

Hydraulic Modelling Study at Land off Gregory Avenue, Breaston

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Prepared for:

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This report describes work commissioned by Peveril Homes, by an instruction dated 24th April 2025. The Client's representative for the contract Tom Broster of Peveril Homes. Ruth Gale of JBA Consulting carried out this work.

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Abbreviations

1D	One Dimensional
2D	Two Dimensional
AEP	Annual Exceedance Probability
CC	Climate Change
DTM	Digital Terrain Model
EA	Environment Agency
FEH	Flood Estimation Handbook
Ha	Hectares
JBA	Jeremy Benn Associates
LIDAR	Light Detection and Ranging
m AOD	Metres Above Ordnance Datum
NGR	National Grid Reference
OS	Ordnance Survey
ReFH	Revitalised Flood Hydrograph
RoFSW	Risk of Flooding from Surface Water

1 Introduction

1.1 Terms of reference

JBA Consulting were commissioned by Peveril Homes to undertake direct rainfall hydraulic modelling to inform a Flood Risk Assessment relating to a proposed development at land off Gregory Avenue, Breaston (hereafter referred to as 'the site').

The purpose of the study is to improve the understanding of the surface water flood risk to the site and test the impact of the proposed development. To achieve this a 1D-2D ESTRY-TUFLOW hydraulic model was produced to allow accurate representation of flood levels, extents, velocities and hazard within the site boundary.

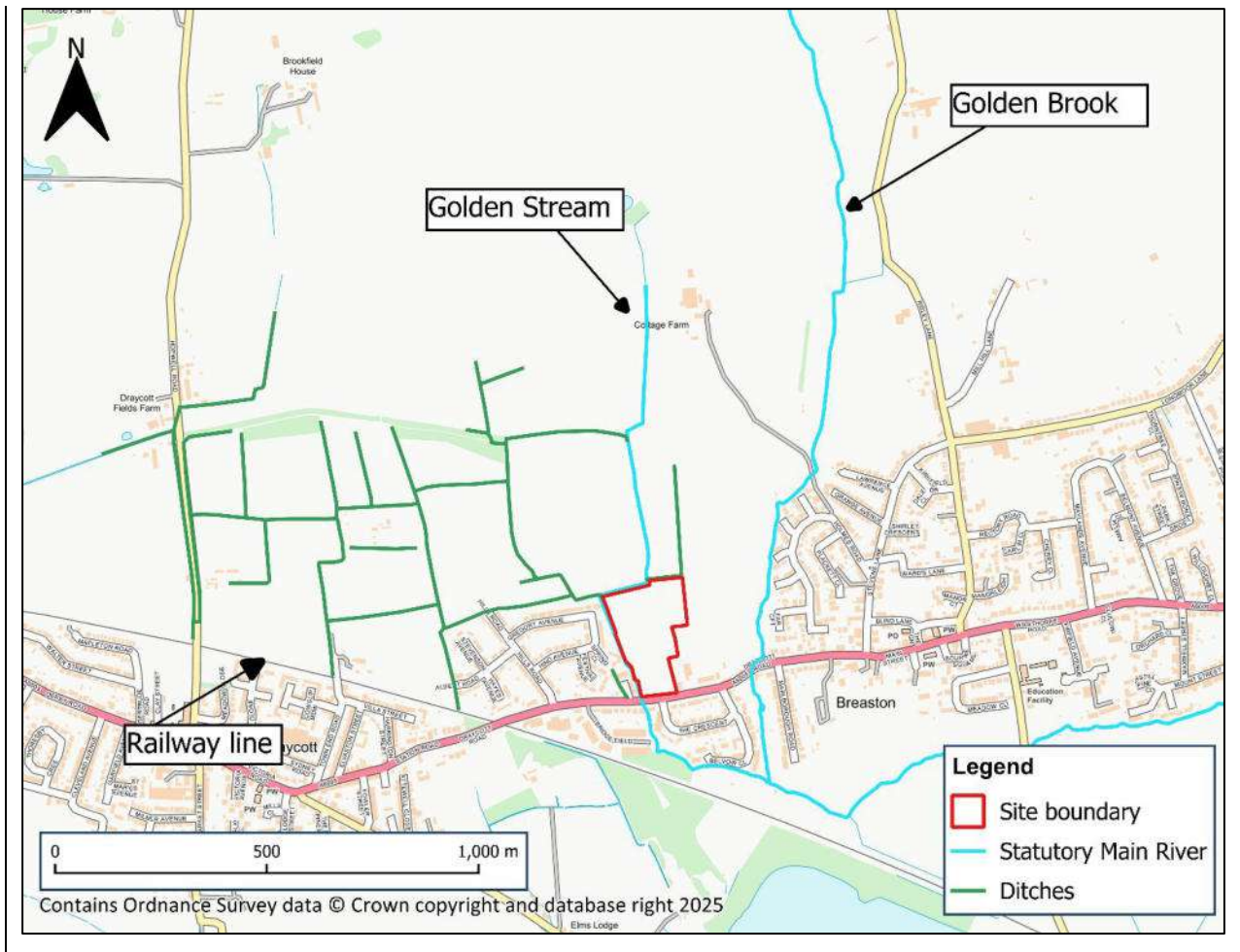
Note that the modelling focusses on the Golden Stream and the site. The risk from the Golden Brook, along the eastern site boundary, is informed from alternative fluvial modelling.

1.2 Site description

The site is located on land north of Draycott Road and east of Gregory Avenue in Breaston, Derbyshire. The site formally housed the Western Mere County Secondary School until the early 1990s. The Golden Brook and the Golden Stream (both statutory main rivers) run from north to south. There is also a series of drainage ditches north of the site and some drain into the Golden Stream and others drain south to towards the railway line. The railway line, managed by Network Rail, is to the south of the site. Three of the drainage ditches in the vicinity of the site interact with the railway with culverts carrying flow into the railway line drainage network.

Table 1-1: Site description

Site address	Land off Gregory Avenue
Site area	3.4 hectares
OS-NGR	SK447336
County	Derbyshire
Country	England



1.3 General approach

A 1D-2D direct rainfall-runoff model was developed in ESTRY-TUFLOW covering the catchment draining towards the site to refine the understanding of surface water flood risk at the site and within the surrounding area.

The model incorporates site-specific topographic survey data and channel survey information to improve upon the Environment Agency's Risk of Flooding from Surface Water mapping. Ground levels in the model extent were informed by site topographic survey data and publicly available Environment Agency LiDAR data. Rainfall hyetographs were derived for the 3.33% (1 in 30-year), 1% (1 in 100-year), 1% with 40% climate change uplift (1 in 100-year plus 40% climate change), and 0.1% (1 in 1000-year) Annual Exceedance Probability (AEP) storm events. These hyetographs were applied directly to the model to provide baseline model results.

In line with best practice, the model's sensitivity to flow, roughness and downstream boundary parameters were tested to improve confidence in the model results.

2 Methodology

2.1 Data availability

Grantham Coates Surveys Ltd were commissioned to collect channel and structure survey data of the Golden Stream, the ditches and some check survey cross sections along the Golden Stream. This survey was carried out in June 2025 and comprised of 120 cross sections taken at regular intervals or at structures (Appendix A).

A topographic survey was conducted by TERRA Measurement in June 2025 to improve the understanding of ground levels within the site (see Appendix B.1). Environment Agency LiDAR data was obtained from the DEFRA data services platform to represent ground levels within the wider floodplain. The LiDAR has a grid resolution of 1m and is obtained from the 2022 National LiDAR Program dataset.

2.2 Site walkover

A site walkover was carried out by Ruth Gale and Amy Evans from JBA Consulting in May 2025 to improve the understanding of connectivity between the drainage ditches within the vicinity of the site and the continuation of flow out of the site.

The site visit established that most of the ditches drain to the railway line south of the site via culverts or more complex structures such as syphons. Drains were observed along the railway line and no watercourses were identified south of the railway line. This information helped to inform the model approach.

2.3 Model extent

A 1D-2D ESTRY-TUFLOW model was built to represent the Golden Stream and the drainage ditches surrounding the site. The model was run using TUFLOW HPC version 2025.0.0-IDP-w64.

The Golden Stream and most of the surveyed ditches were represented in the 1D domain using ESTRY. Reach 1, 2, 6, 8, 12, 14, and 15 (as labelled in Figure 2-1) were represented in the 2D domain by enforcing the bed levels from the survey using 2D z-shapes. Reach 11, 16, 18 and 19 were modelled in the 2D but without any z shapes because after the initial model build it was clear that there was limited flow in these areas making the detail unnecessary.

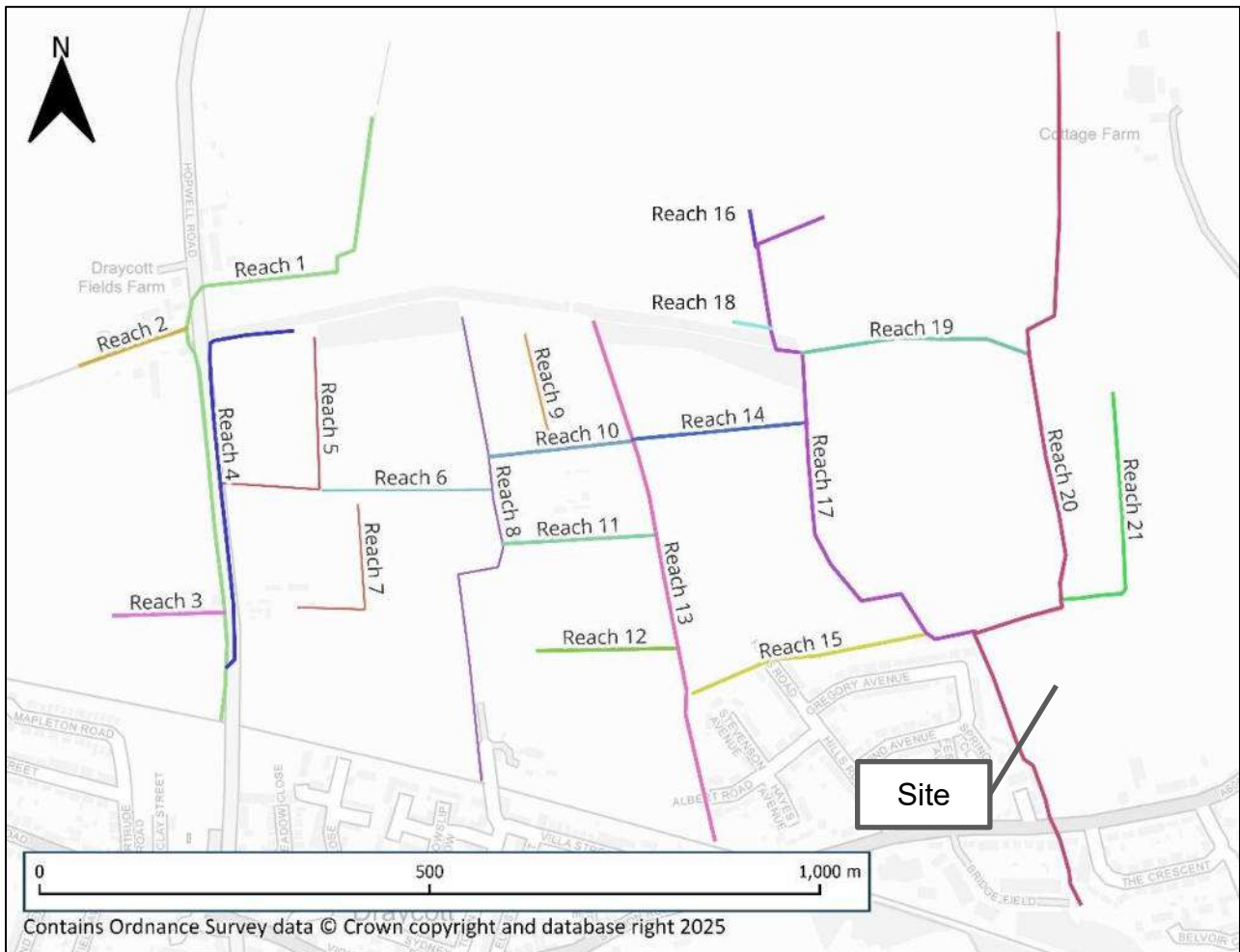


Figure 2-1: Labelled watercourse reaches

Channel sections were trimmed to the top of bank and linked to the 2D domain representing the floodplain. The TUFLOW 2D domain has an area of approximately 2.62km², with a 2m grid resolution. The 1D and 2D model domains are shown in Figure 2-2.

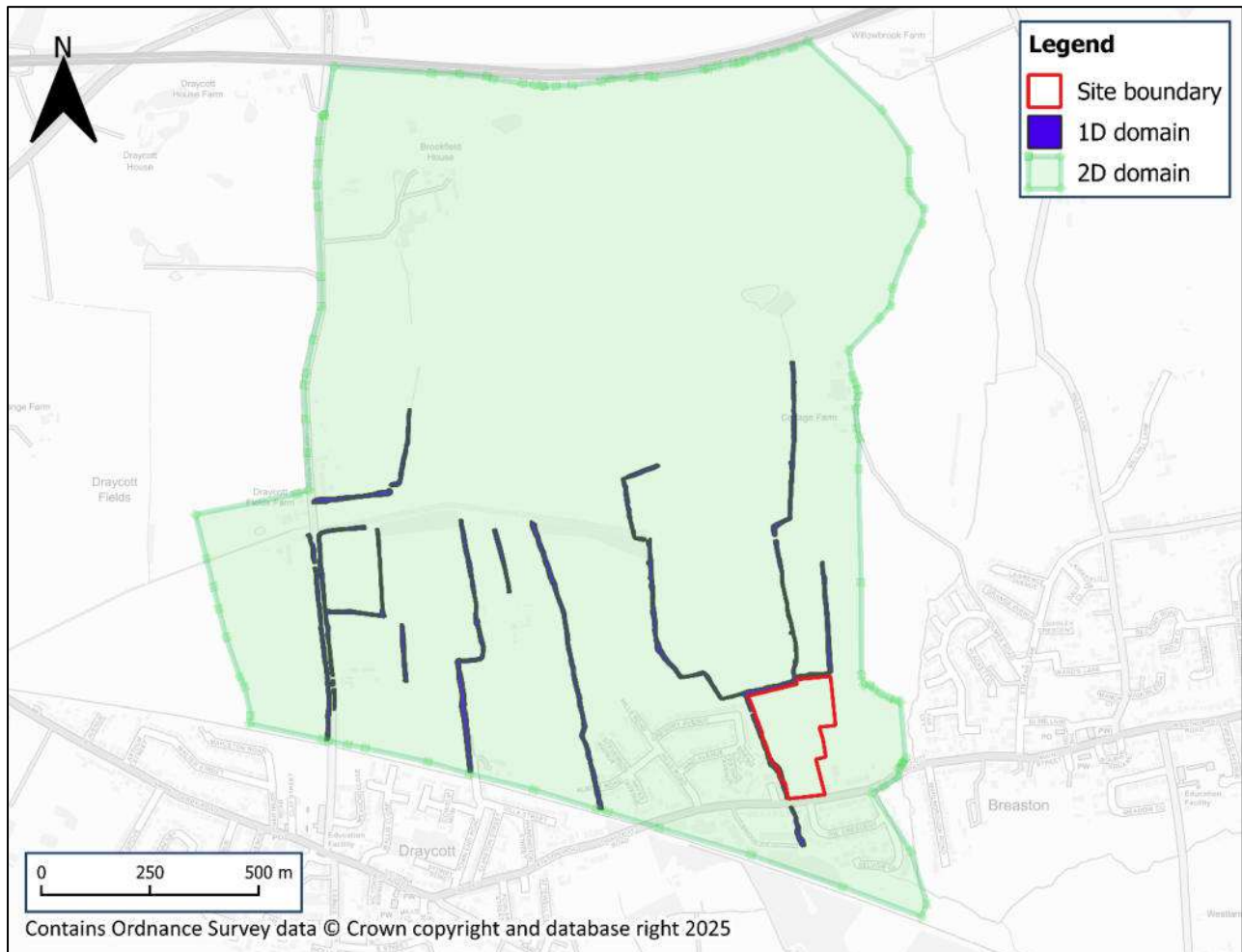


Figure 2-2: Model domains

Detailed information on the hydraulic structures within the model is provided in Appendix C.

Site-specific topographic survey data was used to represent ground levels where available, with 2022 National LiDAR Programme data used to inform the model topography across the wider modelled extent. Figure 2-3 shows the extent of the topographic survey.

A comparison of the topography and LiDAR data was undertaken, and the results of this comparison are provided in Appendix B.2. Overall, the LiDAR and topographic survey have a good correlation however there are some differences in the two datasets. Therefore, a z shape polygon was added to the model to interpolate values between the LiDAR and topographic survey elevations where the two datasets meet. This ensures hydraulic impacts are minimised between the two datasets.

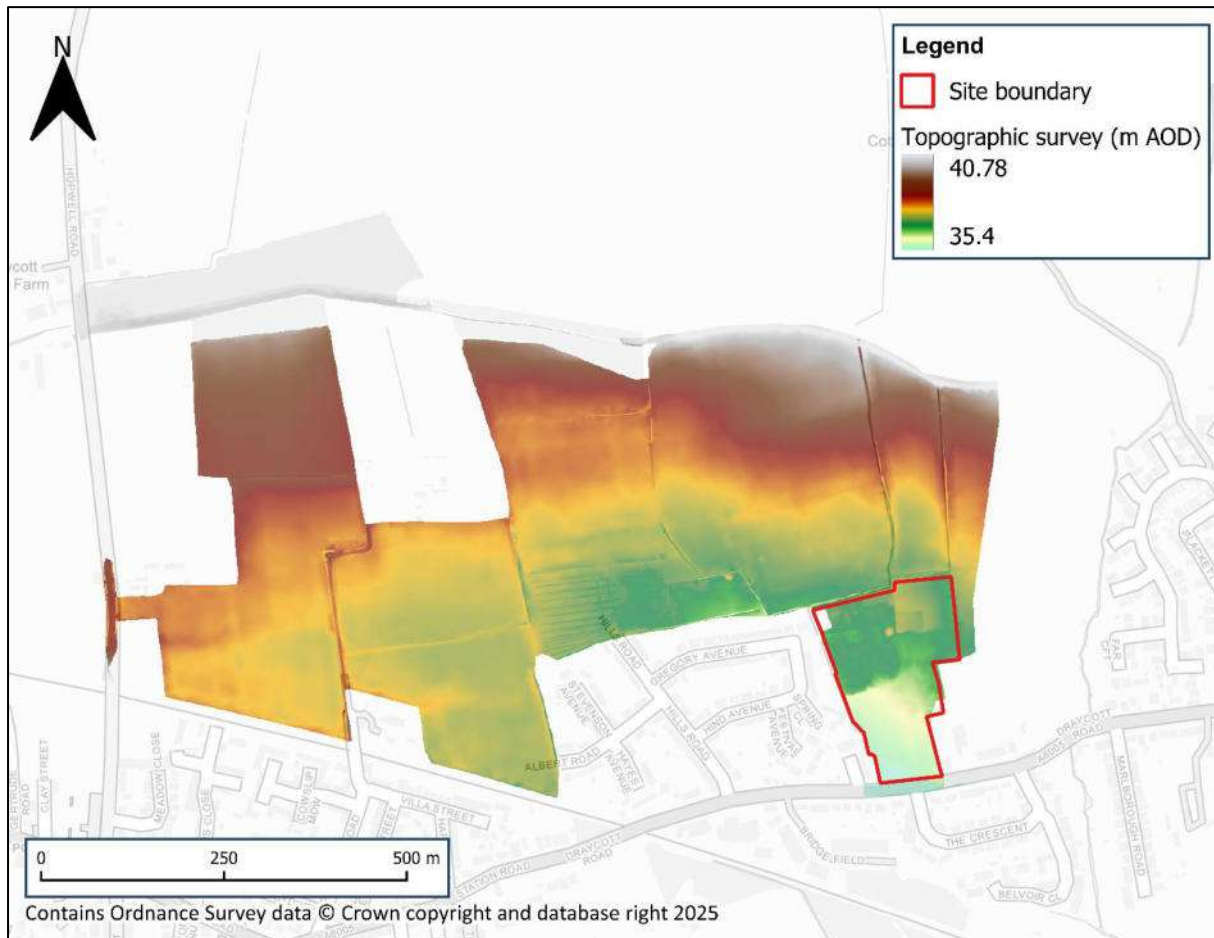


Figure 2-3: Topographic survey extent

2.4 Model roughness

Manning's 'n' values were used to represent the roughness of both the 1D channel and the 2D model extent. The values for the 1D channel roughness were decided using the Chow (1959) approach and are based on photographs provided by Grantham Coates Surveys Ltd and gathered by JBA Consulting during the site walkover.

Manning's 'n' values in the 2D domain were set to represent the different land uses within the model extent. Land uses were defined using satellite imagery and OS mapping. Table 2-1 gives the values of Manning's 'n' values used in the 1D and 2D domains.

Table 2-1: Manning's 'n' range within the hydraulic model

Features	Manning's 'n' value assigned
Buildings	0.3
Water	0.02
Woodland	0.09
Rail	0.06
Roads and Tracks	0.02
General surface	0.05

Features	Manning's 'n' value assigned
Greenspace	0.04
Channel roughness	0.03 - 0.05
Bank roughness	0.06 - 0.07
Stability patches	0.1

2.5 Model boundary conditions

2.5.1 Model inflows

A hydrological assessment was carried out on the catchment to derive rainfall hyetographs for the site and surrounding area. The full hydrological assessment is documented in Appendix D.

Flow-time hyetographs were estimated for the 3.33% AEP, 1% AEP and 0.1% AEP rainfall events. Climate change allowances were applied in line with the latest 2021 Environment Agency Guidance for 2080's peak rainfall intensity, with 1% AEP flows uplifted by 40% (ref: upper end allowance for the 2080s epoch).

The rural hyetographs were applied across the majority of the catchment covering 224 hectares and the urban hyetographs, which take into account drainage losses, were applied in the southeastern corner of the catchment covering 22 hectares.

The baseline 1% AEP rainfall event was run for the 1-hour, 3-hour, 6-hour and 8-hour storm durations to establish which storm event created the largest flood extent within the vicinity of the site. Figure 2-4 shows that during the 1% AEP flood event the 6 and 8-hour storm durations create the largest flood extents depending on the area of the model extent. However, Figure 2-5 which compares the 6-hour and 8-hour storm durations, shows that west of the site, around Gregory Avenue, there is a greater flood extent in the 6-hour. Given there is a known history of flooding around Gregory Avenue the 6-hour storm duration was used to run all events.

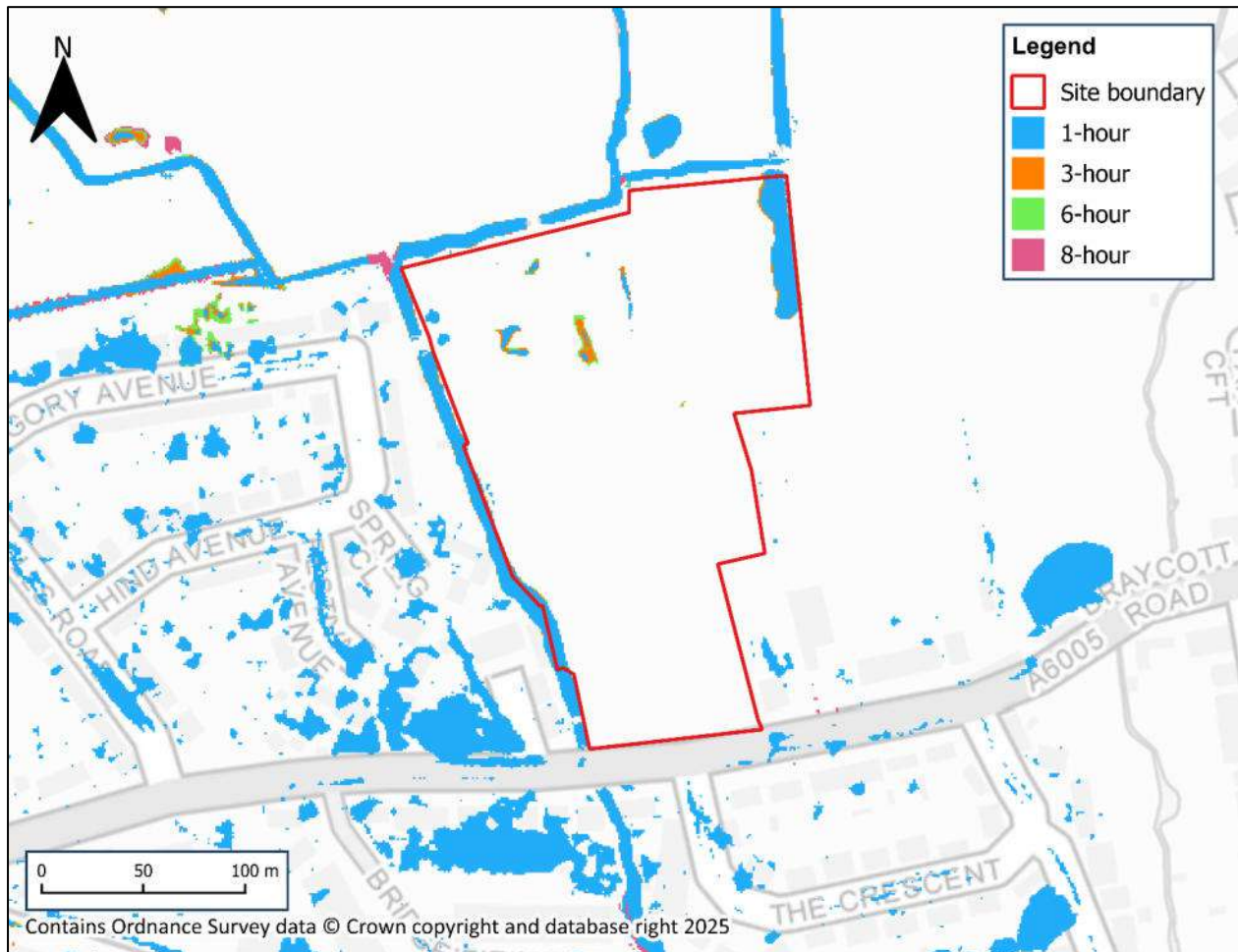


Figure 2-4: Storm duration testing using the 1% AEP event

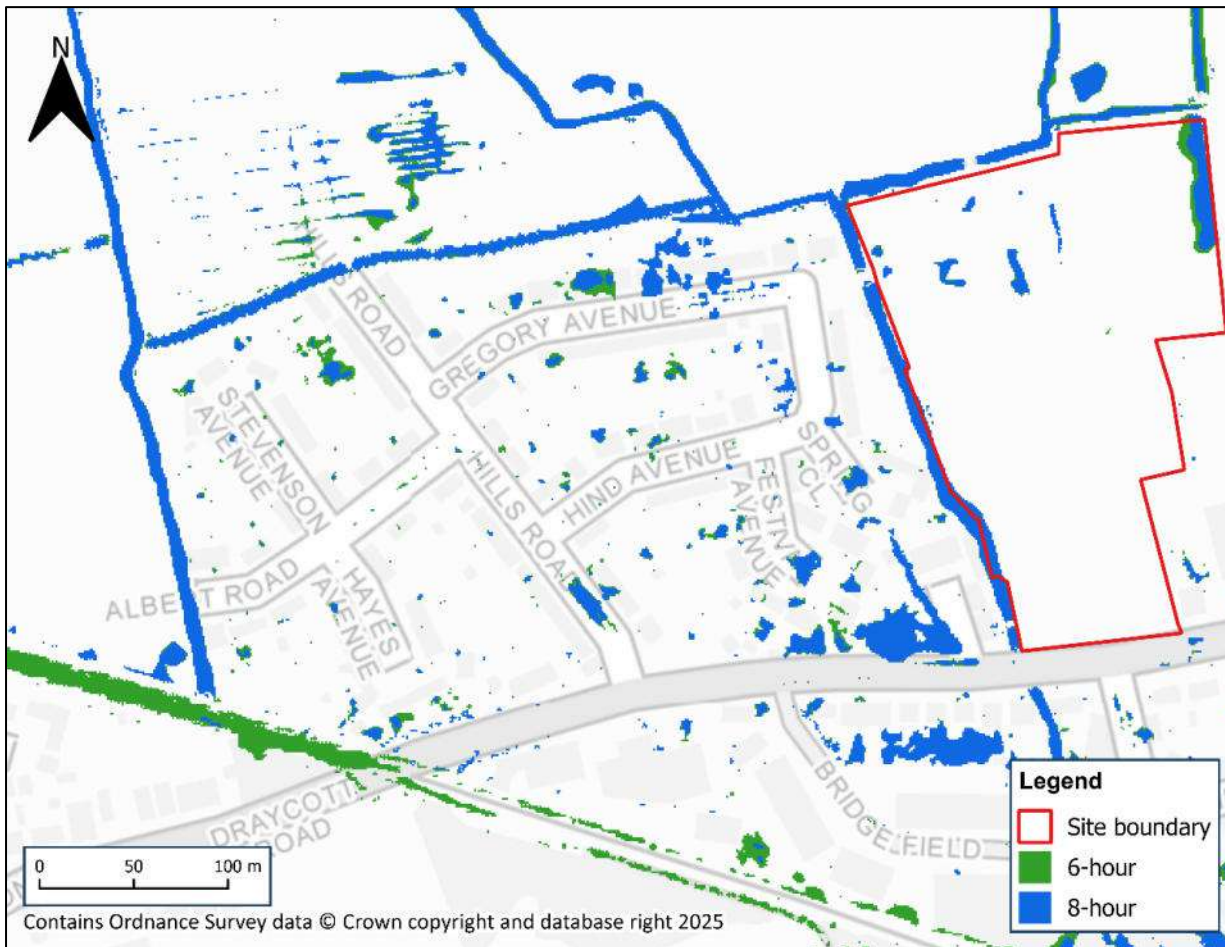


Figure 2-5: Storm duration testing using the 1% AEP event - 6-hour and 8-hour

2.5.2 Downstream boundary conditions

In the 1D domain, no downstream boundaries were used. Instead, at the downstream extent of the Golden Stream connectors were used to allow water to spill into the 2D domain. Due to a lack of knowledge about the connection of the culverts just north of the railway line these were modelled as 100% blocked and therefore did not need a 1D downstream boundary. This approach provides a conservative approach of flood risk at the site, more information regarding this assumption is detailed in Section 9.1.

In the 2D domain, HQ downstream boundaries were used. These are based on the average slope in the floodplain at the downstream extent of the model. This is based on LiDAR DTM and was set at 0.009 at the southern extent and 0.01 at the western extent of the model.

3 Model proving

3.1 Calibration

No gauge data was available to allow for model calibration. However, model validation comparing the model results with the Environment Agency's NAFRA2 (Risk of Flooding from Surface Water and Risk of Flooding from Rivers and the Sea) datasets was carried out as detailed in Section 7.

3.2 Sensitivity analysis

An assessment of the model sensitivity to the key model parameters was undertaken in line with best practices, to understand how parameter uncertainty may impact upon the model results. Sensitivity testing was completed on the 1% AEP event and tested the model's sensitivity to roughness, applied rainfall and downstream boundary parameters (Appendix E).

4 Model runs

The following flood scenarios were simulated using the direct rainfall model:

- [Baseline Scenario]- 3.33% AEP (1 in 30-year) flood event
- [Baseline Scenario]- 1% AEP (1 in 100-year) flood event
- [Baseline Scenario]- 1% AEP (1 in 100-year) plus climate change (40%) flood event
- [Baseline Scenario]- 0.1% AEP (1 in 1000-year) flood event
- [Sensitivity analysis]- 1% AEP (1 in 100-year) +20% roughness
- [Sensitivity analysis]- 1% AEP (1 in 100-year) -20% roughness
- [Sensitivity analysis]- 1% AEP (1 in 100-year) +20% flow
- [Sensitivity analysis]- 1% AEP (1 in 100-year) -20% flow
- [Sensitivity analysis]- 1% AEP (1 in 100-year) +20% slope at the 2D DSBDY
- [Sensitivity analysis]- 1% AEP (1 in 100-year) -20% slope at the 2D DSBDY
- [Blockage Scenario 1]- 1% AEP (1 in 100-year) plus climate change (40%) flood event (75% culvert blockage at Reach 20 - XS6)
- [Blockage Scenario 2]- 1% AEP (1 in 100-year) plus climate change (40%) flood event (75% culvert blockage at Reach 20 - XS9)
- [Blockage Scenario 3]- 1% AEP (1 in 100-year) plus climate change (40%) flood event (75% culvert blockage at Reach 20 - XS13)
- [Blockage Scenario 4]- 1% AEP (1 in 100-year) plus climate change (40%) flood event (75% open channel blockage along Reach 17 between XS1 and 2)
- [Post development Scenario]- 1% AEP (1 in 100-year) plus climate change (40%) flood event

5 Hydraulic model results

5.1 Post processing of model results

The model results outlined in this section have been filtered to a flood depth of 0.075m. This matched the 0.075m filtered depth within the Risk of Flooding from Surface Water (RoFSW) NAFRA2 methodology and meant that the main areas of flooding within the site will be showed within the processed results.

5.2 Existing conditions/baseline scenario

5.2.1 Peak flood extents

Baseline flood extents for the 3.33%, 1% and 0.1% AEP flood events are shown in Figure 5-1 and baseline flood extents for the 1% and 1% AEP with 40% climate change are shown in Figure 5-2. Both figures show that, outside the watercourse and ditches, there is some flooding within the site in all modelled flood events. The most significant areas of flooding occur along the eastern boundary.

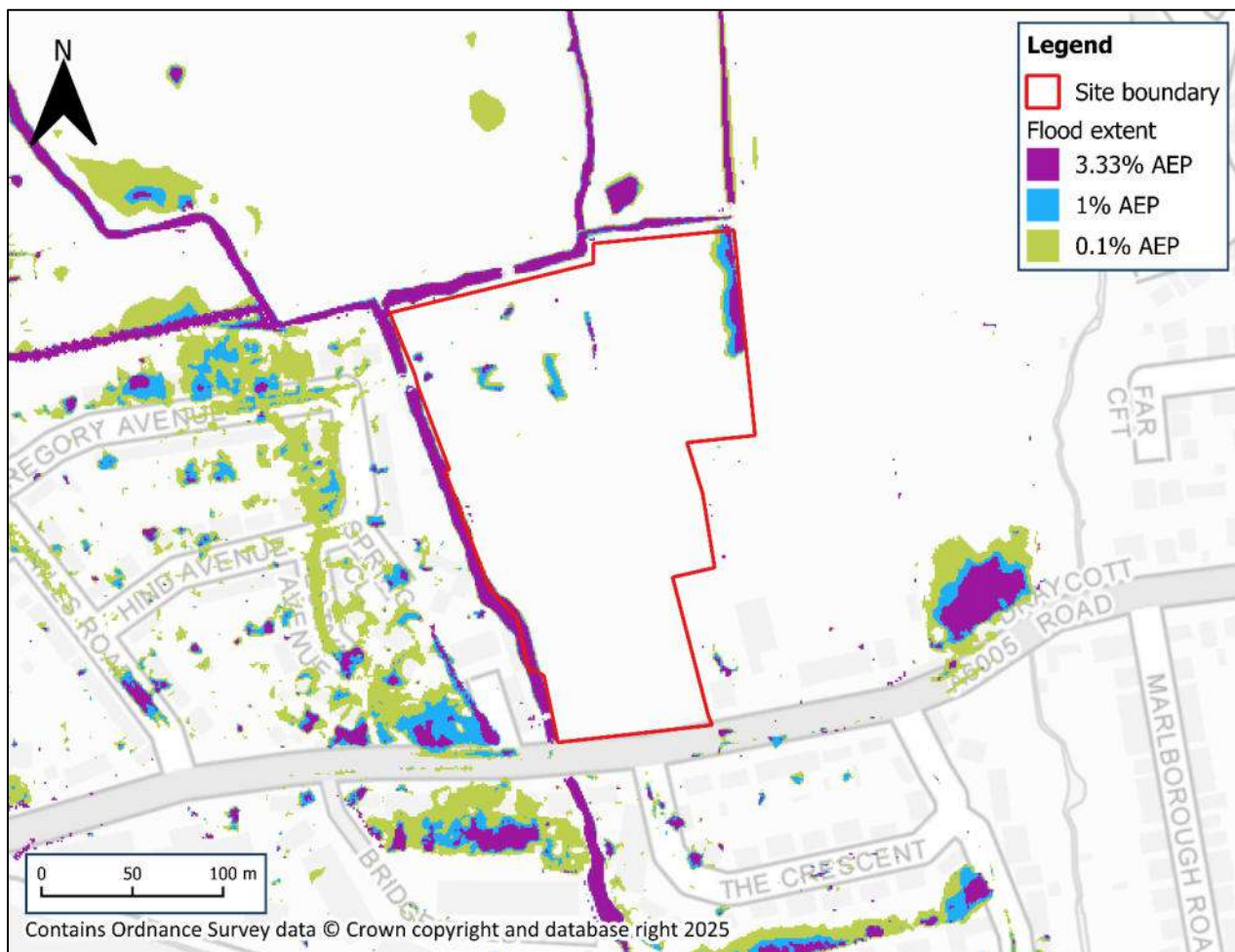


Figure 5-1: Baseline flood extents - 3.33% AEP, 1% AEP and 0.1% AEP

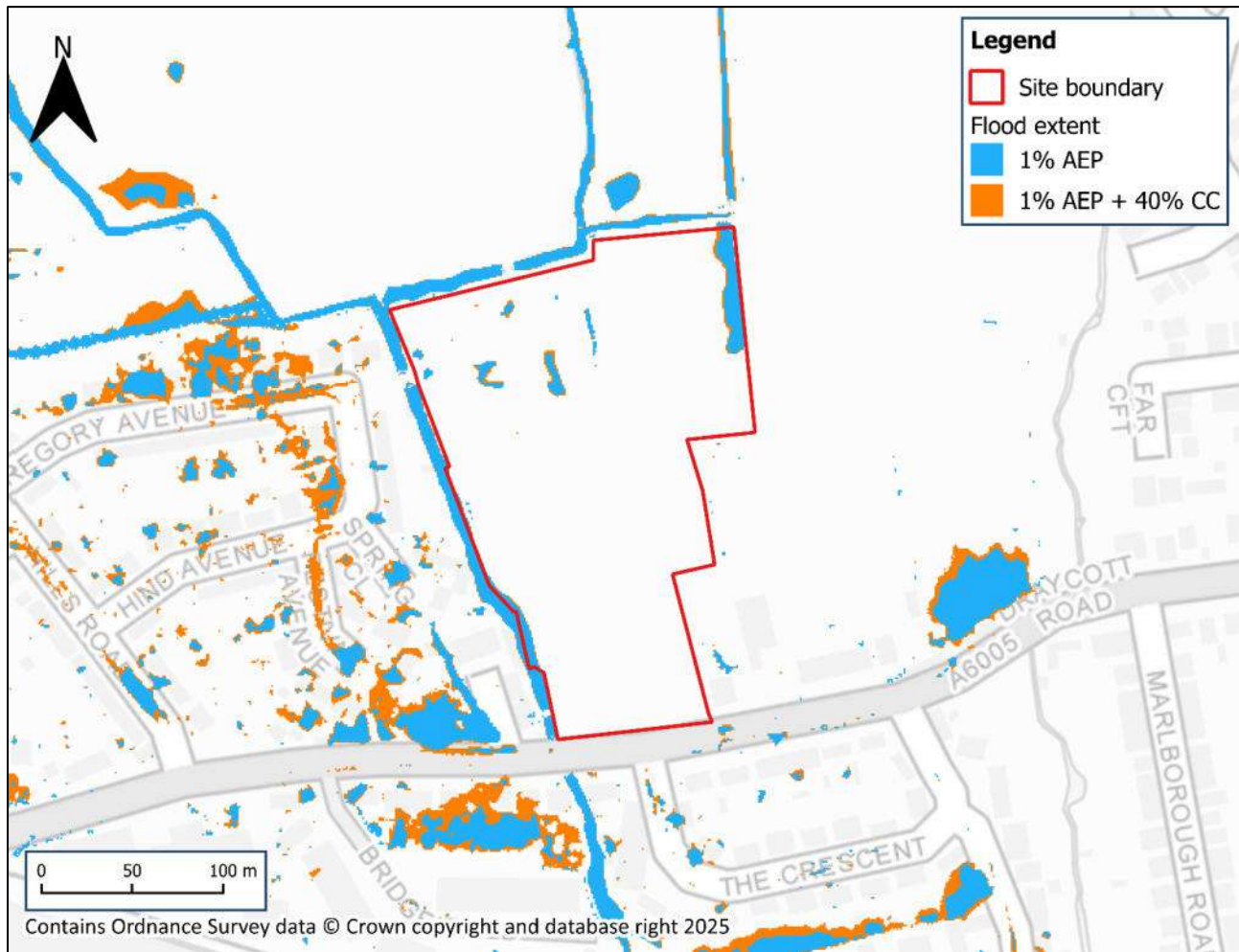


Figure 5-2: Baseline flood extents - 1% AEP and 1% AEP with climate change

5.2.2 Peak flood depths

Figure 5-3 shows the modelled flood depths within the site and surrounding area during the 1% AEP plus 40% climate change flood event, which would be considered the Design Flood for vulnerable development.

The maximum depth, outside of the watercourse and ditches, is predicted to occur at the northeastern boundary of the site where depths reach 0.18m.

Across the rest of the site, flooding is largely within the alignment of the watercourse and ditches with out of bank flow around some structures and some small areas of pooling within the floodplain.

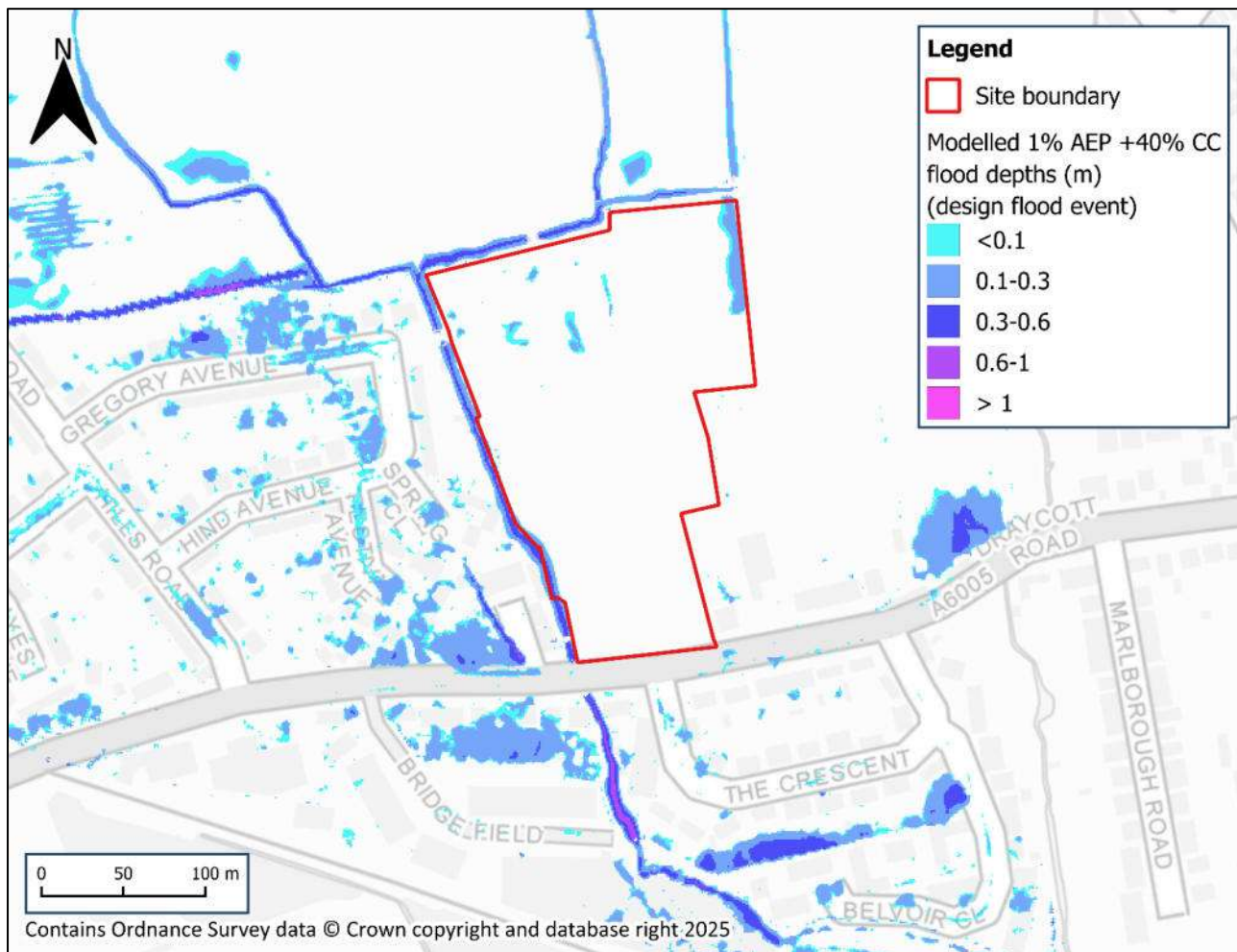


Figure 5-3: Baseline 1% AEP plus climate change (40%) maximum flood depths

5.2.3 Peak modelled levels

Figure 5-4 shows the modelled peak flood levels within the site and surrounding area during the 1% AEP plus 40% climate change flood event. Within the site, the peak levels during this event reach 36.9m AOD.

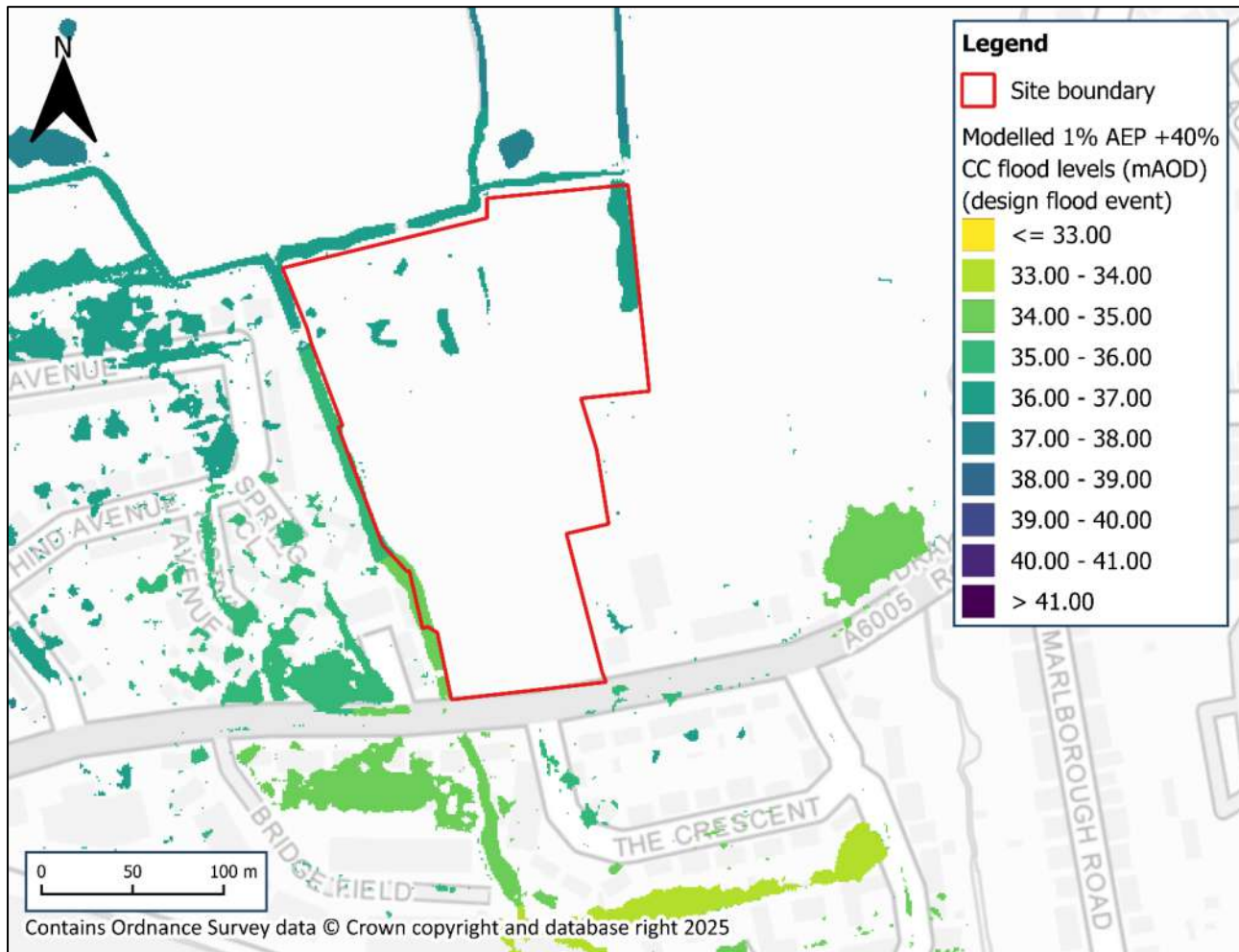


Figure 5-4: Baseline 1% AEP plus climate change (40%) maximum flood levels

5.2.4 Hazard to people classification

The hazard to people rating has been mapped using the formula as specified in Defra's FD2320/TR2 "Flood Risk to People". The different hazard categories are shown in Table 5-1 and the hazard classification to the site during the 1% AEP plus climate change (40%) event is shown in Figure 5-5.

Figure 5-5 shows that the flooded areas outside of the watercourse and ditches within the site have a 'Caution' hazard to people classification.

Table 5-1: Defra's FD2320/TR2 "Flood Risks to People" classifications

Flood hazard rating	Degree of Flood Hazard	Description
<0.75	Caution	Caution "Flood zone with shallow flowing water or deep standing water"
0.75 to 1.25	Moderate	Dangerous for some (i.e. Children) "Danger: flood zone with deep or fast flowing water"
1.25 to 2.00	Significant	Dangerous for most "Danger: flood zone with deep fast flowing water"
>2.00	Extreme	Dangerous for all "Extreme danger: flood zone with deep fast flowing water"

Using the hazard equation $HR = d*(v+0.5) + DF$
Where d = depth of flooding (m) v = velocity of floodwaters (m/sec) DF = debris factor

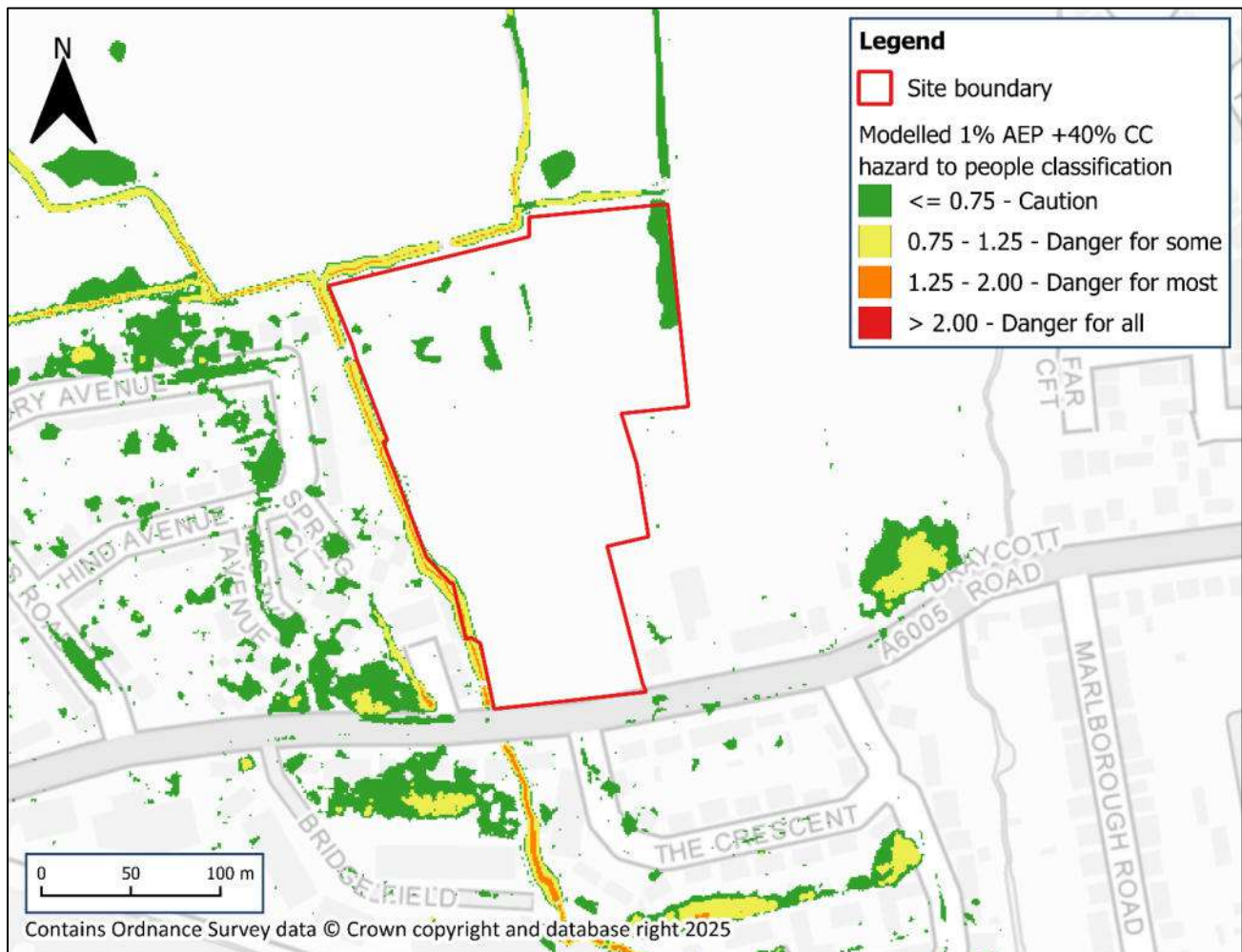


Figure 5-5: Baseline 1% AEP plus climate change (40%) hazard to people classification

5.3 Post development scenario

5.3.1 Post development model amendments

As shown in Figure 5-6, the baseline model was amended by raising the proposed development site by 600mm to form a post development model scenario. The rainfall hyetograph was also removed from the site to represent the impact of a proposed site drainage strategy. The post development model scenario was simulated for the 1% AEP plus climate change (40%) event to determine flood risk during the Design Flood event. Details of the proposal can be found in Appendix F.

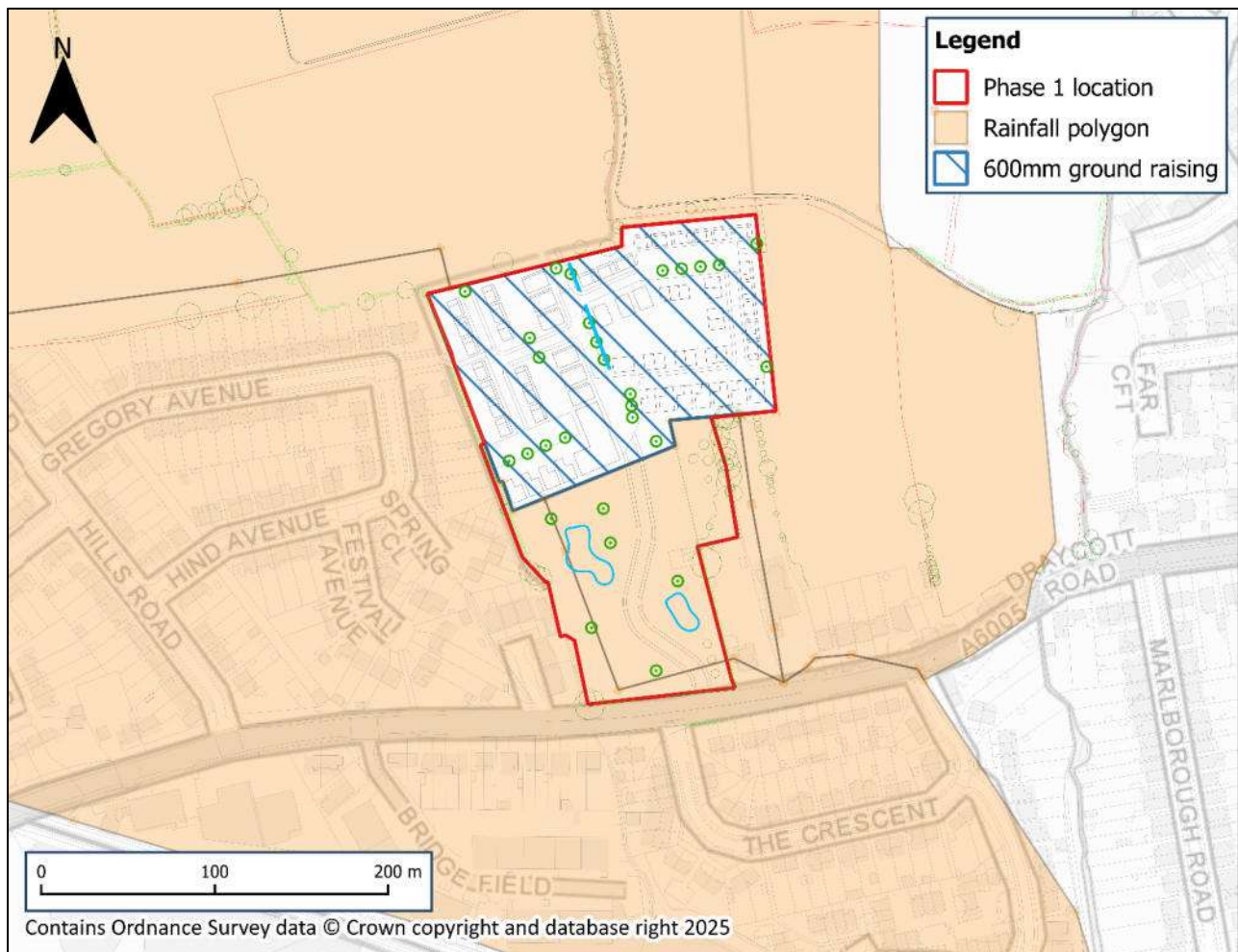


Figure 5-6: Post development model schematisation

5.3.2 Peak flood extents

The baseline and post development flood extents during the 1% AEP plus climate change (40%) are shown in Figure 5-7. In the post development scenario, the site is shown to be flood free. East of the site there is a minimal increase in flood extents along Draycott Road, however, this is largely within the wider ownership boundary. There are no other impacts of the proposed development on flood extents.

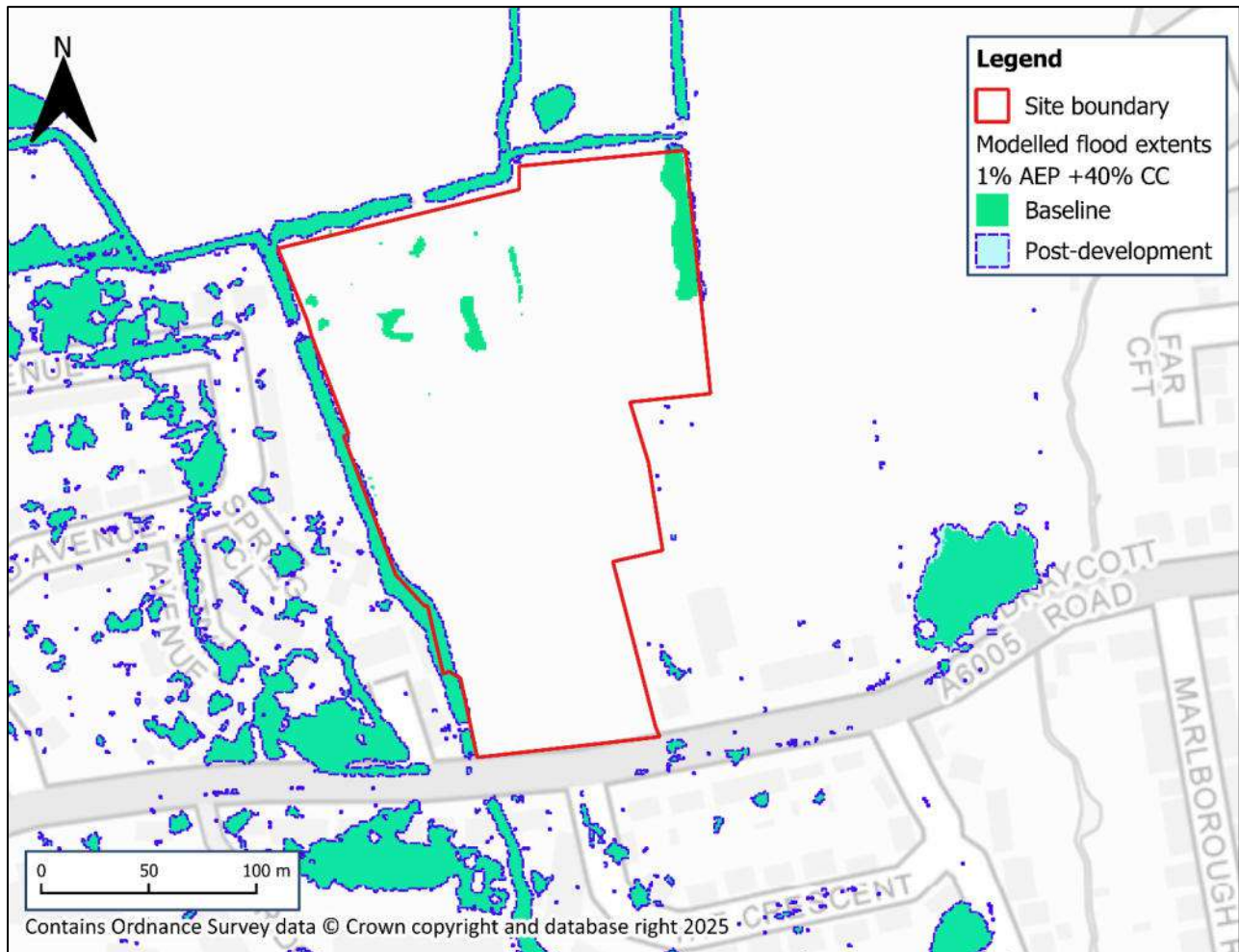


Figure 5-7: Baseline and post development 1% AEP +40% climate change flood extents

5.3.3 Peak flood depths

The post development peak flood depths during the 1% AEP plus climate change (40%) are shown in Figure 5-8. This shows that there is no flooding within the site during the 1% AEP plus climate change (40%) event.

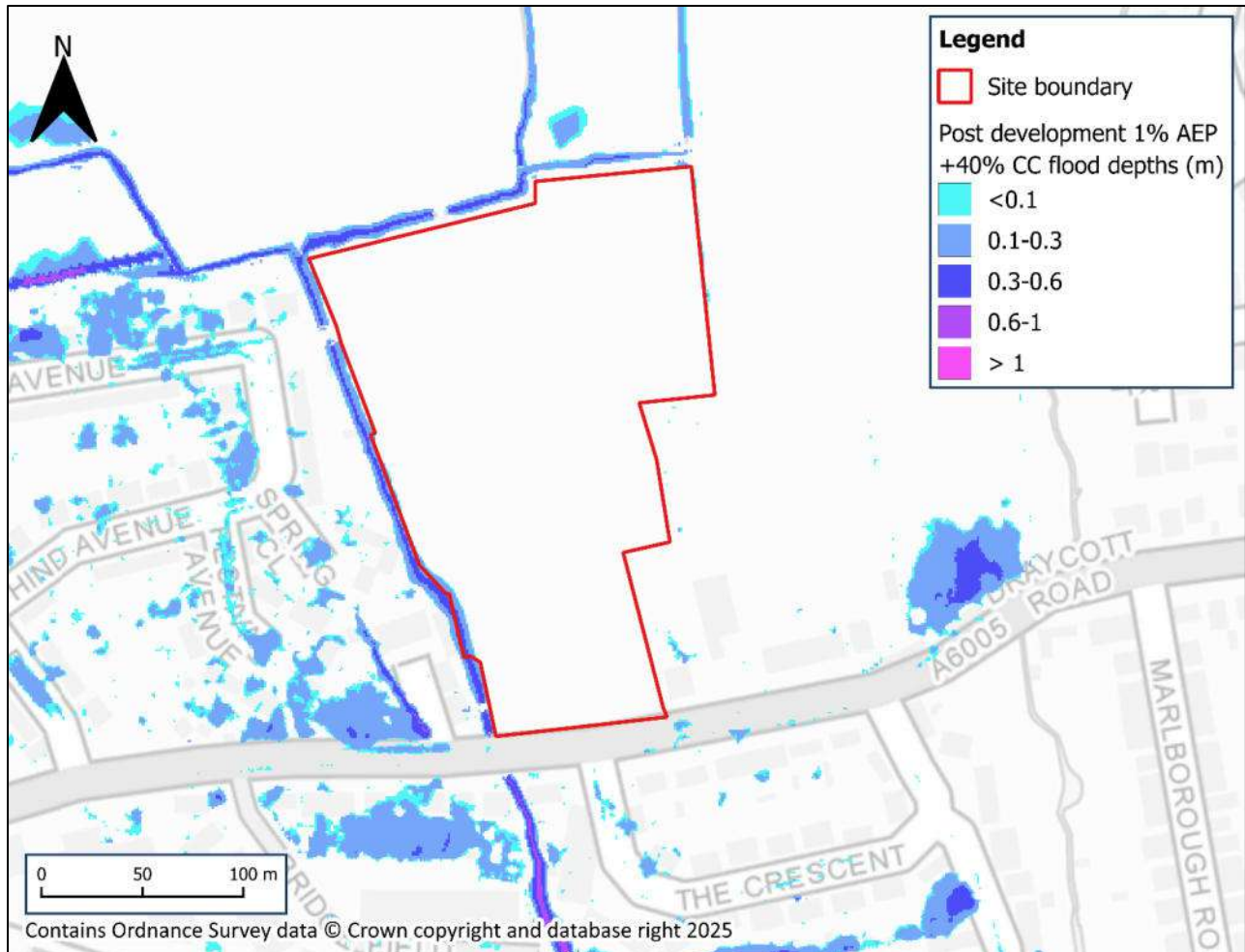


Figure 5-8: Post development flood depths 1% AEP +40% climate change

5.3.4 Peak flood levels

The post development peak flood levels during the 1% AEP plus climate change (40%) are shown in Figure 5-9. This shows that there is no flooding within the site during the 1% AEP plus climate change (40%) event. The peak flood level, within the watercourse adjacent to the site is 36.81m AOD along the northern boundary falling to 34.26m AOD at the southern extent of the western boundary

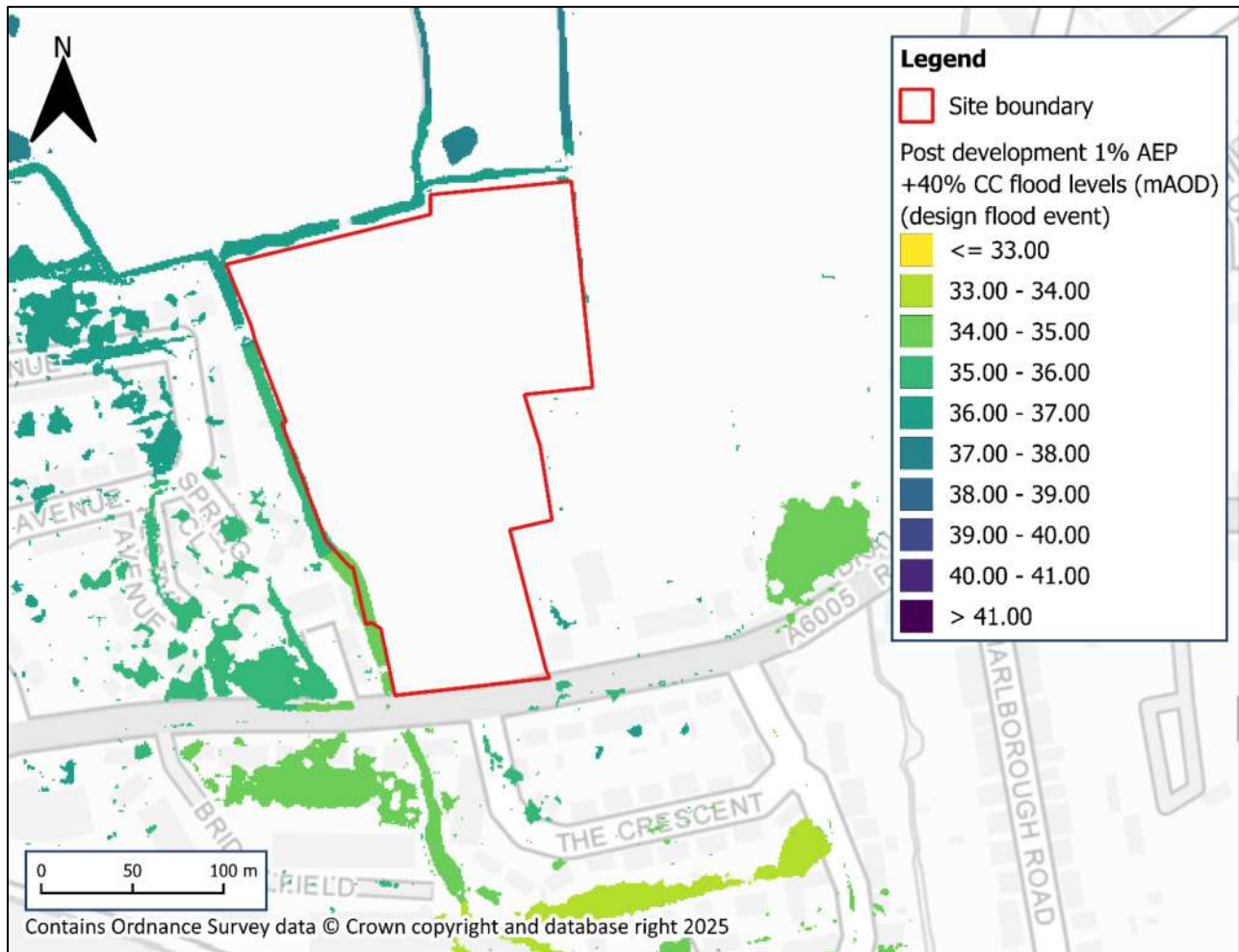


Figure 5-9: Post development flood levels 1% AEP +40% climate change

5.3.5 Hazard to people classification

The post development hazard to people classification in the 1% AEP +40% climate change is shown in Figure 5-10. The results show that there is no hazard to people within the site or proposed access along Draycott Road as there is no flooding.

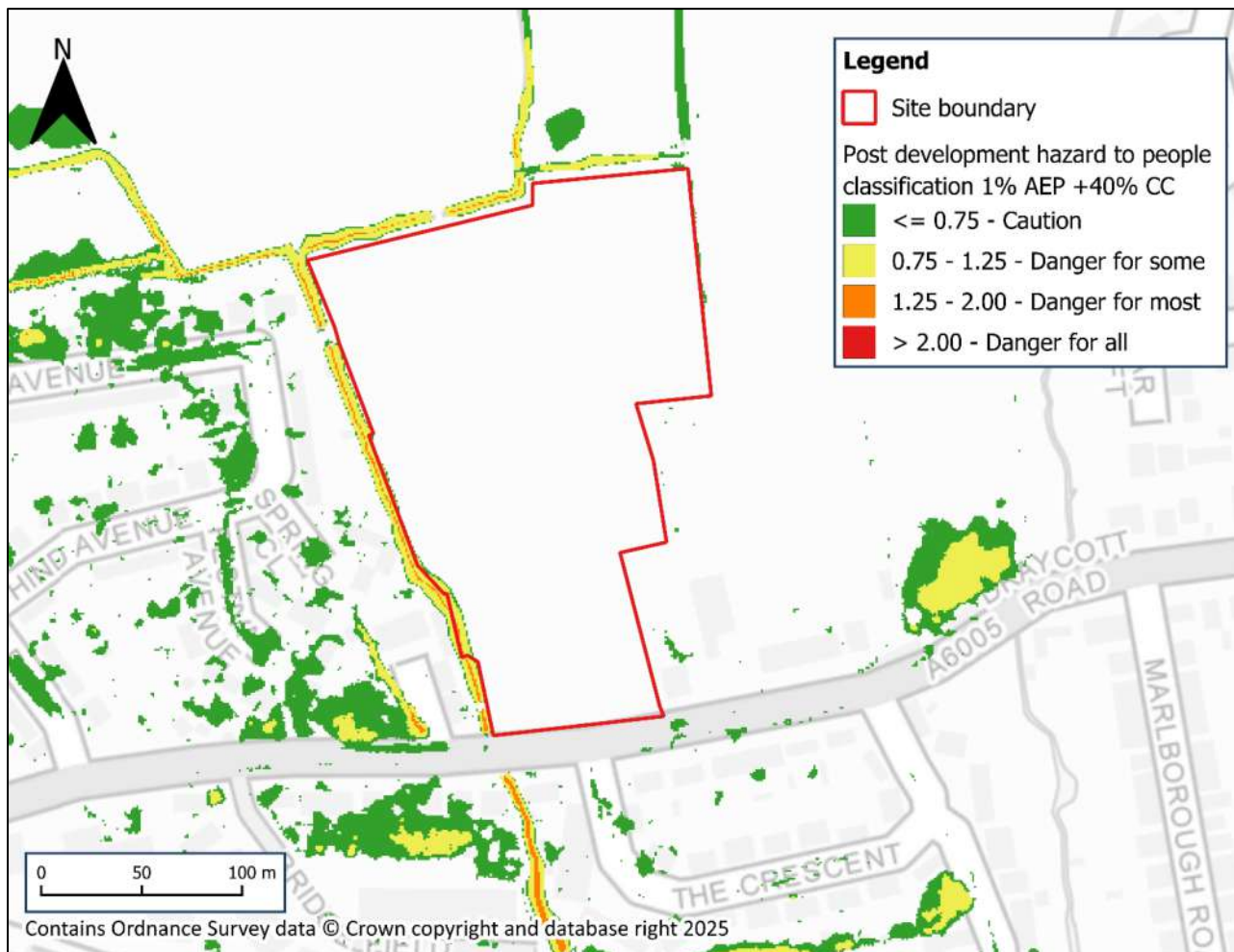


Figure 5-10: Post development 1% AEP plus climate change (40%) hazard to people classification

5.3.6 Flood depth impact analysis

Figure 5-11 shows the impact of the proposed development on flood risk depths during the 1% AEP +40% climate change event. The figure shows that there is a reduction in flood depths within the site. There is a moderate increase in flood depths within a limited area to the east of the site. This is an increase of 25mm when baseline depths are 250mm.

This impact on modelled flood depth mainly lies within the wider ownership boundary and is therefore considered to be acceptable. Given that there is no increase in flood hazard as a result of the proposal and that the dominant source of flooding at this location remains to be from the Golden Brook rather than surface water flooding shown in the modelling, it is considered that it can be confirmed that there is no adverse flood risk impact to third-party land.

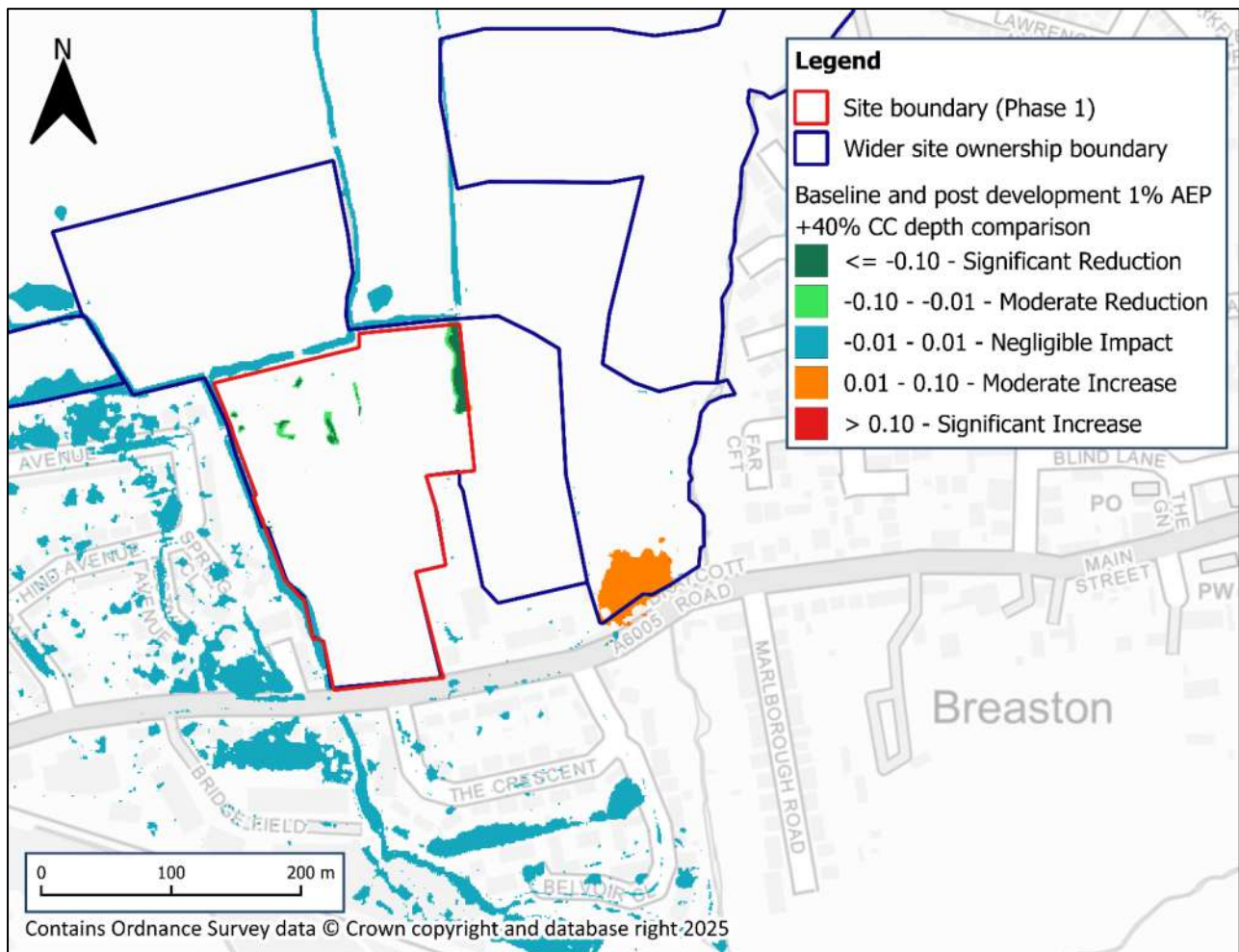


Figure 5-11: 1% AEP +40% climate change flood depth impact analysis

6 Blockage analysis

To determine the residual flood risk in the event of a blockage occurring within the vicinity of the site, the baseline model was run with four individual blockage scenarios. Three culverts were simulated with a 75% blockage, and one section of open channel was simulated as blocked by reducing the cross-sectional area by 75%. The location of each blockage modelled is shown in Figure 6-1.

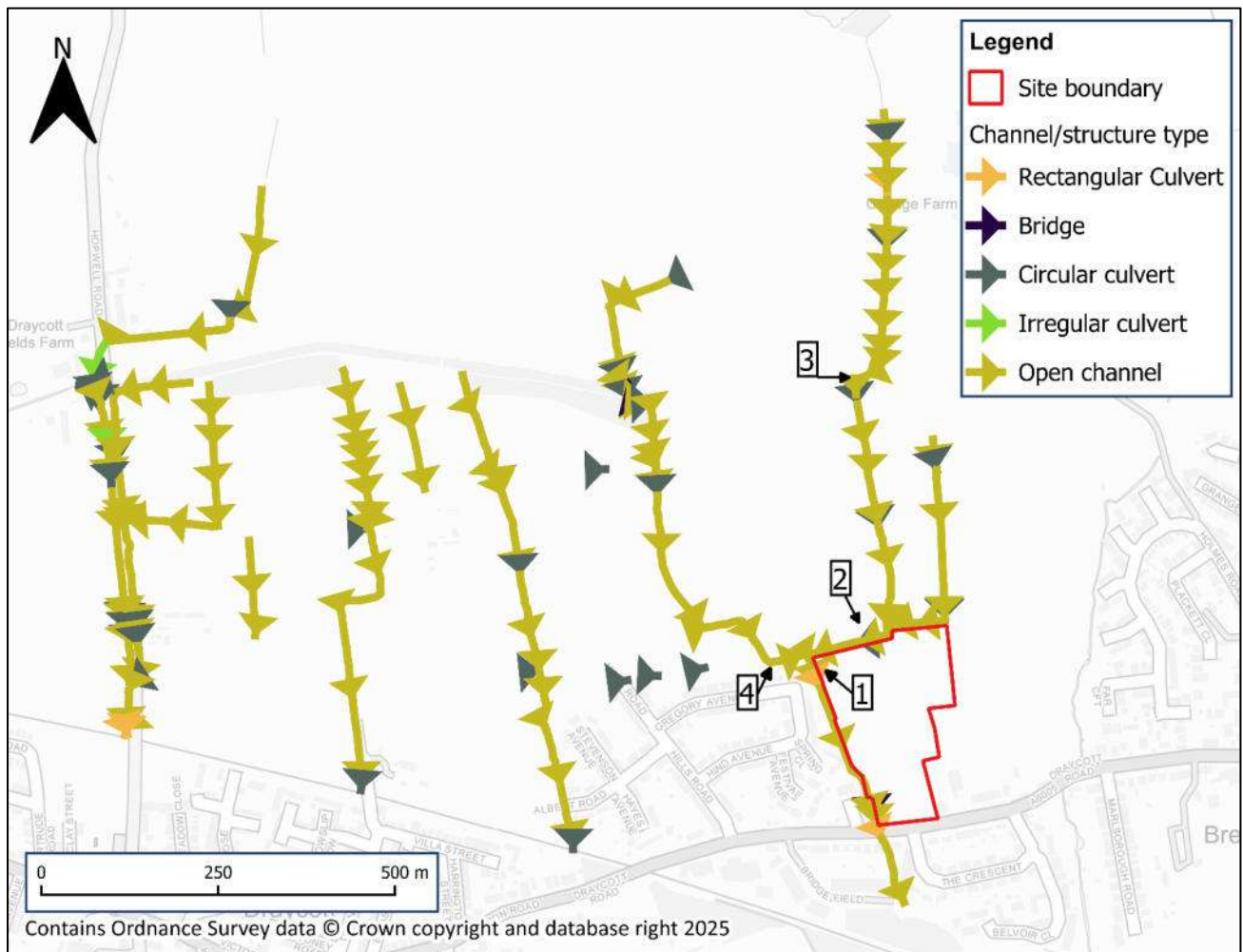


Figure 6-1: Blockage scenario locations

6.1 Blockage scenario 1

Figure 6-2 compares the maximum flood depths of the baseline and blockage 1 scenario for the 1% AEP climate change (40%) event. The results show that when the culvert is blocked by 75%, flow backs up in the upstream channel and overtops the banks just upstream of the structure. This causes a small increase in flood extent where the flow overtops the culvert and a moderate increase in flood depths around Gregory Avenue and Spring Close. Overall, the impact of the blockage is relatively localised with limited impact upstream and no overtopping other than directly at the structure.

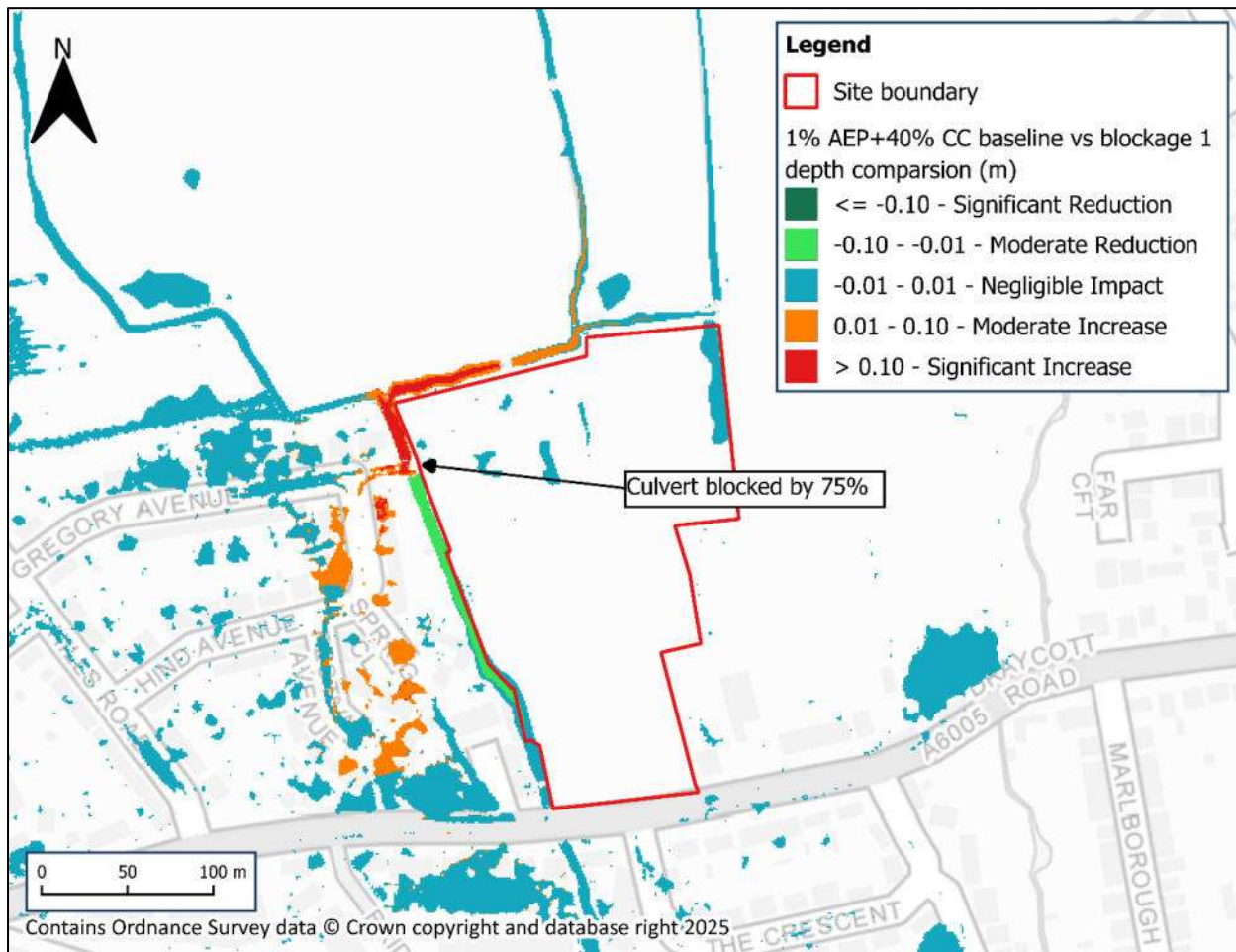


Figure 6-2: 1% AEP with climate change blockage 1 depth comparison

6.2 Blockage scenario 2

Figure 6-3 compares the maximum flood depths of the baseline and blockage 2 scenario for the 1% AEP climate change (40%) event. The results show that when the culvert is blocked by 75%, flow backs up behind the structure causing flood depths to increase but for the water to largely remain in channel. The only change in flood extent is area of flooding directly next to the structure where flow overtops.

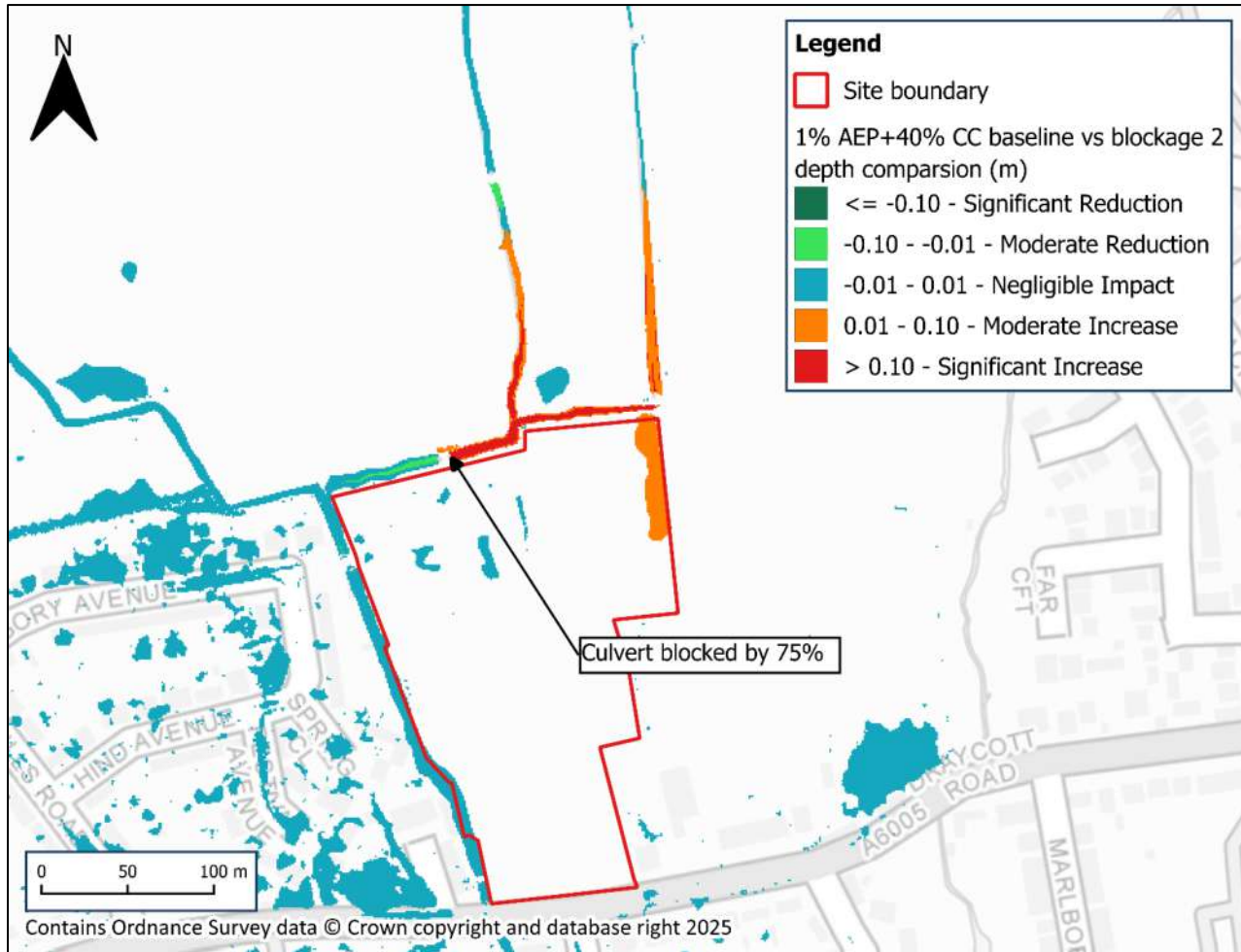


Figure 6-3: 1% AEP with climate change blockage 2 depth comparison

6.3 Blockage scenario 3

Figure 6-4 compares the maximum flood depths of the baseline and blockage 3 scenario for the 1% AEP climate change (40%) event. The results show that when the culvert is blocked by 75%, flow back up behind the structure causing a moderate increase in depths within the channel upstream of the structure and a significant increase in depths in the area where flow overtops the structure. The impacts of the blockage remain within channel.

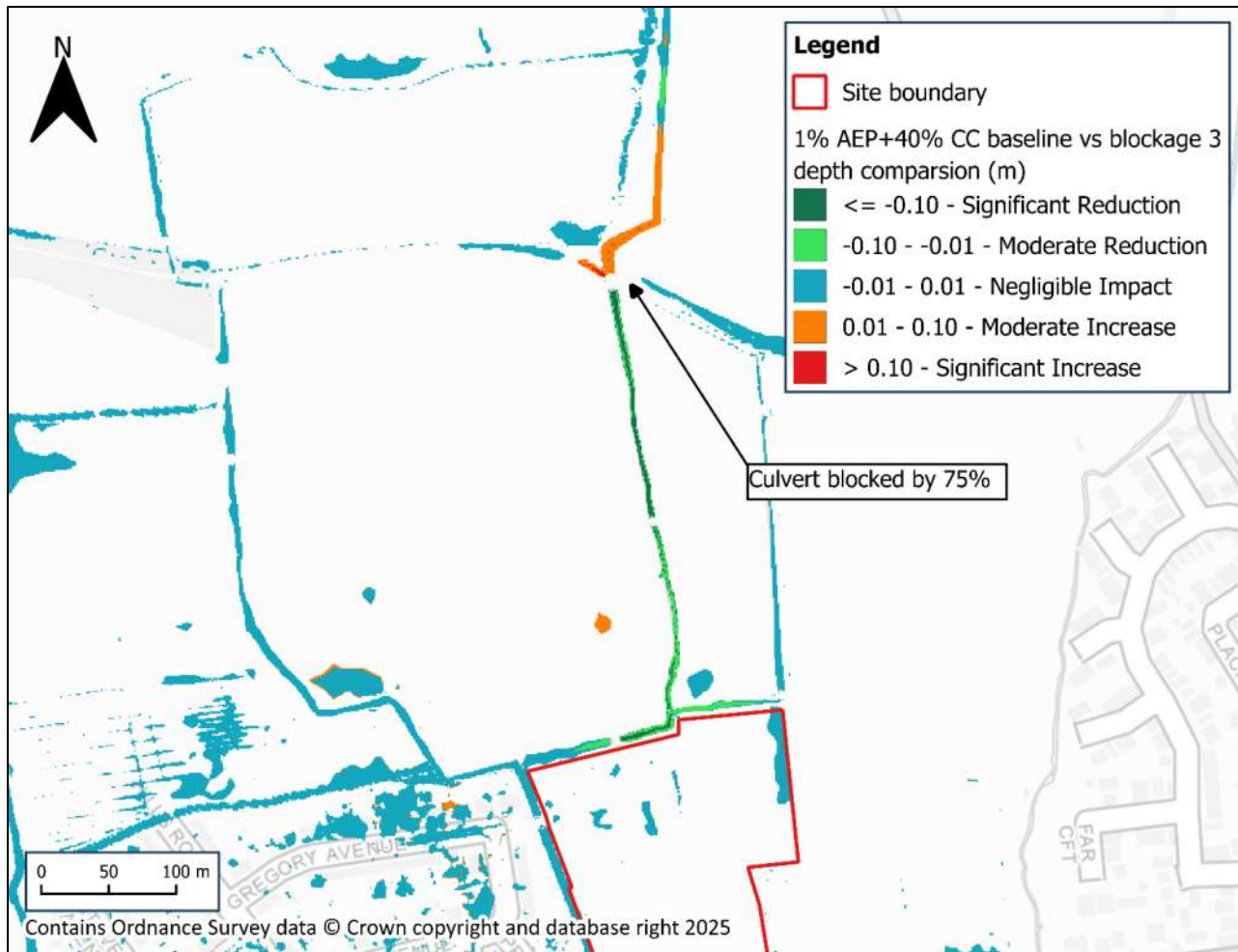


Figure 6-4: 1% AEP with climate change blockage 3 depth comparison

6.4 Blockage scenario 4

Figure 6-5 compares the maximum flood depths of the baseline and blockage 4 scenario for the 1% AEP climate change (40%) event. The results show that when the channel cross-sectional area is reduced by 75%, there is a moderate increase in flood depths in and around Gregory Avenue and a minor increase in flood extents in these areas.

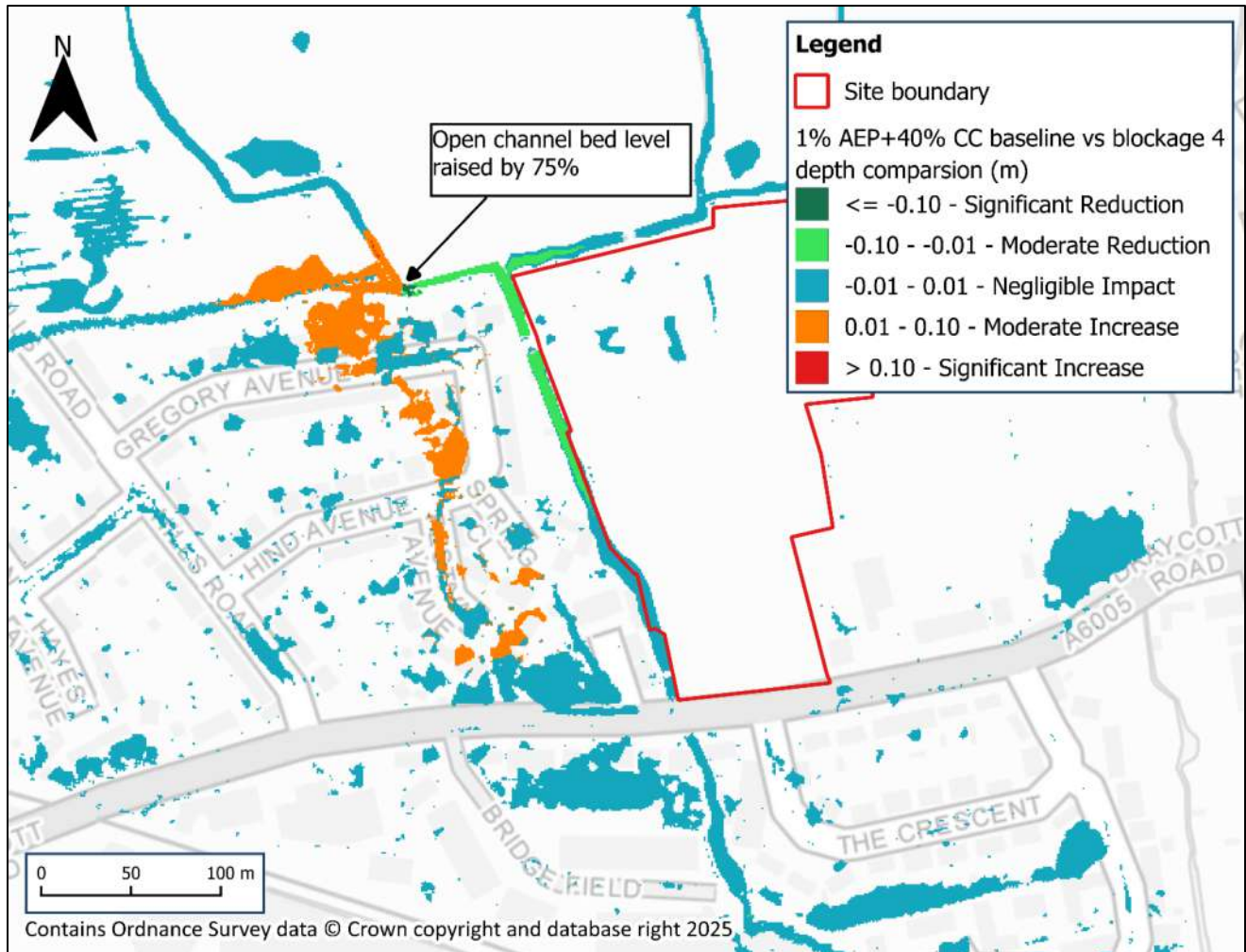


Figure 6-5: 1% AEP with climate change blockage 4 depth comparison

7 Model validation

Within Environment Agency flood mapping, the risk from the Golden Stream is represented within the Risk of Flooding from Rivers and the Sea (RoFRS) dataset. The risk across the remainder of the site is represented within the RoFSW mapping. To assess the validity of the model results, the surface water modelling results were compared with the RoFSW and RoFRS (NAFRA2) mapping.

Figure 7-1 shows the Environment Agency's RoFSW extents compared with the 1% AEP model results. The 1% AEP event can be compared with the 'Medium' flood risk category from the RoFSW. This comparison shows that modelled flood extents are smaller than the RoFSW mapping, however they do show ponding in similar areas. The differences between the modelled extent on the RoFSW mapping is due to the more detailed representation of hydraulic structures and topography data within the modelling that would not have been included in the RoFSW.

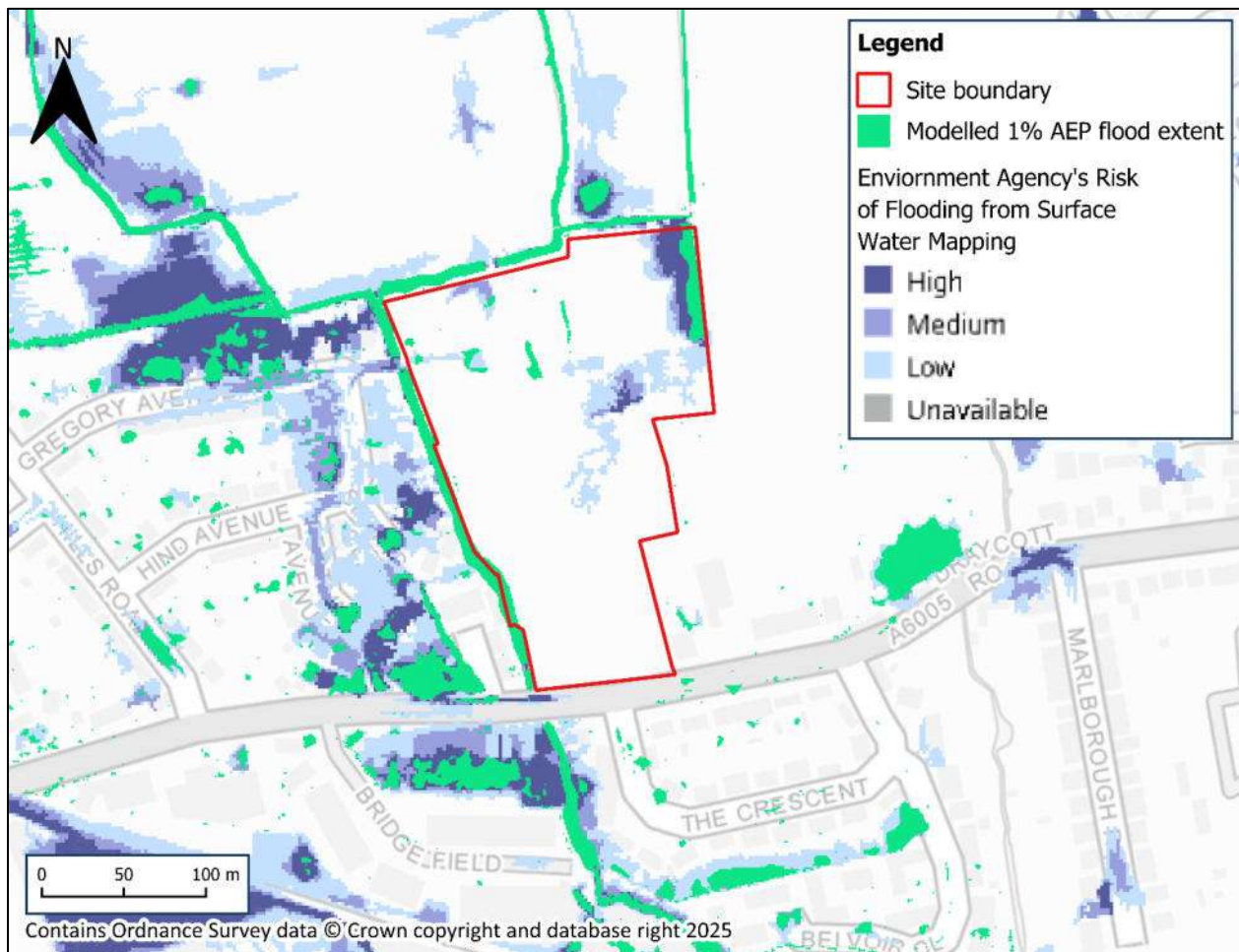


Figure 7-1: Environment Agency's RoFSW compared with the modelled 1% AEP event

Figure 7-2 shows the Environment Agency's Flood Zones which show the flood risk from rivers and the sea compared with the modelled 1% AEP flood extent. This comparison

shows that the modelled extent around the Golden Stream is much smaller than the EA mapping.

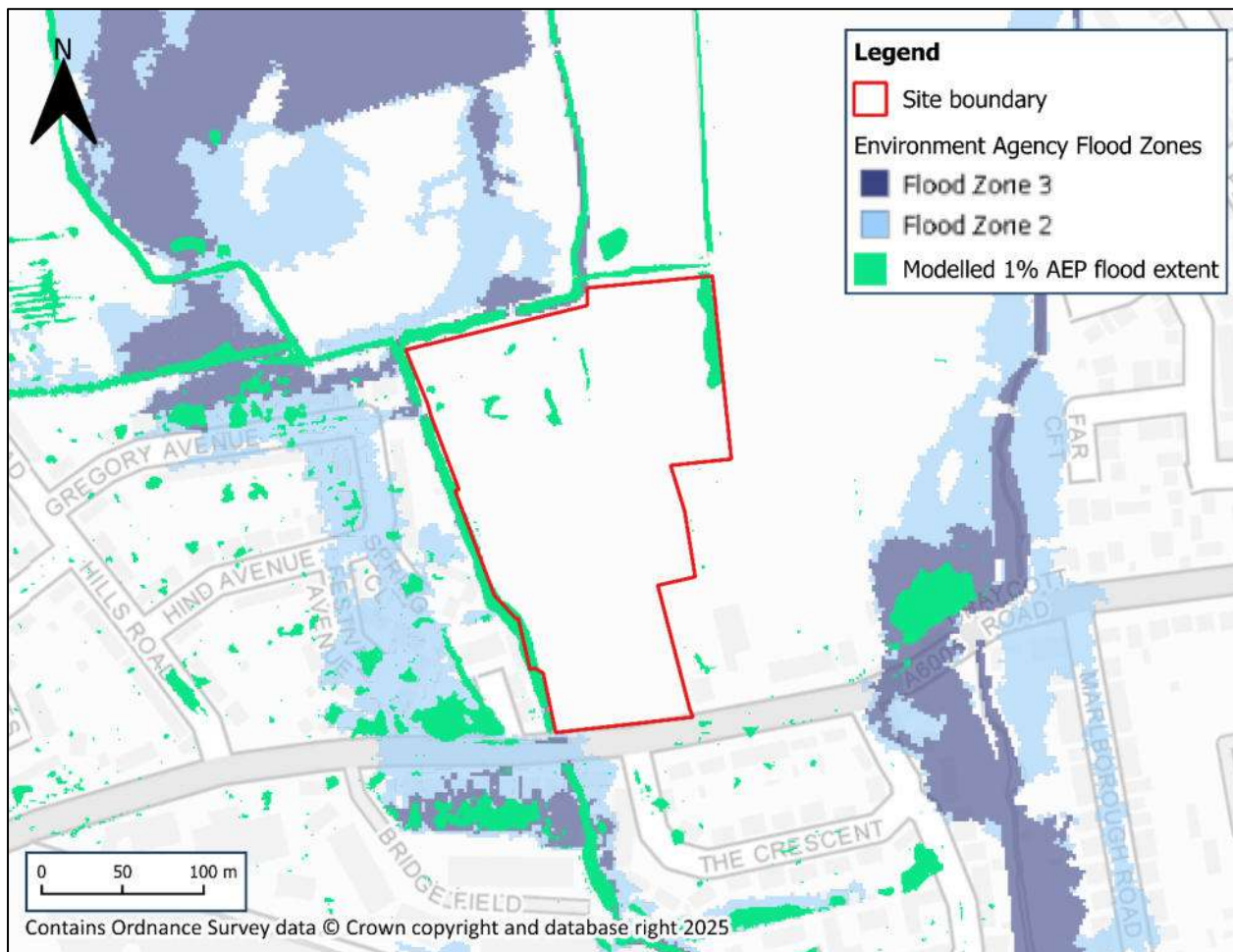


Figure 7-2: Environment Agency's Flood Zones compared with the modelled 1% AEP event

The results of the site-specific modelling detailed within this report should supersede the Environment Agency mapping as they provide an account of the surface water and fluvial flood risk at a greater resolution and consider a greater level of detail. For the Golden Brook the Environment Agency Flood Zones still apply as this watercourse was outside of the model extent.

8 Model stability

8.1 1D model stability plots

Analysis of the TUFLOW Log Files (TLF) for each simulation shows that there are no 1D negative depths being recorded for any of the baseline events implying good stability in the 1D model.

During the model simulations the maximum cumulative mass error in any event was -0.5 during the 3.33% and 1% AEP events. This is within the acceptable range of +/-1%.

8.2 2D model stability plots

The TUFLOW HPC solver is an explicit finite volume solution scheme which is unconditionally stable. This differs from the TUFLOW Classic solver which can continue to simulate a model with some volume error due to it being an implicit finite difference scheme. As such the assessment of the model performance for a TUFLOW HPC simulation is different to that of a TUFLOW Classic simulation. TUFLOW HPC uses adaptive time stepping and one of the key performance indicators is the minimum timestep (dt) value used. Figure 8-1 shows the dt used throughout the model for the 1% AEP event. The plot highlights that there are no significant low dt values, which indicates a generally stable model simulation.

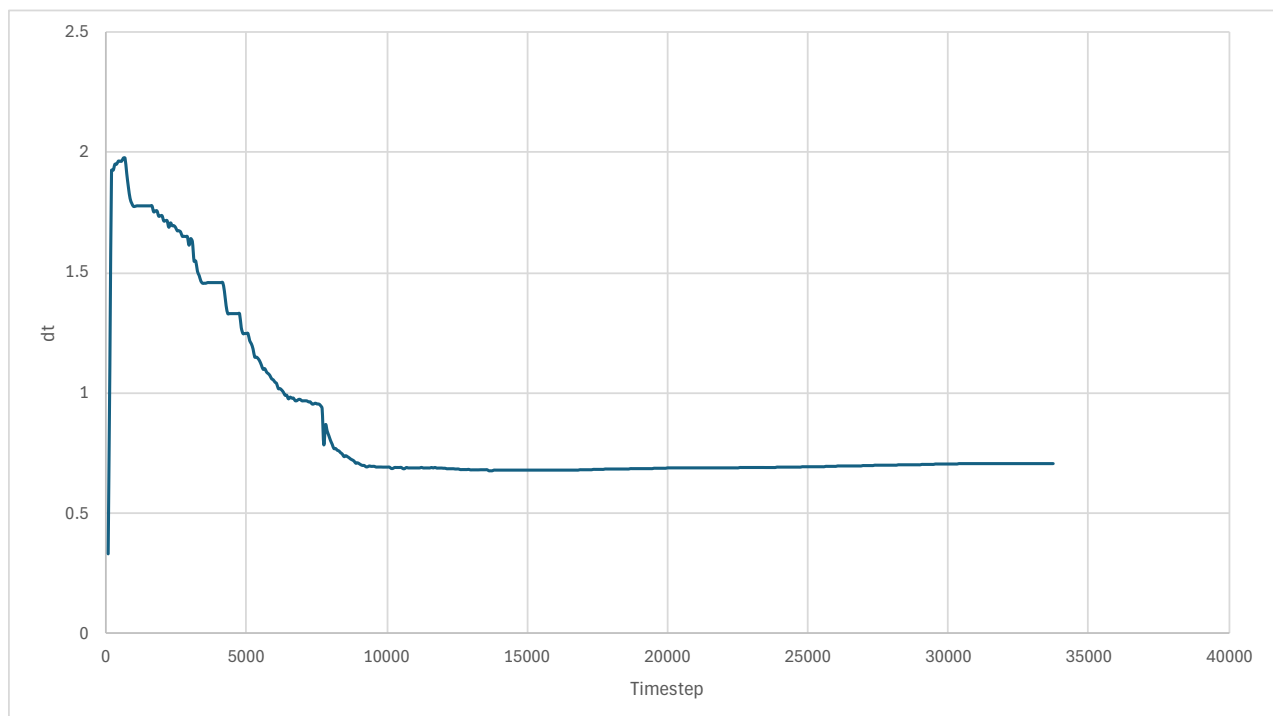


Figure 8-1: 1% AEP dt timestep

There are three primary processes that control the timestep being adopted: Courant number (Nu), the shallow wave celerity number (Nc) and the diffusion number (Nd).

Figure 8-2 shows the values for these three control parameters for the 1% AEP event. Ideally, the Nu will remain below 1, the Nc will remain at or below 1, and the Nd will remain below 0.3. All the control numbers are within the recommended tolerances as set by TUFLOW for the full duration of the model simulation.

The TUFLOW Log File also outputs the number of repeated timesteps which can indicate poor 2D model performance. These are split into two; NCN which looks at repeated timestep associated with high control numbers, and NaN which indicates an erroneous instability value. None of the model simulations exhibit NCN or NaN repeated timesteps.

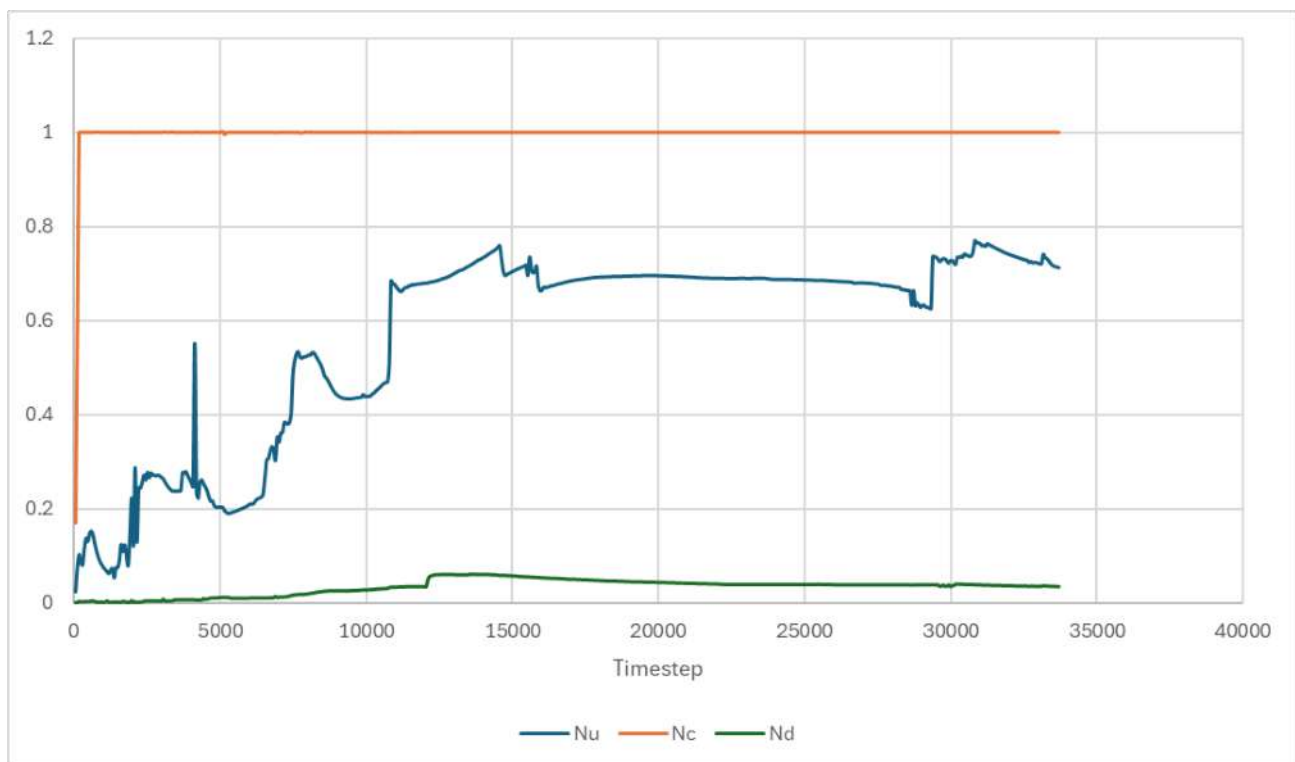


Figure 8-2: Model control number outputs - 1% AEP event

9 Assumptions and limitations

9.1 Railway line

A railway line runs to the south of the site and sits in a cutting. On the site visit and during the channel survey drains were observed along the railway line and no evidence of the watercourse was found south of the railway. Reach 1, 8 and 13 all drain towards the railway line and have culverts inlets just north of the railway line (locations shown in Figure 9-1). With no information regarding the operation of the drainage system along the railway or the outlet of the culverts at the downstream extent of reach 1, 8 and 13, the decision was made to model these culverts as 100% blocked. This is a conservative approach as it allows flow to back up onto the wider catchment in high flows.

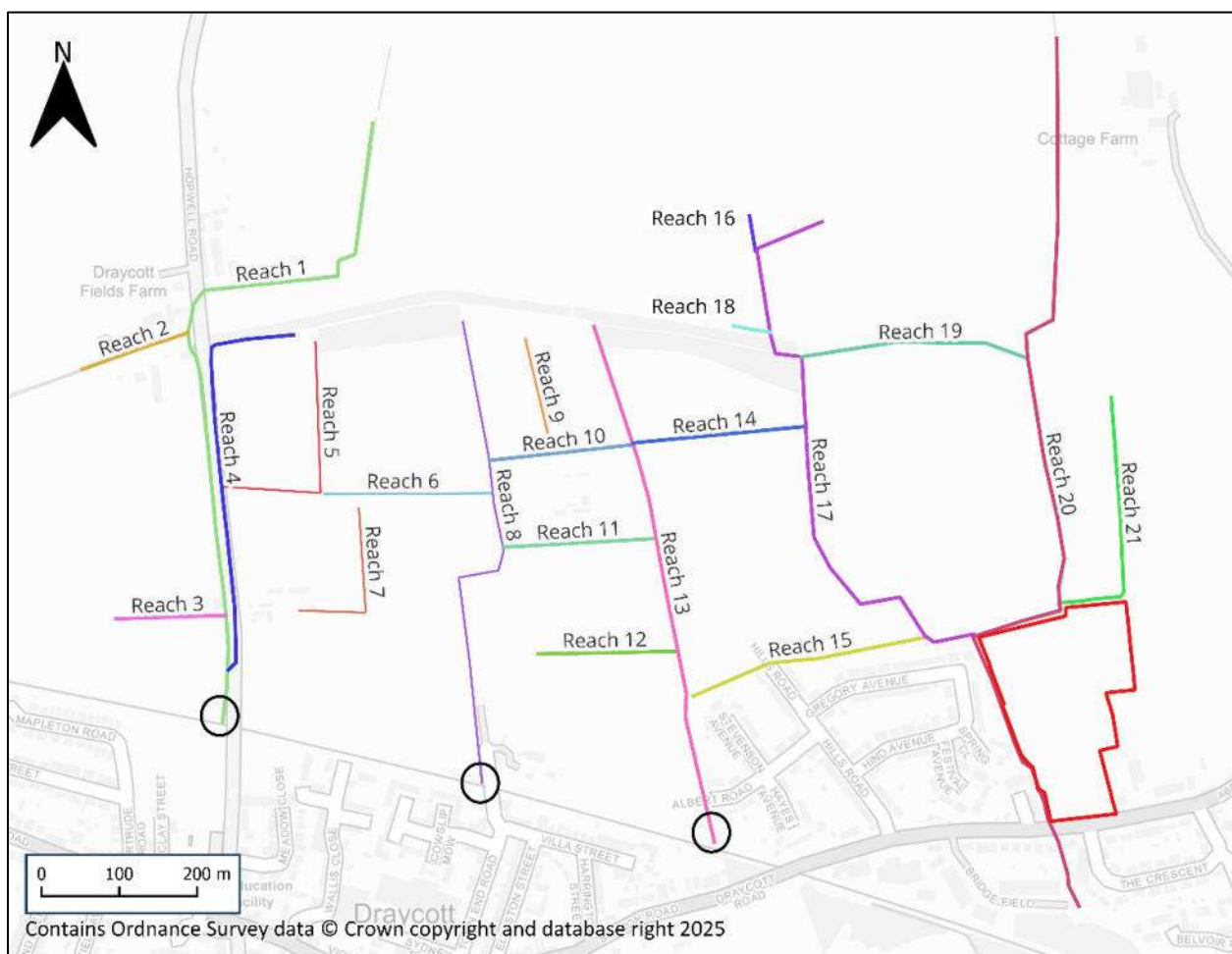


Figure 9-1: Railway culvert locations

9.2 Reach 1 culverts

On the channel survey it was noted that anecdotal evidence suggests that if the pipe at Reach 2 - XS3 becomes blocked then it flows through a hatch and joins Reach 1. With no information on the survey regarding the pipe connecting Reach 2 and Reach 1 a 200mm diameter pipe was assumed based on planning drawing from the Canal Cottage drainage

plan (Appendix 0). The invert levels were assumed based on the upstream culvert labelled as Reach 2 - XS3 and the downstream invert was estimated based on the change in topography. Although assumptions have been made, representing this connection (Dray01_1265C) is important in conveying flow that may potentially impact the flood risk at the site.

The culvert labelled Dray01_1137C in the model was not picked up in the channel survey however Google Street View shows it to be very similar to the upstream culvert on this reach (Dray01_1187C) which was picked up in the survey. Therefore, the diameter was set to 0.75m using to match the height of the upstream culvert. Invert levels and the spill level for this structure were assumed using LiDAR and the length was estimated using satellite imagery. Given that this culvert is not within the site making these assumptions is an appropriate approach.

The locations of these culverts are shown in Figure 9-2.

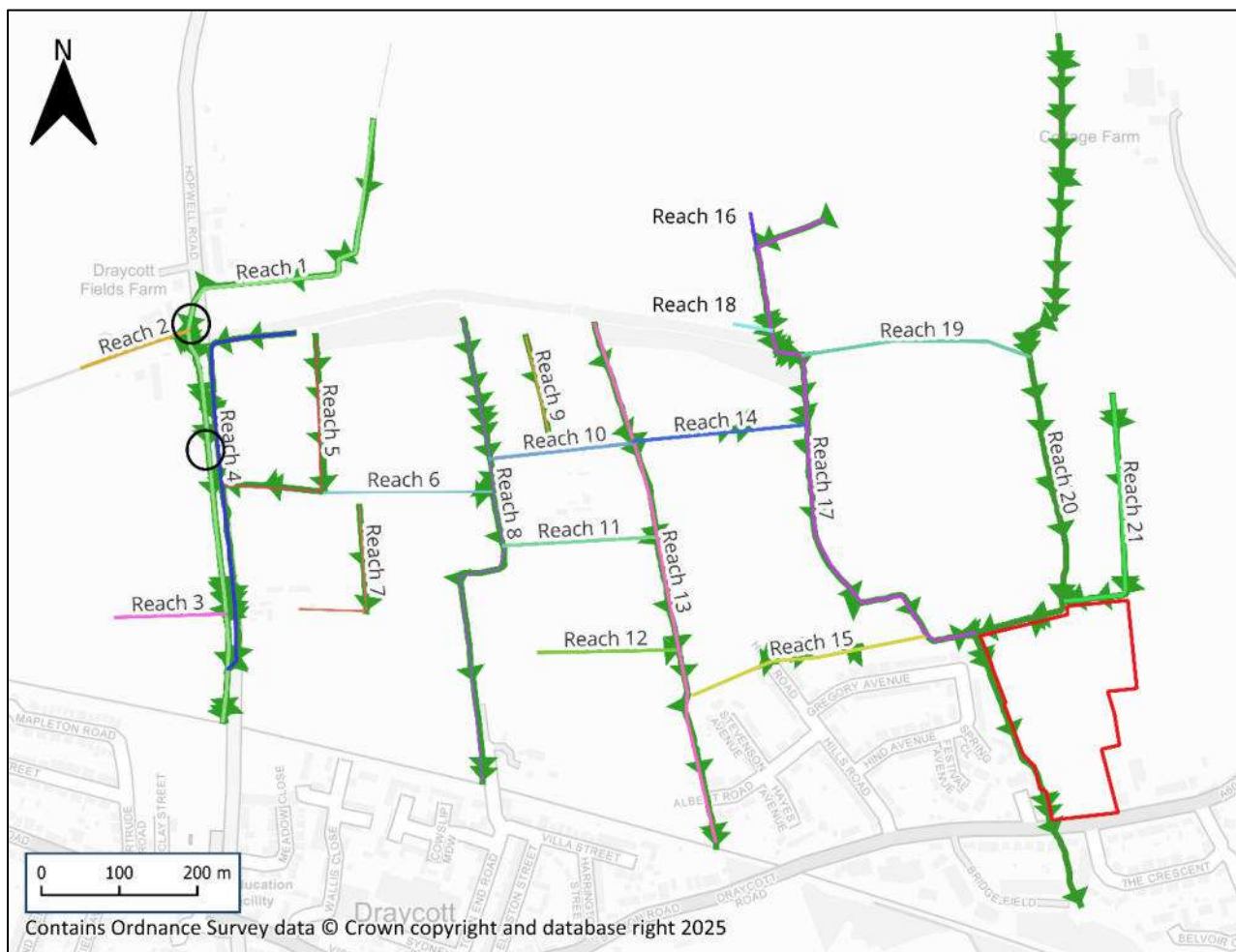


Figure 9-2: Reach 1 culvert locations (with assumptions)

10 Conclusions

JBA Consulting were commissioned by Peveril Homes to undertake a direct rainfall hydraulic modelling study to support a proposed development at land off Draycott road, Breaston.

A direct rainfall 1D-2D ESTRY-TUFLOW hydraulic model was produced to represent the Golden Stream and the ditches that flow through the site. Channel survey collected in June 2025 was used to represent the watercourses and topography survey and Environment Agency LiDAR were used to represent ground levels in the floodplain.

Baseline results indicate that:

- Outside the watercourse, there is some flooding within the site in all modelled flood events. The most significant areas of flooding occur in the north-eastern boundary of the site.
- The modelled flood extents are smaller than the Environment Agency's RoFSW and RoFRS mapping, however they do show ponding and flows in similar areas. The differences between the modelled extent on the RoFSW mapping is due to the more detailed representation of hydraulic structures and topography data within the modelling.
- The maximum depth, outside of the watercourses, is predicted to occur at the in the north-east of the site where depths reach 0.18m in the 1% AEP plus climate change (40%) event.
- Within the site, the peak levels during the 1% AEP plus climate change (40%) event reach 36.9m AOD.
- The flooded areas outside of the watercourse and ditches within the site have a 'Caution' hazard classification in the 1% AEP plus climate change (40%) event.
- Sensitivity test results show that the model is relatively insensitive to changes in roughness, flow and downstream boundary parameters.
- Blockage analysis shows that blockages within the channel and at structures causes localised impacts to the site with flow overtopping the banks in these scenarios.

Post development results indicate that:

- Outside of the watercourses there is no flooding within the site boundary during the 1% AEP plus climate change (40%).
- Outside of the site boundary there is a slight increase in flood depths east of the site just north of Draycott Road. Although there is an impact outside of the site boundary this impact mainly lies within the wider ownership boundary and therefore would be acceptable. There is no adverse flood risk impact to third-party land.

A Channel Survey



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All dimensions to be checked on site prior to design and construction

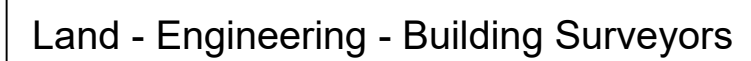
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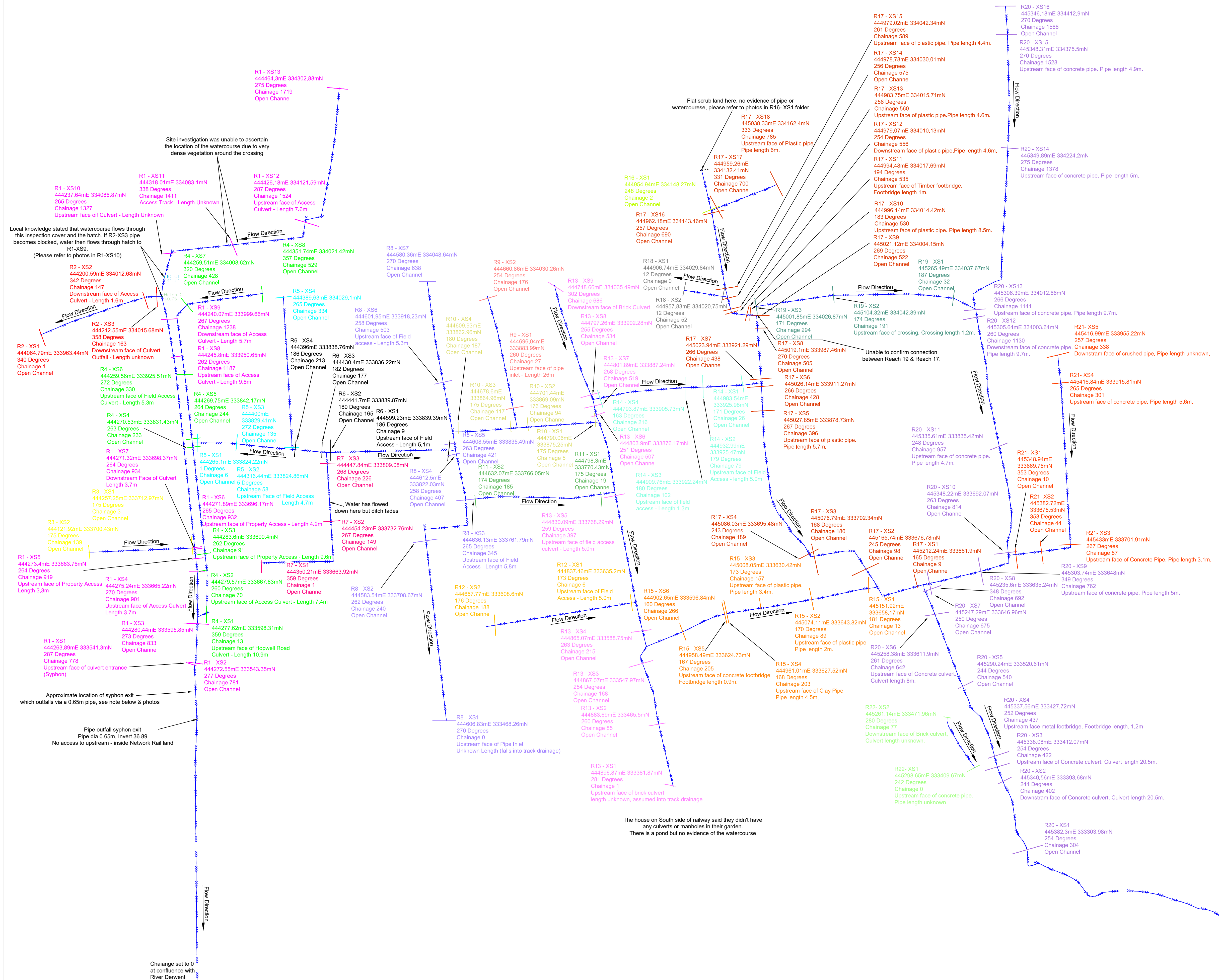
Client:

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Coleshill House
1 Station Road, Colehill
Warwickshire B46 1HT

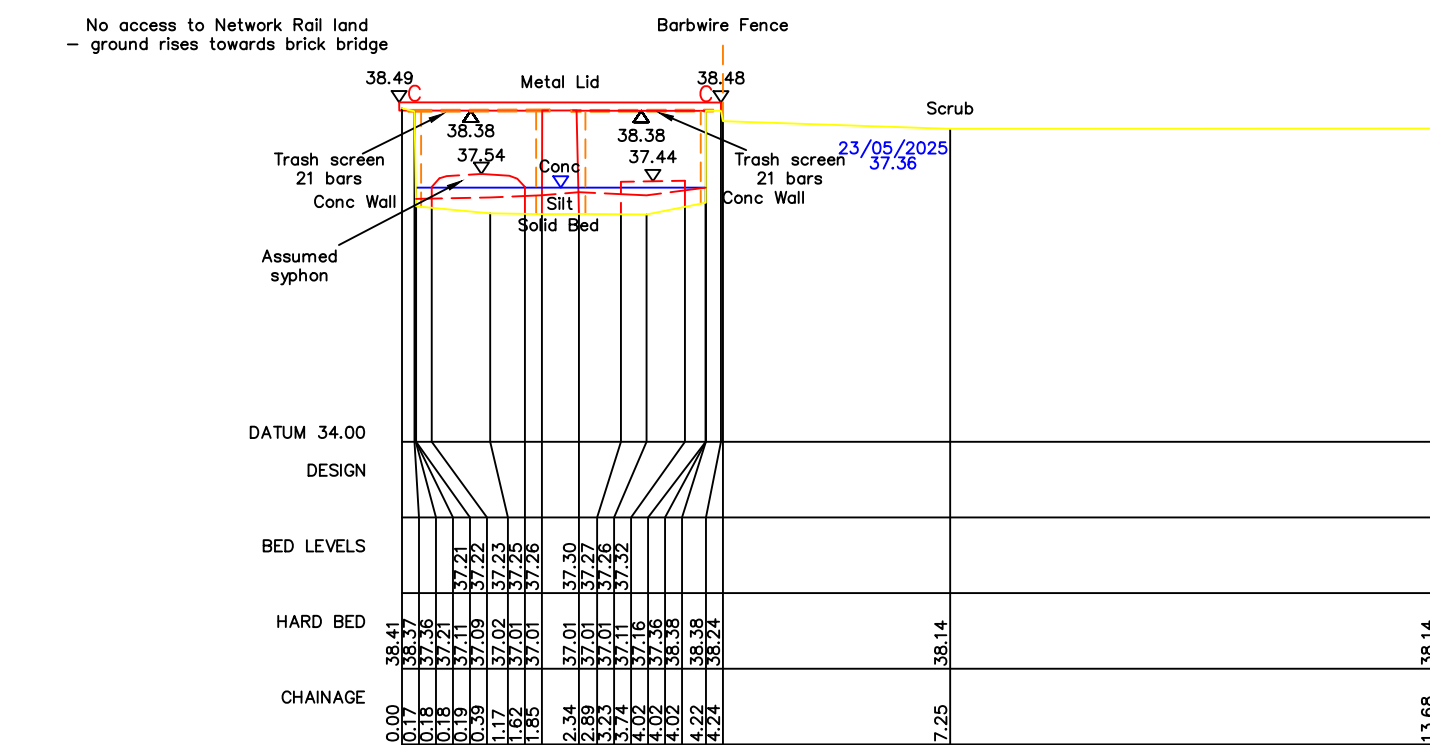


 Tel: 01789 764420 
 THE SURVEY ASSOCIATION E-Mail: info@gcsurveys.co.uk
 FULL MEMBER Web Site: www.gcsurveys.co.uk

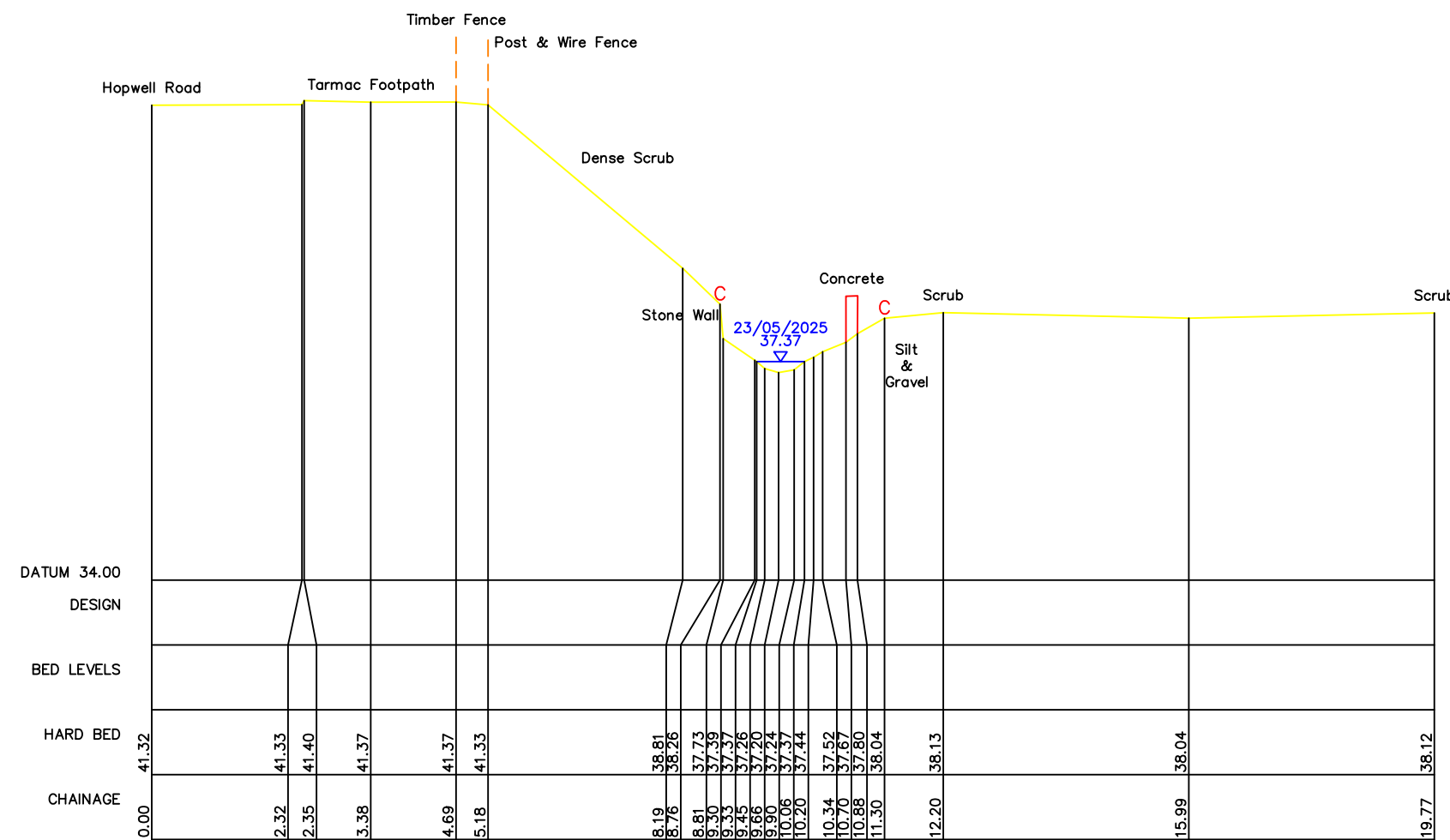
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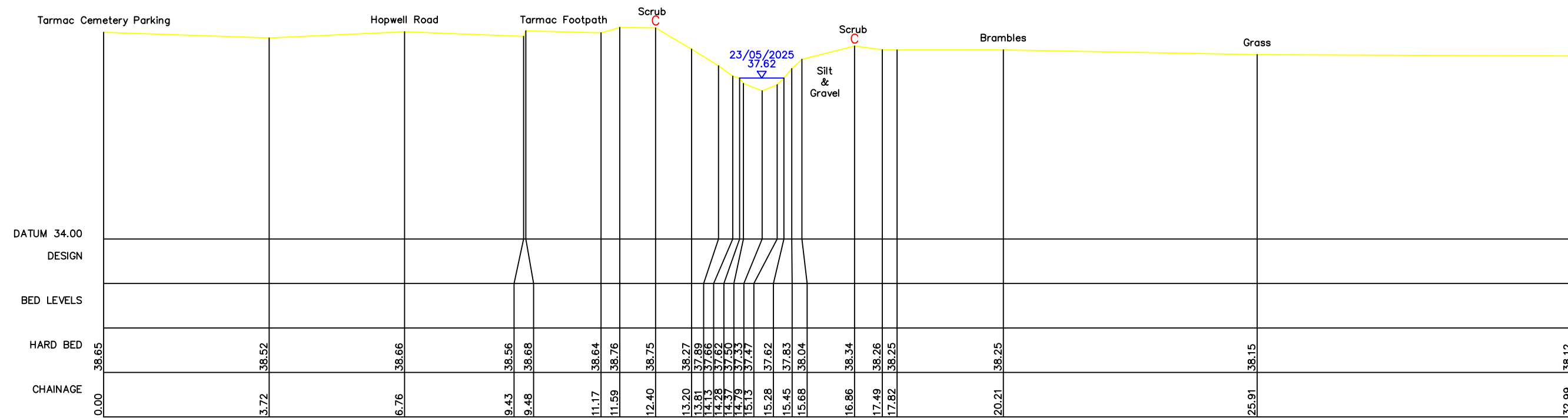
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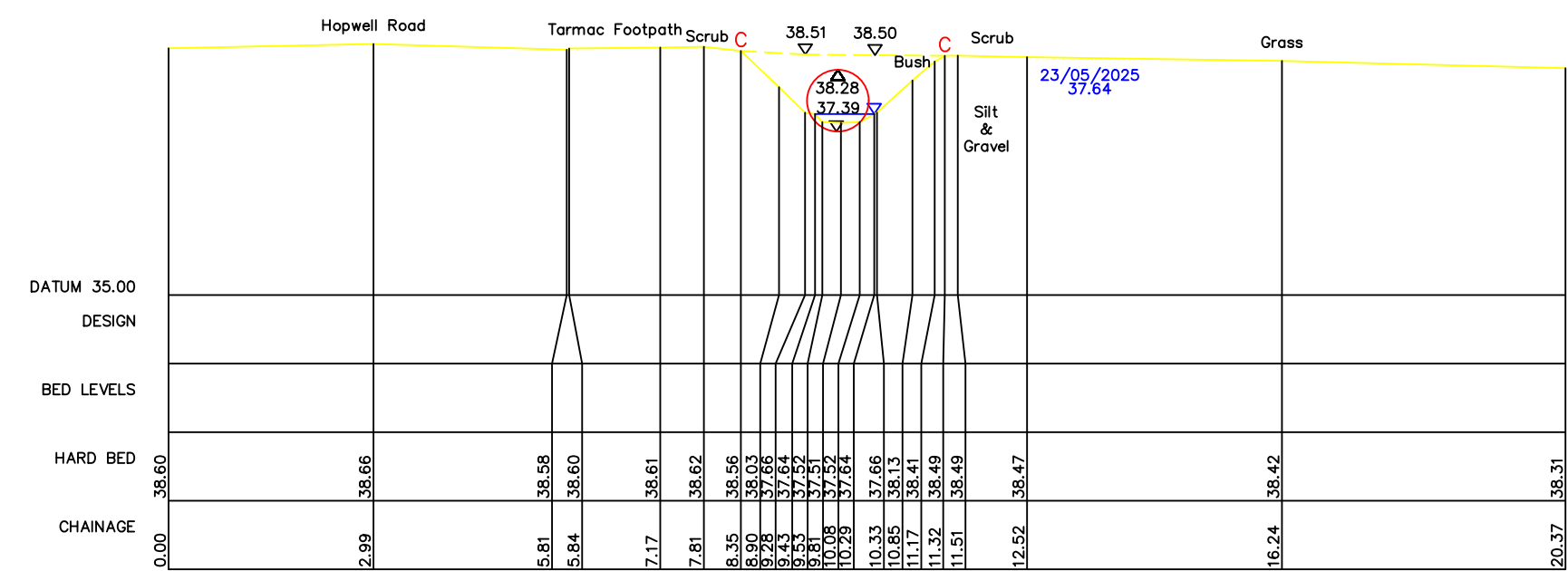
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Upstream face of culvert entrance
(Syphon)



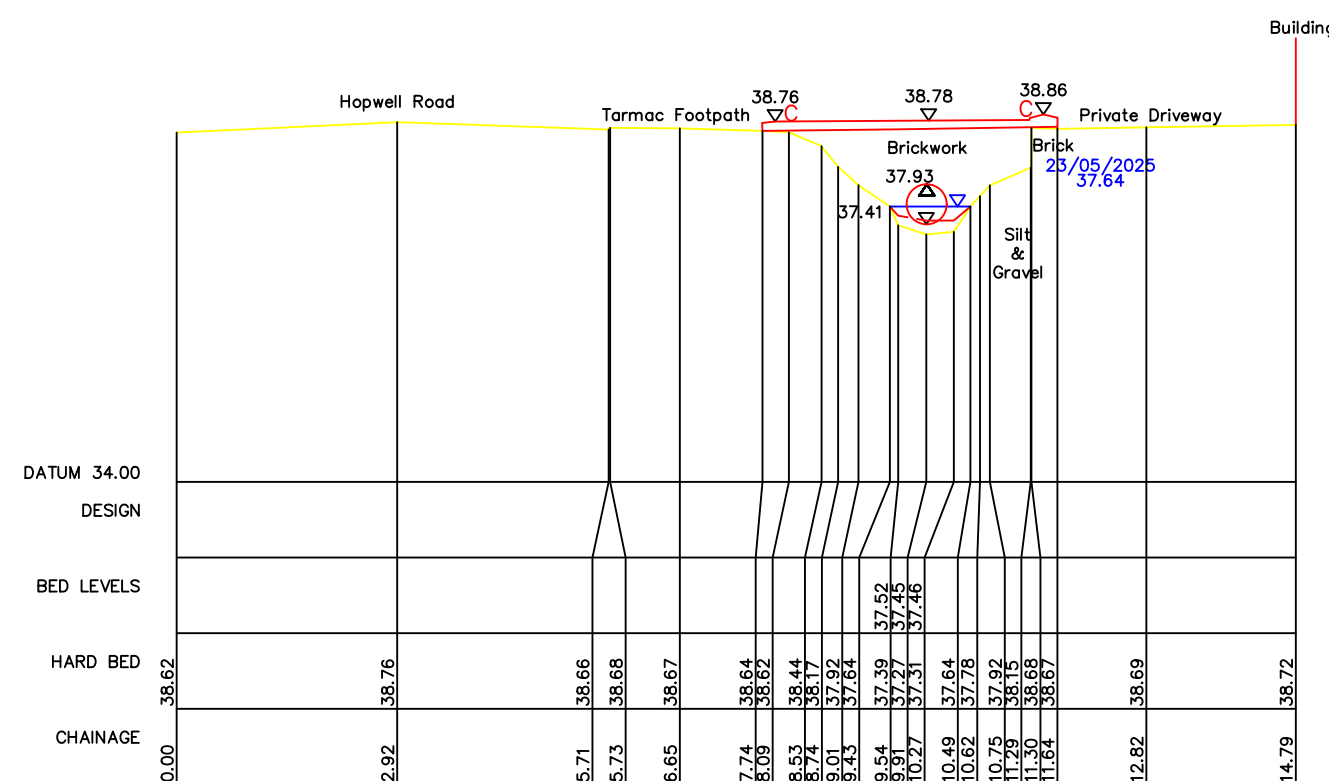
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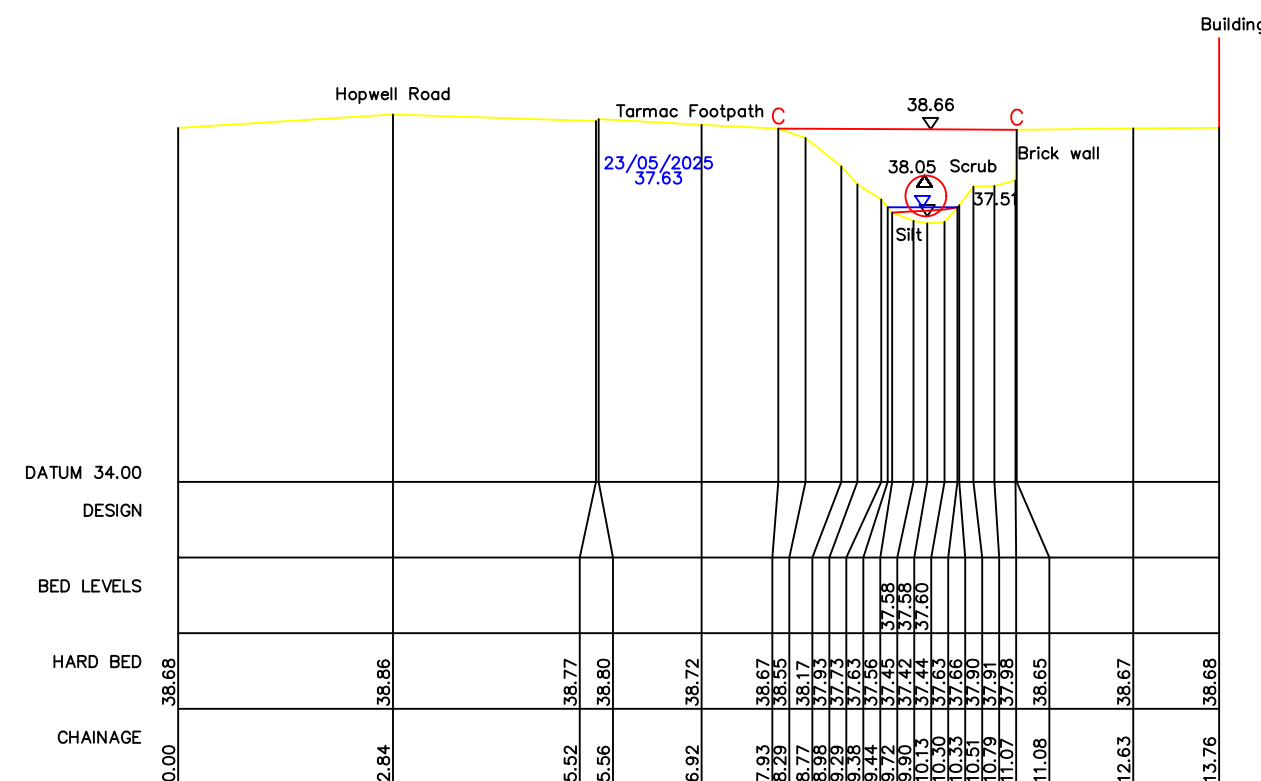
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Chainage 832.7
Open Channel



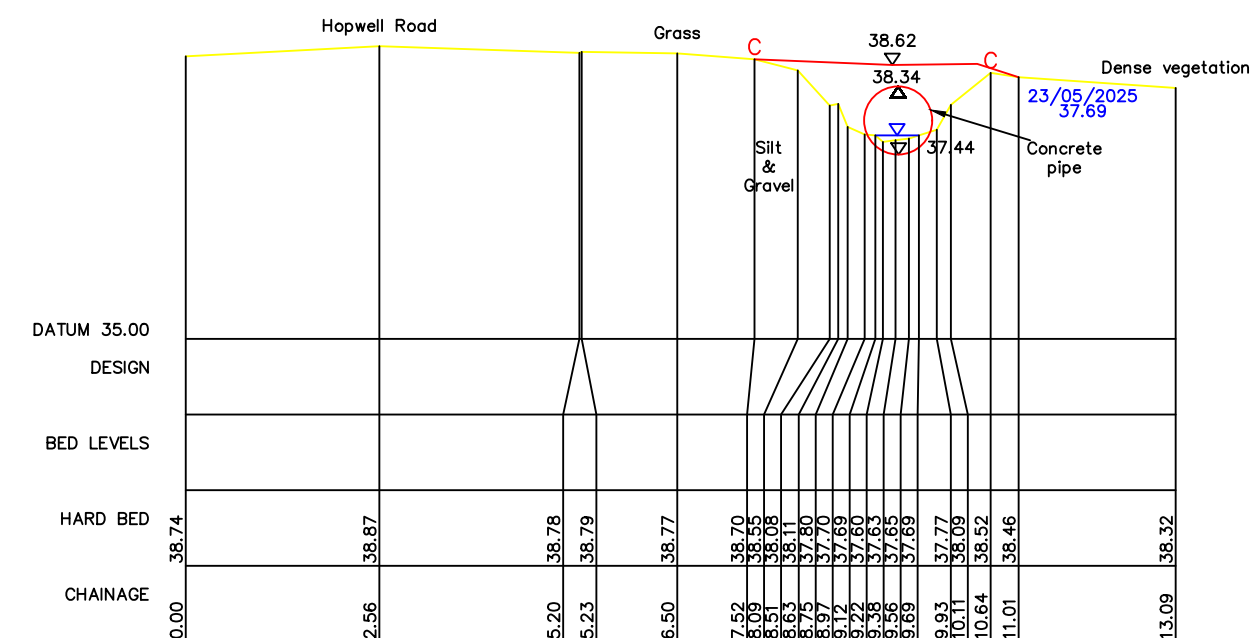
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Chainage 901.4
Upstream face of Access Culvert - Length 3.7m



R1 - XS5
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Chainage 918.9
Upstream face of Property Access - Length 3.3m



R1 - XS6
444271.89mE 333696.17mN Brg 265
Chainage 931.6
Upstream face of Property Access - Length 4.2m



R1 - XS7
444271.32mE 333698.37mN Brg 264
Chainage 933.7
Downstream Face of Culvert - Length 3.7m



Notes

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Legend

BAR WALL	AV	WATER TAP	TAP
IRVINE	BD	TEMPERARY BENCH MARK	TM
TELEPHONE CABLE BOX	BS	TELEPHONE CABLE BOX	TO
BUS STOP	BS	TELEPHONE POST	TP
BT INSPECTION COVER	BT	THRESHOLD LEVEL	THL
TELEPHONE CABLE	BTB	TRAFFIC LIGHT	TL
CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOW
TELEPHONE CABLE	CTV	TELEGRAPHY POLE	TP
DOWN PIPE	DK	UNABLE TO LIFT	UTL
DROPPED KERB	DK	VENT PIPE	VP
ELECTRICITY CONTROL BOX	EH	RAIN WELDED	WE
EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH		
FOUL WATER	FW		
GULLY	GY		
GATE POST	GP		
GAS VALVE	GV		
INSULATED BLOCK JOINT	IJB		
INSPECTOR'S COVER	IC		
INVERT LEVEL	IL		
KERBS OUTLET	KO		
LAMPPOST	LP		
LITTER BIN	LB		
MARKER POST	MP		
MILE POST	MLP		
POST	PO		
RODDING EYE	RE		
HEIGHT RIGHT	RH		
ROAD NAMEPLATE	RN		
ROAD SIGN	RS		
STUMP	ST		
SOFFIT LEVEL	SSL		
SIGNAL POST	SP		
SIGNALS AND TELECOMS BOX	STB		
LOW SLEEPER LEVEL	SLP		
SIGNALS AND TELECOMS BOX	STB		
SIGNALS AND TELECOMS POST	STP		
SIGNAL POST	SP		
STOP TAP	ST		
STOP VALVE	SV		
STAY	SW		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

Grid: *OS National Grid* **Datum:** *Ordnance Datum Newlyn*
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Title:

WATERCOURSE SURVEY AT
DRAYCOTT ROAD
(Cross Sections)

Client:

JBA CONSULTING
Suite 1B First Floor
Coleshill House
1 Station Road, Coleshill
Warwickshire B46 1HT



**Grantham Coates
Surveys Ltd**

Land - Engineering - Building Surveyors

2 Arden Court, Arden Road, Alcester
Warwickshire, B49 6HN



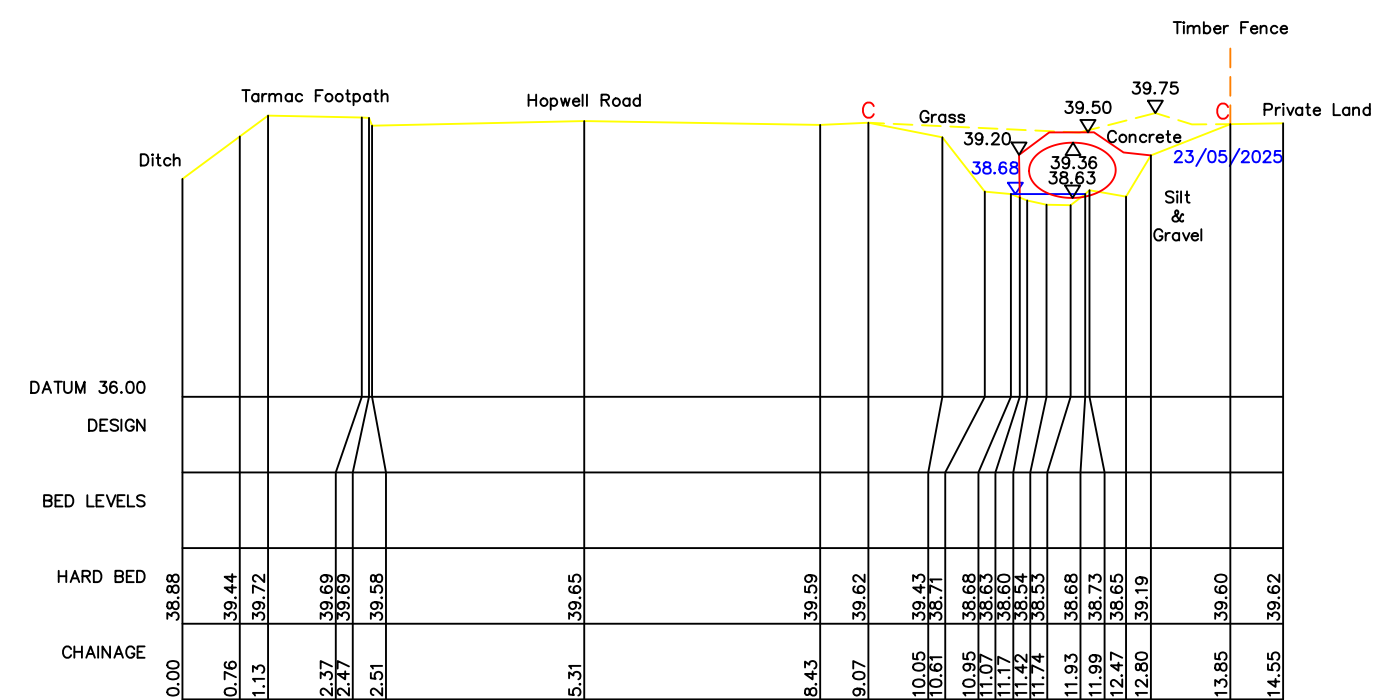
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Web Site: www.gcsurveys.co.uk

Drawing No:	GCS/JBA/2437/1	Rev:	A
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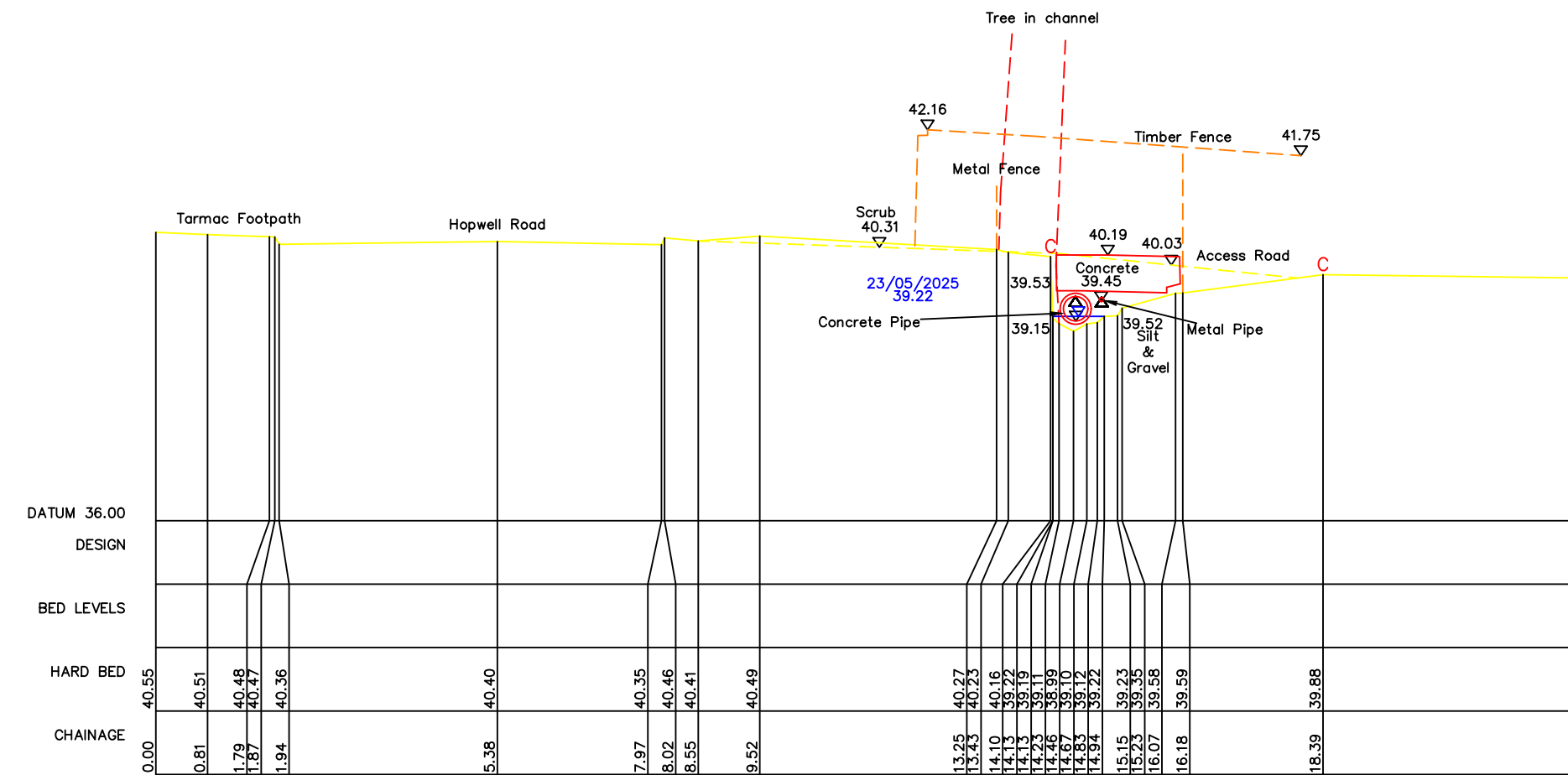
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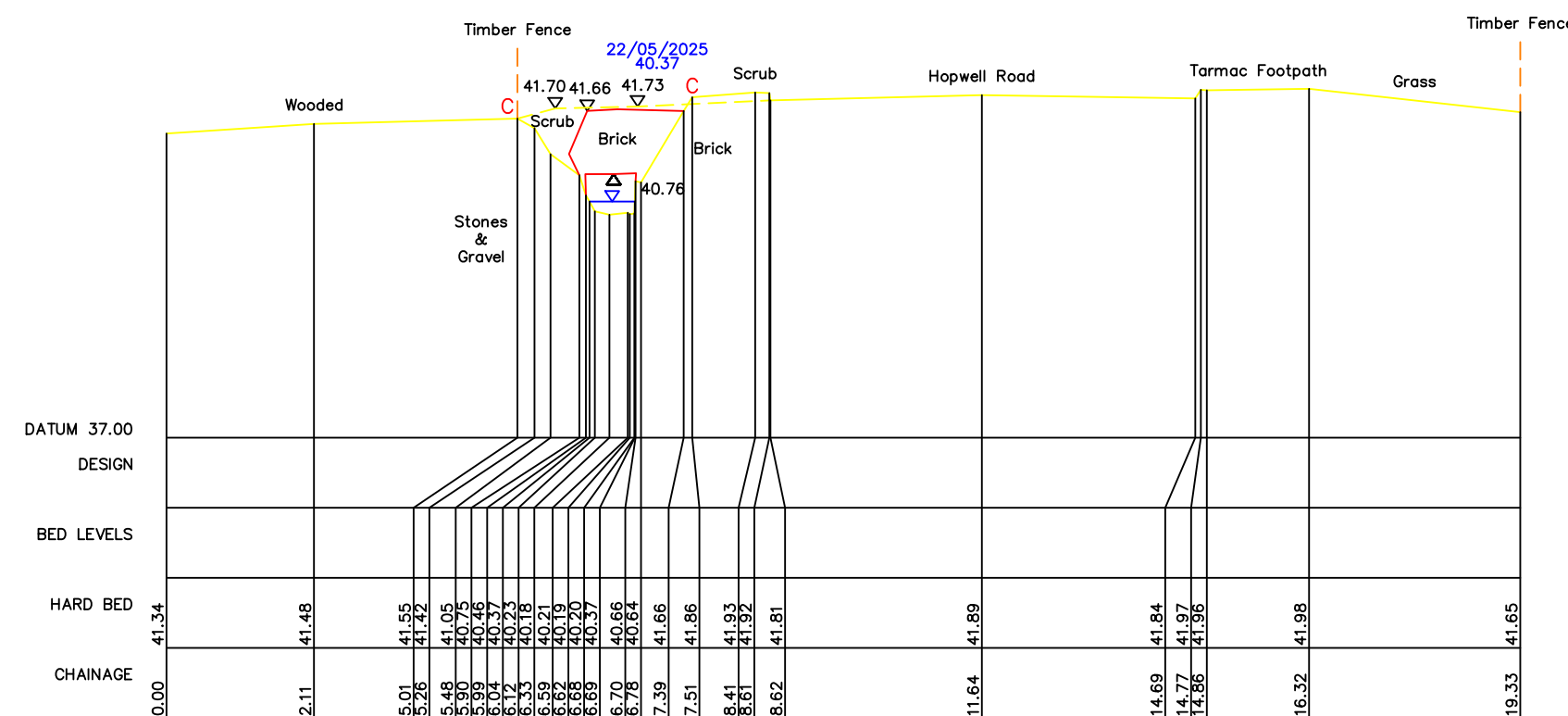
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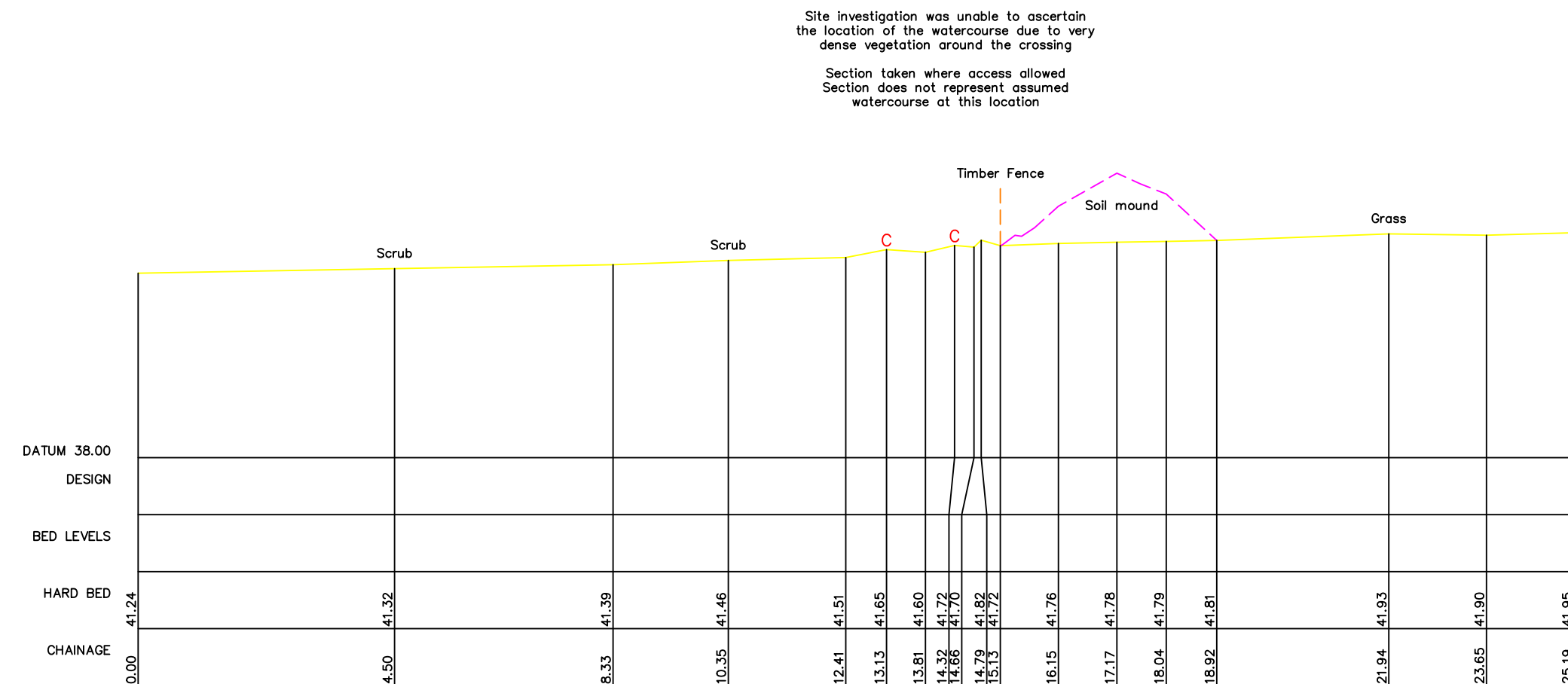
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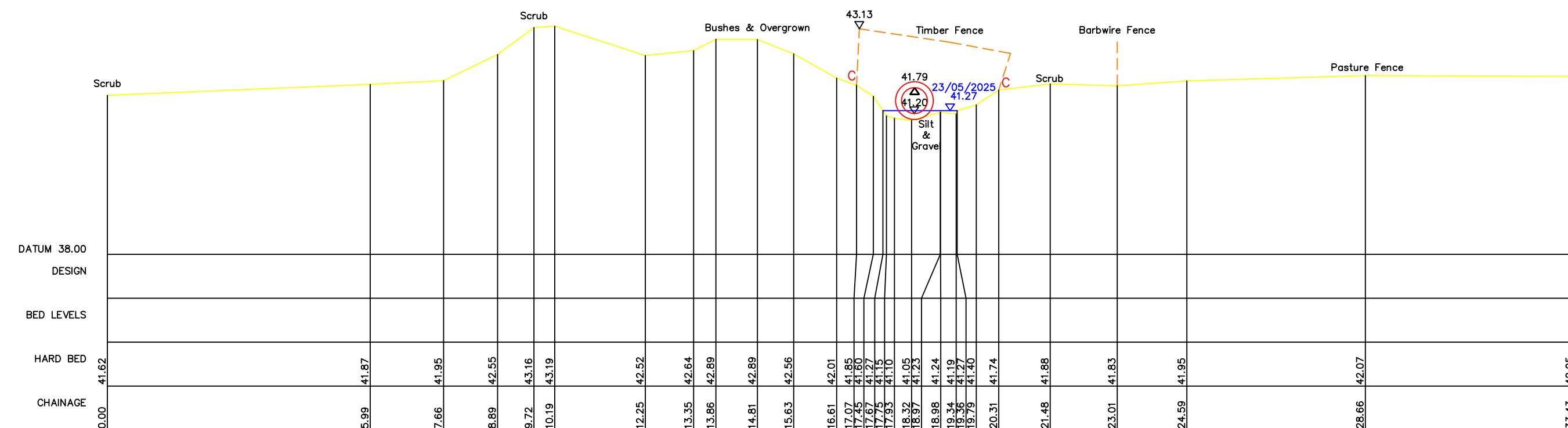
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Chainage 1237.6
Downstream face of Access Culvert - Length 5.7m



R1 - XS10
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Chainage 1327.3
Upstream face oif Culvert - Length Unknown



R1 - XS11
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Chainage 1410.8
Access Track - Length Unknown



R1 - XS12
444426.18mE 334121.59mN Brg 287
Chainage 1523.9
Upstream face of Access Culvert - Length 7.6m



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BAR VALVE	AV	WATER TAP	TAP
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BURIED	BU	TELEPHONE CABLE BOX	TCB
BUS STOP	BS	TELEPHONE POST	TEL
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BT	BT	TRAFFIC LIGHT	TL
CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOW
CAN	CA	TELEGRAPHY POLE	TP
DOWN PIPE	DP	UNABLE TO LIFT	UTL
DROPPED BUSH	DB	VENT PIPE	VP
ELECTRICITY CONTROL BOX	EK	RAIL WELD	WE
EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH	SURVEY STATION	 GS1
FOUL WATER	FW		
GULLY	GY		
GATE POST	GP	BUSHES	
GAS VALVE	GV		
INSULATED BLOCK JOINT	IBJ		
INSPECTOR COVER	IC		
INVERT LEVEL	IL	HEDGES	
KIRKS OUTLET	KO		
LANDPOST	LP	TREES	
LITTER BIN	LB		
MARKER POST	MP	Height Species (Spread to scale)	
MANHOLE	MH		
POST	PO		
RODDING EYE	RE		
EDGE HEIGHT	RH		
ROAD NAME PLATE	RNP		
ROAD SIGN	RS	GATE	
STUMP	SP	SECURITY FENCE	
SOFFIT LEVEL	SL	OVERHEAD CABLES	
SIGNAL POST	SPG	FOUL WATER	FW
MANHOLE SLEEPER	MS	DOWN MAN	DM
SIGNALS AND TELECOMS BOX	STB	LOW POWER LINE	PL
SIGNALS AND TELECOMS CAB	STC	STORM WATER	SW
SIGNALS AND TELECOMS CAB	STC	UP OF TELEPHONE	UTP
SIGN POST	SP	WATER MAIN	WM
STOP	ST		
STOP VALVE	SV		
STAY	SV		
STORM WATER	SW		

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GCS-JBA-2437-1A		A1	3 of 35		

REACH 1



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Legend

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1 Station Road, Colehill
Warwickshire B46 1HT



**Grantham Coates
Surveys Ltd**

Land - Engineering - Building Surveyors

2 Arden Court, Arden Road, Alcester
Warwickshire, B49 6HN

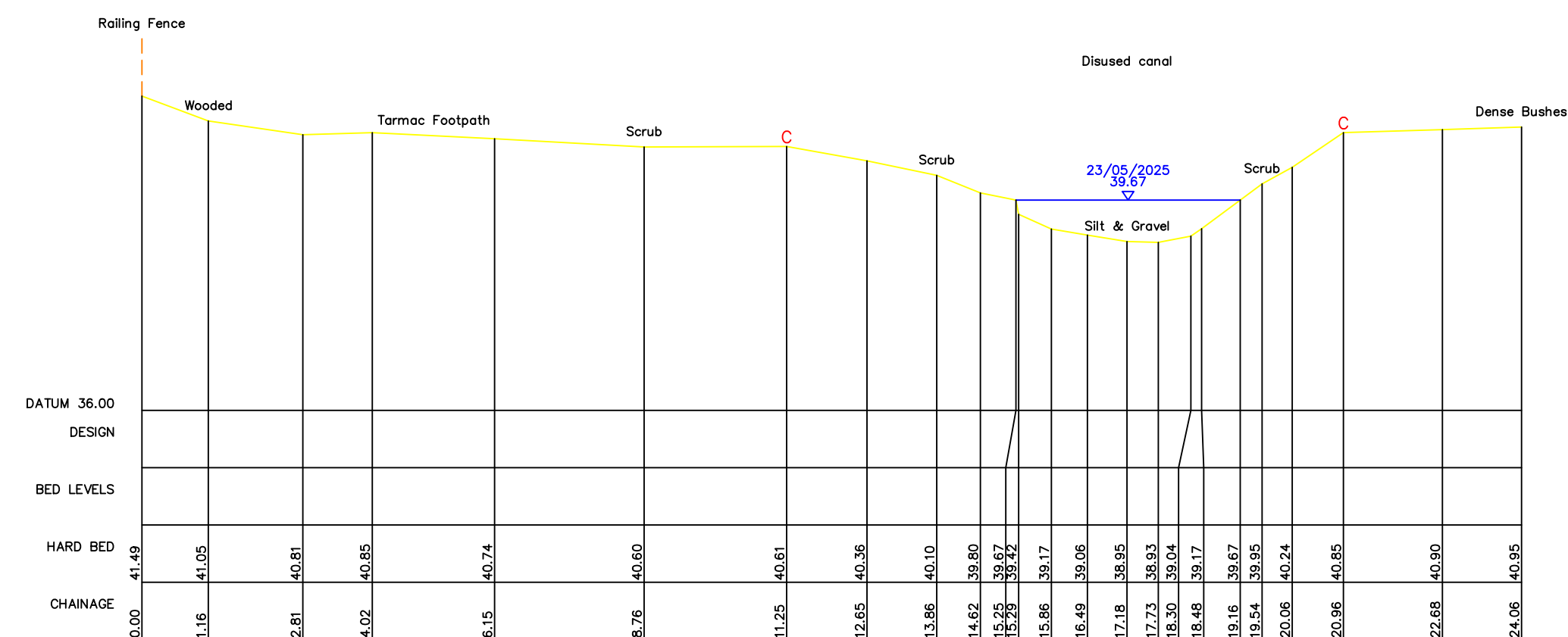


E-Mail: info@gcsurveys.co.uk
Web Site: www.gcsurveys.co.uk

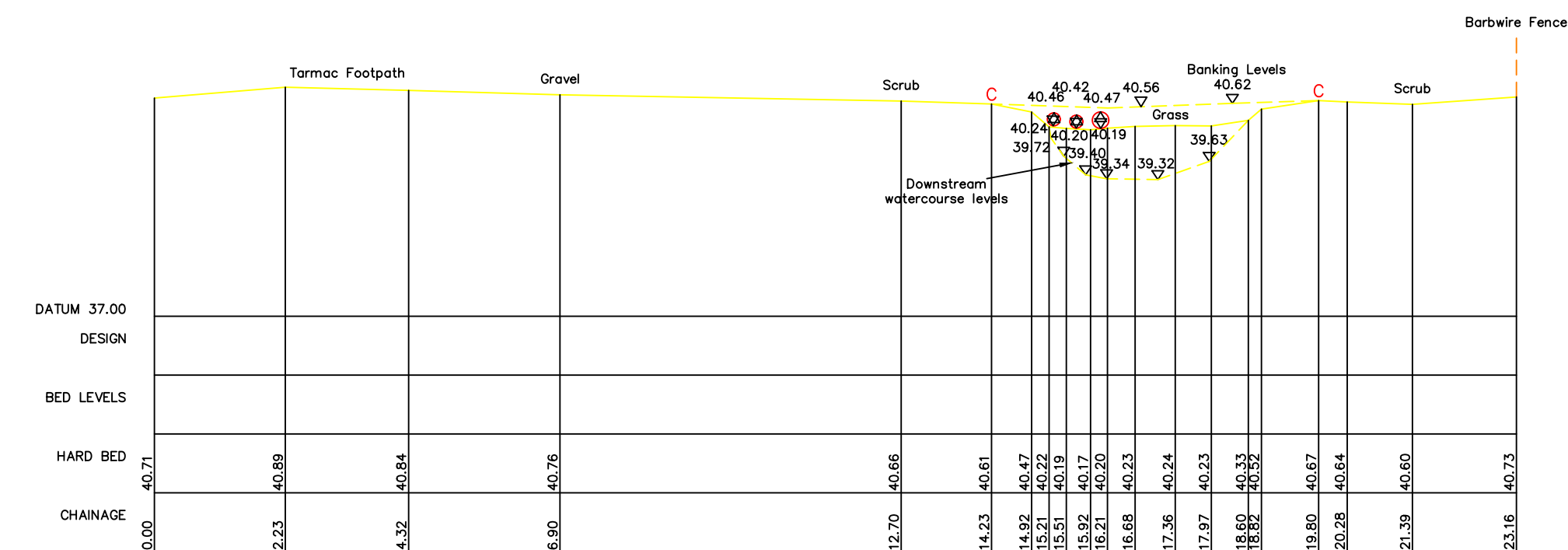


Drawing No:			GCS/JBA/2437/1			Rev:		A	
Date:		Notes:				Name:		Rev:	
18-6-25		XS R1-8 culvert length corrected				CC		A	
Drawn:		Checked:		Scale:		Date:			
MS/MH		CC		1:100		06/06/25			
File Name:				Sheet size:		Sheet:			
GCS-JBA-2437-1A				A1		4		35	

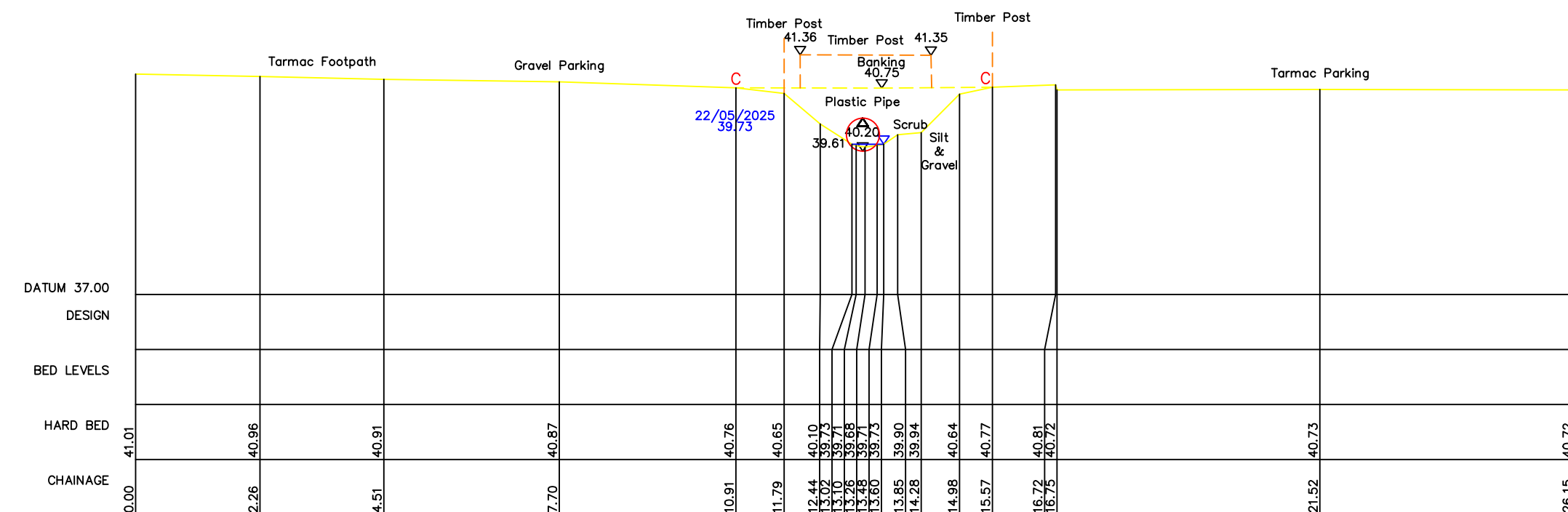
REACH 2



R2 - XS1
444064.79mE 333963.44mN Brg 340
Chainage 1.5
Open Channel



R2 - XS2
444200.59mE 334012.68mN Brg 342
Chainage 146.5
Downstream face of Access Culvert - Length 1.6m



R2 - XS3
444212.55mE 334015.68mN Brg 358
Chainage 163.1
Downstream face of Culvert Outfall - Length unknown



Notes

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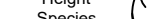
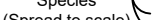
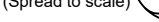
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Legend

ARRIVAL	AV	WATER TAP	TAP
BOMB HOLE	BD	TELEPHONE CABLE MARK	TCB
BUS STOP	BS	TELEPHONE POST	TEL
BT INSPECTION COVER	BTB	THRESHOLD LEVEL	THL
BT SIGN	BTB	TRAFFIC LIGHT	TL
CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOW
CORNER LEVEL	CL	TRAIL	TR
DRAIN PIPE	DP	UNABLE TO LIFT	UTL
DROPPED KERB	DK	VENT PIPE	VP
ELECTRICITY CONTROL BOX	ECB	RAIL WELD	WM
EYES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH	SURVEY STATION	GC51
FOUR WATER	FW		
GULLY	GU		
GATE POST	GP	BUSHES	
GAS VALVE	GV		
INSULATED BLOCK JOINT	IBJ		
INSPECTION COVER	IC		
INVERT LEVEL	IL	HEDGES	
KERB OUTLET	KO		
LAMPPOST	LP		
LITTER BIN	LB		
MARKER POST	MP		
MILE POST	MP		
POST	PO		
PODDING EYE	PE		
RIDGE HEIGHT	RH		
ROAD NAMEPLATE	RN		
ROAD SIGN	RS		
STUMP	ST	SECURITY FENCE	
SOFT LEVEL	SL	FENCE	
SIGNAL POST	SIG	OVERHEAD CABLES	
RAIL SIGNAL POST	SLP	FOUL WATER	
SIGNALS AND TELECOMS BOX	STB	GAS MAIN	
SIGNALS AND TELECOMS CABLE	STC	IGN POWER LINE	
SIGNALS AND TELECOMS POST	STP	STORM WATER	
SIGN POST	SP	UGL TELEPHONE	
STOP TAP	ST	WATER MAIN	
STOP VALVE	SV		
STAY	SW		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

Grid: *OS National Grid* **Datum:** *Ordnance Datum Newlyn*
Survey related to Ordnance Survey National Grid (OSGB36) via GPS and the OS Active Network.
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No scale factor has been applied to the survey

Title:

WATERCOURSE SURVEY AT DRAYCOTT ROAD (Cross Sections)

Client:

JBA CONSULTING
Suite 1B First Floor
Coleshill House
1 Station Road, Coleshill
Warwickshire B46 1HT



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Drawing No:		GCS/JBA/2437/1		Rev: A	
Date:	Notes:			Name:	Rev:
18-6-25	XS R1-8 culvert length corrected			CC	A
Drawn: MS/MH	Checked: CC	Scale: 1:100	Date: 06/06/25		
File Name: GCS-JBA-2437-1A		Sheet size: A1	Sheet: 5 of 35		

REACH 3



Notes

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Legend

AIR VALVE	AV	WATER TAP	WT
BOLLARD	BO	TEMPORARY BENCH MARK	TBM
BURIED BOLT	BB	TELEPHONE CABLE BOX	TCB
BUS STOP	BS	TELEPHONE POST	TEL
CONCRETE INSULATION COVER	CI	THRESHOLD LEVEL	TEL
BT BOX	BTB	TRAFFIC LIGHT	TL
CABLE TAP INSPECTION COVER	CTV	TOP OF WALL	TOW
CEMENT	CE	TRAIL	TR
DOWN PIPE	DP	UNABLE TO LOCATE	UNL
DRAINED KERB	DK	VENT PIPE	VP
ELECTRICITY CONTROL BOX	ECB	RAIN WELD	RW
EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FW		
FOUL WATER	FW		
GULLY	GP		
GATE POST	GP		
GAZ VALVE	GV		
INSULATED BLOCK JOINT	IBJ		
INSPECTION COVER	IC		
INVERT LEVEL	IL		
KERB OUTLET	KO		
LAMPPOST	LP		
LITTER BIN	LB		
MARKER POST	MP		
MINI POST	MP		
POST	PO		
RODDING EYE	RE		
ROUTE HEIGHT	RH		
ROAD NAMEPLATE	RN		
ROAD SIGN	RS		
ROOF	RF		
SOFFIT LEVEL	SL		
SIGNAL POST	SP		
SIGNAL SLEEPER LEVEL	SSL		
SIGNALS AND TELECOMS BOX	STB		
SIGNALS AND TELECOMS CABLE	STC		
SIGNALS AND TELECOMS POST	STP		
SIGN POST	SP		
STOP TAP	ST		
STOP VALVE	SV		
STAY	ST		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

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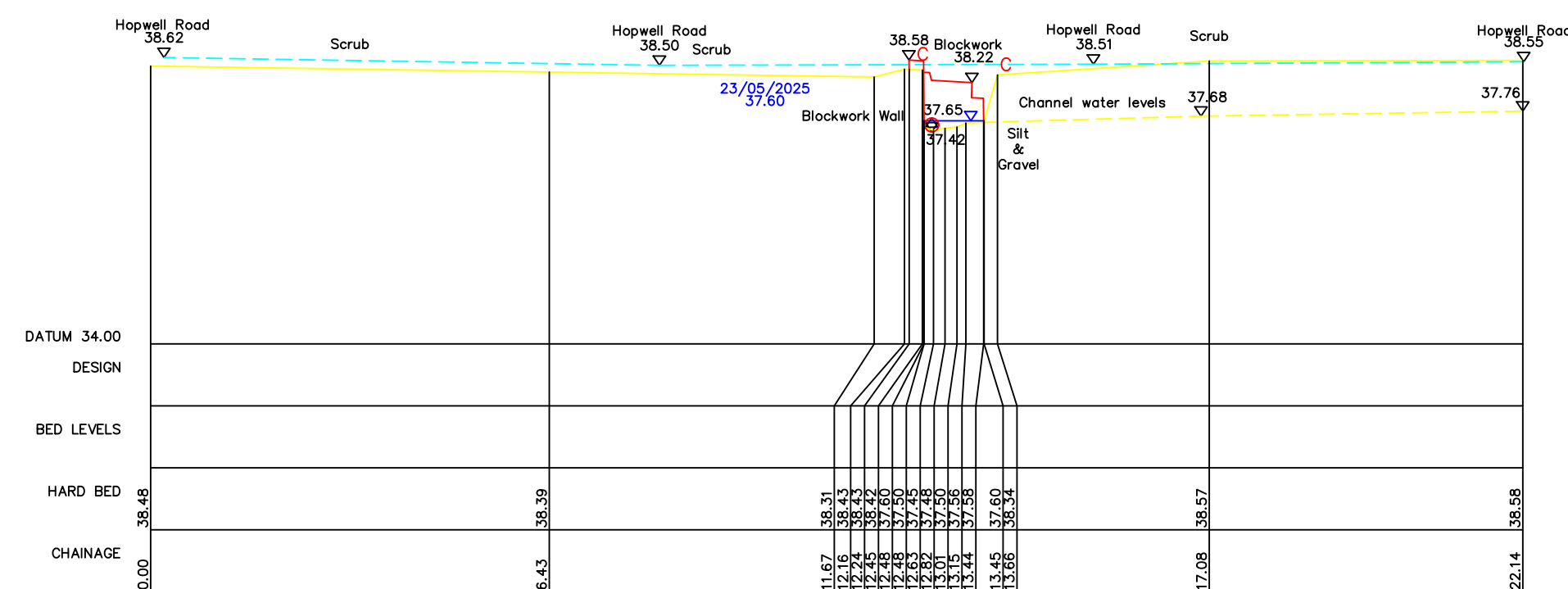


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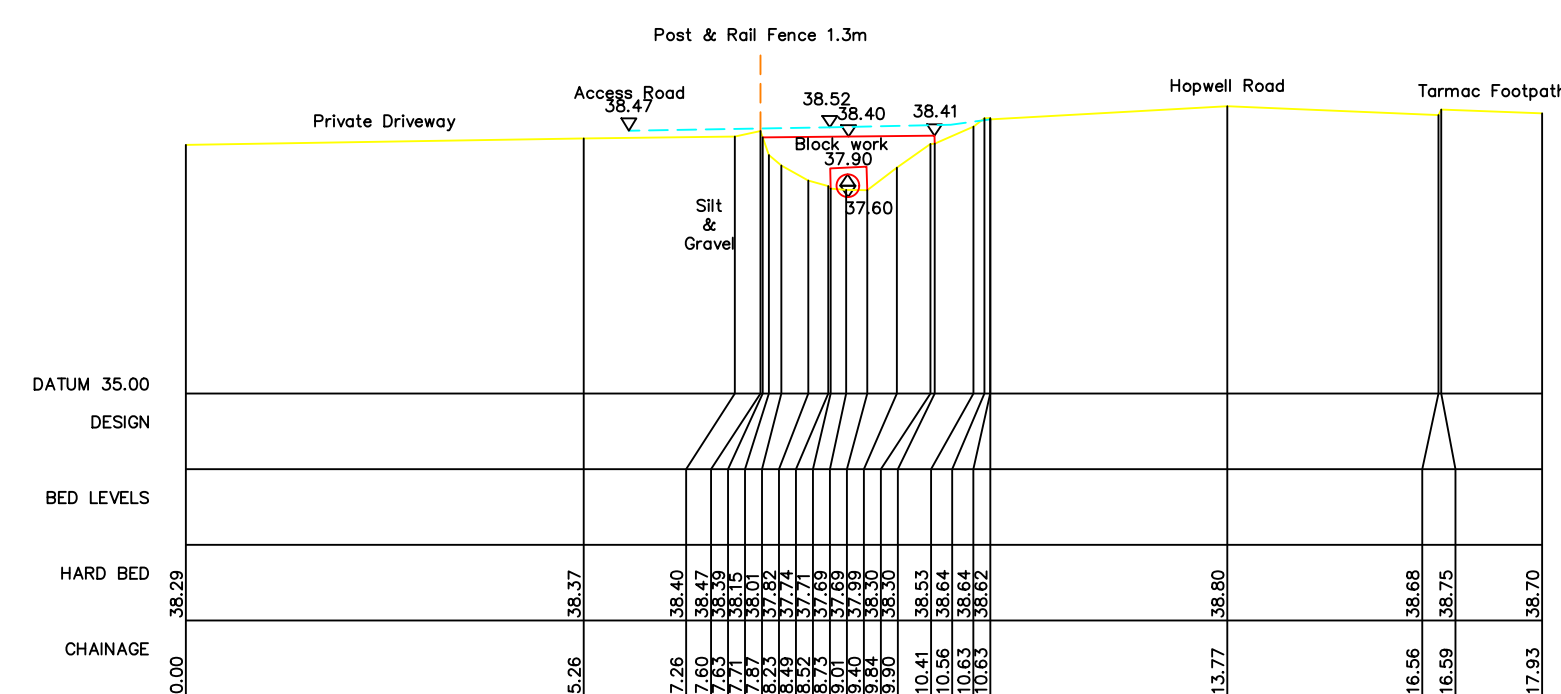


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Date:	Notes:			Name:	Rev:
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Drawn:	Checked:	Scale:	Date:		
MS/MH	CC	1:100	06/06/25		
File Name:		Sheet size:	Sheet:		
GCS-JBA-2437-1A		A1	6 of 35		

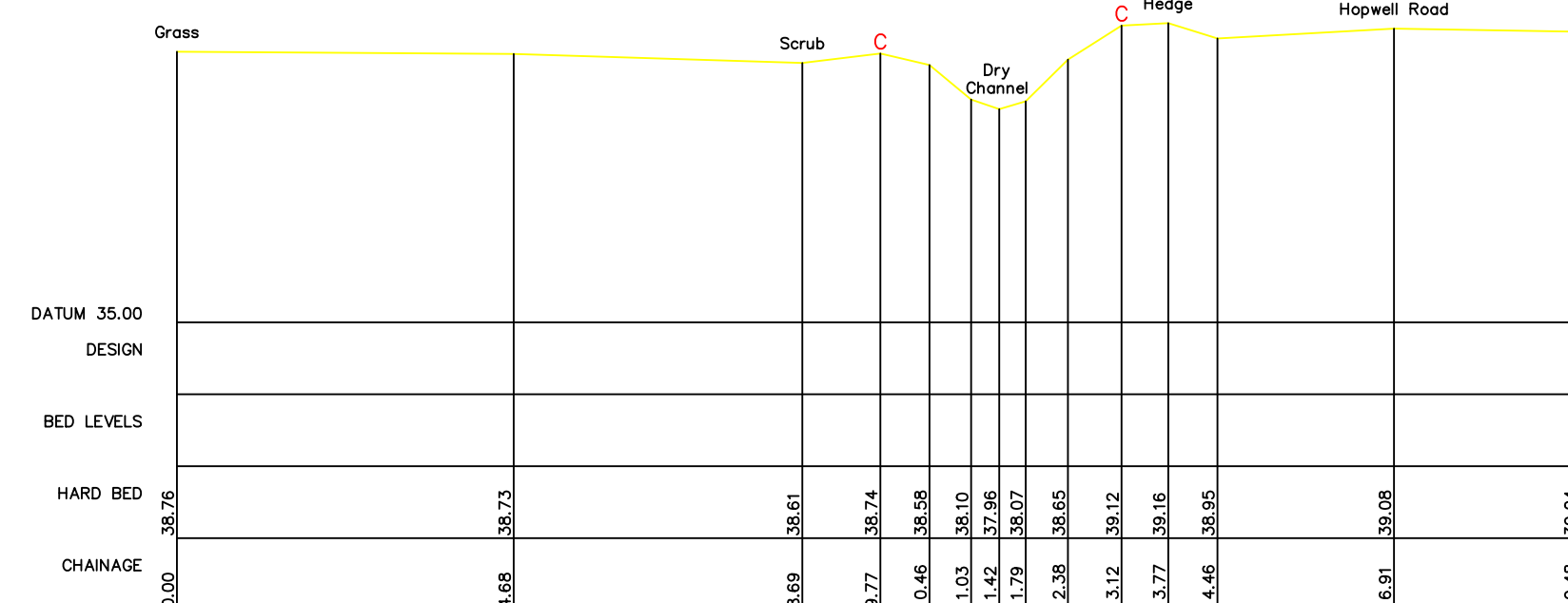
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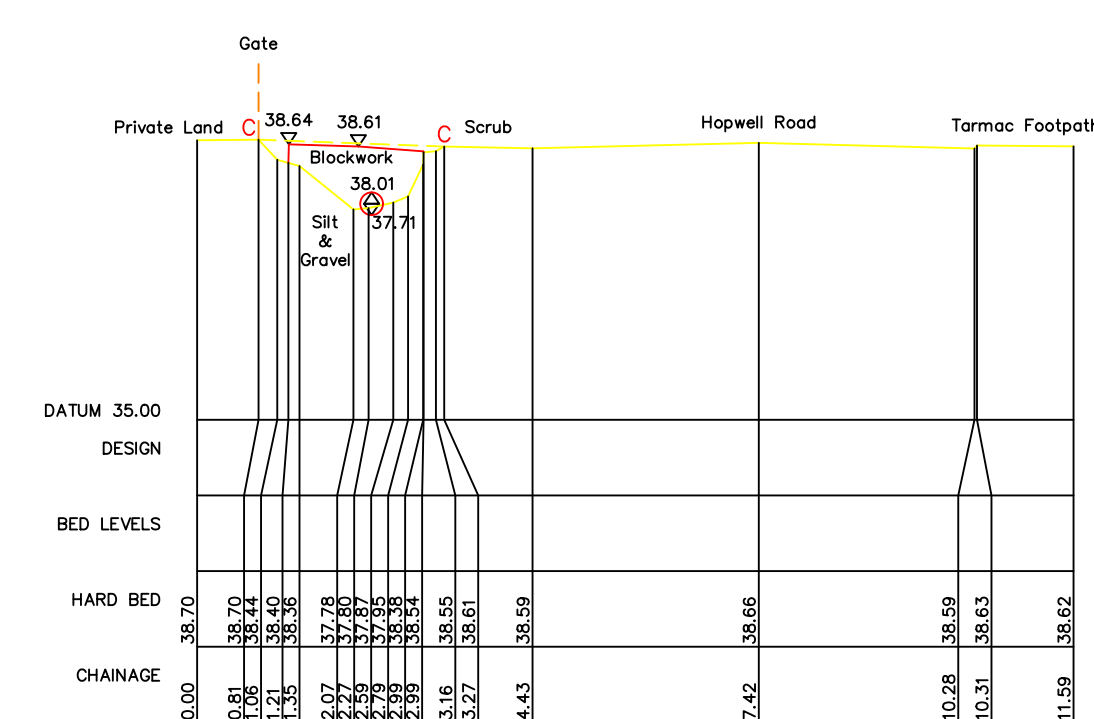
R4 - XS1
444277.62mE 333598.31mN Brg 359
Chainage 12.8
Upstream face of Hopwell Road Culvert - Length 10.9m



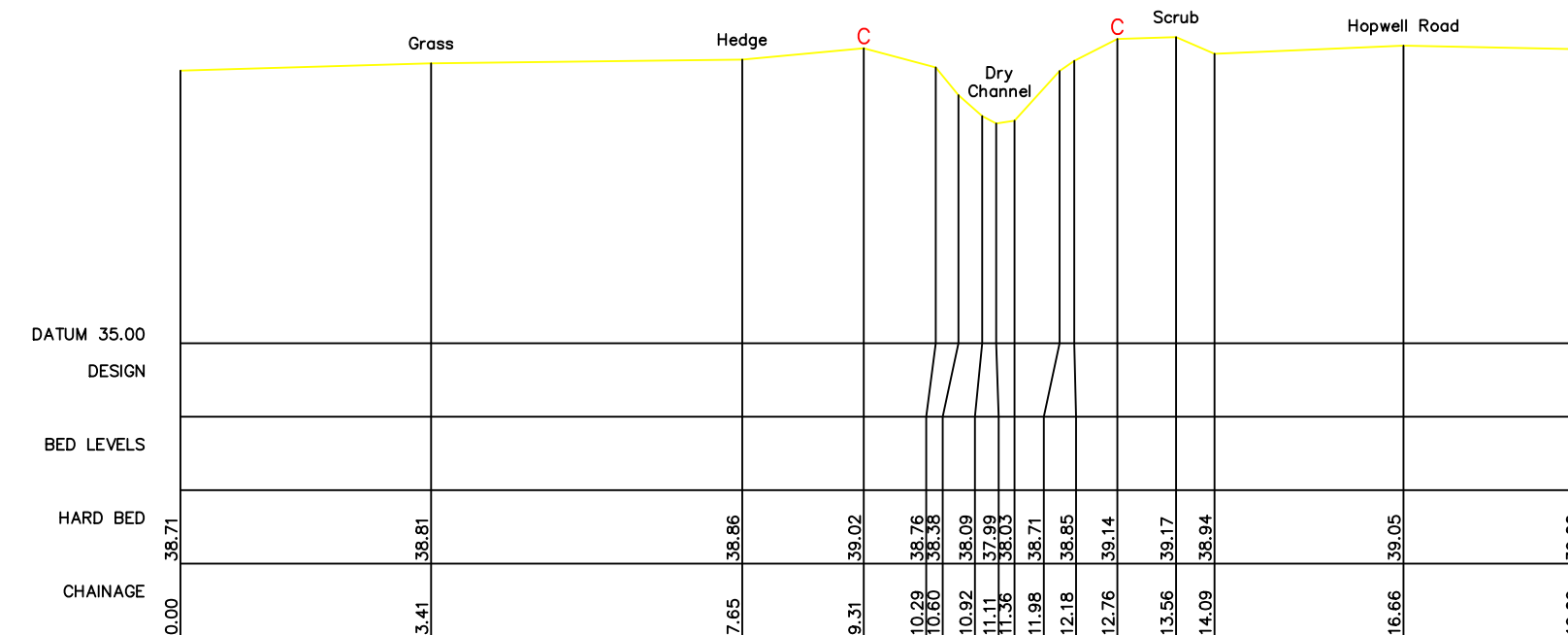
R4 - XS3
444283.6mE 333690.4mN Brg 262
Chainage 91.4
Upstream face of Property Access - Length 9.6m



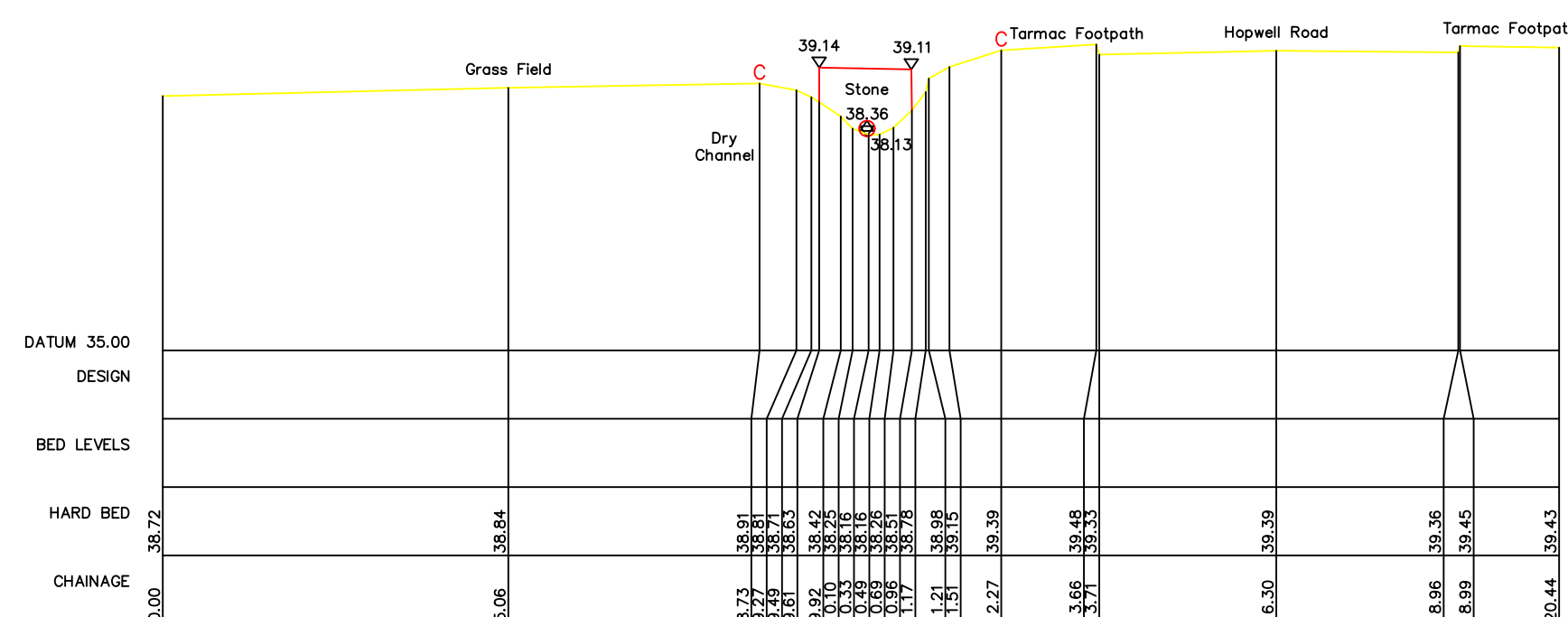
R4 - XS5
444269.75mE 333842.17mN Brg 264
Chainage 244
Open Channel



R4 - XS2
444279.57mE 333667.83mN Brg 260
Chainage 69.6
Upstream face of Access Culvert - Length 7.4m



R4 - XS4
444270.53mE 333831.43mN Brg 263
Chainage 233.1
Open Channel



R4 - XS6
444259.56mE 333925.51mN Brg 272
Chainage 329.5
Upstream face of Field Access Culvert - Length 5.3m



Notes

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Legend

BAR VALVE	AV	WATER TAP	TAP
BENCH	BO	TEMPORARY BENCH MARK	TEMP
BELL TELEPHONE CALL BOX	BT	TELEPHONE CALL BOX	TCB
BUS STOP	BS	TELEPHONE POST	TEL
BT INSPECTION COVER	BT	THRESHOLD LEVEL	THL
BT BOX	BTB	TRAFFIC LIGHT	TL
CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOW
CANAL	CA	TELEGRAPH POLE	TP
DOWN PIPE	DP	UNABLE TO LIFT	UFL
DROPPED KERB	DK	VENT PIPE	VP
ELECTRICITY CONTROL BOX	ECB	RAIL WELD	WR
EVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH	SURVEY STATION	SGS1
FQA WATER	FQW		
GULLY	GU		
GATE POST	GP	BUSHES	
GRASS VALVE	GV		
INSULATED BOLT JOINT	IBJ		
INVERT	IC	HEDGES	
INVERT LEVEL	IL		
KERB OUTLET	KO		
LAMPPOST	LP	TREES	
LIGHT BURN	LB		
MILE POST	MP		
MILE POST	MP		
POST	PO		
ROOFING EYE	RE		
RIDGE HEIGHT	RH	GATE	
ROAD NAMEPLATE	RN		
ROAD SIGN	RS	SECURITY FENCE	
STUMP	ST	FENCE	
SCOFF LEVEL	SL	OVERHEAD CABLES	
SIGNAL POST	SP	FOUL WATER	
SIGNALS AND TELECOMS BOX	STB	24 HOUR MAN	
SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	
SIGNALS AND TELECOMS POST	STC	STORM WATER	
SIGNAL POST	SP	WATER MAIN	
STOP	ST		
STOP VALVE	SV		
STAY	SY		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

Grid: *OS National Grid* **Datum:** *Ordnance Datum Newlyn*
Survey related to Ordnance Survey National Grid (OSGB36) via GPS and the OS Active Network.
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Title:

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Client:

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1 Station Road, Coleshill
Warwickshire B46 1HT



Land - Engineering - Building Surveyors

2 Arden Court, Arden Road, Alcester
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THE SURVEY
ASSOCIATION
FALL MEMBER

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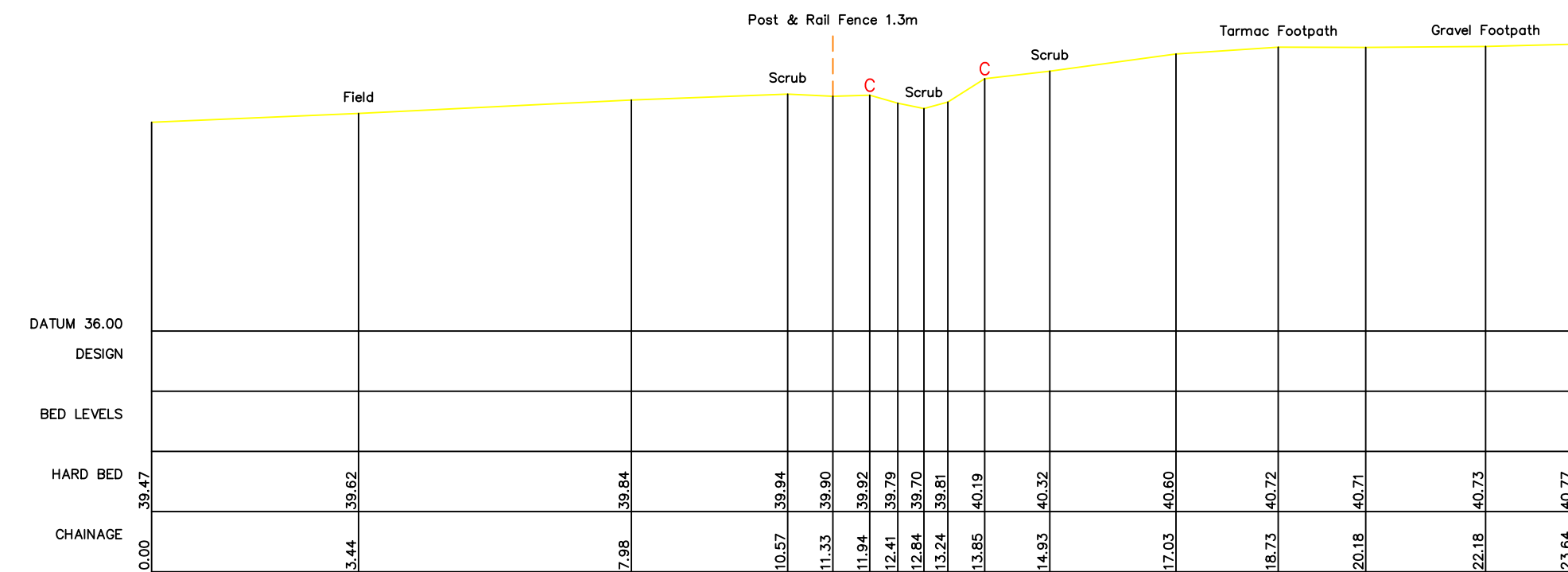


Drawing No: GCS/JBA/2437/1	Rev: A
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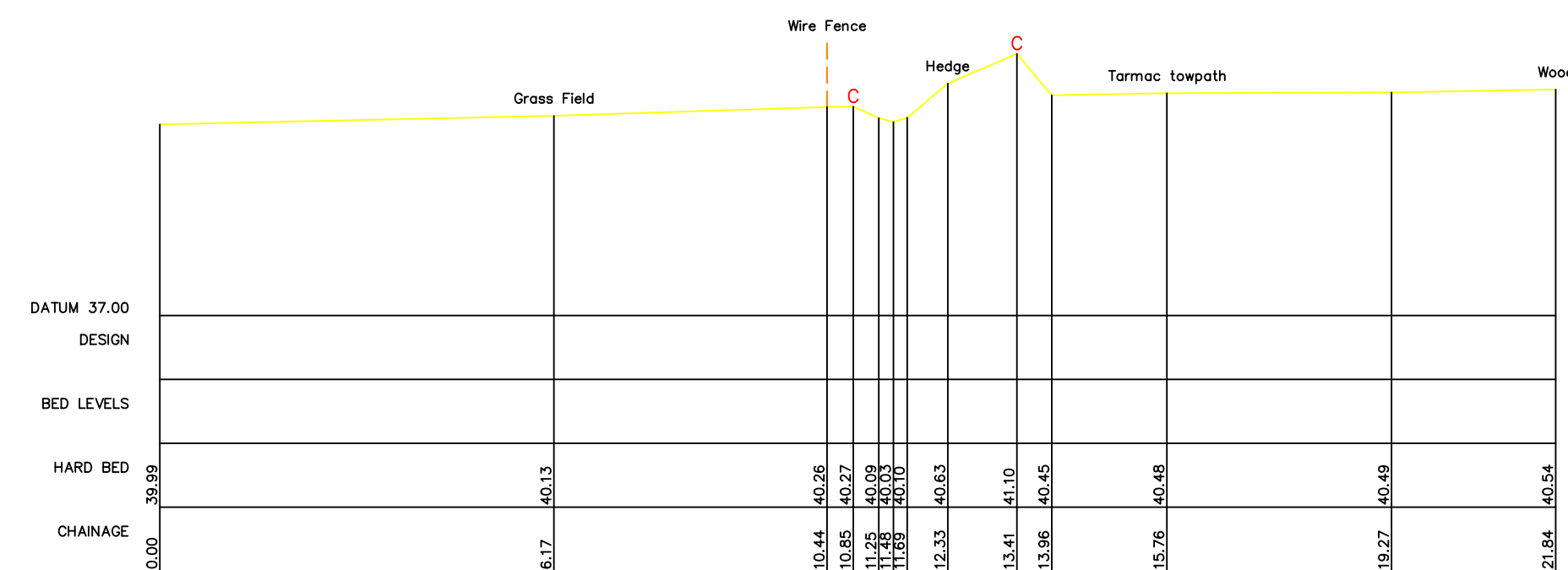
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18-6-25	XS R1-8 culvert length corrected	CC	A

Drawn: MS/MH	Checked: CC	Scale: 1:100	Date: 06/06/25
File Name: GCS-JBA-2437-1A		Sheet size: A1	Sheet: 7 of 35

REACH 4



R4 - XS7
444259.51mE 334008.62mN Brg 320
Chainage 427.6
Open Channel



R4 - XS8
444351.74mE 334021.42mN Brg 357
Chainage 528.5
Open Channel



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Legend

BAR VALVE	AV	WATER TAP	TAP
BELL HOLE	BD	TEMPORARY BENCH MARK	TBM
BENCH MARK	BM	TELEPHONE CALL BOX	TCB
BUS STOP	BS	TELEPHONE POST	TEL
BT INSPECTION COVER	BTB	THRESHOLD LEVEL	THL
BT SIGN	BTB	TRAFFIC LIGHT	TL
CABLE INSPECTION COVER	CTV	TOP OF WALL	TOW
CABLE	CA	TELEPHONE POLE	TEL
DOWN PIPE	DP	UNABLE TO LOCATE	UNL
DROPPED BENCH	DB	VENT PIPE	VP
ELECTRICITY CONTROL BOX	ECB	RAILROAD	RR
EAVES HIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FL		
FIRE HYDRANT	FW	SURVEY STATION	△ GCS
FULL WATER	FV		
GULLY	GY		
GAS POST	GP		
GATE VALVE	GV	BUSHES	
INSULATED GATE JOINT	IGJ		
INSPECTION COVER	IC		
INVERT LEVEL	IL	HEDGES	
KNOS OUTLET	KO		
LAMPPOST	LP		
LITTER BIN	LB	TREES	
MARKER POST	MP		
MILE POST	MP		
POST	PO		
PODDING EYE	PE		
ROD DINGE	RD	GATE	
ROAD NAMEPLATE	RN		
ROAD SIGN	RS	SECURITY FENCE	— x — x —
STUMP	SP		
STREET LEVEL	SF	OVERHEAD CABLES	OH — OH
SIGNAL POST	SP	FOUR WATER	FW — FW
SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM
SIGNALS AND TELECOMS CABLE	STC	LOW POWER	LP — LP
SIGNALS AND TELECOMS POST	STP	STREET LIGHT	SL — SL
SIGN POST	SN	U/P TELEPHONE	— TEL — TEL
STOP	ST	WATER MAIN	— WM — WM
STOP VALVE	SV		
STAY	ST		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

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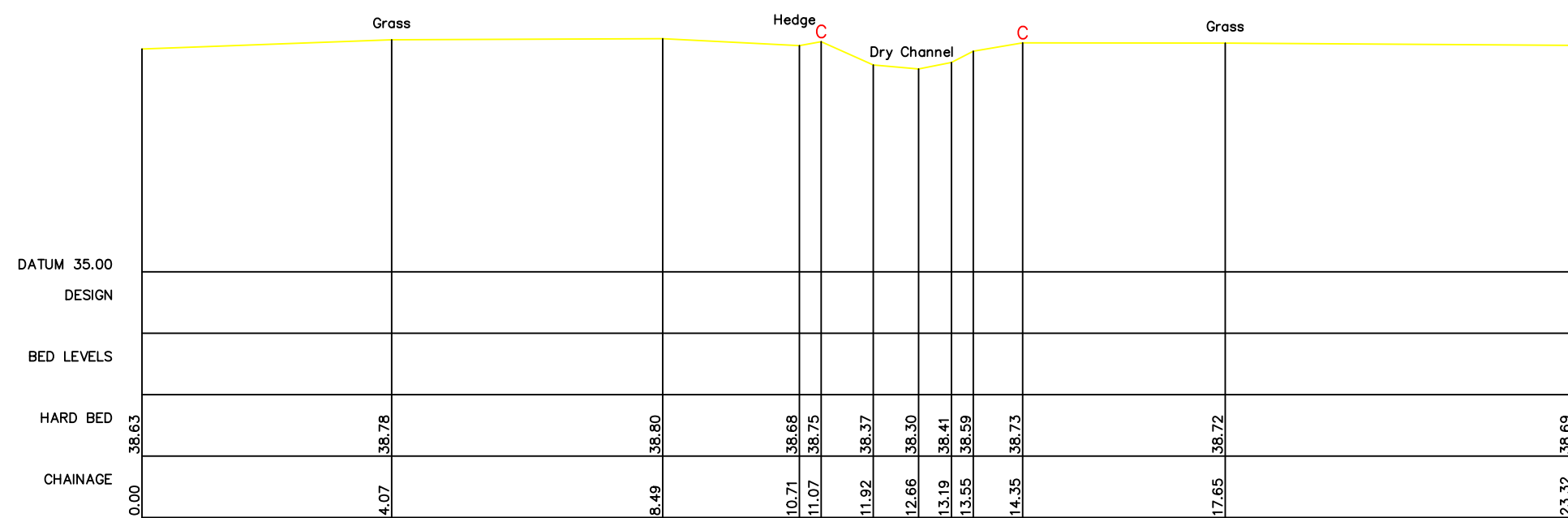


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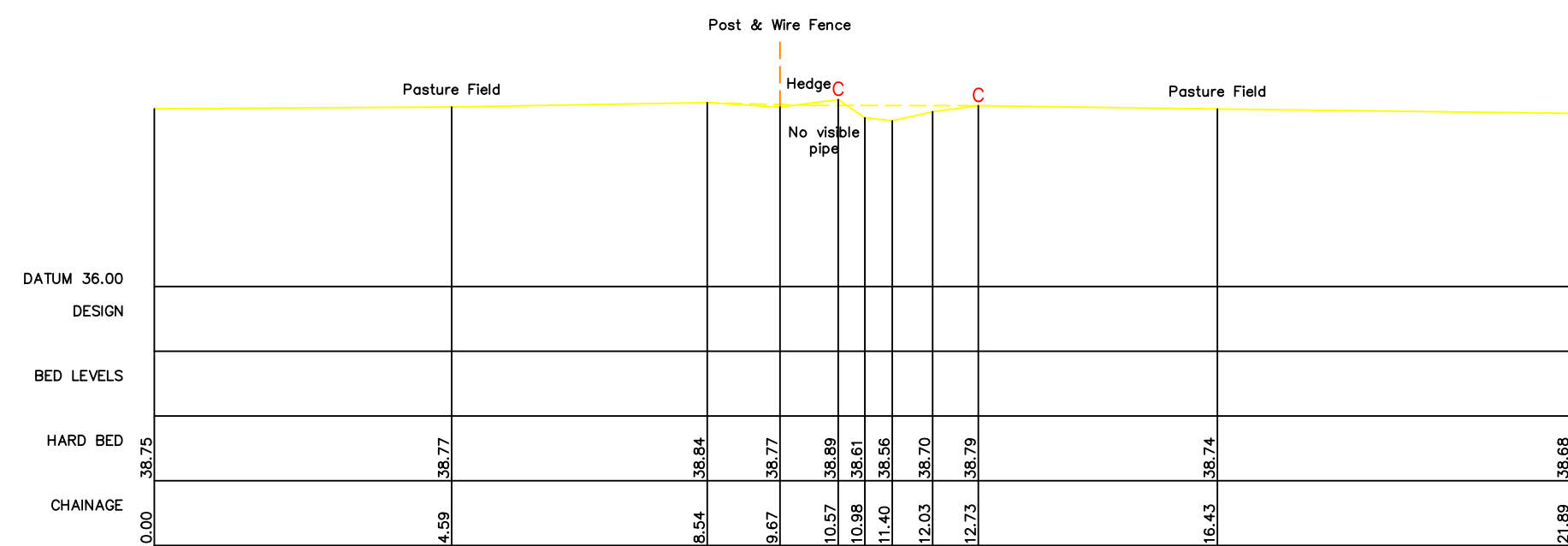


Drawing No:		GCS/JBA/2437/1		Rev: A	
Date:	Notes:			Name:	Rev:
18-6-25	XS R1-8 culvert length corrected			CC	A
Drawn:	Checked:	Scale:	Date:		
MS/MH	CC	1:100	06/06/25		
File Name:		Sheet size:	Sheet:		
GCS-JBA-2437-1A		A1	8 of 35		

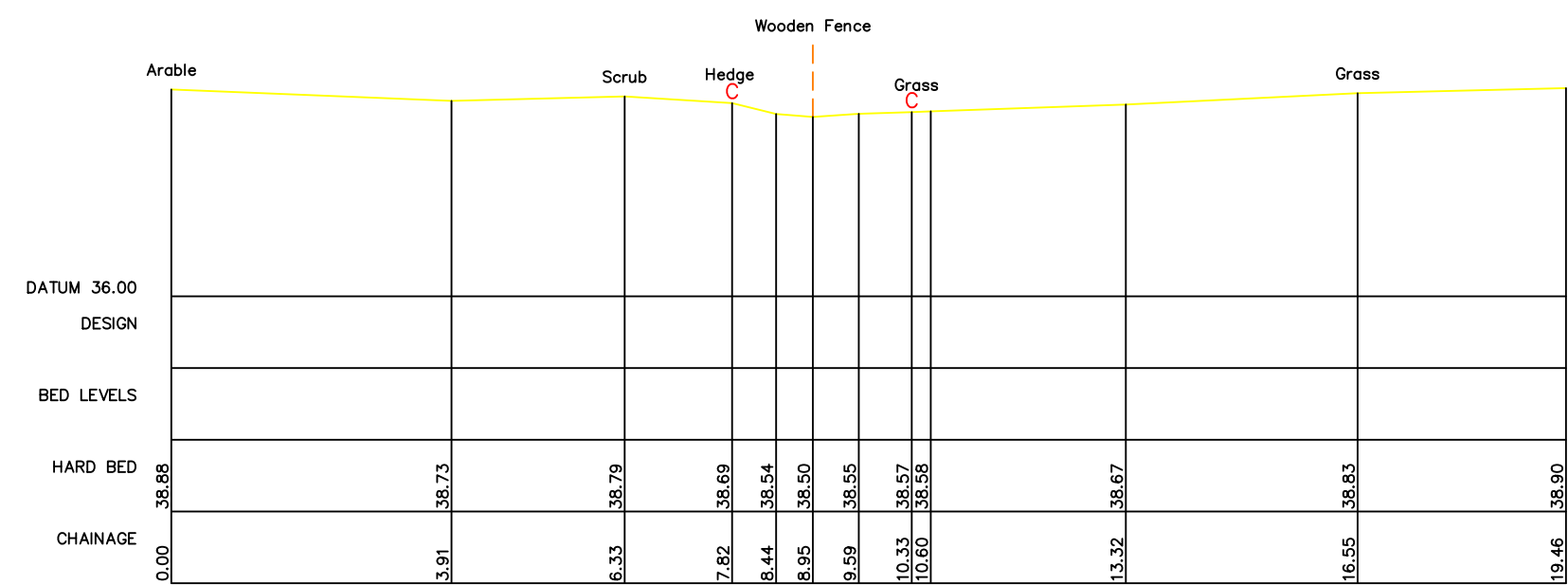
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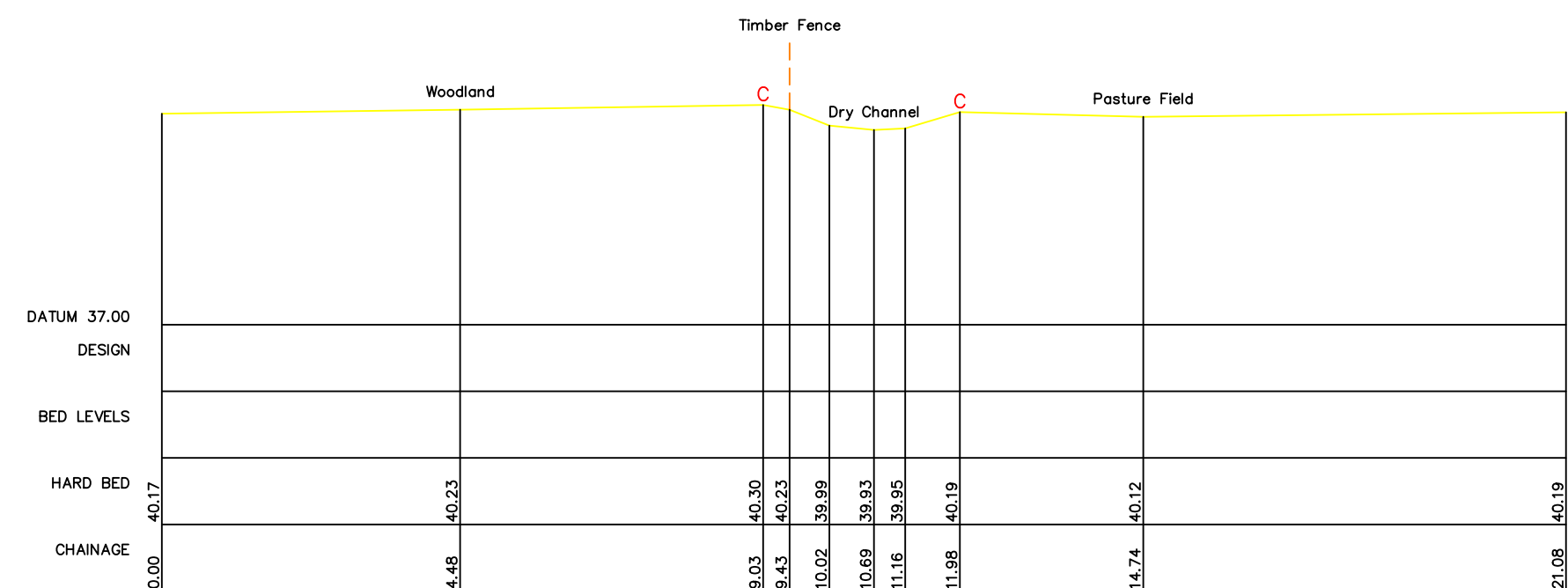
R5 - XS1
444265.1mE 333824.22mN Brg 1
Chainage 6.5
Open Channel



R5 - XS2
444316.44mE 333824.86mN Brg 5
Chainage 58.5
Upstream Face of Field Access - Length 4.7m



R5 - XS3
444400mE 333829.41mN Brg 272
Chainage 135.1
Open Channel



R5 - XS4
444389.63mE 334029.1mN Brg 265
Chainage 333.9
Open Channel



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Legend

ARK VALVE	AV	WATER TAP	TAP
BOLLARD	BD	TEMPORARY BENCH MARK	TBM
BORE HOLE	BH	TELEPHONE CULI BOX	TCS
BUS STOP	BS	TELEPHONE POST	TEL
BT INSPECTION COVER	BT	THRESHOLD LIGHT	TL
BT BOX	BTB	TRAFFIC LIGHT	TLT
CABLE TAP INSPECTION COVER	CTV	TOP OF WALL	TOW
CANAL	CA	UNABLE TO LOCATE	UTL
DOWN PIPE	DP	VENT PIPE	VP
DRY DRAIN KERB	DK	RAIL WELD	WR
ELECTRICITY CONTROL BOX	ECB	WATER METER	WM
EAVES HEIGHT	EH	WASHOUT	WO
ELECTRICITY MANHOLE	EM		
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH		
FOUL WATER	FW		
GULLY	GU		
GATE	GP		
GAZ VALVE	GV		
INSULATED BLOCK JOINT	IBJ		
INSPECTION COVER	IC		
INVERT LEVEL	IL		
KEB OUTLET	KO		
LAMPPOST	LP		
LITTER BIN	LB		
MARKER POST	MP		
MILE POST	MIP		
POST	PO		
RODDING EYE	RE		
HEIGHT RIGHT	RH		
ROAD NAMEPLATE	RN		
ROAD SIGN	RS		
SEALUMP	SL		
SOFFIT LEVEL	SL		
SIGNAL POST	SP		
SLIP SLEEPER LEVEL	SSL		
SIGNALS AND TELECOMS BOX	STB		
SIGNALS AND TELECOMS CABLE	STC		
SIGNALS AND TELECOMS POST	STP		
SIGN POST	SP		
STOP TAP	ST		
STOP VALVE	SV		
STAY	ST		
STORM WATER	SW		

SURVEY STATION

BUSHES

HEDGES

TREES

Height
Species
(Spread to scale)

GATE

SECURITY FENCE

OVERHEAD CABLES

FOUL WATER

OSAS MAIN

UG POWER LINE

SUSPENSION

UG TELEPHONE

WATER MAIN

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

Grid: *OS National Grid* **Datum:** *Ordnance Datum Newlyn*
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2 Arden Court, Arden Road, Alcester
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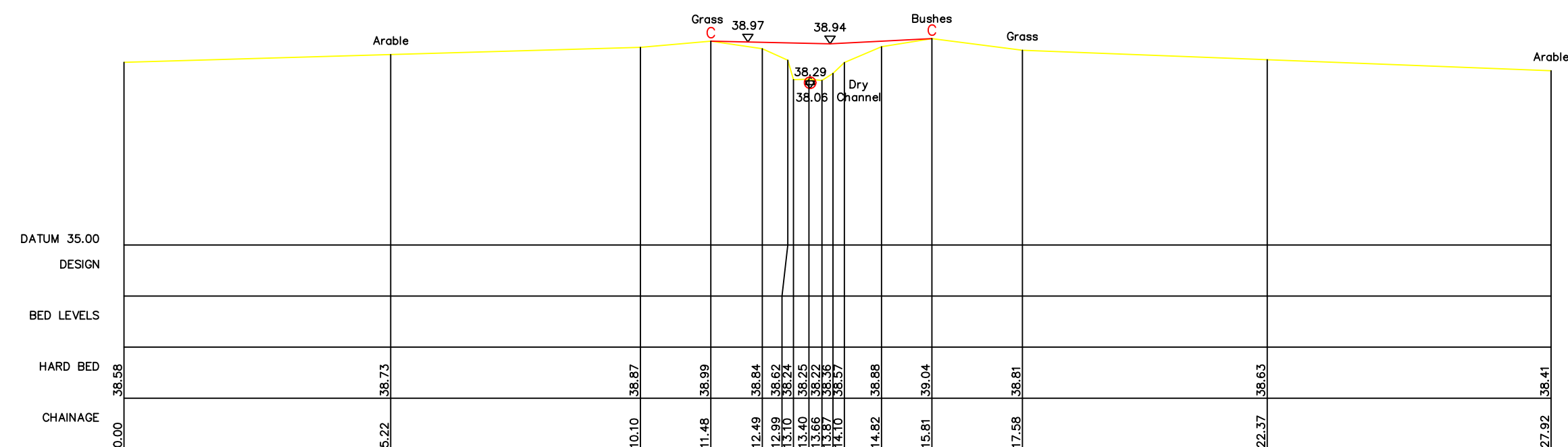


E-Mail: info@gcsurveys.co.uk
Web Site: www.gcsurveys.co.uk

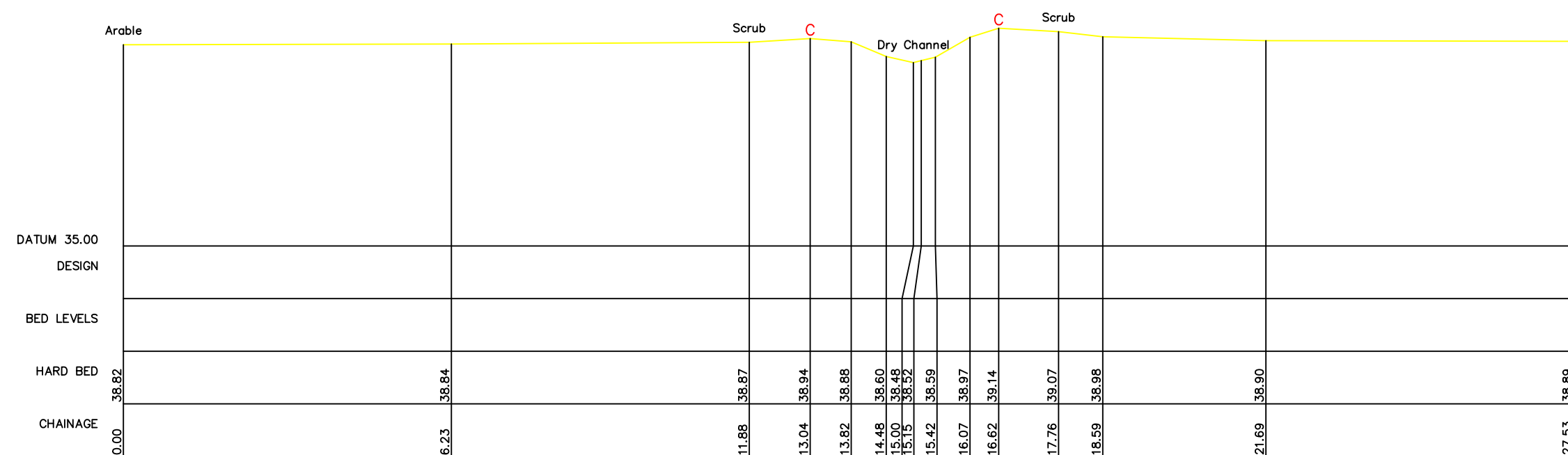


Drawing No:		GCS/JBA/2437/1		Rev: A	
Date:	Notes:			Name:	Rev:
18-6-25	XS R1-8 culvert length corrected			CC	A
Drawn:	Checked:	Scale:	Date:		
MS/MH	CC	1:100	06/06/25		
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GCS-JBA-2437-1A		A1	9 of 35		

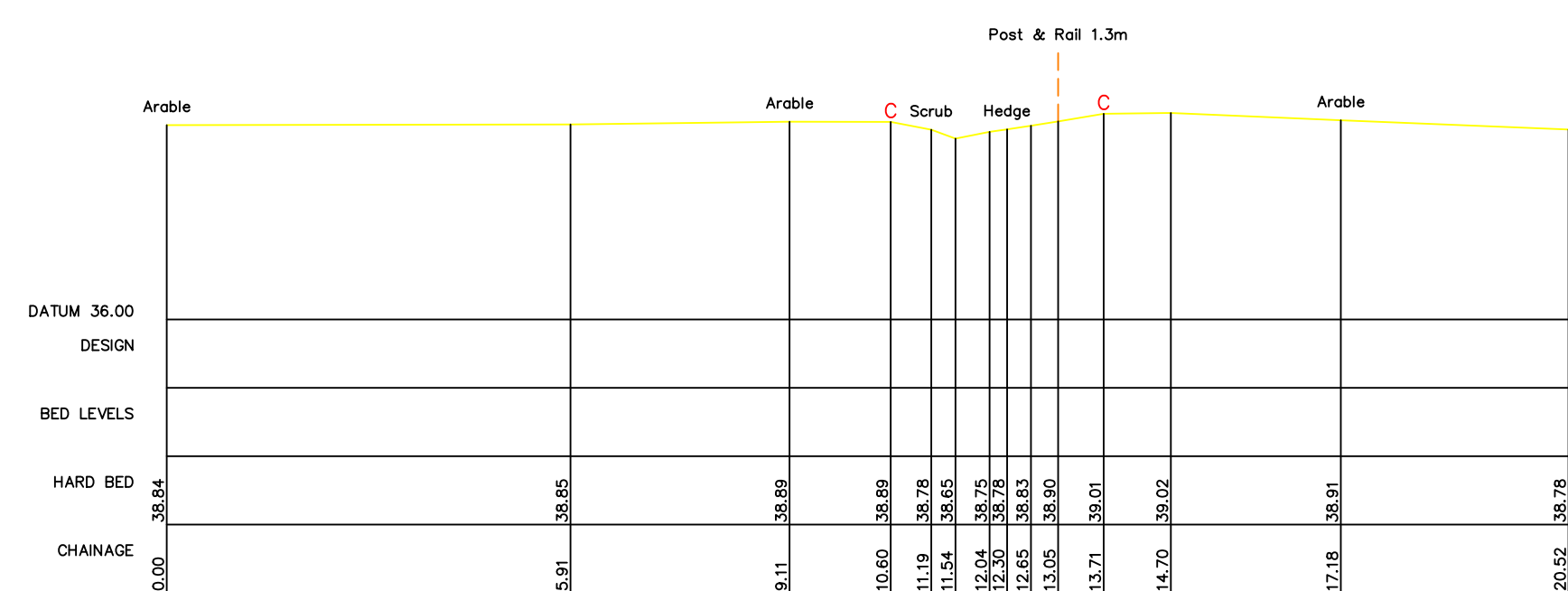
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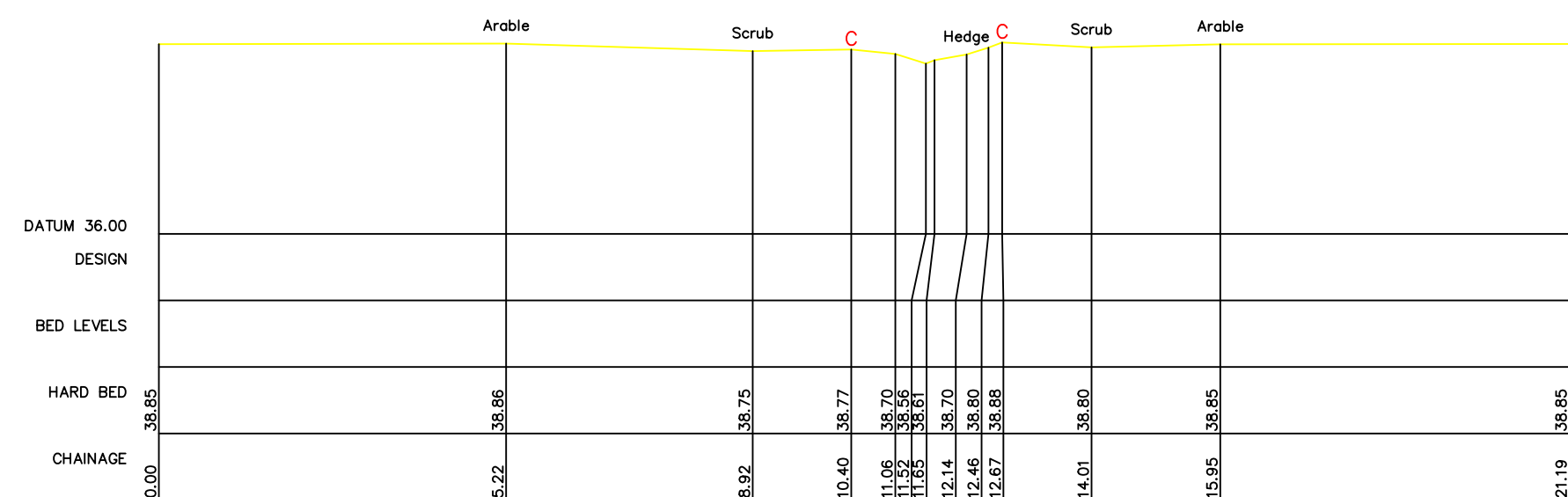
R6 - XS1
444599.23mE 333839.39mN Brg 186
Chainage 9.3
Upstream face of Field Access - Length 5.1m



R6 - XS2
444441.7mE 333839.87mN Brg 180
Chainage 165.4
Open Channel



R6 - XS3
444430.4mE 333836.22mN Brg 182
Chainage 177.1
Open Channel



R6 - XS4
444396mE 333838.76mN Brg 186
Chainage 212.6
Open Channel



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Legend

BAR VALVE	AV	WATER TAP	TAP
BOLLARD	BD	TEMPORARY BENCH MARK	TBM
BUSH	BS	TELEPHONE CABLE BOX	TCB
BUS STOP	BS	TELEPHONE POST	TEL
BT INSPECTION COVER	BT	THRESHOLD LEVEL	THL
BT BOX	BTB	TRAFFIC LIGHT	TL
CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOWP
CANAL	CA	TELEGRAPHY POLE	TP
DOWN PIPE	DP	UNABLE TO LIFT	UTL
DROPPED BUSH	DK	VENT PIPE	VP
ELECTRICITY CONTROL BOX	ECB	RAIL WELD	WE
EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH	SURVEY STATION	 GS1
FOUL WATER	FW		
GULLY	GY		
GATE POST	GP	BUSHES	
GAS VALVE	GV		
INSULATED BLOCK JOINT	IBJ		
INSPECTOR COVER	IC		
INVERT LEVEL	IL	HEDGES	
KIRKS OUTLET	KO		
LANDPOST	LP	TREES	
LITTER BIN	LB		
MARKER POST	MP	Height Species (Spread to scale)	
POST	PO		
RODDING EYE	RE		
EDGE HEIGHT	RH		
ROAD NAME PLATE	RNP		
ROAD SIGN	RS	GATE	
STUMP	SP	SECURITY FENCE	
SOFFIT LEVEL	SL	OVERHEAD CABLES	
SIGNAL POST	SP	FOUL WATER	
MAIL DELIVERER LETTER BOX	MLB	SW-MAN	
SIGNALS AND TELECOMS BOX	STB	LOW POWER LINE	
SIGNALS AND TELECOMS CAB	STC	STORM WATER	
SIGNALS AND TELECOMS CAB	STC	WATER MAIN	
SIGN POST	SP		
STOP SIGN	SS		
STOP VALVE	SV		
STAY	ST		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

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Title:

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DRAYCOTT ROAD
(Cross Sections)

Client:

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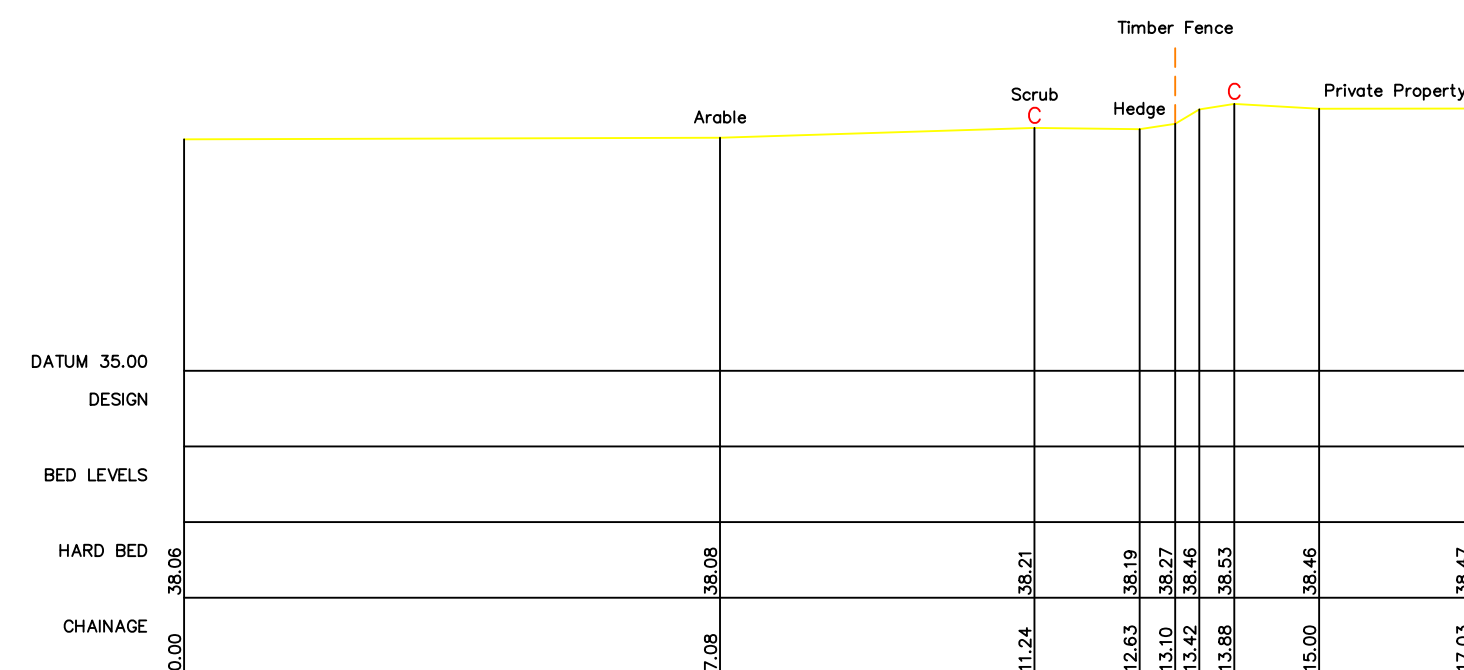
Tel: 01789 764420

E-Mail: info@gcsurveys.co.uk
Web Site: www.gcsurveys.co.uk

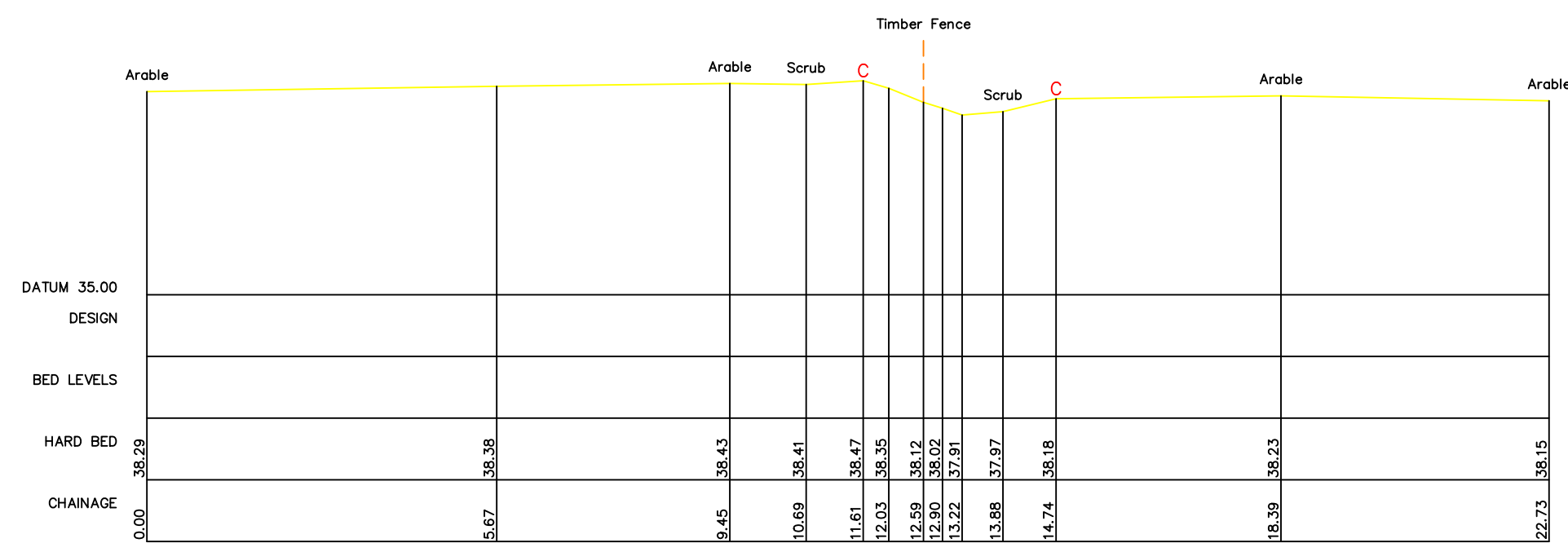


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Date:	Notes:			Name:	Rev:
18-6-25	XS R1-8 culvert length corrected			CC	A
Drawn:	Checked:	Scale:	Date:		
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GCS-JBA-2437-1A		A1	10 of 35		

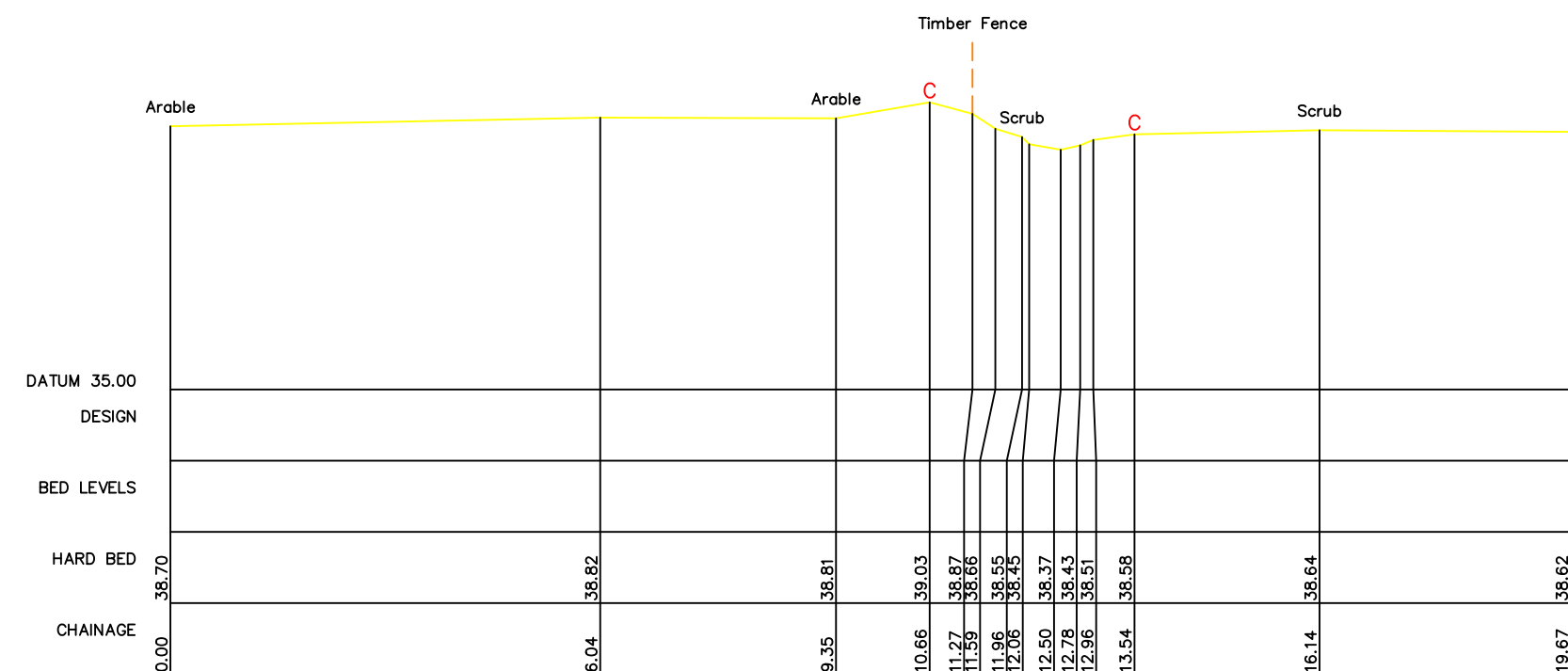
REACH 7



R7 - XS1
444350.21mE 333663.92mN Brg 359
Chainage 1.1
Open Channel



R7 - XS2
444454.23mE 333732.76mN Brg 267
Chainage 149.4
Open Channel



R7 - XS3
444447.84mE 333809.08mN Brg 268
Chainage 226.2
Open Channel



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Legend

BAR WALL	AV	WATER TAP	TAP
IRVINE	BD	TEMPERARY BENCH MARK	TM
TELEPHONE CABLE BOX	BS	TELEPHONE CABLE BOX	TO
BUS STOP	BS	TELEPHONE POST	TP
BT INSPECTION COVER	BT	THRESHOLD LEVEL	THL
TELEPHONE CABLE	BTB	TRAFFIC LIGHT	TL
CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOW
TELEPHONE CABLE	CT	TELEGRAPHY POLE	TP
DOWN PIPE	DK	UNABLE TO LIFT	UTL
DROPPED KERB	DK	VENT PIPE	VP
ELECTRICITY CONTROL BOX	EH	RAIN WELDED	WE
EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH		
FOUL WATER	FW		
GULLY	GY		
GATE POST	GP		
GAS VALVE	GV		
INSULATED BLOCK JOINT	IJB		
INSPECTOR'S COVER	IC		
INVERT LEVEL	IL		
KERBS OUTLET	KO		
LAMPPOST	LP		
LITTER BIN	LB		
MARKER POST	MP		
MILE POST	MLP		
POST	PO		
RODDING EYE	RE		
HEIGHT RIGHT	RH		
ROAD NAMEPLATE	RN		
ROAD SIGN	RS		
STUMP	ST		
SOFFIT LEVEL	SL		
SIGNAL POST	SP		
LOW SLEEPER LEVEL	SLP		
SIGNALS AND TELECOMS BOX	STB		
SIGNALS AND TELECOMS CAB	STC		
SIGNALS AND TELECOMS POST	STP		
SIGNAL POST	SN		
STOP TAP	ST		
STOP VALVE	SV		
STAY	SW		
STORM WATER	SW		

 SURVEY STATION
 BUSHES
 HEDGES
 TREES
 GATE

 GC51
 Height
 Species
 Spread to side
 SECURITY FENCE
 OVERHEAD CABLES
 FOUL WATER
 GAS MAN
 U/P POWER LINE
 STORM WATER
 U/P TELEPHONE
 WATER MAN

Control Table

Station	Description	Eastings	Northings	Height

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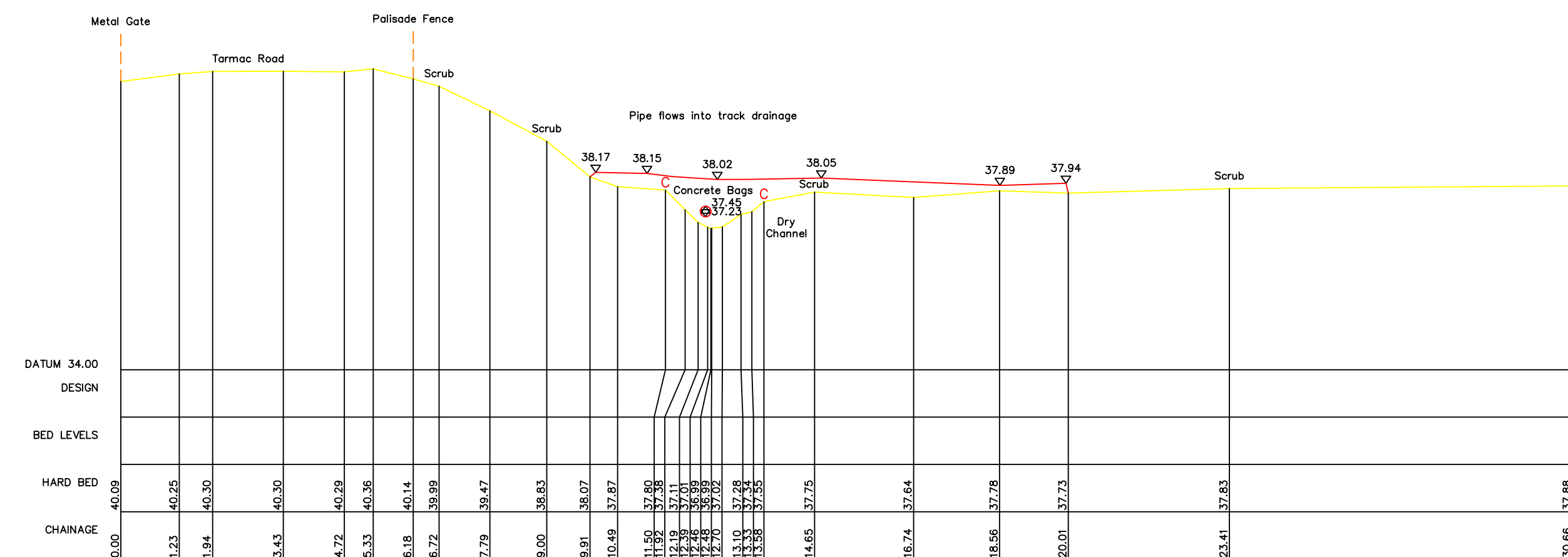


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Web Site: www.gcsurveys.co.uk

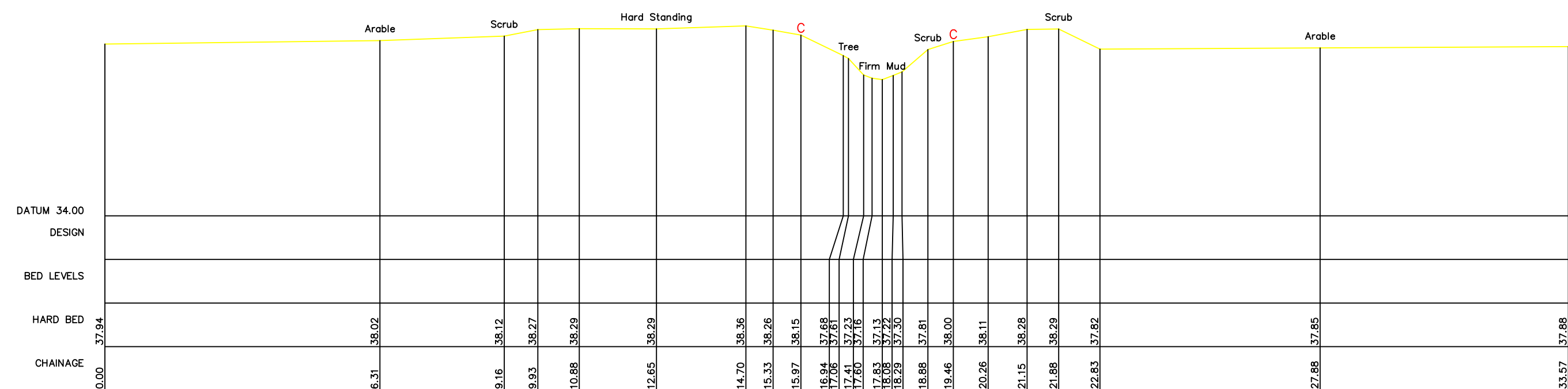


Drawing No:		GCS/JBA/2437/1		Rev: A	
Date:	Notes:			Name:	Rev:
18-6-25	XS R1-8 culvert length corrected			CC	A
Drawn:	Checked:	Scale:	Date:		
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File Name:		Sheet size:	Sheet:		
GCS-JBA-2437-1A		A1	11 of 35		

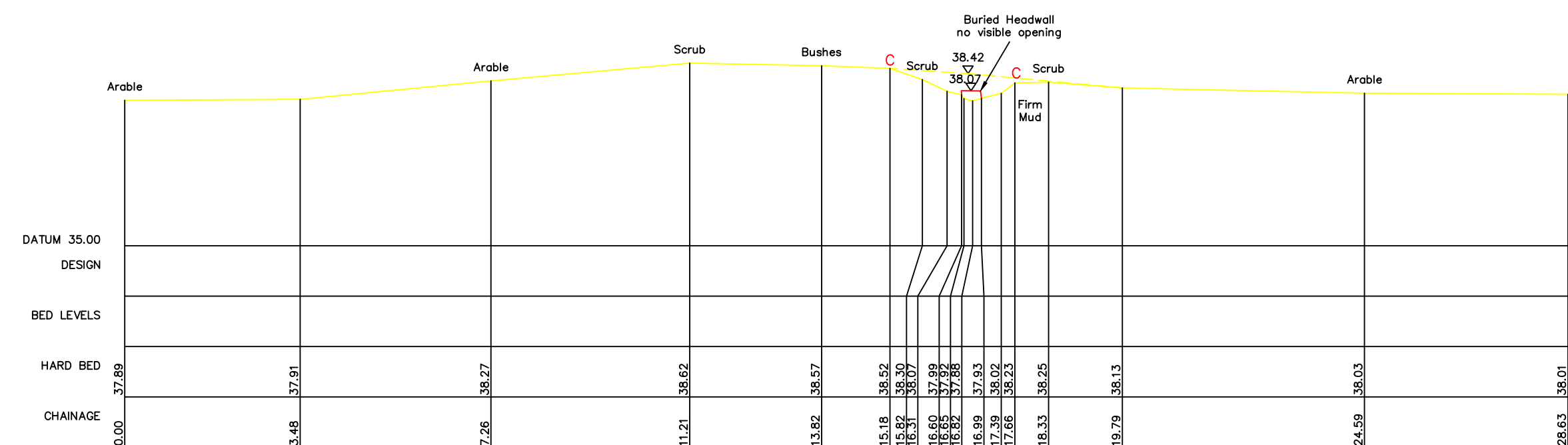
REACH 8



R8 - XS1
444606.83mE 333468.26mN Brg 270
Chainage 0.1
Upstream face of Pipe Inlet - Unknown Length (falls into track drainage)



R8 - XS2
444583.54mE 333708.67mN Brg 262
Chainage 239.6
Open Channel



R8 - XS3
444636.13mE 333761.79mN Brg 265
Chainage 345.1
Upstream face of Field Access - Length 5.8m



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Legend

BAR VALVE	AV	WATER TAP	TAP
BOLLARD	BD	TEMPORARY BENCH MARK	TBM
BUSH	BS	TELEPHONE CABLE BOX	TE
BUS STOP	BS	TELEPHONE POST	TEL
BT INSPECTION COVER	BT	THRESHOLD LEVEL	THL
BT BOX	BTB	TRAFFIC LIGHT	TL
CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOW
CANAL	CA	TELEGRAPHY POLE	TP
DOWN PIPE	DP	UNABLE TO LIFT	UTL
DROPPED KERB	DK	VENT PIPE	VP
INSPECTION CONTROL BOX	ICB	RAIL WELD	WE
EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH	SURVEY STATION	 GS1
FOUL WATER	FW		
GULLY	GY		
GATE POST	GP	BUSHES	
GAS VALVE	GV		
INSULATED BLOCK JOINT	IBJ		
INSPECTOR COVER	IC		
INVERT LEVEL	IL	HEDGES	
KERB OUTLET	KO		
LANDPOST	LP	TREES	
LITTER BIN	LB		
MARKER POST	MP	Height Species (Spread to scale)	
MANHOLE	MH		
POST	PO		
RODDING EYE	RE		
EDGE HEIGHT	RH		
ROAD NAME PLATE	RNP		
ROAD SIGN	RS		
STUMP	SP	SECURITY FENCE	
SOFFIT LEVEL	SL	OVERHEAD CABLES	
SIGNAL POST	SP	FOUL WATER	
MANHOLE SLEEPER	MS	DOWN MAIN	
SIGNALS AND TELECOMS BOX	STB	LOW POWER LINE	
SIGNALS AND TELECOMS CAB	STC	STORM WATER	
SIGNALS AND TELECOMS CAB	STC	UP OF TELEPHONE	
SIGN POST	SP	WATER MAIN	
SOFFIT	SO		
STOP VALVE	SV		
STAY	ST		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

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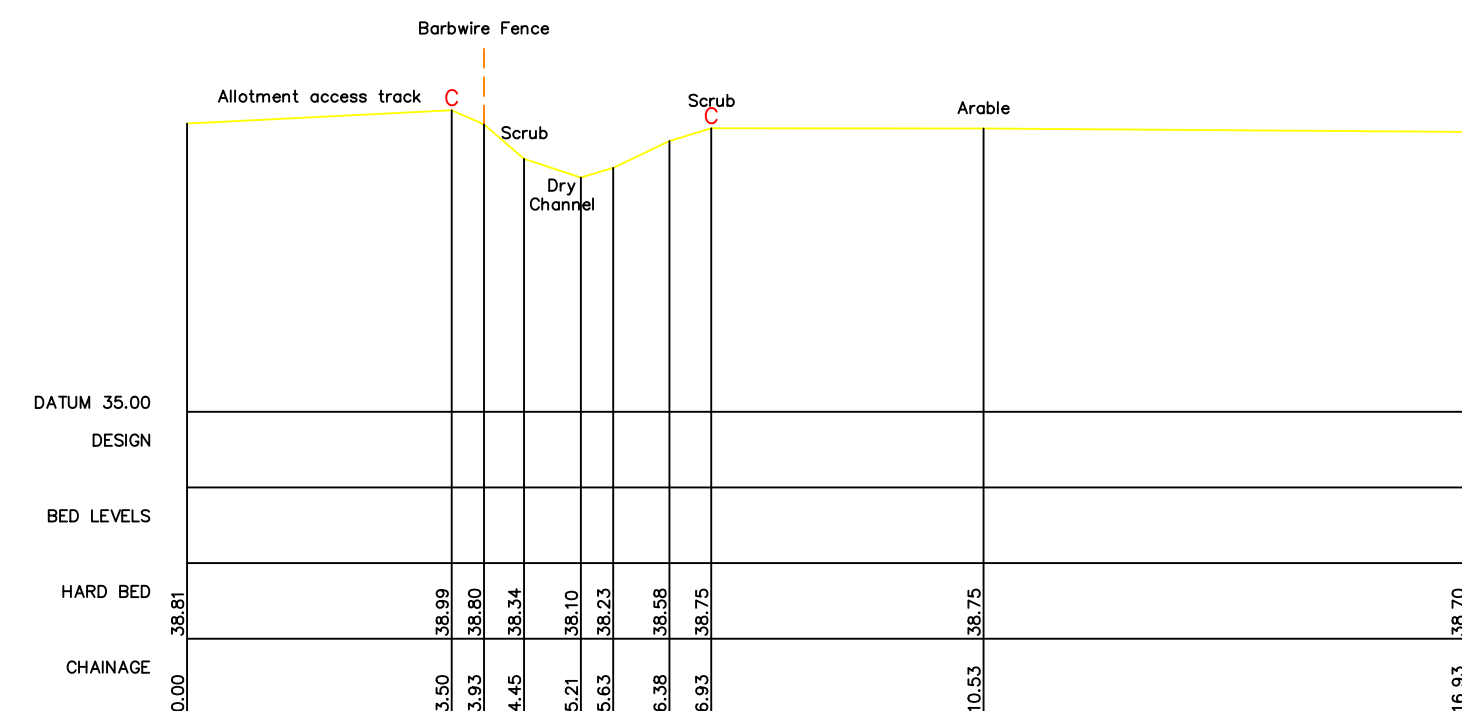


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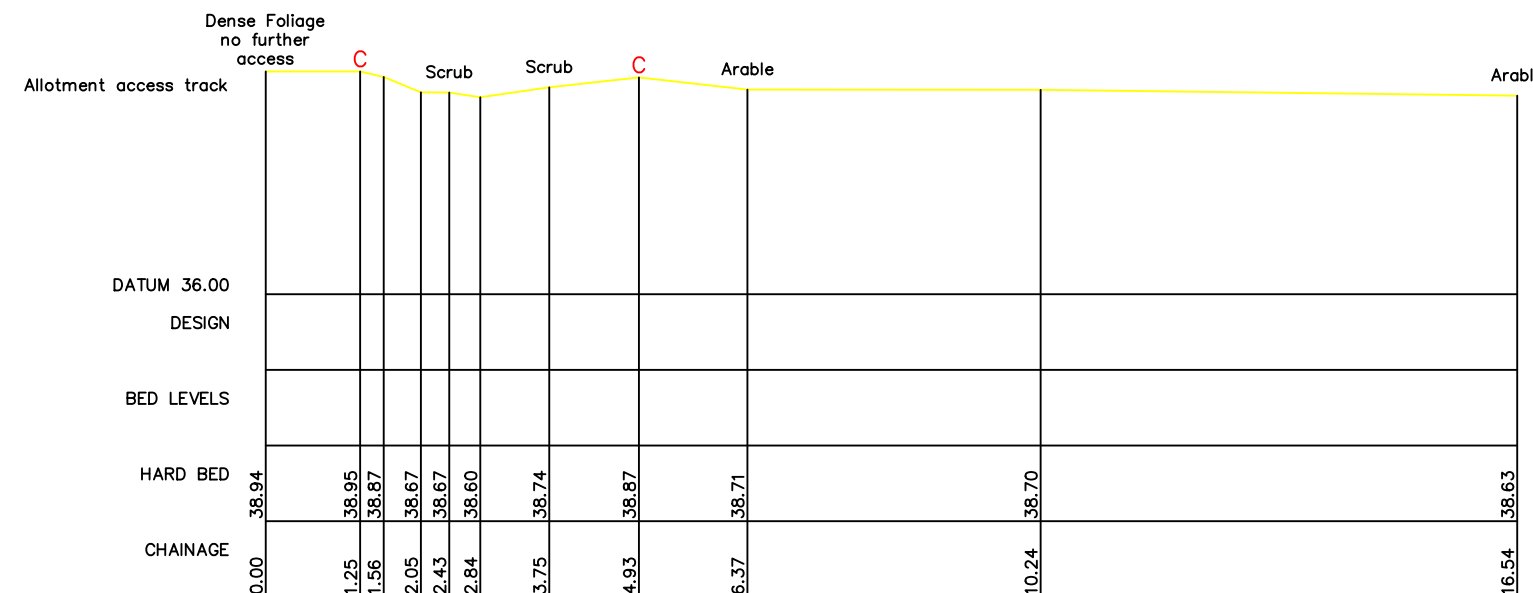
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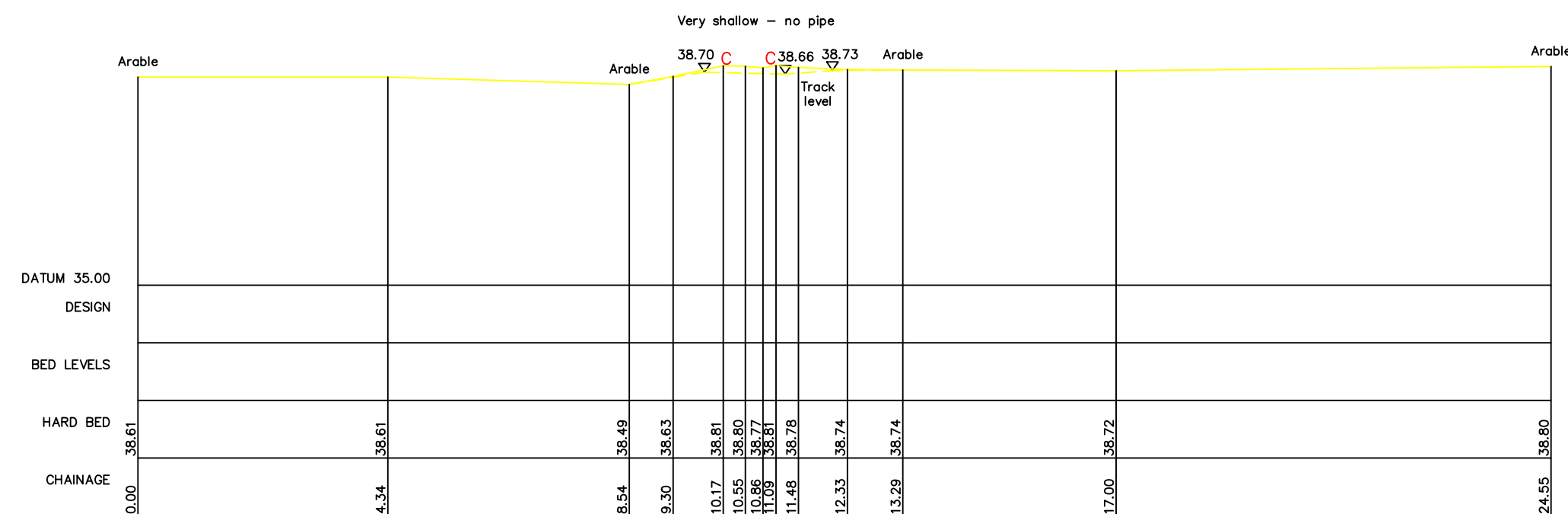
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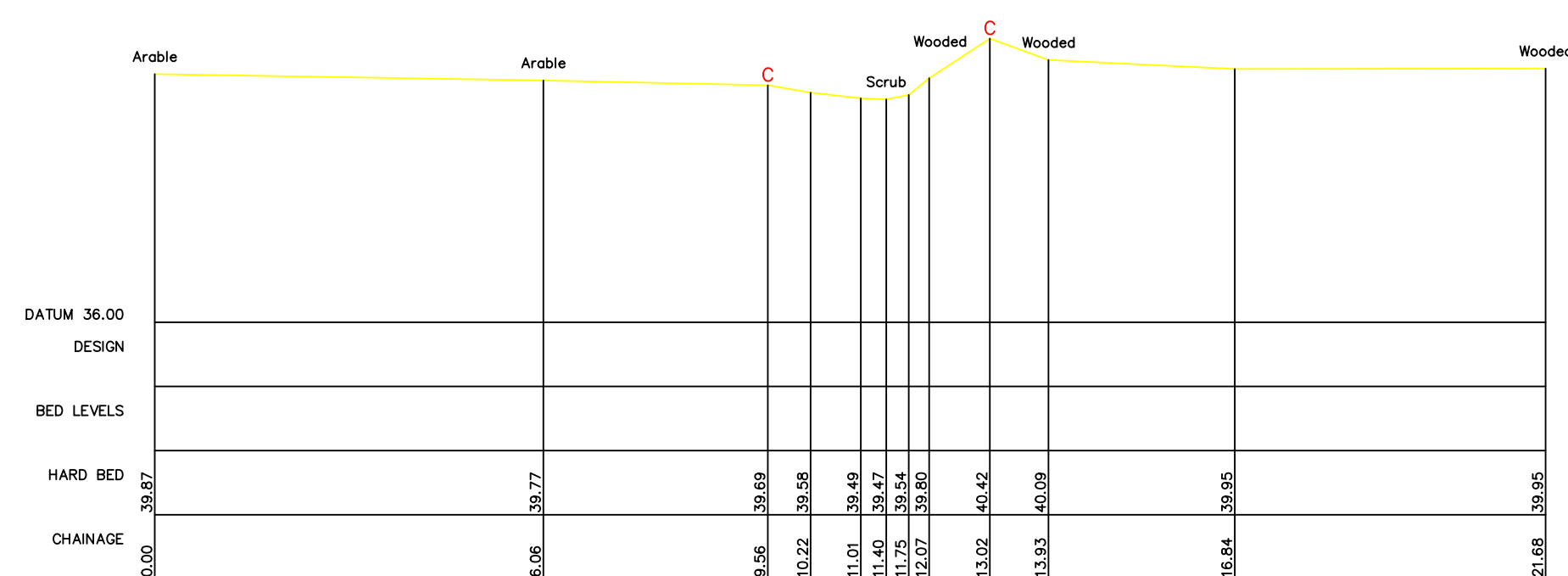
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444612.5mE 333822.03mN Brg 258
Chainage 407
Open Channel



R8 - XS5
444608.55mE 333835.49mN Brg 263
Chainage 421.3
Open Channel



R8 - XS6
444601.95mE 333918.23mN Brg 258
Chainage 503.4
Upstream face of Field access - Length 5.3m



R8 - XS7
444580.36mE 334048.64mN Brg 270
Chainage 638
Open Channel



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IRVINE	BD	TEMPERARY BENCH MARK	TM
TELEPHONE CUI BOX	BS	TELEPHONE CUI BOX	TO
BUS STOP	BS	TELEPHONE POST	TP
BT INSPECTION COVER	BT	THRESHOLD LEVEL	THL
TEX	BTB	TRAFFIC LIGHT	TL
CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOW
TELEPHONE CUI BOX	CU	TELEPHONE POLE	TP
DOWN PIPE	DK	UNABLE TO LIFT	UTL
DROPPED KERB	DK	VENT PIPE	VP
ELECTRICITY CONTROL BOX	EH	RAIN WELD	WE
EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH		
FOUL WATER	FW		
GULLY	GY		
GATE POST	GP		
GAS VALVE	GV		
INSULATED BLOCK JOINT	IBJ		
INSPECTOR'S COVER	IC		
INVERT LEVEL	IL		
KERBS OUTLET	KO		
LAMPPOST	LP		
LITTER BIN	LB		
MARKER POST	MP		
MILE POST	MLP		
POST	PO		
RODDING EYE	RE		
HEIGHT RIGHT	RH		
ROAD NAMEPLATE	RN		
ROAD SIGN	RS		
STUMP	ST		
SOFFIT LEVEL	SL		
SIGNAL POST	SP		
SLIP SLEEPER LEVEL	SSL		
SIGNALS AND TELECOMS BOX	STB		
SIGNALS AND TELECOMS CAB	STC		
SIGNALS AND TELECOMS POST	STP		
SIGNAL POST	SN		
STOP TAP	ST		
STOP VALVE	SV		
STAY	SW		
STORM WATER	SW		

 SURVEY STATION
 BUSHES
 HEDGES
 TREES
 GATE

 GC51
 Height Species
 GATE
 SECURITY FENCE
 OVERHEAD CABLES
 FOUL WATER
 GAS MAN
 U/P POWER LINE
 STORM WATER
 U/L TELEPHONE
 WATER MAIN

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

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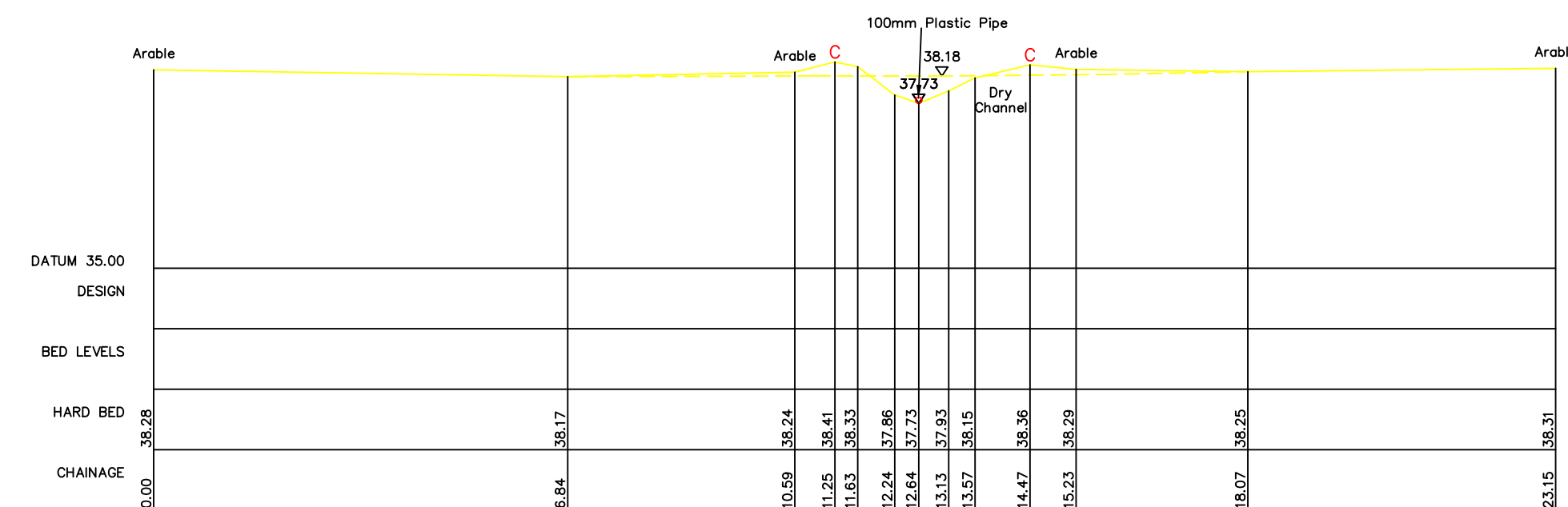
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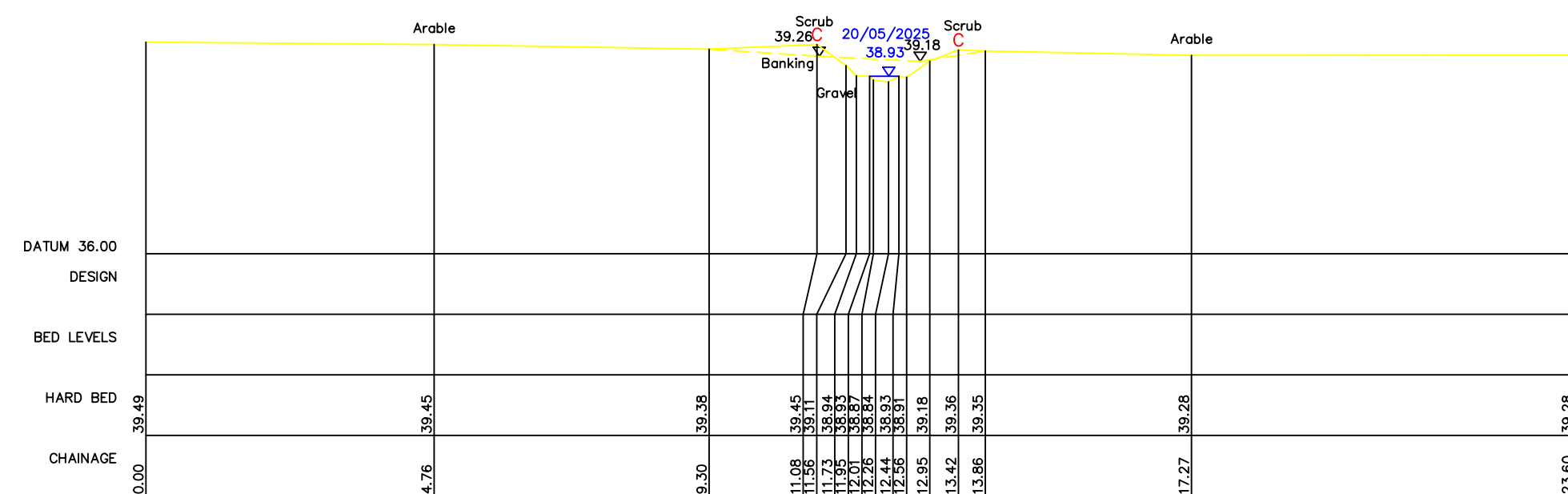
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File Name:		Sheet size:	Sheet:		
GCS-JBA-2437-1A		A1	13 of 35		



R9 - XS1
444696.04mE 333883.99mN Brg 260
Chainage 26.8
Upstream face of pipe inlet - Length 26m



R9 - XS2
444660.86mE 334030.26mN Brg 254
Chainage 175.9
Open Channel



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Legend

[illegible]

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

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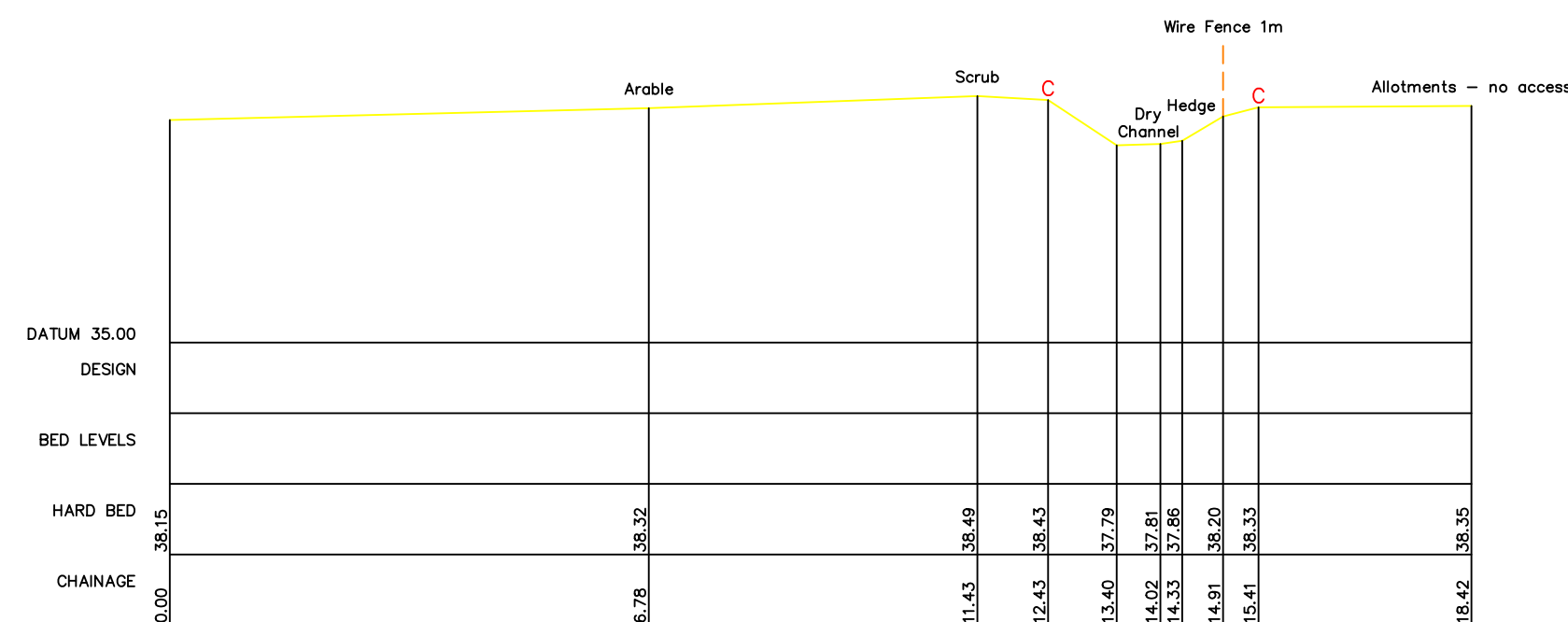


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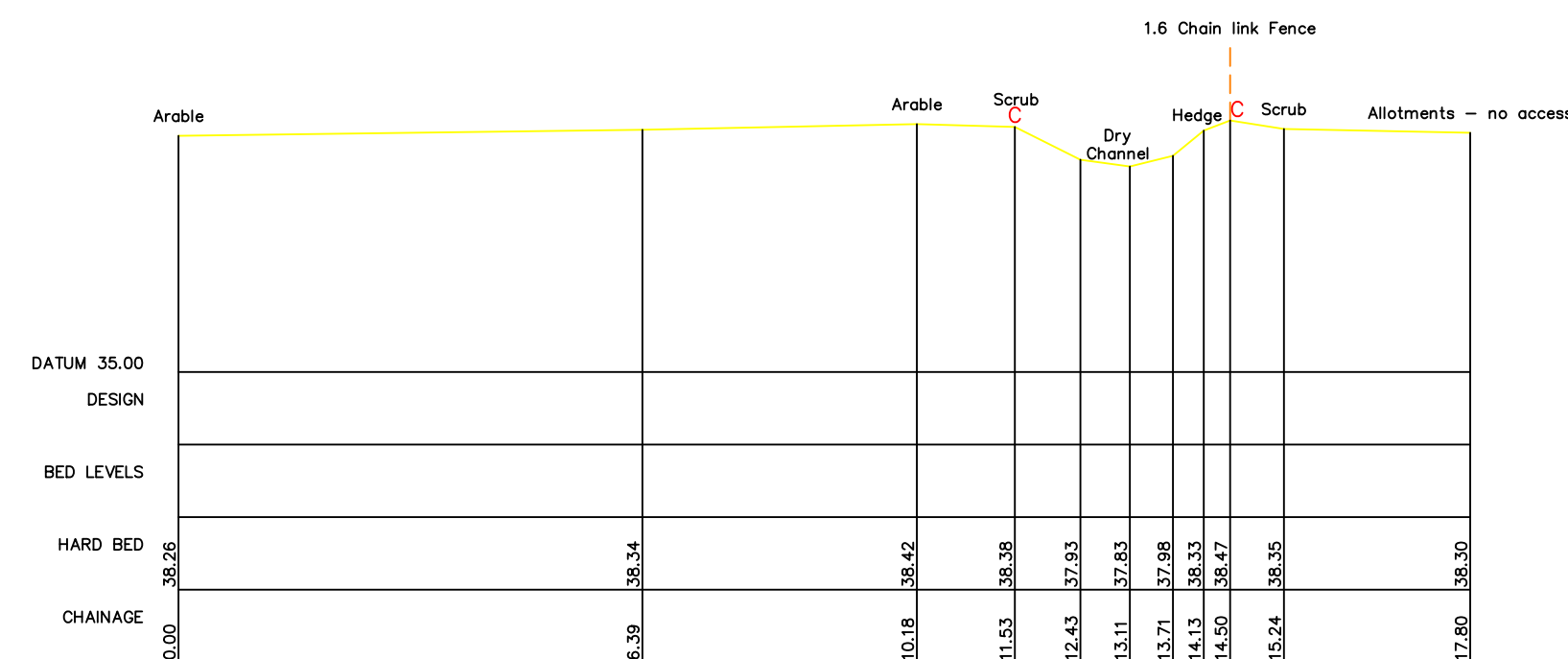


Drawing No:			GCS/JBA/2437/1		Rev: A	
Date:	Notes:			Name:	Rev:	
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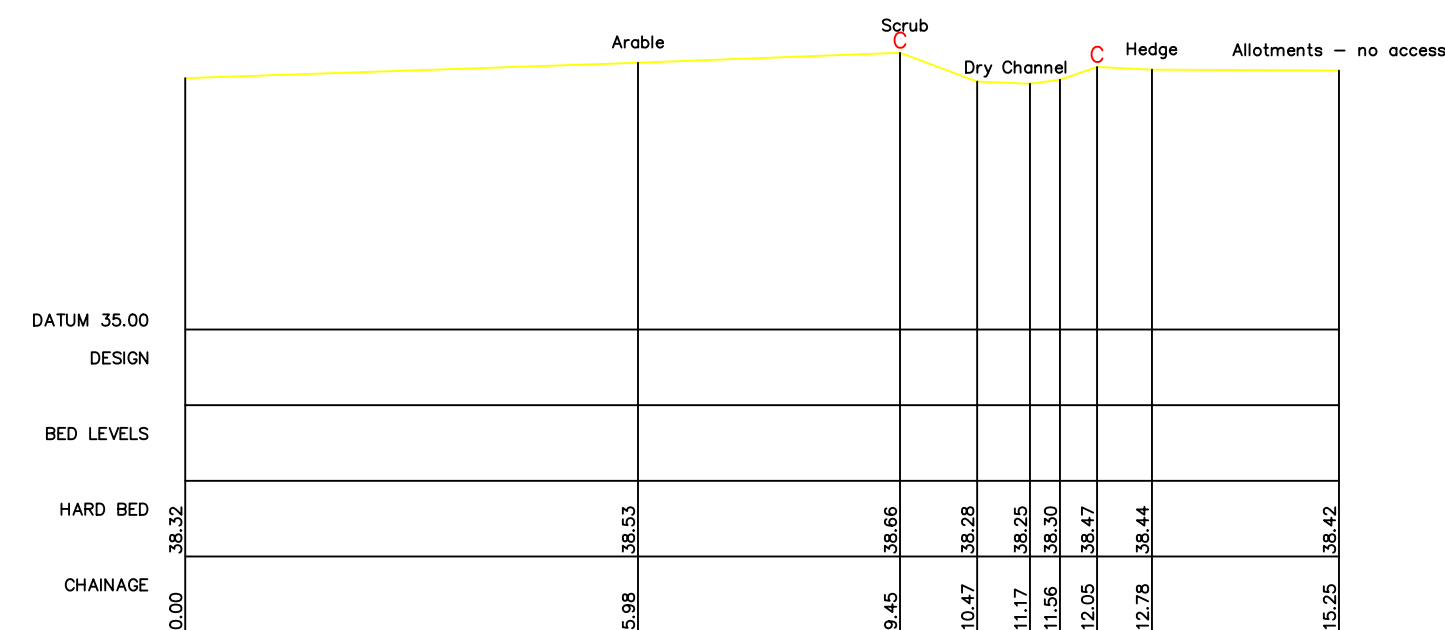
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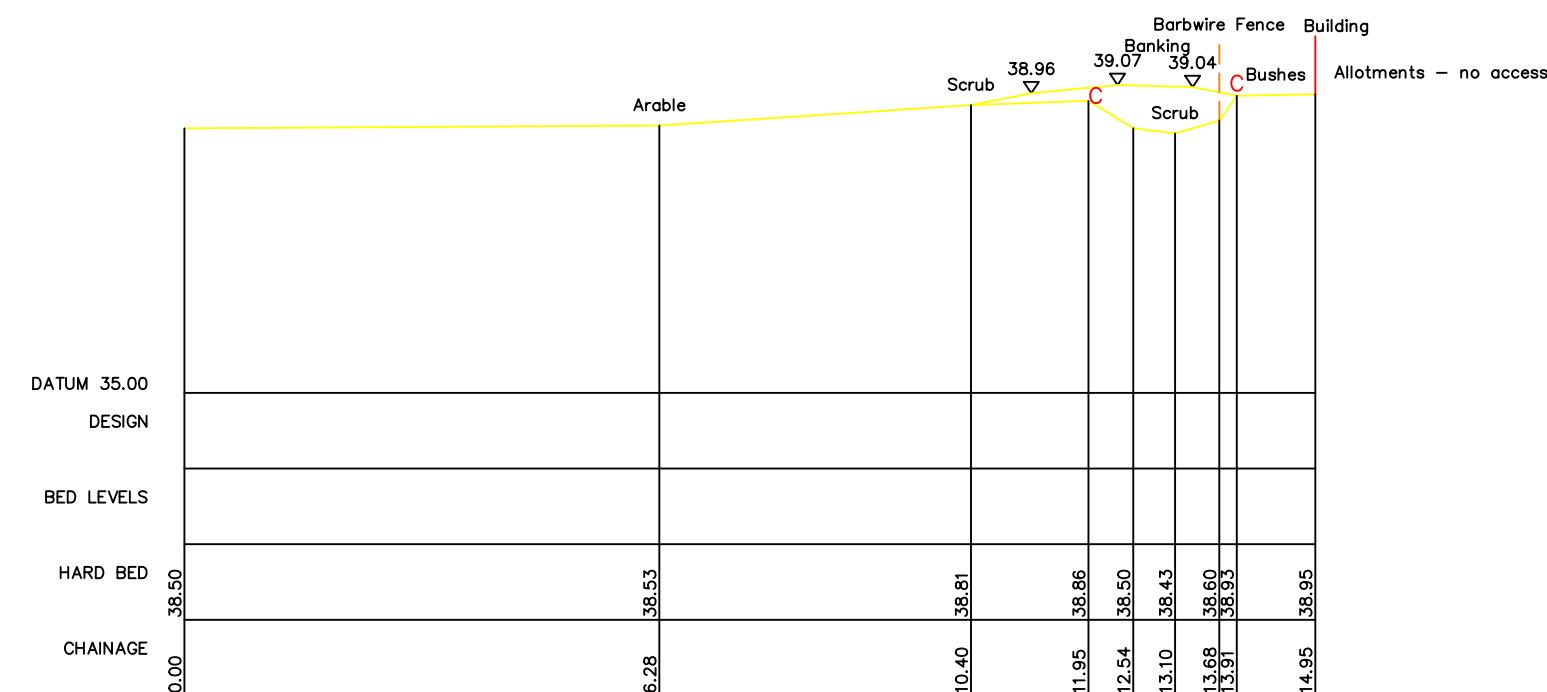
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Chainage 5
Open Channel



R10 - XS2
444701.44mE 333869.09mN Brg 176
Chainage 94.1
Open Channel



R10 - XS3
444678.6mE 333864.96mN Brg 175
Chainage 117
Open Channel



R10 - XS4
444609.93mE 333862.96mN Brg 180
Chainage 186.7
Open Channel



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Legend

BAR WALL	AV	WATER TAP	TAP
IRVINE	BD	TEMPERARY BENCH MARK	TM
TELEPHONE CABLE BOX	BS	TELEPHONE CABLE BOX	TO
BUS STOP	BS	TELEPHONE POST	TP
BT INSPECTION COVER	BT	THRESHOLD LEVEL	THL
TELEPHONE CABLE	BTB	TRAFFIC LIGHT	TL
CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOW
TELEPHONE CABLE	CTV	TELEGRAPHY POLE	TP
DOWN PIPE	DK	UNABLE TO LIFT	UTL
DROPPED KERB	DK	VENT PIPE	VP
ELECTRICITY CONTROL BOX	EH	RAIN WELDED	WE
EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH		
FOUL WATER	FW		
GULLY	GY		
GATE POST	GP		
GAS VALVE	GV		
INSULATED BLOCK JOINT	IJB		
INSPECTOR'S COVER	IC		
INVERT LEVEL	IL		
KERBS OUTLET	KO		
LAMPPOST	LP		
LITTER BIN	LB		
MARKER POST	MP		
MILE POST	MLP		
POST	PO		
RODDING EYE	RE		
HEIGHT RIGHT	RH		
ROAD NAMEPLATE	RN		
ROAD SIGN	RS		
STUMP	ST		
SOFFIT LEVEL	SL		
SIGNAL POST	SP		
LOW SLEEPER LEVEL	SLP		
SIGNALS AND TELECOMS BOX	STB		
SIGNALS AND TELECOMS CABLE	STC		
SIGNALS AND TELECOMS POST	STP		
SIGNAL POST	SN		
STOP TAP	ST		
STOP VALVE	SV		
STAY	SW		
STORM WATER	SW		

 SURVEY STATION
 BUSHES
 HEDGES
 TREES
 GATE

 GC51
 Height
 Species
 Gate
 SECURITY FENCE
 OVERHEAD CABLES
 FOUL WATER
 GAS MAN
 U/P POWER LINE
 STORM WATER
 U/P TELEPHONE
 WATER MAN

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

Grid: *OS National Grid* **Datum:** *Ordnance Datum Newlyn*
Survey related to Ordnance Survey National Grid (OSGB36) via GPS and the OS Active Network.
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No scale factor has been applied to the survey

Title:

WATERCOURSE SURVEY AT
DRAYCOTT ROAD
(Cross Sections)

Client:

JBA CONSULTING
Suite 1B First Floor
Coleshill House
1 Station Road, Coleshill
Warwickshire B46 1HT



**Grantham Coates
Surveys Ltd**

Land - Engineering - Building Surveyors

2 Arden Court, Arden Road, Alcester
Warwickshire, B49 6HN



Tel: 01789 764420

E-Mail: info@gcsurveys.co.uk
Web Site: www.gcsurveys.co.uk



Drawing No:	GCS/JBA/2437/1	Rev:	A
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Date:	Notes:	Name:	Rev:
18-6-25	XS R1-8 culvert length corrected	CC	A

Drawn: MS/MH	Checked: CC	Scale: 1:100	Date: 06/06/25
File Name: GCS-JBA-2437-1A		Sheet size: A1	Sheet: 15 of 35



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Legend

AR VALVE	AV	WATER TAP	TAP
BOLLARD	BD	TEMPORARY BENCH MARK	TBM
BURIED TELEPHONE CABLE BOX	BT	TELEPHONE CABLE BOX	TCS
BUS STOP	BS	TELEPHONE POST	TEL
BUS STOP PROTECTION COVER	BTB	THRESHOLD LEVEL	TL
BUS STOP	BT	TRAFFIC LIGHT	TL
BUS STOP INSPECTION COVER	BTI	TOP OF WALL	TOU
CHIMNEY	CH	TELEGRAPH POLE	TP
CABLE PIPE	CP	DN UNABLE TO LOCATE	UTL
COUPLED KERB	CK	VENT PIPE	VP
CURB AND GUTTER CONTROL BOX	CG	RAIL WELD	WR
EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
FLAT ROOF	FR		
FINISHED FLOOR LEVEL	FL	SURVEY STATION	△ GCS
FIRE HYDRANT	FW		
FLOODWATER	FW		
GULLY	GU		
GRASS	GR	BUSHES	△
GAS VALVE	GV		
INSULATED BOLT JOINT	IBJ		
INSPECTION COVER	IC	HEDGES	⊖
INVERT LEVEL	IL		
KEENUT	K		
LAMPPOST	LP		
LITTER BIN	LB	TREES	⊙
MARKER	MP		
MALE PILE	MP		
POLE	P		
ROOFING EYE	RE		
ROAD HEIGHT	RH		
ROAD MANIPULATE	RN		
ROAD SIGN	RS		
ROOF	R		
SOFFIT LEVEL	SL		
SIGNAL POST	SP		
SIGNAL POST	SP		
SIGNALS AND TELECOMS BOX	STB		
SIGNALS AND TELECOMS BOX	STB		
SIGNALS AND TELECOMS BOX	STB		
SIGNALS AND TELECOMS POST	STP		
STOP TAP	ST		
STOP VALVE	SV		
STW	SW		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

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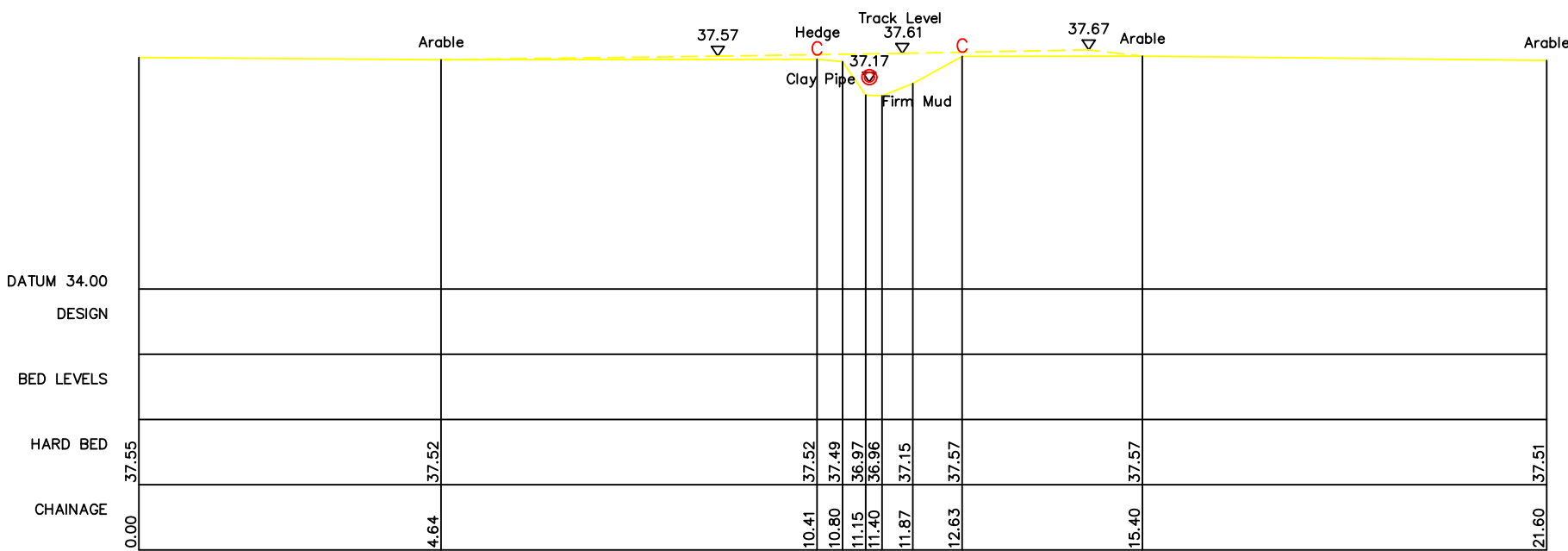


THE SURVEY
ASSOCIATION
FULL MEMBER

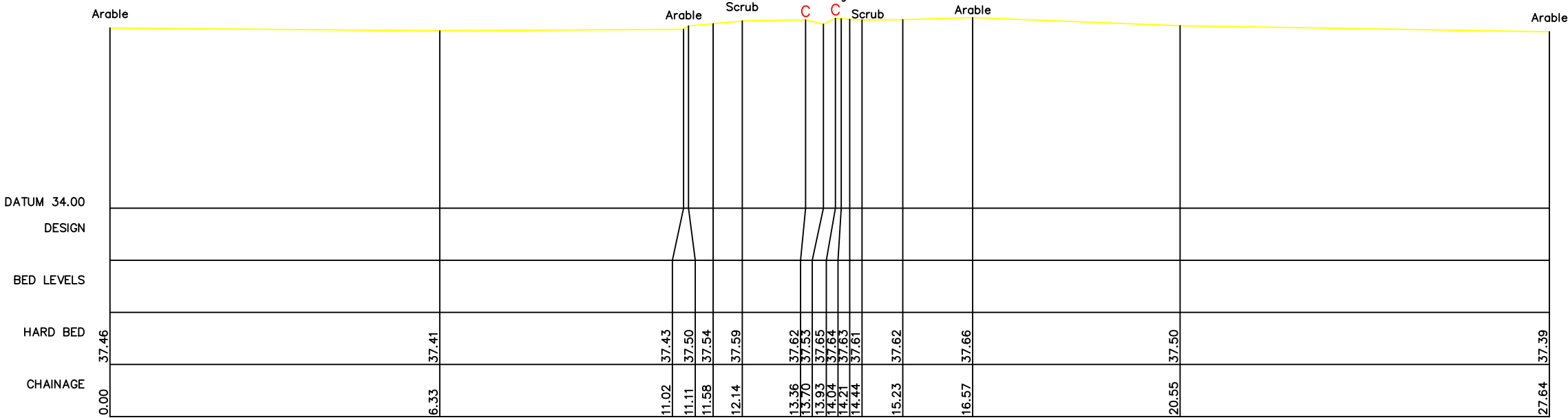


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Drawing No:				GCS/JBA/2437/1		Rev:		A	
Date:		Notes:				Name:		Rev:	
18-6-25		XS R1-8 culvert length corrected				CC		A	
Drawn:		Checked:		Scale:		Date:			
MS/MH		CC		1:100		06/06/25			
File Name:				Sheet size:		Sheet:			
GCS-JBA-2437-1A				A1		16		35	



R12 – XS1
444837.46mE 333635.2mN Brg 173
Chainage 5.9
Upstream face of Field Access – Length 5.0m



R12 – XS2
444657.77mE 333608.6mN Brg 176
Chainage 188.4
Open Channel



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Legend

AIR VALVE	AV	WATER TAP	TAP
BOLLARD	BD	TEMPORARY BENCH MARK	TBM
BORE HOLE	BHL	TELEPHONE CALL BOX	TCB
BUS STOP	BS	TELEPHONE POST	TEL
BT INSPECTION COVER	BT	THRESHOLD LEVEL	THL
BT BOX	BTB	TRAFFIC LIGHT	TL
CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOW
COVER LEVEL	CL	TELEGRAPH POLE	TP
DOWN PIPE	DP	UNABLE TO LIFT	UTL
DROPPED KERB	DK	VENT PIPE	VP
ELECTRICITY CONTROL BOX	ECB	RAIL WELD	WE
EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL	SURVEY STATION	△ GCS1
FIRE HYDRANT	FH		
FOUL WATER	FW		
GULLY	GV		
GATE POST	GP	BUSHES	
GAS VALVE	GV		
INSULATED BLOCK JOINT	IBJ		
INSPECTION COVER	IC	HEDGES	
INVERT LEVEL	IL		
KERB OUTLET	KO		
LAMPPOST	LP	TREES	
LITTER BIN	LB	Height	
MARKER POST	MK	Species	
MILE POST	MP	(Spread to scale)	
POST	PO		
RODDING EYE	RE	GATE	
RODGE HEIGHT	RH		
ROAD NAMEPLATE	RN		
ROAD SIGN	RS	SECURITY FENCE	
STUMP	SP	FENCE	
SOFFIT LEVEL	SF	OVERHEAD CABLES	
SIGNAL POST	SIG		
RAIL SLEEPER LEVEL	SLP	GAS MAIN	
SIGNALS AND TELECOMS BOX	STB	UIG POWER LINE	
SIGNALS AND TELECOMS CABLE	STC	STORM WATER	
SIGNALS AND TELECOMS POST	STP	UIG TELEPHONE	
SIGN POST	SN	WATER MAIN	
STOP TAP	ST		
STOP VALVE	SV		
STAY	SY		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

Grid: OS National Grid Datum: Ordnance Datum Newlyn
Survey related to Ordnance Survey National Grid (OSGB36) via GPS and the OS Active Network.
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No scale factor has been applied to the survey

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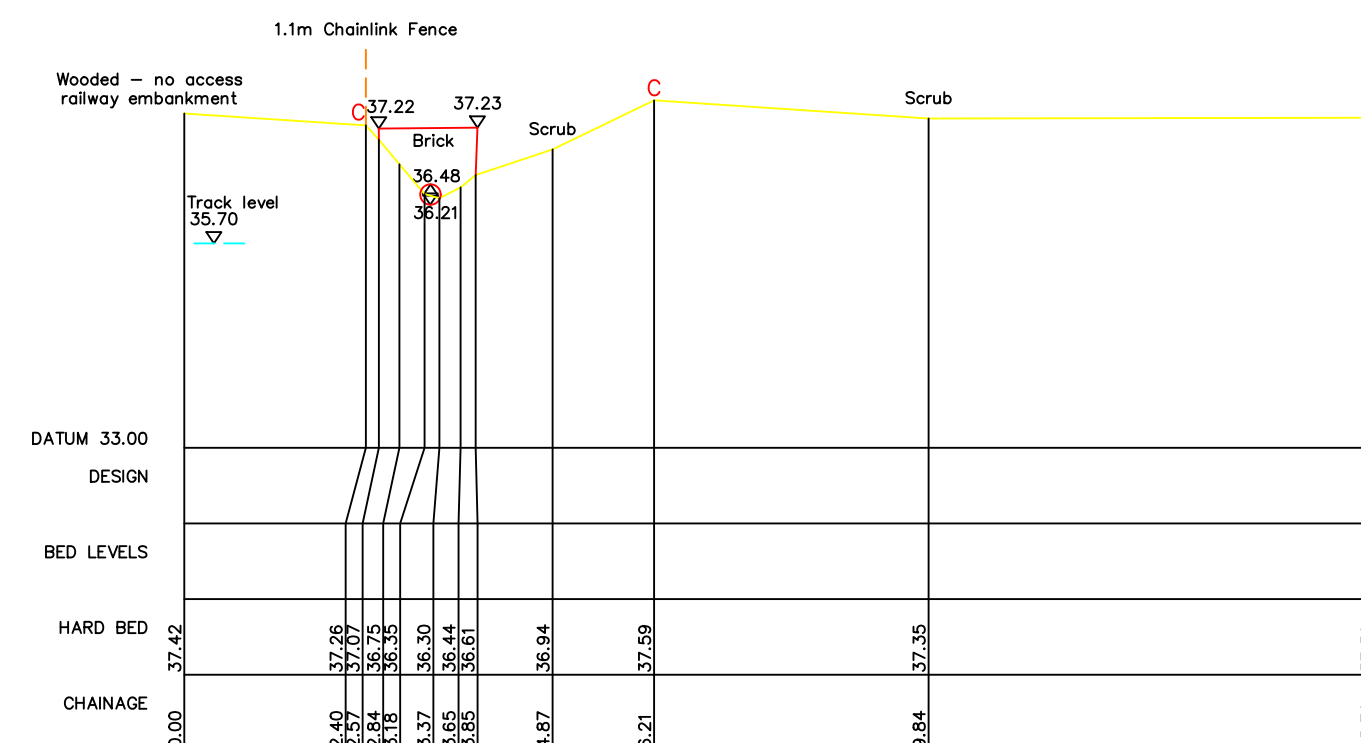
Drawing No:	GCS/JBA/2437/1	Rev:	A
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Date:	Notes:	Name:	Rev:
18-6-25	XS R1-8 culvert length corrected	CC	A

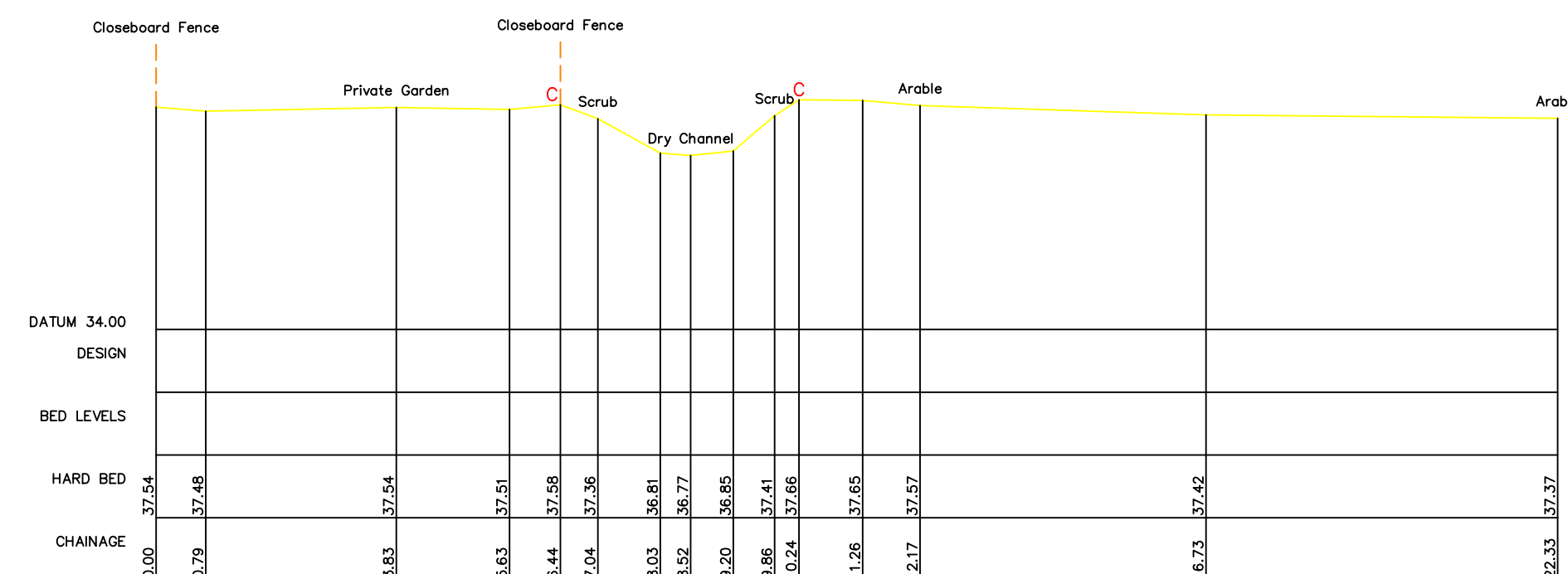
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MS/MH	CC	1:100	06/06/25

File Name:	Sheet size:	Sheet:
GCS-JBA-2437-1A	A1	17 of 35

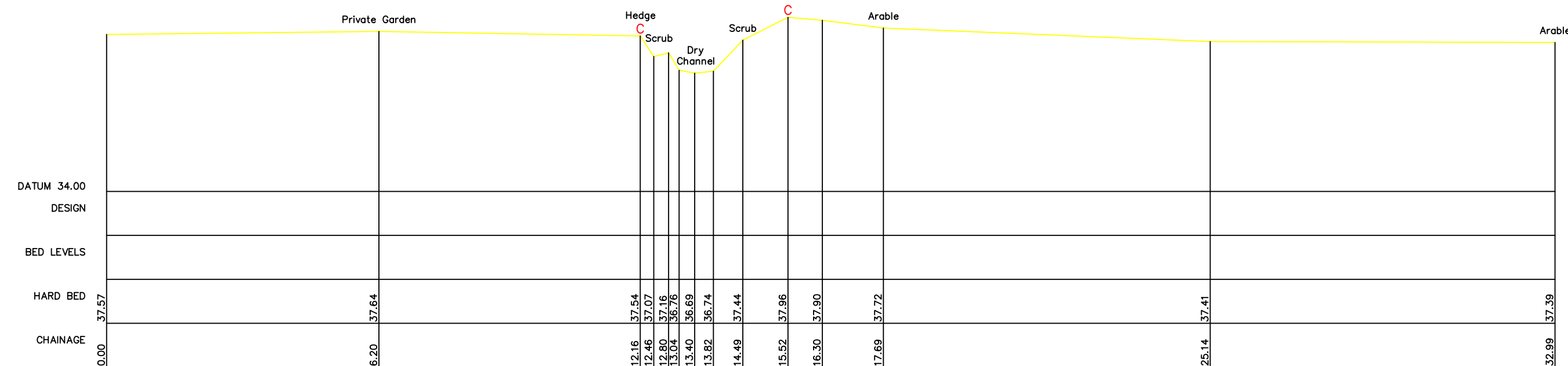
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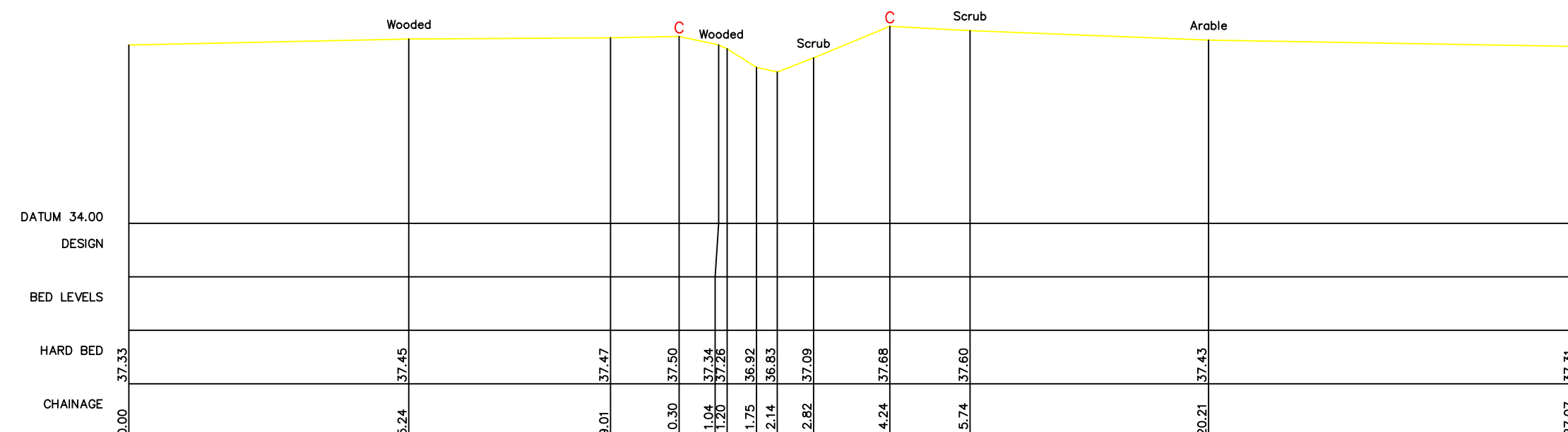
R13 - XS1
444896.87mE 333381.87mN Brg 281
Chainage 1
Upstream face of brick culvert - length unknown, assumed into track drainage



R13 - XS2
444883.69mE 333465.5mN Brg 260
Chainage 84.6
Open Channel



R13 - XS3
444867.07mE 333547.97mN Brg 254
Chainage 168
Open Channel



R13 - XS4
444865.07mE 333588.75mN Brg 263
Chainage 214.6
Open Channel



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Legend

AIR VALVE	AV	WATER TAP	TA
BALL VALVE	BV	TEMPORARY BENCH MARK	TBM
BUS STOP	BS	TELEPHONE CALL BOX	TCB
BT INSPECTION COVER	BS	TELEPHONE POST	TEL
BUTTERFLY VALVE	BU	THRESHOLD LEVEL	TEL
CABLE INSPECTION COVER	CTV	TRAFFIC LIGHT	TOL
CATCH	CA	TOP OF WALL	TOW
DOWN PIPE	DP	UNABLE TO LIFT	UNL
DROPPED KERB	DK	VENT PIPE	VP
ELECTRICITY CONTROL BOX	ECB	RAIN WELD	WM
EAVES HEDGE	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
ERATH ROAD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH	SURVEY STATION	△ GCS1
FOUR WHEEL	FW		
GULLY	GY		
GAS VALVE	GV		
INSULATED BLOCK JOINT	IBJ	GV BUSHES	
INSPECTION COVER	IC		
INVERT LEVEL	IL	HEDGES	
KERB OUTLET	KO		
LAMPPOST	LP		
LITTER BIN	LB		
MARKER POST	MP	TREES	
MILE POST	MP	Height	
POST	PO	Species	
RODGING EYE	RE	(Spread to scale)	
RIDGE HEIGHT	RH		
ROAD NAMEPLATE	RN	GATE	
ROAD SIGN	RS		
SE	SE	SECURITY FENCE	— x — x —
STUMP	SP	OVERHEAD CABLES	OH — OH
STIFF LEVEL	SL		
SIGNAL	SI	FOUL WATER	FW — FW
RAIN SENSING POST	RS	GAS MAIN	GM — GM
SIGNALS AND TELECOMS BOX	STB	LOW POWER LINE	PL — PL
SIGNALS AND TELECOMS POST	STC	STORM WATER	SW — SW
SIGNALS AND TELECOMS POST	STC	TELEPHONE	TEL — TEL
SIGN POST	SN	WATER MAIN	WM — WM
STOP	ST		
STOP VALVE	SV		
STAY	ST		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

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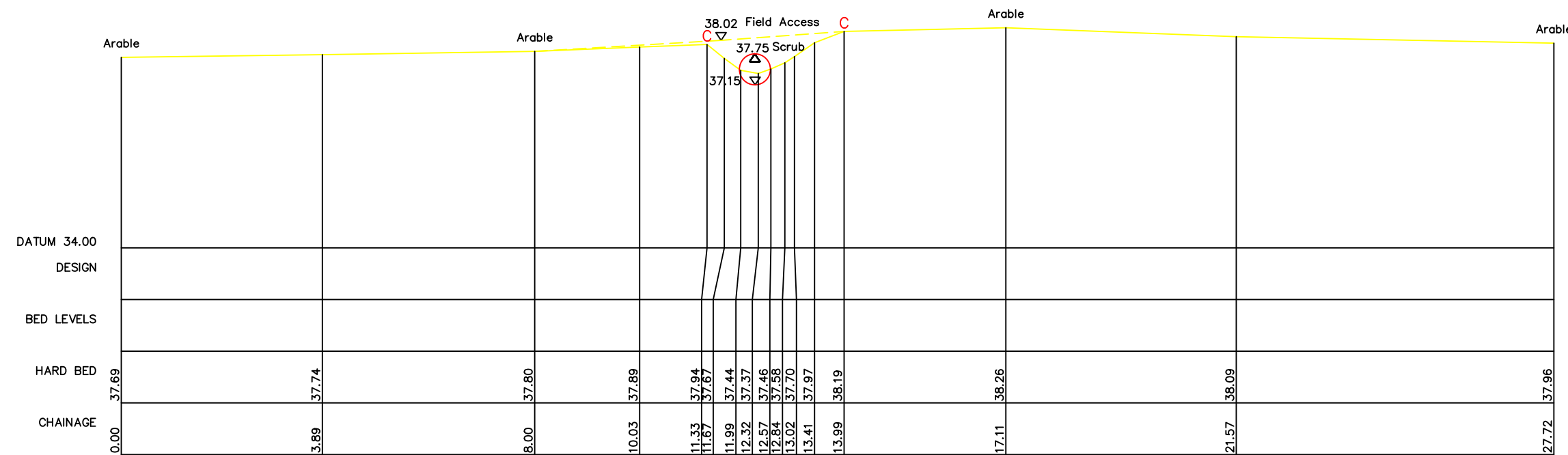


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Drawing No: GCS/JBA/2437/1				Rev: A	
Date:		Notes:		Name: Rev:	
18-6-25		XS R1-8 culvert length corrected		CC A	
Drawn: MS/MH		Checked: CC		Date: 06/06/25	
File Name: GCS-JBA-2437-1A		Sheet size: A1		Sheet: 18 of 35	

REACH 13



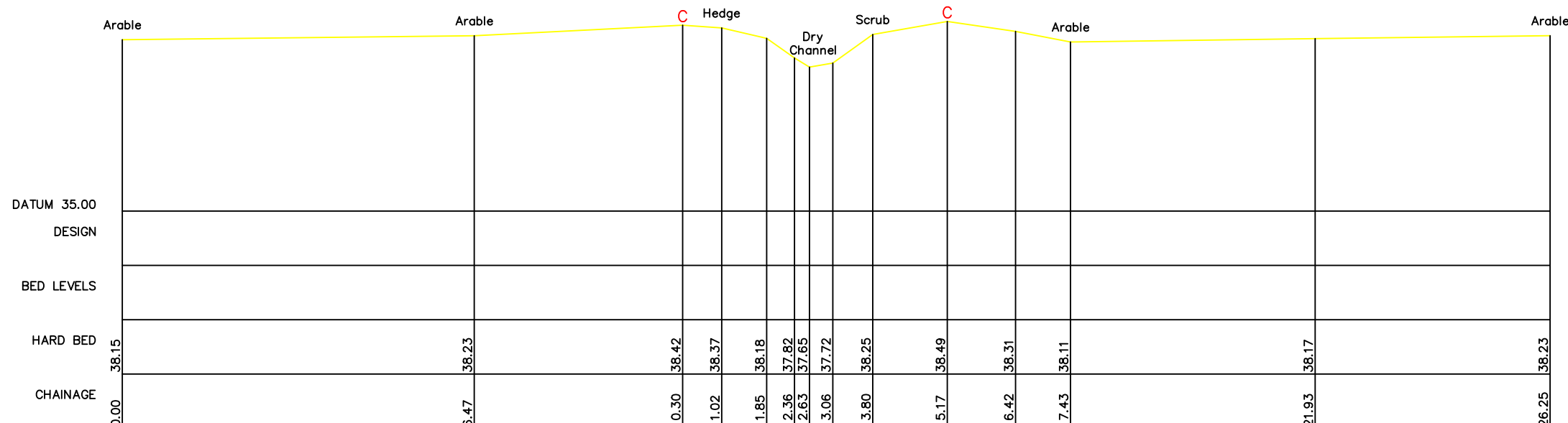
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444830.09mE 333768.29mN Brg 259
Chainage 396.8
Upstream face of field access culvert - Length 5.0m



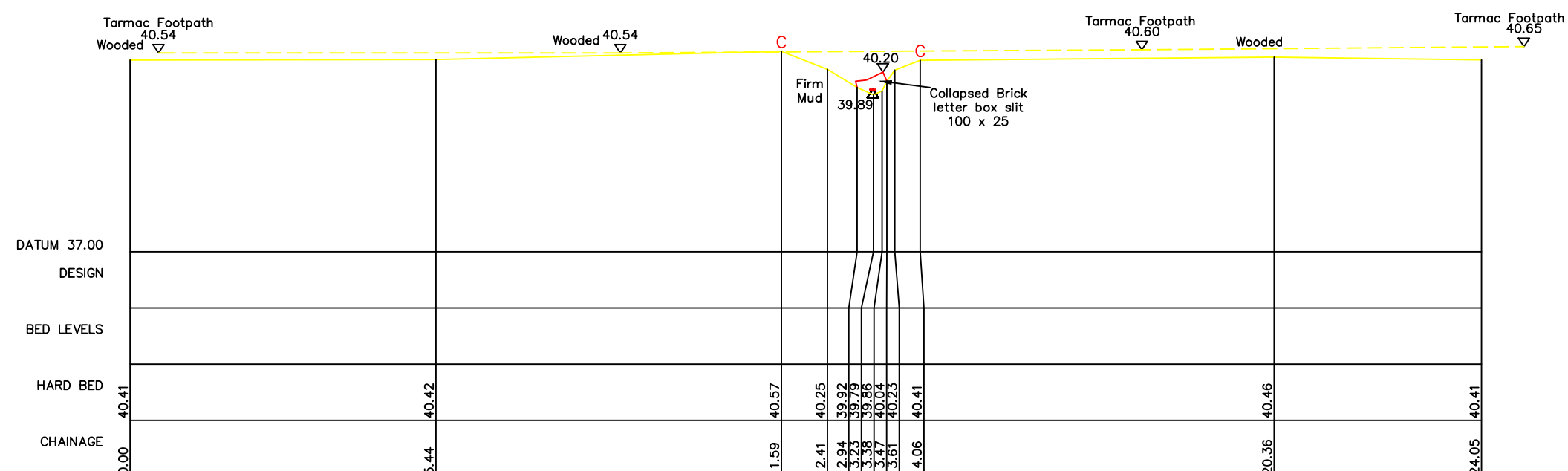
R13 - XS6
444803.9mE 333876.17mN Brg 251
Chainage 506.5
Open Channel



R13 - XS7
444801.89mE 333887.24mN Brg 258
Chainage 519.2
Open Channel



R13 - XS8
444797.26mE 333902.28mN Brg 255
Chainage 534.4
Open Channel



R13 - XS9
444748.66mE 334035.49mN Brg 302
Chainage 685.9
Downstream face of Brick Culvert



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Legend

[illegible]

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

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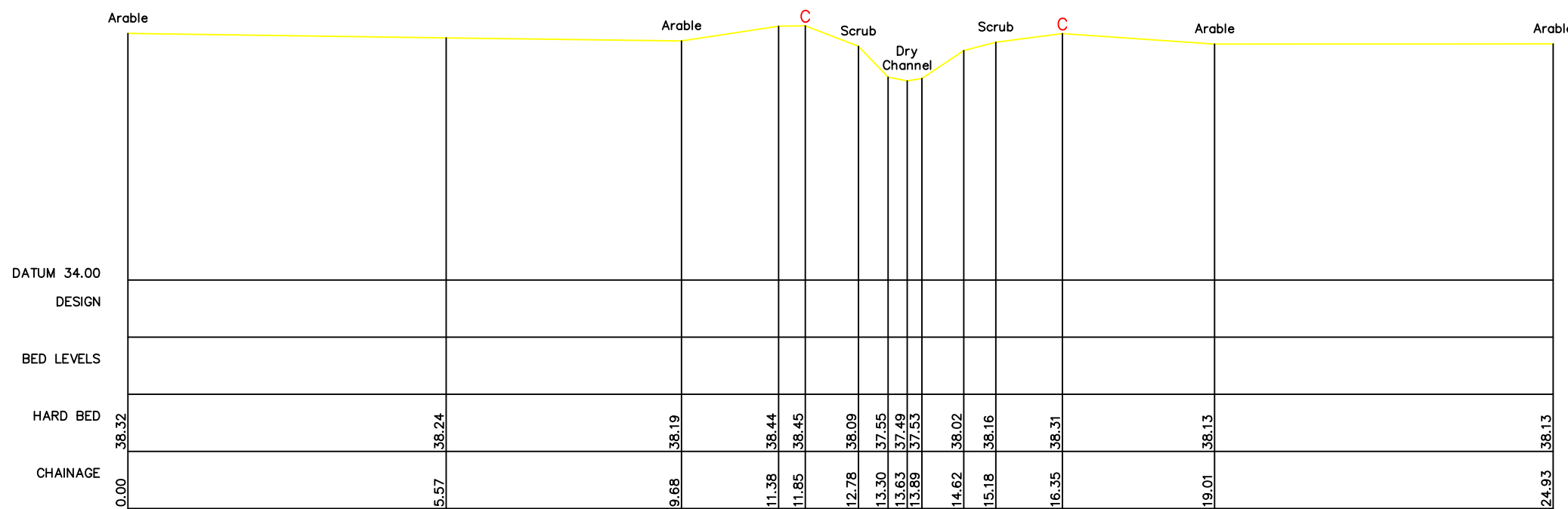
Land - Engineering - Building Surveyors

2 Arden Court, Arden Road, Alcester
Warwickshire, B49 6HN

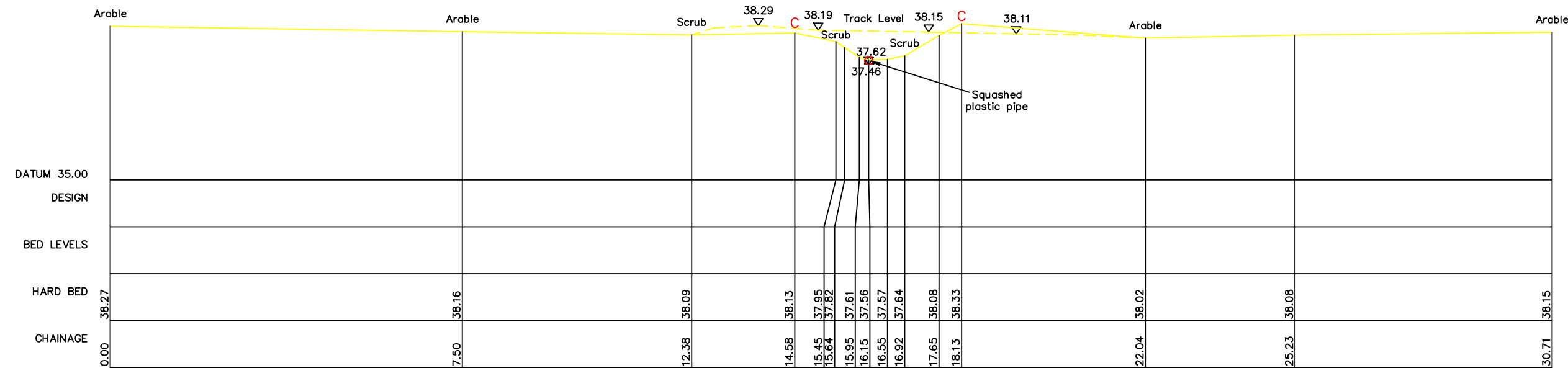


Drawing No:			GCS/JBA/2437/1		Rev: A	
Date:	Notes:			Name:	Rev:	
18-6-25	XS R1-8 culvert length corrected			CC	A	
Drawn:	Checked:	Scale:	Date:			
MS/MH	CC	1:100	06/06/25			
File Name:		Sheet size:	Sheet:			
GCS-JBA-2437-1A		A1	19 of 35			

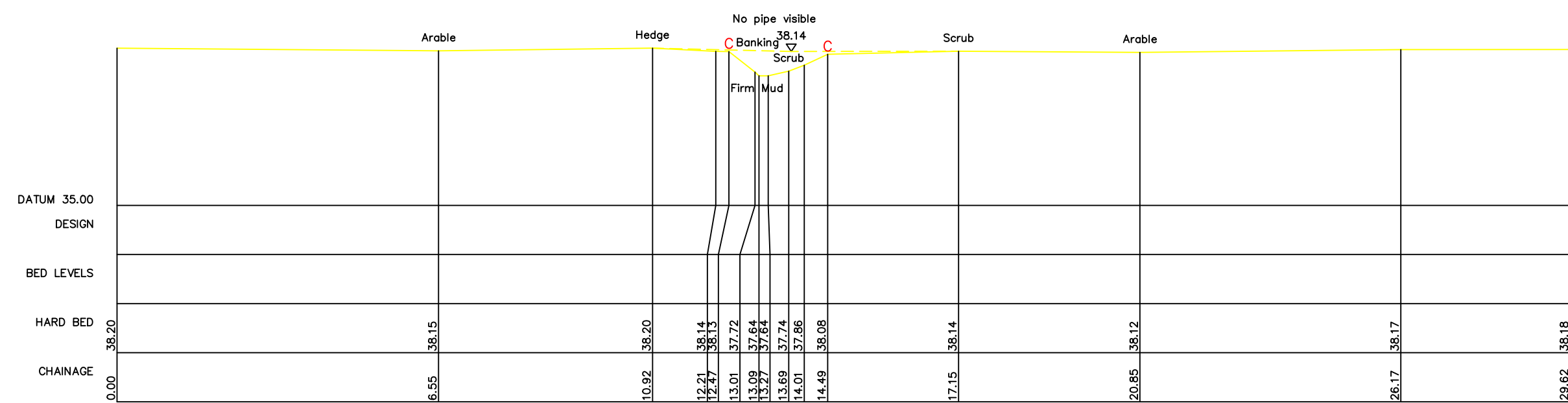
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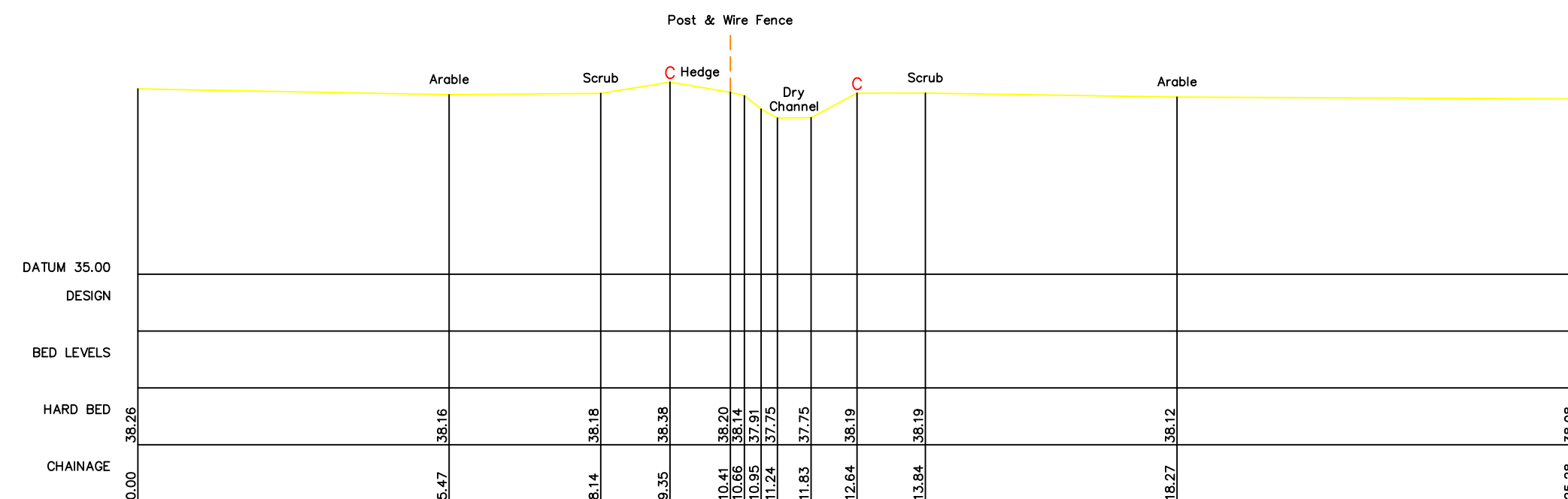
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444983.54mE 333925.98mN Brg 171
Chainage 26
Open Channel



R14 - XS2
444932.99mE 333925.47mN Brg 179
Chainage 78.6
Upstream face of Field Access - length 5.0m



R14 - XS3
444909.76mE 333922.24mN Brg 180
Chainage 102.3
Upstream face of field access - Length 1.3m



R14 - XS4
444793.87mE 333905.73mN Brg 163
Chainage 215.8
Open Channel



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Legend

[illegible]

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

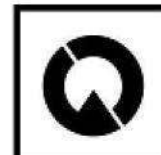
Grid: OS National Grid **Datum:** Ordnance Datum Newlyn
Survey related to Ordnance Survey National Grid (OSGB36) via GPS and the OS Active Network.
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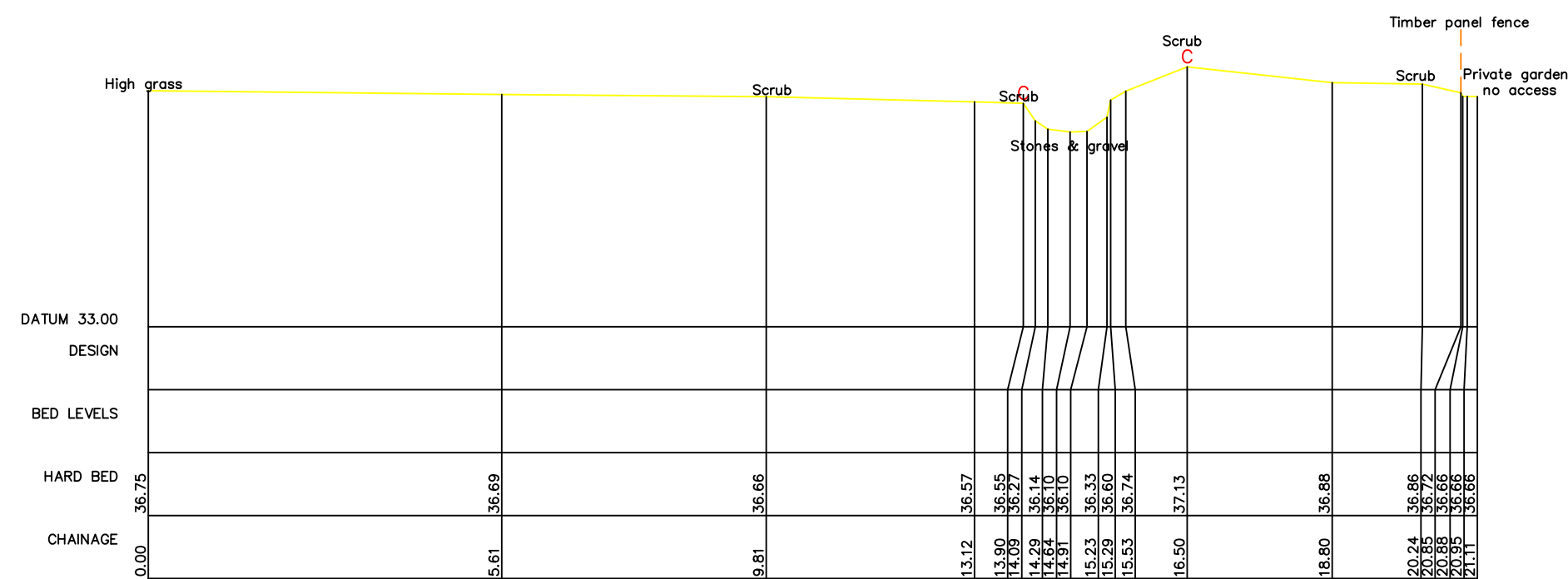


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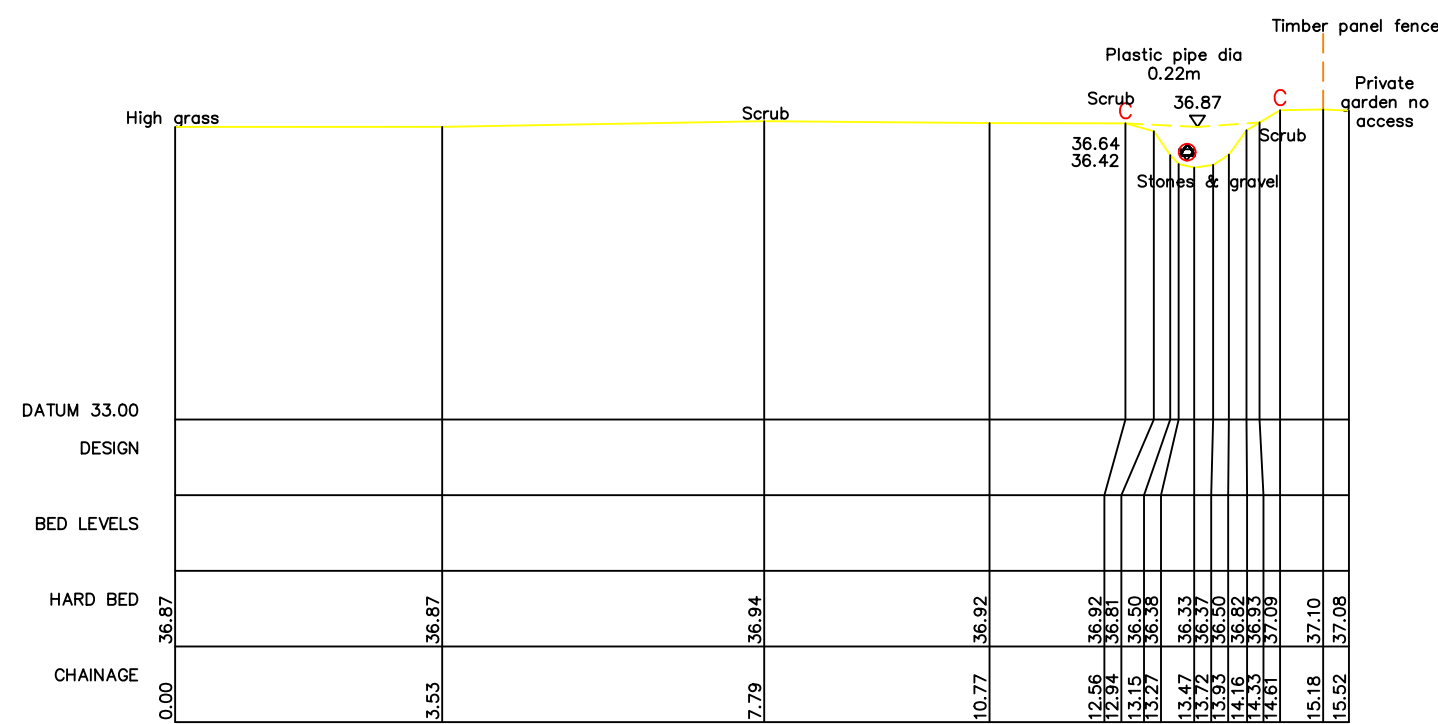


Drawing No:			GCS/JBA/2437/1		Rev: A	
Date:	Notes:			Name:	Rev:	
18-6-25	XS R1-8 culvert length corrected			CC	A	
Drawn:	Checked:	Scale:	Date:			
MS/MH	CC	1:100	06/06/25			
File Name:		Sheet size:	Sheet:			
GCS-JBA-2437-1A		A1	20 of 35			

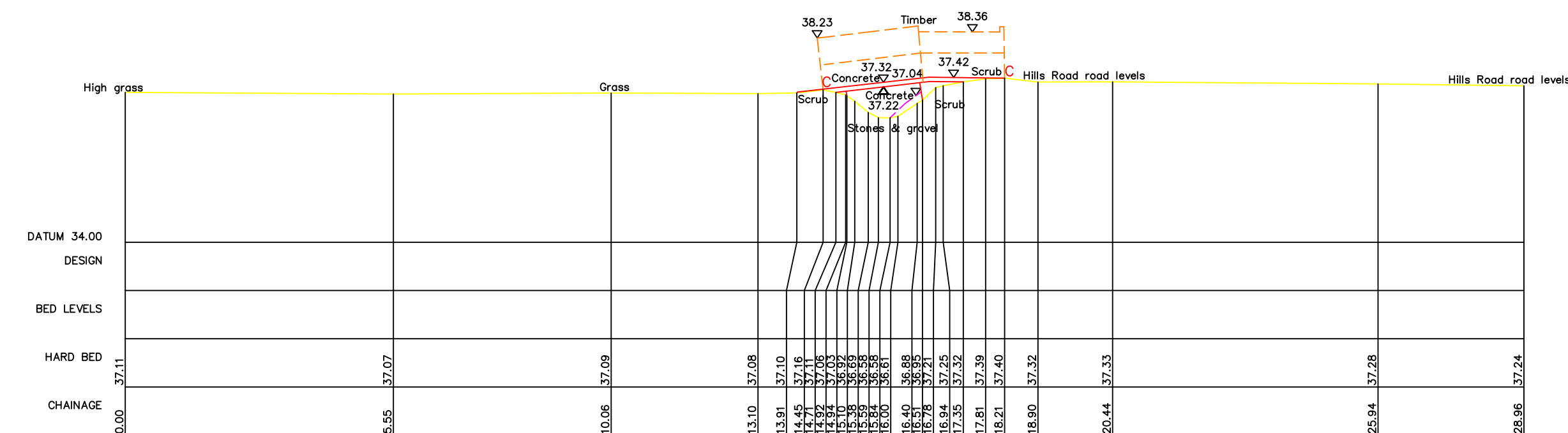
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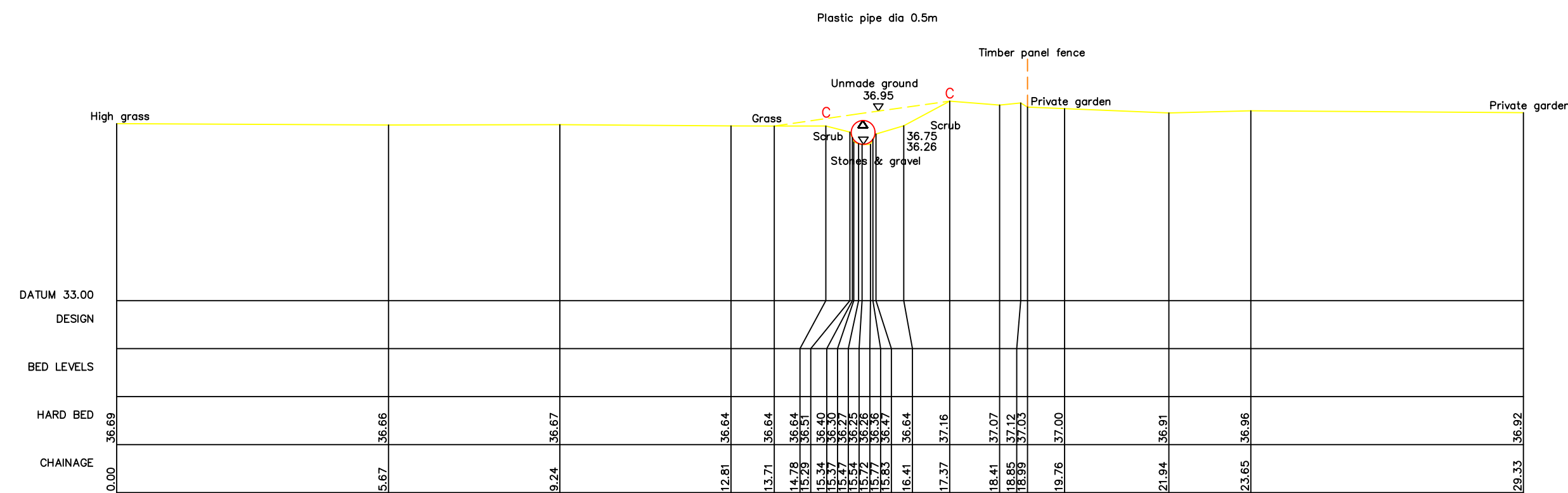
R15 - XS1
445151.92mE 333658.17mN Brg 181
Chainage 12.6
Open Channel



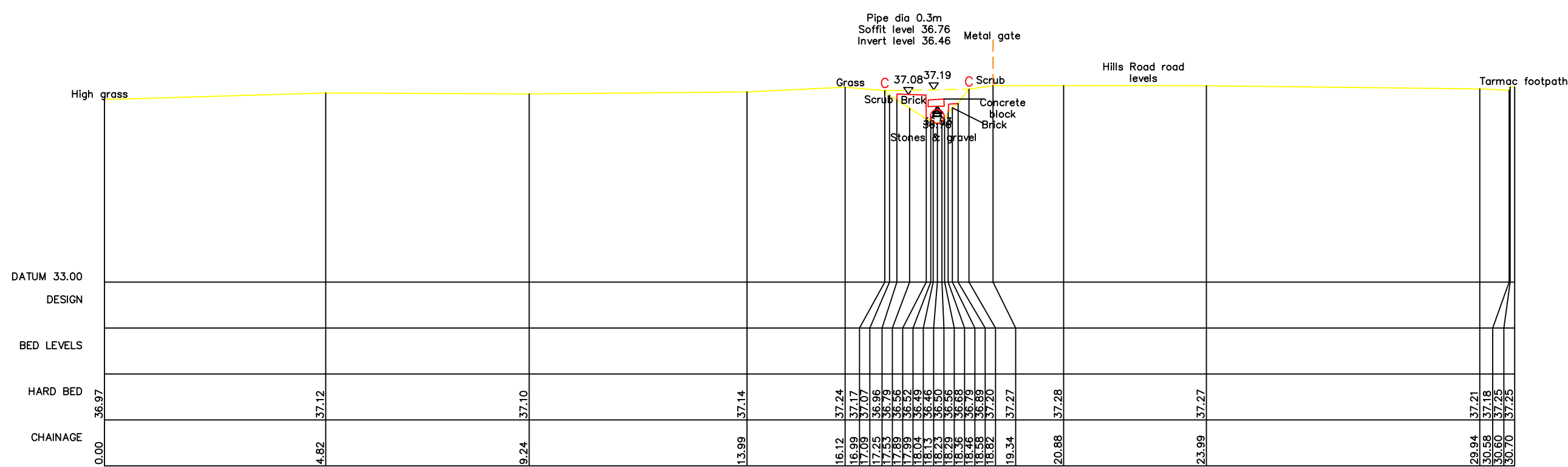
R15 - XS3
445008.05mE 333630.42mN Brg 173
Chainage 157.1
Upstream face of plastic pipe. Pipe length 3.4m.



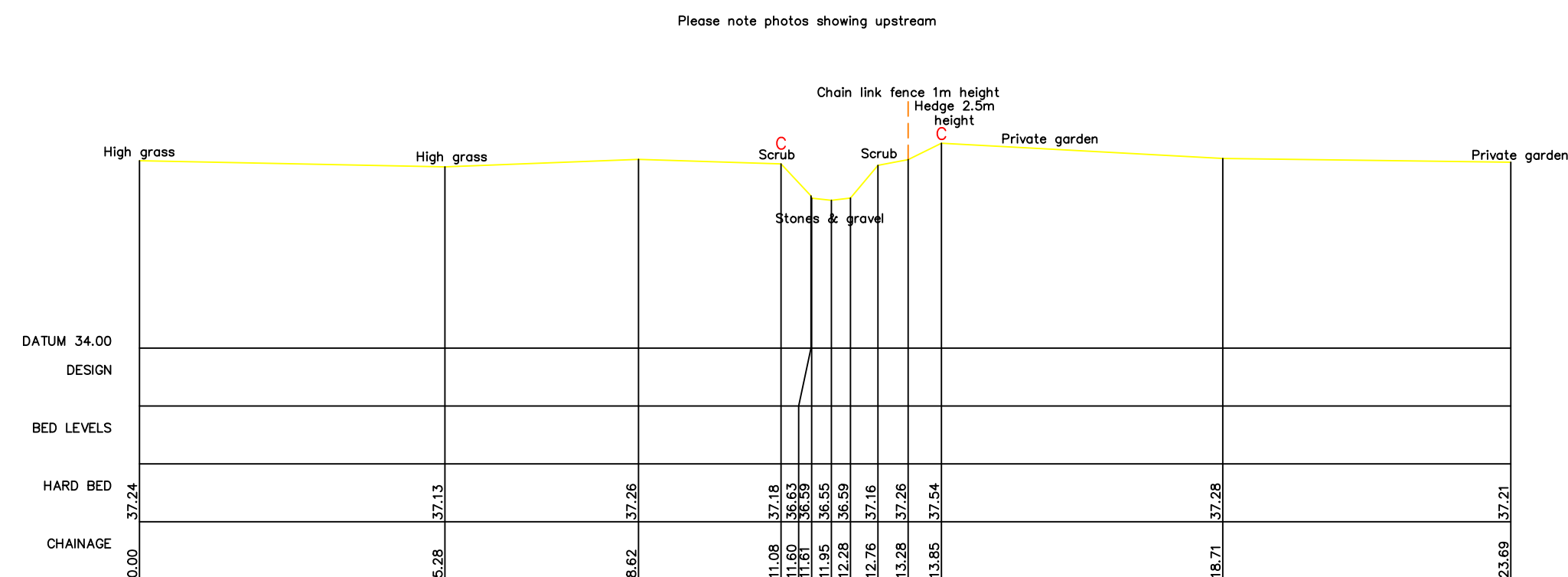
R15 - XS5
444958.49mE 333624.73mN Brg 167
Chainage 205.4
Upstream face of concrete footbridge. Footbridge length 0.9m.



R15 - XS2
445074.11mE 333643.82mN Brg 170
Chainage 88.9
Upstream face of plastic pipe. Pipe length 2m.



R15 - XS4
444961.01mE 333627.52mN Brg 168
Chainage 202.6
Upstream face of Clay Pipe. Pipe length 4.5m.



R15 - XS6
444902.65mE 333596.84mN Brg 160
Chainage 265.7
Open Channel



Notes

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Legend

BAR VALVE	AV	WATER TAP	TAP
BOLLARD	BD	TEMPORARY BENCH MARK	TBM
BUSH	BS	TELEPHONE CABLE BOX	TE
BUS STOP	BS	TELEPHONE POST	TEL
BT INSPECTION COVER	BT	THRESHOLD LEVEL	THL
CEILING	CE	TRAFFIC LIGHT	TL
CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOW
CANAL	CA	TELEGRAPHY POLE	TP
DOWN PIPE	DP	UNABLE TO LIFT	UTL
DROPPED KERB	DK	VENT PIPE	VP
INSPECTION CONTROL BOX	ICB	RAIL WELD	WE
EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH	SURVEY STATION	 GS1
FOUL WATER	FW		
GULLY	GU		
GATE POST	GP	BUSHES	
GAS VALVE	GV		
INSULATED BLOCK JOINT	IBJ		
INSPECTOR COVER	IC		
INVERT LEVEL	IL	HEDGES	
KERB OUTLET	KO		
LANDPOST	LP	TREES	
LITTER BIN	LB		
MARKER POST	MP	Height Species (Spread to scale)	
MANHOLE	MH		
POST	PO		
RODDING EYE	RE		
EDGE HEIGHT	RH		
ROAD NAME PLATE	RNP		
ROAD SIGN	RS		
STUMP	SP	SECURITY FENCE	
SOFFIT LEVEL	SL	OVERHEAD CABLES	
SIGNAL POST	SP	FOUL WATER	
MANHOLE SLEEPER	MS	DOWN MAIN	
SIGNALS AND TELECOMS BOX	STB	LOW POWER LINE	
SIGNALS AND TELECOMS CAB	STC	STORM WATER	
SIGNALS AND TELECOMS CAB	STC	WATER MAIN	
SIGN POST	SP		
SOFFIT	SO		
STOP VALVE	SV		
STAY	ST		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

Grid: *OS National Grid* **Datum:** *Ordnance Datum Newlyn*
Survey related to Ordnance Survey National Grid (OSGB36) via GPS and the OS Active Network.
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No scale factor has been applied to the survey

Title:

WATERCOURSE SURVEY AT
DRAYCOTT ROAD
(Cross Sections)

Client:

JBA CONSULTING
Suite 1B First Floor
Coleshill House
1 Station Road, Coleshill
Warwickshire B46 1HT



**Grantham Coates
Surveys Ltd**

Land - Engineering - Building Surveyors

2 Arden Court, Arden Road, Alcester
Warwickshire, B49 6HN



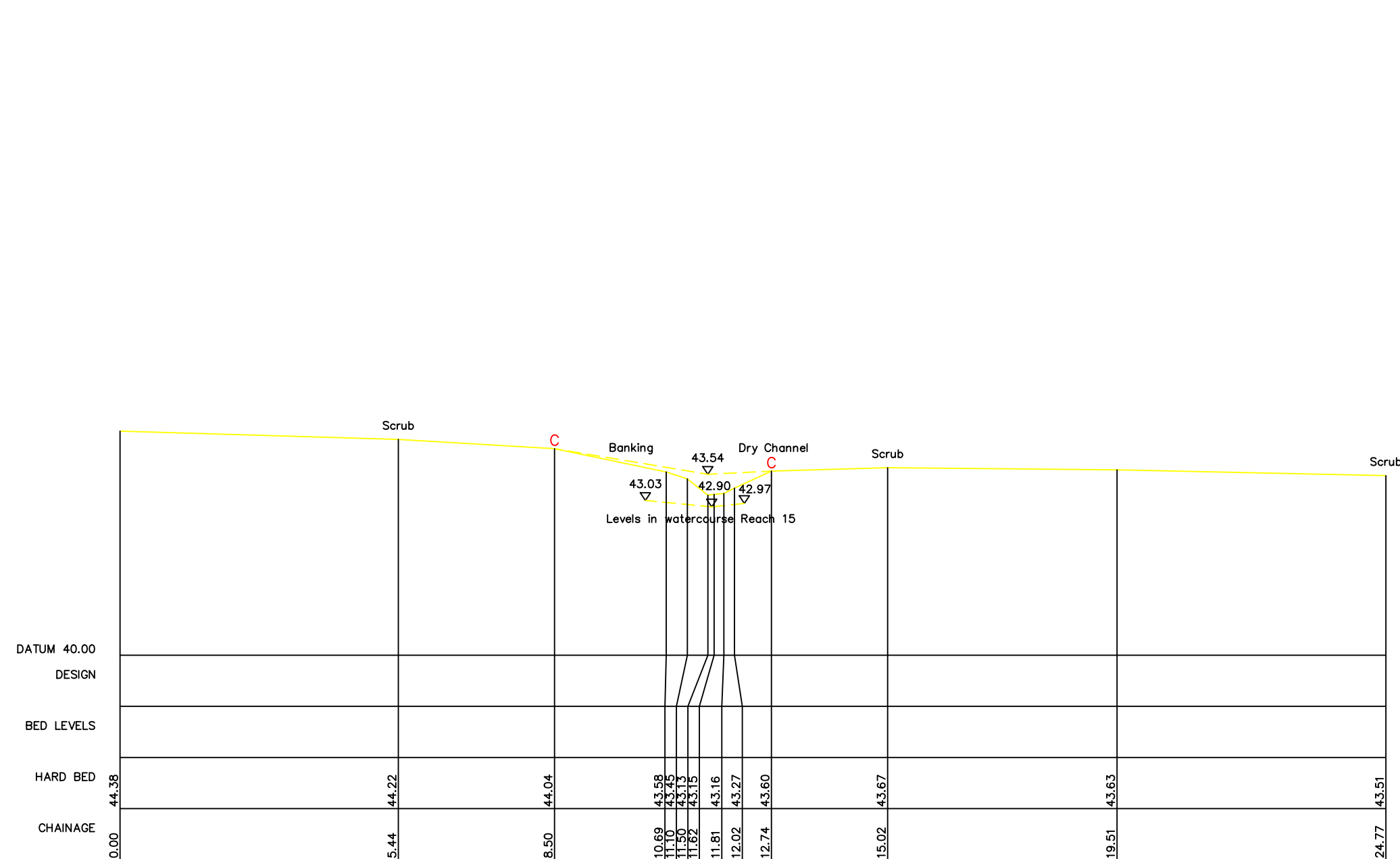
Tel: 01789 764420

E-Mail: info@gcsurveys.co.uk
Web Site: www.gcsurveys.co.uk



Drawing No:		GCS/JBA/2437/1		Rev: A	
Date:	Notes:			Name:	Rev:
18-6-25	XS R1-R culvert length corrected			CC	A
Drawn:	Checked:	Scale:	Date:		
MS/MH	CC	1:100	06/06/25		
File Name:		Sheet size:	Sheet:		
GCS-JBA-2437-1A		A1	21 of 35		

REACH 16



R16 - XS1
444954.94mE 334148.27mN Brg 248
Chainage 2
Open Channel



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Legenc

AIR VALVE	AV	WATER TAP	TA
BALL VALVE	BV	TEMPORARY BENCH MARK	TBM
BUS STOP	BS	TELEPHONE CALL BOX	TCB
BT INSPECTION COVER	BS	TELEPHONE POST	TEL
BUTTERFLY VALVE	BU	THRESHOLD LEVEL	TEL
CABLE INSPECTION COVER	CTV	TRAFFIC LIGHT	TOL
CATCH	CA	TOP OF WALL	TOW
DOWN PIPE	DP	TRUCK	TRU
DROPPED KERB	DK	UNABLE TO LIFT	UNL
ELECTRICITY CONTROL BOX	ECB	VENT PIPE	VP
EAVES HEDGE	EH	RAIN WELD	WM
ELECTRICITY MANHOLE	EM	WATER METER	WM
ELECTRICITY POLE	EP	WASHOUT	WO
ERD ROAD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH	SURVEY STATION	GCS1
FOUR WHEEL	FW		
GULLY	GY		
GAS VALVE	GV		
INSULATED BLOCK JOINT	IBJ	GY BUSHES	
INSPECTION COVER	IC		
INVERT LEVEL	IL	HEDGES	
KERB OUTLET	KO		
LAMPPOST	LP		
LITTER BIN	LB		
MARKER POST	MP	Height	
MILE POST	MP	Species	
POST	PO	(Spread to scale)	
RODGING EYE	RE		
RIDGE HEIGHT	RH		
ROAD NAMEPLATE	RN	GATE	
ROAD SIGN	RS		
STUMP	SP	SECURITY FENCE	X - X - X
STEP LEVEL	SE	OVERHEAD CABLES	OH - OH
SIGNAL BOX	SB	FOLI WARE	FW - FW
RAIN SLOPER SIGN	RS	GAS MAIN	GA - GA
SIGNALS AND TELECOMS BOX	STB	LOW POWER LINE	PL - PL
SIGNALS AND TELECOMS POST	STC	STORM WATER	SW - SW
SIGNALS AND TELECOMS POST	STC	TELEPHONE	TE - TE
SIGN POST	SN	WATER MAIN	WM - WM
STOP	ST		
STOP VALVE	SV		
STAY	ST		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

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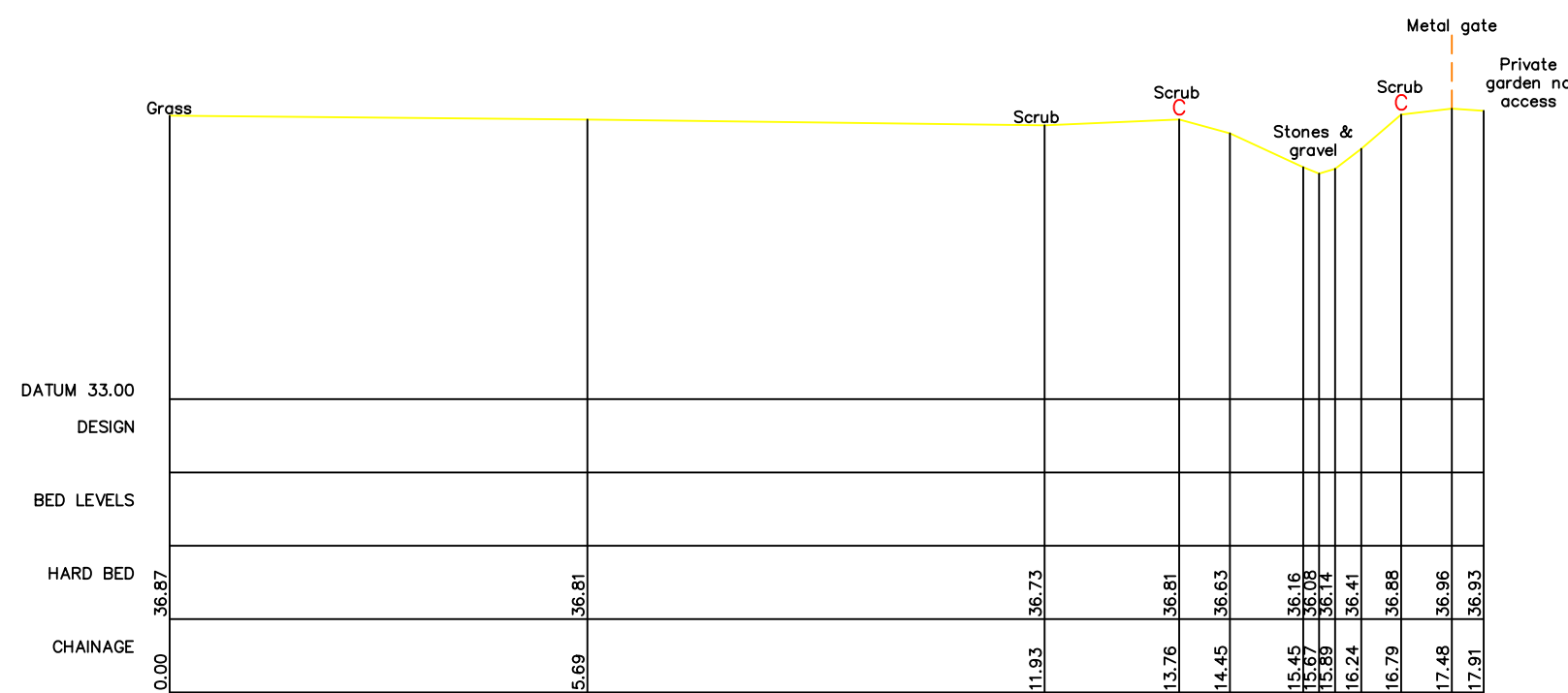
THE SURVEY
ASSOCIATION
FULL MEMBER

E-Mail: info@gcsurveys.co.uk
Web Site: www.gcsurveys.co.uk

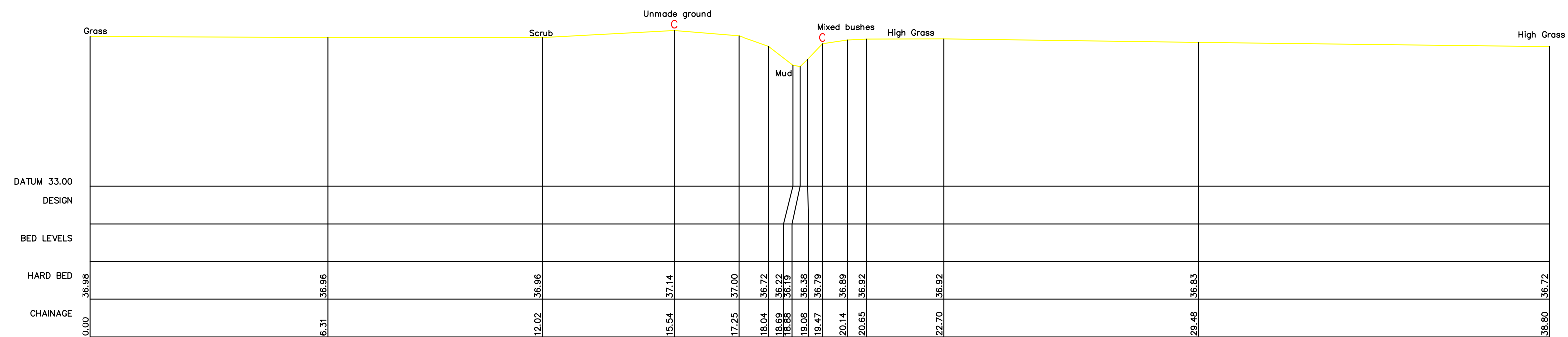


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Date:		Notes:				Name:		Rev:	
18-6-25		XS R1-8 culvert length corrected				CC		A	
Drawn:		Checked:		Scale:		Date:			
MS/MH		CC		1:100		06/06/25			
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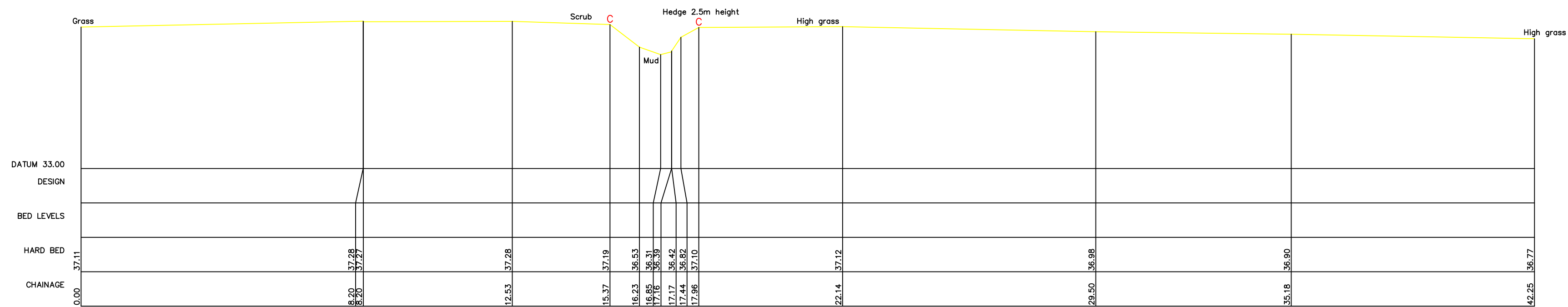
REACH 17



R17 - XS1
445212.24mE 333661.9mN Brg 165
Chainage 8.7
Open Channel



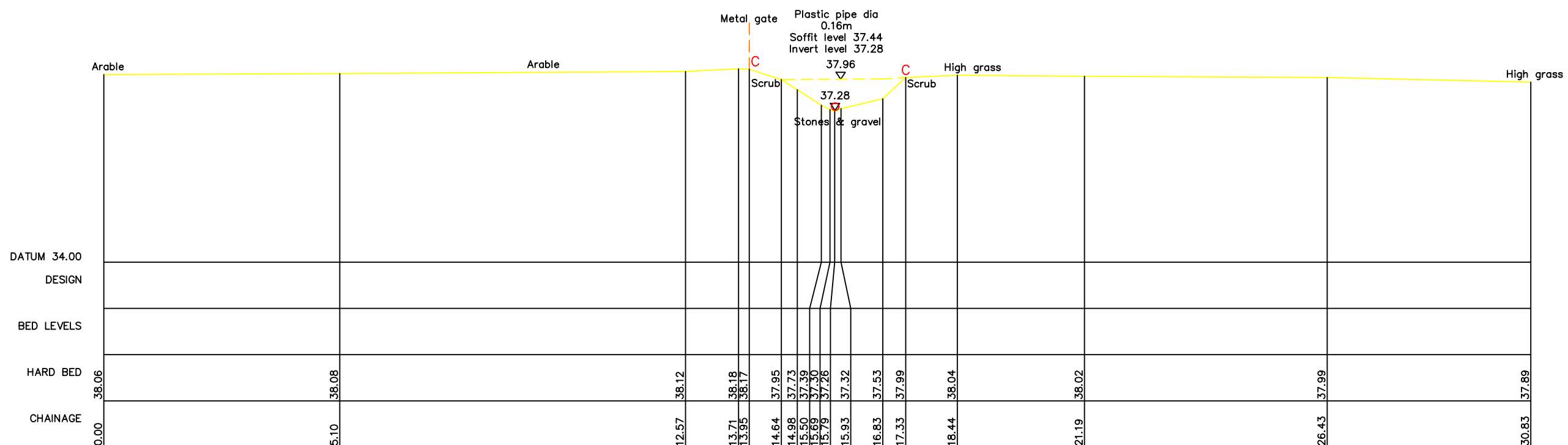
R17 - XS2
445165.74mE 333676.78mN Brg 245
Chainage 98.4
Open Channel



R17 - XS3
445076.79mE 333702.34mN Brg 168
Chainage 180.3
Open Channel



R17 - XS4
445086.03mE 333695.48mN Brg 243
Chainage 189.5
Open Channel



R17 - XS5
445027.85mE 333878.73mN Brg 267
Chainage 395.6
Upstream face of plastic pipe. Pipe length 5.7m.



Notes

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Legend

BAR WALL	AV	WATER TAP	TAP
IRVING	BD	TEMPORARY BENCH MARK	TM
TELEPHONE CABLE BOX	BT	TELEPHONE CABLE BOX	TO
BUS STOP	BS	TELEPHONE POST	TP
BT INSPECTION COVER	BT	THRESHOLD LEVEL	THL
TEX	BTB	TRAFFIC LIGHT	TBL
CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOW
DOWN PIPE	DP	TELEGRAPHY POLE	TP
DOWN PIPE	DP	UNABLE TO LIFT	UTL
DROPPED KERB	DK	VENT PIPE	VP
ELECTRICITY CONTROL BOX	EH	RAIN WELD	WE
EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH	SURVEY STATION	 GS1
FULL WATER	FW		
GULLY	GY		
GATE POST	GP	BUSHES	
GAS VALVE	GV		
INSULATED BLOCK JOINT	IBJ		
INSPECTOR'S COVER	IC	HEDGES	
INVERT LEVEL	IL		
KERBS OUTLET	KO	TREES	
LAMPPOST	LP		
LITTER BIN	LB		
MARKER POST	MP		
MILE POST	MLP		
POST	PO		
RODDING EYE	RE		
HEIGHT RIGHT	RH		
ROAD NAMEPLATE	RN		
ROAD SIGN	RS		
STUMP	ST	SECURITY FENCE	
SOFFIT LEVEL	SL	OVERHEAD CABLES	
SIGNAL POST	SP	FOUL WATER	
SIGNALS AND TELECOMS BOX	STB	LOW POWER LINE	
SIGNALS AND TELECOMS CABLE	STC	STORM WATER	
SIGNALS AND TELECOMS POST	STP	U/L TELEPHONE	
SIGNAL POST	SP	WATER MAIN	
STOP TAP	ST		
STOP VALVE	SV		
STAY	SW		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

Grid: *OS National Grid* **Datum:** *Ordnance Datum Newlyn*
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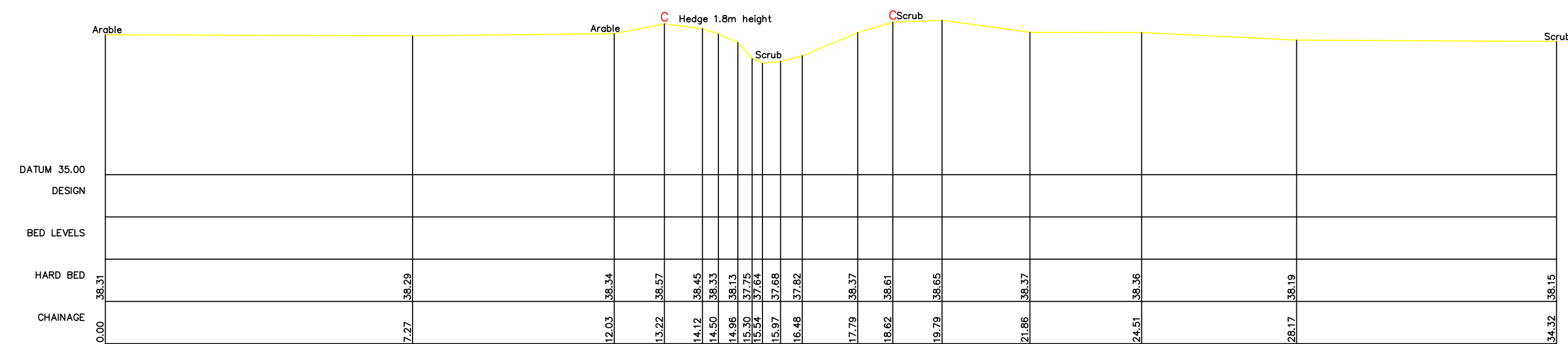


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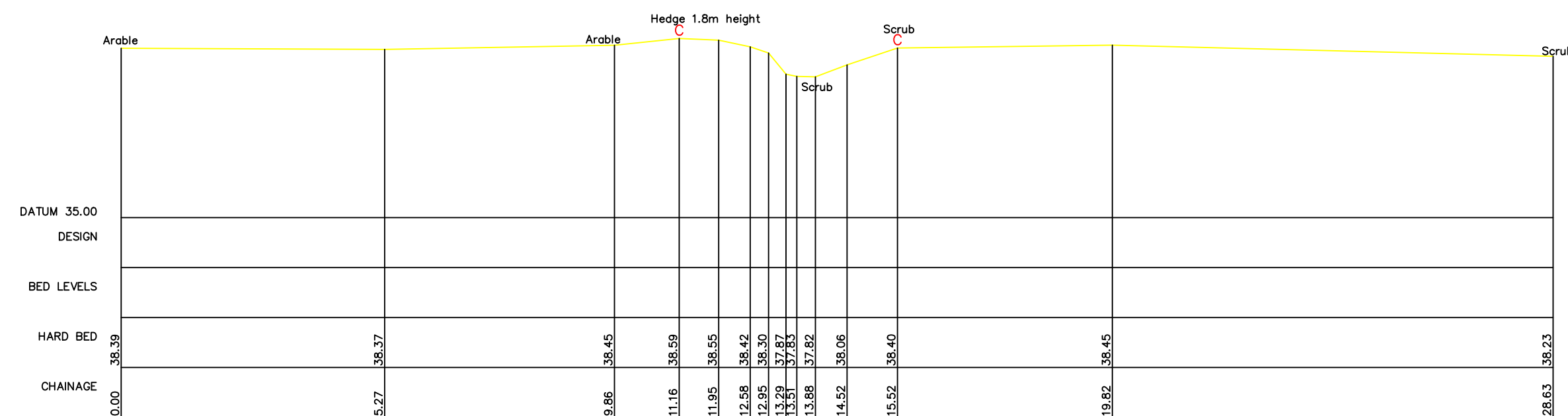
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18-6-25	XS R1-8 culvert length corrected	CC	A

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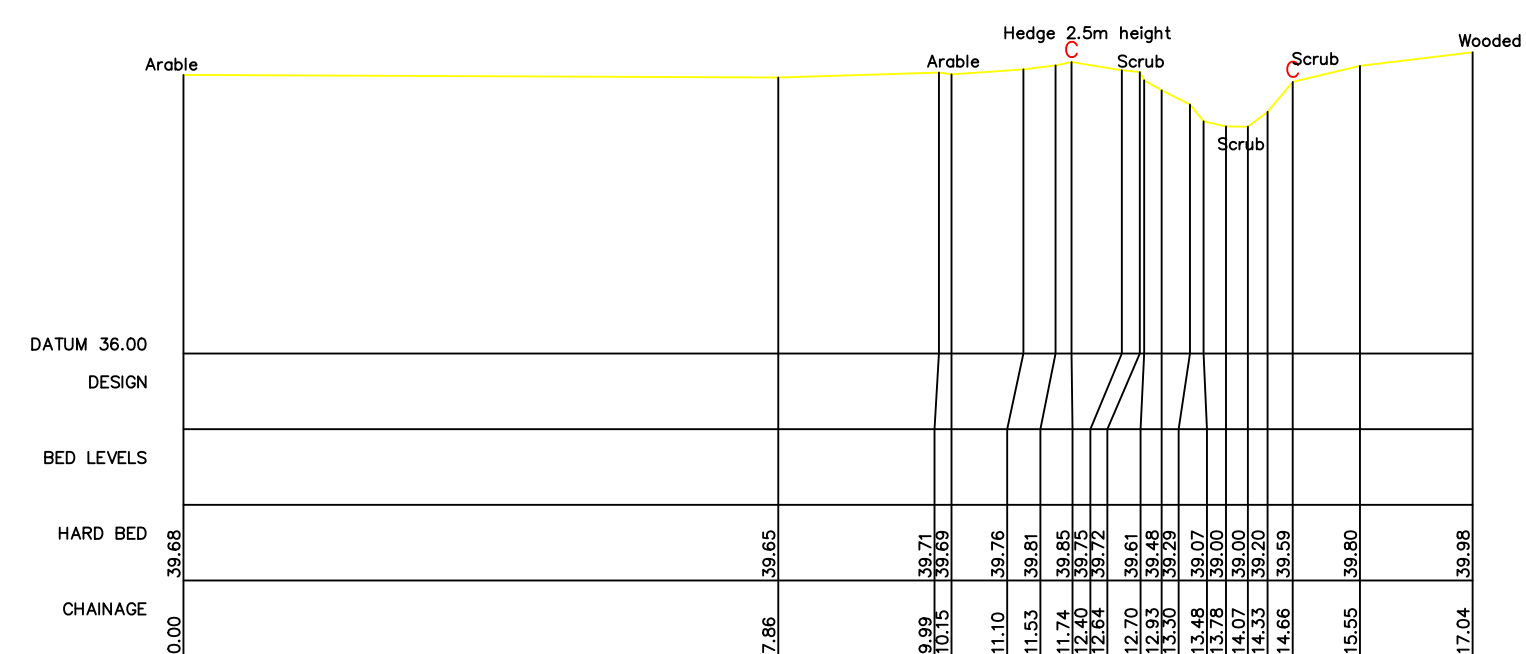
REACH 17



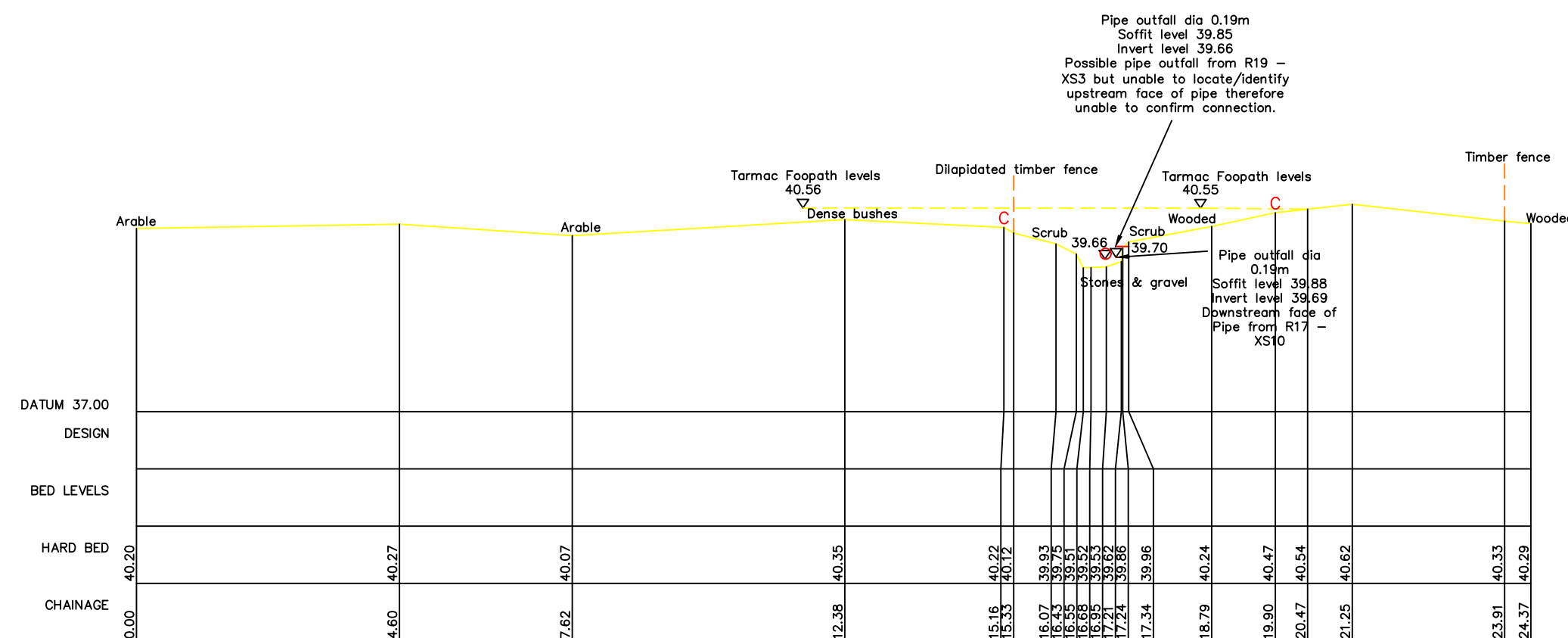
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Chainage 427.8
Open Channel



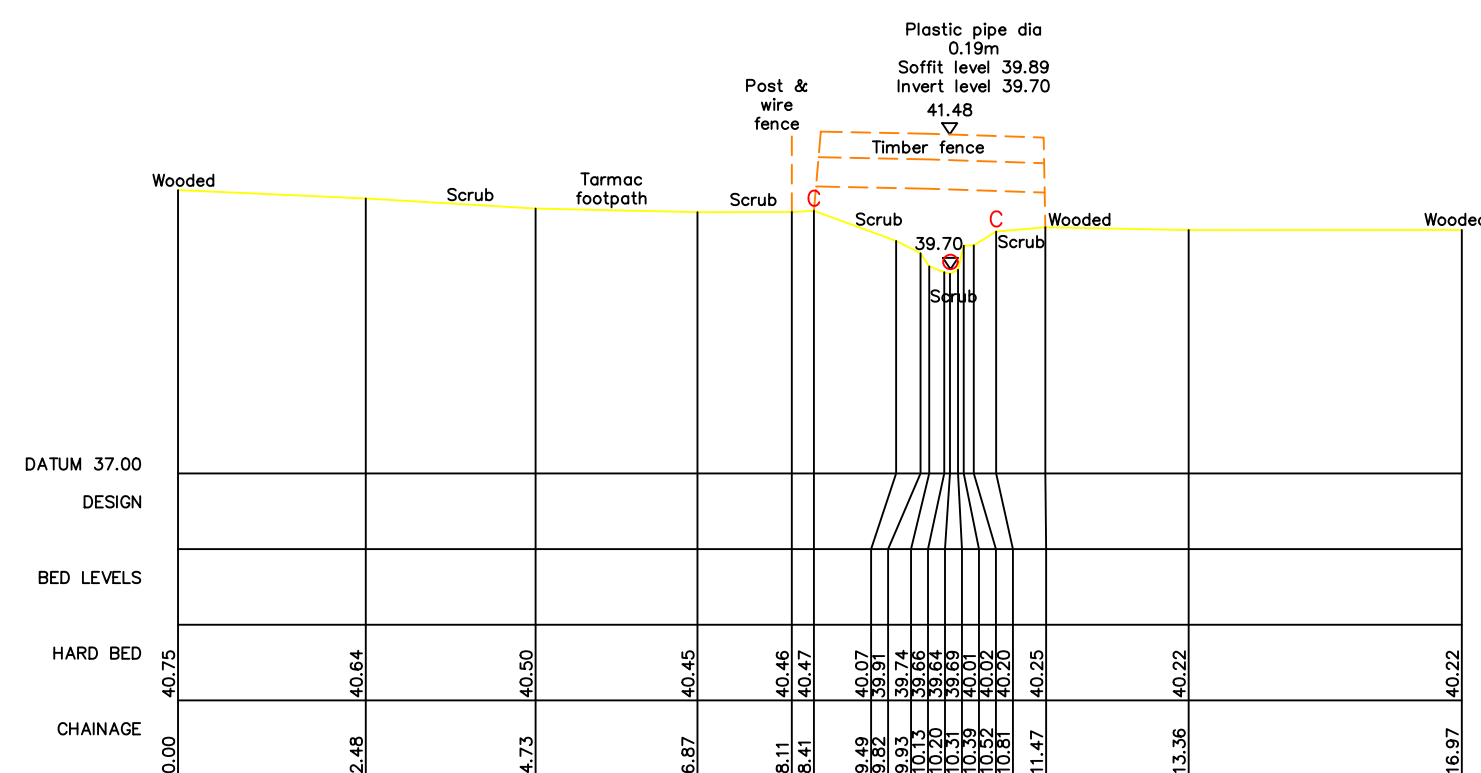
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445023.94mE 333921.29mN Brg 266
Chainage 437.8
Open Channel



R17 - XS8
445019.1mE 333987.46mN Brg 270
Chainage 505.1
Open Channel



R17 - XS9
445021.12mE 334004.15mN Brg 269
Chainage 521.5
Open Channel



R17 - XS10
444996.14mE 334014.42mN Brg 183
Chainage 530.4
Upstream face of plastic pipe. Pipe length 8.5m.



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Legend

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BOLLARD	BD	TEMPORARY BENCH MARK	TBM
BUSH	BS	TELEPHONE CABLE BOX	TCB
BUS STOP	BS	TELEPHONE POST	TEL
BT INSPECTION COVER	BT	THRESHOLD LEVEL	THL
BT BOX	BTB	TRAFFIC LIGHT	TL
CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOW
CANAL	CA	TELEGRAPHY POLE	TP
DOWN PIPE	DP	UNABLE TO LIFT	UTL
DROPPED BUSH	DB	VENT PIPE	VP
ELECTRICITY CONTROL BOX	EK	RAIL WELD	WE
EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH	SURVEY STATION	 GS1
FOUL WATER	FW		
GULLY	GY		
GATE POST	GP	BUSHES	
GAS VALVE	GV		
INSULATED BLOCK JOINT	IBJ		
INSPECTOR COVER	IC		
INVERT LEVEL	IL	HEDGES	
KIRKS OUTLET	KO		
LANDPOST	LP	TREES	
LITTER BIN	LB		
MARKER POST	MP	Height Species (Spread to scale)	
POST	PO		
RODDING EYE	RE		
EDGE HEIGHT	RH		
ROAD NAME PLATE	RNP		
ROAD SIGN	RS	GATE	
STUMP	SP	SECURITY FENCE	
SOFFIT LEVEL	SL	OVERHEAD CABLES	
SIGNAL POST	SP	FOUL WATER	
MAIL DELIVERER LETTER BOX	MLB	SW-MAN	
SIGNALS AND TELECOMS BOX	STB	LOW POWER LINE	
SIGNALS AND TELECOMS CAB	STC	STORM WATER	
SIGNALS AND TELECOMS CAB	STC	WATER MAIN	
SIGN POST	SP		
STOP SIGN	SS		
STOP VALVE	SV		
STAY	ST		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

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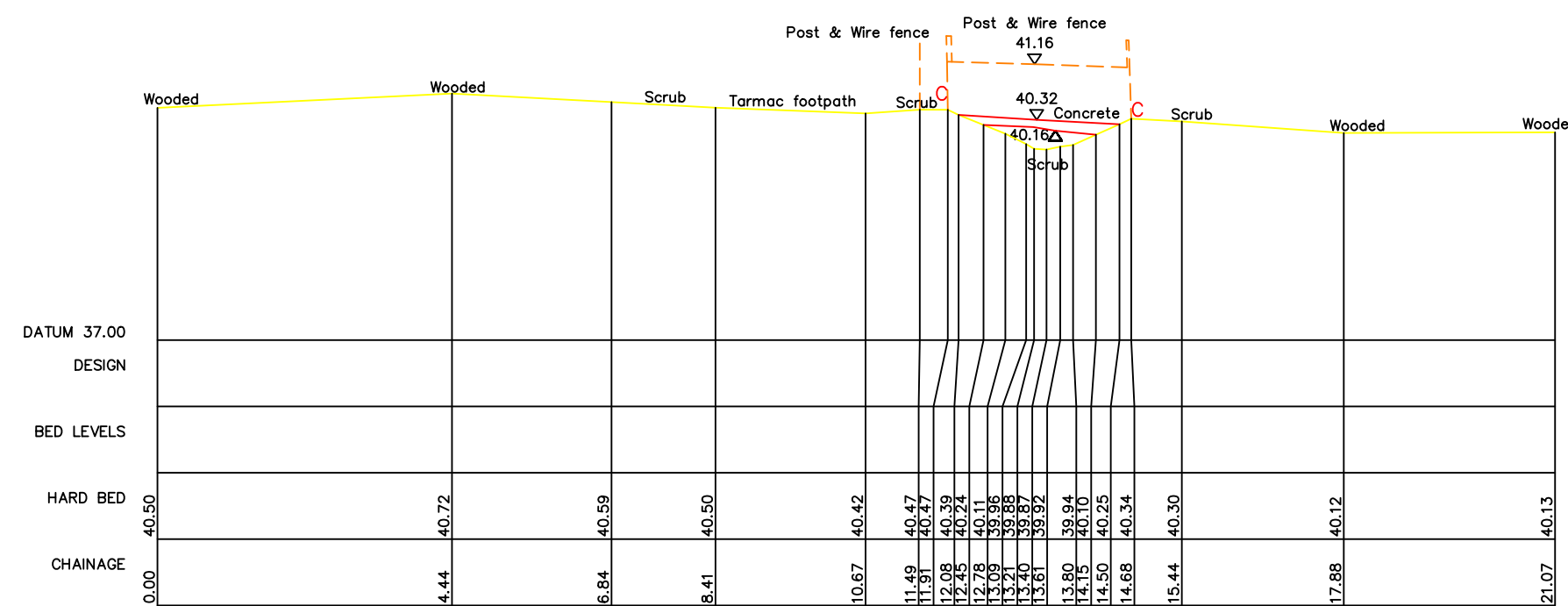


Drawing No:	GCS/JBA/2437/1	Rev:	A
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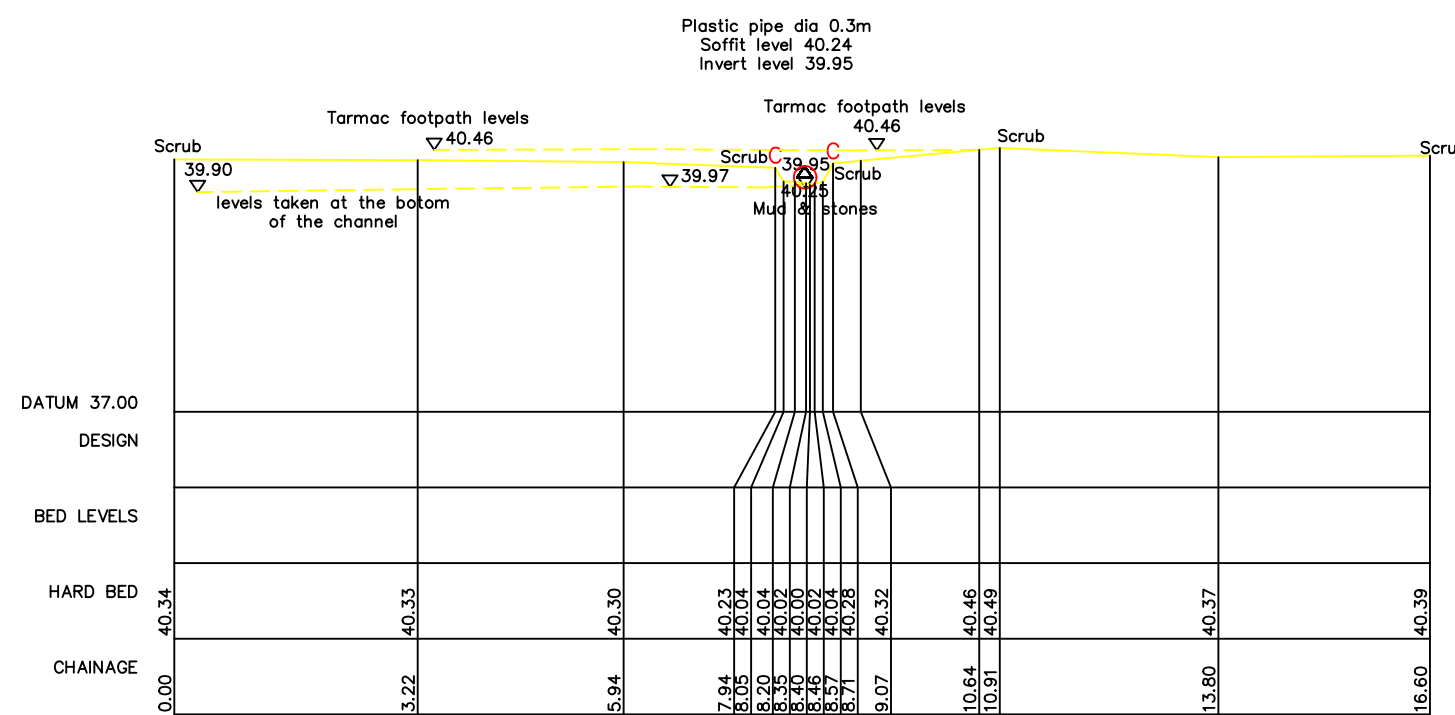
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18-6-25	XS R1-8 culvert length corrected	CC	A

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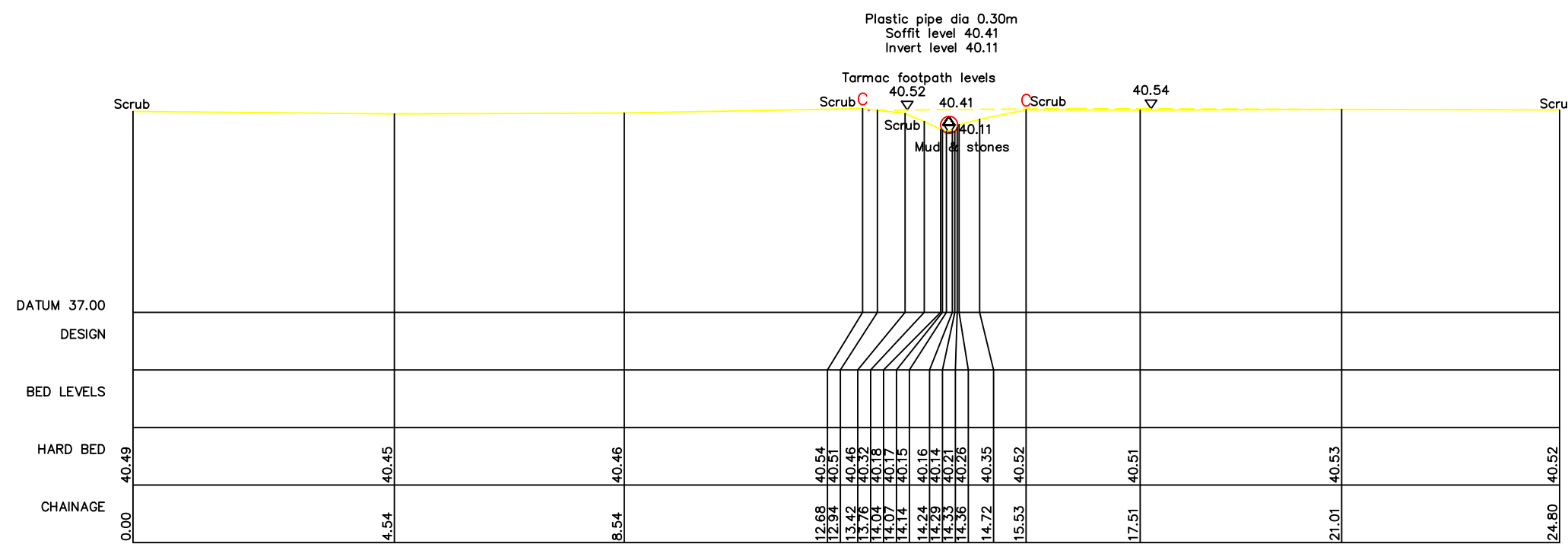
REACH 17



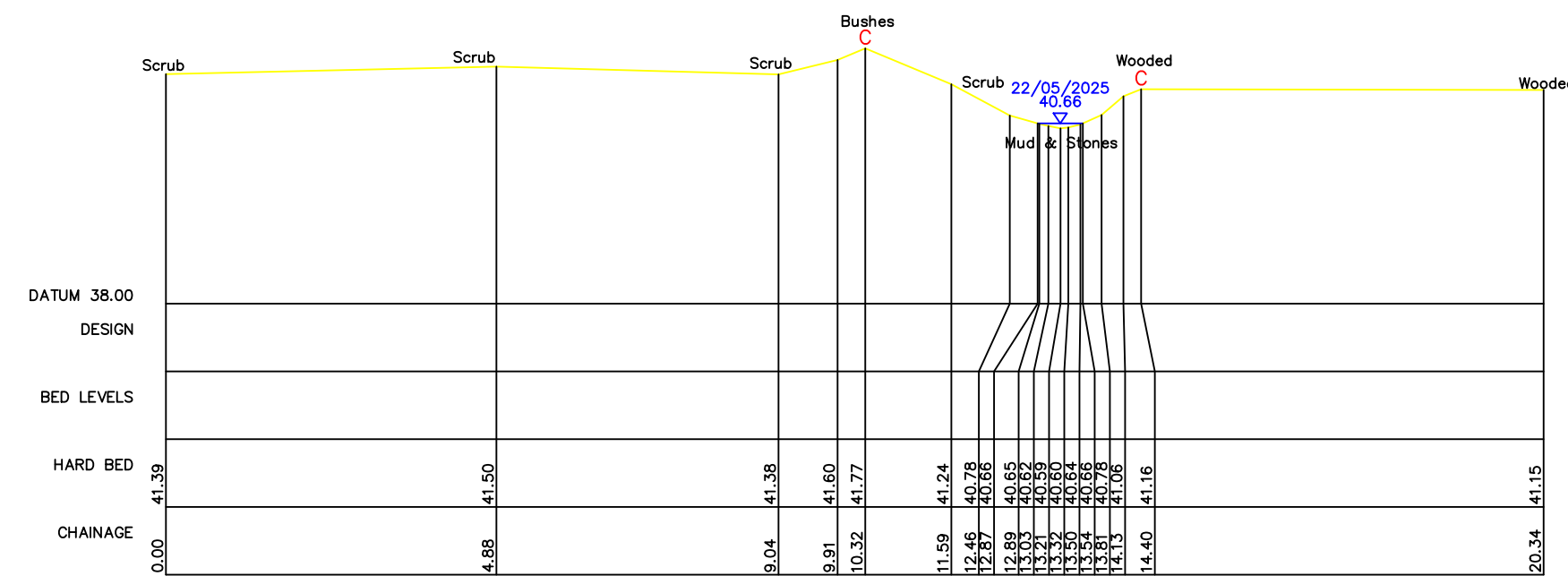
R17 - XS11
444994.48mE 334017.69mN Brg 194
Chainage 534.7
Upstream face of Timber footbridge. Footbridge length 1m.



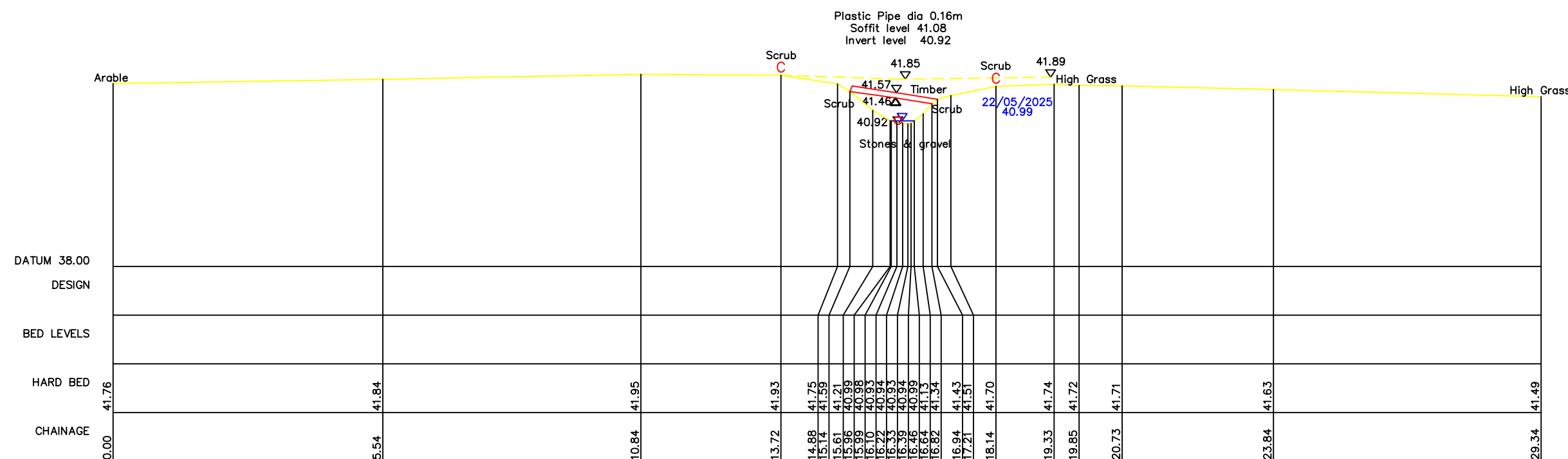
R17 - XS12
444979.07mE 334010.13mN Brg 254
Chainage 555.7
Downstream face of plastic pipe. Pipe length 4.6m.



R17 - XS13
444983.75mE 334015.71mN Brg 256
Chainage 560.3
Upstream face of plastic pipe.Pipe length 4.6m.



R17 - XS14
444978.78mE 334030.01mN Brg 256
Chainage 575.3
Open Channel



R17 - XS15
444979.02mE 334042.34mN Brg 261
Chainage 588.7
Upstream face of plastic pipe. Pipe length 4.4m.



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BOLLARD	BD	TEMPORARY BENCH MARK	TBM
BUSH	BS	TELEPHONE CABLE BOX	TCB
BUS STOP	BS	TELEPHONE POST	TEL
BT INSPECTION COVER	BT	THRESHOLD LEVEL	THL
BT BOX	BTB	TRAFFIC LIGHT	TL
CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOW
CANAL	CA	TELEGRAPHY POLE	TP
DOWN PIPE	DP	UNABLE TO LIFT	UTL
DROPPED BUSH	DB	VENT PIPE	VP
ELECTRICITY CONTROL BOX	EK	RAIL WELD	WE
EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH	SURVEY STATION	 GS1
FOUL WATER	FW		
GULLY	GY		
GATE POST	GP	BUSHES	
GAS VALVE	GV		
INSULATED BLOCK JOINT	IBJ		
INSPECTOR COVER	IC		
INVERT LEVEL	IL	HEDGES	
KIRKS OUTLET	KO		
LANDPOST	LP	TREES	
LITTER BIN	LB		
MARKER POST	MP	Height Species (Spread to scale)	
POST	PO		
RODDING EYE	RE		
EDGE HEIGHT	RH		
ROAD NAME PLATE	RNP		
ROAD SIGN	RS		
STUMP	SP	SECURITY FENCE	
SOFFIT LEVEL	SL	OVERHEAD CABLES	
SIGNAL POST	SP	FOUL WATER	
MAIL DELIVERER LETTER BOX	MLB	SW-MAN	
SIGNALS AND TELECOMS BOX	STB	LOW POWER LINE	
SIGNALS AND TELECOMS CAB	STC	STORM WATER	
SIGNALS AND TELECOMS CAB	STC	WATER MAIN	
SIGN POST	SP		
STOP SIGN	SS		
STOP VALVE	SV		
STAY	ST		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

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2 Arden Court, Arden Road, Alcester
Warwickshire, B49 6HN

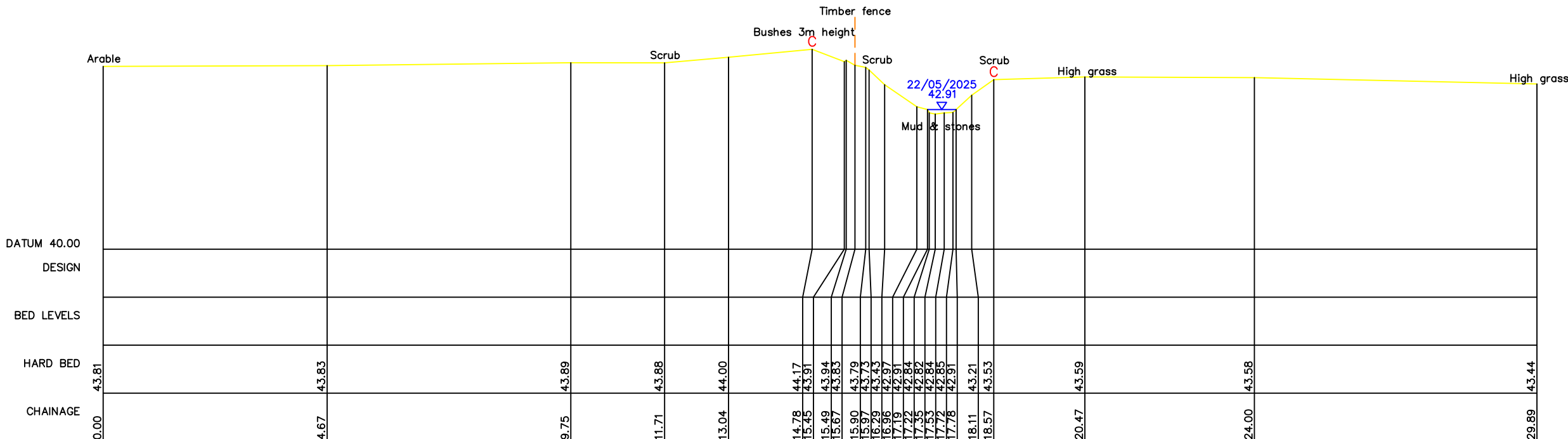


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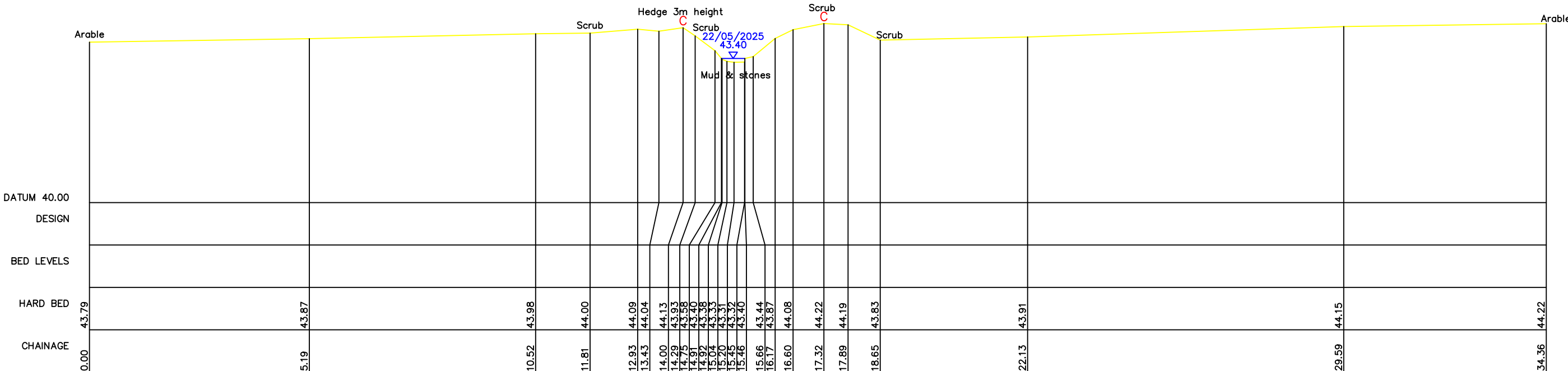


Drawing No:		GCS/JBA/2437/1		Rev: A	
Date:	Notes:			Name:	Rev:
18-6-25	XS R1-R culvert length corrected			CC	A
Drawn:	Checked:	Scale:	Date:		
MS/MH	CC	1:100	06/06/25		
File Name:		Sheet size:	Sheet:		
GCS-JBA-2437-1A		A1	25 of 35		

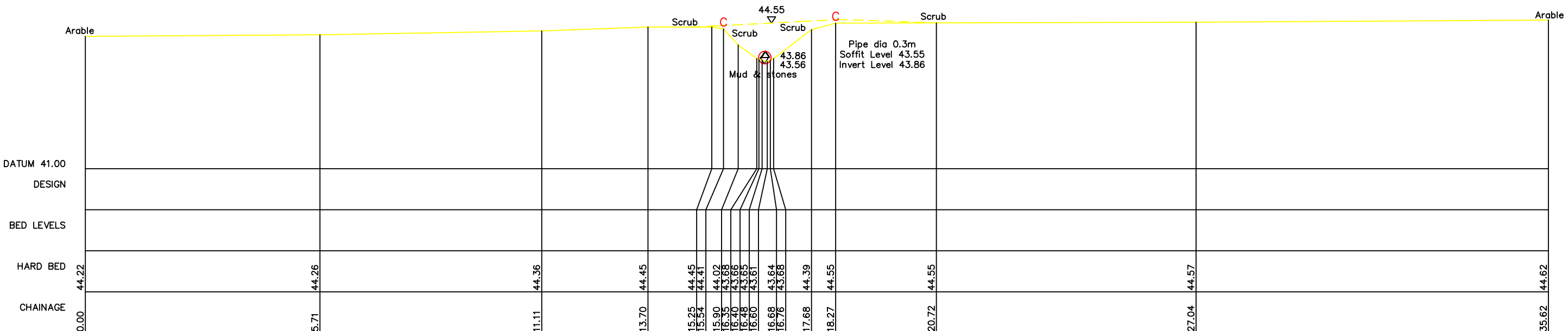
REACH 17



R17 - XS16
444962.18mE 334143.46mN Brg 257
Chainage 689.9
Open Channel



R17 - XS17
444959.26mE 334132.41mN Brg 331
Chainage 700.4
Open Channel



R17 - XS18
445038.33mE 334162.4mN Brg 333
Chainage 785.5
Upstream face of Plastic pipe. Pipe length 6m.



Notes

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Below ground drainage information has been visually inspected from the surface and should therefore be treated as approximate only.

Where this survey has been carried out for the purpose of enabling trackside drainage design. The position of any running rail has been surveyed in line with a general topographic survey and should not be used for the purpose of track design.

All dimensions to be checked on site prior to design and construction.

Legend

BAR WALL	AV	WATER TAP	TAP
IRVINE	BD	TEMPORARY BENCH MARK	TM
TELEPHONE CABLE BOX	BT	TELEPHONE CABLE BOX	TO
BUS STOP	BS	TELEPHONE POST	TP
BT INSPECTION COVER	BT	THRESHOLD LEVEL	THL
TEX	BTB	TRAFFIC LIGHT	TL
CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOW
DOWN PIPE	CP	TELEGRAPHY POLE	TP
DROWN PIPE	CP	UNABLE TO LIFT	UTL
DROPPED KERB	DK	VENT PIPE	VP
ELECTRICITY CONTROL BOX	EH	RAIN WELDED	WE
EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH	SURVEY STATION	
FOUL WATER	FW		
GULLY	GY		
GATE POST	GP	BUSHES	
GAS VALVE	GV		
INSULATED BLOCK JOINT	IBJ		
INSPECTOR'S COVER	IC	HEDGES	
INVERT LEVEL	IL		
KERBS OUTLET	KO	TREES	
LAMPPOST	LP		
LITTER BIN	LB		
MARKER POST	MP		
MILE POST	MLP		
POST	PO		
RODDING EYE	RE		
HEIGHT RIGHT	RH		
ROAD NAMEPLATE	RN		
ROAD SIGN	RS		
STUMP	ST	SECURITY FENCE	
SOFFIT LEVEL	SL	OVERHEAD CABLES	
SIGNAL POST	SP	FOUL WATER	
SLAB SLEEPER LEVEL	SSL	DOWN MAN	
SIGNALS AND TELECOMS BOX	STB	UP POWER LINE	
SIGNALS AND TELECOMS CABLE	STC	STORM WATER	
SIGNALS AND TELECOMS POST	STP	U/L TELEPHONE	
SIGN POST	SN	WATER MAIN	
STOP TAP	ST		
STOP VALVE	SV		
STAY	SW		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

Grid: *OS National Grid* **Datum:** *Ordnance Datum Newlyn*
Survey related to Ordnance Survey National Grid (OSGB36) via GPS and the OS Active Network.
A National Grid (OSGB36) coordinate has been established on site via Transformation OSTN15 and Geoid Model OSGM15, a further OS coordinate was used to orientate the survey to Ordnance Grid.
No scale factor has been applied to the survey

Title:

WATERCOURSE SURVEY AT
DRAYCOTT ROAD
(Cross Sections)

Client:

JBA CONSULTING
Suite 1B First Floor
Coleshill House
1 Station Road, Coleshill
Warwickshire B46 1HT



**Grantham Coates
Surveys Ltd**

Land - Engineering - Building Surveyors

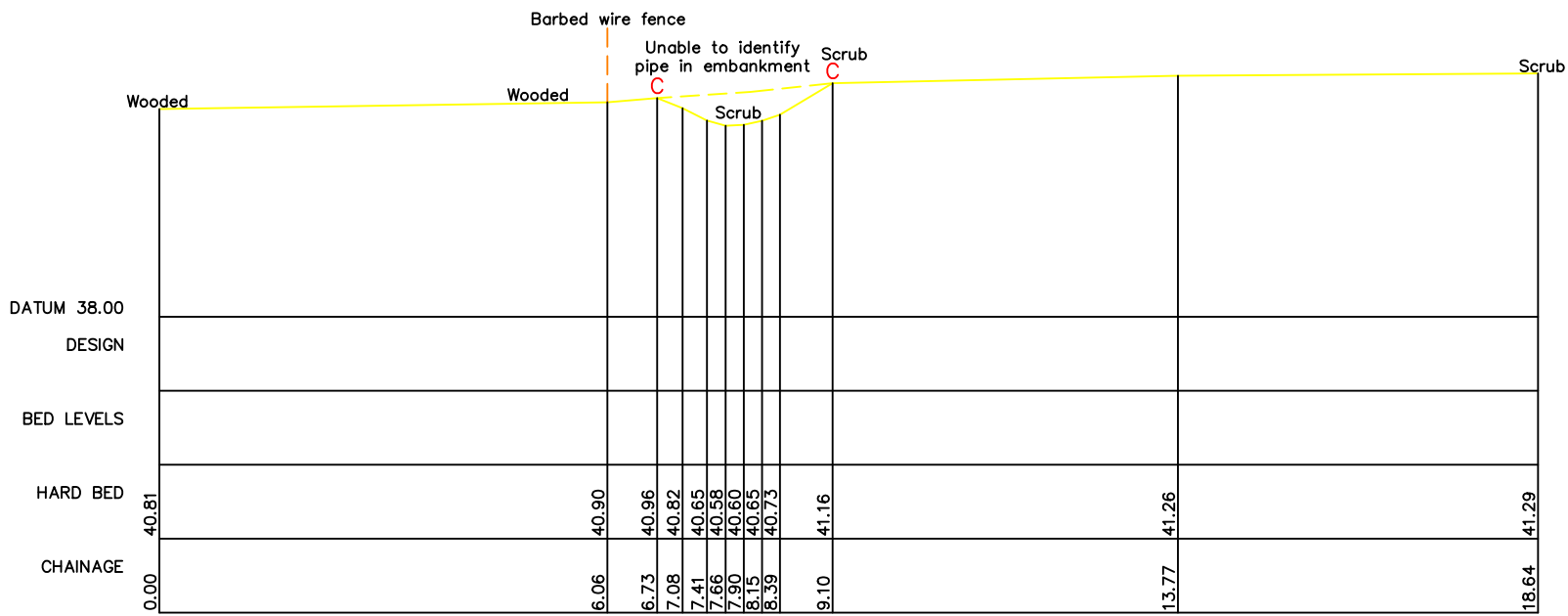
2 Arden Court, Arden Road, Alcester
Warwickshire, B49 6HN

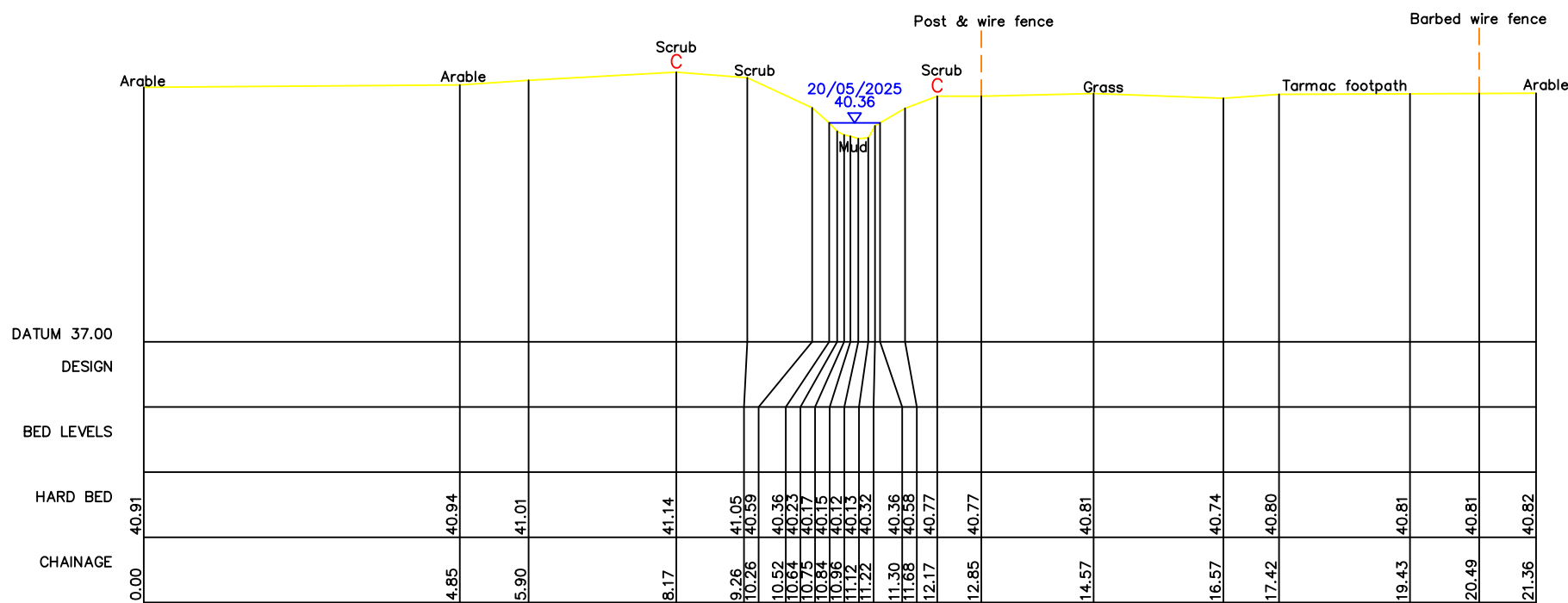


E-Mail: info@gcsurveys.co.uk
Web Site: www.gcsurveys.co.uk

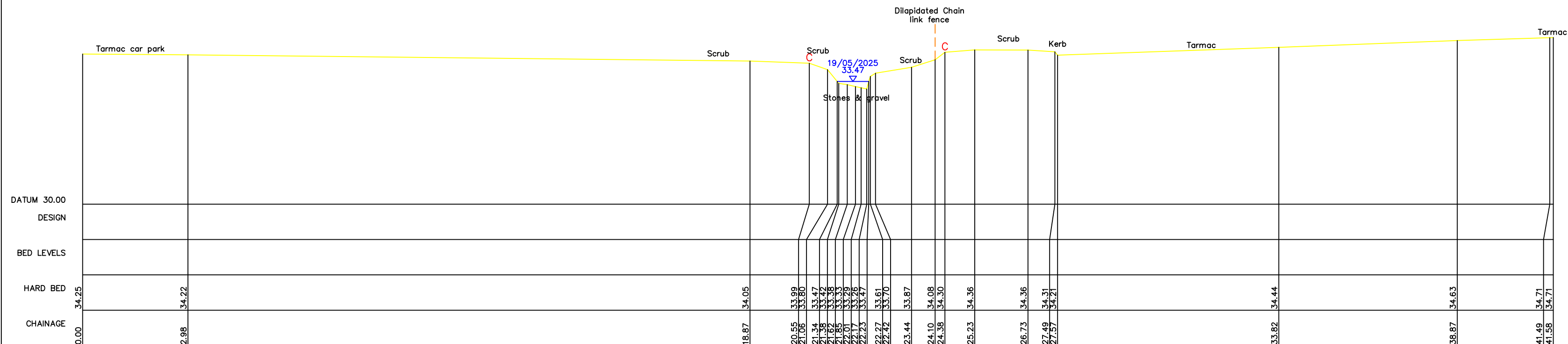


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Date:	Notes:			Name:	Rev:
18-6-25	XS R1-8 culvert length corrected			CC	A
Drawn:	Checked:	Scale:	Date:		
MS/MH	CC	1:100	06/06/25		
File Name:		Sheet size:	Sheet:		
GCS-JBA-2437-1A		A1	26 of 35		

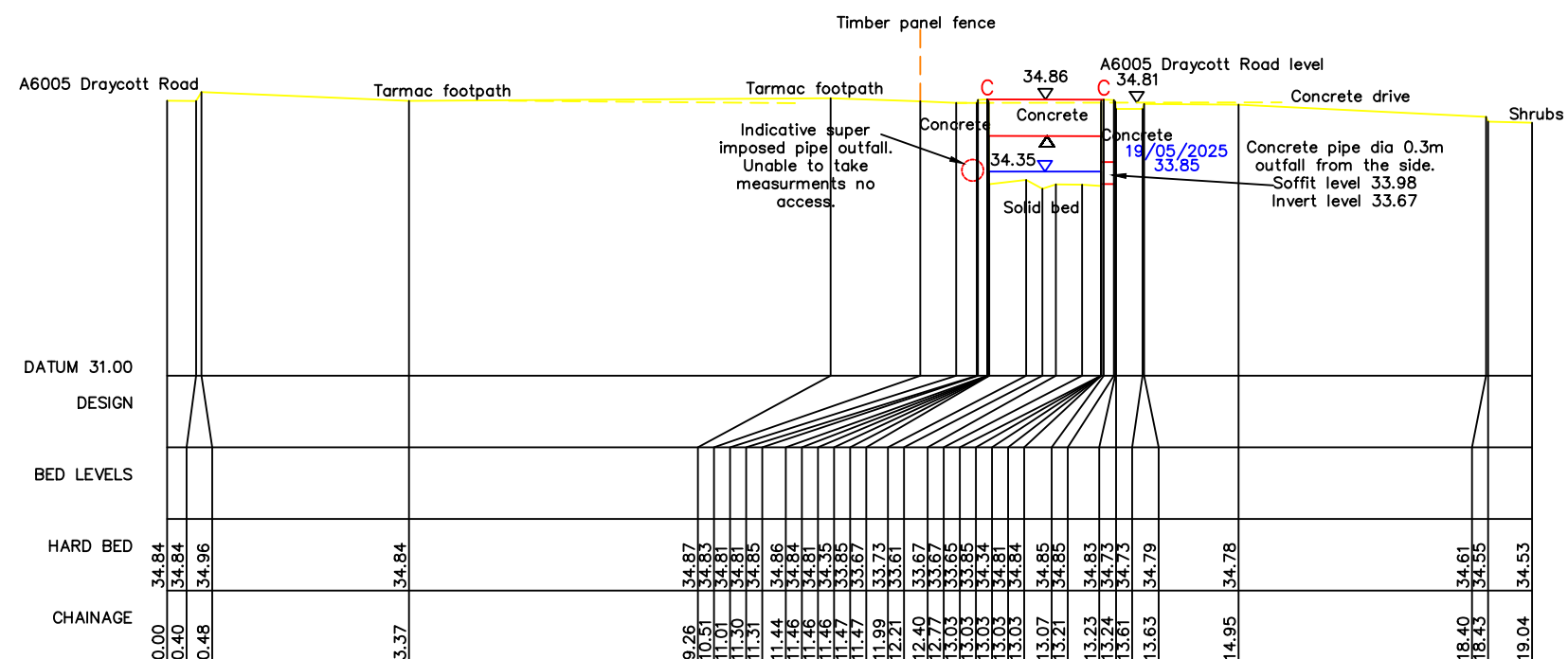




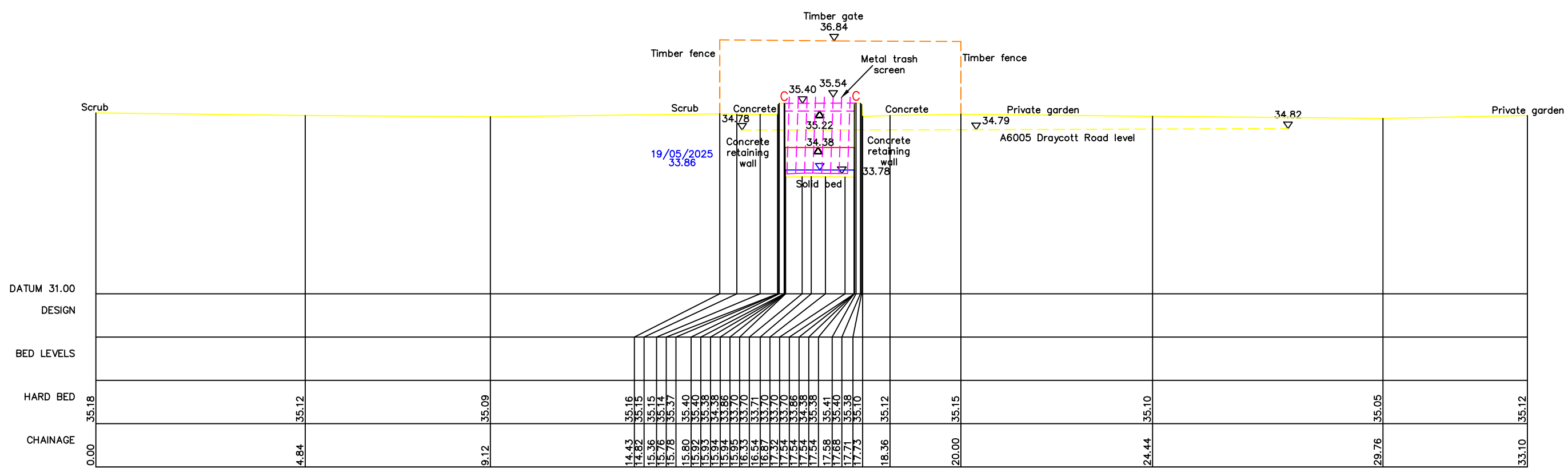
REACH 20



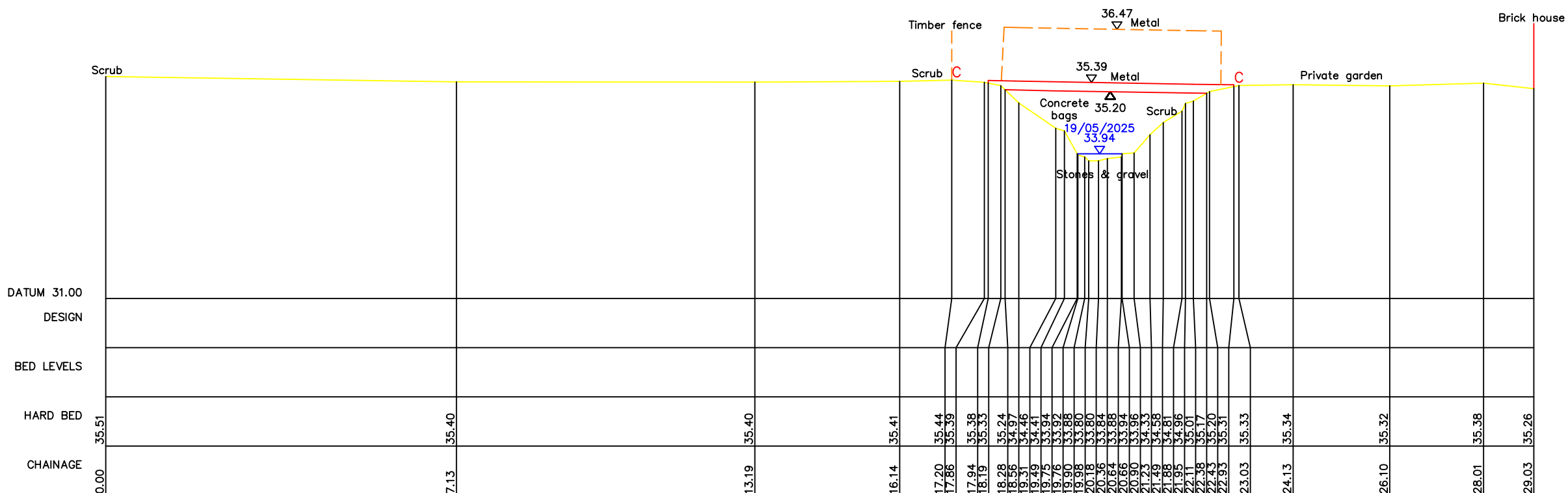
R20 - XS1
445382.3mE 333303.98mN Brg 254
Chainage 304
Open Channel



R20 - XS2
445340.56mE 333393.68mN Brg 244
Chainage 401.5
Downstream face of Concrete culvert. Culvert length 20.5m.



R20 - XS3
445338.08mE 333412.07mN Brg 254
Chainage 422.1
Upstream face of Concrete culvert. Culvert length 20.5m.



R20 - XS4
445337.56mE 333427.72mN Brg 252
Chainage 436.8
Upstream face metal footbridge. Footbridge length. 1.2m



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Legend

AR VALVE	AV	WATER TAP	TAP																																																																																																																																												
BOLLARD	BD	TEMPORARY BENCH MARK	TBM																																																																																																																																												
BH HOLE	BH	TELEPHONE CABLE BOX	TCB																																																																																																																																												
BUS STOP	BS	TELEPHONE POST	TPL																																																																																																																																												
INSPECTION COVER	BTB	THRESHOLD LEVEL	TL																																																																																																																																												
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CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOW																																																																																																																																												
CL	CL	TELEGRAPH POLE	TP																																																																																																																																												
DOWN PIPE	DP	UNABLE TO LIFT	UNL																																																																																																																																												
ENRPIE LENS	EN	NEPT PIPE	NP																																																																																																																																												
ELECTRICITY CONTROL BOX	ECB	RAIN WELD	RW																																																																																																																																												
ELECTRICITY MANHOLE	EM	WASHOUT	WO	ELECTRICITY POLE	EP			EARTH ROD	ER			FINISHED FLOOR LEVEL	FFL			FIRE HYDRANT	FH	SURVEY STATION	GS1	FOUL WATER	FW			GULLY	GY			GATE POST	GP	BUSHES		GAZ VALVE	GV			INSULATED BLOCK JOINT	IBJ			INSPECTION COVER	IC	HEDGES		INVERT LEVEL	IL			KERO OUTLET	KO			LAMPPOST	LP			LITTER BIN	LB	TREES	Height Species (Spread to scale)	MARKER POST	MP			MANHOLE	MH			POST	PO			POSSIBLE EYE	PE			RODING EYE	RE			ROUTE HEIGHT	RH	GATE		ROAD NAMEPLATE	RN			ROAD SIGN	RS			STUMP	ST	SECURITY FENCE	X — X	SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW		
ELECTRICITY POLE	EP			EARTH ROD	ER			FINISHED FLOOR LEVEL	FFL			FIRE HYDRANT	FH	SURVEY STATION	GS1	FOUL WATER	FW			GULLY	GY			GATE POST	GP	BUSHES		GAZ VALVE	GV			INSULATED BLOCK JOINT	IBJ			INSPECTION COVER	IC	HEDGES		INVERT LEVEL	IL			KERO OUTLET	KO			LAMPPOST	LP			LITTER BIN	LB	TREES	Height Species (Spread to scale)	MARKER POST	MP			MANHOLE	MH			POST	PO			POSSIBLE EYE	PE			RODING EYE	RE			ROUTE HEIGHT	RH	GATE		ROAD NAMEPLATE	RN			ROAD SIGN	RS			STUMP	ST	SECURITY FENCE	X — X	SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW						
EARTH ROD	ER			FINISHED FLOOR LEVEL	FFL			FIRE HYDRANT	FH	SURVEY STATION	GS1	FOUL WATER	FW			GULLY	GY			GATE POST	GP	BUSHES		GAZ VALVE	GV			INSULATED BLOCK JOINT	IBJ			INSPECTION COVER	IC	HEDGES		INVERT LEVEL	IL			KERO OUTLET	KO			LAMPPOST	LP			LITTER BIN	LB	TREES	Height Species (Spread to scale)	MARKER POST	MP			MANHOLE	MH			POST	PO			POSSIBLE EYE	PE			RODING EYE	RE			ROUTE HEIGHT	RH	GATE		ROAD NAMEPLATE	RN			ROAD SIGN	RS			STUMP	ST	SECURITY FENCE	X — X	SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW										
FINISHED FLOOR LEVEL	FFL			FIRE HYDRANT	FH	SURVEY STATION	GS1	FOUL WATER	FW			GULLY	GY			GATE POST	GP	BUSHES		GAZ VALVE	GV			INSULATED BLOCK JOINT	IBJ			INSPECTION COVER	IC	HEDGES		INVERT LEVEL	IL			KERO OUTLET	KO			LAMPPOST	LP			LITTER BIN	LB	TREES	Height Species (Spread to scale)	MARKER POST	MP			MANHOLE	MH			POST	PO			POSSIBLE EYE	PE			RODING EYE	RE			ROUTE HEIGHT	RH	GATE		ROAD NAMEPLATE	RN			ROAD SIGN	RS			STUMP	ST	SECURITY FENCE	X — X	SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW														
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FOUL WATER	FW			GULLY	GY			GATE POST	GP	BUSHES		GAZ VALVE	GV			INSULATED BLOCK JOINT	IBJ			INSPECTION COVER	IC	HEDGES		INVERT LEVEL	IL			KERO OUTLET	KO			LAMPPOST	LP			LITTER BIN	LB	TREES	Height Species (Spread to scale)	MARKER POST	MP			MANHOLE	MH			POST	PO			POSSIBLE EYE	PE			RODING EYE	RE			ROUTE HEIGHT	RH	GATE		ROAD NAMEPLATE	RN			ROAD SIGN	RS			STUMP	ST	SECURITY FENCE	X — X	SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW																						
GULLY	GY			GATE POST	GP	BUSHES		GAZ VALVE	GV			INSULATED BLOCK JOINT	IBJ			INSPECTION COVER	IC	HEDGES		INVERT LEVEL	IL			KERO OUTLET	KO			LAMPPOST	LP			LITTER BIN	LB	TREES	Height Species (Spread to scale)	MARKER POST	MP			MANHOLE	MH			POST	PO			POSSIBLE EYE	PE			RODING EYE	RE			ROUTE HEIGHT	RH	GATE		ROAD NAMEPLATE	RN			ROAD SIGN	RS			STUMP	ST	SECURITY FENCE	X — X	SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW																										
GATE POST	GP	BUSHES		GAZ VALVE	GV			INSULATED BLOCK JOINT	IBJ			INSPECTION COVER	IC	HEDGES		INVERT LEVEL	IL			KERO OUTLET	KO			LAMPPOST	LP			LITTER BIN	LB	TREES	Height Species (Spread to scale)	MARKER POST	MP			MANHOLE	MH			POST	PO			POSSIBLE EYE	PE			RODING EYE	RE			ROUTE HEIGHT	RH	GATE		ROAD NAMEPLATE	RN			ROAD SIGN	RS			STUMP	ST	SECURITY FENCE	X — X	SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW																														
GAZ VALVE	GV			INSULATED BLOCK JOINT	IBJ			INSPECTION COVER	IC	HEDGES		INVERT LEVEL	IL			KERO OUTLET	KO			LAMPPOST	LP			LITTER BIN	LB	TREES	Height Species (Spread to scale)	MARKER POST	MP			MANHOLE	MH			POST	PO			POSSIBLE EYE	PE			RODING EYE	RE			ROUTE HEIGHT	RH	GATE		ROAD NAMEPLATE	RN			ROAD SIGN	RS			STUMP	ST	SECURITY FENCE	X — X	SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW																																		
INSULATED BLOCK JOINT	IBJ			INSPECTION COVER	IC	HEDGES		INVERT LEVEL	IL			KERO OUTLET	KO			LAMPPOST	LP			LITTER BIN	LB	TREES	Height Species (Spread to scale)	MARKER POST	MP			MANHOLE	MH			POST	PO			POSSIBLE EYE	PE			RODING EYE	RE			ROUTE HEIGHT	RH	GATE		ROAD NAMEPLATE	RN			ROAD SIGN	RS			STUMP	ST	SECURITY FENCE	X — X	SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW																																						
INSPECTION COVER	IC	HEDGES		INVERT LEVEL	IL			KERO OUTLET	KO			LAMPPOST	LP			LITTER BIN	LB	TREES	Height Species (Spread to scale)	MARKER POST	MP			MANHOLE	MH			POST	PO			POSSIBLE EYE	PE			RODING EYE	RE			ROUTE HEIGHT	RH	GATE		ROAD NAMEPLATE	RN			ROAD SIGN	RS			STUMP	ST	SECURITY FENCE	X — X	SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW																																										
INVERT LEVEL	IL			KERO OUTLET	KO			LAMPPOST	LP			LITTER BIN	LB	TREES	Height Species (Spread to scale)	MARKER POST	MP			MANHOLE	MH			POST	PO			POSSIBLE EYE	PE			RODING EYE	RE			ROUTE HEIGHT	RH	GATE		ROAD NAMEPLATE	RN			ROAD SIGN	RS			STUMP	ST	SECURITY FENCE	X — X	SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW																																														
KERO OUTLET	KO			LAMPPOST	LP			LITTER BIN	LB	TREES	Height Species (Spread to scale)	MARKER POST	MP			MANHOLE	MH			POST	PO			POSSIBLE EYE	PE			RODING EYE	RE			ROUTE HEIGHT	RH	GATE		ROAD NAMEPLATE	RN			ROAD SIGN	RS			STUMP	ST	SECURITY FENCE	X — X	SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW																																																		
LAMPPOST	LP			LITTER BIN	LB	TREES	Height Species (Spread to scale)	MARKER POST	MP			MANHOLE	MH			POST	PO			POSSIBLE EYE	PE			RODING EYE	RE			ROUTE HEIGHT	RH	GATE		ROAD NAMEPLATE	RN			ROAD SIGN	RS			STUMP	ST	SECURITY FENCE	X — X	SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW																																																						
LITTER BIN	LB	TREES	Height Species (Spread to scale)	MARKER POST	MP			MANHOLE	MH			POST	PO			POSSIBLE EYE	PE			RODING EYE	RE			ROUTE HEIGHT	RH	GATE		ROAD NAMEPLATE	RN			ROAD SIGN	RS			STUMP	ST	SECURITY FENCE	X — X	SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW																																																										
MARKER POST	MP			MANHOLE	MH			POST	PO			POSSIBLE EYE	PE			RODING EYE	RE			ROUTE HEIGHT	RH	GATE		ROAD NAMEPLATE	RN			ROAD SIGN	RS			STUMP	ST	SECURITY FENCE	X — X	SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW																																																														
MANHOLE	MH			POST	PO			POSSIBLE EYE	PE			RODING EYE	RE			ROUTE HEIGHT	RH	GATE		ROAD NAMEPLATE	RN			ROAD SIGN	RS			STUMP	ST	SECURITY FENCE	X — X	SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW																																																																		
POST	PO			POSSIBLE EYE	PE			RODING EYE	RE			ROUTE HEIGHT	RH	GATE		ROAD NAMEPLATE	RN			ROAD SIGN	RS			STUMP	ST	SECURITY FENCE	X — X	SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW																																																																						
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SOFFIT LEVEL	SL	FENCE	— — —	SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW																																																																																																		
SIGNAL POST	SP	OVERHEAD CABLES	OH — OH	SIGNAL	SG	FOUL WATER	FW — FW	SIGNALS AND TELECOMS BOX	STB	GAS MAIN	GM — GM	SIGNALS AND TELECOMS BOX	STB	UG POWER LINE	PL — PL	SIGNALS AND TELECOMS BOX	STB	UG WATER MAIN	WM — WM	SIGNALS AND TELECOMS BOX	STB	UG TELEPHONE	TL — TL	SIGN POST	SP	WATER MAIN	WM — WM	STOP TAP	ST			STOP VALVE	SV			STW	STW			STORM WATER	SW																																																																																																						
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Control Table

Station	Description	Eastings	Northings	Height

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Web Site: www.gcsurveys.co.uk

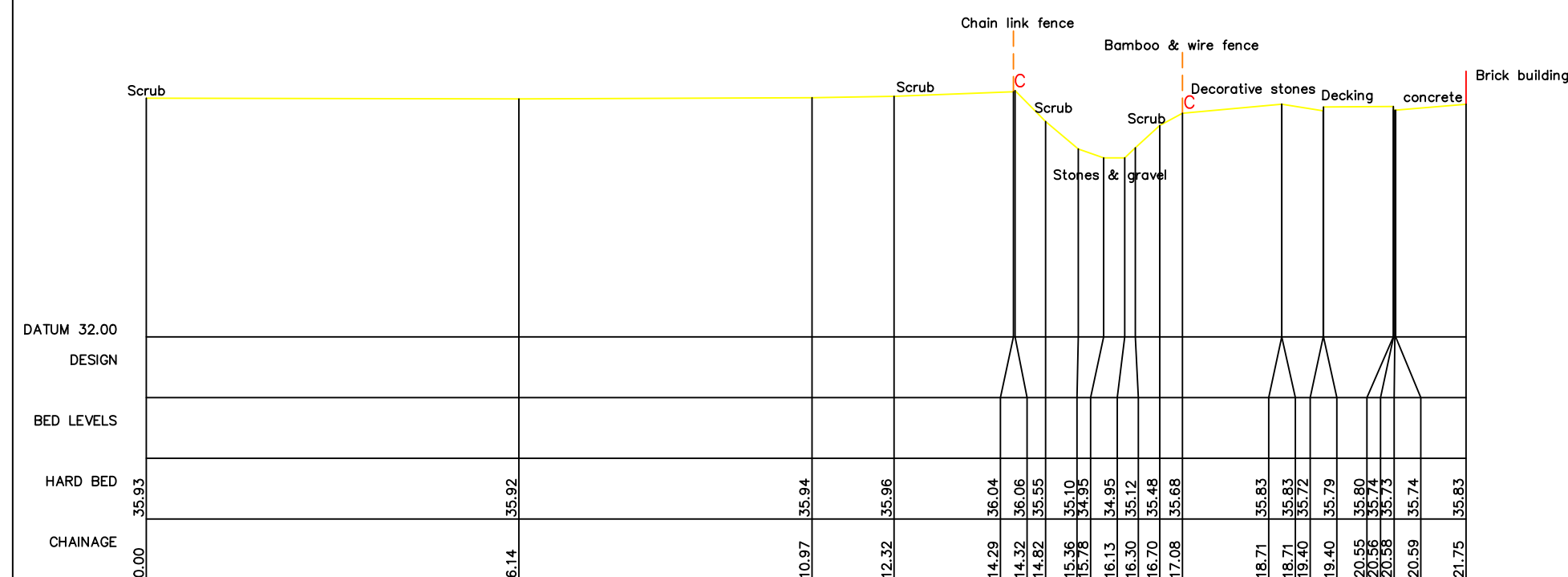


Drawing No: GCS/JBA/2437/1	Rev: A
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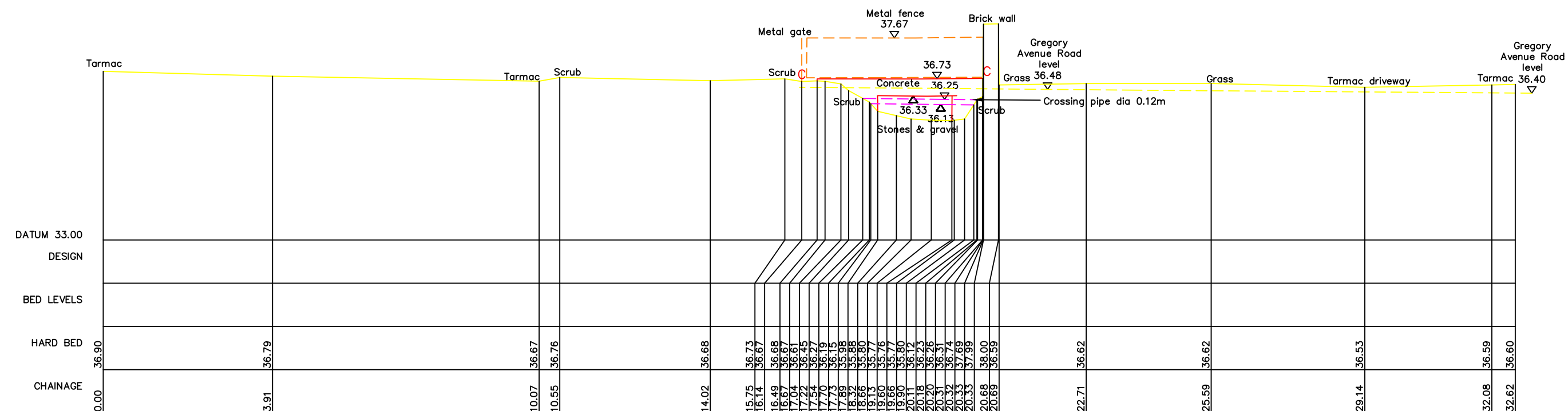
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18-6-25	XS R1-8 culvert length corrected	CC	A

Drawn: MS/MH	Checked: CC	Scale: 1:100	Date: 06/06/25
File Name: GCS-JBA-2437-1A		Sheet size: A1	Sheet: 30 of 35

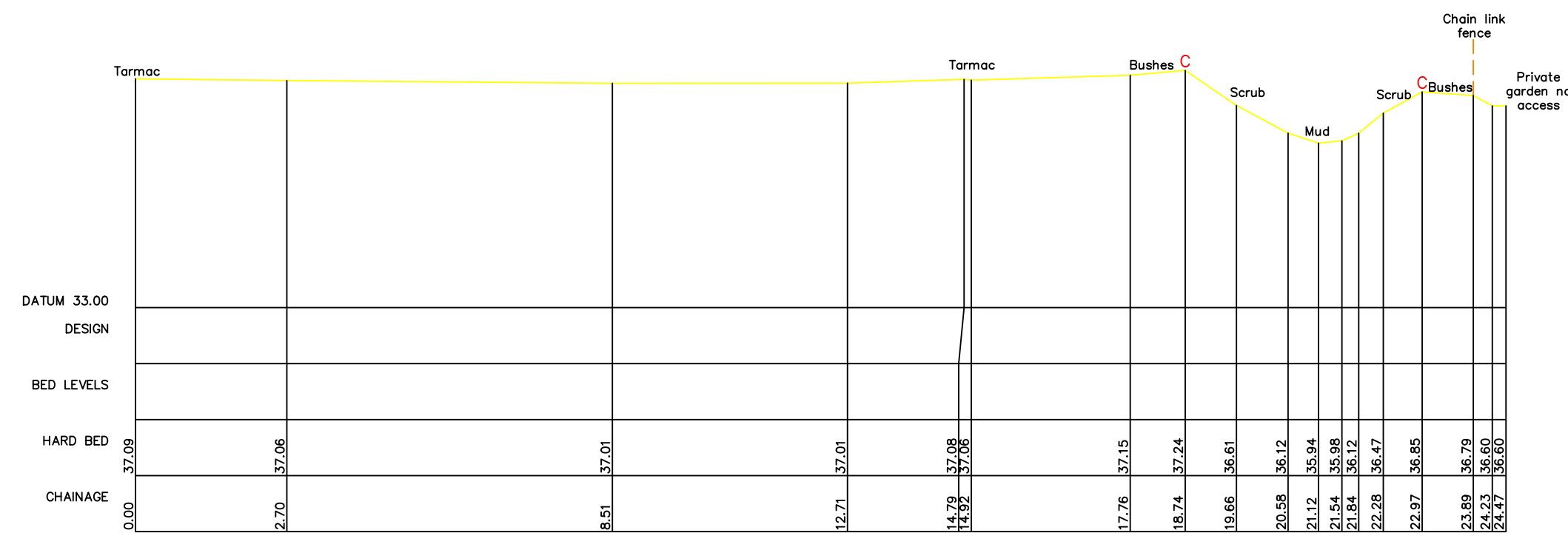
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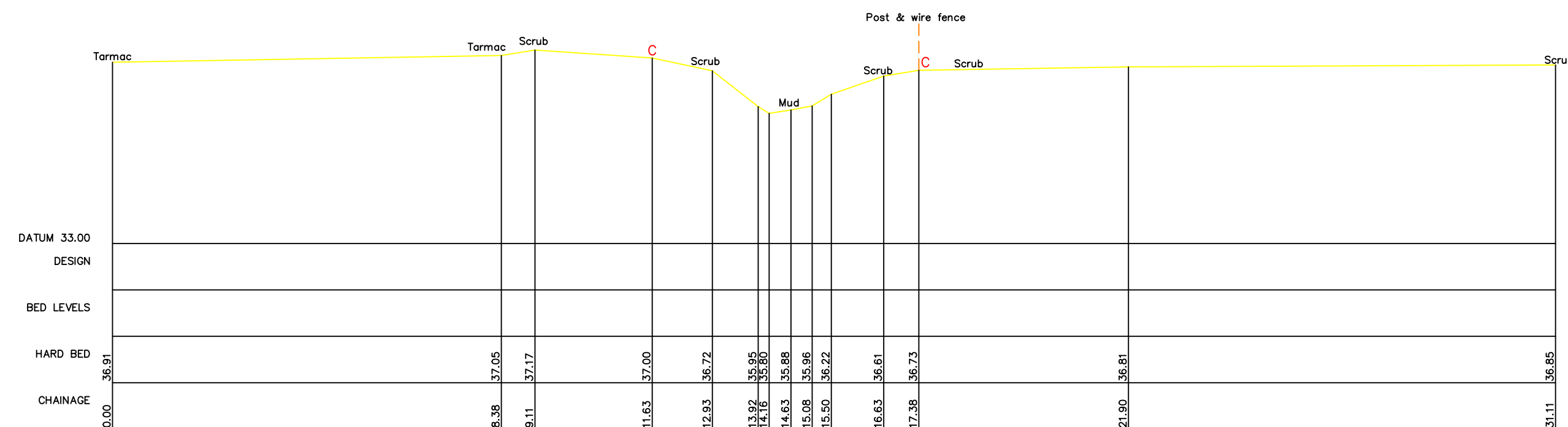
R20 - XS5
445290.24mE 333520.61mN Brg 244
Chainage 539.8
Open Channel



R20 - XS6
445258.38mE 333611.9mN Brg 261
Chainage 641.8
Upstream face of Concrete culvert. Culvert length 8m.



R20 - XS7
445247.29mE 333646.96mN Brg 250
Chainage 675
Open Channel



R20 - XS8
445235.6mE 333635.24mN Brg 348
Chainage 692
Open Channel



Notes

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Legend

BAR VALVE	AV	WATER TAP	TAP
BOLLARD	BD	TEMPORARY BENCH MARK	TBM
BURIED	BU	TELEPHONE CABLE BOX	TCB
BUS STOP	BS	TELEPHONE POST	TEL
BT INSPECTION COVER	BTB	THRESHOLD LEVEL	THL
BT	BT	TRAFFIC LIGHT	TL
CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOW
CAN	CA	TELEGRAPHY POLE	TP
DOWN PIPE	DP	UNABLE TO LIFT	UTL
DROPPED BUSH	DB	VENT PIPE	VP
ELECTRICITY CONTROL BOX	EK	RAIL WELD	WE
EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH	SURVEY STATION	 GS1
FOUL WATER	FW		
GULLY	GY		
GATE POST	GP	BUSHES	
GAS VALVE	GV		
INSULATED BLOCK JOINT	IBJ		
INSPECTOR COVER	IC		
INVERT LEVEL	IL	HEDGES	
KIRKS OUTLET	KO		
LANDPOST	LP	TREES	
LITTER BIN	LB		
MARKER POST	MP	Height Species (Spread to scale)	
POST	PO		
RODDING EYE	RE		
EDGE HEIGHT	RH		
ROAD NAME PLATE	RNP		
ROAD SIGN	RS	GATE	
STUMP	SP	SECURITY FENCE	
SOFFIT LEVEL	SL	OVERHEAD CABLES	
SIGNAL POST	SPG	FOUL WATER	
MAIL DELIVERER-POST	MDP	SW-MAN	
SIGNALS AND TELECOMS BOX	STB	LOW POWER LINE	
SIGNALS AND TELECOMS CAB	STC	STORM WATER	
SIGNALS AND TELECOMS CAB	STC	WATER MAIN	
SIGN POST	SP		
STOP SIGN	SS		
STOP VALVE	SV		
STAY	ST		
STORM WATER	SW		

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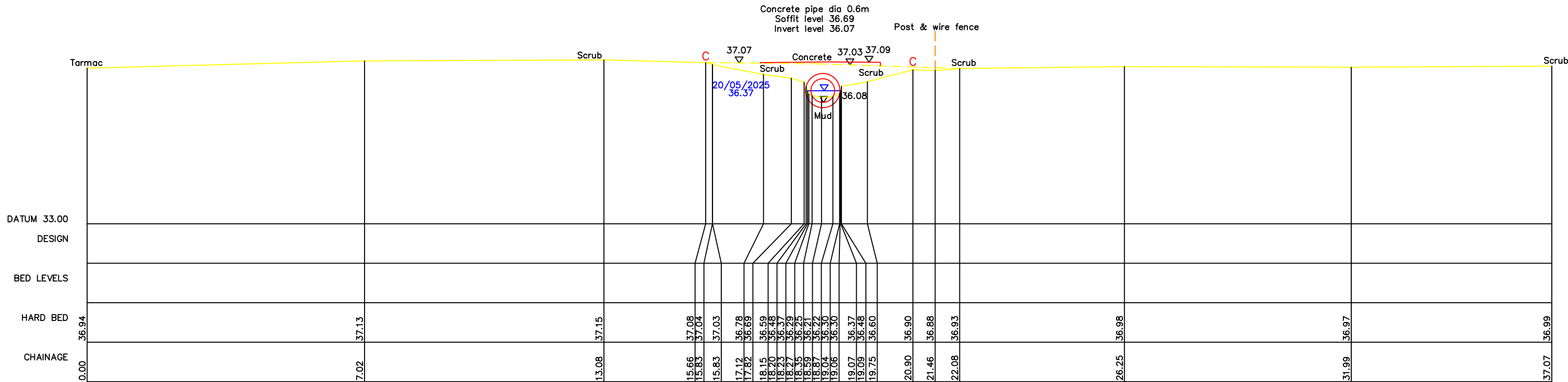


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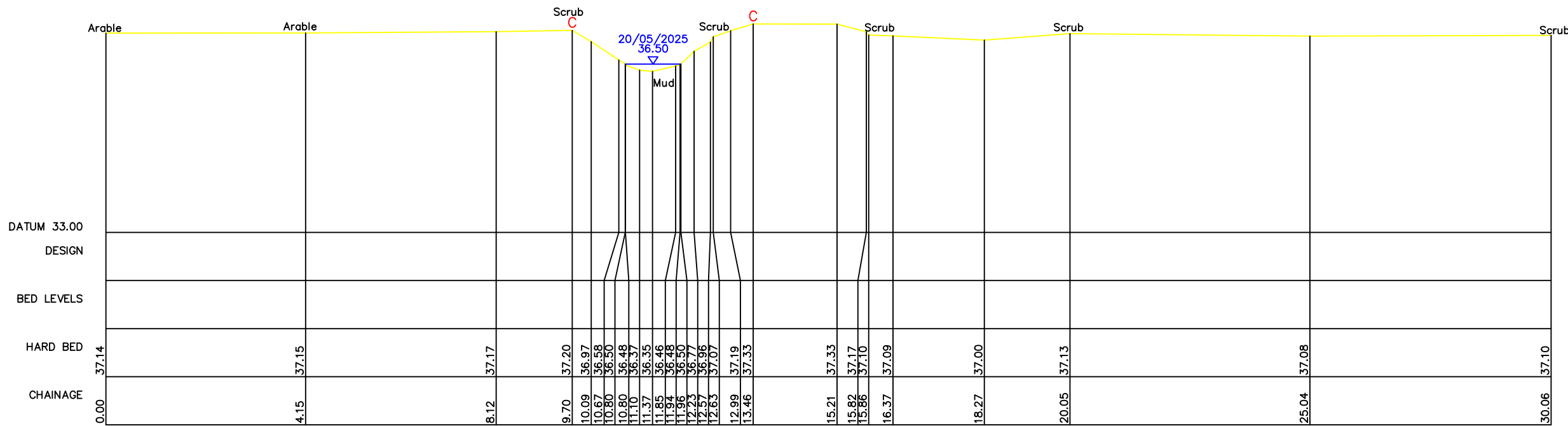


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File Name:		Sheet size:	Sheet:		
GCS-JBA-2437-1A		A1	31 of 35		

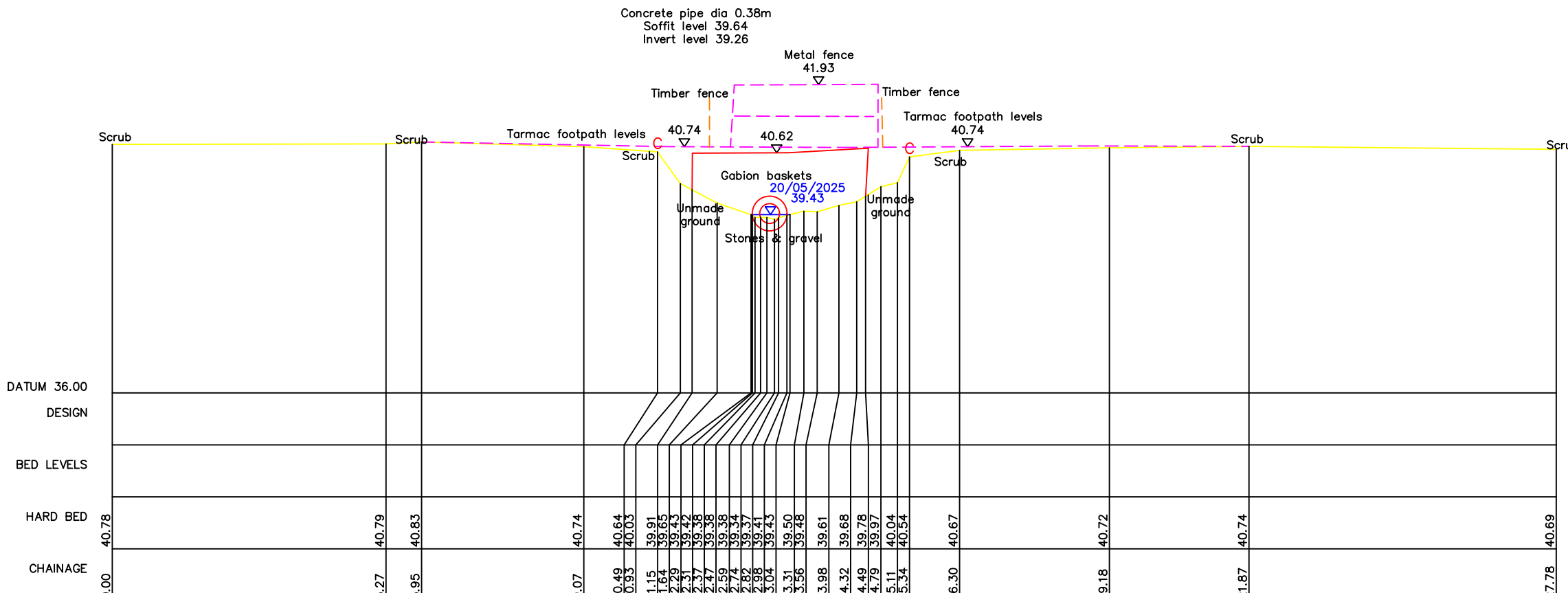
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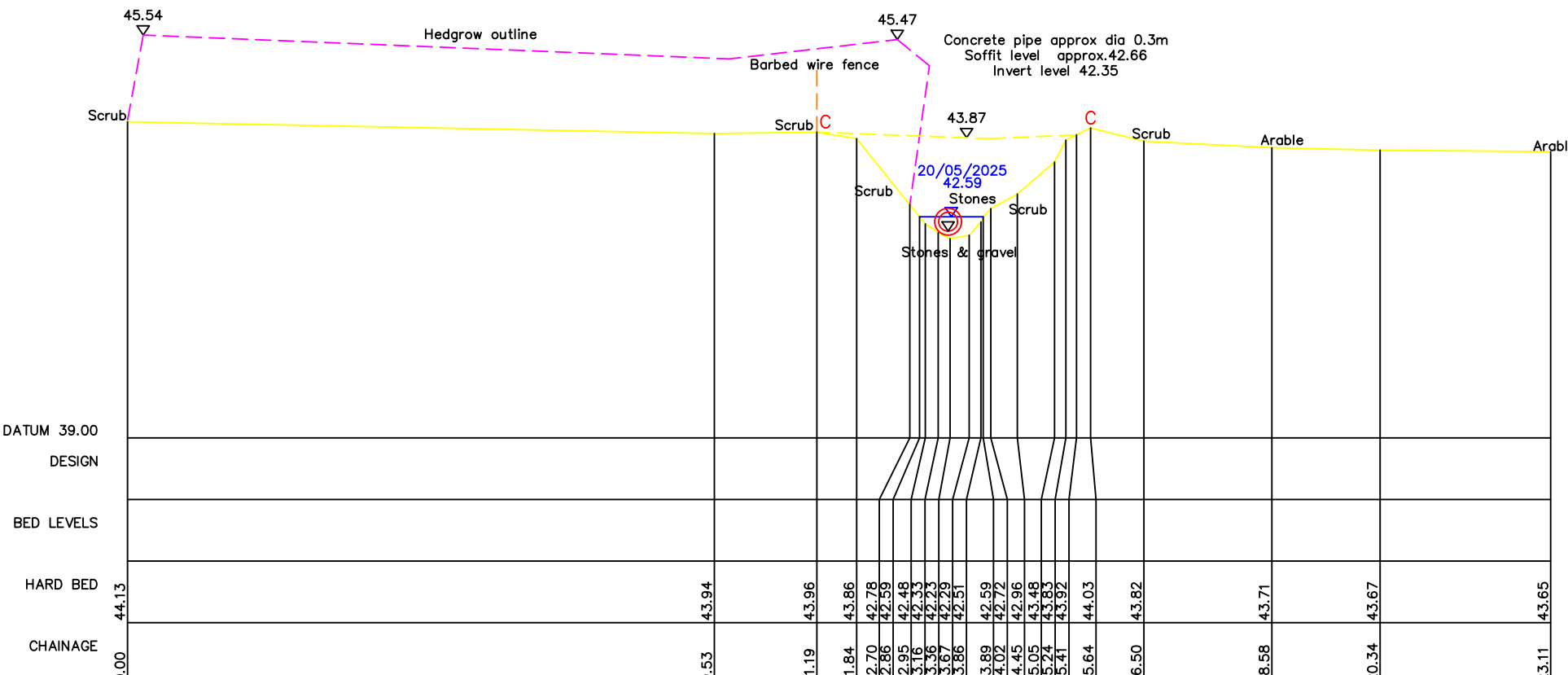
R20 - XS9
445303.74mE 333648mN Brg 349
Chainage 761.6
Upstream face of concrete pipe. Pipe length 5m.



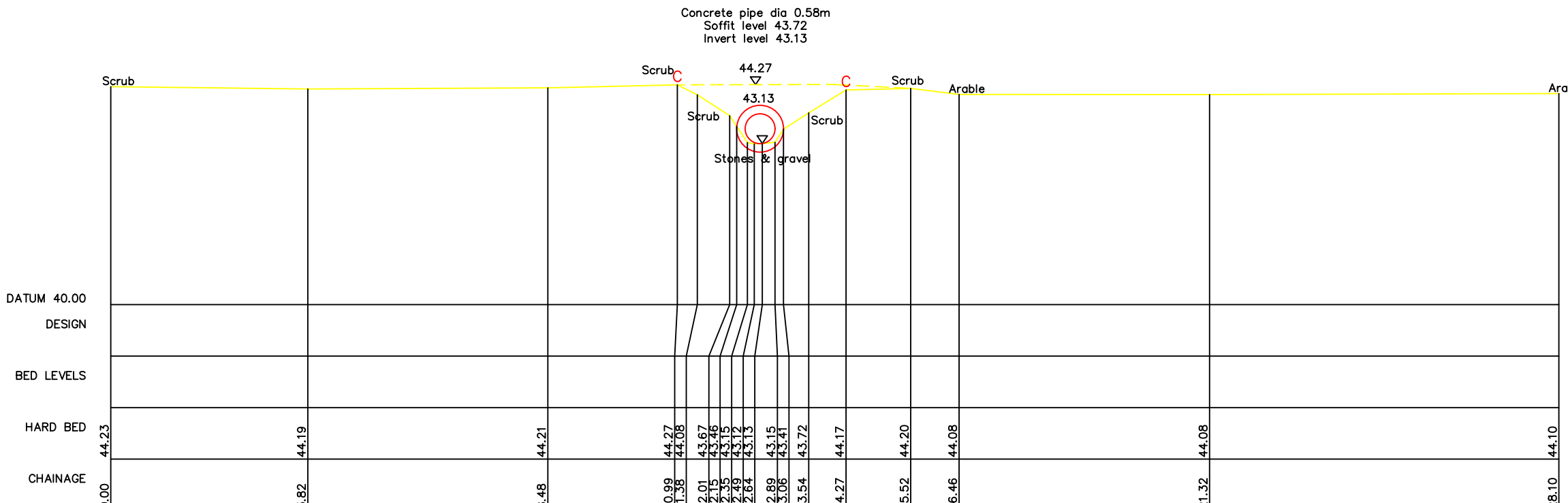
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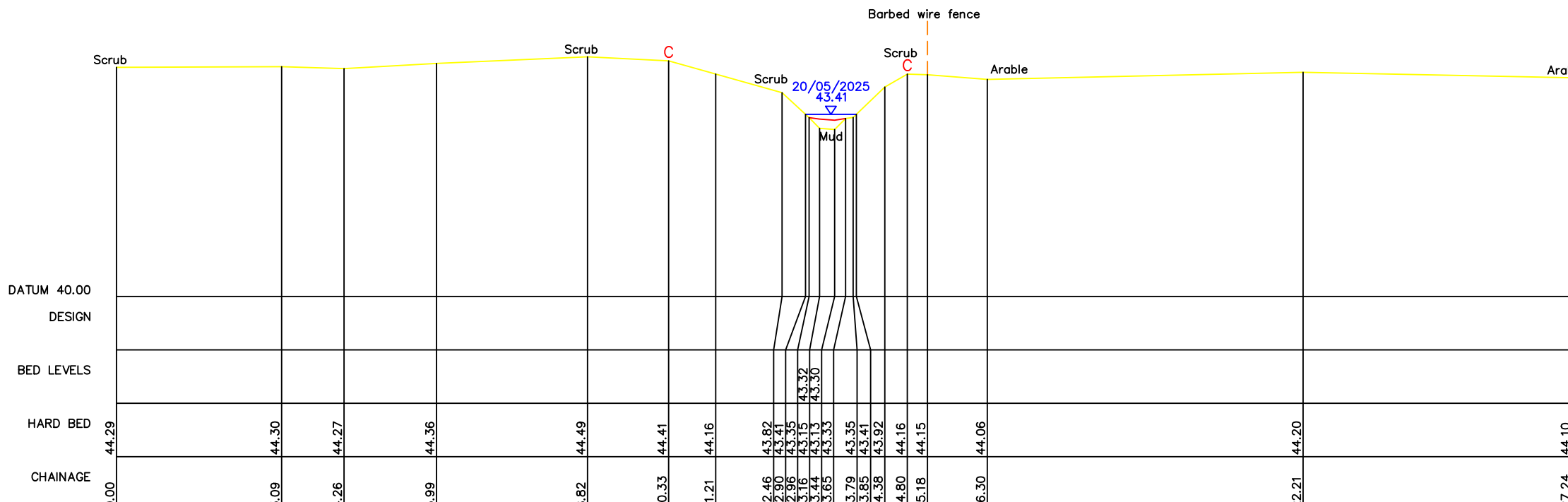
R20 - XS13
445306.39mE 334012.66mN Brg 266
Chainage 1140.5
Upstream face of concrete pipe. Pipe length 9.7m.



R20 - XS14
445349.89mE 334224.2mN Brg 275
Chainage 1378.1
Upstream face of concrete pipe. Pipe length 5m.



R20 - XS15
445348.31mE 334375.5mN Brg 270
Chainage 1528.3
Upstream face of concrete pipe. Pipe length 4.9m.



R20 - XS16
445346.18mE 334412.9mN Brg 270
Chainage 1565.8
Open Channel



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BT BOX	BTB	TRAFFIC LIGHT	TL
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CANAL	CA	TELEGRAPHY POLE	TP
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DROPPED BUSH	DB	VENT PIPE	VP
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EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH	SURVEY STATION	 GS1
FOUL WATER	FW		
GULLY	GY		
GATE POST	GP	BUSHES	
GAS VALVE	GV		
INSULATED BLOCK JOINT	IBJ		
INSPECTOR COVER	IC		
INVERT LEVEL	IL	HEDGES	
KIRKS OUTLET	KO		
LANDPOST	LP	TREES	
LITTER BIN	LB		
MARKER POST	MP	Height Species (Spread to scale)	
POST	PO		
RODDING EYE	RE		
EDGE HEIGHT	RH		
ROAD NAME PLATE	RNP		
ROAD SIGN	RS	GATE	
STUMP	SP	SECURITY FENCE	
SOFFIT LEVEL	SL	OVERHEAD CABLES	
SIGNAL POST	SPG	FOUL WATER	
MAIL DELIVERER LETTER BOX	MLB	SW-MAN	
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SIGNALS AND TELECOMS CAB	STC	STORM WATER	
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SIGN POST	SP		
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2 Arden Court, Arden Road, Alcester
Warwickshire, B49 6HN



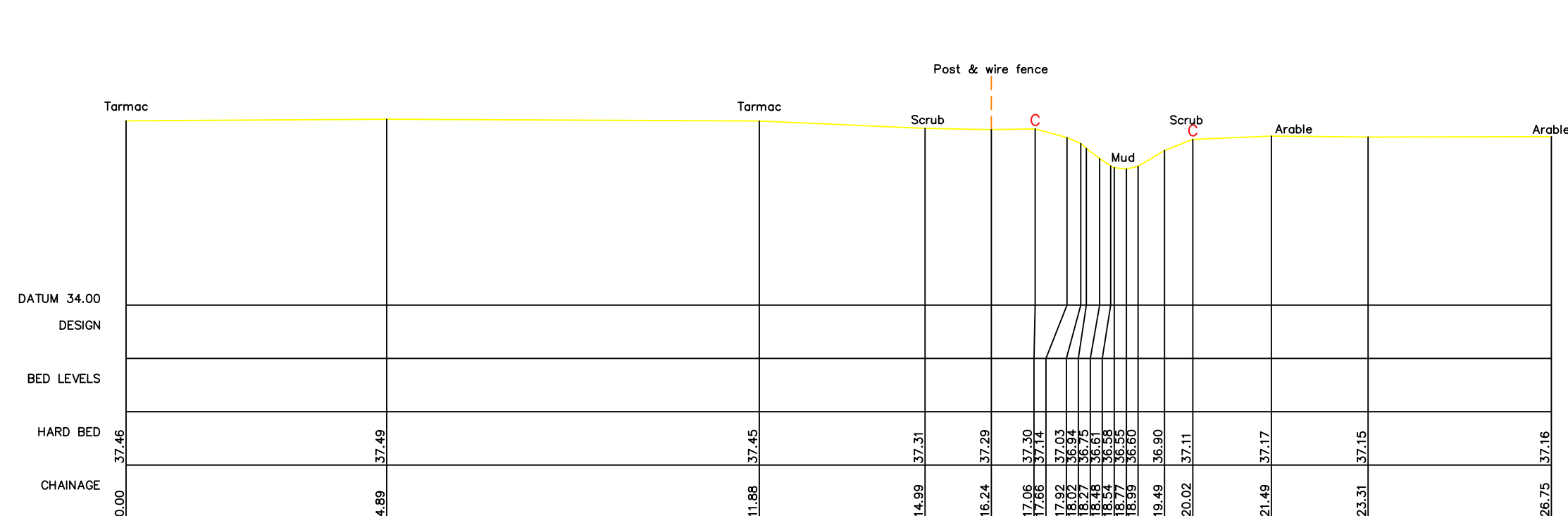
THE SURVEY ASSOCIATION

E-Mail: info@gcsurveys.co.uk
Web Site: www.gcsurveys.co.uk

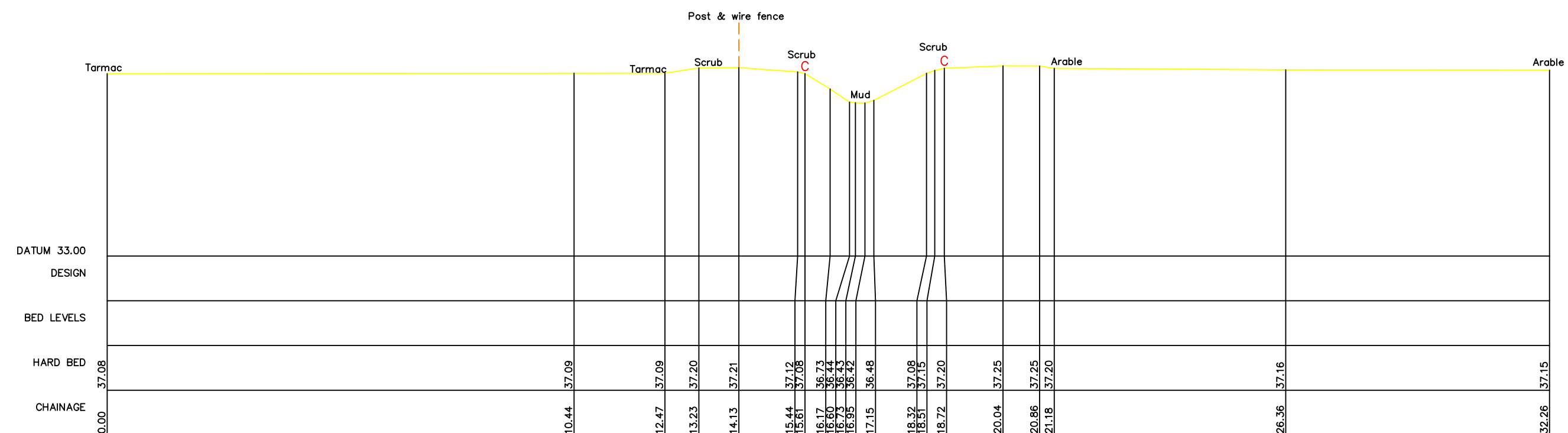


Drawing No:		GCS/JBA/2437/1		Rev: A	
Date:	Notes:			Name:	Rev:
18-6-25	XS R1-8 culvert length corrected			CC	A
Drawn:	Checked:	Scale:	Date:		
MS/MH	CC	1:100	06/06/25		
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GCS-JBA-2437-1A		A1	33 of 35		

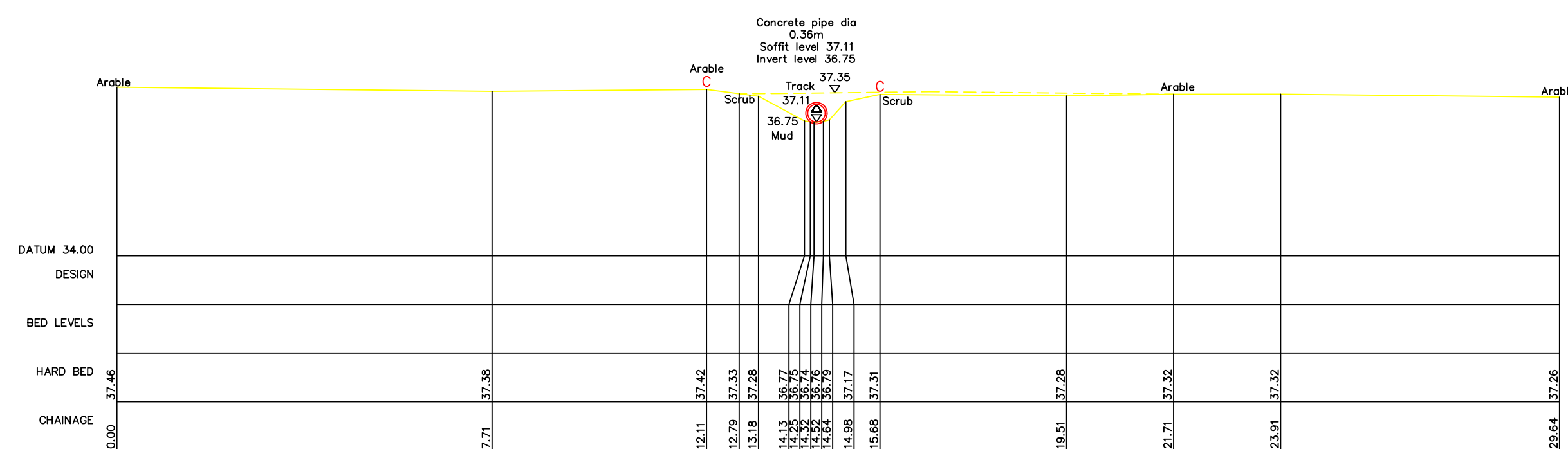
REACH 21



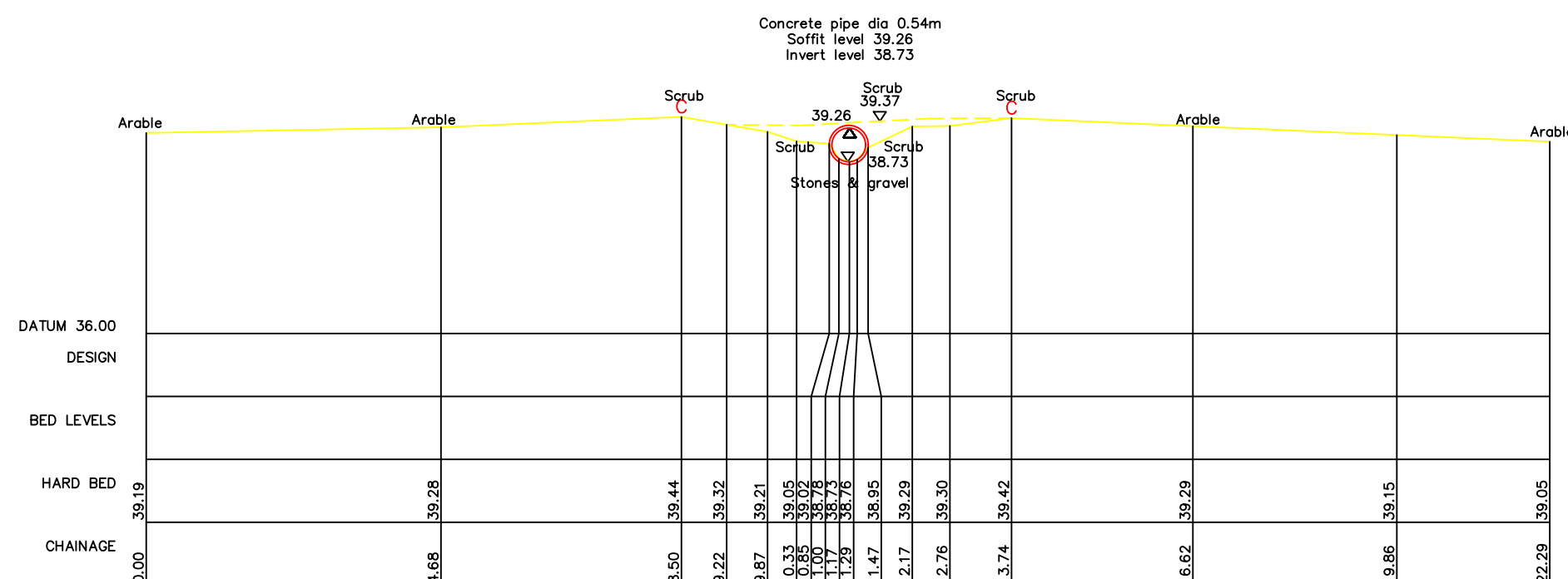
R21- XS1
445348.94mE 333669.76mN Brg 353
Chainage 9.9
Open Channel



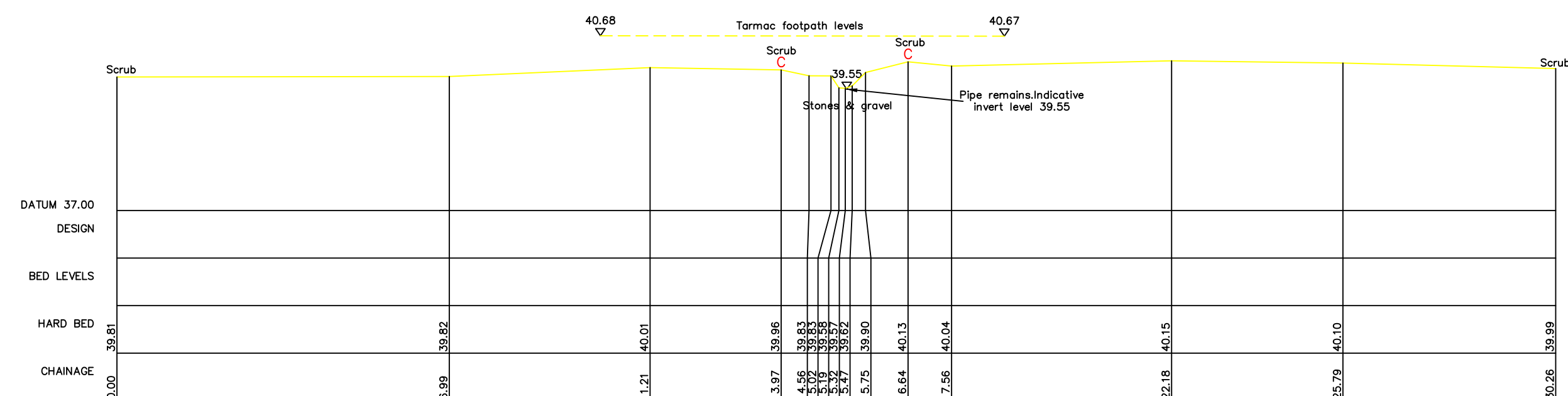
R21- XS2
445382.72mE 333675.53mN Brg 353
Chainage 44
Open Channel



R21- XS3
445433mE 333701.91mN Brg 267
Chainage 86.6
Upstream face of Concrete Pipe. Pipe length 3.1m.



R21- XS4
445416.84mE 333915.81mN Brg 265
Chainage 300.6
Upstream face of concrete pipe. Pipe length 5.6m.



R21- XS5
445416.99mE 333955.22mN Brg 257
Chainage 337.7
Downstream face of crushed pipe. Pipe length unknown.



Notes

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Whilst every effort has been made to identify all above ground details, it should be noted that some items may have been obscured at time of survey.

Below ground drainage information has been visually inspected from the surface and should therefore be treated as approximate only.

Where this survey has been carried out for the purpose of enabling trackside drainage design. The position of any running rail has been surveyed in line with a general topographic survey and should not be used for the purpose of track design.

All dimensions to be checked on site prior to design and construction.

Legend

BAR VALVE	AV	WATER TAP	TAP
BOLLARD	BD	TEMPORARY BENCH MARK	TBM
BUSH	BS	TELEPHONE CABLE BOX	TCB
BUS STOP	BS	TELEPHONE POST	TEL
BT INSPECTION COVER	BT	THRESHOLD LEVEL	THL
BT BOX	BTB	TRAFFIC LIGHT	TL
CABLE TV INSPECTION COVER	CTV	TOP OF WALL	TOW
CANAL	CA	TELEGRAPHY POLE	TP
DOWN PIPE	DP	UNABLE TO LIFT	UTL
DROPPED BUSH	DB	VENT PIPE	VP
ELECTRICITY CONTROL BOX	EK	RAIL WELD	WE
EAVES HEIGHT	EH	WATER METER	WM
ELECTRICITY MANHOLE	EM	WASHOUT	WO
ELECTRICITY POLE	EP		
EARTH ROD	ER		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FH	SURVEY STATION	 GS1
FOUL WATER	FW		
GULLY	GY		
GATE POST	GP	BUSHES	
GAS VALVE	GV		
INSULATED BLOCK JOINT	IBJ		
INSPECTOR COVER	IC		
INVERT LEVEL	IL	HEDGES	
KIRKS OUTLET	KO		
LANDPOST	LP	TREES	
LITTER BIN	LB		
MARKER POST	MP	Height Species (Spread to scale)	
POST	PO		
RODDING EYE	RE		
RIGHT HEIGHT	RH		
ROAD NAME PLATE	RNP		
ROAD SIGN	RS	GATE	
STUMP	SP	SECURITY FENCE	
STIFFET LEVEL	SL	OVERHEAD CABLES	
SIGNAL POST	SP	FOUL WATER	
MAIL DELIVERER LETTER	MLD	SW-DM	
SIGNALS AND TELECOMS BOX	STB	LOW POWER LINE	
SIGNALS AND TELECOMS CAB	STC	STORM WATER	
SIGNALS AND TELECOMS CAB	STC	WATER MAIN	
SIGN POST	SP		
STORM WATER	SW		
STOP VALVE	SV		
STAY	ST		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

Grid: *OS National Grid* **Datum:** *Ordnance Datum Newlyn*
Survey related to Ordnance Survey National Grid (OSGB36) via GPS and the OS Active Network.
A National Grid (OSGB36) coordinate has been established on site via Transformation OSTN15 and Geoid Model OSGM15, a further OS coordinate was used to orientate the survey to Ordnance Grid.
No scale factor has been applied to the survey

Title:

WATERCOURSE SURVEY AT
DRAYCOTT ROAD
(Cross Sections)

Client:

JBA CONSULTING
Suite 1B First Floor
Coleshill House
1 Station Road, Coleshill
Warwickshire B46 1HT



**Grantham Coates
Surveys Ltd**

Land - Engineering - Building Surveyors

2 Arden Court, Arden Road, Alcester
Warwickshire, B49 6HN



E-Mail: info@gcsurveys.co.uk
Web Site: www.gcsurveys.co.uk



Drawing No:		GCS/JBA/2437/1		Rev: A	
Date:	Notes:			Name:	Rev:
18-6-25	XS R1-8 culvert length corrected			CC	A
Drawn:	Checked:	Scale:	Date:		
MS/MH	CC	1:100	06/06/25		
File Name:		Sheet size:	Sheet:		
GCS-JBA-2437-1A		A1	34 of 35		



Notes

This survey should only be relied upon for its original purpose. Grantham Coates Surveys Limited accepts no responsibility for use of this plan outside of the original remit, or by use of any party other than the original client.

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Where this survey has been carried out for the purpose of enabling trackside drainage design. The position of any running rail has been surveyed in line with a general topographic survey and should not be used for the purpose of track design.

All dimensions to be checked on site prior to design and construction.

Legend

AR VALVE	AV	WATER TAP	TAP
BOLLARD	BD	TEMPORARY BENCH MARK	TBM
CELL PHONE CABLE BOX	CB	TELEPHONE CABLE BOX	TCS
BOX CONNECTION COVER	BT	TELEPHONE POST	TEL
BUS STOP	BS	THRESHOLD LEVEL	TL
BUS STOP INSPECTION COVER	BSI	TRAFFIC LIGHT	TLT
CONCRETE LEVEL	CL	TOP OF WALL	TOU
DOWN PIPE	CP	TELEGRAPH POLE	TP
COUPLED KERB	CK	DN UNABLE TO LIFT	UTL
ELECTRICITY CONTROL BOX	ECB	VENT PIPE	VP
EAVES HEIGHT	EH	RAIL WELD	WR
ELECTRICITY MANHOLE	EM	WATER METER	WM
ELECTRICITY POLE	EP	WASHOUT	WO
FLY	FL		
FINISHED FLOOR LEVEL	FFL		
FIRE HYDRANT	FW	SURVEY STATION	 GCS
FLOODWATER	FW		
GULLY	GU		
GNP STOP	GNP	BUSHES	
GAS VALVE	GV		
INSULATED BOLT JOINT	IBJ		
INSPECTION COVER	IC	HEDGES	
INVERT LEVEL	IL		
KEENUT	K		
LAMPPOST	LP		
LITTER BIN	LB	TREES	 Height (Spreads to scale)
MARKER	MP		
MALE PIST	MP		
POLE	P		
ROOFING EYE	RE		
ROAD HEIGHT	RH	GATE	
ROAD MANIPULATE	RN		
ROAD SIGN	RS	SECURITY FENCE	 X-X
ROOF	R	FENCE	 F-F
SOFFIT LEVEL	SL	OVERHEAD CABLES	 O-O
SIGNAL POST	SP	FOLI WARE	 F-F
SIGNAL STOP	SS	GAS MAIN	 G-G
SIGNALS AND TELECOMS BOX	STB	IGU LOWER LINE	 L-L
SIGNALS AND TELECOMS CABLE	STC	LOWER WATER	 W-W
SIGNALS AND TELECOMS POST	STP	TELEPHONE	 T-T
SIGN POST	SP	WATER MAIN	 M-M
STOP TAP	ST		
STOP VALVE	SV		
STW	STW		
STORM WATER	SW		

Control Table

Station	Description	Eastings	Northings	Height

Grid and Datum

Grid: *OS National Grid* **Datum:** *Ordnance Datum Newlyn*
Survey related to Ordnance Survey National Grid (OSGB36) via GPS and the OS Active Network.
A National Grid (OSGB36) coordinate has been established on site via Transformation OSTN15 and Geoid Model OSGM15, a further OS coordinate was used to orientate the survey to Ordnance Grid.
No scale factor has been applied to the survey

Title:

WATERCOURSE SURVEY AT DRAYCOTT ROAD (Cross Sections)

Client:

JBA CONSULTING
Suite 1B First Floor
Coleshill House
1 Station Road, Coleshill
Warwickshire B46 1HT



Land - Engineering - Building Surveyors

2 Arden Court, Arden Road, Alcester
Warwickshire, B49 6HN



THE SURVEY
ASSOCIATION
FULL MEMBER

E-Mail: info@gcsurveys.co.uk
Web Site: www.gcsurveys.co.uk

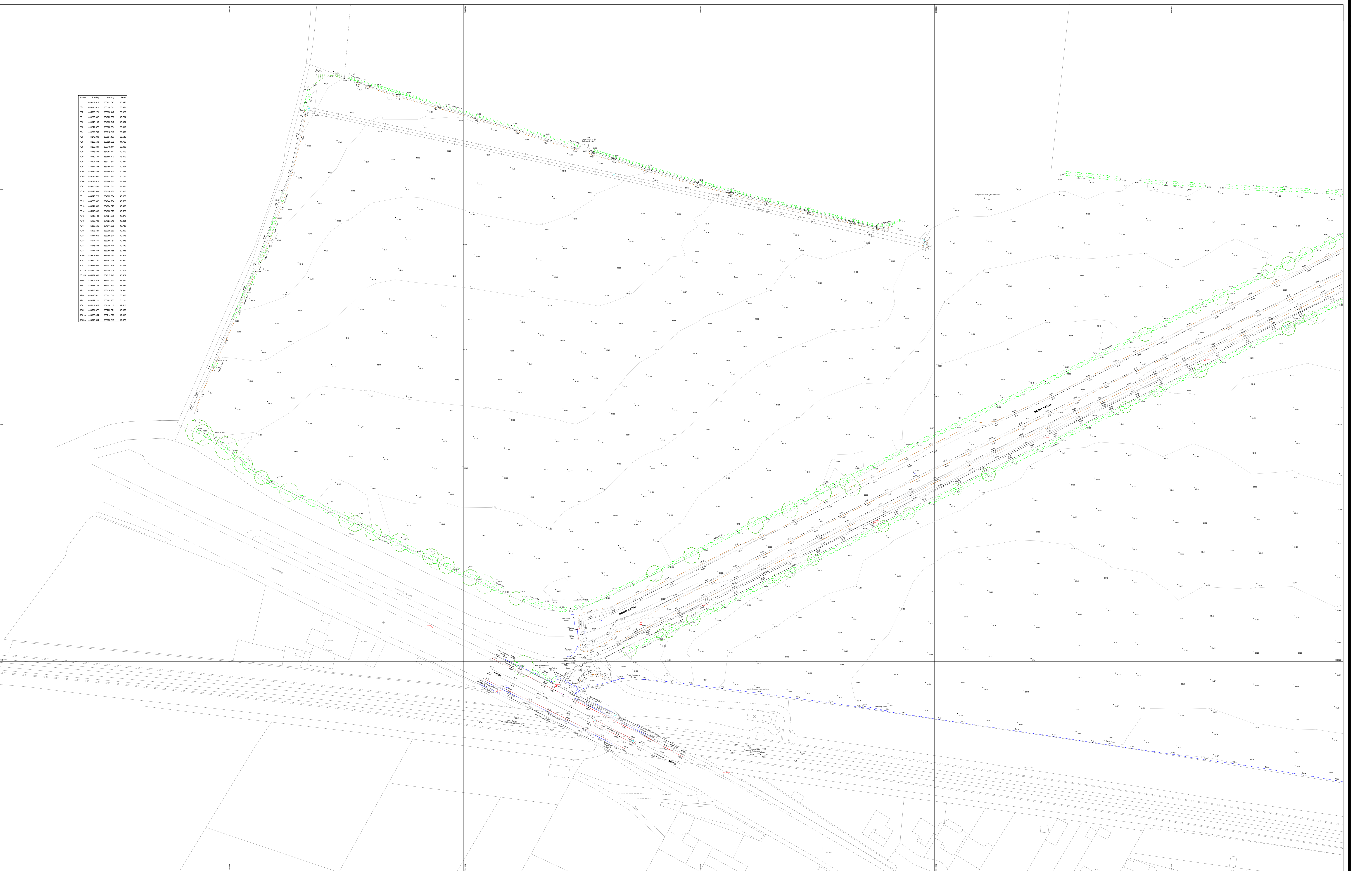


Drawing No:			GCS/JBA/2437/1		Rev:		A	
Date:		Notes:			Name:		Rev:	
18-6-25		XS R1-8 culvert length corrected			CC		A	
Drawn:		Checked:		Scale:		Date:		
MS/IMH		CC		1:100		06/06/25		
File Name:				Sheet size:		Sheet:		
GCS-JBA-2437-1A				A1		35 of 35		

B Topography Survey

B.1 Survey drawing

Station	Survey	Height	Level
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98	40000.00	33000.00	40000.00
99	40000.00	33000.00	40000.00
100	40000.00	33000.00	40000.00



REV. NO.	DESCRIPTION TO REVISION	REV. BY	DATE
A			
B			
C			
D			
NOTES:			
OS digital data has been shown for context only. In certain areas, the OS digital data has been linked/feathered to the accurate survey data to avoid ambiguity. The OS digital data layers within this drawing have been renamed with the prefix TML_OS[DT]. If requested, the original unedited OS digital data can be issued separately. © Crown copyright and database rights 25.03.2024 Ordnance Survey 010222076 OS Mastermap licence for the use of Peveril Homes only.			



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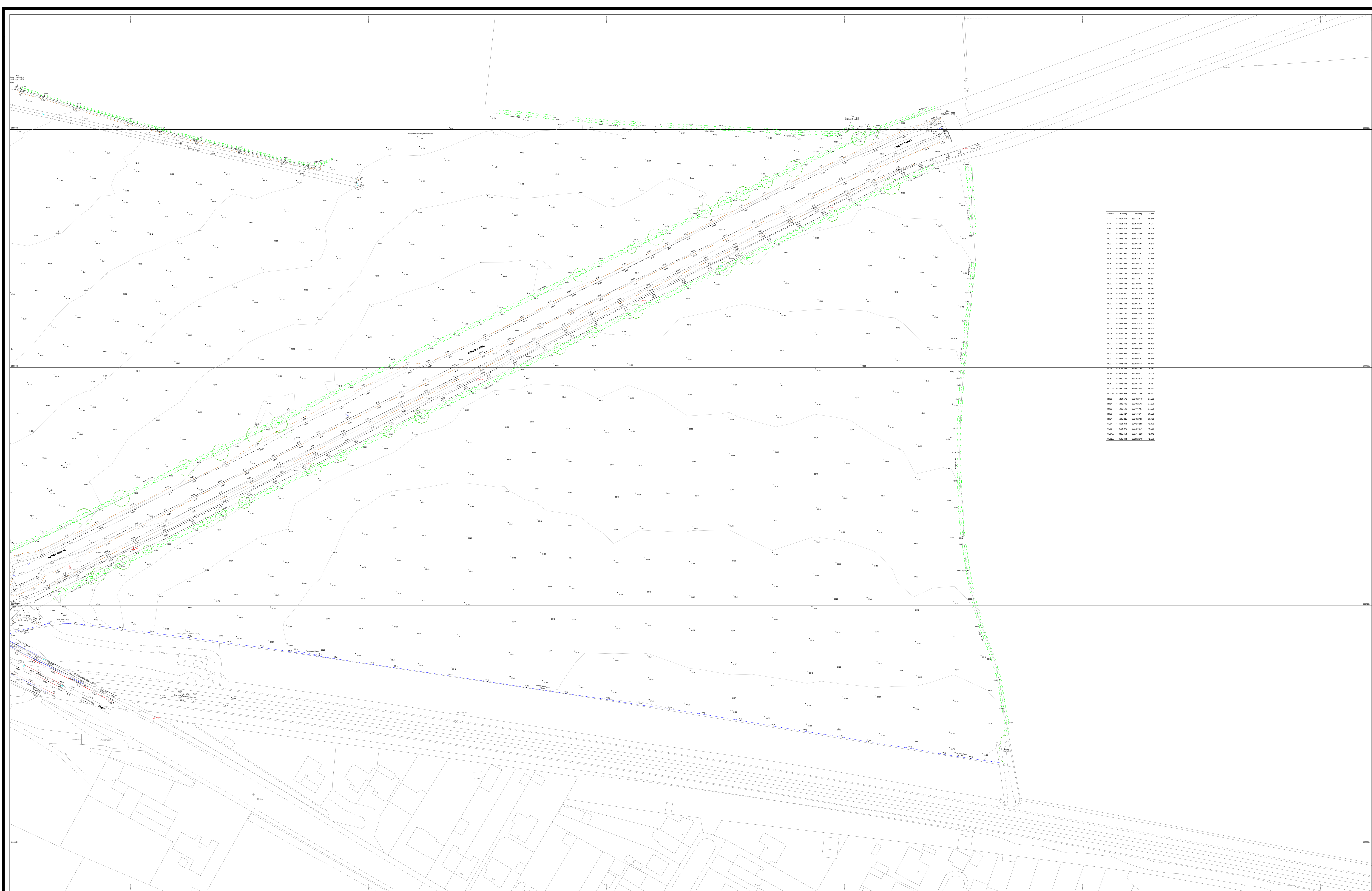
Please follow us on: Twitter, Instagram, Facebook and LinkedIn

CLIENT:	PEVERIL HOMES
PROJECT:	HOPWELL ROAD DRAYCOTT BREASTON DE72 3NX

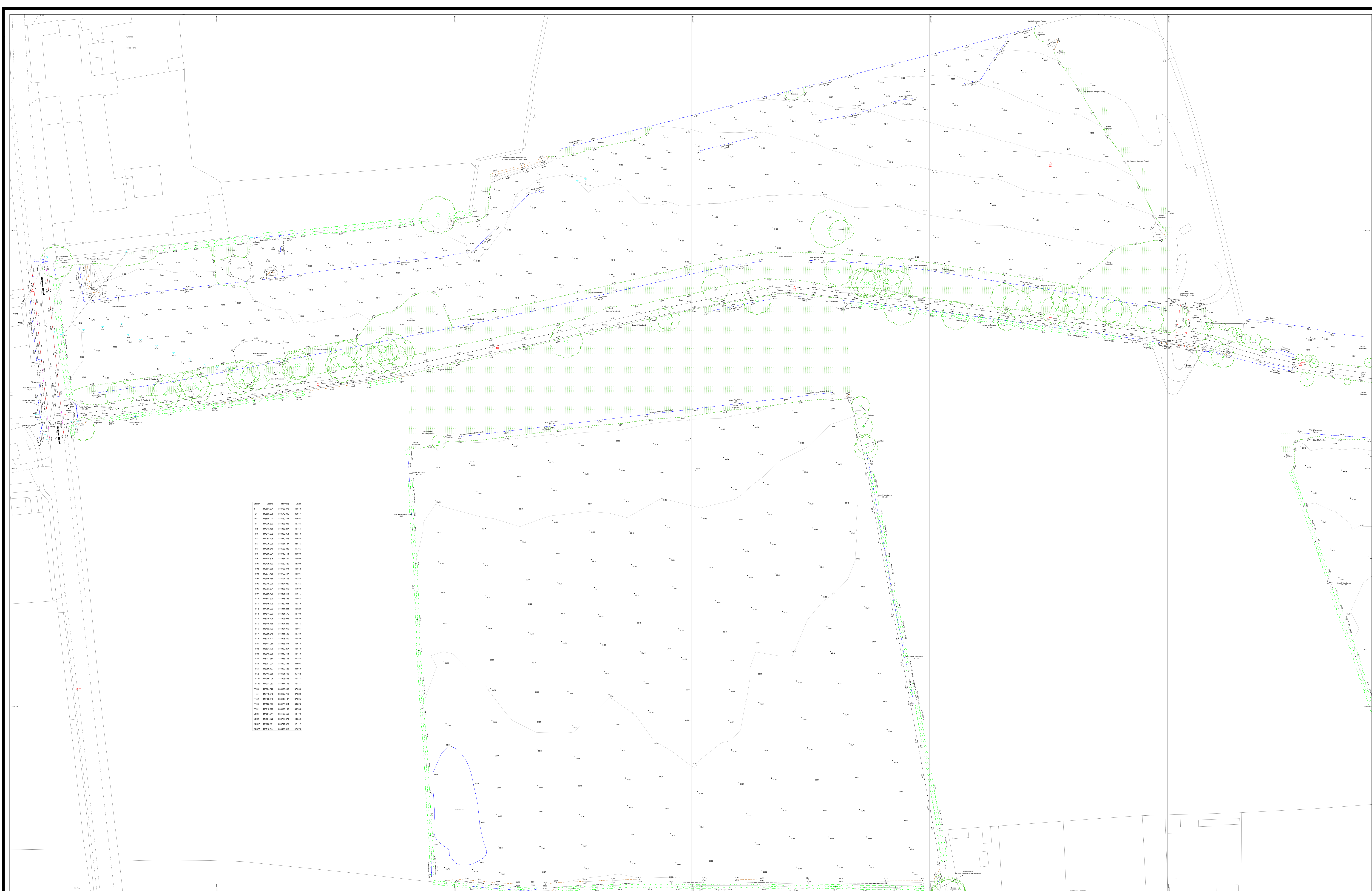
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GRID: ORDNANCE SURVEY	LEVEL: ORDNANCE SURVEY	DATA TYPE: 2D	OTHER DATA AVAILABLE: 3D ACAP: YES 3D BOUNDARY: YES POINT CLOUD: NO SECTION: YES CUT & FILL ANALYSIS: YES
DRAWN BY: KS	SCALE @ AO: 1:500	PROJECT NO.: 4125	DRAWING NAME: 4125 Hopwell Road, Bre

N
W
E
S

REV.



Station	Easting	Northing	Height
1	44580.478	33373.819	42.68
FS1	44585.478	33375.345	46.97
FS2	44589.477	33380.497	46.48
PC1	44592.842	33403.886	47.74
PC2	44593.188	33409.247	48.03
PC3	44594.472	33409.024	48.16
PC4	44595.749	33391.830	48.02
PC5	44597.009	33384.187	48.04
PC6	44598.189	33378.007	47.74
PC7	44599.472	33376.174	47.00
PC8	44600.823	33403.142	48.06
PC9	44602.112	33380.101	47.80
PC10	44603.406	33379.181	47.81
PC11	44604.700	33378.147	47.81
PC12	44606.000	33377.071	47.80
PC13	44607.308	33367.000	47.79
PC14	44608.611	33388.416	47.89
PC15	44609.919	33381.411	47.81
PC16	44611.228	33404.486	48.08
PC17	44612.536	33402.004	48.07
PC18	44613.844	33399.000	48.00
PC19	44615.152	33404.076	48.03
PC20	44616.460	33400.000	48.00
PC21	44617.768	33402.000	48.00
PC22	44619.076	33402.000	48.00
PC23	44620.384	33402.000	48.00
PC24	44621.692	33402.000	48.00
PC25	44623.000	33402.000	48.00
PC26	44624.308	33402.000	48.00
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PC36	44637.388	33402.000	48.00
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PC56	44663.548	33402.000	48.00
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PC111	44735.488	33402.000	48.00
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PC176	44820.508	33402.000	48.00
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Point	Survey	Height	Label
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100	45050.071	33327.015	45050

REV. NO.	DESCRIPTION TO REVISION	REV. BY	DATE
A			
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NOTES:			
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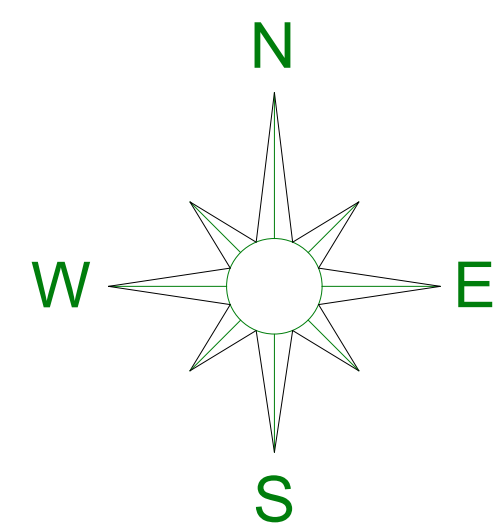
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CLIENT:	PEVERIL HOMES
PROJECT:	HOPWELL ROAD DRAYCOTT BREASTON DE72 3NX

TITLE: TOPOGRAPHICAL SURVEY (Sheet 3 of 8)			
DATE: 03/06/2025			
GRID: ORDNANCE SURVEY	LEVEL: ORDNANCE SURVEY	DATA TYPE: 2D	OTHER DATA AVAILABLE: 3D ACQ. - YES 3D GROUND MODEL - YES POINT CLOUD - NO SECTION - YES CUT & FILL ANALYSIS - YES
DRAWN BY: KS	SCALE @ AO: 1:500	PROJECT NO.: 4125	DRAWING NAME: 4125 Hopwell Road_Breaston_Topographical Survey 2025



REV.

Station	Chainage	Height	Notes
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PC100	44200.00	33022.875	40.840

REV. NO.	DESCRIPTION TO REVISION	REV. BY	DATE
A			
B			
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NOTES:			
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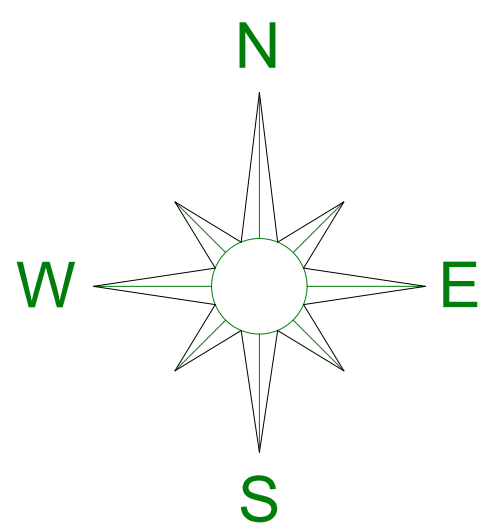
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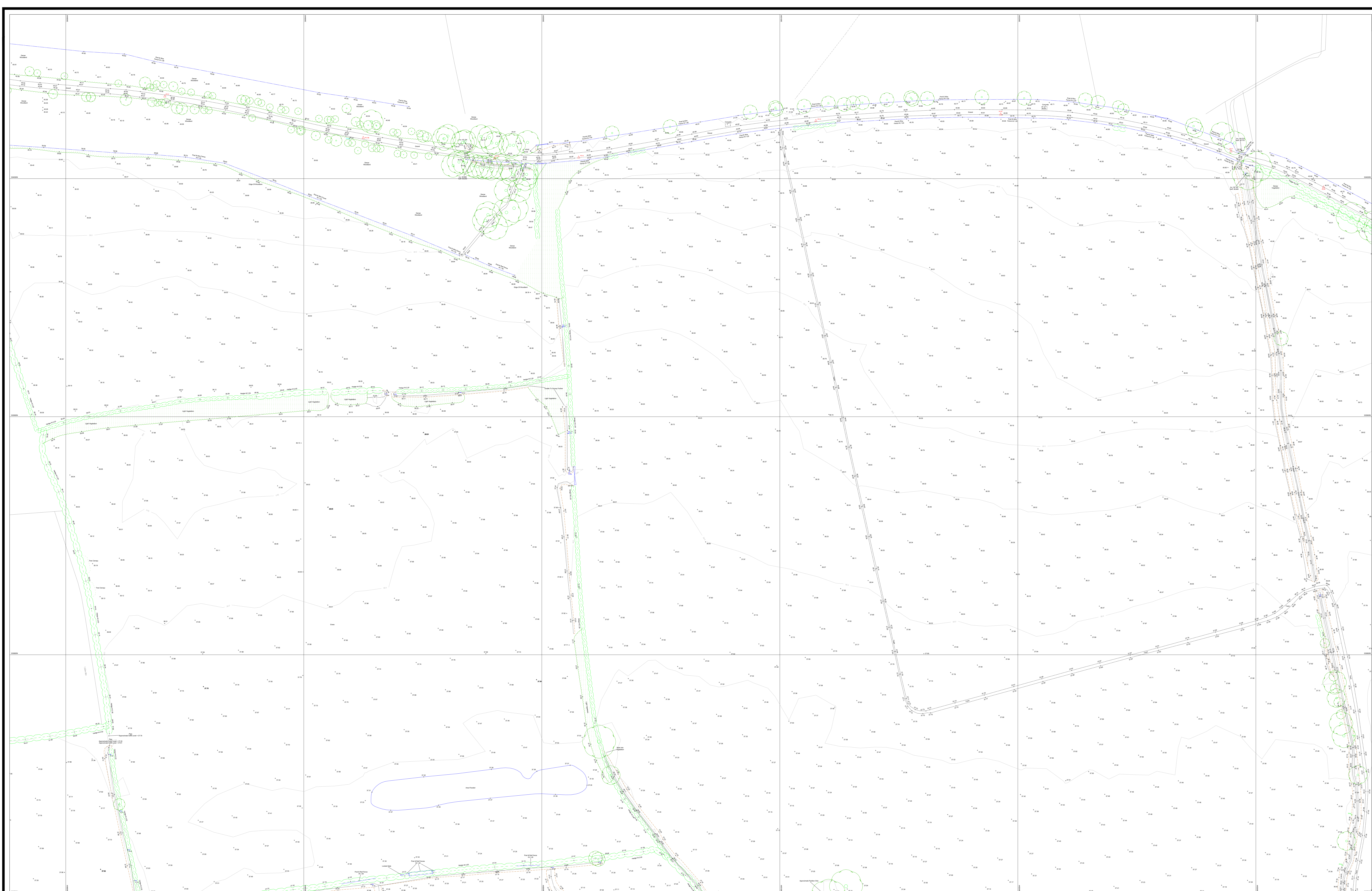
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CLIENT:	PEVERIL HOMES
PROJECT:	HOPWELL ROAD DRAYCOTT BREASTON DE72 3NX

TITLE:			
TOPOGRAPHICAL SURVEY (Sheet 4 of 8)			
DATE:			
03/06/2025			
GRID: ORDNANCE SURVEY	LEVEL: ORDNANCE SURVEY	DATA TYPE: 2D	OTHER DATA AVAILABLE: 3D ACAD: YES 3D ORDNANCE MODEL: YES POINT CLOUD: NO SECTION: YES CUT & FILL ANALYSIS: YES
DRAWN BY: KS	SCALE @ AO: 1:500	PROJECT NO.: 4125	DRAWING NAME: 4125 Hopwell Road, B



REV.



REV. NO.	DESCRIPTION TO REVISION	REV. BY	DATE
A			
B			
C			
D			
NOTES:			
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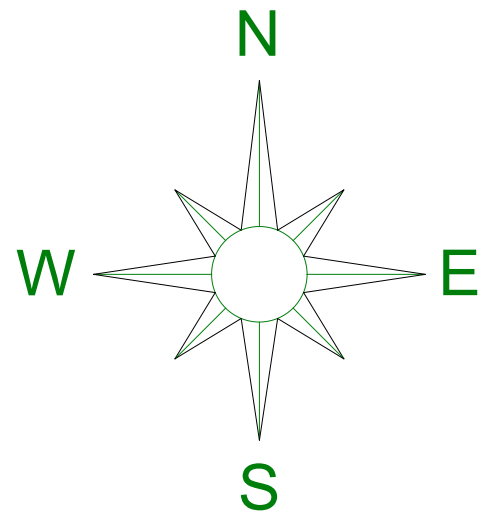


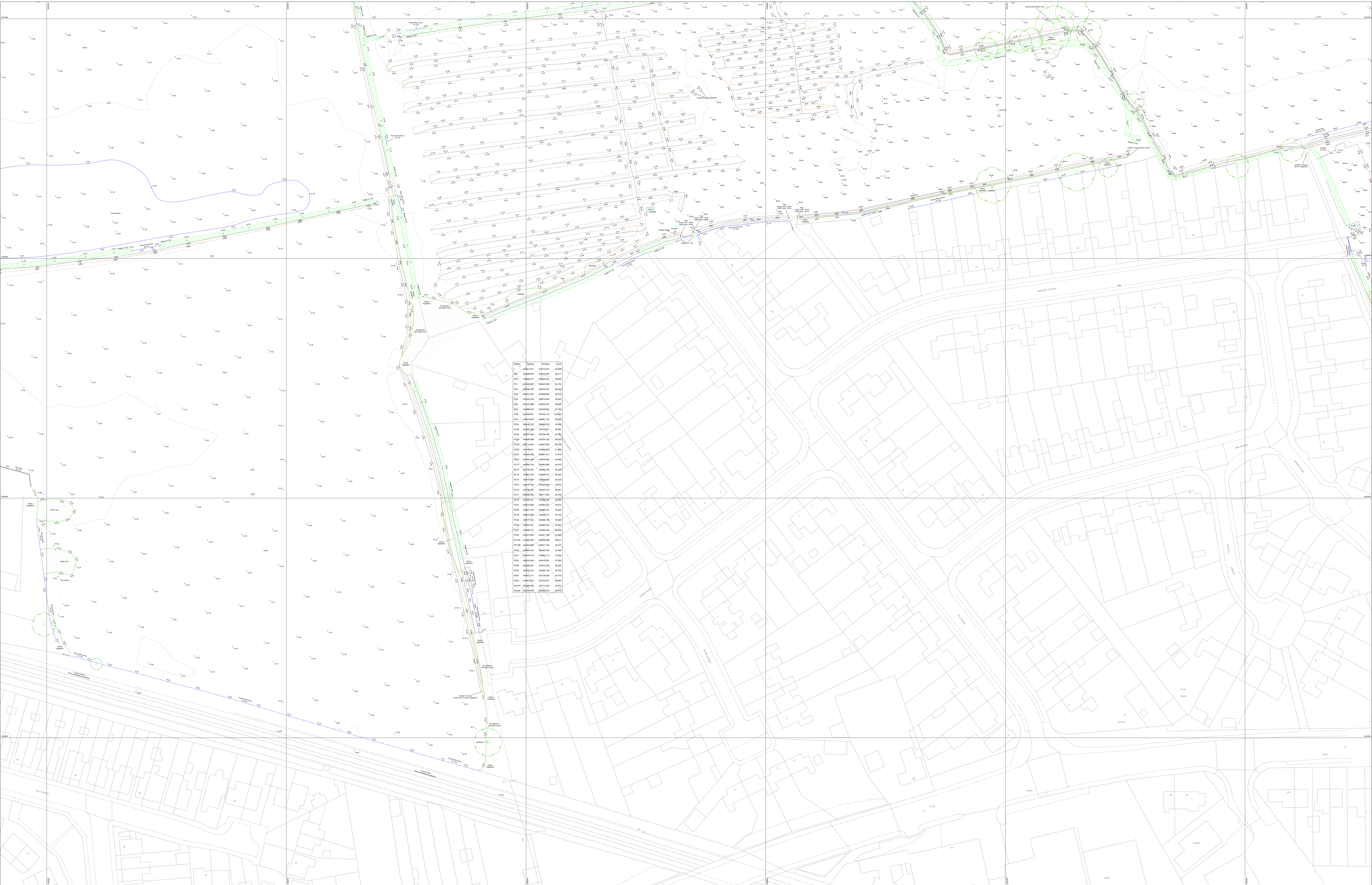
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CLIENT:		PEVERIL HOMES		TITLE:		TOPOGRAPHICAL SURVEY (Sheet 5 of 8)	
PROJECT:		HOPWELL ROAD DRAYCOTT BREASTON DE72 3NX		DATE:		03/06/2025	
GRID: ORDNANCE SURVEY		LEVEL: ORDNANCE SURVEY		DATA TYPE: 2D		OTHER DATA AVAILABLE: 3D ACQU. - YES 3D GROUND MODEL - YES POINT CLOUD - NO SECTION - YES CUT & FILL ANALYSIS - YES	
DRAWN BY: KS		SCALE @ AO: 1:500		PROJECT NO.: 4125		DRAWING NAME: 4125 Hopwell Road, Breaston, Topographical Survey 2025	
						REV.	





REV. NO.	DESCRIPTION TO REVISION	REV. BY	DATE
A			
B			
C			
D			
NOTES:			
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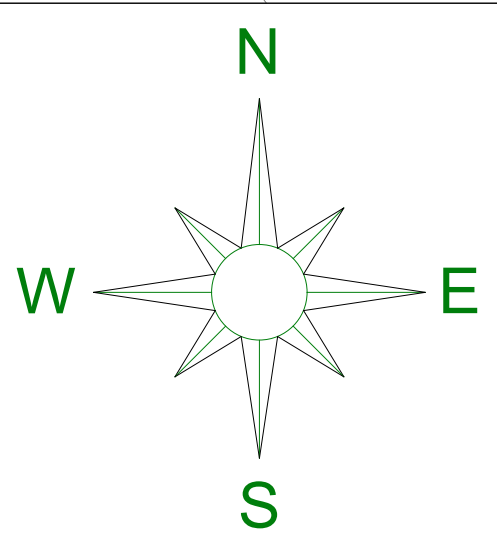
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CLIENT:	PEVERIL HOMES
PROJECT:	HOPWELL ROAD DRAYCOTT BREASTON DE72 3NX

TITLE:			
TOPOGRAPHICAL SURVEY (Sheet 6 of 8)			
DATE:			
03/06/2025			
GRID: ORDNANCE SURVEY	LEVEL: ORDNANCE SURVEY	DATA TYPE: 2D	OTHER DATA AVAILABLE: 3D SURVEY - YES 3D GROUND MODEL - YES POINT CLOUD - YES SECTION - YES CUT & FILL ANALYSIS - YES
DRAWN BY: KS	SCALE @ AO: 1:500	PROJECT NO.: 4125	DRAWING NAME: 4125 Hopwell Road, B



REV.



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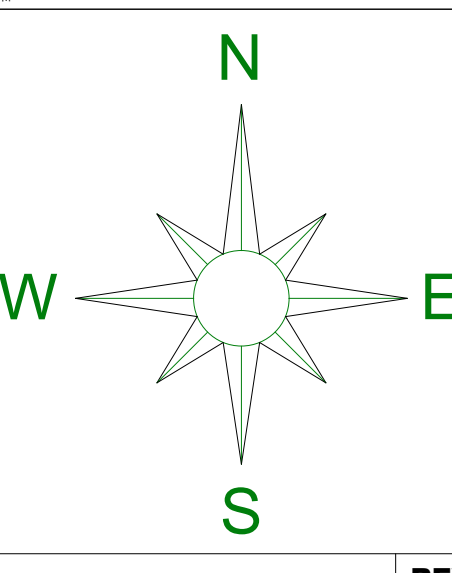
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PROJECT:
**HOPWELL ROAD
DRAYCOTT
BREASTON
DE72 3NX**

TITLE: TOPOGRAPHICAL SURVEY (Sheet 7 of 8)				
DATE: 03/06/2025				
GRID: ORDNANCE SURVEY	LEVEL: ORDNANCE SURVEY		DATA TYPE: 2D	
DRAWN BY: KS	SCALE @ AO: 1:500	PROJECT NO.: 4125	OTHER DATA AVAILABLE: 3D ACQUISITION - YES 3D GROUND MODEL - YES POINT CLOUD - YES SECTION - YES CUT & FILL ANALYSIS - YES	REVISIONS:
DRAWING NAME: 4125 Hopwell Road, Breaston Topographical Survey 2025				



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REV. NO.	DESCRIPTION TO REVISION	REV. BY	DATE
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NOTES:			
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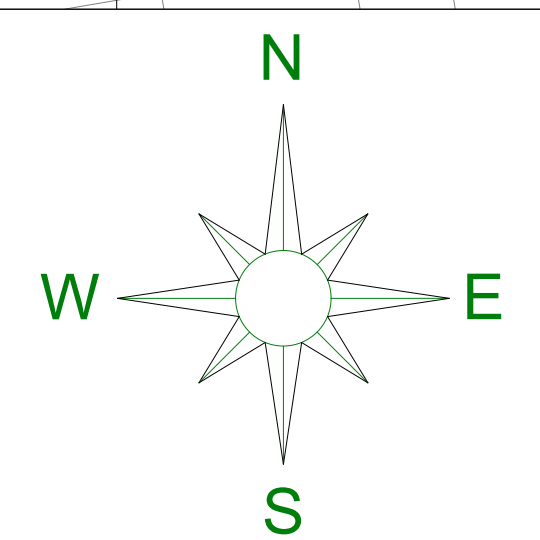
PROJECT: **HOPWELL ROAD
DRAYCOTT
BREASTON
DE72 3NX**

TITLE: **TOPOGRAPHICAL SURVEY
(Sheet 8 of 8)**

DATE: **03/06/2025**

GRID: ORDNANCE SURVEY	LEVEL: ORDNANCE SURVEY	DATA TYPE: 2D	OTHER DATA AVAILABLE: 3D SURVEY: YES 3D ORDNANCE MODELS: YES POINT CLOUD: YES SECTION: YES CUT & FILL ANALYSIS: YES
DRAWN BY: KS	SCALE @ AO: 1:500	PROJECT NO.: 4125	DRAWING NAME: 4125 Hopwell Road, Breaston, Topographical Survey 2025

REV.



B.2 Quality assessment

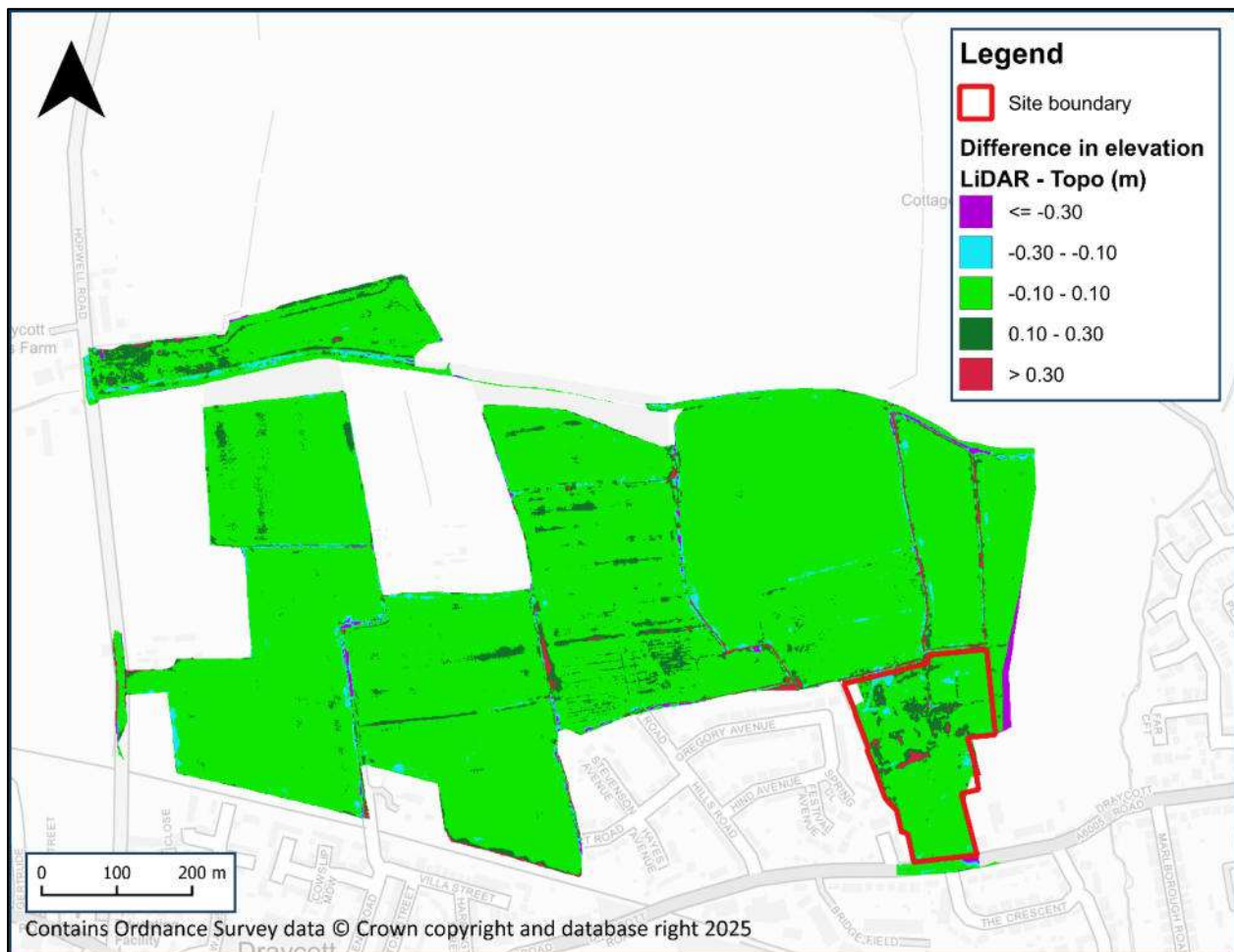


Figure B1: Difference in elevation between the LiDAR and topographic survey data

C Structures Log

C.1 Reach 1

Survey label	R1 - XS1
Model label:	Dray01_778.1C and Dray01_778.2C
Type:	One arched and one rectangular culvert
How has structure been modelled?	The culverts were represented with R units in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 2D. The downstream invert levels of these culverts were assumed. This is because they join into the railway line drainage system which could not be accessed during the channel survey. Both culverts were modelled as 100% blocked due to the unknown nature of their continuation (more detail of this is found in section 9.1).
Upstream face, looking downstream	

Survey label	R1 - XS4
Model label:	Dray01_901C
Type:	Circular culvert
How has structure been modelled?	The culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02.

	The spill was represented in the 1D using a WW unit set to 38.5m AOD and with a weir coefficient of 0.88.
Upstream face, looking downstream	

Survey label	R1 - XS5
Model label:	Dray01_919C
Type:	Circular culvert
How has structure been modelled?	The culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 1D using a WW unit set to 38.78m AOD and with a weir coefficient of 0.88.
Upstream face, looking downstream	

Survey label	R1 - XS6
Model label:	Dray01_932C
Type:	Circular culvert
How has structure been modelled?	The culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 1D using a WW unit set to 38.66m AOD and with a weir coefficient of 0.88.
Upstream face, looking downstream	

Survey label	R1 - XS7
Model label:	Dray01_934C
Type:	Circular culvert
How has structure been modelled?	The culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 1D using a WW unit set to 38.62m AOD and with a weir coefficient of 0.88.

Downstream face, looking upstream



Survey label	N/A
Model label:	Dray01_1137C
Type:	Circular culvert
How has structure been modelled?	The culvert was represented with a C unit in the 1d_nwk and a standard roughness of 0.02. The invert levels for this structure were assumed using LiDAR and the dimensions were estimated using the upstream culvert (Dray01_1187C) as a guide. On Google Streetview this culvert appears to be circular and therefore a diameter of 0.75m was applied which matches the height of the culvert upstream. The spill was represented in the 1D using a WW unit set to 39.18m AOD and with a weir coefficient of 0.88. The spill level was taken from LiDAR.
Upstream face, looking downstream	N/A

Survey label	R1 - XS8
Model label:	Dray01_1187C
Type:	Circular culvert
How has structure been modelled?	The culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 1D using a WW unit with a CS line using spill levels from the survey. A weir coefficient of 0.88 was used due to the uneven nature of the spill.
Upstream face, looking downstream	

Survey label	R1 - XS9
Model label:	Dray01_1238C
Type:	Circular culvert
How has structure been modelled?	The culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The upstream invert of this structure was estimated using the LiDAR. The spill was represented in the 1D using a WW unit set to 40.19m AOD and with a weir coefficient of 0.88. The spill level was taken from LiDAR.

Downstream face, looking upstream



Survey label	N/A (referred in section 9.2)
Model label:	Dray01_1265C
Type:	Circular culvert
How has structure been modelled?	This structure has been assumed based on the information given on the survey that Reach 1 acts as an overflow when the culvert at Reach 2 - XS3 becomes blocked. Dimensions and inverts have been assumed based on the structures upstream and downstream however it was important to add in a structure here to create connectivity.
Downstream face, looking upstream	N/A

Survey label	R1 - X10
Model label:	Dray01_1327C
Type:	Circular culvert

How has structure been modelled?	The culvert was represented with a I unit in the 1d_nwk, with structure dimensions represented by a CS line with data taken from the survey data and a standard roughness of 0.02. The spill was represented in the 2D. With the exact length of this culvert unknown an estimated distance of 60m was used based on the location of connectivity downstream.
Downstream face, looking upstream	

Survey label	R1 - X12
Model label:	Dray01_1524C
Type:	Circular culvert
How has structure been modelled?	The culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 2D.

Upstream face, looking
downstream



C.2 Reach 2

Survey label	R2 - XS2
Model label:	Dray02_147C (1,2,3)
Type:	Three circular culverts
How has structure been modelled?	These culverts were represented with C units in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 2D.
Downstream face, looking upstream	

Survey label	R2 - XS3
Model label:	Dray02_163C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken

	from the survey data and a standard roughness of 0.02. The spill was represented in the 2D.
Downstream face, looking upstream	

C.3 Reach 4

Survey label	R4 - XS1
Model label:	Dray04_12C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 2D.
Upstream face, looking downstream	

Survey label	R4 - XS2
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Model label:	Dray04_70C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 2D.
Upstream face, looking downstream	

Survey label	R4 - XS3
Model label:	Dray04_91C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 2D.
Upstream face, looking downstream	

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Survey label	R4 - XS6
Model label:	Dray04_330C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 1D using a WW unit and a CS line with the spill levels. The weir coefficient was set to 0.88.
Upstream face, looking downstream	

C.4 Reach 5

Survey label	R5 - XS2
Model label:	Dray05_58W
Type:	Weir
How has structure been modelled?	This culvert was represented with a WW unit

	in the 1d_nwk, with structure dimensions taken from the survey data.
Upstream face, looking downstream	

C.5 Reach 6

Survey label	R6 - XS1
Model label:	Dray06_9C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 1D using a WW unit set to a level of 38.94m AOD. The weir coefficient was set to 0.88.
Upstream face, looking downstream	

C.6 Reach 8

Survey label	R8 - XS1
Model label:	Dray08_0C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 2D. This structure was modelled as 100% blocked as the outlet of the structure and interaction with the railway is unknown. This a more conservative approach as it allows flow to back up onto the site.
Upstream face, looking downstream	

Survey label	R8 - XS6
Model label:	Dray08_503W
Type:	Spill/weir
How has structure been modelled?	This weir was represented with a WW unit in the 1d_nwk line, with a CS line to represent structure dimensions.

Upstream face, looking
downstream



C.7 Reach 12

Survey label	R12 - XS1
Model label:	Dray12_6C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 2D.
Upstream face, looking downstream	

C.8 Reach 13

Survey label	R13 - XS1
Model label:	Dray13_1C

Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 2D. This structure was modelled as 100% blocked as the outlet of the structure and interaction with the railway is unknown. This a more conservative approach as it allows flow to back up onto the site.
Upstream face, looking downstream	

Survey label	R13 - XS5
Model label:	Dray13_397C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented with a WW unit in the 1D_nwk, the spill dimensions were represented using a CS line. A weir coefficient of 0.88 was used.

Upstream face, looking
downstream



C.9 Reach 14

Survey label	R14 - XS2
Model label:	Dray14_79C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 1D using a WWW unit set to a level of 38.19m AOD. The weir coefficient was set to 0.88.
Upstream face, looking downstream	

Survey label	R14 - XS3
Model label:	Dray14_102W

Type:	Weir
How has structure been modelled?	This weir was represented with a WW unit in the 1d_nwk, set to a level of 38.14m AOD. The weir coefficient was set to 0.88.
Upstream face, looking downstream	

C.10 Reach 15

Survey label	R15 - XS2
Model label:	Dray15_89C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 1D using a WWW unit and a CS line with the spill levels. The weir coefficient was set to 0.88.
Upstream face, looking downstream	

Survey label	R15 - XS4
Model label:	Dray15_202C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 1D using a WW unit set to a level of 37.19m AOD. The weir coefficient was set to 0.88.
Upstream face, looking downstream	

Survey label	R15 - XS5
Model label:	N/A
Type:	Footbridge
How has structure been modelled?	This structure was not modelled as it is unlikely to restrict flow.
Upstream face, looking downstream	

C.11 Reach 20

Survey label	R20 - XS2 and 3
Model label:	Dray20_402R
Type:	Rectangular culvert
How has structure been modelled?	This culvert was represented with a R unit in the 1d_nwk, with structure dimensions taken from the survey data and a standard roughness of 0.02. The spill was represented in the 2D.
Upstream face, looking downstream	
Downstream face, looking upstream	

Survey label	R20 - XS4
Model label:	Dray20_437B
Type:	Footbridge
How has structure been modelled?	This culvert was represented with a B unit in the 1d_nwk, with structure dimensions taken from the survey data and a roughness of 0.03.

	The spill of this structure was not represented in the model as it in high flows it would be insignificant in restricting flow.
Upstream face, looking downstream	

Survey label	R20 - XS9
Model label:	Dray20_762C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a roughness of 0.02. The spill of this structure was represented in the 1D using a WW unit set to a level of 37.03m AOD. A weir coefficient of 0.88 was used.
Upstream face, looking downstream	

Survey label	R20 - XS11
Model label:	Dray20_957C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a roughness of 0.02. The spill of this structure was represented in the 1D using a WW unit set to a level of 38.37m AOD. A weir coefficient of 0.88 was used.
Upstream face, looking downstream	

Survey label	R20 - XS12 and 13
Model label:	Dray20_1141C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a roughness of 0.02. The spill of this structure was represented in the 2D.

Upstream face, looking downstream



Downstream face, looking upstream



Survey label	R20 - XS14
Model label:	Dray20_1378C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a roughness of 0.02. The spill of this structure was represented in the 1D using a WW unit set to a level of 43.87m AOD. A weir coefficient of 0.88 was used due to the vegetation present across the spill.

Upstream face, looking
downstream



Survey label	N/A
Model label:	Dray20_1359C
Type:	Rectangular culvert
How has structure been modelled?	This culvert was represented with a R unit in the 1d_nwk, with structure dimensions taken from the River Erewash (2013) FM-TUFLOW model. The spill of this structure was represented in the 2D.
Upstream face, looking downstream	N/A

Survey label	R20 - XS15
Model label:	Dray20_1528C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a roughness of 0.02.

	The spill of this structure was represented in the 1D using a WW unit set to a level of 44.27m AOD. A weir coefficient of 0.88 was used due to the vegetation present across the spill.
Upstream face, looking downstream	

C.12 Reach 21

Survey label	R21 - XS3
Model label:	Dray21_87C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a roughness of 0.02. The spill of this structure was represented in the 1D using a WW unit set to a level of 37.35m AOD. A weir coefficient of 0.88 was used.

Upstream face, looking
downstream



Survey label	R21 - XS4
Model label:	Dray21_301C
Type:	Circular culvert
How has structure been modelled?	This culvert was represented with a C unit in the 1d_nwk, with structure dimensions taken from the survey data and a roughness of 0.02. The spill of this structure was represented in the 1D using a WW unit set to a level of 39.37m AOD. A weir coefficient of 0.88 was used due to the vegetation present across the spill.
Upstream face, looking downstream	A photograph showing the upstream face of a circular culvert, heavily overgrown with dense green vegetation. The culvert is a dark, circular opening in a dirt bank, almost completely obscured by the surrounding plants. The image is watermarked with 'gcsurveys.co.uk' in the bottom right corner.

D Hydrology report

Surface Water Rainfall-Runoff Estimation Report

Draycott Road, Breaston

Draft

August 2025

www.jbaconsulting.com

Description

This report template is based on a supporting document to the Environment Agency's Flood Estimation Guidelines (LIT 11832). It provides a record of the hydrological context, the method statement, the calculations, the decisions made, and the results of flood estimation.

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Approval

Revision stage	Analyst	Approved by	Amendments	Date
Method statement	Olalekan Ajayi BSc MSc	N/A	N/A	N/A
Calculations - Revision 1	Olalekan Ajayi BSc MSc	Samantha Cogan BSc MSc	N/A	13/05/25
Calculations - Revision 2				

Revision history

Revision reference	Date issued	Amendments	Issued to
Version 1	August 2025		Peveril Homes

Abbreviations

AEP	annual exceedance probability
AMAX	annual maximum
AREA	catchment area (km ²)
ARF	areal reduction factor
BFI	baseflow index
BFIHOST19	baseflow index derived using the HOST soil classification, revised in 2019
CPRE	Council for the Protection of Rural England
FARL	FEH index of flood attenuation due to reservoirs and lakes
FEH	Flood Estimation Handbook
HOST	Hydrology of Soil Types
LLFA	Local Lead Flood Authority
NRFA	National River Flow Archive
OS	Ordnance Survey
QMED	median annual flood (with return period 2 years)
ReFH2	Revitalised Flood Hydrograph 2 method
RoFSW	Risk of Flooding from Surface Water
SAAR	standard average annual rainfall (mm)
Tp	time to peak of the instantaneous unit hydrograph
uFMfSW	Updated Flood Map for Surface Water
URBAN	Flood Studies Report index of fractional urban extent
URBEXT2000	revised index of urban extent

1 Method statement

1.1 Requirements for flood estimates

1.1.1 Overview

JBA Consulting were commissioned by Peveril Homes to develop a 1D-2D pluvial model for a proposed development site that is located on a green belt land between Jacksdale and Westwood (SK4498233837) along Draycott Road, Breaston, Derbyshire.

The proposed development site is drained by network of drainage ditches/unnamed watercourses towards the Golden Brook, which flows adjacent to the eastern site boundary. Golden Brook flows southward through culverts and ditches, towards River Derwent. In addition the A6005 and A52 road network run through the catchment, which may affect distribution of surface runoff and/or affect transfer of runoff from one side of the catchment to the other.

The on-site network of drainage ditches are too minor to be included in the Environment Agency's Flood Map for Planning but are captured in the Risk of Flooding from Surface Water (RoFSW) maps. These RoFSW maps rely on broadscale modelling, using LiDAR data to estimate the capacity of drains and ditches and does not consider flow limiting structures, such as culverts. Given that pluvial modelling is generally considered more accurate for assessing flooding from smaller watercourses with catchment areas under 3km², a detailed surface water hydraulic model, supported by appropriate rainfall hyetographs, is necessary. This will provide a refined assessment of surface water flood risk, both on-site and to off-site receptors, for the proposed development site.

In view of this, the objective of this study is to accurately assess surface water runoff of the proposed site. A new hydrological assessment is therefore required to derive inflow hyetographs for input to a hydraulic model.

Design event peak flow estimates and hyetographs are required for the 3.3%, 1% and 0.1% AEP events. In addition, the effects of climate change will be accounted for, using the latest guidance, by applying a 40% uplift¹ to the 1% AEP event peak rainfall allowance. This represents the upper end allowance estimates for the 2050s and 2070s epoch for the Lower Trent and Erewash Management Catchment.

This document details the hydrological assessment, which has been undertaken using

¹ <https://environment.data.gov.uk/hydrology/climate-change-allowances/rainfall>

the latest methods, software, guidance, and data.

1.2 The catchment

Study site description:

The proposed development site is predominantly used for agricultural activities. It is made up of green and brown fields and few portion of fallow ground as shown in Figure 1-1 Catchment Boundary. It is steep at the northern part of the catchment and has a moderate slope southward of the catchment to define the topographic pattern of the proposed site.

The proposed site is bisected by several small unnamed drainage channels which drain into the Golden Brook at the eastern boundary, which flows southward through culverts and ditches before eventually discharging into the River Derwent. Due to the size and the topographic profile of the site (Figure 2-2) the site does not fall into one singular drainage catchment. The section below describes the central drainage catchment applicable to the site and is considered a fair representation of the other drainage catchments to the east and west.

Catchment description:

The underlying geology of the catchment has been assessed using the British Geological Survey² (BGS) Mapping and it is predominantly made of mudstone formation with a small portion of sandstone and mudstone formation at the northwest of the catchment as shown in Figure 1-3. The superficial deposits (Figure 1-4) identified within this catchment are sand and gravel and terrace deposit. These formations are sedimentary in nature with fluvial origin and detrital, ranging from coarse- to fine-grained.

The catchment soil³ is predominantly slightly acid loamy and clayey soil with impeded drainage and its texture is composed of loamy some clayey with moderate to high fertility.

The Environment Agency LiDAR DTM data (2022)⁴ shows that the catchment topography has moderate slope towards the southern part of the catchment and steep at the northern part of the catchment. It ranges from 29mAOD and 79mAOD as shown in Figure 1-5.

The annual rainfall (SAAR) for the period 1961 – 1990 is 638mm which is below the average compared to the UK average rainfall (1080mm). The catchment is located within the Midlands regional climate. A large portion of the Midlands lies in the 'rain

² <https://www.bgs.ac.uk/map-viewers/geoindex-onshore/>

³ <https://www.landis.org.uk/soilscapes/>

⁴ <https://environment.data.gov.uk/dataset/09ea3b37-df3a-4e8b-ac69-fb0842227b04>

shadow' of the Welsh mountains. This makes the regional climate relatively dry⁵. In terms of catchment response, this region has rapid runoff in urban area and flashy hydrological responses of the major drainage systems. Due to the topographic pattern of the proposed site, prolonged rainfall can lead to saturated soils and increasing the risk of surface water flooding.

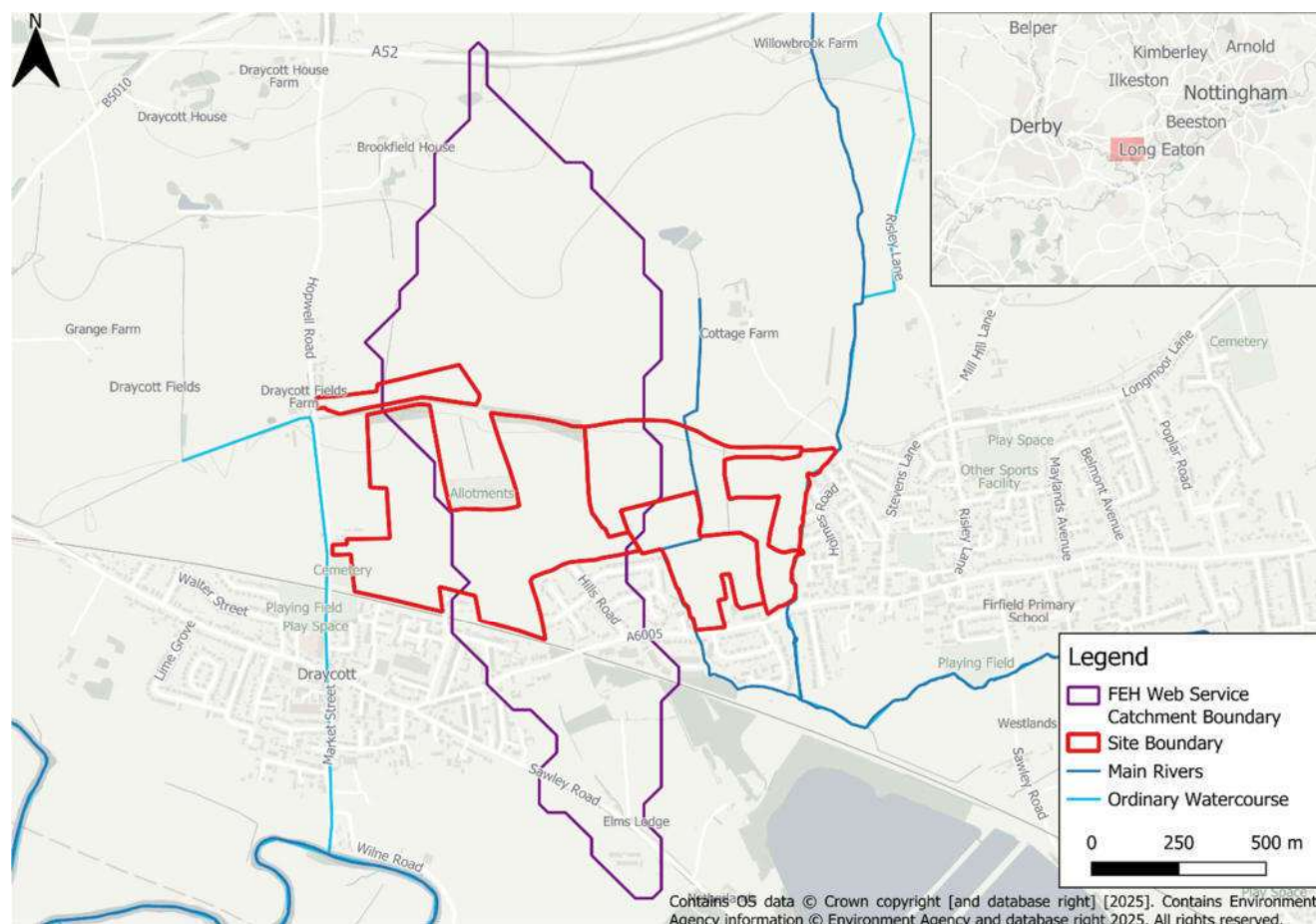


Figure 1-1 Catchment Boundary

5 Met Office (2016) Midlands: climate. Accessed 16/05/2024. [Source: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/uk-past-events/regional-climates/midlands_-_climate---met-office.pdf]

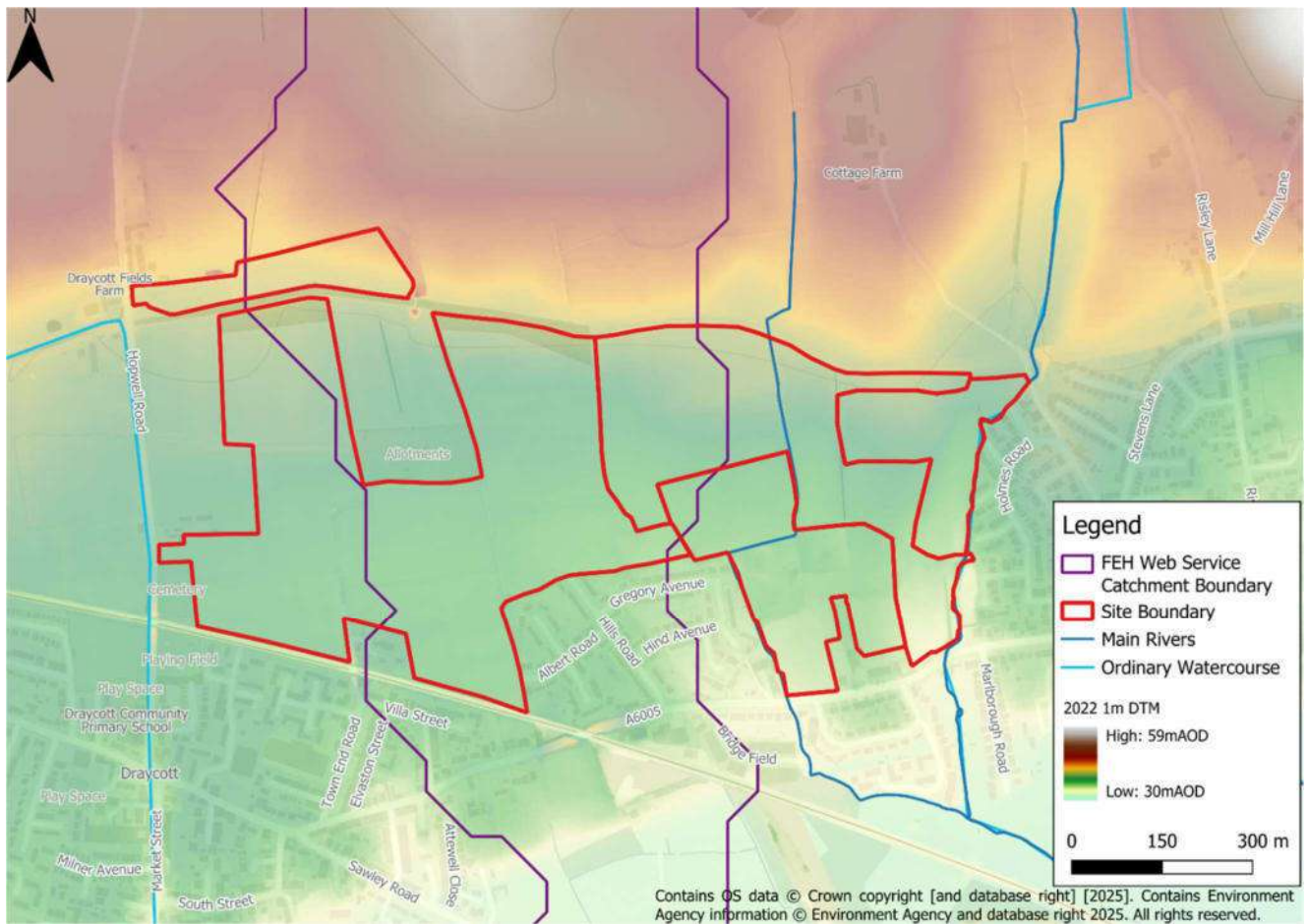


Figure 1-2 Drainage catchment

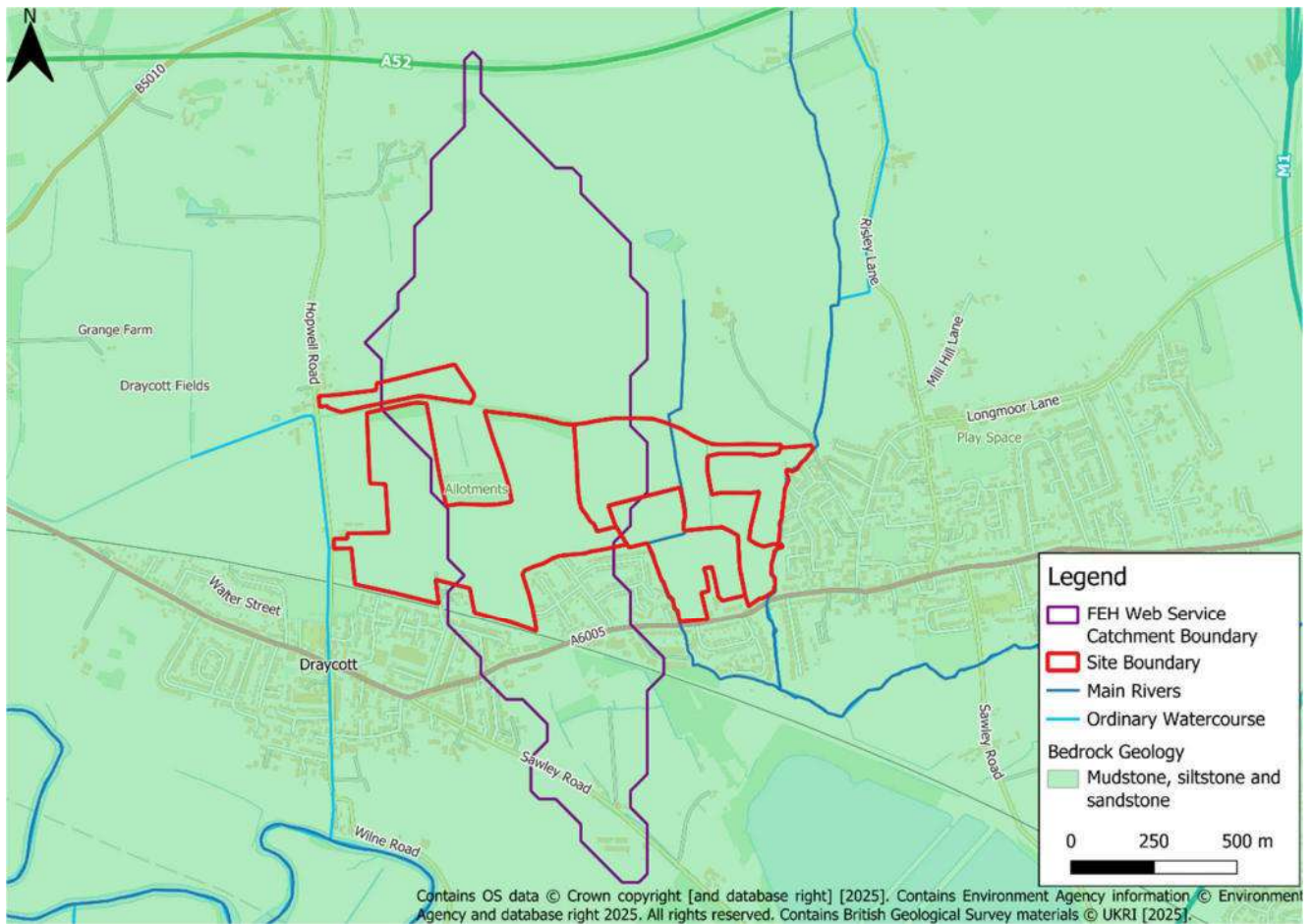


Figure 1-3 Catchment geology

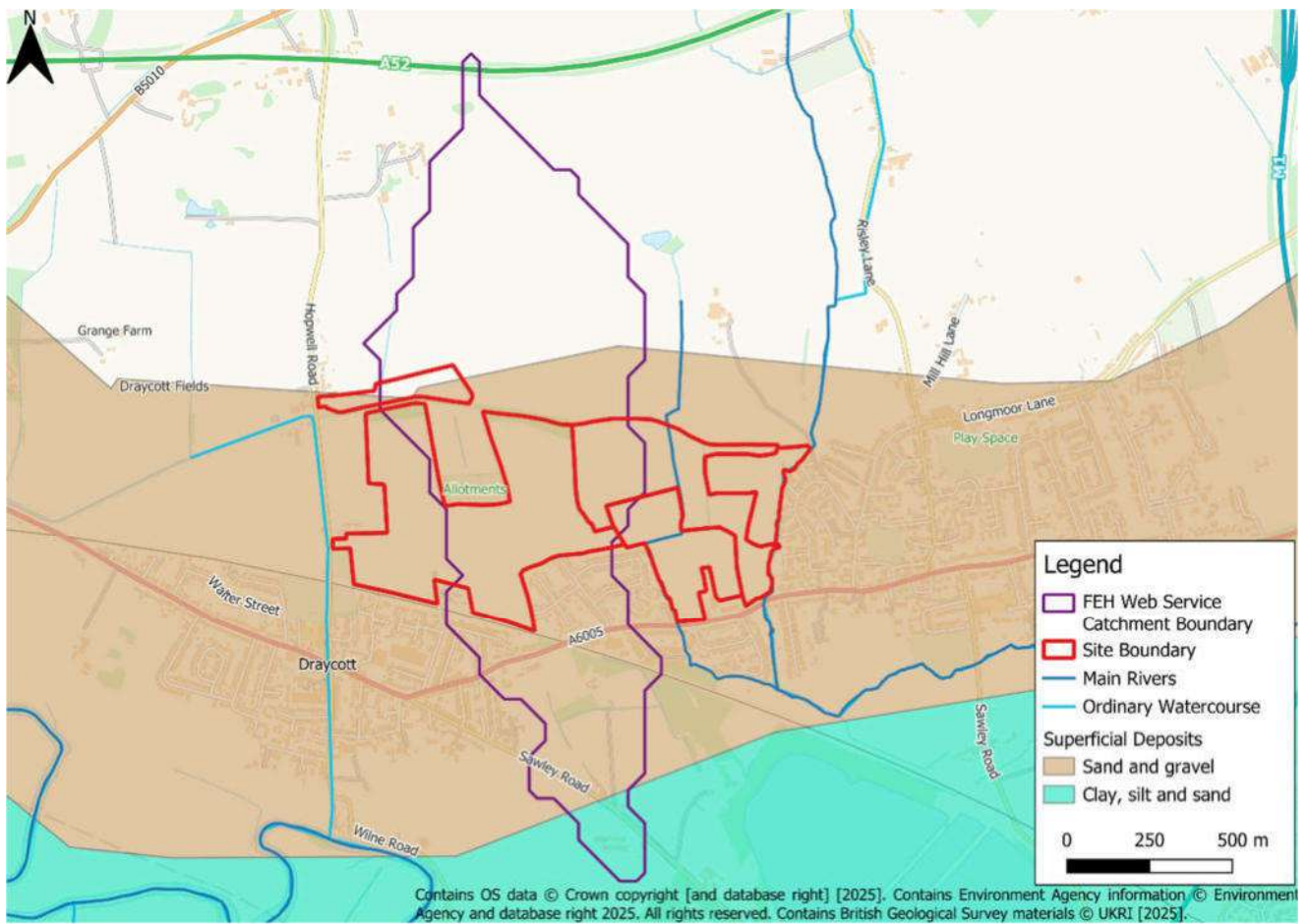


Figure 1-4: Catchment Superficial geology

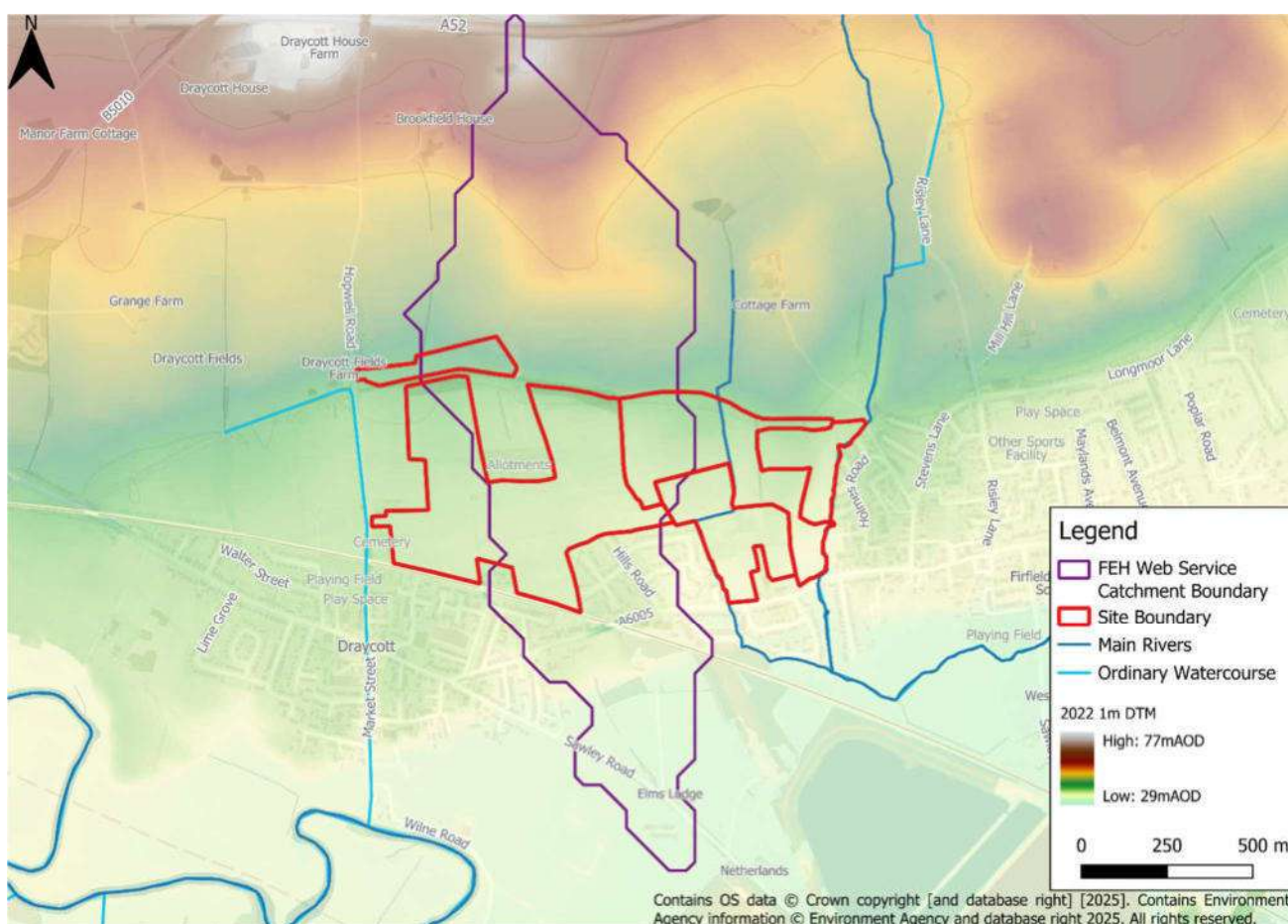


Figure 1-5 Catchment topography

1.3 Data review

This section provides a summary of the data available for the study, initial discussion of data quality, and identifies potential uses of the data for the hydrological assessment. Where relevant an indication is provided regarding other potential uses of the data, for example, hydraulic model calibration. Where applicable, the data is examined in more detail in Section 1.4.

The catchment is ungauged. A review of flood history has been carried out and is detailed in Section 1.3.2.

1.3.1 Gauging station details: Rainfall

Station name	Grid reference	Gauging authority number	Data type
Draycott	SK4310033580	110622	Recording

The Draycott rain gauge is located within close proximity to the study catchment and it was included within this section because it is in the same climatic region with the proposed site.

Data available

Station name	Start and end dates of supplied data (and source of data)	Data resolution	Comments on station
Draycott	22 Feb. 1999 to date	15minute/daily	None

Uses of the data for this study: N/A - No flood event analysis in project scope.

1.3.2 Flood history

Data available

Event date	Flooding source	Details
December 1965	Fluvial River Derwent	The Environment's Recorded Flood Outlines dataset shows that the River Derwent's channel capacity was exceeded due to no raised defences at the south of the catchment.
Recurrent	Surface Water Flooding	The locals ⁶ reported that road floods and overflows Bagthorpe Brook is a common occurrence.

Uses of the data for this study:

Flood history data/information is used to understand the impacts of observed flooding events and may be useful to compare the hydraulic modelling results. There is no record of flooding in this proposed site and the flood event in 1965 did not extend to the study site and catchment. News reports, which includes anecdotal evidence, shows that there is recurrent road floods during times of heavy rainfall and Bagthorpe Brook, opposite the site, also regularly overflows⁶. However, at this stage, there are no viable flood events in order to validate model results.

⁶ <https://www.nottinghampost.com/news/local-news/concerns-new-homes-plans-lead-8856938>

1.4 Hydrological understanding of the catchment

1.4.1 Conceptual model

The proposed development site lies within the greenfield/brownfield along the Draycott road, Breaston. It is drained by network of unnamed watercourses towards the Golden Brook at the eastern part of the catchment and flows southward through culverts and ditches towards River Derwent. The A6005 and A52 road network run through the catchment, which may affect distribution of surface runoff and/or affect transfer of runoff from one side of the catchment to the other.

The Environment Agency Risk of Flooding from Surface Water (RoFSW) maps indicate that the site is affected by a surface water overland flow route during the 3.3%, 1% and 0.1% AEP events which are presumably associated to lack of capacity of the drains/ditches and the minor watercourse particularly at the culverts under Draycott road which has been reported to have built up silt⁷. Also, there are cases of road flooding during heavy rainfall and watercourses exceeding their capacity are regular occurrence within the area of the proposed site.

Flooding at this location is therefore thought to be caused by lack of capacity of drains/ditches crossing the site, driven by overland flows generated both upstream and within the site boundary. Due to the underlying soils (impeded drainage) and the topographic characteristics of the catchment, prolonged rainfall events will likely lead to high saturation of soil, increasing the risk of surface water flooding within the site.

1.4.2 Unusual catchment features

No unusual features were identified within the catchment.

1.5 Initial choice of approach

Initial choice of method(s) and reasons:

The sewer system will not be represented in the model however in line with the EA guidance its influence will be taken into consideration within the simulations. Rainfall hyetographs are required as input to the surface water hydraulic model. The 2025 Risk of Flooding from Surface Water (RoFSW) methodology⁸ has been followed as closely as possible to generate the hyetographs for this study. A climate change allowance of 40% will be applied to the peak rainfall in both the rural and urban hyetographs for the 1% AEP event.

Urban Hyetographs

⁷ <https://www.breastonparishcouncil.gov.uk/wp-content/uploads/2024/05/Minutes-Ordinary-April-2024-public.pdf>

⁸ Risk of flooding from surface water – understanding and using the map - GOV.UK

Rainfall hyetographs are required as input to the hydraulic model. The 2025 Risk of Flooding from Surface Water (RoFSW) methodology has been followed to generate net (accounting for losses) rainfall hyetographs for the urban areas covered within both the drainage catchment and the proposed model catchment.

Design Rainfall Hyetographs for the model will be derived from FEH22 DDF rainfall statistics in the ReFH2 model. Hyetographs will be derived for 1, 3 and 6-hour storm durations for the 3.3%, 1% and 0.1% AEP events. Hyetographs will be tested using the hydraulic model, in order to determine the critical storm duration for each return period.

Rural Hyetographs

Rainfall hyetographs are required as input to the hydraulic model for rural areas which does not consider sewer losses. For hyetographs for the rural areas of both the drainage catchment and the proposed model catchment - which will differ as the study site does not fall within a singular drainage catchment (Section 1.2) so therefore cannot be the basis for a direct rainfall model zone - design hyetographs derived from ReFH2 where losses for the direct rainfall have applied in the hydraulic model will be provided.

Software to be used:

- FEH Web Service⁹
- ReFH 2.3-FEH22 Calibrated

1.6 Selection of flood estimation locations

⁹ CEH 2015. The Flood Estimation Handbook (FEH) Online Service, Centre for Ecology & Hydrology, Wallingford, UK.

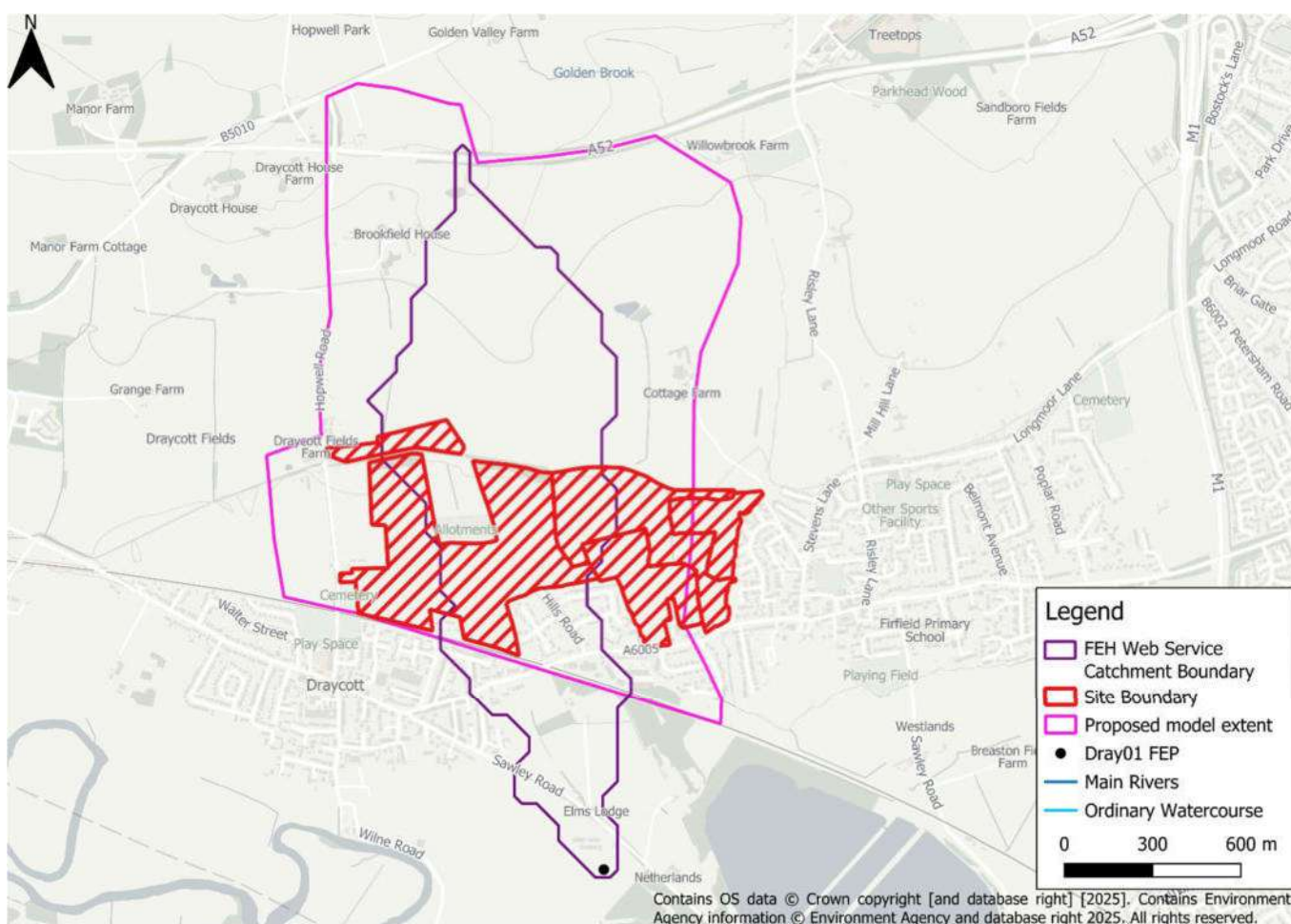


Figure 1-6: Flow estimation points

Site code	Type of estimate:	Watercourse	Site name / description	Easting	Northing
Dray01	L	N/A – study is for pluvial flood risk.	Downstream of the proposed development site	445150	332650

L = lumped catchment

Further details on flood estimation location selection:

The drainage catchment encompasses the majority of the proposed development site and was deemed the most suitable basis for this hydrological assessment due to its hydro-climatological similarity and the need for a suitable catchment to form the basis of hyetograph generation within ReFH2. While the full site boundary does not fall into

the drainage catchment boundary, it will be included within the direct rainfall hydraulic model extent.

2 Locations where flood estimates are required

2.1 Catchment boundary checks and revisions

The FEH Webservice catchment boundary (Original catchment downstream Grid reference: 445150,332650) was maintained to represent the proposed drainage catchment boundary. It should be noted that the FEH catchment does not cover the entire site location, however it covers a large proportion and is presumed to be hydro-climatologically similar to the other drainage catchments that cover the full site boundary.

An areal reduction factor (ARF) of 1 will be applied within ReFH2 as there is no defined catchment into which the rainfall is falling. The direct rainfall approach to surface water mapping is viewed as merging together many separate point rainfall events during a single model run for hyetograph application to a model, which will consider the surface water network extent. It is felt that the application of a ARF of 1 is warranted within this study as the study drainage catchment used within this study and the model 2D zone will not be the same.

Severn Trent Water (STW) sewer maps were obtained which shows no surface water sewer discharge point to Golden Stream from the urban area.

2.2 Other catchment descriptor checks and revisions

URBEXT:

As the study is to derive surface water flood extents, no checks or updates, bar a standard update to current year, was made to URBEXT2000 as it has no basis in deriving rainfall hyetographs for ReFH2 modelling.

BFIHOST:

The FEH BFIHOST19 value for the study catchment appears to be on the higher range (but is not over 0.65 which would classify the catchment as 'highly permeable') which usually does not align with a mudstone bedrock presence. However, while the bedrock is considered to be relatively impermeable, there is a significant cover of superficial deposits (sand and gravel and terrace deposits - Figure 1-4) which is considered to be a contributing factor to the value of 0.64. As an additional check, local borehole data using the Geology of Britain GeoIndex (onshore) Viewer² was used to confirm the presence of the superficial deposits within the catchment. Therefore the BFIHOST19 value of 0.64 is considered representative and has been retained without amendment.

FARL:

As the study is to derive surface water flood extents no checks or updates were made to FARL as it has no basis in deriving rainfall hyetographs for ReFH2 modelling.

Version of URBEXT: URBEXT2000

Method for updating URBEXT: CPRE formula from 2006 CEH report on URBEXT2000

Version of BFIHOST: BFIHOST19

2.3 Catchment descriptors

Final catchment descriptors at each subject site:

Site code	AREA on FEH Web Service (km ²)	Revised AREA (km ²)	BFIHOST19	DPLBAR (km)	DPSBAR (m/km)	FARL	FPEXT	PROPWET	SAAR (mm)	URBEXT 2000
Dray01	1.2	-	0.637	1.52	15.5	1	0.214	0.35	638	0.1098

Manually updated descriptors are shown in red.

3 Rainfall Hyetographs

3.1 Urban Hyetographs

The ReFH2.3 (fed using FEH22 rainfall statistics) model was used to derive rainfall hyetographs for the study area using the proposed drainage catchment as FEH22 provides more up-to-date record over FEH13.

The 2025 Risk of Flooding from Surface Water (RoFSW) methodology for urban method rainfall will be undertaken to provide modellers hyetographs which account for sewer losses within urban areas.

Unlike the previous 2019 methodology used for hyetograph generation in urban areas¹⁰, which utilised FEH99 rainfall statistics, set the coefficient for the urban runoff as 70% and used a default loss rate of 12mm/hr to represent the effects of an urban drainage system, the 2025 RoFSW urban method included updates to the following urban parameters:

- In urban areas (identified using Ordnance Survey data), the surface is represented as 100% impervious with no distinction between city centre runoff coefficients and suburban runoff coefficients
- Application of a default loss rate of 18mm/hr however loss rate varies between 13 and 25 mm/hr if local information was available or for calibration/validation purposes.

The previous 2019 methodology did not apply an areal reduction factor (ARF) to the FEH DDF parameters and there is no mention as to if the 2025 RoFSW method followed the same principle. Therefore, within this study an areal reduction factor (ARF) of 1 was therefore applied to the rainfall, and seasonal correction factor remained as default for the catchment, chosen by ReFH2 because, unlike for fluvial studies, there is no defined catchment into which the rainfall is falling. The direct rainfall approach to surface water mapping can be viewed as merging together many separate point rainfall events during a single model run.

Hyetographs for a 1.1hr, 3.1hr and 6.1hr storm duration were generated. The previous 2019 methodology used 1hr, 3hr and 6hr storm durations and again there is no mention as to if the 2025 RoFSW method followed the same principle, therefore the standard 2019 durations were adopted for use however additional durations will be provided if the 6hour duration is the critical out of the three. ReFH2 requires the use of a data interval which gives an odd integer when the storm duration is divided by the timestep.

¹⁰ Environment Agency (2019) What is the Risk of Flooding from Surface Water map? Report version 2.0 - April 2019. Source: What is the Risk of Flooding from Surface Water Map? (publishing.service.gov.uk)

This is the reason for the slight discrepancy in storm durations between this study and the durations applied within ReFH2.3. A data interval of 6 minutes was used for all storm durations.

Hyetographs for both summer and winter seasons were exported and will be tested in the Rainfall-Runoff model, along with the range of storm durations, to determine which is critical to take forward to the chosen modelling profile.

3.2 Rainfall hyetograph (with losses) – Urban

For the urban hyetograph losses, and in line with the 2025 RoFSW method, no losses due to infiltration were applied to the ReFH2.3 exported design rainfall hyetographs. A loss of 18mm/hr to represent the drainage system was applied to the design rainfall hyetographs (i.e. 0.1hr (6 minute) data interval has a loss of 1.8mm/6 minutes).

Table 3-1: Rural net rainfall and calculated urban net rainfall winter outputs – 1% AEP return period, 1-hour Storm Duration

Time (hr)	Design rainfall (mm)	Rural net rainfall (mm)	Drainage capacity (mm)	Calculated Urban net rainfall (mm)
00:00:00	0.56	0.07	1.80	0.00
00:06:00	0.93	0.13	1.80	0.00
00:12:00	1.55	0.21	1.80	0.00
00:18:00	2.57	0.36	1.80	0.77
00:24:00	4.18	0.61	1.80	2.38
00:30:00	5.75	0.89	1.80	3.95
00:36:00	4.18	0.68	1.80	2.38
00:42:00	2.57	0.44	1.80	0.77
00:48:00	1.55	0.27	1.80	0.00
00:54:00	0.93	0.16	1.80	0.00
01:00:00	0.56	0.10	1.80	0.00

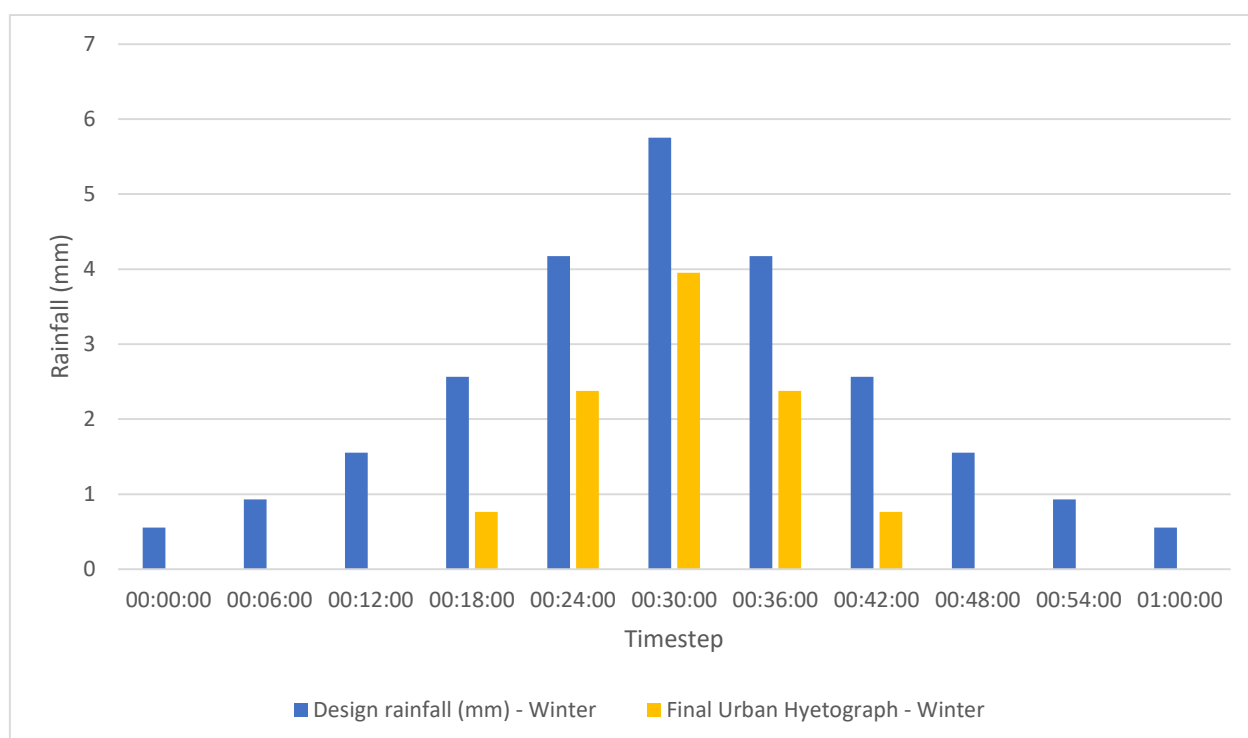


Figure 3-1: DDF Urban Rainfall - 1% AEP rainfall hyetograph (1.1-hour storm) winter outputs – urban

Table 3-2: Gross Urban net rainfall estimates from the ReFH2 method – 1 hour storm duration, FEH22 model (mm)

AEP	Winter – Urban	Summer – Urban
3.3%	5.4	17.2
1%	10.2	27.2
0.1%	24.6	55.2

3.3 Rural Design Hyetographs

Design hyetographs for the model rural areas have been derived from ReFH2.3 (fed using FEH22 rainfall statistics) where losses for the direct rainfall have been applied in the hydraulic model are also required. The hyetographs derived with infiltration losses accounted for are suitable for application on rural areas.

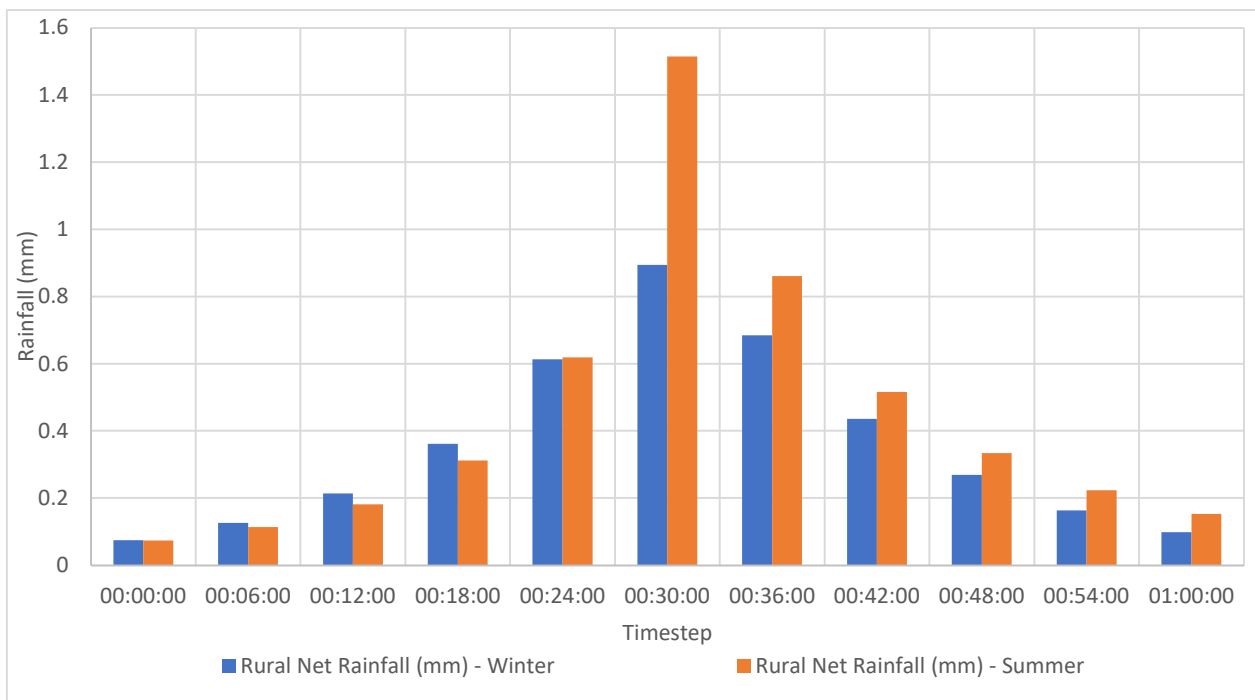


Figure 3-2: 1% AEP design rainfall hyetograph (1.1-hour storm) summer and winter profile - Rural

Table 3-3: Gross Rural net Rainfall estimates from the ReFH2 method – 1 hour storm duration, FEH22 model (mm)

AEP	Winter – Rural	Summer – Rural
3.3%	2.8	3.3
1%	3.9	4.9
0.1%	7.2	10.1

4 Discussion and summary of results

4.1 Choice of method and reasons:

The 2025 Risk of Flooding from Surface Water (RoFSW) methodology has been followed as closely as possible to generate the hyetographs for this study. As infiltration for rural areas and sewer losses for urban areas have not been applied within the model, the preferred method for hyetograph generation is the use of FEH22 rainfall statistics and ReFH2 to derive the gross rainfall (depth-duration-frequency (DDF) rainfall) for the rural-net and urban loss rainfall outputs.

FEH22 rainfall statistics, as the most up to date statistics available, have been used to generate both rural and urban rainfall hyetographs for application within the hydraulic model portion of this study. No losses due to infiltration in urban areas have applied to the ReFH2.3 exported design rainfall hyetographs, in line with RoFSW where in urban areas the surface was represented as 100% impervious and application of a default loss rate of 18mm/hr was used.

For design scenario, the summer events give more conservative ReFH2 peak flows than the winter outputs and so it's recommended that the summer outputs are taken forward for modelling purposes.

An assessment of the catchment indicates that the drainage catchment and proposed model extent is a mixture of rural and urban cover. The RoFSW urban rainfall was applied to the sections of the model/catchment designated as urban while rural rainfall was applied to the rural areas of the model/catchment so as the model results are representative of the study catchment.

No baseflows have been included within the hydraulic model.

4.2 Assumptions, limitations, and uncertainty

Assumptions:

- As the drainage catchment is small, and does not cover the entire 2D modelled zone, it was assumed that the rainfall is relatively uniform across the entire area and that the spatial distribution of intense rainfall is unlikely to differ significantly from one point to the others.
- The rainfall statistics for urban hyetograph generation gives an accurate representation of rainfall over the study area.
- Urban drainage capacity is 18mm/hr across the urban areas of the catchment with no infiltration.

- The rural net rainfall hyetographs from ReFH2 estimates losses are effectively modelled by the ReFH2 loss model, and catchment descriptors are representative of the whole catchment.

Limitations:

The catchment size and typology are suitable for the methods carried out in this analysis. However, as the catchment is ungauged the resultant flow values (once the rainfall has been run through the 2D hydraulic model) cannot be verified.

Suitability of results for future studies:

It is emphasised that the results of the analysis should be considered in the context of the needs of this study. The results of this assessment should be revisited for use on future studies.

Once the baseline model has been undertaken, using the hyetographs provided within this study, consultation with the client should be undertaken to ensure that the baseline model results match on-site knowledge of flood mechanisms on site.

4.3 Final results

It should be noted that the 1% AEP flows were also generated for the 8.1 hour duration to confirm that the 6 hour duration was critical. The critical duration used identified within the hydraulic modelling was shown to be the 6 hour summer duration.

4.3.1 Urban Rainfall

Table 4-1: Peak Rainfall (mm/hr): Summer Scenario - Urban

AEP	1-hour Storm Duration	3-hour Storm Duration	6-hour Storm Duration
3.3%	86	48	26
1%	121	70	40
1% + 40% CC	177	106	63
0.1%	213	125	74

Table 4-2: Gross Rainfall (mm): Summer Scenario - Urban

AEP	1-hour Storm Duration	3-hour Storm Duration	6-hour Storm Duration
3.3%	17.2	12.6	6.8
1%	27.2	22.6	14.3
1% + 40% CC	43.8	41.1	30.5
0.1%	55.2	52.1	39.8

4.3.2 Rural Rainfall

Table 4-3: Peak Rainfall (mm/hr): Summer Scenario - Rural

AEP	1-hour Storm Duration	3-hour Storm Duration	6-hour Storm Duration
3.3%	10	7	5
1%	15	11	8
1% + 40% CC	20	15	10
0.1%	31	22	15

Table 4-4: Gross Rainfall (mm): Summer Scenario - rural

Return Period	1-hour Storm Duration	3-hour Storm Duration	6-hour Storm Duration
3.3%	3.3	5.0	6.3
1%	4.9	7.5	9.3
1% + 40% CC	6.5	10.1	12.7
0.1%	10.1	15.3	18.9

5 Appendix

- ReFH2 PDF report for 1% AEP event – 6hr event.

UK Design Flood Estimation

Generated on 16 May 2025 12:32:14 by jflownw
Printed from the ReFH2 Flood Modelling software package, version 4.1.8879.22310

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH2)

Site detailsChecksum: A68C-2CB6

Site name: FEH_Catchment_Descriptors_445150_332650_v5_0_1

Easting: 445150

Northing: 332650

Country: England, Wales or Northern Ireland

Catchment Area (km²): 1.18

Using plot scale calculations: No

Model: 2.3

Site description:None

Model run: 100 year

Summary of results

Rainfall - FEH22 (mm):	71.42	Total runoff (ML):	14.41
Total Rainfall (mm):	70.60	Total flow (ML):	40.32
Peak Rainfall (mm):	5.79	Peak flow (m³/s):	0.72

Parameters

Where the user has overridden a system-generated value, this original value is shown in square brackets after the value used.
* Indicates that the user locked the duration/timestep

Rainfall parameters (Rainfall - FEH22)

Name	Value	User-defined?
Duration (hh:mm:ss)	06:06:00 [05:30:00]	Yes
Timestep (hh:mm:ss)	00:06:00 [00:30:00]	Yes
SCF (Seasonal correction factor)	0.99	No
ARF (Areal reduction factor)	1 [0.98]	Yes
Seasonality	Summer [Winter]	Yes

Loss model parameters

Name	Value	User-defined?
Cini (mm)	40.69	No
Cmax (mm)	579.5	No
Use alpha correction factor	No	No
Alpha correction factor	n/a	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	3.37	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m ³ /s)	0.01	No
BL (hr)	41.77	No
BR	2.49	No

Urbanisation parameters

Name	Value	User-defined?
Sewer capacity (m ³ /s)	0	No
Exporting drained area (km ²)	0	No
Urban area (km ²)	0.2	No
Effective URBEXT2000	0.11	n/a
Impervious runoff factor	0.7	No
Imperviousness factor	0.4	No
Tp scaling factor	0.75	No
Depression storage depth (mm)	0.5	No

Time series data

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m³/s)	Net Rain (mm)	Runoff (m³/s)	Baseflow (m³/s)	Total Flow (m³/s)
00:00:00	0.249	0.000	0.028	0.000	0.005	0.005
00:06:00	0.267	0.000	0.031	0.000	0.005	0.005
00:12:00	0.286	0.000	0.033	0.000	0.005	0.005
00:18:00	0.307	0.000	0.036	0.000	0.005	0.006
00:24:00	0.329	0.000	0.039	0.001	0.005	0.006
00:30:00	0.353	0.000	0.042	0.001	0.005	0.006
00:36:00	0.380	0.000	0.045	0.001	0.005	0.007
00:42:00	0.408	0.000	0.049	0.002	0.005	0.007
00:48:00	0.439	0.000	0.053	0.003	0.005	0.008
00:54:00	0.473	0.000	0.057	0.004	0.005	0.009
01:00:00	0.510	0.000	0.062	0.005	0.005	0.010
01:06:00	0.550	0.000	0.067	0.006	0.005	0.011
01:12:00	0.595	0.000	0.073	0.007	0.005	0.012
01:18:00	0.644	0.000	0.080	0.009	0.005	0.014
01:24:00	0.697	0.000	0.087	0.010	0.005	0.015
01:30:00	0.756	0.000	0.096	0.012	0.005	0.017
01:36:00	0.822	0.000	0.105	0.014	0.005	0.020
01:42:00	0.896	0.000	0.116	0.017	0.005	0.022
01:48:00	0.978	0.000	0.128	0.019	0.005	0.025
01:54:00	1.069	0.000	0.141	0.022	0.005	0.028
02:00:00	1.173	0.000	0.157	0.026	0.005	0.031
02:06:00	1.292	0.000	0.176	0.029	0.006	0.035
02:12:00	1.428	0.000	0.198	0.033	0.006	0.039
02:18:00	1.586	0.000	0.223	0.038	0.006	0.044
02:24:00	1.771	0.000	0.254	0.043	0.006	0.049
02:30:00	1.992	0.000	0.292	0.049	0.006	0.055
02:36:00	2.272	0.000	0.341	0.055	0.006	0.061
02:42:00	2.638	0.000	0.407	0.062	0.006	0.068
02:48:00	3.173	0.000	0.504	0.070	0.006	0.076
02:54:00	4.069	0.000	0.671	0.079	0.006	0.085
03:00:00	5.794	0.000	1.002	0.089	0.007	0.096
03:06:00	4.069	0.000	0.737	0.101	0.007	0.108
03:12:00	3.173	0.000	0.594	0.116	0.007	0.123
03:18:00	2.638	0.000	0.506	0.131	0.008	0.139

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
03:24:00	2.272	0.000	0.445	0.148	0.008	0.156
03:30:00	1.992	0.000	0.397	0.166	0.008	0.174
03:36:00	1.771	0.000	0.359	0.184	0.009	0.193
03:42:00	1.586	0.000	0.325	0.204	0.009	0.213
03:48:00	1.428	0.000	0.297	0.224	0.010	0.234
03:54:00	1.292	0.000	0.271	0.244	0.011	0.255
04:00:00	1.173	0.000	0.249	0.265	0.012	0.276
04:06:00	1.069	0.000	0.229	0.286	0.012	0.298
04:12:00	0.978	0.000	0.211	0.307	0.013	0.320
04:18:00	0.896	0.000	0.194	0.329	0.014	0.343
04:24:00	0.822	0.000	0.180	0.350	0.015	0.366
04:30:00	0.756	0.000	0.166	0.372	0.017	0.388
04:36:00	0.697	0.000	0.154	0.394	0.018	0.411
04:42:00	0.644	0.000	0.143	0.415	0.019	0.434
04:48:00	0.595	0.000	0.133	0.436	0.020	0.457
04:54:00	0.550	0.000	0.123	0.457	0.022	0.479
05:00:00	0.510	0.000	0.115	0.478	0.023	0.501
05:06:00	0.473	0.000	0.107	0.498	0.025	0.523
05:12:00	0.439	0.000	0.099	0.518	0.027	0.545
05:18:00	0.408	0.000	0.093	0.537	0.028	0.565
05:24:00	0.380	0.000	0.086	0.555	0.030	0.585
05:30:00	0.353	0.000	0.081	0.572	0.032	0.604
05:36:00	0.329	0.000	0.075	0.587	0.034	0.621
05:42:00	0.307	0.000	0.070	0.601	0.036	0.637
05:48:00	0.286	0.000	0.066	0.612	0.038	0.651
05:54:00	0.267	0.000	0.061	0.623	0.040	0.663
06:00:00	0.249	0.000	0.057	0.632	0.043	0.675
06:06:00	0.000	0.000	0.000	0.640	0.045	0.685
06:12:00	0.000	0.000	0.000	0.647	0.047	0.695
06:18:00	0.000	0.000	0.000	0.653	0.050	0.702
06:24:00	0.000	0.000	0.000	0.656	0.052	0.709
06:30:00	0.000	0.000	0.000	0.658	0.055	0.713
06:36:00	0.000	0.000	0.000	0.658	0.057	0.715
06:42:00	0.000	0.000	0.000	0.656	0.060	0.715
06:48:00	0.000	0.000	0.000	0.652	0.062	0.715

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
06:54:00	0.000	0.000	0.000	0.648	0.065	0.713
07:00:00	0.000	0.000	0.000	0.642	0.067	0.710
07:06:00	0.000	0.000	0.000	0.636	0.070	0.706
07:12:00	0.000	0.000	0.000	0.628	0.072	0.701
07:18:00	0.000	0.000	0.000	0.620	0.075	0.695
07:24:00	0.000	0.000	0.000	0.612	0.077	0.689
07:30:00	0.000	0.000	0.000	0.602	0.080	0.682
07:36:00	0.000	0.000	0.000	0.592	0.082	0.674
07:42:00	0.000	0.000	0.000	0.582	0.085	0.666
07:48:00	0.000	0.000	0.000	0.571	0.087	0.658
07:54:00	0.000	0.000	0.000	0.560	0.089	0.649
08:00:00	0.000	0.000	0.000	0.548	0.091	0.640
08:06:00	0.000	0.000	0.000	0.537	0.094	0.631
08:12:00	0.000	0.000	0.000	0.525	0.096	0.621
08:18:00	0.000	0.000	0.000	0.514	0.098	0.612
08:24:00	0.000	0.000	0.000	0.502	0.100	0.602
08:30:00	0.000	0.000	0.000	0.490	0.102	0.592
08:36:00	0.000	0.000	0.000	0.478	0.104	0.582
08:42:00	0.000	0.000	0.000	0.466	0.106	0.572
08:48:00	0.000	0.000	0.000	0.454	0.108	0.562
08:54:00	0.000	0.000	0.000	0.442	0.110	0.551
09:00:00	0.000	0.000	0.000	0.430	0.112	0.541
09:06:00	0.000	0.000	0.000	0.418	0.113	0.531
09:12:00	0.000	0.000	0.000	0.406	0.115	0.520
09:18:00	0.000	0.000	0.000	0.394	0.117	0.510
09:24:00	0.000	0.000	0.000	0.382	0.118	0.500
09:30:00	0.000	0.000	0.000	0.370	0.120	0.489
09:36:00	0.000	0.000	0.000	0.358	0.121	0.479
09:42:00	0.000	0.000	0.000	0.347	0.122	0.469
09:48:00	0.000	0.000	0.000	0.336	0.124	0.459
09:54:00	0.000	0.000	0.000	0.325	0.125	0.450
10:00:00	0.000	0.000	0.000	0.315	0.126	0.441
10:06:00	0.000	0.000	0.000	0.305	0.128	0.432
10:12:00	0.000	0.000	0.000	0.295	0.129	0.424
10:18:00	0.000	0.000	0.000	0.286	0.130	0.416

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
10:24:00	0.000	0.000	0.000	0.276	0.131	0.407
10:30:00	0.000	0.000	0.000	0.267	0.132	0.399
10:36:00	0.000	0.000	0.000	0.258	0.133	0.392
10:42:00	0.000	0.000	0.000	0.250	0.134	0.384
10:48:00	0.000	0.000	0.000	0.241	0.135	0.376
10:54:00	0.000	0.000	0.000	0.233	0.136	0.369
11:00:00	0.000	0.000	0.000	0.225	0.137	0.362
11:06:00	0.000	0.000	0.000	0.217	0.138	0.355
11:12:00	0.000	0.000	0.000	0.209	0.138	0.348
11:18:00	0.000	0.000	0.000	0.201	0.139	0.341
11:24:00	0.000	0.000	0.000	0.194	0.140	0.334
11:30:00	0.000	0.000	0.000	0.186	0.141	0.327
11:36:00	0.000	0.000	0.000	0.179	0.141	0.321
11:42:00	0.000	0.000	0.000	0.172	0.142	0.314
11:48:00	0.000	0.000	0.000	0.165	0.143	0.308
11:54:00	0.000	0.000	0.000	0.158	0.143	0.302
12:00:00	0.000	0.000	0.000	0.152	0.144	0.296
12:06:00	0.000	0.000	0.000	0.145	0.144	0.290
12:12:00	0.000	0.000	0.000	0.139	0.145	0.284
12:18:00	0.000	0.000	0.000	0.134	0.145	0.279
12:24:00	0.000	0.000	0.000	0.128	0.146	0.274
12:30:00	0.000	0.000	0.000	0.123	0.146	0.269
12:36:00	0.000	0.000	0.000	0.118	0.147	0.265
12:42:00	0.000	0.000	0.000	0.113	0.147	0.260
12:48:00	0.000	0.000	0.000	0.108	0.147	0.256
12:54:00	0.000	0.000	0.000	0.104	0.148	0.251
13:00:00	0.000	0.000	0.000	0.099	0.148	0.247
13:06:00	0.000	0.000	0.000	0.095	0.148	0.243
13:12:00	0.000	0.000	0.000	0.090	0.148	0.239
13:18:00	0.000	0.000	0.000	0.086	0.149	0.235
13:24:00	0.000	0.000	0.000	0.082	0.149	0.231
13:30:00	0.000	0.000	0.000	0.078	0.149	0.227
13:36:00	0.000	0.000	0.000	0.074	0.149	0.223
13:42:00	0.000	0.000	0.000	0.070	0.149	0.219
13:48:00	0.000	0.000	0.000	0.066	0.149	0.215

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
13:54:00	0.000	0.000	0.000	0.062	0.149	0.212
14:00:00	0.000	0.000	0.000	0.058	0.150	0.208
14:06:00	0.000	0.000	0.000	0.055	0.150	0.204
14:12:00	0.000	0.000	0.000	0.051	0.150	0.201
14:18:00	0.000	0.000	0.000	0.048	0.150	0.197
14:24:00	0.000	0.000	0.000	0.044	0.149	0.194
14:30:00	0.000	0.000	0.000	0.041	0.149	0.190
14:36:00	0.000	0.000	0.000	0.038	0.149	0.187
14:42:00	0.000	0.000	0.000	0.034	0.149	0.184
14:48:00	0.000	0.000	0.000	0.031	0.149	0.180
14:54:00	0.000	0.000	0.000	0.028	0.149	0.177
15:00:00	0.000	0.000	0.000	0.026	0.149	0.174
15:06:00	0.000	0.000	0.000	0.023	0.149	0.171
15:12:00	0.000	0.000	0.000	0.021	0.148	0.169
15:18:00	0.000	0.000	0.000	0.018	0.148	0.167
15:24:00	0.000	0.000	0.000	0.017	0.148	0.164
15:30:00	0.000	0.000	0.000	0.015	0.148	0.162
15:36:00	0.000	0.000	0.000	0.013	0.147	0.161
15:42:00	0.000	0.000	0.000	0.012	0.147	0.159
15:48:00	0.000	0.000	0.000	0.011	0.147	0.157
15:54:00	0.000	0.000	0.000	0.009	0.147	0.156
16:00:00	0.000	0.000	0.000	0.008	0.146	0.155
16:06:00	0.000	0.000	0.000	0.007	0.146	0.153
16:12:00	0.000	0.000	0.000	0.007	0.146	0.152
16:18:00	0.000	0.000	0.000	0.006	0.145	0.151
16:24:00	0.000	0.000	0.000	0.005	0.145	0.150
16:30:00	0.000	0.000	0.000	0.004	0.145	0.149
16:36:00	0.000	0.000	0.000	0.004	0.144	0.148
16:42:00	0.000	0.000	0.000	0.003	0.144	0.147
16:48:00	0.000	0.000	0.000	0.003	0.144	0.146
16:54:00	0.000	0.000	0.000	0.002	0.143	0.146
17:00:00	0.000	0.000	0.000	0.002	0.143	0.145
17:06:00	0.000	0.000	0.000	0.002	0.143	0.144
17:12:00	0.000	0.000	0.000	0.001	0.142	0.144
17:18:00	0.000	0.000	0.000	0.001	0.142	0.143

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
17:24:00	0.000	0.000	0.000	0.001	0.142	0.143
17:30:00	0.000	0.000	0.000	0.001	0.141	0.142
17:36:00	0.000	0.000	0.000	0.000	0.141	0.142
17:42:00	0.000	0.000	0.000	0.000	0.141	0.141
17:48:00	0.000	0.000	0.000	0.000	0.140	0.141
17:54:00	0.000	0.000	0.000	0.000	0.140	0.140
18:00:00	0.000	0.000	0.000	0.000	0.140	0.140
18:06:00	0.000	0.000	0.000	0.000	0.139	0.139
18:12:00	0.000	0.000	0.000	0.000	0.139	0.139
18:18:00	0.000	0.000	0.000	0.000	0.139	0.139
18:24:00	0.000	0.000	0.000	0.000	0.138	0.138
18:30:00	0.000	0.000	0.000	0.000	0.138	0.138
18:36:00	0.000	0.000	0.000	0.000	0.138	0.138
18:42:00	0.000	0.000	0.000	0.000	0.137	0.137
18:48:00	0.000	0.000	0.000	0.000	0.137	0.137
18:54:00	0.000	0.000	0.000	0.000	0.137	0.137
19:00:00	0.000	0.000	0.000	0.000	0.136	0.136
19:06:00	0.000	0.000	0.000	0.000	0.136	0.136
19:12:00	0.000	0.000	0.000	0.000	0.136	0.136
19:18:00	0.000	0.000	0.000	0.000	0.136	0.136
19:24:00	0.000	0.000	0.000	0.000	0.135	0.135
19:30:00	0.000	0.000	0.000	0.000	0.135	0.135
19:36:00	0.000	0.000	0.000	0.000	0.135	0.135
19:42:00	0.000	0.000	0.000	0.000	0.134	0.134
19:48:00	0.000	0.000	0.000	0.000	0.134	0.134
19:54:00	0.000	0.000	0.000	0.000	0.134	0.134
20:00:00	0.000	0.000	0.000	0.000	0.133	0.133
20:06:00	0.000	0.000	0.000	0.000	0.133	0.133
20:12:00	0.000	0.000	0.000	0.000	0.133	0.133
20:18:00	0.000	0.000	0.000	0.000	0.132	0.132
20:24:00	0.000	0.000	0.000	0.000	0.132	0.132
20:30:00	0.000	0.000	0.000	0.000	0.132	0.132
20:36:00	0.000	0.000	0.000	0.000	0.131	0.131
20:42:00	0.000	0.000	0.000	0.000	0.131	0.131
20:48:00	0.000	0.000	0.000	0.000	0.131	0.131

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
20:54:00	0.000	0.000	0.000	0.000	0.130	0.130
21:00:00	0.000	0.000	0.000	0.000	0.130	0.130
21:06:00	0.000	0.000	0.000	0.000	0.130	0.130
21:12:00	0.000	0.000	0.000	0.000	0.129	0.129
21:18:00	0.000	0.000	0.000	0.000	0.129	0.129
21:24:00	0.000	0.000	0.000	0.000	0.129	0.129
21:30:00	0.000	0.000	0.000	0.000	0.129	0.129
21:36:00	0.000	0.000	0.000	0.000	0.128	0.128
21:42:00	0.000	0.000	0.000	0.000	0.128	0.128
21:48:00	0.000	0.000	0.000	0.000	0.128	0.128
21:54:00	0.000	0.000	0.000	0.000	0.127	0.127
22:00:00	0.000	0.000	0.000	0.000	0.127	0.127
22:06:00	0.000	0.000	0.000	0.000	0.127	0.127
22:12:00	0.000	0.000	0.000	0.000	0.126	0.126
22:18:00	0.000	0.000	0.000	0.000	0.126	0.126
22:24:00	0.000	0.000	0.000	0.000	0.126	0.126
22:30:00	0.000	0.000	0.000	0.000	0.126	0.126
22:36:00	0.000	0.000	0.000	0.000	0.125	0.125
22:42:00	0.000	0.000	0.000	0.000	0.125	0.125
22:48:00	0.000	0.000	0.000	0.000	0.125	0.125
22:54:00	0.000	0.000	0.000	0.000	0.124	0.124
23:00:00	0.000	0.000	0.000	0.000	0.124	0.124
23:06:00	0.000	0.000	0.000	0.000	0.124	0.124
23:12:00	0.000	0.000	0.000	0.000	0.123	0.123
23:18:00	0.000	0.000	0.000	0.000	0.123	0.123
23:24:00	0.000	0.000	0.000	0.000	0.123	0.123
23:30:00	0.000	0.000	0.000	0.000	0.123	0.123
23:36:00	0.000	0.000	0.000	0.000	0.122	0.122
23:42:00	0.000	0.000	0.000	0.000	0.122	0.122
23:48:00	0.000	0.000	0.000	0.000	0.122	0.122
23:54:00	0.000	0.000	0.000	0.000	0.121	0.121
24:00:00	0.000	0.000	0.000	0.000	0.121	0.121
24:06:00	0.000	0.000	0.000	0.000	0.121	0.121
24:12:00	0.000	0.000	0.000	0.000	0.121	0.121
24:18:00	0.000	0.000	0.000	0.000	0.120	0.120

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
24:24:00	0.000	0.000	0.000	0.000	0.120	0.120
24:30:00	0.000	0.000	0.000	0.000	0.120	0.120
24:36:00	0.000	0.000	0.000	0.000	0.119	0.119
24:42:00	0.000	0.000	0.000	0.000	0.119	0.119
24:48:00	0.000	0.000	0.000	0.000	0.119	0.119
24:54:00	0.000	0.000	0.000	0.000	0.119	0.119
25:00:00	0.000	0.000	0.000	0.000	0.118	0.118
25:06:00	0.000	0.000	0.000	0.000	0.118	0.118
25:12:00	0.000	0.000	0.000	0.000	0.118	0.118
25:18:00	0.000	0.000	0.000	0.000	0.117	0.117
25:24:00	0.000	0.000	0.000	0.000	0.117	0.117
25:30:00	0.000	0.000	0.000	0.000	0.117	0.117
25:36:00	0.000	0.000	0.000	0.000	0.117	0.117
25:42:00	0.000	0.000	0.000	0.000	0.116	0.116
25:48:00	0.000	0.000	0.000	0.000	0.116	0.116
25:54:00	0.000	0.000	0.000	0.000	0.116	0.116
26:00:00	0.000	0.000	0.000	0.000	0.115	0.115
26:06:00	0.000	0.000	0.000	0.000	0.115	0.115
26:12:00	0.000	0.000	0.000	0.000	0.115	0.115
26:18:00	0.000	0.000	0.000	0.000	0.115	0.115
26:24:00	0.000	0.000	0.000	0.000	0.114	0.114
26:30:00	0.000	0.000	0.000	0.000	0.114	0.114
26:36:00	0.000	0.000	0.000	0.000	0.114	0.114
26:42:00	0.000	0.000	0.000	0.000	0.114	0.114
26:48:00	0.000	0.000	0.000	0.000	0.113	0.113
26:54:00	0.000	0.000	0.000	0.000	0.113	0.113
27:00:00	0.000	0.000	0.000	0.000	0.113	0.113
27:06:00	0.000	0.000	0.000	0.000	0.112	0.112
27:12:00	0.000	0.000	0.000	0.000	0.112	0.112
27:18:00	0.000	0.000	0.000	0.000	0.112	0.112
27:24:00	0.000	0.000	0.000	0.000	0.112	0.112
27:30:00	0.000	0.000	0.000	0.000	0.111	0.111
27:36:00	0.000	0.000	0.000	0.000	0.111	0.111
27:42:00	0.000	0.000	0.000	0.000	0.111	0.111
27:48:00	0.000	0.000	0.000	0.000	0.111	0.111

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
27:54:00	0.000	0.000	0.000	0.000	0.110	0.110
28:00:00	0.000	0.000	0.000	0.000	0.110	0.110
28:06:00	0.000	0.000	0.000	0.000	0.110	0.110
28:12:00	0.000	0.000	0.000	0.000	0.109	0.109
28:18:00	0.000	0.000	0.000	0.000	0.109	0.109
28:24:00	0.000	0.000	0.000	0.000	0.109	0.109
28:30:00	0.000	0.000	0.000	0.000	0.109	0.109
28:36:00	0.000	0.000	0.000	0.000	0.108	0.108
28:42:00	0.000	0.000	0.000	0.000	0.108	0.108
28:48:00	0.000	0.000	0.000	0.000	0.108	0.108
28:54:00	0.000	0.000	0.000	0.000	0.108	0.108
29:00:00	0.000	0.000	0.000	0.000	0.107	0.107
29:06:00	0.000	0.000	0.000	0.000	0.107	0.107
29:12:00	0.000	0.000	0.000	0.000	0.107	0.107
29:18:00	0.000	0.000	0.000	0.000	0.107	0.107
29:24:00	0.000	0.000	0.000	0.000	0.106	0.106
29:30:00	0.000	0.000	0.000	0.000	0.106	0.106
29:36:00	0.000	0.000	0.000	0.000	0.106	0.106
29:42:00	0.000	0.000	0.000	0.000	0.106	0.106
29:48:00	0.000	0.000	0.000	0.000	0.105	0.105
29:54:00	0.000	0.000	0.000	0.000	0.105	0.105
30:00:00	0.000	0.000	0.000	0.000	0.105	0.105
30:06:00	0.000	0.000	0.000	0.000	0.105	0.105
30:12:00	0.000	0.000	0.000	0.000	0.104	0.104
30:18:00	0.000	0.000	0.000	0.000	0.104	0.104
30:24:00	0.000	0.000	0.000	0.000	0.104	0.104
30:30:00	0.000	0.000	0.000	0.000	0.104	0.104
30:36:00	0.000	0.000	0.000	0.000	0.103	0.103
30:42:00	0.000	0.000	0.000	0.000	0.103	0.103
30:48:00	0.000	0.000	0.000	0.000	0.103	0.103
30:54:00	0.000	0.000	0.000	0.000	0.103	0.103
31:00:00	0.000	0.000	0.000	0.000	0.102	0.102
31:06:00	0.000	0.000	0.000	0.000	0.102	0.102
31:12:00	0.000	0.000	0.000	0.000	0.102	0.102
31:18:00	0.000	0.000	0.000	0.000	0.102	0.102

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
31:24:00	0.000	0.000	0.000	0.000	0.101	0.101
31:30:00	0.000	0.000	0.000	0.000	0.101	0.101
31:36:00	0.000	0.000	0.000	0.000	0.101	0.101
31:42:00	0.000	0.000	0.000	0.000	0.101	0.101
31:48:00	0.000	0.000	0.000	0.000	0.100	0.100
31:54:00	0.000	0.000	0.000	0.000	0.100	0.100
32:00:00	0.000	0.000	0.000	0.000	0.100	0.100
32:06:00	0.000	0.000	0.000	0.000	0.100	0.100
32:12:00	0.000	0.000	0.000	0.000	0.100	0.100
32:18:00	0.000	0.000	0.000	0.000	0.099	0.099
32:24:00	0.000	0.000	0.000	0.000	0.099	0.099
32:30:00	0.000	0.000	0.000	0.000	0.099	0.099
32:36:00	0.000	0.000	0.000	0.000	0.099	0.099
32:42:00	0.000	0.000	0.000	0.000	0.098	0.098
32:48:00	0.000	0.000	0.000	0.000	0.098	0.098
32:54:00	0.000	0.000	0.000	0.000	0.098	0.098
33:00:00	0.000	0.000	0.000	0.000	0.098	0.098
33:06:00	0.000	0.000	0.000	0.000	0.097	0.097
33:12:00	0.000	0.000	0.000	0.000	0.097	0.097
33:18:00	0.000	0.000	0.000	0.000	0.097	0.097
33:24:00	0.000	0.000	0.000	0.000	0.097	0.097
33:30:00	0.000	0.000	0.000	0.000	0.096	0.096
33:36:00	0.000	0.000	0.000	0.000	0.096	0.096
33:42:00	0.000	0.000	0.000	0.000	0.096	0.096
33:48:00	0.000	0.000	0.000	0.000	0.096	0.096
33:54:00	0.000	0.000	0.000	0.000	0.096	0.096
34:00:00	0.000	0.000	0.000	0.000	0.095	0.095
34:06:00	0.000	0.000	0.000	0.000	0.095	0.095
34:12:00	0.000	0.000	0.000	0.000	0.095	0.095
34:18:00	0.000	0.000	0.000	0.000	0.095	0.095
34:24:00	0.000	0.000	0.000	0.000	0.094	0.094
34:30:00	0.000	0.000	0.000	0.000	0.094	0.094
34:36:00	0.000	0.000	0.000	0.000	0.094	0.094
34:42:00	0.000	0.000	0.000	0.000	0.094	0.094
34:48:00	0.000	0.000	0.000	0.000	0.093	0.093

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
34:54:00	0.000	0.000	0.000	0.000	0.093	0.093
35:00:00	0.000	0.000	0.000	0.000	0.093	0.093
35:06:00	0.000	0.000	0.000	0.000	0.093	0.093
35:12:00	0.000	0.000	0.000	0.000	0.093	0.093
35:18:00	0.000	0.000	0.000	0.000	0.092	0.092
35:24:00	0.000	0.000	0.000	0.000	0.092	0.092
35:30:00	0.000	0.000	0.000	0.000	0.092	0.092
35:36:00	0.000	0.000	0.000	0.000	0.092	0.092
35:42:00	0.000	0.000	0.000	0.000	0.092	0.092
35:48:00	0.000	0.000	0.000	0.000	0.091	0.091
35:54:00	0.000	0.000	0.000	0.000	0.091	0.091
36:00:00	0.000	0.000	0.000	0.000	0.091	0.091
36:06:00	0.000	0.000	0.000	0.000	0.091	0.091
36:12:00	0.000	0.000	0.000	0.000	0.090	0.090
36:18:00	0.000	0.000	0.000	0.000	0.090	0.090
36:24:00	0.000	0.000	0.000	0.000	0.090	0.090
36:30:00	0.000	0.000	0.000	0.000	0.090	0.090
36:36:00	0.000	0.000	0.000	0.000	0.090	0.090
36:42:00	0.000	0.000	0.000	0.000	0.089	0.089
36:48:00	0.000	0.000	0.000	0.000	0.089	0.089
36:54:00	0.000	0.000	0.000	0.000	0.089	0.089
37:00:00	0.000	0.000	0.000	0.000	0.089	0.089
37:06:00	0.000	0.000	0.000	0.000	0.088	0.088
37:12:00	0.000	0.000	0.000	0.000	0.088	0.088
37:18:00	0.000	0.000	0.000	0.000	0.088	0.088
37:24:00	0.000	0.000	0.000	0.000	0.088	0.088
37:30:00	0.000	0.000	0.000	0.000	0.088	0.088
37:36:00	0.000	0.000	0.000	0.000	0.087	0.087
37:42:00	0.000	0.000	0.000	0.000	0.087	0.087
37:48:00	0.000	0.000	0.000	0.000	0.087	0.087
37:54:00	0.000	0.000	0.000	0.000	0.087	0.087
38:00:00	0.000	0.000	0.000	0.000	0.087	0.087
38:06:00	0.000	0.000	0.000	0.000	0.086	0.086
38:12:00	0.000	0.000	0.000	0.000	0.086	0.086
38:18:00	0.000	0.000	0.000	0.000	0.086	0.086

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
38:24:00	0.000	0.000	0.000	0.000	0.086	0.086
38:30:00	0.000	0.000	0.000	0.000	0.086	0.086
38:36:00	0.000	0.000	0.000	0.000	0.085	0.085
38:42:00	0.000	0.000	0.000	0.000	0.085	0.085
38:48:00	0.000	0.000	0.000	0.000	0.085	0.085
38:54:00	0.000	0.000	0.000	0.000	0.085	0.085
39:00:00	0.000	0.000	0.000	0.000	0.085	0.085
39:06:00	0.000	0.000	0.000	0.000	0.084	0.084
39:12:00	0.000	0.000	0.000	0.000	0.084	0.084
39:18:00	0.000	0.000	0.000	0.000	0.084	0.084
39:24:00	0.000	0.000	0.000	0.000	0.084	0.084
39:30:00	0.000	0.000	0.000	0.000	0.084	0.084
39:36:00	0.000	0.000	0.000	0.000	0.083	0.083
39:42:00	0.000	0.000	0.000	0.000	0.083	0.083
39:48:00	0.000	0.000	0.000	0.000	0.083	0.083
39:54:00	0.000	0.000	0.000	0.000	0.083	0.083
40:00:00	0.000	0.000	0.000	0.000	0.083	0.083
40:06:00	0.000	0.000	0.000	0.000	0.082	0.082
40:12:00	0.000	0.000	0.000	0.000	0.082	0.082
40:18:00	0.000	0.000	0.000	0.000	0.082	0.082
40:24:00	0.000	0.000	0.000	0.000	0.082	0.082
40:30:00	0.000	0.000	0.000	0.000	0.082	0.082
40:36:00	0.000	0.000	0.000	0.000	0.081	0.081
40:42:00	0.000	0.000	0.000	0.000	0.081	0.081
40:48:00	0.000	0.000	0.000	0.000	0.081	0.081
40:54:00	0.000	0.000	0.000	0.000	0.081	0.081
41:00:00	0.000	0.000	0.000	0.000	0.081	0.081
41:06:00	0.000	0.000	0.000	0.000	0.080	0.080
41:12:00	0.000	0.000	0.000	0.000	0.080	0.080
41:18:00	0.000	0.000	0.000	0.000	0.080	0.080
41:24:00	0.000	0.000	0.000	0.000	0.080	0.080
41:30:00	0.000	0.000	0.000	0.000	0.080	0.080
41:36:00	0.000	0.000	0.000	0.000	0.079	0.079
41:42:00	0.000	0.000	0.000	0.000	0.079	0.079
41:48:00	0.000	0.000	0.000	0.000	0.079	0.079

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
41:54:00	0.000	0.000	0.000	0.000	0.079	0.079
42:00:00	0.000	0.000	0.000	0.000	0.079	0.079
42:06:00	0.000	0.000	0.000	0.000	0.079	0.079
42:12:00	0.000	0.000	0.000	0.000	0.078	0.078
42:18:00	0.000	0.000	0.000	0.000	0.078	0.078
42:24:00	0.000	0.000	0.000	0.000	0.078	0.078
42:30:00	0.000	0.000	0.000	0.000	0.078	0.078
42:36:00	0.000	0.000	0.000	0.000	0.078	0.078
42:42:00	0.000	0.000	0.000	0.000	0.077	0.077
42:48:00	0.000	0.000	0.000	0.000	0.077	0.077
42:54:00	0.000	0.000	0.000	0.000	0.077	0.077
43:00:00	0.000	0.000	0.000	0.000	0.077	0.077
43:06:00	0.000	0.000	0.000	0.000	0.077	0.077
43:12:00	0.000	0.000	0.000	0.000	0.076	0.076
43:18:00	0.000	0.000	0.000	0.000	0.076	0.076
43:24:00	0.000	0.000	0.000	0.000	0.076	0.076
43:30:00	0.000	0.000	0.000	0.000	0.076	0.076
43:36:00	0.000	0.000	0.000	0.000	0.076	0.076
43:42:00	0.000	0.000	0.000	0.000	0.076	0.076
43:48:00	0.000	0.000	0.000	0.000	0.075	0.075
43:54:00	0.000	0.000	0.000	0.000	0.075	0.075
44:00:00	0.000	0.000	0.000	0.000	0.075	0.075
44:06:00	0.000	0.000	0.000	0.000	0.075	0.075
44:12:00	0.000	0.000	0.000	0.000	0.075	0.075
44:18:00	0.000	0.000	0.000	0.000	0.074	0.074
44:24:00	0.000	0.000	0.000	0.000	0.074	0.074
44:30:00	0.000	0.000	0.000	0.000	0.074	0.074
44:36:00	0.000	0.000	0.000	0.000	0.074	0.074
44:42:00	0.000	0.000	0.000	0.000	0.074	0.074
44:48:00	0.000	0.000	0.000	0.000	0.074	0.074
44:54:00	0.000	0.000	0.000	0.000	0.073	0.073
45:00:00	0.000	0.000	0.000	0.000	0.073	0.073
45:06:00	0.000	0.000	0.000	0.000	0.073	0.073
45:12:00	0.000	0.000	0.000	0.000	0.073	0.073
45:18:00	0.000	0.000	0.000	0.000	0.073	0.073

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
45:24:00	0.000	0.000	0.000	0.000	0.073	0.073
45:30:00	0.000	0.000	0.000	0.000	0.072	0.072
45:36:00	0.000	0.000	0.000	0.000	0.072	0.072
45:42:00	0.000	0.000	0.000	0.000	0.072	0.072
45:48:00	0.000	0.000	0.000	0.000	0.072	0.072
45:54:00	0.000	0.000	0.000	0.000	0.072	0.072
46:00:00	0.000	0.000	0.000	0.000	0.072	0.072
46:06:00	0.000	0.000	0.000	0.000	0.071	0.071
46:12:00	0.000	0.000	0.000	0.000	0.071	0.071
46:18:00	0.000	0.000	0.000	0.000	0.071	0.071
46:24:00	0.000	0.000	0.000	0.000	0.071	0.071
46:30:00	0.000	0.000	0.000	0.000	0.071	0.071
46:36:00	0.000	0.000	0.000	0.000	0.070	0.070
46:42:00	0.000	0.000	0.000	0.000	0.070	0.070
46:48:00	0.000	0.000	0.000	0.000	0.070	0.070
46:54:00	0.000	0.000	0.000	0.000	0.070	0.070
47:00:00	0.000	0.000	0.000	0.000	0.070	0.070
47:06:00	0.000	0.000	0.000	0.000	0.070	0.070
47:12:00	0.000	0.000	0.000	0.000	0.069	0.069
47:18:00	0.000	0.000	0.000	0.000	0.069	0.069
47:24:00	0.000	0.000	0.000	0.000	0.069	0.069
47:30:00	0.000	0.000	0.000	0.000	0.069	0.069
47:36:00	0.000	0.000	0.000	0.000	0.069	0.069
47:42:00	0.000	0.000	0.000	0.000	0.069	0.069
47:48:00	0.000	0.000	0.000	0.000	0.068	0.068
47:54:00	0.000	0.000	0.000	0.000	0.068	0.068
48:00:00	0.000	0.000	0.000	0.000	0.068	0.068
48:06:00	0.000	0.000	0.000	0.000	0.068	0.068
48:12:00	0.000	0.000	0.000	0.000	0.068	0.068
48:18:00	0.000	0.000	0.000	0.000	0.068	0.068
48:24:00	0.000	0.000	0.000	0.000	0.068	0.068
48:30:00	0.000	0.000	0.000	0.000	0.067	0.067
48:36:00	0.000	0.000	0.000	0.000	0.067	0.067
48:42:00	0.000	0.000	0.000	0.000	0.067	0.067
48:48:00	0.000	0.000	0.000	0.000	0.067	0.067

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
48:54:00	0.000	0.000	0.000	0.000	0.067	0.067
49:00:00	0.000	0.000	0.000	0.000	0.067	0.067
49:06:00	0.000	0.000	0.000	0.000	0.066	0.066
49:12:00	0.000	0.000	0.000	0.000	0.066	0.066
49:18:00	0.000	0.000	0.000	0.000	0.066	0.066
49:24:00	0.000	0.000	0.000	0.000	0.066	0.066
49:30:00	0.000	0.000	0.000	0.000	0.066	0.066
49:36:00	0.000	0.000	0.000	0.000	0.066	0.066
49:42:00	0.000	0.000	0.000	0.000	0.065	0.065
49:48:00	0.000	0.000	0.000	0.000	0.065	0.065
49:54:00	0.000	0.000	0.000	0.000	0.065	0.065
50:00:00	0.000	0.000	0.000	0.000	0.065	0.065
50:06:00	0.000	0.000	0.000	0.000	0.065	0.065
50:12:00	0.000	0.000	0.000	0.000	0.065	0.065
50:18:00	0.000	0.000	0.000	0.000	0.065	0.065
50:24:00	0.000	0.000	0.000	0.000	0.064	0.064
50:30:00	0.000	0.000	0.000	0.000	0.064	0.064
50:36:00	0.000	0.000	0.000	0.000	0.064	0.064
50:42:00	0.000	0.000	0.000	0.000	0.064	0.064
50:48:00	0.000	0.000	0.000	0.000	0.064	0.064
50:54:00	0.000	0.000	0.000	0.000	0.064	0.064
51:00:00	0.000	0.000	0.000	0.000	0.063	0.063
51:06:00	0.000	0.000	0.000	0.000	0.063	0.063
51:12:00	0.000	0.000	0.000	0.000	0.063	0.063
51:18:00	0.000	0.000	0.000	0.000	0.063	0.063
51:24:00	0.000	0.000	0.000	0.000	0.063	0.063
51:30:00	0.000	0.000	0.000	0.000	0.063	0.063
51:36:00	0.000	0.000	0.000	0.000	0.063	0.063
51:42:00	0.000	0.000	0.000	0.000	0.062	0.062
51:48:00	0.000	0.000	0.000	0.000	0.062	0.062
51:54:00	0.000	0.000	0.000	0.000	0.062	0.062
52:00:00	0.000	0.000	0.000	0.000	0.062	0.062
52:06:00	0.000	0.000	0.000	0.000	0.062	0.062
52:12:00	0.000	0.000	0.000	0.000	0.062	0.062
52:18:00	0.000	0.000	0.000	0.000	0.061	0.061

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
52:24:00	0.000	0.000	0.000	0.000	0.061	0.061
52:30:00	0.000	0.000	0.000	0.000	0.061	0.061
52:36:00	0.000	0.000	0.000	0.000	0.061	0.061
52:42:00	0.000	0.000	0.000	0.000	0.061	0.061
52:48:00	0.000	0.000	0.000	0.000	0.061	0.061
52:54:00	0.000	0.000	0.000	0.000	0.061	0.061
53:00:00	0.000	0.000	0.000	0.000	0.060	0.060
53:06:00	0.000	0.000	0.000	0.000	0.060	0.060
53:12:00	0.000	0.000	0.000	0.000	0.060	0.060
53:18:00	0.000	0.000	0.000	0.000	0.060	0.060
53:24:00	0.000	0.000	0.000	0.000	0.060	0.060
53:30:00	0.000	0.000	0.000	0.000	0.060	0.060
53:36:00	0.000	0.000	0.000	0.000	0.060	0.060
53:42:00	0.000	0.000	0.000	0.000	0.059	0.059
53:48:00	0.000	0.000	0.000	0.000	0.059	0.059
53:54:00	0.000	0.000	0.000	0.000	0.059	0.059
54:00:00	0.000	0.000	0.000	0.000	0.059	0.059
54:06:00	0.000	0.000	0.000	0.000	0.059	0.059
54:12:00	0.000	0.000	0.000	0.000	0.059	0.059
54:18:00	0.000	0.000	0.000	0.000	0.059	0.059
54:24:00	0.000	0.000	0.000	0.000	0.058	0.058
54:30:00	0.000	0.000	0.000	0.000	0.058	0.058
54:36:00	0.000	0.000	0.000	0.000	0.058	0.058
54:42:00	0.000	0.000	0.000	0.000	0.058	0.058
54:48:00	0.000	0.000	0.000	0.000	0.058	0.058
54:54:00	0.000	0.000	0.000	0.000	0.058	0.058
55:00:00	0.000	0.000	0.000	0.000	0.058	0.058
55:06:00	0.000	0.000	0.000	0.000	0.058	0.058
55:12:00	0.000	0.000	0.000	0.000	0.057	0.057
55:18:00	0.000	0.000	0.000	0.000	0.057	0.057
55:24:00	0.000	0.000	0.000	0.000	0.057	0.057
55:30:00	0.000	0.000	0.000	0.000	0.057	0.057
55:36:00	0.000	0.000	0.000	0.000	0.057	0.057
55:42:00	0.000	0.000	0.000	0.000	0.057	0.057
55:48:00	0.000	0.000	0.000	0.000	0.057	0.057

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
55:54:00	0.000	0.000	0.000	0.000	0.056	0.056
56:00:00	0.000	0.000	0.000	0.000	0.056	0.056
56:06:00	0.000	0.000	0.000	0.000	0.056	0.056
56:12:00	0.000	0.000	0.000	0.000	0.056	0.056
56:18:00	0.000	0.000	0.000	0.000	0.056	0.056
56:24:00	0.000	0.000	0.000	0.000	0.056	0.056
56:30:00	0.000	0.000	0.000	0.000	0.056	0.056
56:36:00	0.000	0.000	0.000	0.000	0.055	0.055
56:42:00	0.000	0.000	0.000	0.000	0.055	0.055
56:48:00	0.000	0.000	0.000	0.000	0.055	0.055
56:54:00	0.000	0.000	0.000	0.000	0.055	0.055
57:00:00	0.000	0.000	0.000	0.000	0.055	0.055
57:06:00	0.000	0.000	0.000	0.000	0.055	0.055
57:12:00	0.000	0.000	0.000	0.000	0.055	0.055
57:18:00	0.000	0.000	0.000	0.000	0.055	0.055
57:24:00	0.000	0.000	0.000	0.000	0.054	0.054
57:30:00	0.000	0.000	0.000	0.000	0.054	0.054
57:36:00	0.000	0.000	0.000	0.000	0.054	0.054
57:42:00	0.000	0.000	0.000	0.000	0.054	0.054
57:48:00	0.000	0.000	0.000	0.000	0.054	0.054
57:54:00	0.000	0.000	0.000	0.000	0.054	0.054
58:00:00	0.000	0.000	0.000	0.000	0.054	0.054
58:06:00	0.000	0.000	0.000	0.000	0.054	0.054
58:12:00	0.000	0.000	0.000	0.000	0.053	0.053
58:18:00	0.000	0.000	0.000	0.000	0.053	0.053
58:24:00	0.000	0.000	0.000	0.000	0.053	0.053
58:30:00	0.000	0.000	0.000	0.000	0.053	0.053
58:36:00	0.000	0.000	0.000	0.000	0.053	0.053
58:42:00	0.000	0.000	0.000	0.000	0.053	0.053
58:48:00	0.000	0.000	0.000	0.000	0.053	0.053
58:54:00	0.000	0.000	0.000	0.000	0.053	0.053
59:00:00	0.000	0.000	0.000	0.000	0.052	0.052
59:06:00	0.000	0.000	0.000	0.000	0.052	0.052
59:12:00	0.000	0.000	0.000	0.000	0.052	0.052
59:18:00	0.000	0.000	0.000	0.000	0.052	0.052

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
59:24:00	0.000	0.000	0.000	0.000	0.052	0.052
59:30:00	0.000	0.000	0.000	0.000	0.052	0.052
59:36:00	0.000	0.000	0.000	0.000	0.052	0.052
59:42:00	0.000	0.000	0.000	0.000	0.052	0.052
59:48:00	0.000	0.000	0.000	0.000	0.051	0.051
59:54:00	0.000	0.000	0.000	0.000	0.051	0.051
60:00:00	0.000	0.000	0.000	0.000	0.051	0.051
60:06:00	0.000	0.000	0.000	0.000	0.051	0.051
60:12:00	0.000	0.000	0.000	0.000	0.051	0.051
60:18:00	0.000	0.000	0.000	0.000	0.051	0.051
60:24:00	0.000	0.000	0.000	0.000	0.051	0.051
60:30:00	0.000	0.000	0.000	0.000	0.051	0.051
60:36:00	0.000	0.000	0.000	0.000	0.050	0.050
60:42:00	0.000	0.000	0.000	0.000	0.050	0.050
60:48:00	0.000	0.000	0.000	0.000	0.050	0.050
60:54:00	0.000	0.000	0.000	0.000	0.050	0.050
61:00:00	0.000	0.000	0.000	0.000	0.050	0.050
61:06:00	0.000	0.000	0.000	0.000	0.050	0.050
61:12:00	0.000	0.000	0.000	0.000	0.050	0.050
61:18:00	0.000	0.000	0.000	0.000	0.050	0.050
61:24:00	0.000	0.000	0.000	0.000	0.049	0.049
61:30:00	0.000	0.000	0.000	0.000	0.049	0.049
61:36:00	0.000	0.000	0.000	0.000	0.049	0.049
61:42:00	0.000	0.000	0.000	0.000	0.049	0.049
61:48:00	0.000	0.000	0.000	0.000	0.049	0.049
61:54:00	0.000	0.000	0.000	0.000	0.049	0.049
62:00:00	0.000	0.000	0.000	0.000	0.049	0.049
62:06:00	0.000	0.000	0.000	0.000	0.049	0.049
62:12:00	0.000	0.000	0.000	0.000	0.049	0.049
62:18:00	0.000	0.000	0.000	0.000	0.048	0.048
62:24:00	0.000	0.000	0.000	0.000	0.048	0.048
62:30:00	0.000	0.000	0.000	0.000	0.048	0.048
62:36:00	0.000	0.000	0.000	0.000	0.048	0.048
62:42:00	0.000	0.000	0.000	0.000	0.048	0.048
62:48:00	0.000	0.000	0.000	0.000	0.048	0.048

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
62:54:00	0.000	0.000	0.000	0.000	0.048	0.048
63:00:00	0.000	0.000	0.000	0.000	0.048	0.048
63:06:00	0.000	0.000	0.000	0.000	0.047	0.047
63:12:00	0.000	0.000	0.000	0.000	0.047	0.047
63:18:00	0.000	0.000	0.000	0.000	0.047	0.047
63:24:00	0.000	0.000	0.000	0.000	0.047	0.047
63:30:00	0.000	0.000	0.000	0.000	0.047	0.047
63:36:00	0.000	0.000	0.000	0.000	0.047	0.047
63:42:00	0.000	0.000	0.000	0.000	0.047	0.047
63:48:00	0.000	0.000	0.000	0.000	0.047	0.047
63:54:00	0.000	0.000	0.000	0.000	0.047	0.047
64:00:00	0.000	0.000	0.000	0.000	0.046	0.046
64:06:00	0.000	0.000	0.000	0.000	0.046	0.046
64:12:00	0.000	0.000	0.000	0.000	0.046	0.046
64:18:00	0.000	0.000	0.000	0.000	0.046	0.046
64:24:00	0.000	0.000	0.000	0.000	0.046	0.046
64:30:00	0.000	0.000	0.000	0.000	0.046	0.046
64:36:00	0.000	0.000	0.000	0.000	0.046	0.046
64:42:00	0.000	0.000	0.000	0.000	0.046	0.046
64:48:00	0.000	0.000	0.000	0.000	0.046	0.046
64:54:00	0.000	0.000	0.000	0.000	0.045	0.045
65:00:00	0.000	0.000	0.000	0.000	0.045	0.045
65:06:00	0.000	0.000	0.000	0.000	0.045	0.045
65:12:00	0.000	0.000	0.000	0.000	0.045	0.045
65:18:00	0.000	0.000	0.000	0.000	0.045	0.045
65:24:00	0.000	0.000	0.000	0.000	0.045	0.045
65:30:00	0.000	0.000	0.000	0.000	0.045	0.045
65:36:00	0.000	0.000	0.000	0.000	0.045	0.045
65:42:00	0.000	0.000	0.000	0.000	0.045	0.045
65:48:00	0.000	0.000	0.000	0.000	0.045	0.045
65:54:00	0.000	0.000	0.000	0.000	0.044	0.044
66:00:00	0.000	0.000	0.000	0.000	0.044	0.044
66:06:00	0.000	0.000	0.000	0.000	0.044	0.044
66:12:00	0.000	0.000	0.000	0.000	0.044	0.044
66:18:00	0.000	0.000	0.000	0.000	0.044	0.044

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
66:24:00	0.000	0.000	0.000	0.000	0.044	0.044
66:30:00	0.000	0.000	0.000	0.000	0.044	0.044
66:36:00	0.000	0.000	0.000	0.000	0.044	0.044
66:42:00	0.000	0.000	0.000	0.000	0.044	0.044
66:48:00	0.000	0.000	0.000	0.000	0.043	0.043
66:54:00	0.000	0.000	0.000	0.000	0.043	0.043
67:00:00	0.000	0.000	0.000	0.000	0.043	0.043
67:06:00	0.000	0.000	0.000	0.000	0.043	0.043
67:12:00	0.000	0.000	0.000	0.000	0.043	0.043
67:18:00	0.000	0.000	0.000	0.000	0.043	0.043
67:24:00	0.000	0.000	0.000	0.000	0.043	0.043
67:30:00	0.000	0.000	0.000	0.000	0.043	0.043
67:36:00	0.000	0.000	0.000	0.000	0.043	0.043
67:42:00	0.000	0.000	0.000	0.000	0.043	0.043
67:48:00	0.000	0.000	0.000	0.000	0.042	0.042
67:54:00	0.000	0.000	0.000	0.000	0.042	0.042
68:00:00	0.000	0.000	0.000	0.000	0.042	0.042
68:06:00	0.000	0.000	0.000	0.000	0.042	0.042
68:12:00	0.000	0.000	0.000	0.000	0.042	0.042
68:18:00	0.000	0.000	0.000	0.000	0.042	0.042
68:24:00	0.000	0.000	0.000	0.000	0.042	0.042
68:30:00	0.000	0.000	0.000	0.000	0.042	0.042
68:36:00	0.000	0.000	0.000	0.000	0.042	0.042
68:42:00	0.000	0.000	0.000	0.000	0.042	0.042
68:48:00	0.000	0.000	0.000	0.000	0.041	0.041
68:54:00	0.000	0.000	0.000	0.000	0.041	0.041
69:00:00	0.000	0.000	0.000	0.000	0.041	0.041
69:06:00	0.000	0.000	0.000	0.000	0.041	0.041
69:12:00	0.000	0.000	0.000	0.000	0.041	0.041
69:18:00	0.000	0.000	0.000	0.000	0.041	0.041
69:24:00	0.000	0.000	0.000	0.000	0.041	0.041
69:30:00	0.000	0.000	0.000	0.000	0.041	0.041
69:36:00	0.000	0.000	0.000	0.000	0.041	0.041
69:42:00	0.000	0.000	0.000	0.000	0.041	0.041
69:48:00	0.000	0.000	0.000	0.000	0.040	0.040

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
69:54:00	0.000	0.000	0.000	0.000	0.040	0.040
70:00:00	0.000	0.000	0.000	0.000	0.040	0.040
70:06:00	0.000	0.000	0.000	0.000	0.040	0.040
70:12:00	0.000	0.000	0.000	0.000	0.040	0.040
70:18:00	0.000	0.000	0.000	0.000	0.040	0.040
70:24:00	0.000	0.000	0.000	0.000	0.040	0.040
70:30:00	0.000	0.000	0.000	0.000	0.040	0.040
70:36:00	0.000	0.000	0.000	0.000	0.040	0.040
70:42:00	0.000	0.000	0.000	0.000	0.040	0.040
70:48:00	0.000	0.000	0.000	0.000	0.039	0.039
70:54:00	0.000	0.000	0.000	0.000	0.039	0.039
71:00:00	0.000	0.000	0.000	0.000	0.039	0.039
71:06:00	0.000	0.000	0.000	0.000	0.039	0.039
71:12:00	0.000	0.000	0.000	0.000	0.039	0.039
71:18:00	0.000	0.000	0.000	0.000	0.039	0.039
71:24:00	0.000	0.000	0.000	0.000	0.039	0.039
71:30:00	0.000	0.000	0.000	0.000	0.039	0.039
71:36:00	0.000	0.000	0.000	0.000	0.039	0.039
71:42:00	0.000	0.000	0.000	0.000	0.039	0.039
71:48:00	0.000	0.000	0.000	0.000	0.039	0.039
71:54:00	0.000	0.000	0.000	0.000	0.038	0.038
72:00:00	0.000	0.000	0.000	0.000	0.038	0.038
72:06:00	0.000	0.000	0.000	0.000	0.038	0.038
72:12:00	0.000	0.000	0.000	0.000	0.038	0.038
72:18:00	0.000	0.000	0.000	0.000	0.038	0.038
72:24:00	0.000	0.000	0.000	0.000	0.038	0.038
72:30:00	0.000	0.000	0.000	0.000	0.038	0.038
72:36:00	0.000	0.000	0.000	0.000	0.038	0.038
72:42:00	0.000	0.000	0.000	0.000	0.038	0.038
72:48:00	0.000	0.000	0.000	0.000	0.038	0.038
72:54:00	0.000	0.000	0.000	0.000	0.038	0.038
73:00:00	0.000	0.000	0.000	0.000	0.037	0.037
73:06:00	0.000	0.000	0.000	0.000	0.037	0.037
73:12:00	0.000	0.000	0.000	0.000	0.037	0.037
73:18:00	0.000	0.000	0.000	0.000	0.037	0.037

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
73:24:00	0.000	0.000	0.000	0.000	0.037	0.037
73:30:00	0.000	0.000	0.000	0.000	0.037	0.037
73:36:00	0.000	0.000	0.000	0.000	0.037	0.037
73:42:00	0.000	0.000	0.000	0.000	0.037	0.037
73:48:00	0.000	0.000	0.000	0.000	0.037	0.037
73:54:00	0.000	0.000	0.000	0.000	0.037	0.037
74:00:00	0.000	0.000	0.000	0.000	0.037	0.037
74:06:00	0.000	0.000	0.000	0.000	0.036	0.036
74:12:00	0.000	0.000	0.000	0.000	0.036	0.036
74:18:00	0.000	0.000	0.000	0.000	0.036	0.036
74:24:00	0.000	0.000	0.000	0.000	0.036	0.036
74:30:00	0.000	0.000	0.000	0.000	0.036	0.036
74:36:00	0.000	0.000	0.000	0.000	0.036	0.036
74:42:00	0.000	0.000	0.000	0.000	0.036	0.036
74:48:00	0.000	0.000	0.000	0.000	0.036	0.036
74:54:00	0.000	0.000	0.000	0.000	0.036	0.036
75:00:00	0.000	0.000	0.000	0.000	0.036	0.036
75:06:00	0.000	0.000	0.000	0.000	0.036	0.036
75:12:00	0.000	0.000	0.000	0.000	0.036	0.036
75:18:00	0.000	0.000	0.000	0.000	0.035	0.035
75:24:00	0.000	0.000	0.000	0.000	0.035	0.035
75:30:00	0.000	0.000	0.000	0.000	0.035	0.035
75:36:00	0.000	0.000	0.000	0.000	0.035	0.035
75:42:00	0.000	0.000	0.000	0.000	0.035	0.035
75:48:00	0.000	0.000	0.000	0.000	0.035	0.035
75:54:00	0.000	0.000	0.000	0.000	0.035	0.035
76:00:00	0.000	0.000	0.000	0.000	0.035	0.035
76:06:00	0.000	0.000	0.000	0.000	0.035	0.035
76:12:00	0.000	0.000	0.000	0.000	0.035	0.035
76:18:00	0.000	0.000	0.000	0.000	0.035	0.035
76:24:00	0.000	0.000	0.000	0.000	0.035	0.035
76:30:00	0.000	0.000	0.000	0.000	0.034	0.034
76:36:00	0.000	0.000	0.000	0.000	0.034	0.034
76:42:00	0.000	0.000	0.000	0.000	0.034	0.034
76:48:00	0.000	0.000	0.000	0.000	0.034	0.034

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
76:54:00	0.000	0.000	0.000	0.000	0.034	0.034
77:00:00	0.000	0.000	0.000	0.000	0.034	0.034
77:06:00	0.000	0.000	0.000	0.000	0.034	0.034
77:12:00	0.000	0.000	0.000	0.000	0.034	0.034
77:18:00	0.000	0.000	0.000	0.000	0.034	0.034
77:24:00	0.000	0.000	0.000	0.000	0.034	0.034
77:30:00	0.000	0.000	0.000	0.000	0.034	0.034
77:36:00	0.000	0.000	0.000	0.000	0.034	0.034
77:42:00	0.000	0.000	0.000	0.000	0.033	0.033
77:48:00	0.000	0.000	0.000	0.000	0.033	0.033
77:54:00	0.000	0.000	0.000	0.000	0.033	0.033
78:00:00	0.000	0.000	0.000	0.000	0.033	0.033
78:06:00	0.000	0.000	0.000	0.000	0.033	0.033
78:12:00	0.000	0.000	0.000	0.000	0.033	0.033
78:18:00	0.000	0.000	0.000	0.000	0.033	0.033
78:24:00	0.000	0.000	0.000	0.000	0.033	0.033
78:30:00	0.000	0.000	0.000	0.000	0.033	0.033
78:36:00	0.000	0.000	0.000	0.000	0.033	0.033
78:42:00	0.000	0.000	0.000	0.000	0.033	0.033
78:48:00	0.000	0.000	0.000	0.000	0.033	0.033
78:54:00	0.000	0.000	0.000	0.000	0.033	0.033
79:00:00	0.000	0.000	0.000	0.000	0.032	0.032
79:06:00	0.000	0.000	0.000	0.000	0.032	0.032
79:12:00	0.000	0.000	0.000	0.000	0.032	0.032
79:18:00	0.000	0.000	0.000	0.000	0.032	0.032
79:24:00	0.000	0.000	0.000	0.000	0.032	0.032
79:30:00	0.000	0.000	0.000	0.000	0.032	0.032
79:36:00	0.000	0.000	0.000	0.000	0.032	0.032
79:42:00	0.000	0.000	0.000	0.000	0.032	0.032
79:48:00	0.000	0.000	0.000	0.000	0.032	0.032
79:54:00	0.000	0.000	0.000	0.000	0.032	0.032
80:00:00	0.000	0.000	0.000	0.000	0.032	0.032
80:06:00	0.000	0.000	0.000	0.000	0.032	0.032
80:12:00	0.000	0.000	0.000	0.000	0.032	0.032
80:18:00	0.000	0.000	0.000	0.000	0.031	0.031

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
80:24:00	0.000	0.000	0.000	0.000	0.031	0.031
80:30:00	0.000	0.000	0.000	0.000	0.031	0.031
80:36:00	0.000	0.000	0.000	0.000	0.031	0.031
80:42:00	0.000	0.000	0.000	0.000	0.031	0.031
80:48:00	0.000	0.000	0.000	0.000	0.031	0.031
80:54:00	0.000	0.000	0.000	0.000	0.031	0.031
81:00:00	0.000	0.000	0.000	0.000	0.031	0.031
81:06:00	0.000	0.000	0.000	0.000	0.031	0.031
81:12:00	0.000	0.000	0.000	0.000	0.031	0.031
81:18:00	0.000	0.000	0.000	0.000	0.031	0.031
81:24:00	0.000	0.000	0.000	0.000	0.031	0.031
81:30:00	0.000	0.000	0.000	0.000	0.031	0.031
81:36:00	0.000	0.000	0.000	0.000	0.030	0.030
81:42:00	0.000	0.000	0.000	0.000	0.030	0.030
81:48:00	0.000	0.000	0.000	0.000	0.030	0.030
81:54:00	0.000	0.000	0.000	0.000	0.030	0.030
82:00:00	0.000	0.000	0.000	0.000	0.030	0.030
82:06:00	0.000	0.000	0.000	0.000	0.030	0.030
82:12:00	0.000	0.000	0.000	0.000	0.030	0.030
82:18:00	0.000	0.000	0.000	0.000	0.030	0.030
82:24:00	0.000	0.000	0.000	0.000	0.030	0.030
82:30:00	0.000	0.000	0.000	0.000	0.030	0.030
82:36:00	0.000	0.000	0.000	0.000	0.030	0.030
82:42:00	0.000	0.000	0.000	0.000	0.030	0.030
82:48:00	0.000	0.000	0.000	0.000	0.030	0.030
82:54:00	0.000	0.000	0.000	0.000	0.030	0.030
83:00:00	0.000	0.000	0.000	0.000	0.029	0.029
83:06:00	0.000	0.000	0.000	0.000	0.029	0.029
83:12:00	0.000	0.000	0.000	0.000	0.029	0.029
83:18:00	0.000	0.000	0.000	0.000	0.029	0.029
83:24:00	0.000	0.000	0.000	0.000	0.029	0.029
83:30:00	0.000	0.000	0.000	0.000	0.029	0.029
83:36:00	0.000	0.000	0.000	0.000	0.029	0.029
83:42:00	0.000	0.000	0.000	0.000	0.029	0.029
83:48:00	0.000	0.000	0.000	0.000	0.029	0.029

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
83:54:00	0.000	0.000	0.000	0.000	0.029	0.029
84:00:00	0.000	0.000	0.000	0.000	0.029	0.029
84:06:00	0.000	0.000	0.000	0.000	0.029	0.029
84:12:00	0.000	0.000	0.000	0.000	0.029	0.029
84:18:00	0.000	0.000	0.000	0.000	0.029	0.029
84:24:00	0.000	0.000	0.000	0.000	0.029	0.029
84:30:00	0.000	0.000	0.000	0.000	0.028	0.028
84:36:00	0.000	0.000	0.000	0.000	0.028	0.028
84:42:00	0.000	0.000	0.000	0.000	0.028	0.028
84:48:00	0.000	0.000	0.000	0.000	0.028	0.028
84:54:00	0.000	0.000	0.000	0.000	0.028	0.028
85:00:00	0.000	0.000	0.000	0.000	0.028	0.028
85:06:00	0.000	0.000	0.000	0.000	0.028	0.028
85:12:00	0.000	0.000	0.000	0.000	0.028	0.028
85:18:00	0.000	0.000	0.000	0.000	0.028	0.028
85:24:00	0.000	0.000	0.000	0.000	0.028	0.028
85:30:00	0.000	0.000	0.000	0.000	0.028	0.028
85:36:00	0.000	0.000	0.000	0.000	0.028	0.028
85:42:00	0.000	0.000	0.000	0.000	0.028	0.028
85:48:00	0.000	0.000	0.000	0.000	0.028	0.028
85:54:00	0.000	0.000	0.000	0.000	0.028	0.028
86:00:00	0.000	0.000	0.000	0.000	0.027	0.027
86:06:00	0.000	0.000	0.000	0.000	0.027	0.027
86:12:00	0.000	0.000	0.000	0.000	0.027	0.027
86:18:00	0.000	0.000	0.000	0.000	0.027	0.027
86:24:00	0.000	0.000	0.000	0.000	0.027	0.027
86:30:00	0.000	0.000	0.000	0.000	0.027	0.027
86:36:00	0.000	0.000	0.000	0.000	0.027	0.027
86:42:00	0.000	0.000	0.000	0.000	0.027	0.027
86:48:00	0.000	0.000	0.000	0.000	0.027	0.027
86:54:00	0.000	0.000	0.000	0.000	0.027	0.027
87:00:00	0.000	0.000	0.000	0.000	0.027	0.027
87:06:00	0.000	0.000	0.000	0.000	0.027	0.027
87:12:00	0.000	0.000	0.000	0.000	0.027	0.027
87:18:00	0.000	0.000	0.000	0.000	0.027	0.027

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
87:24:00	0.000	0.000	0.000	0.000	0.027	0.027
87:30:00	0.000	0.000	0.000	0.000	0.026	0.026
87:36:00	0.000	0.000	0.000	0.000	0.026	0.026
87:42:00	0.000	0.000	0.000	0.000	0.026	0.026
87:48:00	0.000	0.000	0.000	0.000	0.026	0.026
87:54:00	0.000	0.000	0.000	0.000	0.026	0.026
88:00:00	0.000	0.000	0.000	0.000	0.026	0.026
88:06:00	0.000	0.000	0.000	0.000	0.026	0.026
88:12:00	0.000	0.000	0.000	0.000	0.026	0.026
88:18:00	0.000	0.000	0.000	0.000	0.026	0.026
88:24:00	0.000	0.000	0.000	0.000	0.026	0.026
88:30:00	0.000	0.000	0.000	0.000	0.026	0.026
88:36:00	0.000	0.000	0.000	0.000	0.026	0.026
88:42:00	0.000	0.000	0.000	0.000	0.026	0.026
88:48:00	0.000	0.000	0.000	0.000	0.026	0.026
88:54:00	0.000	0.000	0.000	0.000	0.026	0.026
89:00:00	0.000	0.000	0.000	0.000	0.026	0.026
89:06:00	0.000	0.000	0.000	0.000	0.025	0.025
89:12:00	0.000	0.000	0.000	0.000	0.025	0.025
89:18:00	0.000	0.000	0.000	0.000	0.025	0.025
89:24:00	0.000	0.000	0.000	0.000	0.025	0.025
89:30:00	0.000	0.000	0.000	0.000	0.025	0.025
89:36:00	0.000	0.000	0.000	0.000	0.025	0.025
89:42:00	0.000	0.000	0.000	0.000	0.025	0.025
89:48:00	0.000	0.000	0.000	0.000	0.025	0.025
89:54:00	0.000	0.000	0.000	0.000	0.025	0.025
90:00:00	0.000	0.000	0.000	0.000	0.025	0.025
90:06:00	0.000	0.000	0.000	0.000	0.025	0.025
90:12:00	0.000	0.000	0.000	0.000	0.025	0.025
90:18:00	0.000	0.000	0.000	0.000	0.025	0.025
90:24:00	0.000	0.000	0.000	0.000	0.025	0.025
90:30:00	0.000	0.000	0.000	0.000	0.025	0.025
90:36:00	0.000	0.000	0.000	0.000	0.025	0.025
90:42:00	0.000	0.000	0.000	0.000	0.025	0.025
90:48:00	0.000	0.000	0.000	0.000	0.024	0.024

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
90:54:00	0.000	0.000	0.000	0.000	0.024	0.024
91:00:00	0.000	0.000	0.000	0.000	0.024	0.024
91:06:00	0.000	0.000	0.000	0.000	0.024	0.024
91:12:00	0.000	0.000	0.000	0.000	0.024	0.024
91:18:00	0.000	0.000	0.000	0.000	0.024	0.024
91:24:00	0.000	0.000	0.000	0.000	0.024	0.024
91:30:00	0.000	0.000	0.000	0.000	0.024	0.024
91:36:00	0.000	0.000	0.000	0.000	0.024	0.024
91:42:00	0.000	0.000	0.000	0.000	0.024	0.024
91:48:00	0.000	0.000	0.000	0.000	0.024	0.024
91:54:00	0.000	0.000	0.000	0.000	0.024	0.024
92:00:00	0.000	0.000	0.000	0.000	0.024	0.024
92:06:00	0.000	0.000	0.000	0.000	0.024	0.024
92:12:00	0.000	0.000	0.000	0.000	0.024	0.024
92:18:00	0.000	0.000	0.000	0.000	0.024	0.024
92:24:00	0.000	0.000	0.000	0.000	0.024	0.024
92:30:00	0.000	0.000	0.000	0.000	0.023	0.023
92:36:00	0.000	0.000	0.000	0.000	0.023	0.023
92:42:00	0.000	0.000	0.000	0.000	0.023	0.023
92:48:00	0.000	0.000	0.000	0.000	0.023	0.023
92:54:00	0.000	0.000	0.000	0.000	0.023	0.023
93:00:00	0.000	0.000	0.000	0.000	0.023	0.023
93:06:00	0.000	0.000	0.000	0.000	0.023	0.023
93:12:00	0.000	0.000	0.000	0.000	0.023	0.023
93:18:00	0.000	0.000	0.000	0.000	0.023	0.023
93:24:00	0.000	0.000	0.000	0.000	0.023	0.023
93:30:00	0.000	0.000	0.000	0.000	0.023	0.023
93:36:00	0.000	0.000	0.000	0.000	0.023	0.023
93:42:00	0.000	0.000	0.000	0.000	0.023	0.023
93:48:00	0.000	0.000	0.000	0.000	0.023	0.023
93:54:00	0.000	0.000	0.000	0.000	0.023	0.023
94:00:00	0.000	0.000	0.000	0.000	0.023	0.023
94:06:00	0.000	0.000	0.000	0.000	0.023	0.023
94:12:00	0.000	0.000	0.000	0.000	0.023	0.023
94:18:00	0.000	0.000	0.000	0.000	0.023	0.023

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
94:24:00	0.000	0.000	0.000	0.000	0.022	0.022
94:30:00	0.000	0.000	0.000	0.000	0.022	0.022
94:36:00	0.000	0.000	0.000	0.000	0.022	0.022
94:42:00	0.000	0.000	0.000	0.000	0.022	0.022
94:48:00	0.000	0.000	0.000	0.000	0.022	0.022
94:54:00	0.000	0.000	0.000	0.000	0.022	0.022
95:00:00	0.000	0.000	0.000	0.000	0.022	0.022
95:06:00	0.000	0.000	0.000	0.000	0.022	0.022
95:12:00	0.000	0.000	0.000	0.000	0.022	0.022
95:18:00	0.000	0.000	0.000	0.000	0.022	0.022
95:24:00	0.000	0.000	0.000	0.000	0.022	0.022
95:30:00	0.000	0.000	0.000	0.000	0.022	0.022
95:36:00	0.000	0.000	0.000	0.000	0.022	0.022
95:42:00	0.000	0.000	0.000	0.000	0.022	0.022
95:48:00	0.000	0.000	0.000	0.000	0.022	0.022
95:54:00	0.000	0.000	0.000	0.000	0.022	0.022
96:00:00	0.000	0.000	0.000	0.000	0.022	0.022
96:06:00	0.000	0.000	0.000	0.000	0.022	0.022
96:12:00	0.000	0.000	0.000	0.000	0.021	0.021
96:18:00	0.000	0.000	0.000	0.000	0.021	0.021
96:24:00	0.000	0.000	0.000	0.000	0.021	0.021
96:30:00	0.000	0.000	0.000	0.000	0.021	0.021
96:36:00	0.000	0.000	0.000	0.000	0.021	0.021
96:42:00	0.000	0.000	0.000	0.000	0.021	0.021
96:48:00	0.000	0.000	0.000	0.000	0.021	0.021
96:54:00	0.000	0.000	0.000	0.000	0.021	0.021
97:00:00	0.000	0.000	0.000	0.000	0.021	0.021
97:06:00	0.000	0.000	0.000	0.000	0.021	0.021
97:12:00	0.000	0.000	0.000	0.000	0.021	0.021
97:18:00	0.000	0.000	0.000	0.000	0.021	0.021
97:24:00	0.000	0.000	0.000	0.000	0.021	0.021
97:30:00	0.000	0.000	0.000	0.000	0.021	0.021
97:36:00	0.000	0.000	0.000	0.000	0.021	0.021
97:42:00	0.000	0.000	0.000	0.000	0.021	0.021
97:48:00	0.000	0.000	0.000	0.000	0.021	0.021

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
97:54:00	0.000	0.000	0.000	0.000	0.021	0.021
98:00:00	0.000	0.000	0.000	0.000	0.021	0.021
98:06:00	0.000	0.000	0.000	0.000	0.021	0.021
98:12:00	0.000	0.000	0.000	0.000	0.020	0.020
98:18:00	0.000	0.000	0.000	0.000	0.020	0.020
98:24:00	0.000	0.000	0.000	0.000	0.020	0.020
98:30:00	0.000	0.000	0.000	0.000	0.020	0.020
98:36:00	0.000	0.000	0.000	0.000	0.020	0.020
98:42:00	0.000	0.000	0.000	0.000	0.020	0.020
98:48:00	0.000	0.000	0.000	0.000	0.020	0.020
98:54:00	0.000	0.000	0.000	0.000	0.020	0.020
99:00:00	0.000	0.000	0.000	0.000	0.020	0.020
99:06:00	0.000	0.000	0.000	0.000	0.020	0.020
99:12:00	0.000	0.000	0.000	0.000	0.020	0.020
99:18:00	0.000	0.000	0.000	0.000	0.020	0.020
99:24:00	0.000	0.000	0.000	0.000	0.020	0.020
99:30:00	0.000	0.000	0.000	0.000	0.020	0.020
99:36:00	0.000	0.000	0.000	0.000	0.020	0.020
99:42:00	0.000	0.000	0.000	0.000	0.020	0.020
99:48:00	0.000	0.000	0.000	0.000	0.020	0.020
99:54:00	0.000	0.000	0.000	0.000	0.020	0.020
100:00:00	0.000	0.000	0.000	0.000	0.020	0.020
100:06:00	0.000	0.000	0.000	0.000	0.020	0.020
100:12:00	0.000	0.000	0.000	0.000	0.020	0.020
100:18:00	0.000	0.000	0.000	0.000	0.019	0.019
100:24:00	0.000	0.000	0.000	0.000	0.019	0.019
100:30:00	0.000	0.000	0.000	0.000	0.019	0.019
100:36:00	0.000	0.000	0.000	0.000	0.019	0.019
100:42:00	0.000	0.000	0.000	0.000	0.019	0.019
100:48:00	0.000	0.000	0.000	0.000	0.019	0.019
100:54:00	0.000	0.000	0.000	0.000	0.019	0.019
101:00:00	0.000	0.000	0.000	0.000	0.019	0.019
101:06:00	0.000	0.000	0.000	0.000	0.019	0.019
101:12:00	0.000	0.000	0.000	0.000	0.019	0.019
101:18:00	0.000	0.000	0.000	0.000	0.019	0.019

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
101:24:00	0.000	0.000	0.000	0.000	0.019	0.019
101:30:00	0.000	0.000	0.000	0.000	0.019	0.019
101:36:00	0.000	0.000	0.000	0.000	0.019	0.019
101:42:00	0.000	0.000	0.000	0.000	0.019	0.019
101:48:00	0.000	0.000	0.000	0.000	0.019	0.019
101:54:00	0.000	0.000	0.000	0.000	0.019	0.019
102:00:00	0.000	0.000	0.000	0.000	0.019	0.019
102:06:00	0.000	0.000	0.000	0.000	0.019	0.019
102:12:00	0.000	0.000	0.000	0.000	0.019	0.019
102:18:00	0.000	0.000	0.000	0.000	0.019	0.019
102:24:00	0.000	0.000	0.000	0.000	0.019	0.019
102:30:00	0.000	0.000	0.000	0.000	0.018	0.018
102:36:00	0.000	0.000	0.000	0.000	0.018	0.018
102:42:00	0.000	0.000	0.000	0.000	0.018	0.018
102:48:00	0.000	0.000	0.000	0.000	0.018	0.018
102:54:00	0.000	0.000	0.000	0.000	0.018	0.018
103:00:00	0.000	0.000	0.000	0.000	0.018	0.018
103:06:00	0.000	0.000	0.000	0.000	0.018	0.018
103:12:00	0.000	0.000	0.000	0.000	0.018	0.018
103:18:00	0.000	0.000	0.000	0.000	0.018	0.018
103:24:00	0.000	0.000	0.000	0.000	0.018	0.018
103:30:00	0.000	0.000	0.000	0.000	0.018	0.018
103:36:00	0.000	0.000	0.000	0.000	0.018	0.018
103:42:00	0.000	0.000	0.000	0.000	0.018	0.018
103:48:00	0.000	0.000	0.000	0.000	0.018	0.018
103:54:00	0.000	0.000	0.000	0.000	0.018	0.018
104:00:00	0.000	0.000	0.000	0.000	0.018	0.018
104:06:00	0.000	0.000	0.000	0.000	0.018	0.018
104:12:00	0.000	0.000	0.000	0.000	0.018	0.018
104:18:00	0.000	0.000	0.000	0.000	0.018	0.018
104:24:00	0.000	0.000	0.000	0.000	0.018	0.018
104:30:00	0.000	0.000	0.000	0.000	0.018	0.018
104:36:00	0.000	0.000	0.000	0.000	0.018	0.018
104:42:00	0.000	0.000	0.000	0.000	0.018	0.018
104:48:00	0.000	0.000	0.000	0.000	0.017	0.017

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
104:54:00	0.000	0.000	0.000	0.000	0.017	0.017
105:00:00	0.000	0.000	0.000	0.000	0.017	0.017
105:06:00	0.000	0.000	0.000	0.000	0.017	0.017
105:12:00	0.000	0.000	0.000	0.000	0.017	0.017
105:18:00	0.000	0.000	0.000	0.000	0.017	0.017
105:24:00	0.000	0.000	0.000	0.000	0.017	0.017
105:30:00	0.000	0.000	0.000	0.000	0.017	0.017
105:36:00	0.000	0.000	0.000	0.000	0.017	0.017
105:42:00	0.000	0.000	0.000	0.000	0.017	0.017
105:48:00	0.000	0.000	0.000	0.000	0.017	0.017
105:54:00	0.000	0.000	0.000	0.000	0.017	0.017
106:00:00	0.000	0.000	0.000	0.000	0.017	0.017
106:06:00	0.000	0.000	0.000	0.000	0.017	0.017
106:12:00	0.000	0.000	0.000	0.000	0.017	0.017
106:18:00	0.000	0.000	0.000	0.000	0.017	0.017
106:24:00	0.000	0.000	0.000	0.000	0.017	0.017
106:30:00	0.000	0.000	0.000	0.000	0.017	0.017
106:36:00	0.000	0.000	0.000	0.000	0.017	0.017
106:42:00	0.000	0.000	0.000	0.000	0.017	0.017
106:48:00	0.000	0.000	0.000	0.000	0.017	0.017
106:54:00	0.000	0.000	0.000	0.000	0.017	0.017
107:00:00	0.000	0.000	0.000	0.000	0.017	0.017
107:06:00	0.000	0.000	0.000	0.000	0.017	0.017
107:12:00	0.000	0.000	0.000	0.000	0.017	0.017
107:18:00	0.000	0.000	0.000	0.000	0.016	0.016
107:24:00	0.000	0.000	0.000	0.000	0.016	0.016
107:30:00	0.000	0.000	0.000	0.000	0.016	0.016
107:36:00	0.000	0.000	0.000	0.000	0.016	0.016
107:42:00	0.000	0.000	0.000	0.000	0.016	0.016
107:48:00	0.000	0.000	0.000	0.000	0.016	0.016
107:54:00	0.000	0.000	0.000	0.000	0.016	0.016
108:00:00	0.000	0.000	0.000	0.000	0.016	0.016
108:06:00	0.000	0.000	0.000	0.000	0.016	0.016
108:12:00	0.000	0.000	0.000	0.000	0.016	0.016
108:18:00	0.000	0.000	0.000	0.000	0.016	0.016

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
108:24:00	0.000	0.000	0.000	0.000	0.016	0.016
108:30:00	0.000	0.000	0.000	0.000	0.016	0.016
108:36:00	0.000	0.000	0.000	0.000	0.016	0.016
108:42:00	0.000	0.000	0.000	0.000	0.016	0.016
108:48:00	0.000	0.000	0.000	0.000	0.016	0.016
108:54:00	0.000	0.000	0.000	0.000	0.016	0.016
109:00:00	0.000	0.000	0.000	0.000	0.016	0.016
109:06:00	0.000	0.000	0.000	0.000	0.016	0.016
109:12:00	0.000	0.000	0.000	0.000	0.016	0.016
109:18:00	0.000	0.000	0.000	0.000	0.016	0.016
109:24:00	0.000	0.000	0.000	0.000	0.016	0.016
109:30:00	0.000	0.000	0.000	0.000	0.016	0.016
109:36:00	0.000	0.000	0.000	0.000	0.016	0.016
109:42:00	0.000	0.000	0.000	0.000	0.016	0.016
109:48:00	0.000	0.000	0.000	0.000	0.016	0.016
109:54:00	0.000	0.000	0.000	0.000	0.015	0.015
110:00:00	0.000	0.000	0.000	0.000	0.015	0.015
110:06:00	0.000	0.000	0.000	0.000	0.015	0.015
110:12:00	0.000	0.000	0.000	0.000	0.015	0.015
110:18:00	0.000	0.000	0.000	0.000	0.015	0.015
110:24:00	0.000	0.000	0.000	0.000	0.015	0.015
110:30:00	0.000	0.000	0.000	0.000	0.015	0.015
110:36:00	0.000	0.000	0.000	0.000	0.015	0.015
110:42:00	0.000	0.000	0.000	0.000	0.015	0.015
110:48:00	0.000	0.000	0.000	0.000	0.015	0.015
110:54:00	0.000	0.000	0.000	0.000	0.015	0.015
111:00:00	0.000	0.000	0.000	0.000	0.015	0.015
111:06:00	0.000	0.000	0.000	0.000	0.015	0.015
111:12:00	0.000	0.000	0.000	0.000	0.015	0.015
111:18:00	0.000	0.000	0.000	0.000	0.015	0.015
111:24:00	0.000	0.000	0.000	0.000	0.015	0.015
111:30:00	0.000	0.000	0.000	0.000	0.015	0.015
111:36:00	0.000	0.000	0.000	0.000	0.015	0.015
111:42:00	0.000	0.000	0.000	0.000	0.015	0.015
111:48:00	0.000	0.000	0.000	0.000	0.015	0.015

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
111:54:00	0.000	0.000	0.000	0.000	0.015	0.015
112:00:00	0.000	0.000	0.000	0.000	0.015	0.015
112:06:00	0.000	0.000	0.000	0.000	0.015	0.015
112:12:00	0.000	0.000	0.000	0.000	0.015	0.015
112:18:00	0.000	0.000	0.000	0.000	0.015	0.015
112:24:00	0.000	0.000	0.000	0.000	0.015	0.015
112:30:00	0.000	0.000	0.000	0.000	0.015	0.015
112:36:00	0.000	0.000	0.000	0.000	0.015	0.015
112:42:00	0.000	0.000	0.000	0.000	0.014	0.014
112:48:00	0.000	0.000	0.000	0.000	0.014	0.014
112:54:00	0.000	0.000	0.000	0.000	0.014	0.014
113:00:00	0.000	0.000	0.000	0.000	0.014	0.014
113:06:00	0.000	0.000	0.000	0.000	0.014	0.014
113:12:00	0.000	0.000	0.000	0.000	0.014	0.014
113:18:00	0.000	0.000	0.000	0.000	0.014	0.014
113:24:00	0.000	0.000	0.000	0.000	0.014	0.014
113:30:00	0.000	0.000	0.000	0.000	0.014	0.014
113:36:00	0.000	0.000	0.000	0.000	0.014	0.014
113:42:00	0.000	0.000	0.000	0.000	0.014	0.014
113:48:00	0.000	0.000	0.000	0.000	0.014	0.014
113:54:00	0.000	0.000	0.000	0.000	0.014	0.014
114:00:00	0.000	0.000	0.000	0.000	0.014	0.014
114:06:00	0.000	0.000	0.000	0.000	0.014	0.014
114:12:00	0.000	0.000	0.000	0.000	0.014	0.014
114:18:00	0.000	0.000	0.000	0.000	0.014	0.014
114:24:00	0.000	0.000	0.000	0.000	0.014	0.014
114:30:00	0.000	0.000	0.000	0.000	0.014	0.014
114:36:00	0.000	0.000	0.000	0.000	0.014	0.014
114:42:00	0.000	0.000	0.000	0.000	0.014	0.014
114:48:00	0.000	0.000	0.000	0.000	0.014	0.014
114:54:00	0.000	0.000	0.000	0.000	0.014	0.014
115:00:00	0.000	0.000	0.000	0.000	0.014	0.014
115:06:00	0.000	0.000	0.000	0.000	0.014	0.014
115:12:00	0.000	0.000	0.000	0.000	0.014	0.014
115:18:00	0.000	0.000	0.000	0.000	0.014	0.014

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
115:24:00	0.000	0.000	0.000	0.000	0.014	0.014
115:30:00	0.000	0.000	0.000	0.000	0.014	0.014
115:36:00	0.000	0.000	0.000	0.000	0.014	0.014
115:42:00	0.000	0.000	0.000	0.000	0.013	0.013
115:48:00	0.000	0.000	0.000	0.000	0.013	0.013
115:54:00	0.000	0.000	0.000	0.000	0.013	0.013
116:00:00	0.000	0.000	0.000	0.000	0.013	0.013
116:06:00	0.000	0.000	0.000	0.000	0.013	0.013
116:12:00	0.000	0.000	0.000	0.000	0.013	0.013
116:18:00	0.000	0.000	0.000	0.000	0.013	0.013
116:24:00	0.000	0.000	0.000	0.000	0.013	0.013
116:30:00	0.000	0.000	0.000	0.000	0.013	0.013
116:36:00	0.000	0.000	0.000	0.000	0.013	0.013
116:42:00	0.000	0.000	0.000	0.000	0.013	0.013
116:48:00	0.000	0.000	0.000	0.000	0.013	0.013
116:54:00	0.000	0.000	0.000	0.000	0.013	0.013
117:00:00	0.000	0.000	0.000	0.000	0.013	0.013
117:06:00	0.000	0.000	0.000	0.000	0.013	0.013
117:12:00	0.000	0.000	0.000	0.000	0.013	0.013
117:18:00	0.000	0.000	0.000	0.000	0.013	0.013
117:24:00	0.000	0.000	0.000	0.000	0.013	0.013
117:30:00	0.000	0.000	0.000	0.000	0.013	0.013
117:36:00	0.000	0.000	0.000	0.000	0.013	0.013
117:42:00	0.000	0.000	0.000	0.000	0.013	0.013
117:48:00	0.000	0.000	0.000	0.000	0.013	0.013
117:54:00	0.000	0.000	0.000	0.000	0.013	0.013
118:00:00	0.000	0.000	0.000	0.000	0.013	0.013
118:06:00	0.000	0.000	0.000	0.000	0.013	0.013
118:12:00	0.000	0.000	0.000	0.000	0.013	0.013
118:18:00	0.000	0.000	0.000	0.000	0.013	0.013
118:24:00	0.000	0.000	0.000	0.000	0.013	0.013
118:30:00	0.000	0.000	0.000	0.000	0.013	0.013
118:36:00	0.000	0.000	0.000	0.000	0.013	0.013
118:42:00	0.000	0.000	0.000	0.000	0.013	0.013
118:48:00	0.000	0.000	0.000	0.000	0.013	0.013

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
118:54:00	0.000	0.000	0.000	0.000	0.012	0.012
119:00:00	0.000	0.000	0.000	0.000	0.012	0.012
119:06:00	0.000	0.000	0.000	0.000	0.012	0.012
119:12:00	0.000	0.000	0.000	0.000	0.012	0.012
119:18:00	0.000	0.000	0.000	0.000	0.012	0.012
119:24:00	0.000	0.000	0.000	0.000	0.012	0.012
119:30:00	0.000	0.000	0.000	0.000	0.012	0.012
119:36:00	0.000	0.000	0.000	0.000	0.012	0.012
119:42:00	0.000	0.000	0.000	0.000	0.012	0.012
119:48:00	0.000	0.000	0.000	0.000	0.012	0.012
119:54:00	0.000	0.000	0.000	0.000	0.012	0.012
120:00:00	0.000	0.000	0.000	0.000	0.012	0.012
120:06:00	0.000	0.000	0.000	0.000	0.012	0.012
120:12:00	0.000	0.000	0.000	0.000	0.012	0.012
120:18:00	0.000	0.000	0.000	0.000	0.012	0.012
120:24:00	0.000	0.000	0.000	0.000	0.012	0.012
120:30:00	0.000	0.000	0.000	0.000	0.012	0.012
120:36:00	0.000	0.000	0.000	0.000	0.012	0.012
120:42:00	0.000	0.000	0.000	0.000	0.012	0.012
120:48:00	0.000	0.000	0.000	0.000	0.012	0.012
120:54:00	0.000	0.000	0.000	0.000	0.012	0.012
121:00:00	0.000	0.000	0.000	0.000	0.012	0.012
121:06:00	0.000	0.000	0.000	0.000	0.012	0.012
121:12:00	0.000	0.000	0.000	0.000	0.012	0.012
121:18:00	0.000	0.000	0.000	0.000	0.012	0.012
121:24:00	0.000	0.000	0.000	0.000	0.012	0.012
121:30:00	0.000	0.000	0.000	0.000	0.012	0.012
121:36:00	0.000	0.000	0.000	0.000	0.012	0.012
121:42:00	0.000	0.000	0.000	0.000	0.012	0.012
121:48:00	0.000	0.000	0.000	0.000	0.012	0.012
121:54:00	0.000	0.000	0.000	0.000	0.012	0.012
122:00:00	0.000	0.000	0.000	0.000	0.012	0.012
122:06:00	0.000	0.000	0.000	0.000	0.012	0.012
122:12:00	0.000	0.000	0.000	0.000	0.012	0.012
122:18:00	0.000	0.000	0.000	0.000	0.012	0.012

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
122:24:00	0.000	0.000	0.000	0.000	0.011	0.011
122:30:00	0.000	0.000	0.000	0.000	0.011	0.011
122:36:00	0.000	0.000	0.000	0.000	0.011	0.011
122:42:00	0.000	0.000	0.000	0.000	0.011	0.011
122:48:00	0.000	0.000	0.000	0.000	0.011	0.011
122:54:00	0.000	0.000	0.000	0.000	0.011	0.011
123:00:00	0.000	0.000	0.000	0.000	0.011	0.011
123:06:00	0.000	0.000	0.000	0.000	0.011	0.011
123:12:00	0.000	0.000	0.000	0.000	0.011	0.011
123:18:00	0.000	0.000	0.000	0.000	0.011	0.011
123:24:00	0.000	0.000	0.000	0.000	0.011	0.011
123:30:00	0.000	0.000	0.000	0.000	0.011	0.011
123:36:00	0.000	0.000	0.000	0.000	0.011	0.011
123:42:00	0.000	0.000	0.000	0.000	0.011	0.011
123:48:00	0.000	0.000	0.000	0.000	0.011	0.011
123:54:00	0.000	0.000	0.000	0.000	0.011	0.011
124:00:00	0.000	0.000	0.000	0.000	0.011	0.011
124:06:00	0.000	0.000	0.000	0.000	0.011	0.011
124:12:00	0.000	0.000	0.000	0.000	0.011	0.011
124:18:00	0.000	0.000	0.000	0.000	0.011	0.011
124:24:00	0.000	0.000	0.000	0.000	0.011	0.011
124:30:00	0.000	0.000	0.000	0.000	0.011	0.011
124:36:00	0.000	0.000	0.000	0.000	0.011	0.011
124:42:00	0.000	0.000	0.000	0.000	0.011	0.011
124:48:00	0.000	0.000	0.000	0.000	0.011	0.011
124:54:00	0.000	0.000	0.000	0.000	0.011	0.011
125:00:00	0.000	0.000	0.000	0.000	0.011	0.011
125:06:00	0.000	0.000	0.000	0.000	0.011	0.011
125:12:00	0.000	0.000	0.000	0.000	0.011	0.011
125:18:00	0.000	0.000	0.000	0.000	0.011	0.011
125:24:00	0.000	0.000	0.000	0.000	0.011	0.011
125:30:00	0.000	0.000	0.000	0.000	0.011	0.011
125:36:00	0.000	0.000	0.000	0.000	0.011	0.011
125:42:00	0.000	0.000	0.000	0.000	0.011	0.011
125:48:00	0.000	0.000	0.000	0.000	0.011	0.011

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
125:54:00	0.000	0.000	0.000	0.000	0.011	0.011
126:00:00	0.000	0.000	0.000	0.000	0.011	0.011
126:06:00	0.000	0.000	0.000	0.000	0.011	0.011
126:12:00	0.000	0.000	0.000	0.000	0.010	0.010
126:18:00	0.000	0.000	0.000	0.000	0.010	0.010
126:24:00	0.000	0.000	0.000	0.000	0.010	0.010
126:30:00	0.000	0.000	0.000	0.000	0.010	0.010
126:36:00	0.000	0.000	0.000	0.000	0.010	0.010
126:42:00	0.000	0.000	0.000	0.000	0.010	0.010
126:48:00	0.000	0.000	0.000	0.000	0.010	0.010
126:54:00	0.000	0.000	0.000	0.000	0.010	0.010
127:00:00	0.000	0.000	0.000	0.000	0.010	0.010
127:06:00	0.000	0.000	0.000	0.000	0.010	0.010
127:12:00	0.000	0.000	0.000	0.000	0.010	0.010
127:18:00	0.000	0.000	0.000	0.000	0.010	0.010
127:24:00	0.000	0.000	0.000	0.000	0.010	0.010
127:30:00	0.000	0.000	0.000	0.000	0.010	0.010
127:36:00	0.000	0.000	0.000	0.000	0.010	0.010
127:42:00	0.000	0.000	0.000	0.000	0.010	0.010
127:48:00	0.000	0.000	0.000	0.000	0.010	0.010
127:54:00	0.000	0.000	0.000	0.000	0.010	0.010
128:00:00	0.000	0.000	0.000	0.000	0.010	0.010
128:06:00	0.000	0.000	0.000	0.000	0.010	0.010
128:12:00	0.000	0.000	0.000	0.000	0.010	0.010
128:18:00	0.000	0.000	0.000	0.000	0.010	0.010
128:24:00	0.000	0.000	0.000	0.000	0.010	0.010
128:30:00	0.000	0.000	0.000	0.000	0.010	0.010
128:36:00	0.000	0.000	0.000	0.000	0.010	0.010
128:42:00	0.000	0.000	0.000	0.000	0.010	0.010
128:48:00	0.000	0.000	0.000	0.000	0.010	0.010
128:54:00	0.000	0.000	0.000	0.000	0.010	0.010
129:00:00	0.000	0.000	0.000	0.000	0.010	0.010
129:06:00	0.000	0.000	0.000	0.000	0.010	0.010
129:12:00	0.000	0.000	0.000	0.000	0.010	0.010
129:18:00	0.000	0.000	0.000	0.000	0.010	0.010

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
129:24:00	0.000	0.000	0.000	0.000	0.010	0.010
129:30:00	0.000	0.000	0.000	0.000	0.010	0.010
129:36:00	0.000	0.000	0.000	0.000	0.010	0.010
129:42:00	0.000	0.000	0.000	0.000	0.010	0.010
129:48:00	0.000	0.000	0.000	0.000	0.010	0.010
129:54:00	0.000	0.000	0.000	0.000	0.010	0.010
130:00:00	0.000	0.000	0.000	0.000	0.010	0.010
130:06:00	0.000	0.000	0.000	0.000	0.010	0.010
130:12:00	0.000	0.000	0.000	0.000	0.010	0.010
130:18:00	0.000	0.000	0.000	0.000	0.010	0.010
130:24:00	0.000	0.000	0.000	0.000	0.009	0.009
130:30:00	0.000	0.000	0.000	0.000	0.009	0.009
130:36:00	0.000	0.000	0.000	0.000	0.009	0.009
130:42:00	0.000	0.000	0.000	0.000	0.009	0.009
130:48:00	0.000	0.000	0.000	0.000	0.009	0.009
130:54:00	0.000	0.000	0.000	0.000	0.009	0.009
131:00:00	0.000	0.000	0.000	0.000	0.009	0.009
131:06:00	0.000	0.000	0.000	0.000	0.009	0.009
131:12:00	0.000	0.000	0.000	0.000	0.009	0.009
131:18:00	0.000	0.000	0.000	0.000	0.009	0.009
131:24:00	0.000	0.000	0.000	0.000	0.009	0.009
131:30:00	0.000	0.000	0.000	0.000	0.009	0.009
131:36:00	0.000	0.000	0.000	0.000	0.009	0.009
131:42:00	0.000	0.000	0.000	0.000	0.009	0.009
131:48:00	0.000	0.000	0.000	0.000	0.009	0.009
131:54:00	0.000	0.000	0.000	0.000	0.009	0.009
132:00:00	0.000	0.000	0.000	0.000	0.009	0.009
132:06:00	0.000	0.000	0.000	0.000	0.009	0.009
132:12:00	0.000	0.000	0.000	0.000	0.009	0.009
132:18:00	0.000	0.000	0.000	0.000	0.009	0.009
132:24:00	0.000	0.000	0.000	0.000	0.009	0.009
132:30:00	0.000	0.000	0.000	0.000	0.009	0.009
132:36:00	0.000	0.000	0.000	0.000	0.009	0.009
132:42:00	0.000	0.000	0.000	0.000	0.009	0.009
132:48:00	0.000	0.000	0.000	0.000	0.009	0.009

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
132:54:00	0.000	0.000	0.000	0.000	0.009	0.009
133:00:00	0.000	0.000	0.000	0.000	0.009	0.009
133:06:00	0.000	0.000	0.000	0.000	0.009	0.009
133:12:00	0.000	0.000	0.000	0.000	0.009	0.009
133:18:00	0.000	0.000	0.000	0.000	0.009	0.009
133:24:00	0.000	0.000	0.000	0.000	0.009	0.009
133:30:00	0.000	0.000	0.000	0.000	0.009	0.009
133:36:00	0.000	0.000	0.000	0.000	0.009	0.009
133:42:00	0.000	0.000	0.000	0.000	0.009	0.009
133:48:00	0.000	0.000	0.000	0.000	0.009	0.009
133:54:00	0.000	0.000	0.000	0.000	0.009	0.009
134:00:00	0.000	0.000	0.000	0.000	0.009	0.009
134:06:00	0.000	0.000	0.000	0.000	0.009	0.009
134:12:00	0.000	0.000	0.000	0.000	0.009	0.009
134:18:00	0.000	0.000	0.000	0.000	0.009	0.009
134:24:00	0.000	0.000	0.000	0.000	0.009	0.009
134:30:00	0.000	0.000	0.000	0.000	0.009	0.009
134:36:00	0.000	0.000	0.000	0.000	0.009	0.009
134:42:00	0.000	0.000	0.000	0.000	0.009	0.009
134:48:00	0.000	0.000	0.000	0.000	0.009	0.009
134:54:00	0.000	0.000	0.000	0.000	0.009	0.009
135:00:00	0.000	0.000	0.000	0.000	0.008	0.008
135:06:00	0.000	0.000	0.000	0.000	0.008	0.008
135:12:00	0.000	0.000	0.000	0.000	0.008	0.008
135:18:00	0.000	0.000	0.000	0.000	0.008	0.008
135:24:00	0.000	0.000	0.000	0.000	0.008	0.008
135:30:00	0.000	0.000	0.000	0.000	0.008	0.008
135:36:00	0.000	0.000	0.000	0.000	0.008	0.008
135:42:00	0.000	0.000	0.000	0.000	0.008	0.008
135:48:00	0.000	0.000	0.000	0.000	0.008	0.008
135:54:00	0.000	0.000	0.000	0.000	0.008	0.008
136:00:00	0.000	0.000	0.000	0.000	0.008	0.008
136:06:00	0.000	0.000	0.000	0.000	0.008	0.008
136:12:00	0.000	0.000	0.000	0.000	0.008	0.008
136:18:00	0.000	0.000	0.000	0.000	0.008	0.008

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
136:24:00	0.000	0.000	0.000	0.000	0.008	0.008
136:30:00	0.000	0.000	0.000	0.000	0.008	0.008
136:36:00	0.000	0.000	0.000	0.000	0.008	0.008
136:42:00	0.000	0.000	0.000	0.000	0.008	0.008
136:48:00	0.000	0.000	0.000	0.000	0.008	0.008
136:54:00	0.000	0.000	0.000	0.000	0.008	0.008
137:00:00	0.000	0.000	0.000	0.000	0.008	0.008
137:06:00	0.000	0.000	0.000	0.000	0.008	0.008
137:12:00	0.000	0.000	0.000	0.000	0.008	0.008
137:18:00	0.000	0.000	0.000	0.000	0.008	0.008
137:24:00	0.000	0.000	0.000	0.000	0.008	0.008
137:30:00	0.000	0.000	0.000	0.000	0.008	0.008
137:36:00	0.000	0.000	0.000	0.000	0.008	0.008
137:42:00	0.000	0.000	0.000	0.000	0.008	0.008
137:48:00	0.000	0.000	0.000	0.000	0.008	0.008
137:54:00	0.000	0.000	0.000	0.000	0.008	0.008
138:00:00	0.000	0.000	0.000	0.000	0.008	0.008
138:06:00	0.000	0.000	0.000	0.000	0.008	0.008
138:12:00	0.000	0.000	0.000	0.000	0.008	0.008
138:18:00	0.000	0.000	0.000	0.000	0.008	0.008
138:24:00	0.000	0.000	0.000	0.000	0.008	0.008
138:30:00	0.000	0.000	0.000	0.000	0.008	0.008
138:36:00	0.000	0.000	0.000	0.000	0.008	0.008
138:42:00	0.000	0.000	0.000	0.000	0.008	0.008
138:48:00	0.000	0.000	0.000	0.000	0.008	0.008
138:54:00	0.000	0.000	0.000	0.000	0.008	0.008
139:00:00	0.000	0.000	0.000	0.000	0.008	0.008
139:06:00	0.000	0.000	0.000	0.000	0.008	0.008
139:12:00	0.000	0.000	0.000	0.000	0.008	0.008
139:18:00	0.000	0.000	0.000	0.000	0.008	0.008
139:24:00	0.000	0.000	0.000	0.000	0.008	0.008
139:30:00	0.000	0.000	0.000	0.000	0.008	0.008
139:36:00	0.000	0.000	0.000	0.000	0.008	0.008
139:42:00	0.000	0.000	0.000	0.000	0.008	0.008
139:48:00	0.000	0.000	0.000	0.000	0.008	0.008

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
139:54:00	0.000	0.000	0.000	0.000	0.008	0.008
140:00:00	0.000	0.000	0.000	0.000	0.008	0.008
140:06:00	0.000	0.000	0.000	0.000	0.008	0.008
140:12:00	0.000	0.000	0.000	0.000	0.007	0.007
140:18:00	0.000	0.000	0.000	0.000	0.007	0.007
140:24:00	0.000	0.000	0.000	0.000	0.007	0.007
140:30:00	0.000	0.000	0.000	0.000	0.007	0.007
140:36:00	0.000	0.000	0.000	0.000	0.007	0.007
140:42:00	0.000	0.000	0.000	0.000	0.007	0.007
140:48:00	0.000	0.000	0.000	0.000	0.007	0.007
140:54:00	0.000	0.000	0.000	0.000	0.007	0.007
141:00:00	0.000	0.000	0.000	0.000	0.007	0.007
141:06:00	0.000	0.000	0.000	0.000	0.007	0.007
141:12:00	0.000	0.000	0.000	0.000	0.007	0.007
141:18:00	0.000	0.000	0.000	0.000	0.007	0.007
141:24:00	0.000	0.000	0.000	0.000	0.007	0.007
141:30:00	0.000	0.000	0.000	0.000	0.007	0.007
141:36:00	0.000	0.000	0.000	0.000	0.007	0.007
141:42:00	0.000	0.000	0.000	0.000	0.007	0.007
141:48:00	0.000	0.000	0.000	0.000	0.007	0.007
141:54:00	0.000	0.000	0.000	0.000	0.007	0.007
142:00:00	0.000	0.000	0.000	0.000	0.007	0.007
142:06:00	0.000	0.000	0.000	0.000	0.007	0.007
142:12:00	0.000	0.000	0.000	0.000	0.007	0.007
142:18:00	0.000	0.000	0.000	0.000	0.007	0.007
142:24:00	0.000	0.000	0.000	0.000	0.007	0.007
142:30:00	0.000	0.000	0.000	0.000	0.007	0.007
142:36:00	0.000	0.000	0.000	0.000	0.007	0.007
142:42:00	0.000	0.000	0.000	0.000	0.007	0.007
142:48:00	0.000	0.000	0.000	0.000	0.007	0.007
142:54:00	0.000	0.000	0.000	0.000	0.007	0.007
143:00:00	0.000	0.000	0.000	0.000	0.007	0.007
143:06:00	0.000	0.000	0.000	0.000	0.007	0.007
143:12:00	0.000	0.000	0.000	0.000	0.007	0.007
143:18:00	0.000	0.000	0.000	0.000	0.007	0.007

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
143:24:00	0.000	0.000	0.000	0.000	0.007	0.007
143:30:00	0.000	0.000	0.000	0.000	0.007	0.007
143:36:00	0.000	0.000	0.000	0.000	0.007	0.007
143:42:00	0.000	0.000	0.000	0.000	0.007	0.007
143:48:00	0.000	0.000	0.000	0.000	0.007	0.007
143:54:00	0.000	0.000	0.000	0.000	0.007	0.007
144:00:00	0.000	0.000	0.000	0.000	0.007	0.007
144:06:00	0.000	0.000	0.000	0.000	0.007	0.007
144:12:00	0.000	0.000	0.000	0.000	0.007	0.007
144:18:00	0.000	0.000	0.000	0.000	0.007	0.007
144:24:00	0.000	0.000	0.000	0.000	0.007	0.007
144:30:00	0.000	0.000	0.000	0.000	0.007	0.007
144:36:00	0.000	0.000	0.000	0.000	0.007	0.007
144:42:00	0.000	0.000	0.000	0.000	0.007	0.007
144:48:00	0.000	0.000	0.000	0.000	0.007	0.007
144:54:00	0.000	0.000	0.000	0.000	0.007	0.007
145:00:00	0.000	0.000	0.000	0.000	0.007	0.007
145:06:00	0.000	0.000	0.000	0.000	0.007	0.007
145:12:00	0.000	0.000	0.000	0.000	0.007	0.007
145:18:00	0.000	0.000	0.000	0.000	0.007	0.007
145:24:00	0.000	0.000	0.000	0.000	0.007	0.007
145:30:00	0.000	0.000	0.000	0.000	0.007	0.007
145:36:00	0.000	0.000	0.000	0.000	0.007	0.007
145:42:00	0.000	0.000	0.000	0.000	0.007	0.007
145:48:00	0.000	0.000	0.000	0.000	0.007	0.007
145:54:00	0.000	0.000	0.000	0.000	0.007	0.007
146:00:00	0.000	0.000	0.000	0.000	0.007	0.007
146:06:00	0.000	0.000	0.000	0.000	0.007	0.007
146:12:00	0.000	0.000	0.000	0.000	0.006	0.006
146:18:00	0.000	0.000	0.000	0.000	0.006	0.006
146:24:00	0.000	0.000	0.000	0.000	0.006	0.006
146:30:00	0.000	0.000	0.000	0.000	0.006	0.006
146:36:00	0.000	0.000	0.000	0.000	0.006	0.006
146:42:00	0.000	0.000	0.000	0.000	0.006	0.006
146:48:00	0.000	0.000	0.000	0.000	0.006	0.006

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
146:54:00	0.000	0.000	0.000	0.000	0.006	0.006
147:00:00	0.000	0.000	0.000	0.000	0.006	0.006
147:06:00	0.000	0.000	0.000	0.000	0.006	0.006
147:12:00	0.000	0.000	0.000	0.000	0.006	0.006
147:18:00	0.000	0.000	0.000	0.000	0.006	0.006
147:24:00	0.000	0.000	0.000	0.000	0.006	0.006
147:30:00	0.000	0.000	0.000	0.000	0.006	0.006
147:36:00	0.000	0.000	0.000	0.000	0.006	0.006
147:42:00	0.000	0.000	0.000	0.000	0.006	0.006
147:48:00	0.000	0.000	0.000	0.000	0.006	0.006
147:54:00	0.000	0.000	0.000	0.000	0.006	0.006
148:00:00	0.000	0.000	0.000	0.000	0.006	0.006
148:06:00	0.000	0.000	0.000	0.000	0.006	0.006
148:12:00	0.000	0.000	0.000	0.000	0.006	0.006
148:18:00	0.000	0.000	0.000	0.000	0.006	0.006
148:24:00	0.000	0.000	0.000	0.000	0.006	0.006
148:30:00	0.000	0.000	0.000	0.000	0.006	0.006
148:36:00	0.000	0.000	0.000	0.000	0.006	0.006
148:42:00	0.000	0.000	0.000	0.000	0.006	0.006
148:48:00	0.000	0.000	0.000	0.000	0.006	0.006
148:54:00	0.000	0.000	0.000	0.000	0.006	0.006
149:00:00	0.000	0.000	0.000	0.000	0.006	0.006
149:06:00	0.000	0.000	0.000	0.000	0.006	0.006
149:12:00	0.000	0.000	0.000	0.000	0.006	0.006
149:18:00	0.000	0.000	0.000	0.000	0.006	0.006
149:24:00	0.000	0.000	0.000	0.000	0.006	0.006
149:30:00	0.000	0.000	0.000	0.000	0.006	0.006
149:36:00	0.000	0.000	0.000	0.000	0.006	0.006
149:42:00	0.000	0.000	0.000	0.000	0.006	0.006
149:48:00	0.000	0.000	0.000	0.000	0.006	0.006
149:54:00	0.000	0.000	0.000	0.000	0.006	0.006
150:00:00	0.000	0.000	0.000	0.000	0.006	0.006
150:06:00	0.000	0.000	0.000	0.000	0.006	0.006
150:12:00	0.000	0.000	0.000	0.000	0.006	0.006
150:18:00	0.000	0.000	0.000	0.000	0.006	0.006

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
150:24:00	0.000	0.000	0.000	0.000	0.006	0.006
150:30:00	0.000	0.000	0.000	0.000	0.006	0.006
150:36:00	0.000	0.000	0.000	0.000	0.006	0.006
150:42:00	0.000	0.000	0.000	0.000	0.006	0.006
150:48:00	0.000	0.000	0.000	0.000	0.006	0.006
150:54:00	0.000	0.000	0.000	0.000	0.006	0.006
151:00:00	0.000	0.000	0.000	0.000	0.006	0.006
151:06:00	0.000	0.000	0.000	0.000	0.006	0.006
151:12:00	0.000	0.000	0.000	0.000	0.006	0.006
151:18:00	0.000	0.000	0.000	0.000	0.006	0.006
151:24:00	0.000	0.000	0.000	0.000	0.006	0.006
151:30:00	0.000	0.000	0.000	0.000	0.006	0.006
151:36:00	0.000	0.000	0.000	0.000	0.006	0.006
151:42:00	0.000	0.000	0.000	0.000	0.006	0.006
151:48:00	0.000	0.000	0.000	0.000	0.006	0.006
151:54:00	0.000	0.000	0.000	0.000	0.006	0.006
152:00:00	0.000	0.000	0.000	0.000	0.006	0.006
152:06:00	0.000	0.000	0.000	0.000	0.006	0.006
152:12:00	0.000	0.000	0.000	0.000	0.006	0.006
152:18:00	0.000	0.000	0.000	0.000	0.006	0.006
152:24:00	0.000	0.000	0.000	0.000	0.006	0.006
152:30:00	0.000	0.000	0.000	0.000	0.006	0.006
152:36:00	0.000	0.000	0.000	0.000	0.006	0.006
152:42:00	0.000	0.000	0.000	0.000	0.006	0.006
152:48:00	0.000	0.000	0.000	0.000	0.006	0.006
152:54:00	0.000	0.000	0.000	0.000	0.006	0.006
153:00:00	0.000	0.000	0.000	0.000	0.006	0.006
153:06:00	0.000	0.000	0.000	0.000	0.006	0.006
153:12:00	0.000	0.000	0.000	0.000	0.005	0.005
153:18:00	0.000	0.000	0.000	0.000	0.005	0.005
153:24:00	0.000	0.000	0.000	0.000	0.005	0.005
153:30:00	0.000	0.000	0.000	0.000	0.005	0.005
153:36:00	0.000	0.000	0.000	0.000	0.005	0.005
153:42:00	0.000	0.000	0.000	0.000	0.005	0.005
153:48:00	0.000	0.000	0.000	0.000	0.005	0.005

Time (hh:mm:ss)	Rain (mm)	Sewer Loss (m ³ /s)	Net Rain (mm)	Runoff (m ³ /s)	Baseflow (m ³ /s)	Total Flow (m ³ /s)
153:54:00	0.000	0.000	0.000	0.000	0.005	0.005
154:00:00	0.000	0.000	0.000	0.000	0.005	0.005
154:06:00	0.000	0.000	0.000	0.000	0.005	0.005
154:12:00	0.000	0.000	0.000	0.000	0.005	0.005

Appendix

Catchment descriptors

Name	Value	User-defined value used?
Area (km ²)	1.18	No
ALTBAR	42	No
ASPBAR	183	No
ASPVAR	0.8	No
BFIHOST	0.56	No
BFIHOST19	0.64	No
DPLBAR (km)	1.52	No
DPSBAR (mkm ⁻¹)	15.5	No
FARL	1	No
LDP	2.84	No
PROPWET	0.35	No
RMED1H	10.2	No
RMED1D	30.2	No
RMED2D	39.7	No
SAAR (mm)	638	No
SAAR4170 (mm)	643	No
SPRHOST	40.35	No
URBEXT2000	0.11	No
URBEXT1990	0.07	No
URBCONC	0.83	No
URBLOC	0.68	No
DDF parameter C	-0.03	No
DDF parameter D1	0.33	No
DDF parameter D2	0.38	No
DDF parameter D3	0.27	No
DDF parameter E	0.3	No
DDF parameter F	2.36	No
DDF parameter C (1km grid value)	-0.03	No
DDF parameter D1 (1km grid value)	0.33	No
DDF parameter D2 (1km grid value)	0.38	No
DDF parameter D3 (1km grid value)	0.27	No
DDF parameter E (1km grid value)	0.3	No
DDF parameter F (1km grid value)	2.37	No

E Sensitivity analysis

E.1 Roughness

Figure E1 shows the change in peak flood extent of the 1% AEP event when the 1D and 2D roughness is adjusted by +/-20%. Overall, the model is insensitive to changes in roughness.

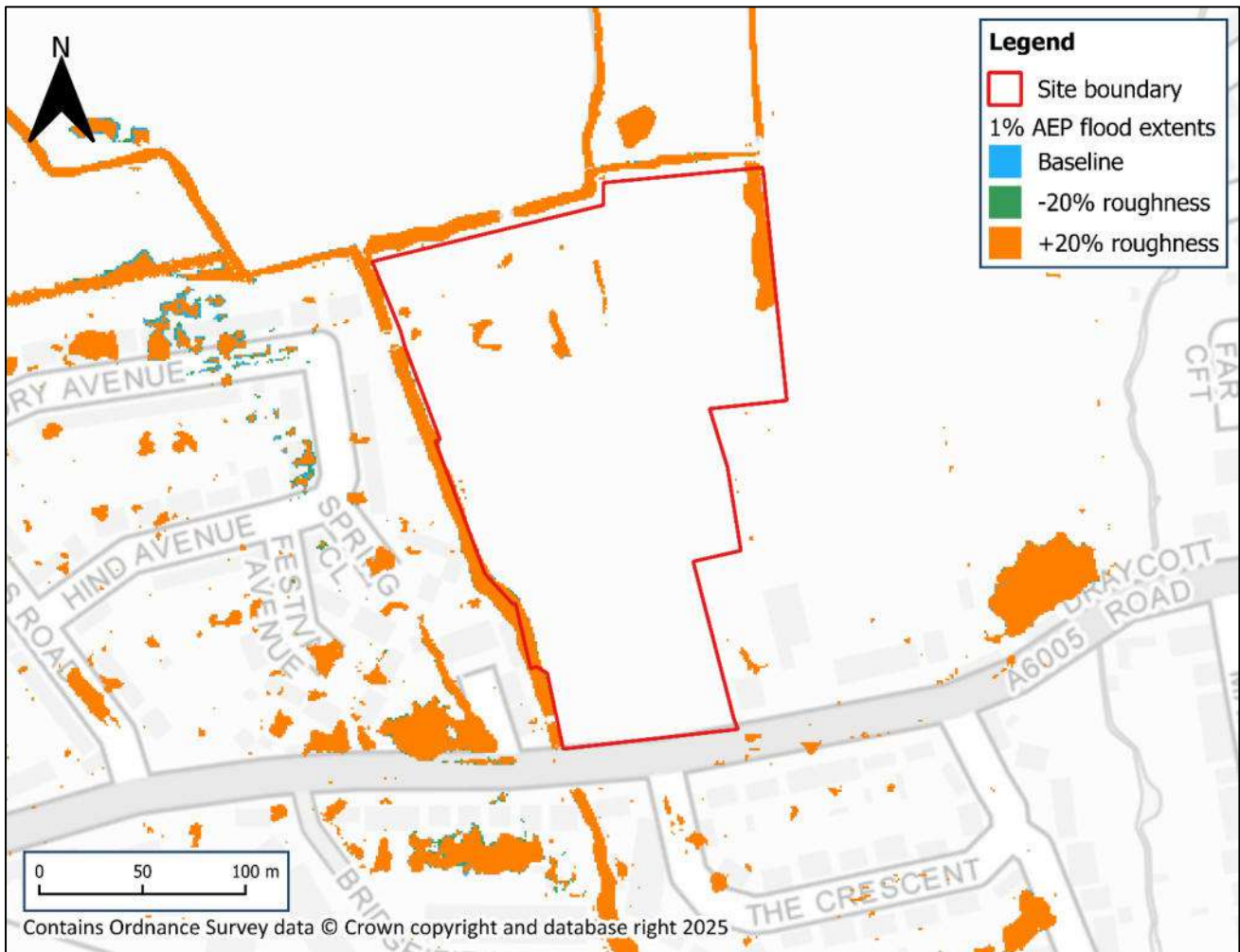


Figure E1: Sensitivity analysis for +/-20% roughness

E.2 Rainfall

Figure E2 shows the changes in peak flood extent compared to the baseline 1% AEP event when the rainfall is increased by +/-20%. The results show that the model is relatively insensitive to changes in applied rainfall. However, in areas where water pools when the rainfall is increased the flood extents increase slightly and when it is decreased flood extents are slightly reduced.

However, in areas where water pools, flood extents are increased slightly when rainfall is increased and reduced slightly when rainfall is decreased.

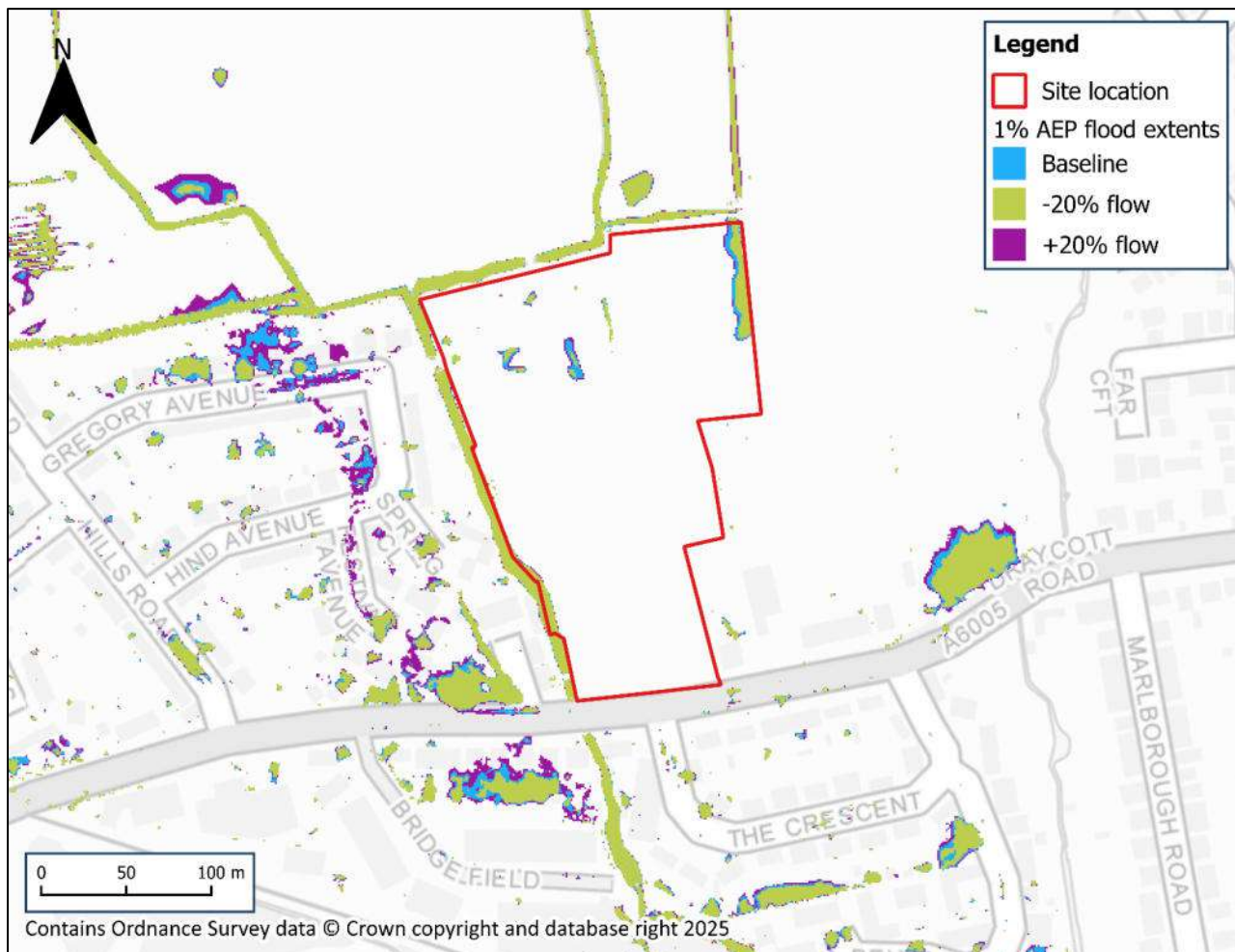


Figure E2: Sensitivity analysis for +/-20% flow

E.3 Downstream boundary

Figure E3 shows the changes in peak flood extents compared to the baseline 1% AEP event when the 2D downstream boundary slope is increased or decreased by 20%. The results show that the model is insensitive to changes in downstream boundary conditions within the site as there is no difference between the flood extents.

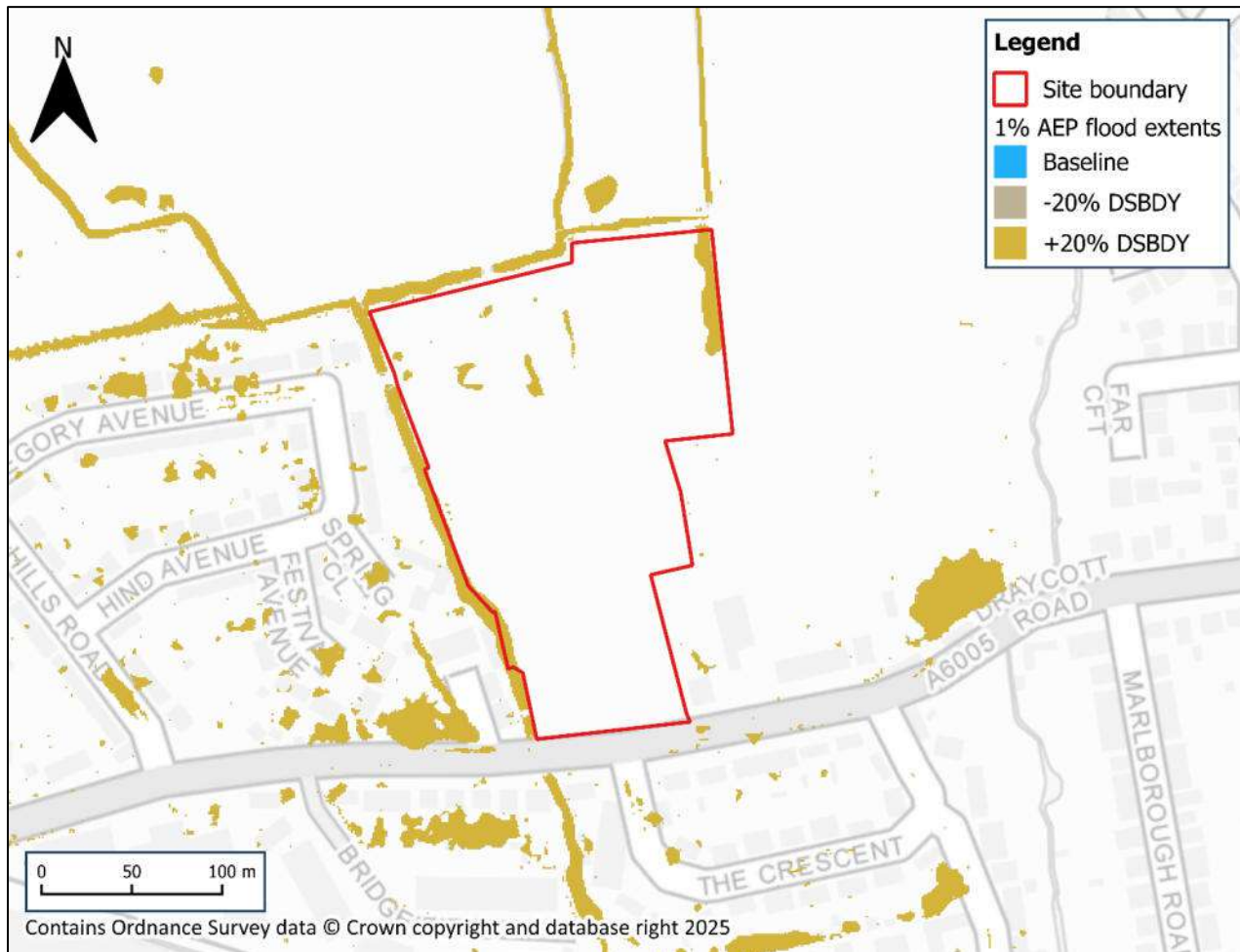


Figure E3: Sensitivity analysis for changes to the downstream boundary conditions

F Proposed development



— Site boundary

P02	UPDATED LAYOUT	10.10.2025	SH	AC	AC
P01	DRAFT PROVING LAYOUT	01.10.2025	SH	AC	AC
Rev	Description	Date	Drn / Chk / App		

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Client **Peveril Homes**

Project Name
Land at Breaston

Sheet Title	
Proving Layout	

TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale @ A3	Suitability
784-B075234	SH	Oct 25	AC	Oct 25	AC	Oct 25	1:1000	S0
Client Project Number	Originator	Volume/System	Level/Location	Type/Code	Role	Number	Revision	
B075234	- TTE	- 00	- ZZ	- DR	- H	- 0001	P02	

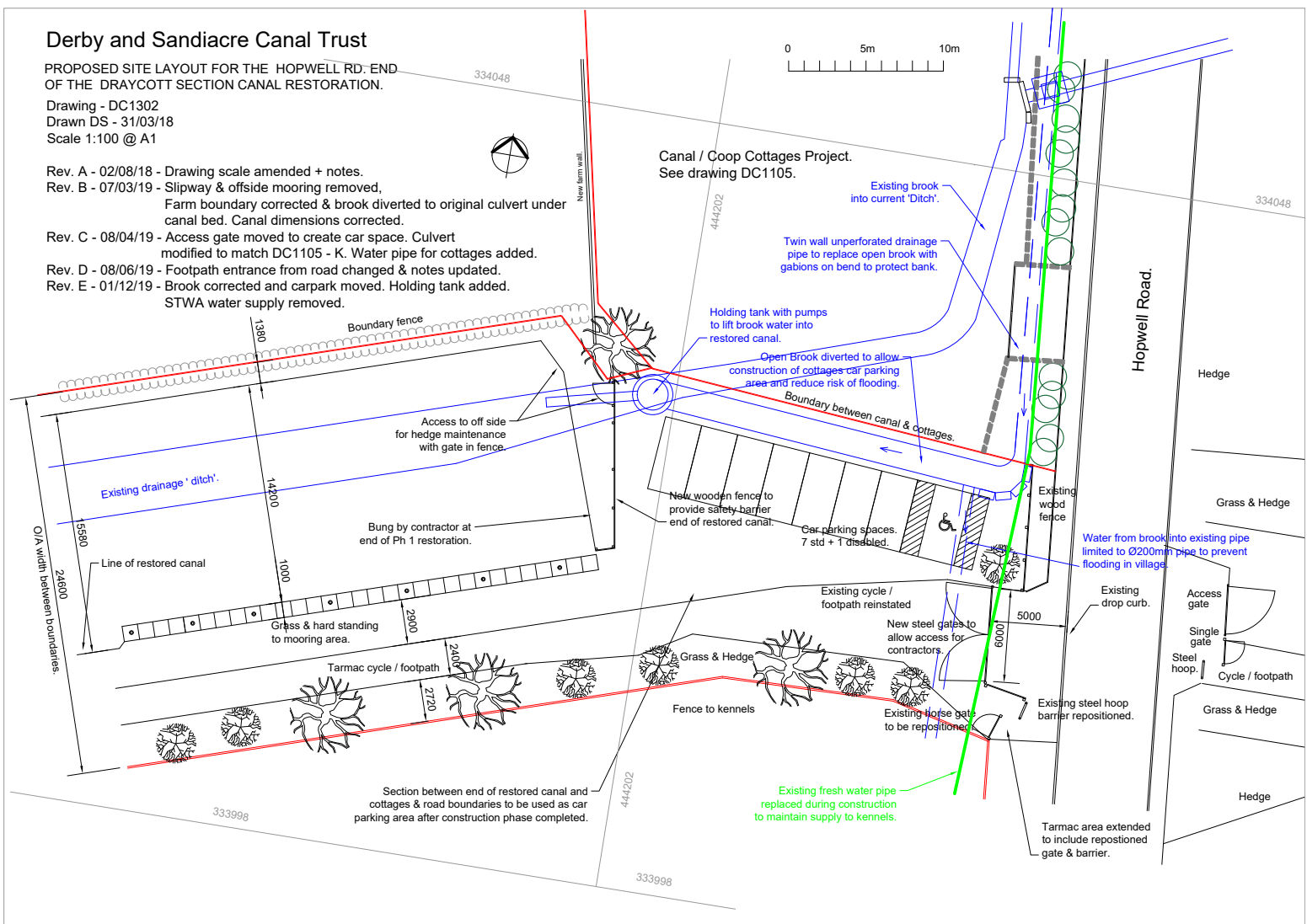
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G Canal Cottage Drainage Plan

PROPOSED SITE LAYOUT FOR THE HOPWELL RD. END
OF THE DRAYCOTT SECTION CANAL RESTORATION.

Drawing - DC1302
Drawn DS - 31/03/18
Scale 1:100 @ A1

- Rev. A - 02/08/18 - Drawing scale amended + notes.
- Rev. B - 07/03/19 - Slipway & offside mooring removed,
Farm boundary corrected & brook diverted to original culvert under canal bed. Canal dimensions corrected.
- Rev. C - 08/04/19 - Access gate moved to create car space. Culvert modified to match DC1105 - K. Water pipe for cottages added.
- Rev. D - 08/06/19 - Footpath entrance from road changed & notes updated.
- Rev. E - 01/12/19 - Brook corrected and carpark moved. Holding tank added. STWA water supply removed.



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