE ROAD, CLITHEROE

Drawing Title
WATERCOURSE SURVEY EXISTING SECTIONS SHEET 1 OF 3

Drawn:	J.LODGE	Reviewed:	S.SHREEVES
BWB Ref:	255496	Date:	08.12.25
Scale:	As Shown	Scale:	1:100
Drawing Status			
INFORMATION			
Project - Originator - Zone - Level - Type - Role - Number			
255464-BWB-01-01-DR-G-0060	S2	Rev	P1

Appendix 4: United Utilities Sewer Records

ariya shademani

Waterfront House, Floor 5
Station St, United Kingdom
Nottingham, United Kingdom
NG2 3DQ

FAO:

How to contact us:

**United Utilities Water Limited
Property Searches
Haweswater House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP**

Telephone: 0370 7510101

E-mail: propertysearches@uuplc.co.uk

**Your Ref: 255496
Our Ref: UUPS-ORD-684874
Date: 16/10/2025**

Dear Sirs

Location: 1 NORTH GATE, CLITHEROE, BB7 1FS

I acknowledge with thanks your request dated 15/10/2025 for information on the location of our services.

Please find enclosed plans showing the approximate position of United Utilities' apparatus known to be in the vicinity of this site.

The enclosed plans are being provided to you subject to the United Utilities terms and conditions for both the wastewater and water distribution plans which are shown attached.

If you are planning works anywhere in the North West, please read United Utilities' access statement before you start work to check how it will affect our network. <http://www.unitedutilities.com/work-near-asset.aspx>.

I trust the above meets with your requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please [contact us](#).

Yours Faithfully,



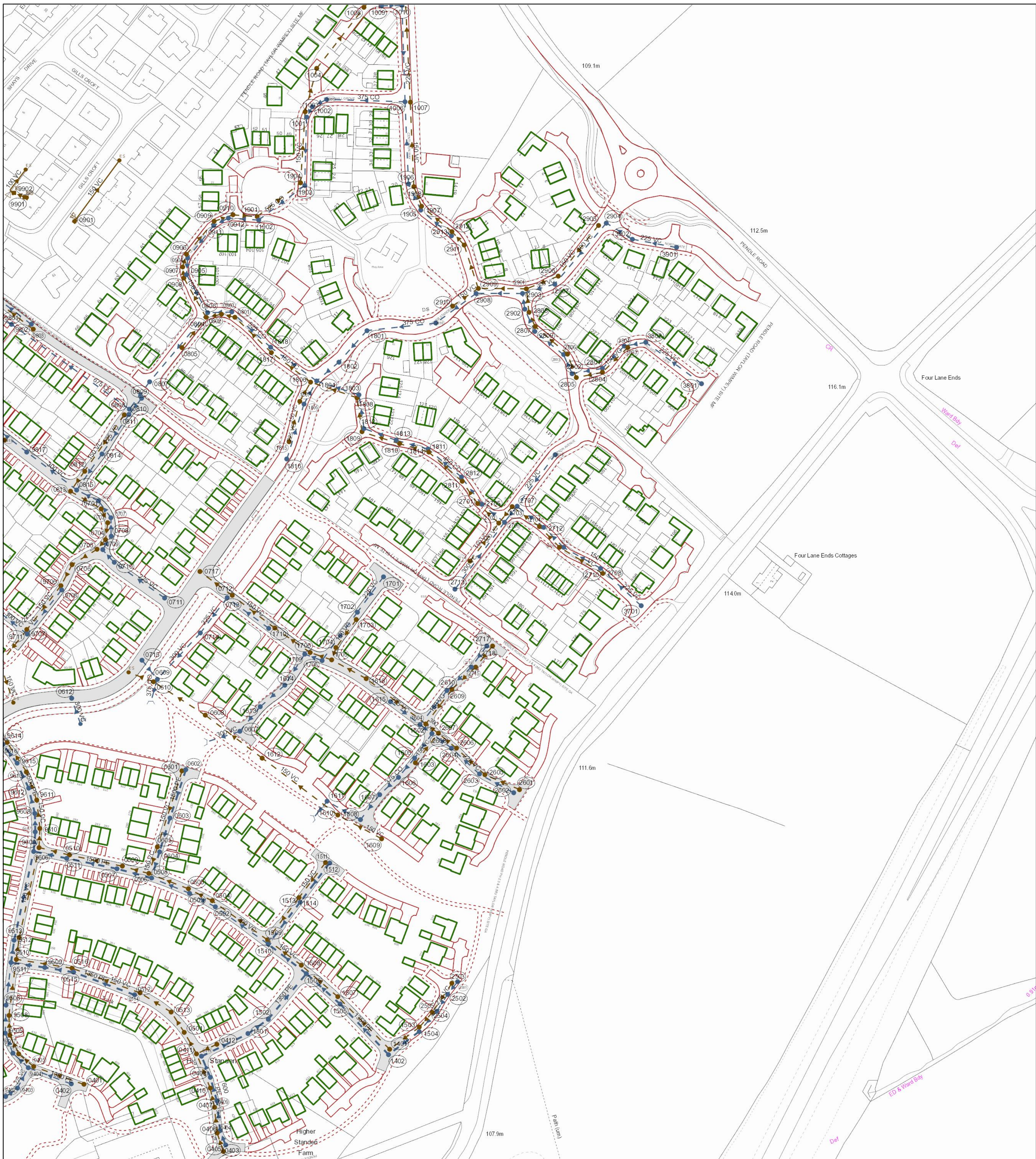
Karen McCormack
Property Searches Manager

TERMS AND CONDITIONS - WASTEWATER AND WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUWL apparatus) of United Utilities Water Limited "(UUWL)".

TERMS AND CONDITIONS:

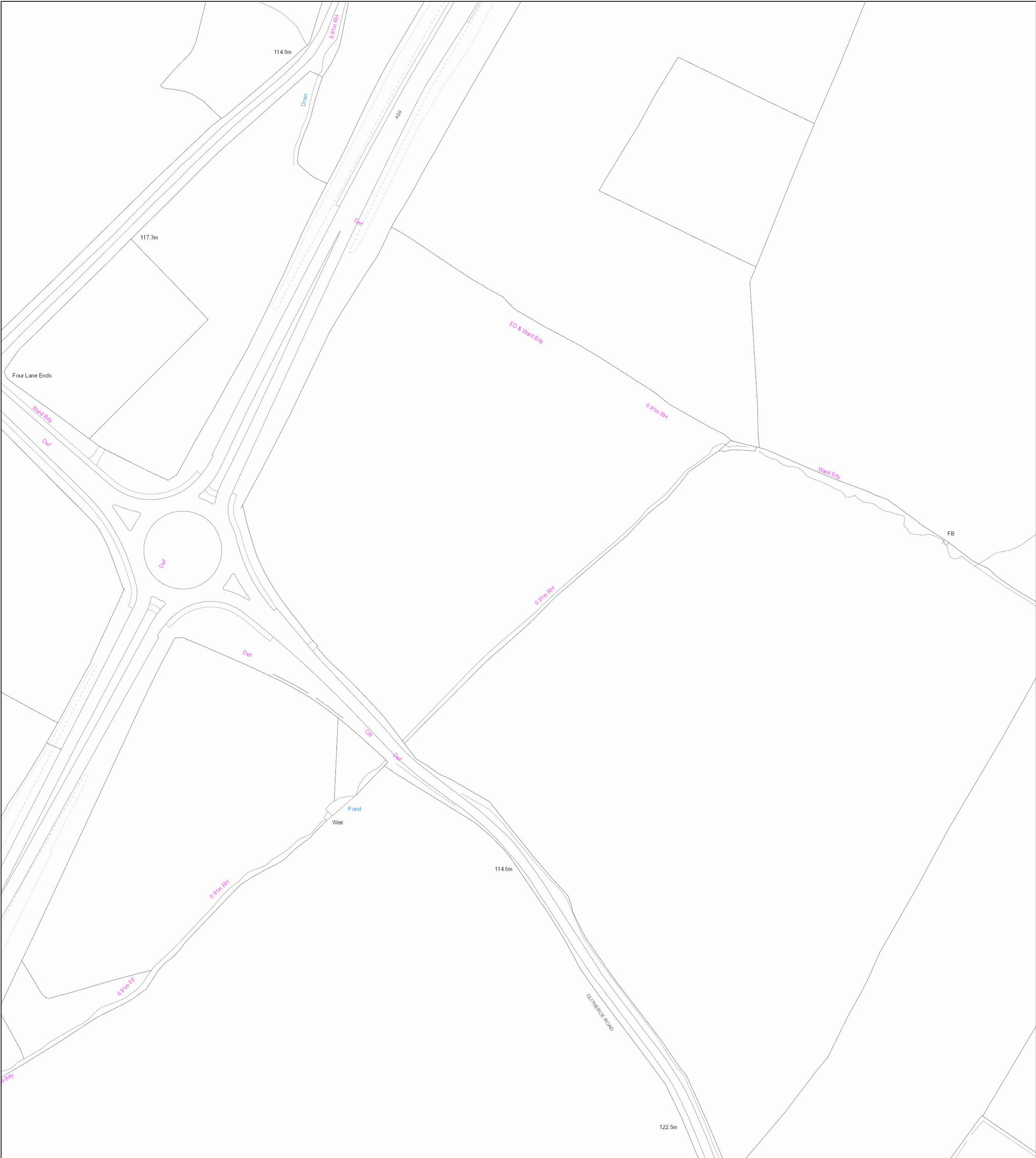
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- This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUWL apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.
- No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUWL apparatus by reason of the actual position and/or depths of UUWL apparatus being different from those shown on the Map and any information supplied with it.
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- This agreement shall be governed by English law and all parties submit to the exclusive jurisdiction of the English courts, save that nothing will prevent UUWL from bringing proceedings in any other competent jurisdiction, whether concurrently or otherwise.



The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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Refo	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
2704	111.62	FO	108.10	150			VC	18.5023	1 in 71
9906	108.45	FO	105.55	150			VC	23.83224	1 in 131
2705	110.97	SW	108.14	450			CO	18.79618	1 in 134
1818	109.8	SW	106.08	150			VC	28.99627	1 in 121
2911	111.41	FO	105.27	150			VC	10.04165	1 in 101
2911	111.41	FO	105.27	150			VC	10.04165	1 in 101
0910	109.01	FO	105.29	150			VC	13.369	1 in 134
0910	109.01	FO	105.29	150			VC	13.369	1 in 134
1003	108.79	FO	104.67	150			VC	24.8117	1 in 131
1003	108.79	FO	104.67	150			VC	24.8117	1 in 131
2706	111.17	SW	108.26	450			CO	15.82645	1 in 132
2810	111.35	SW	108.37	375			CO	38.21778	1 in 239
1001	108.82	SW	105.27	375			CO	37.8916	1 in 314
1001	108.82	SW	105.27	375			CO	37.8916	1 in 314
0906	108.8	FO	105.37	150			VC	11.02816	1 in 138
0909	108.8	FO	105.37	150			VC	11.02816	1 in 138
1902	109.31	SW	104.92	525			VC	16.65288	1 in 416
2708	112.54	FO	111.19	150			VC	27.83427	1 in 52
2801	112.37	SW	110.34	225			VC	16.82096	1 in 89
1904	109.76	FO	104.96	150			VC	39.23731	1 in 135
1904	109.76	FO	104.96	150			VC	39.23731	1 in 135
2714	110.59	FO	109.24	150			VC	26.3738	1 in 80
1817	109.94	FO	106.59	150			VC	27.56534	1 in 133
2912	111.5	FO	108.63	150			VC	21.75549	1 in 128
2912	111.5	FO	108.63	150			VC	21.75549	1 in 128
1810	110.39	FO	108.37	150			VC	21.86951	1 in 136
1803	110.38	SW	107.41	450			CO	24.81953	1 in 25
2905	111.29	FO	108.85	150			VC	35.87725	1 in 79
2905	111.29	FO	108.85	150			VC	35.87725	1 in 79
2903	111.36	SW	108.89	225			VC	25.59502	1 in 233
2808	111.44	FO	110.09	150			VC	12.87929	1 in 16
1008	109.66	SW	105.47	375			VC	10.25334	1 in 309
1008	109.66	SW	105.47	375			VC	10.25334	1 in 309
2811	110.81	FO	108.68	150			VC	24.44998	1 in 136
2702	111.12	FO	110.85	150			VC	15.84047	1 in 132
3802	112.9	SW	111.17	225			VC	12.13595	1 in 38
2802	112.18	FO	108.51	225			VC	15.53112	1 in 55
2913	111.33	SW	108.2	225			VC	21.87244	1 in 137
2913	111.33	SW	108.2	225			VC	21.87244	1 in 137
2906	111.57	FO	108.4	150			VC	18.85687	1 in 135
2711	111.97	SW	110.15	225			VC	15.52952	1 in 49
2709	112	FO	110.85	150			VC	15.87895	1 in 241
3801	113.58	SW	112.16	225			VC	38.24902	1 in 39
0905	108.45	FO	105.6	150			VC	21.53845	1 in 79
2703	111.36	FO	110.01	150			VC	11.89808	1 in 49
1909	110.23	SW	108.21	150			VC	18.87087	1 in 138
1002	108.74	SW	105.3	375			VC	6.53738	1 in 218
1002	108.74	SW	105.3	375			VC	6.53738	1 in 218
3803	112.68	SW	110.85	225			VC	17.13883	1 in 55
1906	110.85	SW	107.92	225			VC	45.38987	1 in 133
1906	110.85	SW	107.92	225			VC	45.38987	1 in 133
0912	108.99	SW	104.88	525			VC	8.903517	1 in 450
0912	108.99	SW	104.88	525			VC	8.903517	1 in 450
0911	108.79	SW	104.86	525			VC	23.02457	1 in 384
0911	108.79	SW	104.86	525			VC	23.02457	1 in 384
1903	109.78	SW	105	525			VC	31.71834	1 in 306
1903	109.78	SW	105	525			VC	31.71834	1 in 306
1903	109.78	SW	105	525			VC	31.71834	1 in 306
2713	110.24	SW	108.3	300			VC	48.82742	1 in 241
1801	111.35	SW	108.21	375			VC	23.27767	1 in 233
1807	109.89	FO	107.77	150			VC	12.10073	1 in 81
0907	108.46	FO	105.6	150			VC	7.3142	1 in 146
1008	111.97	SW	110.07	150			VC	35.81972	1 in 132
1008	111.97	SW	110.07	150			VC	35.81972	1 in 132
1804	110.47	FO	108.34	300			VC	31.34996	1 in 121
1815	109.21	FO	107.56	150			VC	23.88027	1 in 80
0411	110.56	FO	106.5	150			VC	16.88103	1 in 128
3902	111.58	SW	110.15	225			VC	16.76263	1 in 23
3902	111.58	SW	110.15	225			VC	16.76263	1 in 23
3901	112.28	SW	110.86	225			VC	24.77324	1 in 35
3901	112.28	SW	110.86	225			VC	24.77324	1 in 35
1803	110.86	SW	108.3	225			VC	8.54026	1 in 69
2902	111.39	SW	109.36	300			VC	8.815686	1 in 13
3804	112.72	FO	111.37	150			VC	19.69822	1 in 16
0806	109.14	SW	104.56	675			CO	49.62674	1 in 414
2804	112.34	FO	110.89	150			VC	14.68467	1 in 86
2909	111.24	FO	109.06	150			VC	25.0345	1 in 58
1010	107.87	SW	105.83	225			VC	53.15542	1 in 171
1010	107.87	SW	105.83	225			VC	53.15542	1 in 171
2806	111.96	FO	110.61	150			VC	23.49815	1 in 62
1816	108.8	FO	107.22	150			VC	31.75594	1 in 81
2701	110.85	FO	108.79	150			VC	15.00384	1 in 136
0804	108.1	FO	106.29	150			VC	24.51453	1 in 81
1808	110.31	FO	108.07	150			VC	27.02514	1 in 28
2805	112.17	FO	110.82	150			VC	13.53002	1 in 88
2910	111.39	FO	110.04	150			VC	17.15883	1 in 82
3701	113.04	SW	111.62	225			VC	30.40685	1 in 32
0805	108.53	SW	104.77	525			VC	23.85901	1 in 388
1005	108.77	SW	105.33	375			VC	8.89919	1 in 297
1005	108.77	SW	105.33	375			VC	8.89919	1 in 297
2812	110.78	SW	108	450			VC	24.07946	1 in 134
1908	111	FO	108.38	150			VC	48.71589	1 in 133
1908	111	FO	108.38	150			VC	48.71589	1 in 133
2712	111.68	SW	109.83	225			VC	18.7362	1 in 69
2710	112.48	SW	110.86	225			VC	23.5044	1 in 46
1009	107.39	SW	106	225			VC	11.27438	1 in 161
1009	107.39	SW	106	225			VC	11.27438	1 in 161
2707	111.39	SW	110.65	225			VC	35.44416	1 in 33
2707	111.39	SW	110.65	225			VC	35.44416	1 in 33
0801	109.48	FO	108.71	150			VC	11.8999	1 in 53
1812	110.25	SW	107.54	450			VC	7.662889	1 in 128
0803	109.41	SW	105.84	525			VC	18.72416	1 in 144
2904	111.26	SW	109.36	300			VC	13.93037	1 in 122
2904	111.26	SW	109.36	300			VC	13.93037	1 in 122
2904	111.26	SW	109.36	300			VC	13.93037	1 in 122
1806	110.39	FO	107.12	150			VC	44.11549	1 in 79
2901	111.37	FO	108.26	150			VC	44.11549	1 in 79
1007	108.66	FO	108.03	150			VC	27.01934	1 in 135
1007	108.66	FO	108.03	150			VC	26.81645	1 in 133
1007	108.66	FO	108.03	150			VC	26.81645	1 in 133
1007	108.66	FO	108.03	150			VC	80.4076	1 in 29
2908	111.28	SW	108.48	375			VC	89.4076	1 in 29
0802	109.04	FO	106.65	150			VC	27.66966	1 in 252
0904	108.46	SW	104.8	525			VC	8.844891	1 in 72
1814	110.54	SW	107.82	450			VC	9.222712	1 in 307
0908	108.53	FO	106.22	150			VC	18.28142	1 in 141
1907	111.32	FO	108.46	150			VC	6.071609	1 in 10
1907	111.32	FO	108.46	150			VC	11.56567	1 in 145
2809	111.61	SW	109.71	300			VC	11.56566	1 in 145
1901	109.28	FO	108.19	150			VC	13.33104	1 in 38
1901	109.28	FO	108.19	150			VC	30.26267	1 in 132
1004	107.74	FO	104.48	150			VC	30.40685	1 in 137
1004	107.74	FO	104.48	150			VC	42.54041	1 in 137
1905	111.33	SW	108.04	225			VC	15.80745	1 in 133
1905	111.33	SW	108.04	225			VC	15.80745	1 in 133
2907	111.52	SW	108.8	300			VC	18.41929	1 in 142
1802	110.38	SW	108.11	375			VC	16.03099	1 in 229
0412	108.46	FO	106.53	150			VC	12.338	1 in 14
0708	104.88	SW	102.77	300			VC	10.80116	1 in 102
0702	105.09	SW	102.36	300			VC	13.4418	1 in 96
9505	104.95	FO	100.98	1350			PE	15.38495	1 in 385
1708	107.58	SW	106.16	225			VC	10.14176	1 in 25
9510	104.34	FO	102.99	150			VC	12.11884	1 in 121
2808	110.17	SW	108.07	225			VC	13.42779	1 in 43
2808	110.17	SW	108.07	225			VC	16.6261	1 in 277
0509	104.85	FO	102.82						



The position of the underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. United Utilities Water will not accept liability for any loss or damage caused by the actual position being different from those shown.

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Reho	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
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Reho	Cover	Func	Invert	Size x	Size y	Shape	Matl	Length	Grad
------	-------	------	--------	--------	--------	-------	------	--------	------

LEGEND

Abandoned	Foul	Surface Water	Combined	Public Sewer
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----

All point assets follow the standard colour convention:
red - combined
blue - surface water
brown - foul
purple - overflow

Manhole	Side Entry Manhole
Head of System	Outfall
Extent of Survey	Screen Chamber
Rodding Eye	Inspection Chamber
Inlet	Bifurcation Chamber
Discharge Point	Lamp Hole
Vortex	T Junction / Saddle
Penstock	Catchpit
Washout Chamber	Valve Chamber
Valve	Vent Column
Air Valve	Vortex Chamber
Non Return Valve	Penstock Chamber
Soakaway	Network Storage Tank
Gully	Sewer Overflow
Cascade	Ww Treatment Works
Flow Meter	Ww Pumping Station
Hatch Box	Septic Tank
Oil Interceptor	Control Kiosk
Summit	DNM Network Monitoring Point
Drop Shaft	Change of Characteristic
Orifice Plate	

MANHOLE FUNCTION

FO	Foul
SW	Surface Water
CO	Combined
OV	Overflow

SEWER SHAPE

CI	Circular	TR	Trapezoidal
EG	Egg	AR	Arch
OV	Oval	BA	Barrel
FT	Flat Top	HO	HorseShoe
RE	Rectangular	UN	Unspecified
SQ	Square		

SEWER MATERIAL

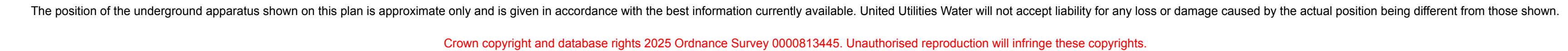
AC	Asbestos Cement
BR	Brick
PE	Polyethylene
RP	Reinforced Plastic Matrix
CO	Concrete
CSB	Concrete Segment Bolted
CSU	Concrete Segment Unbolted
CC	Concrete Box Culvert
PSC	Plastic / Steel Composite
GRC	Glass Reinforced Plastic
DI	Ductile Iron
PVC	Polyvinyl Chloride
CI	Cast Iron
SI	Spun Iron
ST	Steel
VC	Vitrified Clay
PP	Polypropylene
PF	Pitch Fibre
MAC	Masonry, Coursed
MAR	Masonry, Random
U	Unspecified

Address or Site Reference:

1 NORTH GATE,
CLITHEROE,
BB7 1FS

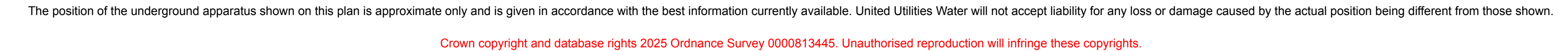
OS sheet SD7540NE
Number:
Scale: 1:1250 Date: 16/10/2025
Nodes: 0
Sheet: 2 of 4

Printed by: Property Searches



**SEWER
RECORDS**

 **United
Utilities**



Appendix 5: Existing Runoff Rates

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	14/10/2025
Calculated by	
Reference	
Model version	2.2.1

Location

Site name	
Site location	



Site easting (British National Grid)	375411
Site northing (British National Grid)	441062

Site details

Total site area (ha)	1	ha
----------------------	--------------------------------	----

Greenfield runoff

Method

Method	IH124	
IH124		
	<u>My value</u>	<u>Map value</u>
SAAR (mm)	1241 mm	1241
How should SPR be derived?	WRAP soil type	
WRAP soil type	4	4
SPR	0.47	
QBar (IH124) (l/s)	9.4 l/s	

Growth curve factors

	<u>My value</u>	<u>Map value</u>
Hydrological region	10	10
1 year growth factor	0.87	
2 year growth factor	0.93	
10 year growth factor	1.38	
30 year growth factor	1.7	
100 year growth factor	2.08	
200 year growth factor	2.37	

Results

Method	IH124
Flow rate 1 year (l/s)	8.2 l/s
Flow rate 2 year (l/s)	8.8 l/s
Flow rate 10 years (l/s)	13.0 l/s
Flow rate 30 years (l/s)	16.0 l/s
Flow rate 100 years (l/s)	19.6 l/s
Flow rate 200 years (l/s)	22.4 l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.1) developed by HR Wallingford and available at uksuds.com (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

Appendix 6: Causeway Flow Network Calculations

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)	1.200
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)	Invert Level (m)
Catchment 3	2.160	5.00	110.000		42.506	45.451	1.400	108.600
Catchment 2	0.900	5.00	103.000		-12.942	72.594	1.400	101.600
Catchment 1	1.010	5.00	102.500		-4.397	89.629	1.400	101.100
Catchment 3 outfall	0.000		107.950	1200	40.356	62.124	0.650	107.300
Catchment 2 Outfall	0.000		102.400	1200	-15.166	81.962	1.800	100.600
Catchment 1 outfall			102.400	1200	-12.167	80.607	1.800	100.600

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)
2.000	Catchment 3	Catchment 3 outfall	25.000	0.600	108.600	107.300	1.300	19.2	300	5.12	0.0
3.000	Catchment 2	Catchment 2 Outfall	17.000	0.600	101.600	100.600	1.000	17.0	225	5.09	0.0
1.000	Catchment 1	Catchment 1 outfall	40.000	0.600	101.100	100.600	0.500	80.0	225	5.46	0.0

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
2.000	3.601	254.5	0.0	1.100	0.350	2.160	0.0	0	0.000
3.000	3.189	126.8	0.0	1.175	1.575	0.900	0.0	0	0.000
1.000	1.463	58.2	0.0	1.175	1.575	1.010	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)
2.000	25.000	19.2	300	Circular	110.000	108.600	1.100	107.950	107.300	0.350
3.000	17.000	17.0	225	Circular	103.000	101.600	1.175	102.400	100.600	1.575
1.000	40.000	80.0	225	Circular	102.500	101.100	1.175	102.400	100.600	1.575

Link	US Node	Node Type	DS Node	Dia (mm)	Node Type	MH Type
2.000	Catchment 3	Junction	Catchment 3 outfall	1200	Manhole	Adoptable
3.000	Catchment 2	Junction	Catchment 2 Outfall	1200	Manhole	Adoptable
1.000	Catchment 1	Junction	Catchment 1 outfall	1200	Manhole	Adoptable

Manhole Schedule

Node	Easting (m)	Northing (m)	CL (m)	Depth (m)	Dia (mm)	Connections	Link	IL (m)	Dia (mm)
Catchment 3	42.506	45.451	110.000	1.400					
						0	2.000	108.600	300
Catchment 2	-12.942	72.594	103.000	1.400					
						0	3.000	101.600	225
Catchment 1	-4.397	89.629	102.500	1.400					
						0	1.000	101.100	225
Catchment 3 outfall	40.356	62.124	107.950	0.650	1200		1	2.000	107.300
Catchment 2 Outfall	-15.166	81.962	102.400	1.800	1200		1	3.000	100.600
Catchment 1 outfall	-12.167	80.607	102.400	1.800	1200		1	1.000	100.600

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Detailed	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	✓
Winter CV	1.000	Additional Storage (m³/ha)	0.0	100 year 360 minute (m³)	1825

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	50	0	0

Pre-development Discharge Volume

Site Makeup	Greenfield	Return Period (years)	100
Greenfield Method	FSR/FEH	Climate Change (%)	0
Positively Drained Area (ha)	5.460	Storm Duration (mins)	360
Soil Index	4	Betterment (%)	0
SPR	0.47	PR	0.514
CWI	125.470	Runoff Volume (m³)	1825

Node Catchment 3 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Downstream Link	2.000	Sump Available	✓
Replaces Downstream Link	x	Product Number	CTL-SHE-0228-2750-1000-2750
Invert Level (m)	108.600	Min Outlet Diameter (m)	0.300
Design Depth (m)	1.000	Min Node Diameter (mm)	1800
Design Flow (l/s)	27.5		

Node Catchment 2 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	101.600	Product Number	CTL-SHE-0152-1100-1000-1100
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	11.0	Min Node Diameter (mm)	1500

Node Catchment 1 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	x	Sump Available	✓
Invert Level (m)	101.100	Product Number	CTL-SHE-0163-1280-1000-1280
Design Depth (m)	1.000	Min Outlet Diameter (m)	0.225
Design Flow (l/s)	12.8	Min Node Diameter (mm)	1500

Node Catchment 3 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00030	Safety Factor	2.0	Invert Level (m)	108.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	1440.0	0.0	1.500	2380.0	0.0

Node Catchment 2 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00030	Safety Factor	2.0	Invert Level (m)	101.500
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	480.0	0.0	1.500	1240.0	0.0

Node Catchment 1 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.00030	Safety Factor	2.0	Invert Level (m)	101.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	

Depth (m)	Area (m ²)	Inf Area (m ²)	Depth (m)	Area (m ²)	Inf Area (m ²)
0.000	590.0	0.0	1.500	1165.0	0.0

Results for 100 year +50% CC Critical Storm Duration. Lowest mass balance: 99.99%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute summer	Catchment 3	720	109.570	0.970	184.7	1899.9680	0.0000	SURCHARGED
960 minute summer	Catchment 2	735	102.536	0.936	76.9	769.5833	0.0000	SURCHARGED
960 minute summer	Catchment 1	720	102.086	0.986	86.4	866.8740	0.0000	SURCHARGED
60 minute winter	Catchment 3 outfall	270	107.366	0.066	27.4	0.0000	0.0000	OK
2880 minute winter	Catchment 2 Outfall	1320	100.645	0.045	11.0	0.0000	0.0000	OK
30 minute winter	Catchment 1 outfall	157	100.671	0.071	12.8	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)
960 minute summer	Catchment 3	2.000	Catchment 3 outfall	27.4	2.361	0.108	0.2903	1331.6
960 minute summer	Catchment 3	Infiltration		0.0				
960 minute summer	Catchment 2	3.000	Catchment 2 Outfall	11.0	1.952	0.087	0.0957	563.9
960 minute summer	Catchment 2	Infiltration		0.0				
960 minute summer	Catchment 1	1.000	Catchment 1 outfall	12.8	1.178	0.220	0.4342	643.2
960 minute summer	Catchment 1	Infiltration		0.0				

Appendix 7: Illustrative Drainage Strategy



Detention Basin 1
CL: 102.50
Basin base level (IL): 101.00
Outlet invert level: 101.10 (set 100mm above the basin base)
Maximum water depth: 1.0m (from outlet level)
Minimum freeboard: 400mm
Maximum water volume: 865m³
Total approximate footprint: 1,165m²
Proposed discharge rate: 12.8l/s

3m maintenance walkway buffer.
1:4 minimum internal side slopes.

Indicative Type 3 Pumping Station
To be accessed via public highway.
15m easement from wetwell to nearest dwelling and third-party land.

Location and details to be confirmed in detailed design.

Catchment 1
Total catchment area: 1.24ha
Assumed residential plots (65% + 10% urban creep): 0.89ha
Surface level suds footprint (100%): 0.12ha

Assumed catchment total impermeable area: 1.01ha
Discharge rate: 12.8l/s

The basin levels are set 100mm below the outlet invert level.
This provides dedicated storage to accommodate the runoff generated by the first 5mm rainfall event in accordance with the SuDS interception requirement.

Any exceedance above this depth will discharge via the outlet control at the equivalent greenfield runoff rate. More information can be found in the SDS (255496-BWB-ZZ-XX-T-W-0002_SDS)

Detention Basin 2
CL: 103.00
Basin base level (IL): 101.50
Outlet invert level: 101.60 (set 100mm above the basin base)
Maximum water depth: 1.0m (from outlet level)
Minimum freeboard: 400mm
Maximum water volume: 770m³
Total approximate footprint: 1,240m²
Proposed discharge rate: 11.0l/s

3m maintenance walkway buffer.
1:4 minimum internal side slopes.

MH1103
Proposed connection to foul manhole is subject to confirmation by UU

Catchment 2
Total catchment area: 1.04ha
Assumed residential plots (65% + 10% urban creep): 0.74ha
Surface level suds footprint (100%): 0.13ha

Assumed catchment total impermeable area: 0.90ha
Discharge rate: 11.0l/s

Swale proposed to intercept and divert overland flow to the Shaw Brook. Refer to FRA: 255496-BWB-ZZ-XX-T-W-0001_FRA for further details

Detention Basin 3
CL: 110.00
Basin base level (IL): 108.50
Outlet invert level: 108.60 (set 100mm above basin base)
Maximum water depth: 1.0m (from outlet level)
Minimum freeboard: 400mm
Maximum water volume: 1,900m³
Total approximate footprint: 2,380m²
Proposed discharge rate: 27.5l/s

3m maintenance walkway buffer.
1:4 minimum internal side slopes.

Development levels to tie in with basin levels

Catchment 3
Total catchment area: 2.69ha
Assumed residential plots (65% + 10% urban creep): 1.92ha
Surface level suds footprint (100%): 0.24ha

Assumed catchment total impermeable area: 2.16ha
Discharge rate: 27.5l/s

Notes

- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
- Any discrepancies noted on site are to be reported to the engineer immediately.
- The discharge rate has been calculated based on a greenfield run off rate of 9.4l/s/ha multiplied by the total developable area.
- Outfalls are subject to confirmation by the LLFA and United Utilities.
- Surface water extents and flood map for planning from EA data.
- Sewer locations based on Anglian Water asset records.
- Masterplan based on Pegasus drawing reference 'P25-2352_DE_002_01 D' dated 19.09.2025.
- The topographic survey is based on BWB drawing reference '255496-BWB-03-ZZ-DR-G-0001' dated 21.08.25.
- A Cv value of 1 has been used to design the basins. All basins have been designed to accommodate the 1 in 100-year + 50% critical storm event with a 400mm freeboard. The attenuation calculations has been undertaken using Flood Estimation Handbook (FEH) rainfall data.
- The impermeable area of the residential developments is assumed to be 65% of the developable area. An additional 10% allowance has been included to account for urban creep.
- All detention basins to have minimum 1:4 internal side slopes and a minimum 400mm freeboard. Basin forebays and erosion protection should be considered at detailed design.

Legend

- Watercourse with 8m easement (16m total)
- Detention Basin with 3m Maintenance Easement and Earthworks
- Proposed Foul Sewers
- Existing Public Foul Sewers
- Proposed Surface Water Sewers
- Headwall
- Flow Control Chamber
- Tree Root Protection Area's
- Foul Water Pumping Station
- Proposed Foul Rising Main
- Surface Water Exceedance Flow Route
- Proposed Tree Pits
- EA Flood map for planning**
 - Flood Zone 3
 - Flood Zone 2
 - +40% CC
- EA Surface Water Flood Extents**
 - High Chance
 - Medium Chance
 - Low Chance

P04	17.02.26	Updated Masterplan	AS	RJ
P03	15.12.25	Updated Masterplan	AS	RJ
P02	24.10.25	Updated Masterplan	AS	RJ
P01	17.10.25	Preliminary Issue	AS	RJ
Rev	Date	Details of issue / revision	Drw	Rev

Issues & Revisions



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www.bwbconsulting.com

Client
RICHBOROUGH

Project Title
LAND AT PENDLE ROAD, CLITHEROE

Drawing Title
ILLUSTRATIVE DRAINAGE STRATEGY

Drawn:	A. Shademani	Reviewed:	R. Jobling
BWB Ref:	255496	Date:	17.10.25
Scale@A1:	1:1000		
Drawing Status PRELIMINARY			
Project - Originator - Zone - Level - Type - Role - Number	Status	Rev	
255469-BWB-ZZ-XX-D-NBS-0001	S2	P04	

Appendix 8: Interception of the first 5mm of rainfall Causeway Flow Calculations

Approval Settings

Node Size	x	Crossings	x	Surcharged Depth	x	First Flush	✓
Node Losses	x	Cover Depth	x	Flooding	x	Return Period (years)	1
Link Size	x	Backdrops	x	Time to Half Empty	x	First Flush Depth (mm)	5
Link Length	x	Full Bore Velocity	x	Discharge Rates	x		
Coordinates	x	Proportional Velocity	x	Discharge Volume	x		

Rainfall

Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)	Event	Peak Intensity (mm/hr)	Average Intensity (mm/hr)
1 year (first 5mm) 15 minute summer	63.145	17.868	1 year (first 5mm) 360 minute summer	4.255	0.833
1 year (first 5mm) 15 minute winter	44.312	17.868	1 year (first 5mm) 360 minute winter	4.879	0.833
1 year (first 5mm) 30 minute summer	43.012	10.000	1 year (first 5mm) 480 minute summer	3.336	0.625
1 year (first 5mm) 30 minute winter	30.184	10.000	1 year (first 5mm) 480 minute winter	3.626	0.625
1 year (first 5mm) 60 minute summer	30.650	5.000	1 year (first 5mm) 600 minute summer	2.421	0.500
1 year (first 5mm) 60 minute winter	20.363	5.000	1 year (first 5mm) 600 minute winter	2.880	0.500
1 year (first 5mm) 120 minute summer	18.106	2.500	1 year (first 5mm) 720 minute summer	1.943	0.417
1 year (first 5mm) 120 minute winter	14.057	2.500	1 year (first 5mm) 720 minute winter	2.360	0.417
1 year (first 5mm) 180 minute summer	9.827	1.667	1 year (first 5mm) 960 minute summer	1.465	0.312
1 year (first 5mm) 180 minute winter	9.171	1.667	1 year (first 5mm) 960 minute winter	1.780	0.312
1 year (first 5mm) 240 minute summer	8.272	1.250	1 year (first 5mm) 1440 minute summer	0.962	0.208
1 year (first 5mm) 240 minute winter	7.376	1.250	1 year (first 5mm) 1440 minute winter	1.089	0.208

Results for 1 year (first 5mm) Critical Storm Duration. Lowest mass balance: 100.00%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
60 minute winter	Catchment 3	39	108.574	-0.026	119.2	107.9904	0.0000	OK
120 minute winter	Catchment 2	64	101.590	-0.010	32.9	44.9998	0.0000	OK
120 minute winter	Catchment 1	64	101.083	-0.017	36.9	50.4957	0.0000	OK
15 minute summer	Catchment 3 outfall	1	107.300	0.000	0.0	0.0000	0.0000	OK
15 minute summer	Catchment 2 Outfall	1	100.600	0.000	0.0	0.0000	0.0000	OK
15 minute summer	Catchment 1 outfall	1	100.600	0.000	0.0	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)
60 minute winter	Catchment 3	2.000	Catchment 3 outfall	0.0	0.000	0.000	0.0000	0.0
60 minute winter	Catchment 3	Infiltration		0.0				
120 minute winter	Catchment 2	3.000	Catchment 2 Outfall	0.0	0.000	0.000	0.0000	0.0
120 minute winter	Catchment 2	Infiltration		0.0				
120 minute winter	Catchment 1	1.000	Catchment 1 outfall	0.0	0.000	0.000	0.0000	0.0
120 minute winter	Catchment 1	Infiltration		0.0				

