



Technical Note

Electric vehicle charging facility

Chippenham

This Technical Note has been prepared in response to Wiltshire Council's request for pre-commencement drainage information (planning ref: PL/2025/07726).

This Technical Note has been prepared for Instavolt Ltd. Its contents cannot be copied or relied upon by others, except the planning and drainage authorities, without the written authority of Amazi Consulting Ltd.

The pre-commencement information:

Item	Information requested	Applicant's response
1	Site-Specific Groundwater Flood Risk Assessment The site is identified as being susceptible to groundwater flooding. A groundwater FRA is required in line with the Council's Groundwater Management Strategy.	Please refer to attached Groundwater Flood Risk Assessment.
2	Discharge Rate Review The current strategy proposes 2 l/s. The Lead Local Flood Authority (LLFA) has indicated that discharge should be restricted to 1 l/s and expects justification if this is not achievable.	The attached surface water storage calculations confirm that the outflow has been restricted to 2 l/s for storms up to the future 1:100 year event. This is so that the diameter of the outfall is not unreasonably small (reducing the risk of blockage). This is particularly important since the network comprises gulleys, pipes and tanks, which is a system more susceptible to blockage than some other SuDS systems. (Note: although these calculations include an error of 1:3 side slope to the storage system (pg. 2) it is the value for storage volume of 121 m³ that has been correctly translated onto the drawing for construction, meaning this error is not relevant. Also, the latest drainage layout drawing (HDL-INST-20-500 Rev D) shows an orifice of 54 mm, which we understand relates to a Hydrobrake, rather than the orifice flow control type mentioned in the calculations.) In addition, the design has also now been analysed in Info Drainage software. The calculations for this are attached and these supersede the aforementioned storage calculations. This has provided opportunity for a full network analysis. The key results: • Maximum outflow = 1.2 l/s • Maximum total required storage in the two tanks = 99 m³, less than the 121 m³ provided.

		No flooding from the network in both the 1:30 + 45% CC and 1:100 + 45% CC events.
3	National Standard 2 - 5mm Interception Requirement Demonstrate how the first 5mm of rainfall is intercepted on site, either through additional calculations or quantification in accordance with National Standard 2.	The Standard (§2.6): <i>‘Evidence shall be provided to demonstrate that the runoff from each positively drained surface, for at least 5mm of rainfall, is either collected for use, infiltrated into the ground, or else captured, conveyed and stored within SuDS features’.</i> It will be difficult to meet this requirement at this site given the type and size of the site and the fact that infiltration drainage is not feasible due to the clay soil. It is not really possible lose water unless you can introduce measures such as: permeable paving, large area of soft/vegetated SuDS (e.g. swale, basin), water re-use. None of these are applicable at this small site. The outfall from the site is into the public surface water system. The destination of the public system downstream of the site is not currently known, and Wessex Water has raised no objection to receiving the site runoff.
4	Pre- and Post-Development Overland Flow Routes Plan A plan clearly showing exceedance flow routes to confirm no increased flood risk to people or property.	Refer to exceedance plan: HDL-INST-20-510 HDL-INST-20-510 Again, the fundamental design of the site (with vehicular access being the ‘valley’ leading off site) use makes this requirement very difficult to meet. The drainage design includes a channel drain across the site low point/access route. This is stated as 100 mm channel drain on the design drawing, although we can confirm that it will be installed as a larger, high capacity 200 mm channel. This will enable greater interception capacity and significantly reduce the risk of blockage. Also, the site drainage maintenance will include regular cleaning of this channel to maintain its function.
5	Hydraulic Calculations Updated calculations demonstrating: - No on-site flooding during the 1 in 30-year event; and - No flooding affecting people or property during the 1 in 100-year plus climate change event.	Refer to calculations in item 2 above. These confirm that there is no flooding from the network in the 1:30 year plus climate change and the 1:100 year plus climate change storm events.
6	Flotation Calculations / Tank Lining Evidence The SFRA indicates groundwater levels between 0.025m and 0.5m below ground level. Evidence is required to	Given that there is now the benefit of knowing the clay soil conditions within excavations on site, it is felt that this would no longer be relevant.

	demonstrate the attenuation tank will not be subject to flotation, or confirmation of an appropriate lining/design solution.	
7	Firefighting Runoff Containment (BESS) The final drainage design must demonstrate that, in the event of a battery fire, all firefighting runoff and effluent can be safely contained on site with no unacceptable risk of pollution.	The BESS has been removed from the design.
8	Outfall Consent Confirmation of consent for discharge into the public sewer (S106 agreement).	Highway Developments Ltd has submitted an application to Wessex Water and are awaiting a final response (Wessex Water Developer Services Application CRM:002516433). Approval has now been given – refer to attached information.
9	Cross sections	Site levels cross sections are included in the attached Groundwater Flood Risk Assessment. The proposed drainage sections are on the Construction Details drawing.

Attachments

- Amazi Groundwater Flood Risk Assessment (AMA1017 GW)
- Highways Development documentation:
 - HDL-INST-20-500 Revision D Proposed Drainage Strategy
 - Surface water storage estimation (November 2025)
 - SHE-0054-1900-2281-1900 HydroBrake specification
 - HDL-INST-20-111 Revision A Construction Details Sheet 2
- Info Drainage calculations
- Wessex Water information

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Groundwater Flood Risk Assessment

Electric vehicle charging facility

Chippenham

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 - 3.1 Data
 - 3.2 Discussion
 - 3.3 Mitigation

Summary

- ⇒ The proposed development comprises the construction of a new electric vehicle charging facility.
- ⇒ This Assessment has been prepared because the site is identified as being within an area at potential risk of groundwater emergence in the Wiltshire Council Strategic Flood Risk Assessment.
- ⇒ It is concluded that the site is at low risk of groundwater flooding (and all other sources of flooding).
- ⇒ In the unlikely event that the site were to flood, local drainage systems, and the ground surface levels, would direct flow southwards as the existing situation. Any flows would remain shallow.

Attachments

- T20-P1528-DR-0001, Topographic and utility survey, July 2025
- 10829 - 0001_01-PL Planning Site Layout Review of Commercially Available Groundwater Flood Risk Mapping
- HDL-INST-20-120 Rev A Proposed Levels Strategy & Contour Plan
- HDL-INST-20-121-Proposed Cross Sections

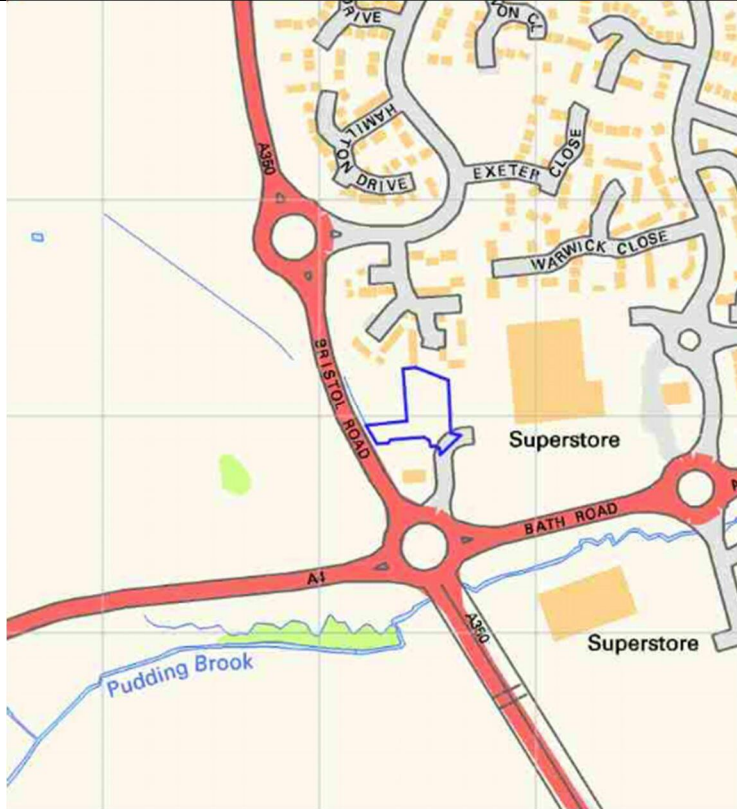
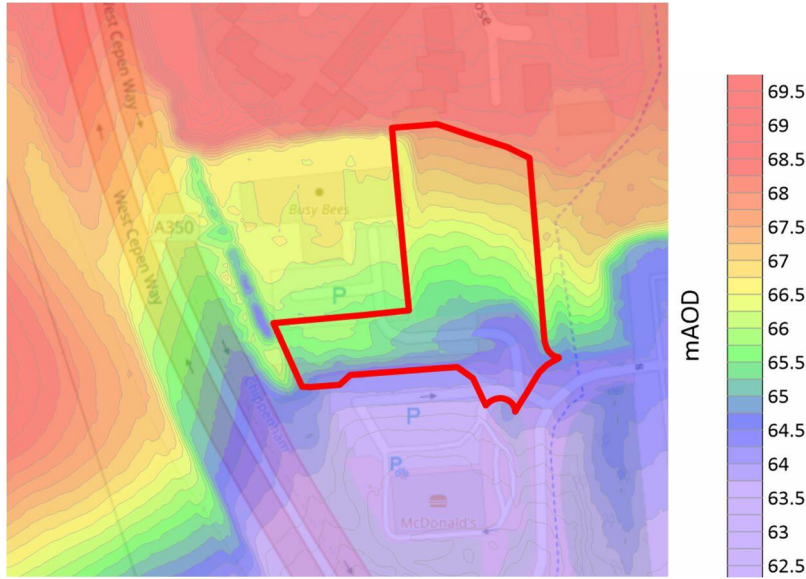
1 Introduction

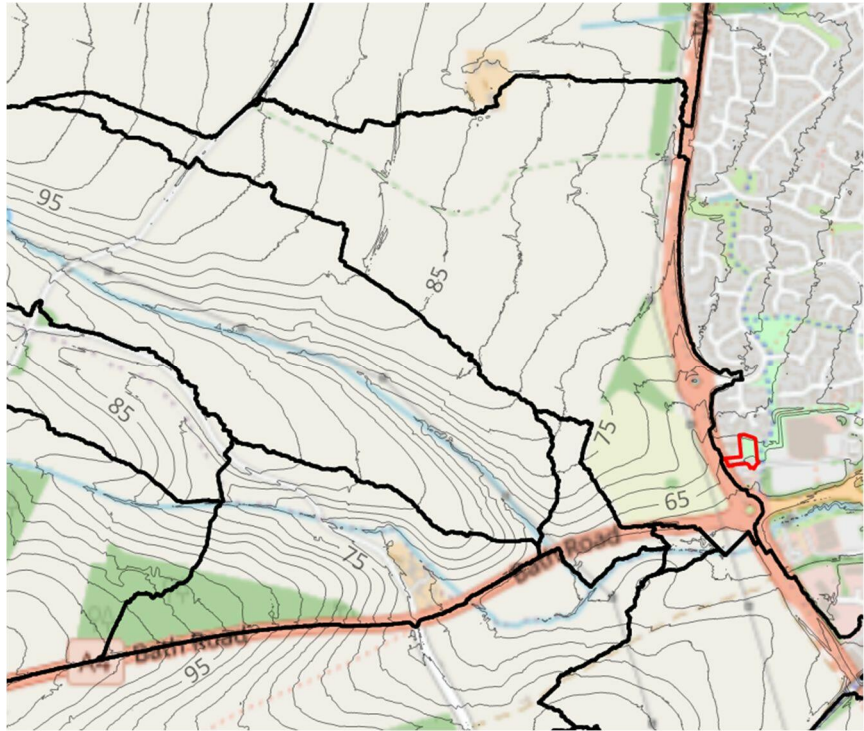
- 1.1 Amazi Consulting Ltd has been instructed to prepare this Groundwater Flood Risk Assessment (FRA) associated with the proposed electric vehicle charging facility at Land North of Bath Road, Chippenham, SN14 0BJ.
- 1.2 This report has been prepared for the sole use of Instavolt Ltd. Its contents cannot be copied or relied upon by others, except the planning and drainage authorities, without the written authority of Amazi Consulting Ltd.
- 1.3 This FRA has been prepared in response to the planning authority's pre-commencement request for a 'Site-Specific Groundwater Flood Risk Assessment' (Wiltshire Council planning ref: PL/2025/07726).
- 1.4 This Assessment has been undertaken as a desk study and relies upon data produced by others. The flood data used is currently the best available for assessing flood risks at the site. This report does not attempt to comment upon insurance, or for flood events other than as stipulated by planning policy. There is always the risk, however small, that flooding could be different to that assessed.

2 The Development

2.1 The site location information and setting are summarised in Table 2.1.

Table 2.1 – Existing site overview

Address	Land North of Bath Road, Chippenham
Post code	SN14 0BJ
NGR	389700 mE, 172200 mN
Location plan	 Figure 2.1 – Site location
Local topography	See attached survey for site topographical survey. This relates to Ordnance datum (mAOD). Site levels vary from 67.85 mAOD at the north boundary, to 65.5 mAOD at the south west corner and 64 mAOD at the south east of the site.  Figure 2.2 – Contours near site 0.25 m c-c (Source: lidar composite: Contours-ST87se_DTM_1m.tif, downloaded 25 March 2026)

	 Figure 2.3 – Contours near site 0.5 m c-c (Source: lidar composite: Contours-ST87se_DTM_1m.tif, downloaded 25 March 2026) The approximate topographical watersheds are outlined in black. These are theoretical only and do not include the effects of drainage systems or localised topographical features (kerbs, buildings, pipes, ponds, walls, small watercourses etc.), and localised depressions have been filled.
Local planning authority	Wiltshire Council
Lead Local Flood Authority (LLFA)	Wiltshire Council

- 2.2 The site is currently classified as *less vulnerable* in accordance with Annex 3 of the NPPF.
- 2.3 The proposed development comprises the construction of an electric vehicle charging facility.
- 2.4 The proposed use is classified as *less vulnerable*, in accordance with Annex 3 of the NPPF.

3 Groundwater Flooding

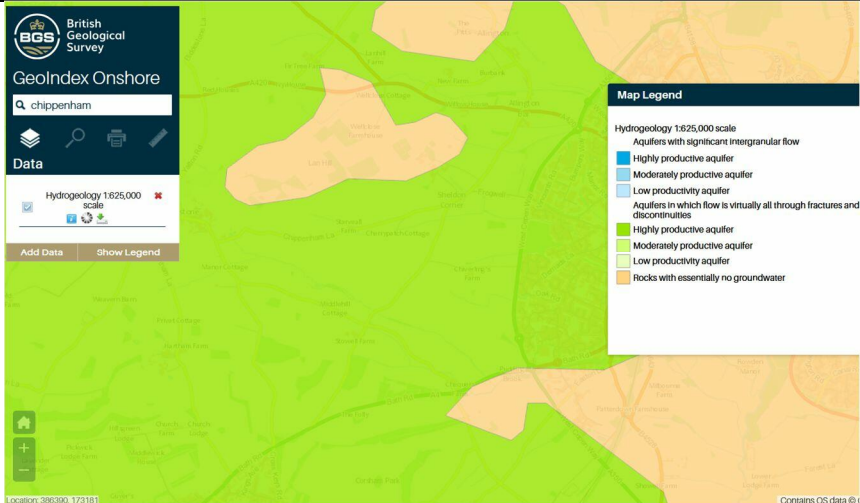
3.1 Data

3.1.1 The planning authority has stated that ‘the site is identified as being susceptible to groundwater flooding. A groundwater FRA is required in line with the Council’s Groundwater Management Strategy.’

3.1.2 In order to undertake this assessment we first present the data relating to groundwater flooding. This is then proceeded by commentary from §3.2.

- Table 3.1: Soil data
- Table 3.2: Groundwater flood mapping
- Table 3.3: Groundwater monitoring data

Table 3.1 - Soils

Ref	Source	Extracts
A	British Geological Survey Hydrogeology 1:625,000	
b	British Geological Survey (BGS) Boreholes	 These records are to a maximum depth of 4m. They mainly indicate clay at these shallow depths.

e.g.:

SdT87SE16 (1990):

Ground Level					
Description	Depth (m)	Level (m OD)	Sample or Test	Depth (m) to Sample or Test	Water Level (m)
Firm, dark brown, silty CLAY with many roots.	0.25				
Very stiff, grey-green and yellow-brown silty CLAY.	0.5		CBR	0.5	
Strong to very strong, grey-green weathered brown on discontinuity surfaces, medium grained LIMESTONE, very thinly bedded dipping at 180/10, with joints dipping steeply to 110 and 340.	1.1		B	0.8	
TRIAL PIT COMPLETE AT 1.1m					

ST87SE18 (1990):

Description	Depth (m)	Level (m OD)	Sample or Test	Depth (m) to Sample or Test	Water Level (m)
Firm, light brown, silty CLAY with some roots.	0.25		V	0.4	
Firm to stiff becoming stiff, light yellow-brown, silty CLAY with dark red plant remains.			CBR, ISD	0.75	
			B, V	1.1	
Very stiff, grey, silty CLAY, becoming very weak, slightly weathered MUDSTONE.	1.6				
Dark grey below 3.1m.	3.1				
			B	3.5	
TRIAL PIT COMPLETE AT 3.7m	3.7				3.7

c	Highways Development Ltd Drainage Strategy report, HDL-INST-20-RP-001, September 2025	This report, submitted in support of the planning application, refers to insitu soil testing from a previous planning application by others at the site. Although we cannot rely upon this data, we have also reviewed it and it describes the soil as stiff (blue) clay down to at least 62.3 mAOD. When drilling they record that the clay was wet, but it drained away.
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d	Castledine Environmental Phase 1 Land Contamination Risk Assessment, September 2025	4084D P1 Hand – Chippenham Castledine Environmental 6.8.1 SUPERFICIAL DEPOSITS Both BGS geological mapping and the Groundsure report record no superficial geological deposits located on site with the nearest record being an area of Alluvium, comprising sands with clays and gravels and possible organic inclusions, located 101m south of site. 6.8.2 BEDROCK DEPOSITS Both BGS geological mapping and the Groundsure report records bedrock geology of the Cornbrash Formation underlying site, comprising a medium- to fine-grained limestone with bioclastic wackestones and packstones (generally bluish grey when fresh, weathering to olive or yellowish brown). Records of the Forest Marble Formation, comprising a silicate mudstone are then located 14m south west of site; with records of the Kellaways Formation, comprising a silicate sandstone and siltstone, then located 26m south of site.
e	Insitu excavations 2026	Parco Civil Engineering & Groundworks Ltd have made the following comments relating to excavations on site in the past few weeks: • Two excavations to levels of 63.85 and 64.25 mAOD. • This is down to 1 to 2 m below proposed site ground levels. Proposed site levels are shown on the attached Proposed Levels drawing. • Neither excavation encountered groundwater. • The soil profile has been reported as <i>'50-100mm of topsoil, 200mm of soil and stone, then into a clay/stone material across the whole of site'</i>. See photographs below:

																						
f	Wiltshire Council Level 1 Strategic Flood Risk Assessment (SFRA), 2024	There are limited superficial deposit in the study area. <i>‘To the east and west of the Chippenham study area there are small deposits of Head. These comprise a mixture of clay, silt, sand & gravel’.</i> §2.3.1 <i>‘The Cornbrash Formation is classified as a secondary A aquifer (water bearing) and rests above the Forest Marble Formation. The thin aquifer is typically hydraulically separated from the Combe Down Oolite aquifer (Table 2) by the clays in the Forest Marble Formation. This scenario is expected to lead to the development of a perched water table in the Cornbrash Formation. Therefore, the Cornbrash Formation is of interest to this study because it outcrops at surface over much of the study area.’</i> 2.3.3 Bedrock Groundwater Levels Cornbrash Formation There is no monitoring of groundwater levels undertaken by the Environment Agency in the Cornbrash Formation. However, Table 3 presents water level data from three BGS borehole logs. Whilst it is important to note that the data is not recent and does not show seasonal fluctuations, it does indicate that a perched water table exists within the thin Formation and is close to ground level in places. The locations of the boreholes identified within Table 3 are shown on Figure 1. Table 3: Water levels in the Cornbrash Formation obtained from BGS logs <table><tr><th>Borehole Reference</th><th>Approximate Location</th><th>Water Level (mbgl)</th><th>Date of record</th><th>Base of Cornbrash below GL (m)</th></tr><tr><td>ST97SW37</td><td>Central Chippenham</td><td>1.85</td><td>5/02/1988</td><td>4</td></tr><tr><td>ST97SW204</td><td>NW of Chippenham</td><td>1.6</td><td>1/09/1993</td><td>2.7</td></tr><tr><td>ST97SW13</td><td>SW of Chippenham</td><td>0.84</td><td>1937</td><td>4.5</td></tr></table> ‘mbgl’ – meters below ground level. ‘GL’ – Ground Level; ‘NW’ – north west; ‘SW’ - southwest The Ladyfield Brook and Pudding Brook probably receive groundwater inflow (baseflow) from the Cornbrash Formation. However, there are no available data to confirm groundwater / surface water interactions.	Borehole Reference	Approximate Location	Water Level (mbgl)	Date of record	Base of Cornbrash below GL (m)	ST97SW37	Central Chippenham	1.85	5/02/1988	4	ST97SW204	NW of Chippenham	1.6	1/09/1993	2.7	ST97SW13	SW of Chippenham	0.84	1937	4.5
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ST97SW37	Central Chippenham	1.85	5/02/1988	4																		
ST97SW204	NW of Chippenham	1.6	1/09/1993	2.7																		
ST97SW13	SW of Chippenham	0.84	1937	4.5																		

Table 3.2 - Groundwater flood mapping

Source	Extract
Wiltshire Strategic Flood Risk Assessment Appendix G Groundwater Emergence	<i>There is a risk of groundwater flooding to surface and sub-surface assets. Groundwater levels are between 0.025 and 0.5 m below the ground surface.</i>

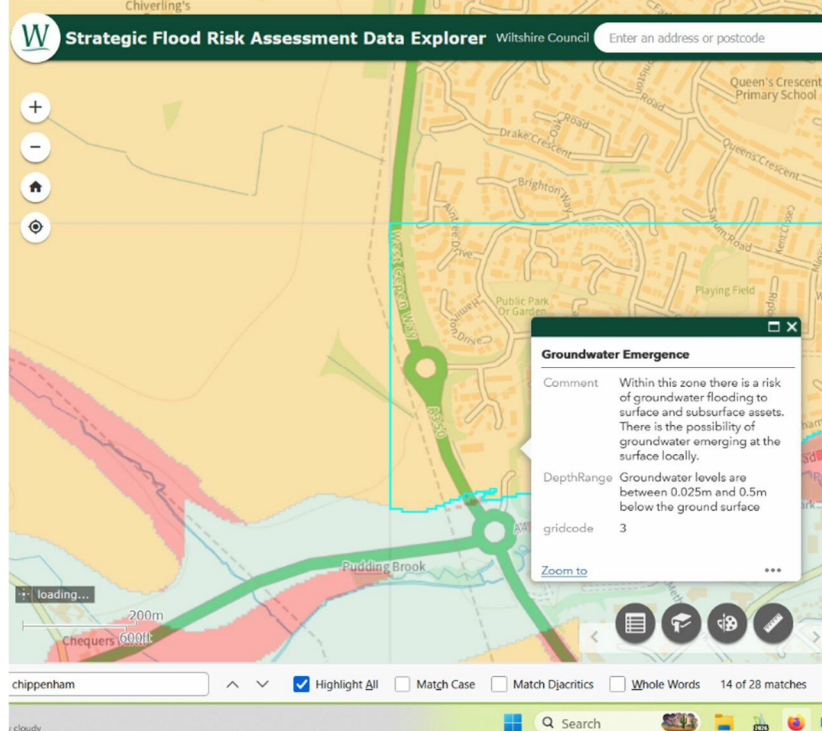
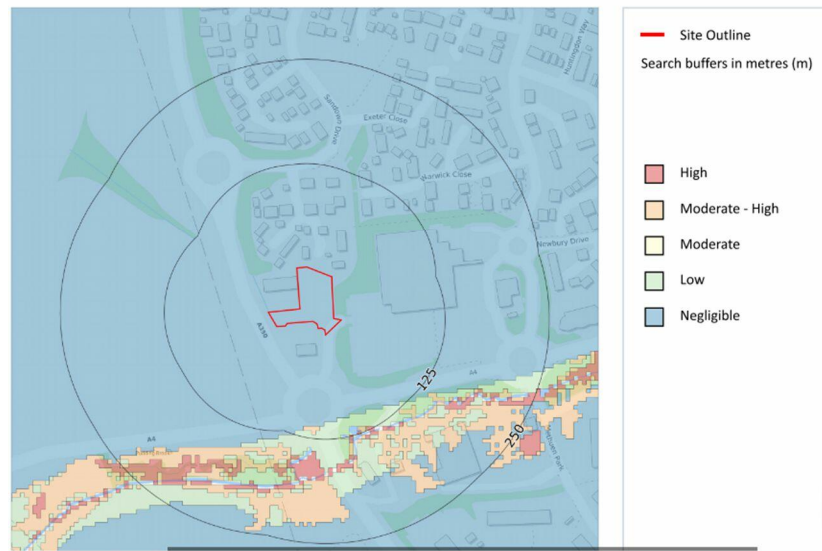
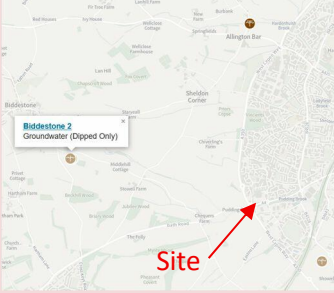
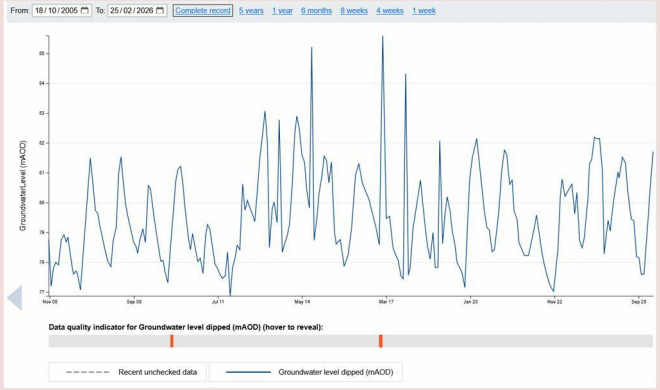
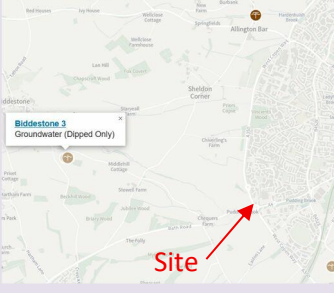
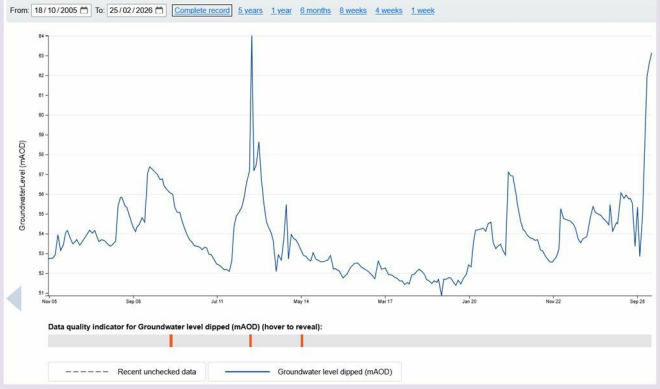
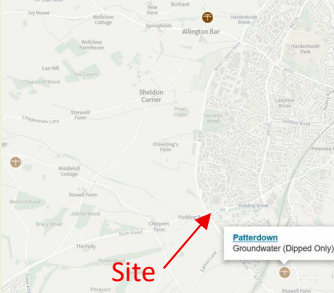
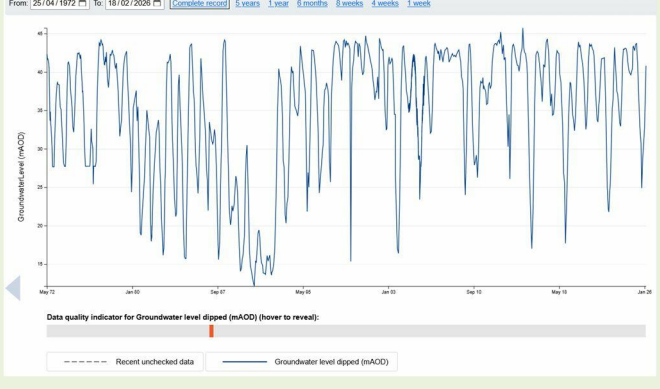
	
Groundsure report ref: GS-54M-BYW-JV9-L6Y (August 2025) appended to Castledine Environmental Phase 1 Land Contamination Risk Assessment, September 2025	9 Groundwater flooding  This data is stated as being sourced from Ambiantal Risk Analytics[^]. Although we understand that the data is essentially GeoSmart's Groundwater Flood Risk Mapping (GW5)*, which is repackaged into a different flood product. * originally created by ESI Ltd [^] now part of the Twinn by Haskoning brand !!
Highways Development Ltd Drainage Strategy report, HDL-INST-20-RP-001, September 2025	This report submitted in support of the planning application mentions how a <i>'ground investigation undertaken in relation to previous development proposals for the site identified.....groundwater levels within the testing locations were found to be at 1.65 and 2.3 m below ground level'</i>.



Table 3.3 - Groundwater monitoring data

Station identifiers	Location map	Data extracts
Allington 2 Station Type Groundwater Grid Reference ST8969074870 Station ID (WISKI) 91487435 Aquifer Great Oolite Borehole Depth 53.5 m Datum 83.9 mAOD		2006-2026: From: 22/09/2006 To: 02/03/2026 Complete record 5 years 1 year 6 months 8 weeks 4 weeks 1 week Advisory Dates provided for sub-daily data exceed the limit for display. Graph shows daily reading at 5am for this date range. To see sub-daily data choose dates no more than eight weeks apart. Data quality indicator for Sub-daily groundwater level (mAOD) (hover to reveal): Recent unchecked data Sub-daily groundwater level (mAOD) 2025-2026: From: 02/03/2025 To: 02/03/2026 Complete record 5 years 1 year 6 months 8 weeks 4 weeks 1 week Advisory Dates provided for sub-daily data exceed the limit for display. Graph shows daily reading at 5am for this date range. To see sub-daily data choose dates no more than eight weeks apart. Data quality indicator for Sub-daily groundwater level (mAOD) (hover to reveal): Recent unchecked data Sub-daily groundwater level (mAOD) Min = 66 mAOD (November 2017) Max = 81.255 mAOD (April 2024) ∴ Shallowest depth on record = 2.645 m bgl

Biddeston 2 Station Type Groundwater (Dipped Only) Grid Reference ST8704872874 Station ID (WISKI) 91487434 Aquifer Great Oolite Borehole Depth 45 m Datum 106.72 mAOD		2005-2026:  Min = 76.87 mAOD (November 2011) Max = 85.6 mAOD (January 2017) ∴ Shallowest depth on record = 21.12 m bgl
Biddeston 3 Station Type Groundwater (Dipped Only) Grid Reference ST8701972876 Station ID (WISKI) 90887433 Aquifer Inferior Oolite Borehole Depth 110 m Datum 106.82 mAOD		2005-2026:  Min = 50.87 mAOD (January 2019) Max = 64.02 mAOD (August 2012) ∴ Shallowest depth on record = 42.8 m bgl Not regular annual variations
Patterdown Station Type Groundwater (Dipped Only) Grid Reference ST9075171344 Station ID (WISKI) 91497131 Aquifer Great Oolite & Fuller's Earth Borehole Depth 89.6 m Datum 53.8 mAOD		1972-2026:  Min = 12.12 mAOD (December 1990) Max = 45.73 mAOD (January 2015) ∴ Shallowest depth on record = 8.07 m bgl Generally above 40 mAOD in winter

3.2 Discussion

- 3.2.1 Soil data shows that there is likely to a layer of superficial deposits of clayey soil with the Cornbrash limestone at shallow depth beneath. The Cornbrash is expected to host groundwater as a perched, secondary aquifer, with the primary aquifer at greater depth. The BGS soil data suggests that the clay beneath the site may be as thin as c1 m at the south of the site, but thicker at the higher, north end of the site.
- 3.2.2 The monitoring data in Table 3.3 is for groundwater within the primary aquifer. Although the stations are, in the scheme of national hydrogeology, quite close to the site, the ground levels, and depth of superficial deposits at the stations, are significantly different compared to the site. So they do not provide much background data on the risks at the site itself.
- 3.2.3 There is no national Government produced groundwater flood risk mapping. The two main commercially available groundwater flood mapping in Table 3.2 show what initially appear to be opposing risk of groundwater flooding at the site:
- GeoSmart GW5 shows 'Negligible' risk of groundwater flooding
 - Jba mapping in the Wiltshire Council Level 1 Strategic Flood risk assessment (SFRA) shows groundwater between 0.025 and 0.5 m below the surface with the possibility of groundwater emerging at the surface.

Neither confirm that that groundwater flooding is likely though. As stated at a webinar on groundwater flooding hosted by the Chartered Institution of Water and Environmental Management (27 March 2026), these maps indicate "*where groundwater flooding should be considered, not where it could occur*".

- 3.2.4 As explained in the attached *Review of Commercially Available Groundwater Flood Risk Mapping*, the two aforementioned data sets have been produced using differing methods. And as stated in the SFRA, '*mapping within the SFRA should not be used in place of local groundwater monitoring*', and we suggest, site specific ground investigation. The SFRA makes use of the risk of the Jba groundwater emergence mapping alongside the Environment Agency groundwater Flood Alert Areas and the groundwater and surface water Recorded Flood Outlines to identify those areas which could be most at risk of groundwater flooding (described in more detail in section 4.5 of the SFRA). We know from Table 3.2 that the site is not within a flood alert area, and Appendix J of the SFRA confirms that there has been no recorded flooding at the site. As stated in the (SFRA), Jba mapping, '*groundwater Flood risk mapping is not available for the county*' and '*in general, less is known about groundwater flooding than other sources and availability of data is limited*'. It '*is suitable for general broad-scale assessment of the groundwater emergence in an area but is not explicitly designed for assessment at the scale of a single property*'.
- 3.2.5 As stated in the SFRA, the (groundwater emergence) risk bands it presents are based on the risk of emergence, and not surface flooding due to groundwater. As stated in the SFRA, '*the dataset also shows the risk of emergence of groundwater rather than the actual flood risk from groundwater flooding*' and that it '*only identifies the predicted groundwater levels and*

does not show the flow paths or impact of groundwater once it has emerged.' Furthermore, the Wiltshire Council Groundwater Management Strategy (2016) further clarifies:

'Typically groundwater flooding may be defined as the emergence of groundwater at the ground surface away from perennial river channels, under conditions where the "normal" ranges of groundwater level and groundwater flow are exceeded.'

'Our understanding of the mechanisms of groundwater flood risk is in its infancy and to date prediction of future events is unsophisticated when compared to the modelling of fluvial or surface water flood events. This is primarily because of the lack of data and complexity of groundwater flow behaviour and emergence.....Currently there is no standard method to predict the future risk of groundwater flooding'.

3.2.6 We note that:

The SFRA seems to confuse the terminology used in relation to groundwater mapping....SFRA §4.5 states: *'JBA has developed a Groundwater Flood Map product at the national scale. This dataset shows variations in the risk of groundwater emergence at the surface..... It should be noted that these risk bands are based on the risk of emergence, and not surface flooding due to groundwater. The 5m resolution JBA Groundwater flood map has been used within the SFRA'.* The groundwater emergence maps are produced at a national scale and understood to be the same as SFRA Appendix G, which is not entitled Groundwater Flood Map, but Groundwater Emergence.

Contrastingly, §3.2.3 of the SFRA introduces the term 'groundwater zone' that *'has also been defined using the JBA risk of groundwater emergence mapping (three highest risk categories) alongside the EA groundwater Flood Alert Areas'.* Groundwater zone is not mentioned again in the SFRA text, but Groundwater Flood Zone is used as a heading for the mapping within SFRA Appendix R. The only direct reference to the purpose of Appendix R in the SFRA is in §12.3 (Sequential testing) which states *'Appendix R provides a methodology for using flood risk data within the application of the Sequential Test'.* Appendix R itself does not, however, 'provide a methodology', but instead it is entitled 'Groundwater Flood Zone for Application of Sequential Test' and the mapping shown is called 'Groundwater Sequential Test area'!

Appendix R also states:

The analyses performed to prepare the mapping are all for a 1 in 100-year (1% AEP) event and so provide a risk of groundwater flooding to the surface as they are based on predicted difference between groundwater level and the ground surface.

So, our main conclusions from all this are that SFRA Appendix G is the nationally produced Groundwater Emergence mapping, and Appendix R is the Wiltshire specific Groundwater Flood Zones. And we assume that if a site is within a Groundwater Flood Zone (Appendix R), then it is expected to be considered for a Sequential Test. However, this mapping is not legible, so we cannot use it, E.g.:



- 3.2.7 The proposed site levels are shown on the attached drawing. This indicate that in order to level the site, there will be up to c1.6 m of cut into existing ground. The recent excavations described in Table 3.1, confirm no groundwater encountered to a level of 63.85 mAOD, over 1m below proposed ground levels. There is no evidence from insitu records that groundwater would be present at the surface.

3.3 Mitigation

- 3.3.1 The discussion in §3.2 concludes that groundwater is unlikely, especially from a water table as such. Although there is no evidence to suggest it would, or could, emerge on site, this section considers a precautionary approach in the unlikely event of groundwater emerging at the surface on site.
- 3.3.2 Figure 2.2 shows that the site is not at a low area in local topography. Ground falls north to south across the site and continues falling to the south. The site ground level on site is higher than the ground around the adjacent Sainsburys store which is mainly set at a ground level of 64.3 mAOD and below. So if there are similar soil characteristics on the adjacent site, any groundwater emerge is likely to occur there, rather than at the site.
- 3.3.3 Primarily, any water at the surface on site would follow the same route as rainwater on site. It would enter the site drainage systems or follow the site surface water exceedance route. Refer to designs by Highways Development Ltd for proposed site drainage. There would be nowhere on site for water to pond and any surface flow would be shallow since the ground levels fall relatively steeply.
- 3.3.4 As per the SFRA methodology, if groundwater did emerge, a reliable way of assessing the resulting flooding is to use *the 0.1% AEP (1 in 1,000 year) Risk of Flooding from Surface Water dataset has then been used to identify the key topographic flow paths within these areas, providing a proxy dataset of the potential flow route of any groundwater flooding*. Figure 3.1 shows that the site is not at risk of surface water flooding, i.e. it is not within any notable flow paths of surface water from off site. There is an existing watercourse to the west of the site that assists to convey flows past the site to the south. And, as shown in Figure 2.3, there is very limited land uphill of the site that falls towards the site. So, if groundwater flooding occurred uphill of the site, it should not be directed onto the site.

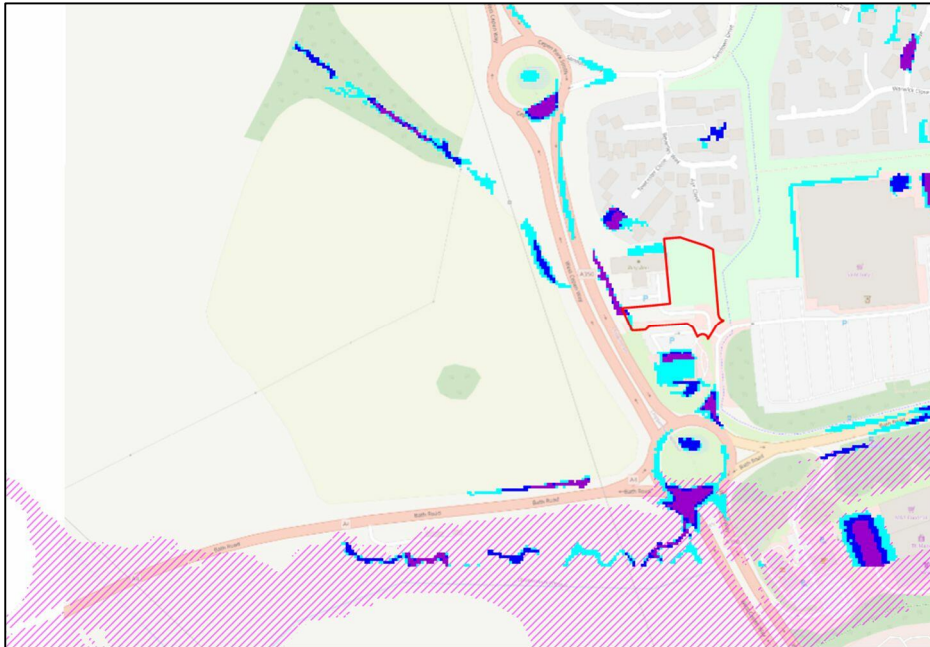


Figure 3.1 – Risk of flooding – including climate change

Surface Water

High ⇒ greater than or equal to 3.3% chance in any given year (1:30)

Medium ⇒ less than 3.3% (1:30) but greater than or equal to 1% (1:100) chance in any given year

Low ⇒ less than 1% (1:1,000) chance in any given year

(Source: rofsw_cc01Polygon.shp)

Fluvial

Pink hatching ⇒ flood zones plus climate change

(Source: Flood_Zone_River_and_Sea_plus_CCP1Polygon.shp)

Contours at 0.5 m c-c

(Source: lidar composite: Contours-ST87se_DTM_1m.tif, downloaded 25March 2026)

- 3.3.5 The sensitive areas of the proposed site listed below are all located at the north of the site on the highest ground and, where possible, will be raised up by at least 250 mm from surrounding ground:

RMC 1250 (Data Cabinet)

16-Way Schneider Feeder Pillar for BESS

TR7 (500kVA - 800kVA)

- 3.3.6 As a precaution, underground site infrastructure is be designed to withstand groundwater near to the ground surface.

- 3.3.7 It is never safe to enter floodwater (walk, swim, cycle or drive etc.). It may be fast flowing, contain debris, be contaminated, cold or hide unseen dangers. Other advice and information on local flooding is available from the following websites:

Environment Agency Floodline: 0345 988 1188 and <https://www.gov.uk/prepare-for-a-flood>

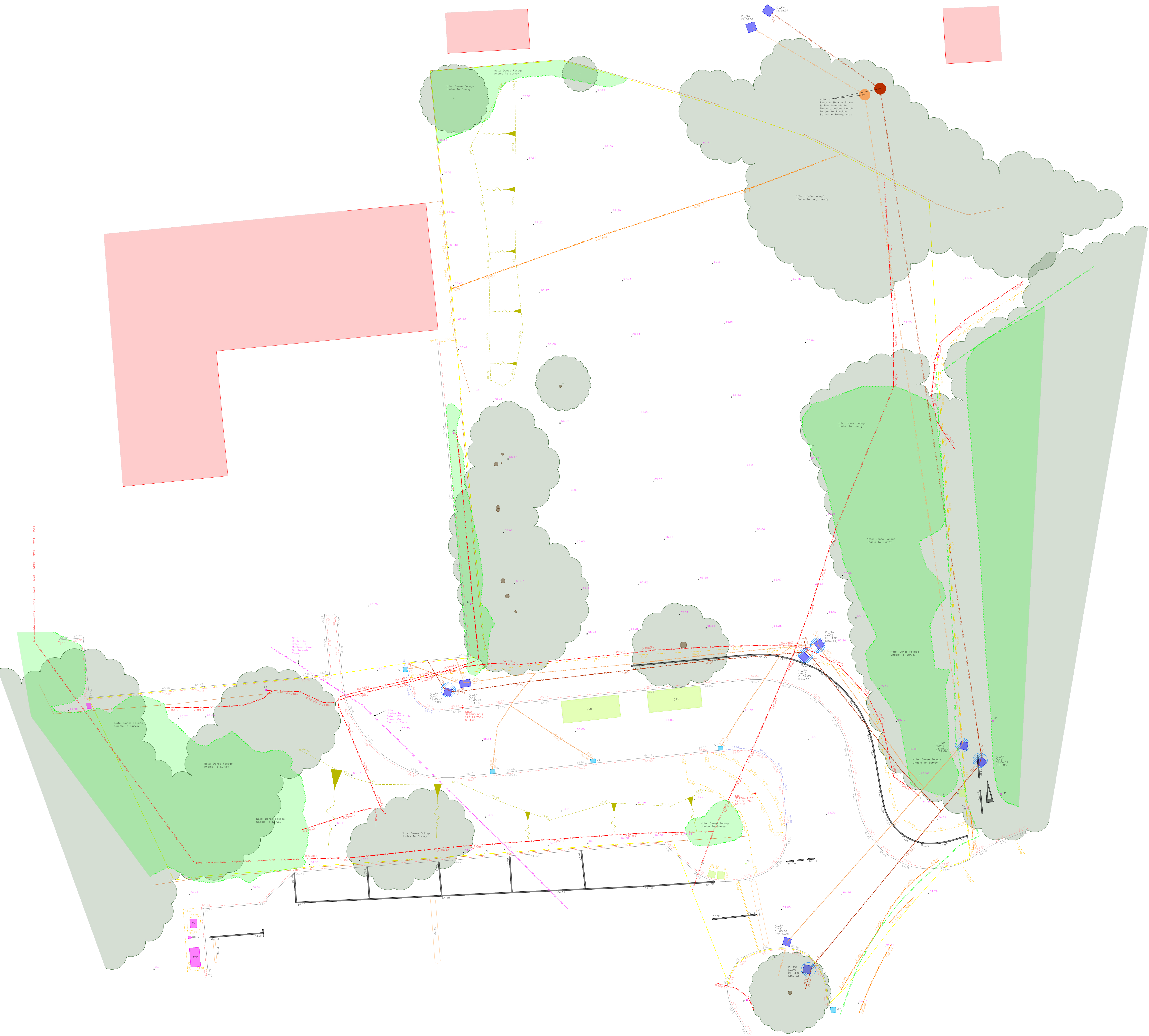
National Flood Forum: <https://nationalfloodforum.org.uk/about-flooding/preparing/checklist-action-plan/>

Wiltshire Council: <https://www.wiltshire.gov.uk/article/10596/Flooding-advice-for-homeowners>

Prepared by Leigh Parratt

BEng (Hons) CEng MICE CWEM MCIWEM PCHEP FHEA

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Notes

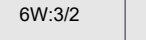
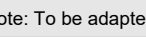
[illegible][illegible]

Legend

Utility Configuration Examples		
Annotation	Graphic	Description
1W		1Way Single Duct
2W		2Way Flat
2W, 1/2		2Way-1Wider/2Deep
4W, 2/2		4Way-2Wider/2Deep
6W, 3/2		6Way-3Wider/2Deep

Note: To be adapted for each chamber, manhole or excavation

Hatch Patterns

	Chamber
	Chamber With Unknown Extents
	Radar Detected Reinforcing Mesh
	Radar Detected Anomaly

Utility Line Types			
DETECTED	ASSIGNED Control Systems	RECORDS	
1-100%	1-100%	1-100%	Traffic Control Signal Surveillance System
1-100%	1-100%	1-100%	Drainage Systems
1-100%	1-100%	1-100%	Combined
1-100%	1-100%	1-100%	Vent
1-100%	1-100%	1-100%	Electrical Systems
1-100%	1-100%	1-100%	Unknown: Voltage
1-100%	1-100%	1-100%	Electric: High Voltage
1-100%	1-100%	1-100%	Electric: Low Voltage
1-100%	1-100%	1-100%	Gas Systems
1-100%	1-100%	1-100%	Telemeter Systems
1-100%	1-100%	1-100%	Bitter: Telemeter
1-100%	1-100%	1-100%	CO2
1-100%	1-100%	1-100%	Unknown
1-100%	1-100%	1-100%	Argon: Media
1-100%	1-100%	1-100%	Yodane
1-100%	1-100%	1-100%	Gase
1-100%	1-100%	1-100%	Water Systems
1-100%	1-100%	1-100%	Water
1-100%	1-100%	1-100%	Pipes
1-100%	1-100%	1-100%	Hot Water
1-100%	1-100%	1-100%	Water
1-100%	1-100%	1-100%	Unknown
1-100%	1-100%	1-100%	Ground Penetrating Radar: Linear Features
1-100%	1-100%	1-100%	Electromagnetic: Locator
1-100%	1-100%	1-100%	Linear Features
Survey Boundaries			Survey Area

Topographical Line Types

	Fence Line
	Building
	Building Overhead
	Wall
	Surface Change
	Trench Scar
	Kerb
	Top Kerb
	Drop Kerb
	Banking
	Electric Overhead
	Telecom Overhead

Topographical Symbols

	Tree
	Hedge/Foliage
	Inspection Cover
	Valve
	Service
	Street Furniture
	Gully
	Survey Station
	Gate
	Banking

Warning Notes

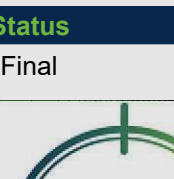
1. Water & Gas:
Water and Gas utilities to individual properties are often of a size that cannot be detected using RMI or GPR investigation. Whenever possible the route has been added from surface evidence (pipe risers, valves, etc.), but this should be viewed as a guide only. Safe digging techniques shall be used at all times, in line with the requirements of HSG47 and current CDM regulations.

2. Assumed Route:
Assumed Route positions are indicative only and are not an approximate position. Safe digging practices in accordance with HSG47, must be used to verify the information and establish their actual position.

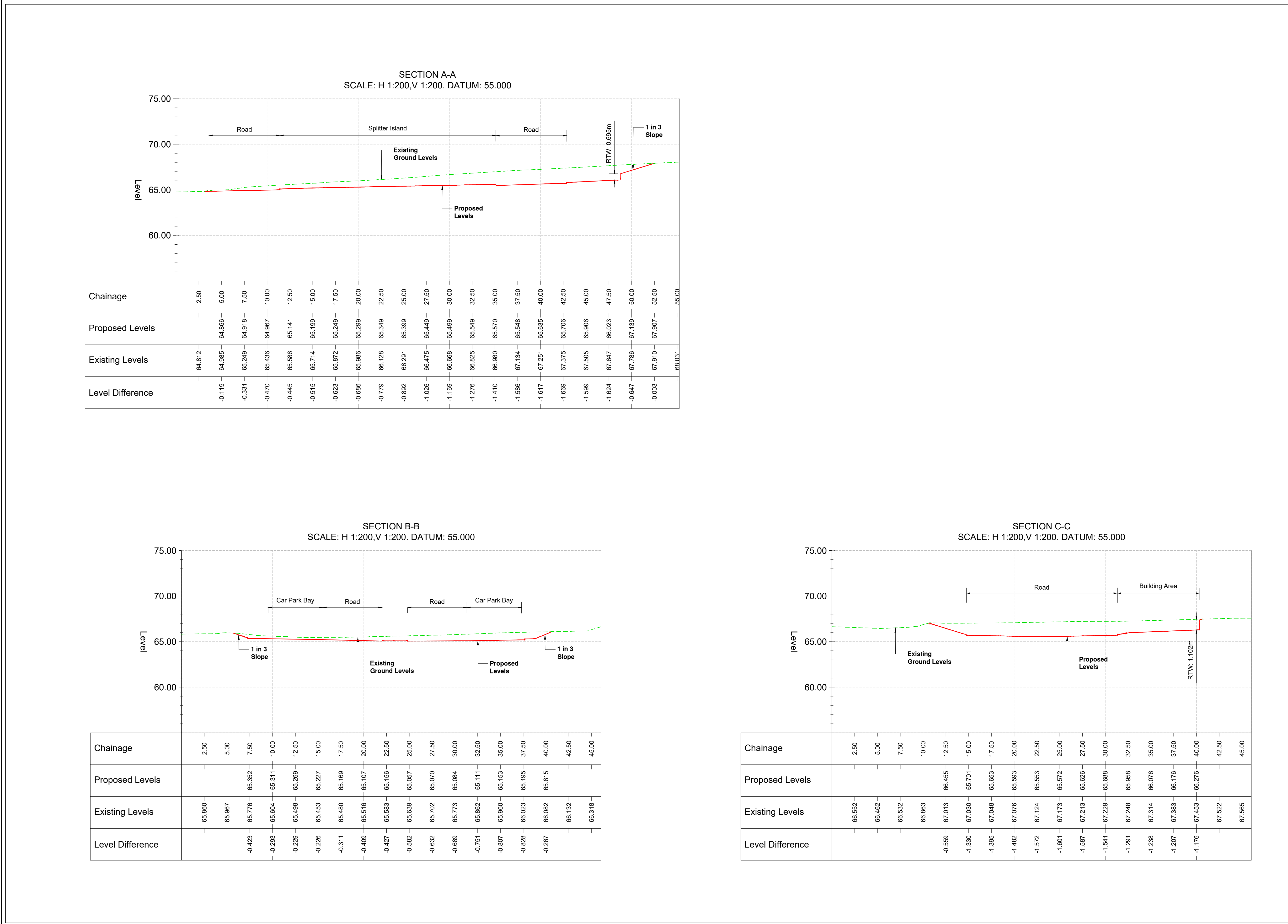
3. Records:
Records information and positions are indicative only and are not an approximate position. Safe digging practices in accordance with HSG47, must be used to verify the information and establish their actual position.

[illegible]

Client	Parco		
Survey Type	Utility & Topographical Survey		
Site Address	Chippenhurst Hub, Landlying North of Bath Road, Chippenhurst, SN14 0AF		
Drawing Number	Scale	Survey Date	
T20-1528-DR-0001	1:125	July 2025	
Surveyed by	Drawn by	Checked by	
AW	IAV	AW	
Status	Issue	Completion	
Final	1 OF 1	A	



Twenty20 Surveys Ltd
22 Plemmole Road
Salisbury
Wiltshire
SP2 9DG
T 01752 500605
E info@twenty20surveys.co.uk
W www.twenty20surveys.co.uk



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KEY

Existing Ground Levels

Proposed Ground Levels

FOR APPROVAL

NOTES

1. InstaVolt to provide 12x wider EV charging bays and 4x fully accessible EV charging bays.
2. Chargers to be installed flush to ground on proposed tarmac, level with bays.
3. Feeder pillars, substation and BESS unit to be installed on proposed hardstanding verge as shown.
4. Existing line painting within site boundary to be configured as shown.
5. Existing vegetation to be removed within site boundary where required to accommodate equipment. For proposed landscaping information, see Appendix 6 of ecology report (**Ref. no.: '250405'**) Further detail is expected to be provided in the form of an HMMP that will be conditioned
 - Vegetation removed for hardstanding: 1087m²
 - New planting / habitat enhancement: 515m²
6. Existing kerb line and verge (hatched blue) to be dropped for a new vehicle crossover. Proposed kerb line to be installed as shown (hatched pink). Footpath to be extended as shown (hatched green). Tarmac to be installed up to the proposed kerb line in level with the charging bays. Dropped kerb to be installed as shown (hatched orange) to provide vehicle access, with pedestrians retaining the right of way.
7. Existing Trees (shown light blue) to be removed. New trees (area shown dark blue) to be planted. All new cabling must avoid retained tree's RPA's (shown circled pink around tree trunk).
8. CCTV Masking Requirements:
 - Masking to be applied for all private property.
 - Masking to be applied for views of commercial buildings outside Instavolt's leasehold.
 - Masking not required for roads and other publicly accessible areas.
9. All measurements to be taken from the centre point of a line, unless stated otherwise.
10. Site Area = 2899m²
11. Please also refer to the following:
 - Transport Note - **Ref. no.: '2508-020 TS01'**
 - Tree Constraints Plan - **Drawing no.: 'TCP-1'**
 - Ecology Report - **Ref. no.: '250405'**

CCTV to be installed for site security,
location subject to change within site boundary.
CCTV to be affixed to lamppost pole.

Nursery

Steep grass bank as shown.
Ground will need to be completely leveled for the construction of the site.

Proposed acoustic fence
to be installed as shown.

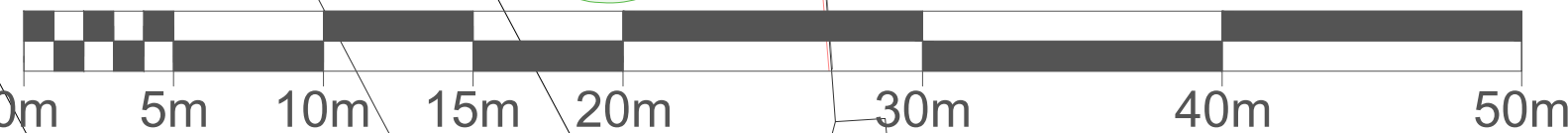
Bins to be attached to lampposts as shown.

1.2m pedestrian access to
be installed as shown for
additional accessibility.

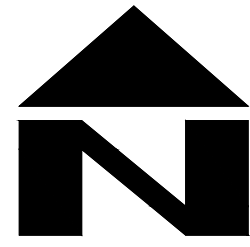
See note '6'. *V*

InstaVolt totem to be installed as shown.

Bins to be attached to lampposts as shown.



COMMENTS			REV.	DESCRIPTION		REV. BY	APP.	DATE	ADDRESS Land lying North of Bath Road, Chippenham, SN14 0AF United Kingdom	PROJECT NAME COOPER ESTATES - CHIPPENHAM HUB		
			A	Issued for comment		DB	NB	23/07/25		DRAWING TITLE PLANNING SITE LAYOUT		
			B	Updated layout as per latest design		NB	RK	05/09/25				
			C	Removed amended kerb line		NB	JM	12/09/25				
			D	Schneider feeder pillar specification updated		CB	JM	24/09/25			DRAWING NO. 10829 - 0001_01-PL	
SCALE (@A2) 1:250		DRAWN BY DB								InstaVolt Ltd, 6 Cedarwood, Crockford Lane, Chineham Park, Hampshire, RG24 8WD © InstaVolt Ltd. 2025		REV. D



8

5

2

4

Nursery

SECTION C-C

8

SECTION A-A

55

SECTION C-C

48

SECTION B-B

00

SECTION A-A

00

SECTION B-B

46

0m 1m 2m 3m 4m 5m

NOTES

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KEY

- Site Boundary
- Major Contour (100mm)
- Minor Contour (25mm)
- Proposed Spot Levels
- Proposed Top of RTW Level
- Existing Level
- Proposed Retaining Wall

FOR APPROVAL

A	UPDATED TO REFLECT REVISED SITE LAYOUT	12.01.2026	A.O	D.O	D.O
-	PRELIMINARY DESIGN FOR APPROVAL	17.12.2025	A.O	D.O	D.O
REV	AMENDMENTS	DATE	CAD	CHKD	APPD

CLIENT



CONSULTANT



DESIGNER	A.O
CAD	A.O
CHECKED	D.O
APPROVED	D.O

SCHEME

CHIPPENHAM HUB,
BATH ROAD, CHIPPENHAM

JOB No. HDL-INST-20

SCALE @ A1
1:200

DATE
17/12/2025

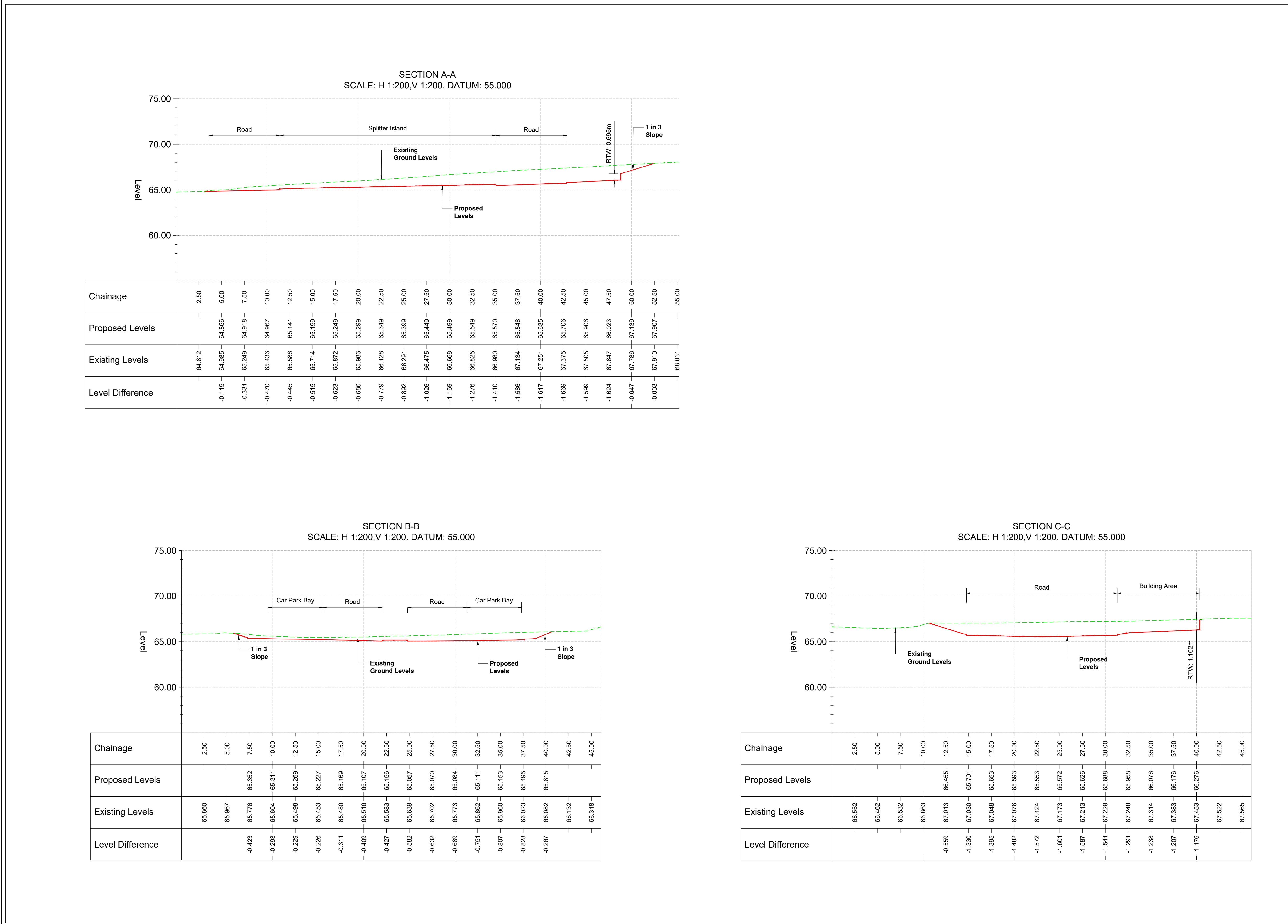
SHEET NUMBER
1 of 1

DRAWING TITLE

PROPOSED LEVELS
STRATEGY & CONTOUR PLAN

DRAWING NUMBER
HDL-INST-20-120

REV
A



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KEY

Existing Ground Levels

Proposed Ground Levels

FOR APPROVAL



Review of Commercially Available

Groundwater Flood Risk Mapping

1.0 Introduction

- 1.1 This Review summarises available information regarding commercially available groundwater flood risk maps.
- 1.2 This report has been undertaken as a brief study to accompany our flood risk assessments. If this information is used by any other party, or for any other purpose, then the user accepts full liability in doing so.
- 1.3 This Review relies mainly upon Environment Agency publications.

2.0 Groundwater Flood Data

2.1 The British Geological Survey defines groundwater flooding as:

"The emergence of groundwater at the ground surface away from perennial river channels or the rising of groundwater into man-made ground, under conditions where the 'normal' ranges of groundwater level and groundwater flow are exceeded".

And 'natural seasonal waterlogging or poor drainage are not defined as groundwater flooding.'¹

2.2 There is national scale flood risk mapping produced by:

a) Jacobs GEMS (2004),

- First attempt at mapping groundwater flooding¹
- Tends to over estimate flooding¹

and

b) the Environment 'areas Susceptible to groundwater flooding (AStGwf, 2010).

- 1 km² strategic scale grid¹
- It does not show the likelihood of groundwater flooding, only isolated locations within susceptible areas are actually likely to flood¹
- It should not be used as sole evidence for any specific flood risk¹
- This mapping has specific technical weakness¹
- This was produced solely for the purposes of the preliminary flood risk assessment in 2011 to meet the European Floods Directive (Directive 2007/60/EC) and the Flood Risk Regulations (2009).¹

2.3 Both these mapping are older, less detailed and less accurate than commercial products.¹

2.4 Commercially available data is more detailed and includes:

- i. GEoSmart GW5 groundwater flood risk mapping: 5 m grid
- ii. Jba GB Groundwater Flood mapping: 5 m grid
- iii. British Geological Survey susceptibility to groundwater flooding: 50 m grid

2.5 This Review focuses on the former two more detailed 5 m grid mapping.

2.6 The table given below is a useful summary of the comparison between the GeoSmart and Jba commercial data. Regarding both these datasets, the following quotes have been taken from reference 1:

- i. Based upon BGS 50 K geology, Lidar DTM
- ii. Their methods are not published in full
- iii. Less transparency around methods used
- iv. The method used to produce the final products is not freely available and so it is difficult to make a detailed accurate assessment of the suitability and accuracy of each

- v. They aim to establish groundwater flooding in terms of risk, with a 1 in 100-year flood event criteria (JBA's groundwater flood map in the Chalk aquifer in south-east England at 75, 100 and 200-year return periods)
- vi. Uncertainty regarding the methodology of the commercial products can be barriers to their usage.
- vii. There are considerable technical difficulties and uncertainties in mapping groundwater flood risk, so it is important that the methodology used in developing mapping products is clearly documented including any limitations. At present, as the national products are all commercially developed (without a published detailed methodology), there is no forum for discussing accuracy, limitations, weaknesses and potential errors in the risk mapping (6.6.3).
- viii. Even the most developed groundwater flooding risk maps produced are not as specific, or accurate, in terms of predicting flood risk in the way the current maps for fluvial flood risk do
- ix. Climate change is not considered.
- x. They are generally not fit for purpose* to assess the likelihood at property level.

*This is a bold statement to make and the author may not fully understand the implications of saying this. Given the intended usage stated by the producers, we would not necessarily consider the data not fit for purpose and the mapping does have a useful role in highlighting areas that may require assessment.

Table 6.6 National scale groundwater flood risk mapping approaches¹

	GeoSmart (previously part of ESI)	BGS	JBA Consulting
Method	Combines a likelihood of flooding during a 1 in 100-year return period scenario with the underlying uncertainty in groundwater flooding. The severity of the flooding is then based on the underlying aquifer (transmissivity), range and extent of properties to come to overall risk.	Developed groundwater surface map based on geological permeability and distance from watercourses. Used conceptual models of PSD and clear water flooding to determine groundwater flooding susceptibility.	Groundwater table generated under 1 in 100-year flood event conditions. This is then compared against ground levels to establish potential depth to groundwater for a given area.
Software	Python coding for processing and modelling, ArcGIS for visuals.	ArcGIS for processing and visuals.	ArcGIS for processing and visuals, R statistical package for rainfall modelling.
Data inputs	Groundwater levels from monitoring boreholes, LiDAR DTM (5m), BGS 50k geology, river levels.	Groundwater levels from monitoring boreholes, BGS 50k geology, BGS permeability index data set, DTM, river base levels.	Rainfall, LiDAR DTM (5m), BGS 50k geology, river levels, OS vector mapping.
Data outputs	5m GIS raster grid and polygon of groundwater flood risk score bands.	50m GIS raster grid of groundwater flood susceptibility bands.	5m GIS raster grid and polygon of depth to groundwater/flood risk score bands.
Validation	Database of groundwater flood events is maintained (for example, sourced from projects, or the internet). This feeds into a 6-month update cycle, where discrepancies are highlighted, and calibrations are made where necessary.	The BGS has data on the locations of previous groundwater flooding events gathered through research projects and discussions with environment regulators and local authorities. This information has provided a means to validate the susceptibility data set.	Calibrated against monitoring borehole data and observed flood events.
Limitations	Uncertainty in underlying permeability in the geology. Local variations in topography, uncertainty in where groundwater seepage occurs and accumulates. It is advised that the model is calibrated with local primary data,	One of the main limitations is scale. It is difficult to combine the detail of small scale modelling with national scale modelling. Often small scale features can determine areas of groundwater emergence, but are difficult to include within large aquifer	Broad national scale, local models and mapping may be more accurate (for example, chalk catchments with varied responses). Where superficial deposits are thin, only the underlying bedrock characteristics are considered.

	where available, to improve results.	scale models. Need constant refinement and improved parameterisation of large aquifers.	
Climate change considered?	Not considered in the product. Although guidance can be provided on impacts of climate change, which will vary spatially.	Not considered in the product.	Not considered in the product. The rainfall grid model could be updated to produce recharge under climate change scenarios.

- 2.7 We have contacted the producers of both these datasets and not gained any further insight into the differences in the data. Both provide probability of occurrence information, with the GW5 data categorising the results into score bands, and the Jba mapping also gives the estimated maximum depth of groundwater below ground level. GeoSmart has stated that:

The GeoSmart model takes into account not only bedrock groundwater flooding but also the risk of groundwater flooding from permeable superficial deposits (PSD) from rivers and tides. The GW5 map uses depth to groundwater, bedrock geology, superficial geology, plus other geological characteristics to determine risk at a 5m resolution and the map is calibrated against a database of groundwater flooding events. We are confident that the GeoSmart GW5 map represents a market-leading indicative screening tool, with areas with a >1% annual probability of groundwater flooding. Like other current groundwater flood maps used in the UK, the GeoSmart map also shows areas of potential groundwater emergence.

- 2.8 We conclude that neither data set appears preferable over the other. We suggest that since there is no other data available both data is beneficial to establishing if groundwater flooding is a possible risk and they are best used alongside site specific geological and topographical data.

3 References

- 1 - Environment Agency/DEFRA/NRW Rapid evidence assessment and overview of groundwater flood risk management in England FRS19217, June 2021
- 2 – Jba GB Groundwater Flood risk Mapping, technical overview, 2016
- 3 - <https://geosmartinfo.co.uk/data/groundwater-flood-risk-map/geosmart-gw5/>
- 4-<https://www.jbaconsulting.com/knowledge-hub/jba-launches-5m-resolution-groundwater-flood-map/>

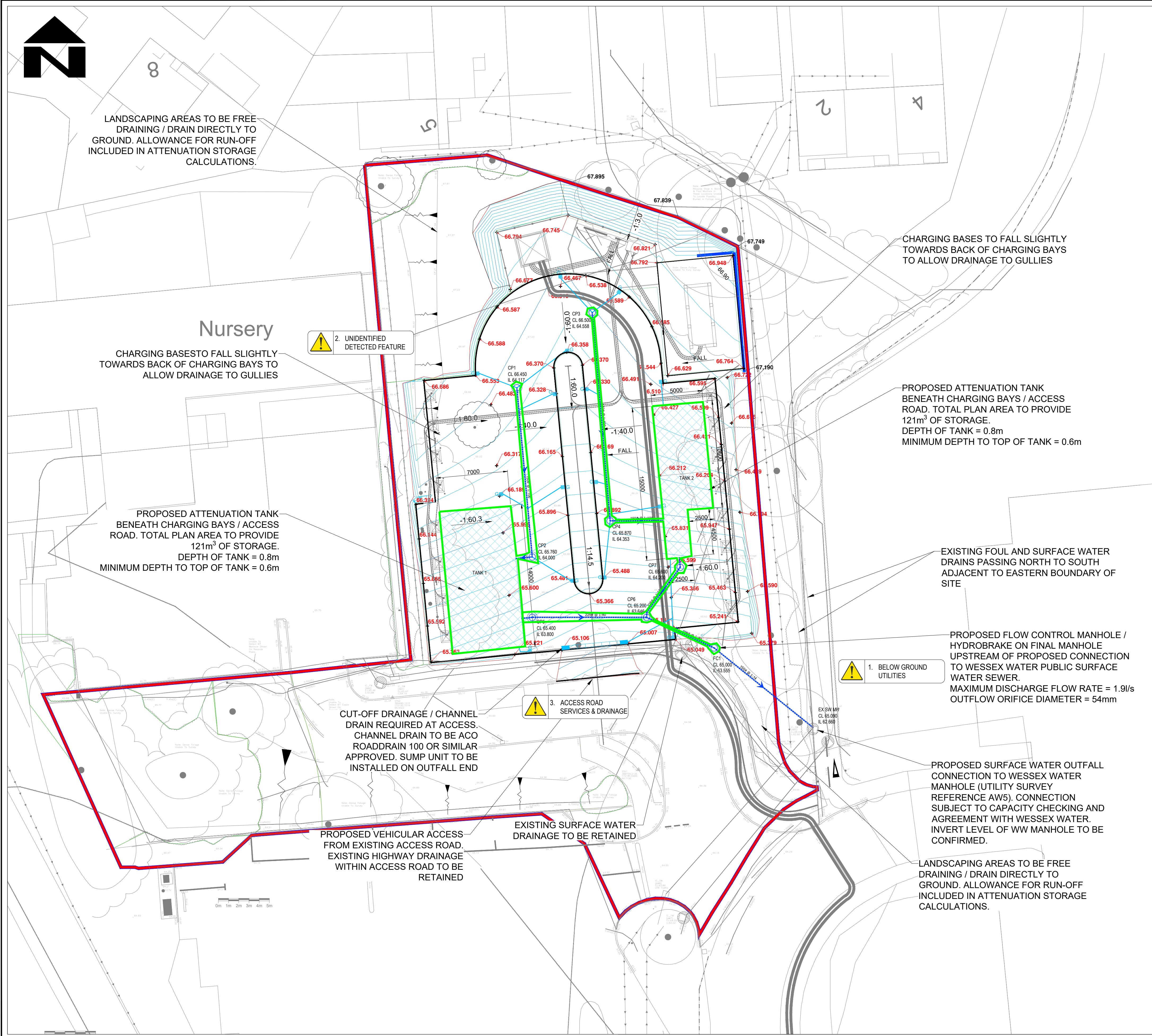
Prepared by Leigh Parratt
 BEng (Hons) CEng MICE CWEM MCIWEM PCHEP FHEA
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cover photography: Lindsey Wakelin



KEY

- PROPOSED ATTENUATION TANK BELOW CHARGING BAYS / ACCESS ROAD. DIMENSIONS TO PROVIDE AN APPROXIMATE STORAGE VOLUME OF 121m³
- PROPOSED INSPECTION CHAMBER ON 1500 / 2250 SURFACE WATER CARRIER DRAIN LINE
- FC1 PROPOSED FLOW CONTROL MANHOLE ON OUTFALL RESTRICTING FLOWS TO 1.9l/s MAXIMUM DISCHARGE
- PROPOSED GULLY AND 1500 CONNECTION PIPE TO CARRIER DRAIN
- PROPOSED CHANNEL DRAIN GULLY AND 1500 OUTFALL PIPE WITH SUMP UNIT ON OUTFALL END
- FALL PROPOSED CROSSFALL (SURFACING LAID TO FALL) TO GULLIES AND INFILTRATION TANK
- MAJOR CONTOUR (100mm)
- MINOR CONTOUR (25mm)
- 64.993 PROPOSED SPOT LEVELS

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 - ANY DISCREPANCIES SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY, SO THAT CLARIFICATION CAN BE SOUGHT PRIOR TO COMMENCEMENT OF WORKS.
 - INFILTRATION SOLUTION TO BE CONFIRMED THROUGH APPROPRIATE INFILTRATION TESTING IN ACCORDANCE WITH BRE 365 DIGEST. RATES TO BE CONFIRMED WITH DESIGNER FOLLOWING COMPLETION ON-SITE TESTING. ALTERNATIVE DRAINAGE SOLUTION MAY BE REQUIRED IF SUITABLE INFILTRATION RATES ARE NOT DETERMINED.**
 - ATTENUATION STRUCTURE TO BE POLYPIPE POLYSTORM SYSTEM OR SIMILAR APPROVED, INSTALLED IN ACCORDANCE WITH ALL MANUFACTURERS GUIDANCE AND RECOMMENDATIONS.
 - PAVEMENT CONSTRUCTION DETAIL OVER PROPOSED ATTENUATION TANK TO BE SUITABLE FOR THE PROPOSED SITE INCLUDING OCCASIONAL / ACCIDENTAL HOV OVERRUN. MINIMUM COVER TO TOP OF TANK = 0.6m.
 - ACCESS ARRANGEMENTS AND GULLY CONNECTIONS TO BE IN ACCORDANCE WITH POLYPIPE POLYSTORM MANUFACTURERS DETAILS AND RECOMMENDATIONS.
 - FLOW CONTROL DEVICE TO BE HYDROBRAKE OPTIMUM OR SIMILAR APPROVED, INSTALLED IN ACCORDANCE WITH ALL MANUFACTURERS GUIDANCE AND RECOMMENDATIONS. REFER TO DESIGN CALCULATIONS OUTPUT FOR RELEVANT DESIGN PARAMETERS.
 - EXTENTS AND DEPTH OF DRAINAGE, ATTENUATION TANK AND CARRIAGEWAY CONSTRUCTION SUBJECT TO COORDINATION WITH EXISTING AND INCOMING UTILITIES.
 - FOR PAVEMENT CONSTRUCTION, REFER TO HDL DRAWING HDL-INST-20-100.
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 - ALL COVERS/VALVES LOCATED WITHIN EXISTING CARRIAGEWAY/FOOTWAY ARE TO BE ADJUSTED TO SUIT DESIGN LEVELS.
 - CHANNEL DRAIN TO BE ACO ROADRAIN® 100 OR SIMILAR APPROVED WITH ASSOCIATED SUMP UNIT ON OUTFALL END. CHANNEL DRAIN TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS GUIDANCE. COVER GRADE TO BE D400 MINIMUM.

LEGEND

BLOCKS

- 20t Storage BESS Container
- Proposed CCTV
- Slate Chipping with Concrete Edging Strip
- Bin attached to post
- CCTV Signage
- Parking Restriction / CCTV Signage - Single Sided
- BESS Signage - Single Sided
- Proposed Bollard
- Existing Lamppost (approx. location)
- New Lamppost to be installed by installers/contractors
- Point of Connection
- Proposed 3.8m Insta/Vol Totem
- Proposed 2m Insta/Vol Totem
- Proposed Gully (from drainage strategy)
- Proposed Inspection Chamber (from drainage strategy)
- Proposed Tactile Paving

LINE TYPES

- Site Boundary
- Ownership Boundary
- LV Cable Route (Feeder Pillar > Charger)
- LV Cable Route (Substation > Feeder Pillar)
- Additional Services Cable Route
- Battery Control Cable
- Battery Power Cable
- Small Power Cable
- DNO Cable Route
- Proposed Fence (approx. location)
- Existing Underground LV Cable - including 1m statutory guideline (approx. location)
- Existing Underground Gas Pipeline MP (approx. location)
- Existing Underground BT/Fibre Cable (approx. location)
- Existing Water Distribution Main (approx. location)
- Existing Surface Water Drainage (approx. location)
- Existing Foul Sewer (approx. location)
- Proposed 1500 Connection Pipe To Carrier Drain (from drainage strategy)
- Proposed 1500 Surface Water Carrier Drain Line (from drainage strategy)

MATERIAL MATCH

- Grass
- Slate Chipping
- 6mm surface course Asphalt
- Proposed Tarmac
- Proposed Infiltration Tank (from drainage strategy)
- Existing Vegetation Retained
- Proposed Trees (refer to Softworks Schedule)
- Proposed Native Woodland Planting and Wildflower Meadow Seeding
- Proposed Shrub, Herbaceous & Groundcover Planting
- Proposed Seeding - Shade Tolerant Wildflower Meadow
- Proposed Mixed Scrub Planting

LANDSCAPING

HEALTH AND SAFETY NOTES

INDICATES A RESIDUAL RISK AS A WARNING

CONSTRUCTION

CLIENT					CONSULTANT		DESIGNER				DRAWING TITLE			
PARCO CIVIL ENGINEERING & GROUNDWORKS					Highways Development Ltd		CHIPPENHAM HUB, BATH ROAD, CHIPPENHAM				PROPOSED DRAINAGE STRATEGY			
AMENDMENTS							JOB No. HDL-INST-20				DRAWING NUMBER HDL-INST-20-500			
REV	DATE	CAD	CHKD	APPD			DESIGNER	SCALE @ A1	DATE	SHEET NUMBER	REV			
D	26.01.2026	A.O	D.O	D.O			A.O	1:200	09/09/2025	1 of 1	D			
C	12.01.2026	A.O	D.O	D.O			A.O							
B	18.12.2025	A.O	D.O	D.O			D.O							
A	03.11.2025	A.O	D.O	D.O			D.O							
-	09.09.2025	A.O	D.O	D.O			D.O							

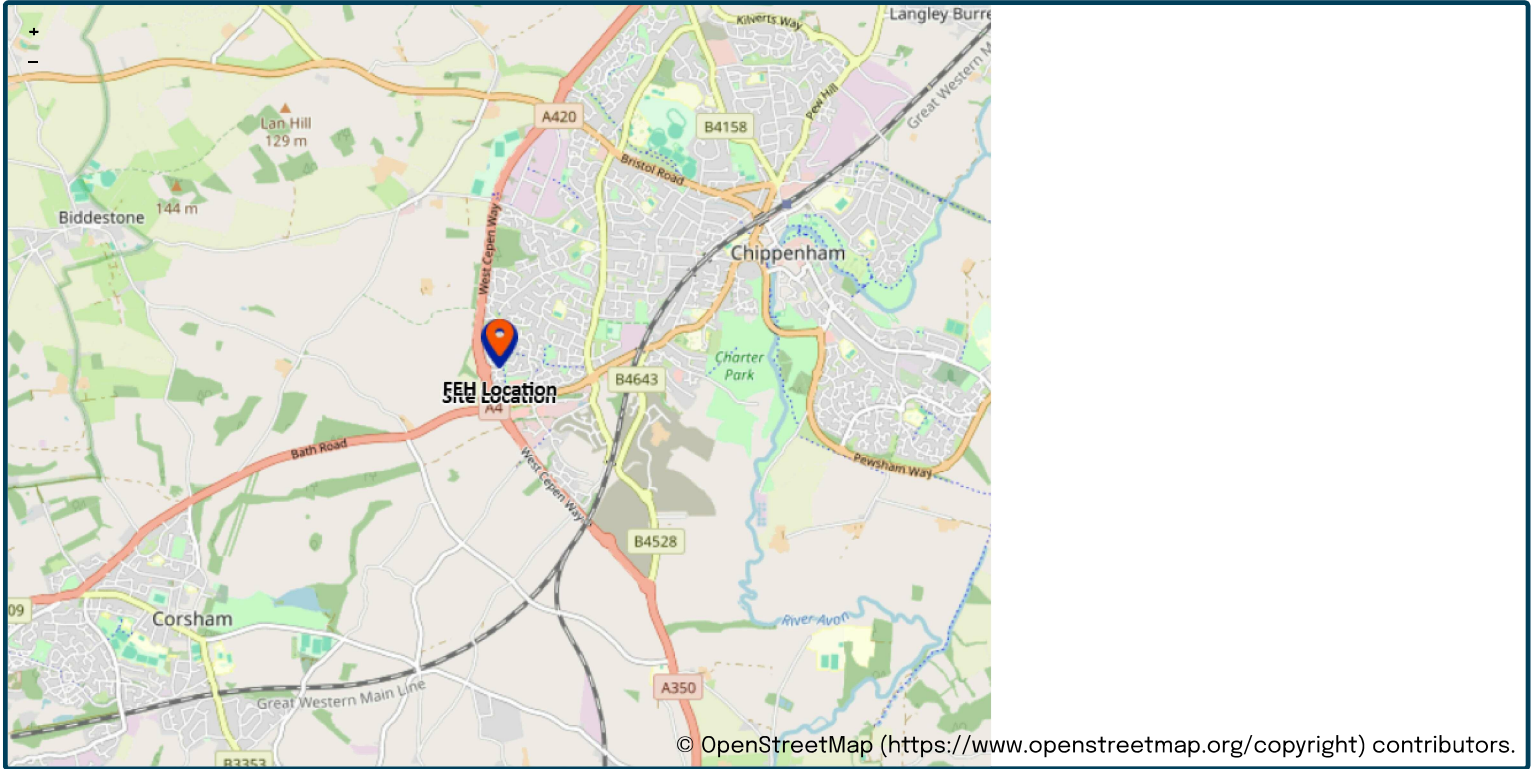
This is an estimation of the storage volume requirements that are needed to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). It is recommended that the total storage volume for the site is distributed across the site using multiple SuDS and that hydraulic modelling software is used to undertake and finalise the detailed design of the drainage system.

Project details

Date	03/11/2025
Calculated by	Andrea O'Shea
Reference	Chippenham
Model version	2.2.1

Location

Site name	Chippenham Hub
Site location	Bath Road, Chippenham



Site easting (British National Grid)	389692
Site northing (British National Grid)	172209

Site areas

Total site area (ha)	0.182	ha
----------------------	------------------	----

Roof area

Total roof area (ha)	0	ha
----------------------	--------------	----

Contributing roof area (ha)	0	ha
-----------------------------	--------------	----

Non-contributing roof area (ha)	0	ha
---------------------------------	--------------	----

Paved area

Total paved area (ha)	0.1096	ha
-----------------------	-------------------	----

Contributing paved area (ha)	0.1096	ha
------------------------------	-------------------	----

Non-contributing paved area (ha)	0	ha
----------------------------------	--------------	----

Grass / vegetated area

Total grass / vegetated area (ha)	0.0724	ha
-----------------------------------	-------------------	----

Contributing grass / vegetated area (ha)	0.0724	ha
--	-------------------	----

Non-contributing grass / vegetated area (ha)	0	ha
--	--------------	----

Total area

Total contributing area (ha)	0.182	ha
------------------------------	------------------	----

Contributing areas with urban creep allowance

Urban creep allowance factor	+0% (no creep)
------------------------------	---------------------------

Storage design parameters

Storage base shape	Rectangular / square
--------------------	---------------------------------

Storage base length to width ratio	3:1
------------------------------------	----------------

Storage design depth (m)	0.8	m
--------------------------	----------------	---

Storage side slope (1 in x)	1 in 3
-----------------------------	-------------------

Storage voids ratio (%)	90% (e.g. geocellular crate systems)
-------------------------	---

Storage volume design return period (years)	1:100 years
---	------------------------

Discharge flow rate from the site

Method

Type of site	Greenfield
Specify the method	IH124

IH124

	<u>My value</u>		<u>Map/default value</u>
SAAR (mm)	762mm		762
How should SPR be derived?	Estimate using BFI		
BFIHOST	0.636		
SPR	0.297		
Total area for greenfield runoff calculation (ha)	0.182ha		0.182
QBar (l/s)	0.4l/s		
Hydrological region	8		8
Return period (years)	Qbar (1:2.3 years)		
Growth curve factor	1		
Flow rate (IH124) (l/s)	0.4l/s		

Final discharge rate

Runoff calculation method	IH124
Design flow rate (l/s)	0.4l/s

Blockage risk

Specify the method	Flow rate		
Minimum discharge flow rate to prevent blockage	2l/s		
	<u>My value</u>		<u>Calculated value</u>
Design orifice diameter (mm)	32mm		32
Flow rate of orifice (l/s)	1.9l/s		

Rainfall and runoff

Rainfall input type	FEH22 CSV file		
	FEH_Point_Rainfall_FEH22_AM_389701_172202 (4).csv		
Distance from FEH location to site (km)	0km		
Climate change allowance factor	140%		
Specify the runoff method from grass / vegetated areas	Fixed percentage - based on rainfall event depth and SPR		
	<u>My value</u>		<u>Map value</u>
How should SPR be derived?	Estimate using BFI		
BFIHOST	0.636		

Model results

- Maximum discharge flow rate: 1.9 (l/s)
- Outflow orifice diameter: 32 (mm)
- Storage base length: 17 (m)
- Storage base width: 5.5 (m)
- Storage base area: 91 (m²)
- Storage total volume: 121 (m³)
- Storage total water volume: 109 (m³)
- Storm return periods run: 1, 2, 10, 30, 100, 200 (years)
- Storm durations run: 15, 30, 60, 120, 180, 240, 360, 540, 720, 900, 1080, 1440, 1800, 2160, 2880, 3600, 4320, 5040, 5760 (minutes)

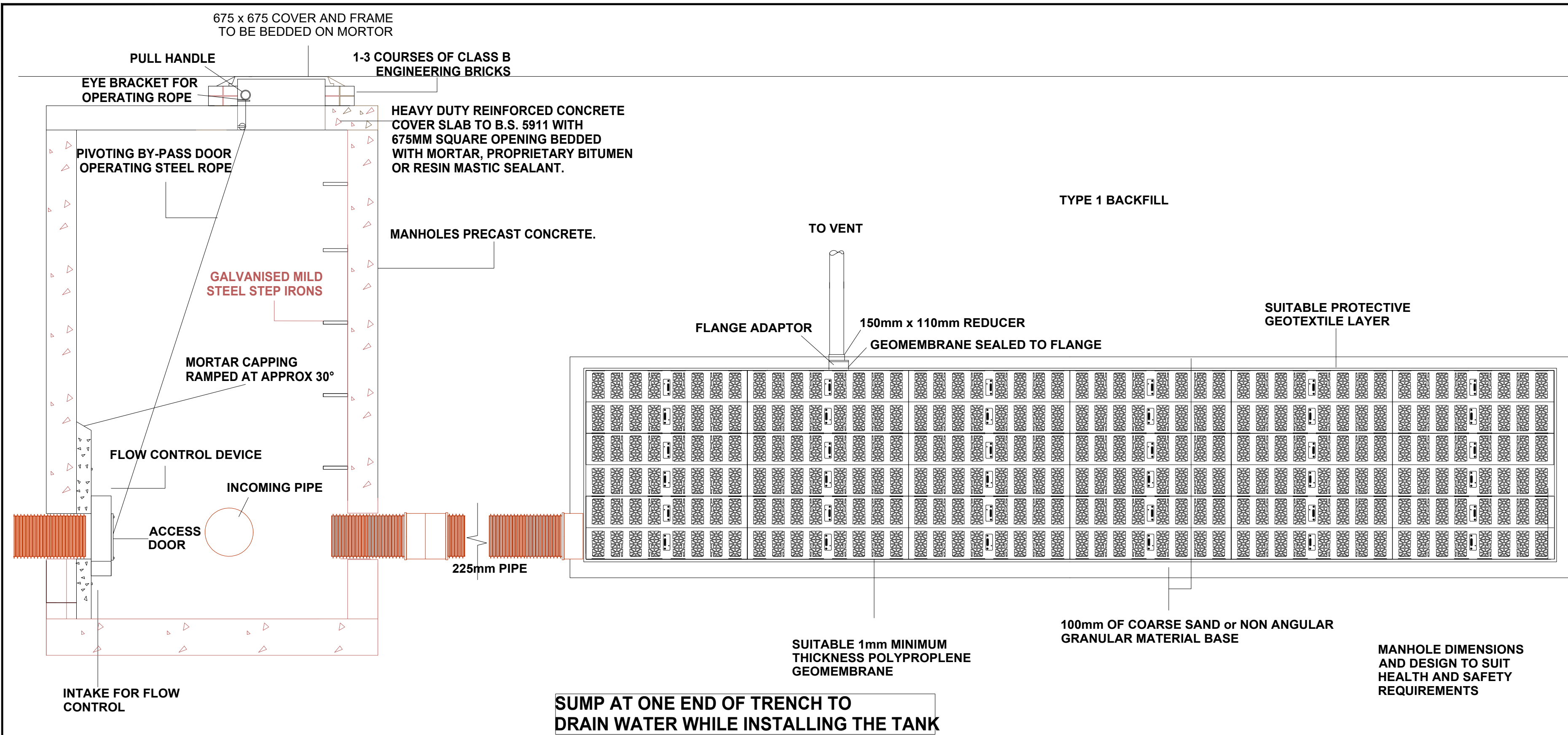
Return Period (years)	Critical Duration (minutes)	Peak Flow Rate (l/s)	Max Depth (m)	Max water volume (m ³)	Max storage volume (m ³)
1	720	1.0	0.25	25	28
2	720	1.1	0.30	31	34
10	720	1.5	0.48	55	61
30	900	1.7	0.62	76	84
<u>100</u>	<u>900</u>	<u>1.9</u>	<u>0.80</u>	<u>109</u>	<u>121</u>
200	900	2.0	0.90	131	146

Please note runoff estimation and storage volume estimation are subject to uncertainty. Storage volume results are therefore reported to the nearest 1 m³ value, unless storage volumes are less than 10 m³, in which case, storage volumes are provided to 1 decimal place.

Disclaimer

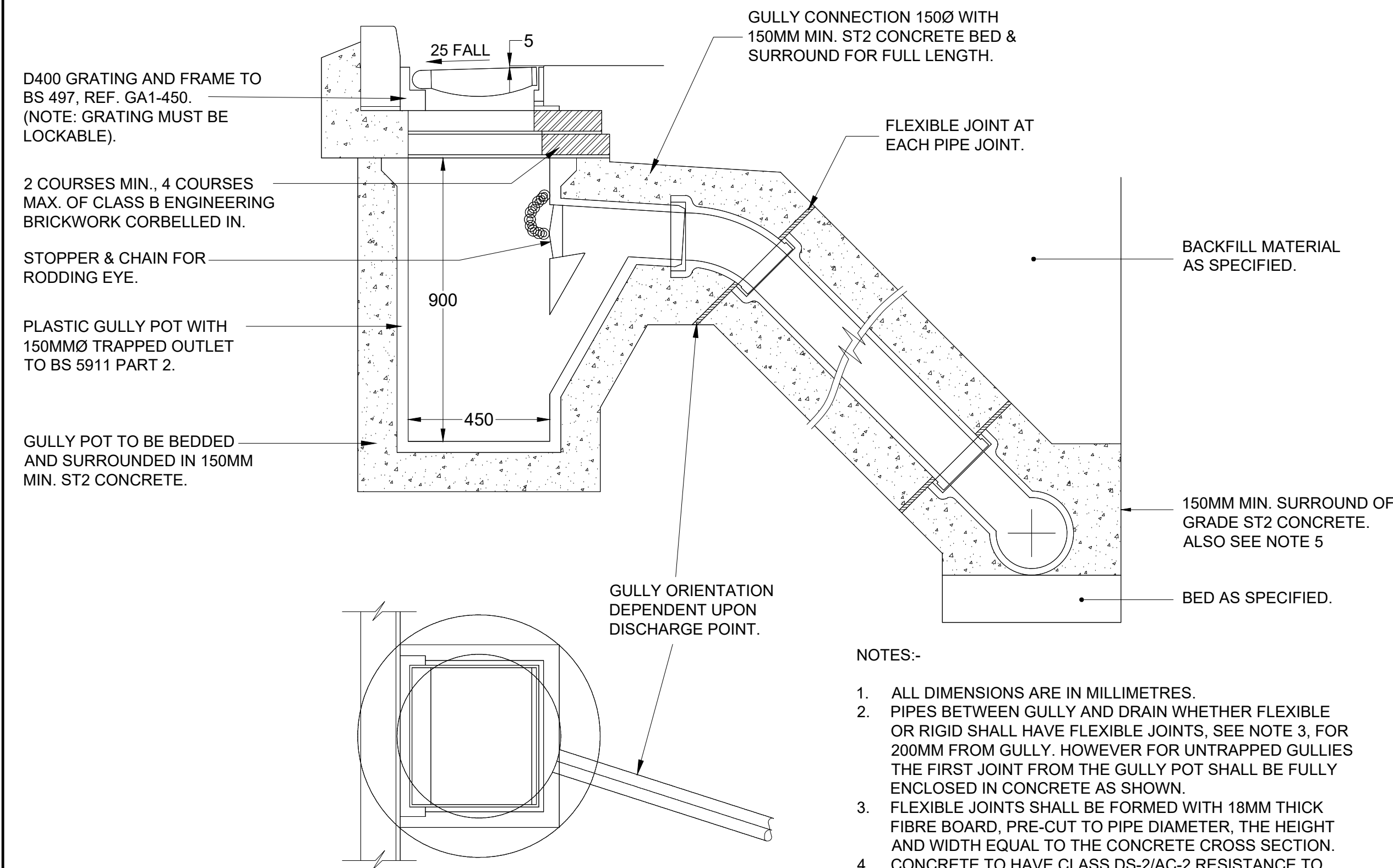
This report was produced using the surface water storage volume design tool (2.2.1) developed by HR Wallingford and available at [uksuds.com](https://www.uksuds.com) (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both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

HR Wallingford are not responsible for any rainfall data shared that is subject to licensing terms imposed by UK Centre for Ecology & Hydrology's Flood Estimation Handbook web service (<https://fehweb.ceh.ac.uk/Home/Terms> (<https://fehweb.ceh.ac.uk/Home/Terms>)).



TYPICAL POLYPIPE POLYSTORM ATTENUATION DETAIL (REFER TO ALL MANUFACTURERS GUIDANCE & RECOMMENDATIONS)

Scale (1:15)



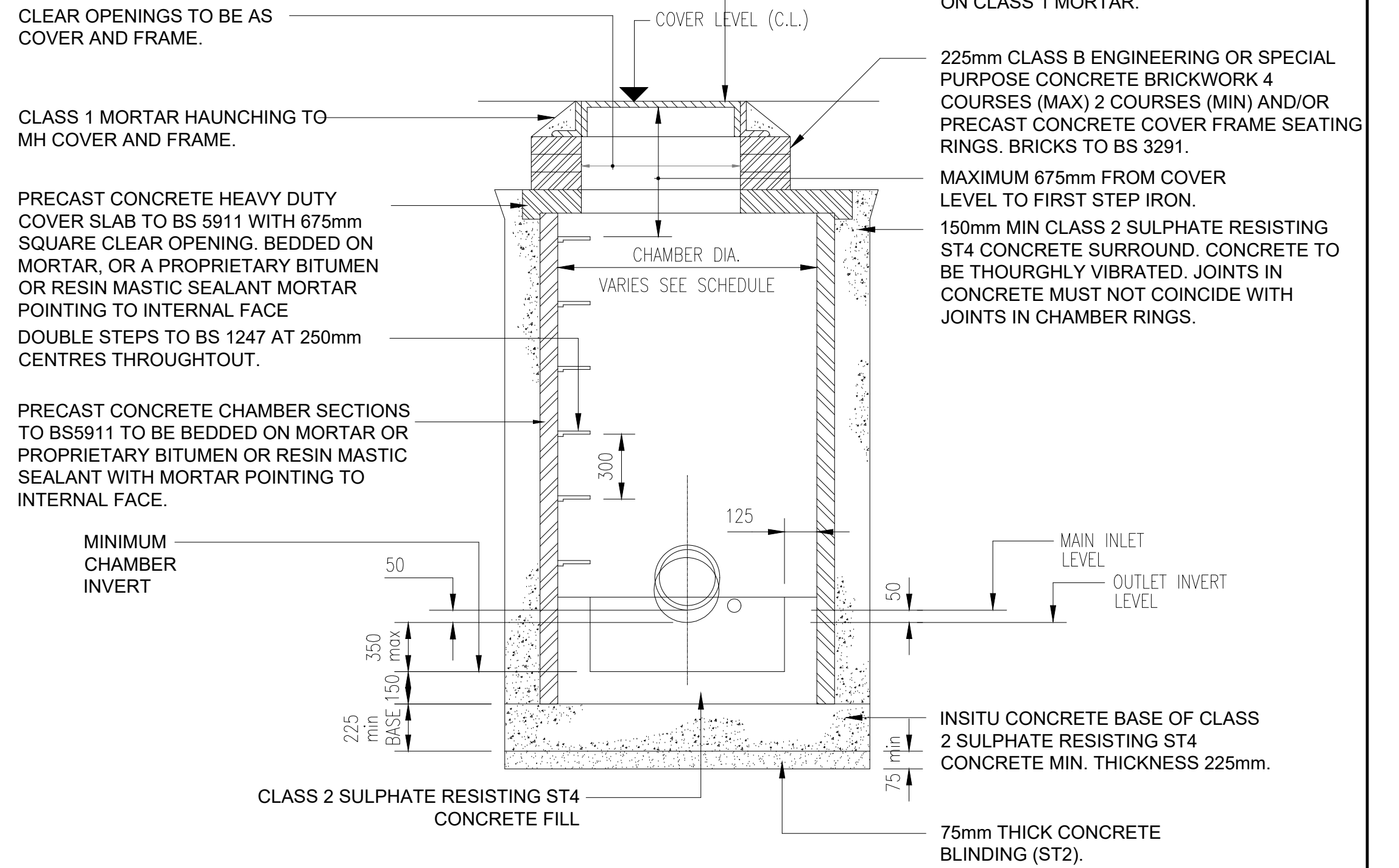
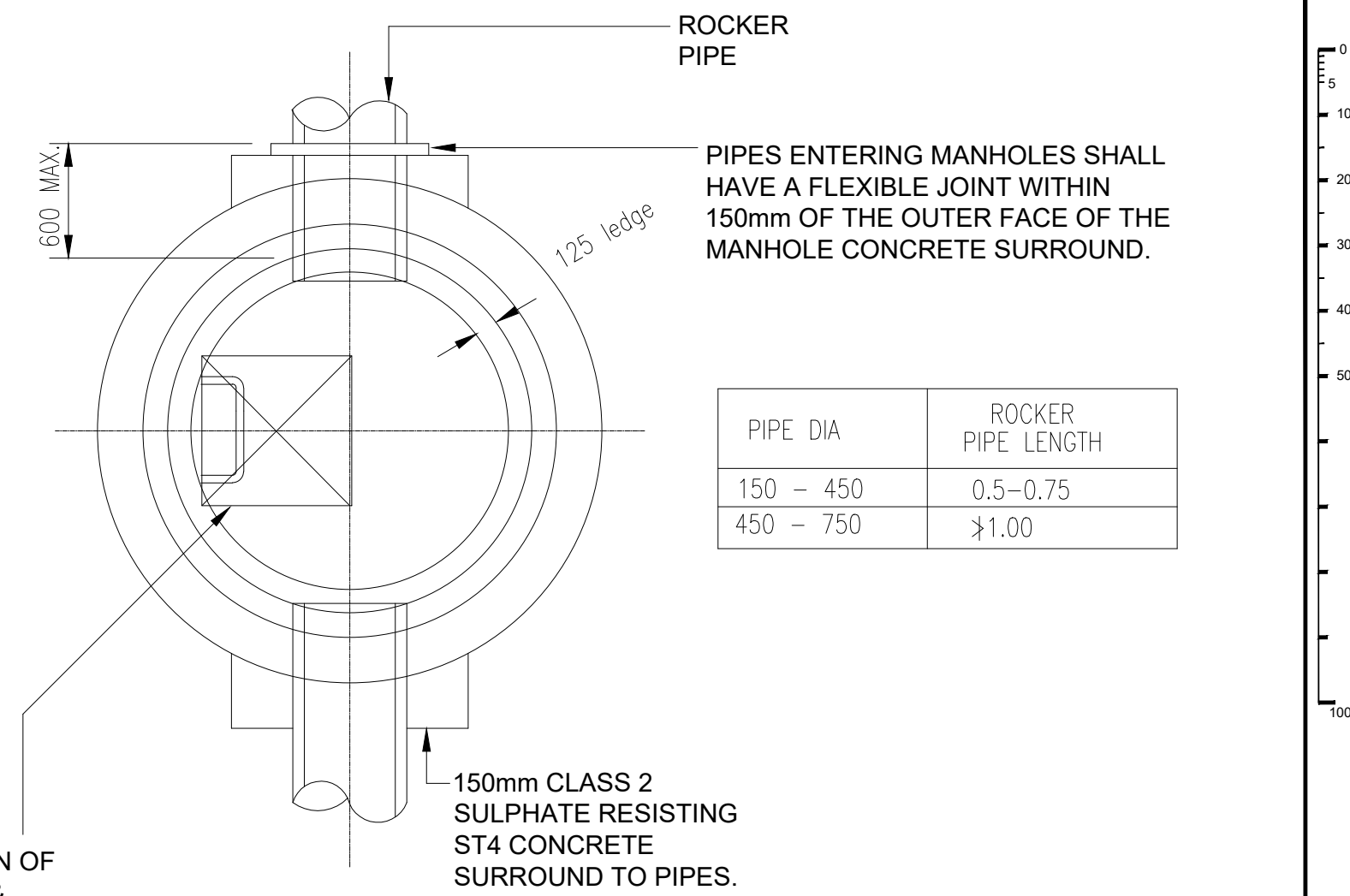
GULLY DETAIL

NOTES:-

- ALL DIMENSIONS ARE IN MILLIMETRES.
- PIPES BETWEEN GULLY AND DRAIN WHETHER FLEXIBLE OR RIGID SHALL HAVE FLEXIBLE JOINTS, SEE NOTE 3, FOR 200MM FROM GULLY. HOWEVER FOR UNTRAPPED GULLIES THE FIRST JOINT FROM THE GULLY POT SHALL BE FULLY ENCLOSED IN CONCRETE AS SHOWN.
- FLEXIBLE JOINTS SHALL BE FORMED WITH 18MM THICK FIBRE BOARD, PRE-CUT TO PIPE DIAMETER, THE HEIGHT AND WIDTH EQUAL TO THE CONCRETE CROSS SECTION.
- CONCRETE TO HAVE CLASS DS-2/AC-2 RESISTANCE TO SULPHATES. WHERE DEPTHS ARE GREATER THAN 4M BELOW GROUND LEVEL, CONCRETE TO HAVE CLASS DS-3/AC-2 SULPHATE RESISTANCE.
- WHERE A PREFABRICATED JUNCTION IS USED, THE CONCRETE SURROUND TO THE DRAIN JUNCTION MAY BE OMITTED.

NOTES:

- Outgoing pipes greater than 600mm diameter are to be fitted with safety chains
- Where specified on manhole schedules, provided a 65mm diameter pipe 600mm long, built into manhole at pipe soffit level to drain pipe bed and surround.
- Sulphate resisting portland cement shall be used for all concretes and mortars having equivalent compressive strength of 20N/mm or greater (including precast concrete products).
- Refer to drawings and/or schedules for details of covers, pipe sizes, invert levels, manhole diameter etc.



CATCHPIT - TYPE B

DEPTH TO SOFFIT = 3.0M MAXIMUM

CONSTRUCTION

							CLIENT 					CONSULTANT  Highways Development Ltd	DESIGNER A.O		SCHEME CHIPPENHAM HUB, BATH ROAD, CHIPPENHAM		DRAWING TITLE CONSTRUCTION DETAILS SHEET 2						
								CAD A.O															
								CHECKED D.O D.O															
								APPROVED D.O D.O															
A		ISSUED FOR CONSTRUCTION				26.01.2026		A.O		D.O			D.O		JOB No. HDL-INST-20		DRAWING NUMBER		REV				
-		FOR APPROVAL				18.12.2025		A.O		D.O		D.O		SCALE @ A1 AS SHOWN		DATE 18/12/2025		SHEET NUMBER 2 of 3		HDL-INST-20-111		A	
REV		AMENDMENTS				DATE		CAD		CHKD		APPD											



SURFACE LEVEL DATA					
NUMBER	MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR	AREA	VOLUME
1	-2.500	-2.000		107.296m²	11.346m³
2	-2.000	-1.500		295.787m²	115.758m³
3	-1.500	-1.000		506.256m²	330.067m³
4	-1.000	-0.500		370.532m²	551.424m³
5	-0.500	0.000		143.670m²	675.831m³
6	0.000	0.500		75.976m²	9.551m³

NOTES

- THE NET VOLUME SHOWN ABOVE ASSUMES THAT ALL MATERIAL EXCAVATED FROM THE SITE IS SUITABLE FOR USE AS FILL.
- THE CALCULATIONS SHOWN ABOVE DO NOT INCLUDE THE VOLUME OF TOPSOIL TO BE REMOVED FROM THE SITE.
- NO BULKING FACTORS ASSUMED.
- THE EARTHWORKS CALCULATION IS HIGH LEVEL AND SUBJECT TO FURTHER MODELLING AT

TOPSOIL

TOPSOIL VOLUME: 0mm AVERAGE THICKNESS

OVERALL SITE AREA = 1 499 m²

THEREFORE 1 499X 0.25 = 374 m³

TOPSOIL VOLUME: 374 m³

THEREFORE AN EXCESS OF APPROX. 374 m³ OF TOPSOIL TO BE STRIPPED, STOCKPILED FOR RE-USE / REMOVED FROM SITE.
NO BULKING FACTOR HAS BEEN APPLIED TO THE VOLUME OF TOPSOIL FOR CART AWAY PURPOSES.

EARTHWORKS CALCULATIONS

THE VOLUME OF CUT AND FILL VOLUMES HAVE BEEN CALCULATED AFTER COMPARING THE PROPOSED WORKS FORMATION LEVELS WITH THE EXISTING TOPOGRAPHICAL SURVEY MINUS TOPSOIL STRIP.

ROAD CONSTRUCTION = 720mm
FOOTWAYS = 250mm
VEGETATION = 300mm
FOUNDATION = 800mm

REDUCED DIG EARTHWORKS VOLUME

	Cut	Fill
GROSS:	1, 684m³	9m³
NET:	1, 675m³ (Cut)	

NOTES

- ALL DIMENSIONS IN METRES UNLESS OTHERWISE STATED.
- ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM.
- DO NOT SCALE FROM THIS DRAWING. WORK ONLY FROM STATED DIMENSIONS OR SETTING OUT DETAILS.
- THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERING DETAILS, DRAWINGS AND SPECIFICATIONS.
- ALL SETTING OUT INFORMATION TO BE PROVIDED BY THE END CLIENT. BEFORE COMMENCING CONSTRUCTION OF ANY PART OF THE WORKS, THE CONTRACTOR SHALL VERIFY THE SETTING OUT DATA IN RELATION TO THE SITE AND INFORM THE END CLIENT AND/OR ENGINEER IMMEDIATELY SHOULD ANY ISSUES BE IDENTIFIED.
- CUT AND FILL CONTOURS ARE INTENDED TO BE INDICATIVE ONLY AND DO NOT REPRESENT EXACT LOCATIONS ON SITE.
- FOR PAVEMENT CONSTRUCTION, REFER TO HDL DRAWING HDL-INST-20-100.
- UTILITIES INFORMATION PROVIDED BY END CLIENT. INFORMATION IS NOT TO BE RELIED UPON. CONTRACTOR IS TO TAKE ALL NECESSARY PRECAUTIONS TO IDENTIFY AND PROTECT EXISTING SERVICES WITHIN THE VICINITY OF THE WORKS.

FOR APPROVAL

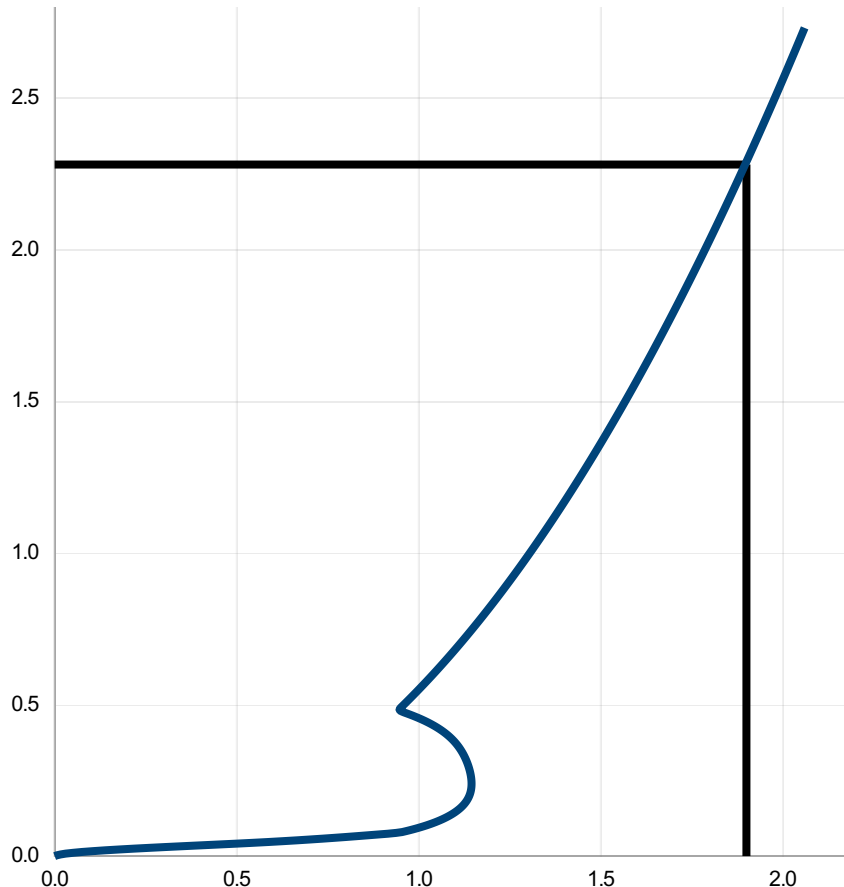
						CLIENT 						CONSULTANT  Highways Development Ltd						DESIGNER		A.O		SCHEME				DRAWING TITLE			
																		CAD		A.O									
																		CHECKED		D.O D.O									
																		APPROVED		D.O D.O		JOB No. HDL-INST-20				DATE		SHEET NUMBER	
D.O D.O		D.O D.O		1:200				17/12/2025		1 of 1		HDL-INST-20-122		-															
- PRELIMINARY DESIGN FOR APPROVAL		17.12.2025		A.O		D.O		D.O																					
REV		AMENDMENTS		DATE		CAD		CHKD		APPD																			

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	2.281	1.900
Flush-Flo™	0.239	1.145
Kick-Flo®	0.480	0.942
Mean Flow		1.379



hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.079	0.952
0.157	1.113
0.236	1.145
0.315	1.131
0.393	1.085
0.472	0.964
0.551	1.001
0.629	1.062
0.708	1.119
0.787	1.172
0.865	1.223
0.944	1.272
1.023	1.318
1.101	1.363
1.180	1.406
1.258	1.447
1.337	1.488
1.416	1.527
1.494	1.564
1.573	1.601
1.652	1.637
1.730	1.672
1.809	1.706
1.888	1.740
1.966	1.772
2.045	1.804
2.124	1.836
2.202	1.866
2.281	1.896

DESIGN ADVICE



The head/flow characteristics of this SHE-0054-1900-2281-1900 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

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

Hydro
International
A CRH COMPANY

DATE	18/12/2025 08:25
Site	Chippenham Hub
DESIGNER	Andrea O'Shea
Ref	HDL-INST_20_500

SHE-0054-1900-2281-1900
Hydro-Brake® Optimum



Chippenham EV Hub

Info Drainage Calculations

This drainage analysis comprises setting up the drainage design from Highways Development Ltd drawing HDL-INST-20-500 Revision D, Proposed Drainage Strategy (which was supplied to us in AutoCAD format) and running for the 1:30 and 1:100 year events in order to respond to some of the pre-commencement conditions (planning ref: PL/2025/07726).

INPUT

All network information (pipe sizes, levels and tanks) has been taken from the aforementioned drawing.

The hydrobrake flow control data is taken from the attached manufacturer's details.

FEH rainfall data has been supplied by Highways Development Ltd.

Catchment areas are shown in the plan below. These have been established using the proposed site levels information:



RESULTS

For full results refer to attached Info Drainage printouts.

The key results:

- Maximum outflow = 1.2 l/s
- Maximum total required storage in the two tanks = 99 m³, less than the 121 m³ provided.
- No flooding from the network in both the 1:30 + 45% CC and 1:100 + 45% CC events.

Below are some extracts from the results for ease of reference:

Stormwater Controls Summary

All Items

All Storms

Select Filter

All Items

Critical Rank By:

Max. Resident Volume

Critical Storm

Critical by Return Period

Set Visible Columns

Simulation Health Warnings

Critical Storm Per Item

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. Avg. Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Avg. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)
Tank_west	AMA1017_FEH_rainfall: 100 years +45 %; 720 mins: Summer	64.210	64.210	64.210	0.560	0.560	0.560	7.5	52.087	0.000	0.000	1.4	33.259	435	31
Tank_east	AMA1017_FEH_rainfall: 100 years +45 %; 720 mins: Summer	64.210	64.210	64.210	0.660	0.660	0.660	8.6	47.044	0.000	0.000	8.5	62.475		19

Stormwater Controls Summary															
All Items All Storms		Select item Tank_west		Critical Rank By: Max. Resident Volume		Critical Storm		Critical by Return Period		Set Visible Columns		Simulation Health Warnings			
Summary Results for Tank_west															
Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. Avg. Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Avg. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)	Percentage Available (%)	Status
AMA1017_FEH_rainfall: 100 years +45 %; 30 mins: Winter	63.859	63.859	63.859	0.209	0.209	0.209	26.4	19.420	0.000	0.000	5.1	2.383		74	OK
AMA1017_FEH_rainfall: 100 years +45 %; 60 mins: Summer	63.970	63.970	63.970	0.320	0.320	0.320	29.4	29.760	0.000	0.000	3.4	3.717		60	OK
AMA1017_FEH_rainfall: 100 years +45 %; 60 mins: Winter	63.915	63.915	63.915	0.265	0.265	0.265	20.7	24.699	0.000	0.000	3.6	3.671		67	OK
AMA1017_FEH_rainfall: 100 years +45 %; 120 mins: Summer	64.035	64.035	64.035	0.385	0.385	0.385	21.0	35.829	0.000	0.000	2.7	6.493		52	OK
AMA1017_FEH_rainfall: 100 years +45 %; 120 mins: Winter	63.970	63.970	63.970	0.320	0.320	0.320	12.8	29.760	0.000	0.000	2.9	6.184		60	OK
AMA1017_FEH_rainfall: 100 years +45 %; 180 mins: Summer	64.078	64.078	64.078	0.428	0.428	0.428	16.6	39.867	0.000	0.000	2.5	8.943	70	47	OK
AMA1017_FEH_rainfall: 100 years +45 %; 180 mins: Winter	64.007	64.007	64.007	0.357	0.357	0.357	9.6	33.211	0.000	0.000	2.7	8.594		56	OK
AMA1017_FEH_rainfall: 100 years +45 %; 240 mins: Summer	64.112	64.112	64.112	0.462	0.462	0.462	13.7	43.032	0.000	0.000	2.2	11.506	165	43	OK
AMA1017_FEH_rainfall: 100 years +45 %; 240 mins: Winter	64.034	64.034	64.034	0.384	0.384	0.384	7.9	35.726	0.000	0.000	2.5	10.939		52	OK
AMA1017_FEH_rainfall: 100 years +45 %; 360 mins: Summer	64.158	64.158	64.158	0.508	0.508	0.508	11.1	47.317	0.000	0.000	2.0	16.807	295	37	OK
AMA1017_FEH_rainfall: 100 years +45 %; 360 mins: Winter	64.071	64.071	64.071	0.421	0.421	0.421	5.9	39.153	0.000	0.000	1.9	15.970	50	48	OK
AMA1017_FEH_rainfall: 100 years +45 %; 480 mins: Summer	64.188	64.188	64.188	0.538	0.538	0.538	9.7	50.072	0.000	0.000	1.7	22.257	375	33	OK
AMA1017_FEH_rainfall: 100 years +45 %; 480 mins: Winter	64.093	64.093	64.093	0.443	0.443	0.443	5.9	41.231	0.000	0.000	1.6	20.992	120	45	OK
AMA1017_FEH_rainfall: 100 years +45 %; 600 mins: Summer	64.204	64.204	64.204	0.554	0.554	0.554	7.7	51.584	0.000	0.000	1.9	27.931	420	31	OK
AMA1017_FEH_rainfall: 100 years +45 %; 600 mins: Winter	64.103	64.103	64.103	0.453	0.453	0.453	5.0	42.190	0.000	0.000	2.1	26.037	155	44	OK
AMA1017_FEH_rainfall: 100 years +45 %; 720 mins: Summer	64.210	64.210	64.210	0.560	0.560	0.560	7.5	52.087	0.000	0.000	1.4	33.259	435	31	OK
AMA1017_FEH_rainfall: 100 years +45 %; 720 mins: Winter	64.108	64.108	64.108	0.458	0.458	0.458	4.0	42.571	0.000	0.000	1.6	30.816	175	43	OK
AMA1017_FEH_rainfall: 100 years +45 %; 960 mins: Summer	64.207	64.207	64.207	0.557	0.557	0.557	6.3	51.851	0.000	0.000	1.7	43.754	520	31	OK
AMA1017_FEH_rainfall: 100 years +45 %; 960 mins: Winter	64.101	64.101	64.101	0.451	0.451	0.451	3.1	41.942	0.000	0.000	1.3	42.273	165	44	OK
AMA1017_FEH_rainfall: 100 years +45 %; 1440 mins: Summer	64.188	64.188	64.188	0.538	0.538	0.538	4.9	50.101	0.000	0.000	1.6	67.626	635	33	OK
AMA1017_FEH_rainfall: 100 years +45 %; 1440 mins: Winter	64.075	64.075	64.075	0.425	0.425	0.425	2.5	39.512	0.000	0.000	1.7	58.210	295	47	OK

Junctions Summary

All Items

All Storms

Select Filter

All Items

Critical Rank By:

Max. Outflow

Critical Storm

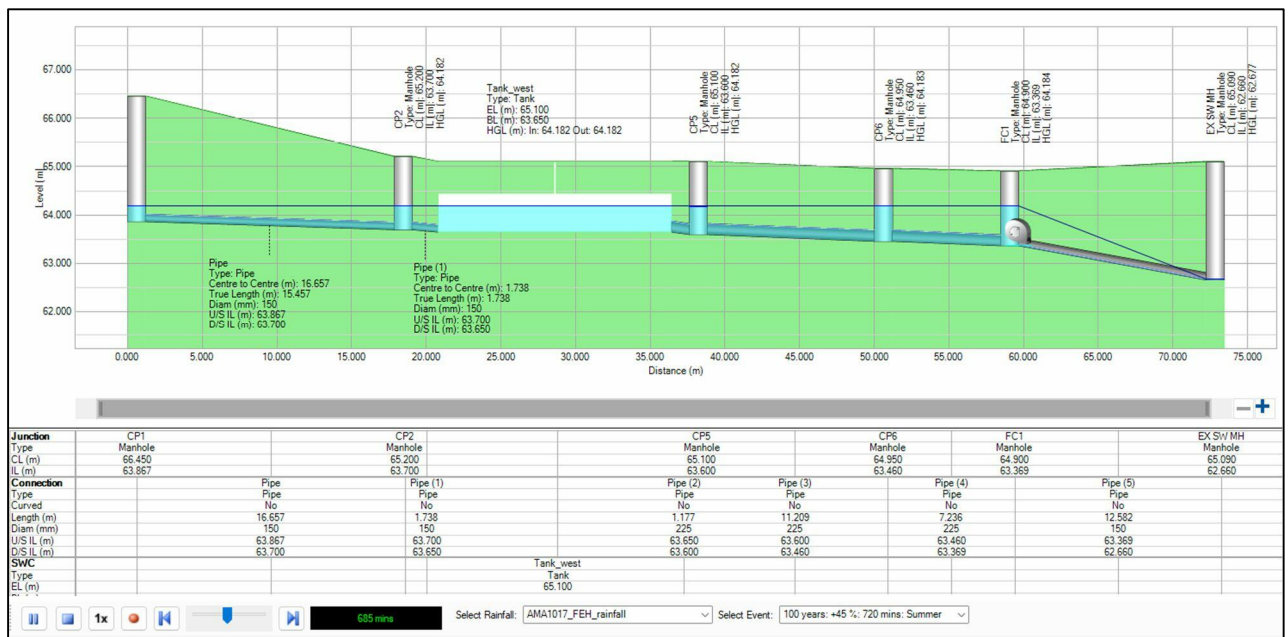
Critical by Return Period

Set Visible Columns

Simulation Health Warnings

Critical Storm Per Item

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
CP1	AMA1017_FEH_rainfall: 100 years +45 %: 15 mins: Summer	66.450	63.867	63.992	0.125	17.0	0.142	0.000	16.3	7.362	OK
CP2	AMA1017_FEH_rainfall: 100 years +45 %: 15 mins: Summer	65.200	63.700	63.824	0.124	24.6	0.141	0.000	23.9	10.678	OK
CP5	AMA1017_FEH_rainfall: 100 years +45 %: 15 mins: Summer	65.100	63.600	63.824	0.224	9.6	0.254	0.000	6.7	4.692	OK
CP6	AMA1017_FEH_rainfall: 30 years +45 %: 30 mins: Winter	64.950	63.460	63.797	0.337	7.0	0.381	0.000	2.9	7.294	Surcharged
FC1	AMA1017_FEH_rainfall: 100 years +45 %: 720 mins: Summer	64.900	63.369	64.184	0.815	1.6	0.921	0.000	1.2	93.476	Surcharged
EX SW MH	AMA1017_FEH_rainfall: 100 years +45 %: 720 mins: Summer	65.090	62.660	62.677	0.017	1.2	0.000	0.000	1.2	93.457	OK
CP3	AMA1017_FEH_rainfall: 100 years +45 %: 15 mins: Summer	65.654	63.810	64.160	0.350	23.8	0.396	0.000	20.3	10.282	Surcharged
CP4	AMA1017_FEH_rainfall: 100 years +45 %: 15 mins: Summer	65.200	63.600	63.851	0.251	26.3	0.284	0.000	25.0	12.443	Surcharged
CP4A	AMA1017_FEH_rainfall: 100 years +45 %: 30 mins: Summer	64.900	63.500	63.894	0.394	12.6	0.445	0.000	12.2	8.542	Surcharged



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AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage	Date: 07/05/2026		
	Designed by: LSP	Checked by:	Approved By: LSP
Report Details: Type: Inflows Storm Phase: Phase	Company Address:		





1

Type : Catchment Area

Area (ha)	0.006
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Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100



2

Type : Catchment Area

Area (ha)	0.002
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Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100



3

Type : Catchment Area

Area (ha)	0.003
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Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage	Date: 07/05/2026			
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4

Type : Catchment Area

Area (ha)	0.014
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Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100



5

Type : Catchment Area

Area (ha)	0.011
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Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100



6

Type : Catchment Area

Area (ha)	0.022
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Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage	Date: 07/05/2026		
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7

Type : Catchment Area

Area (ha)	0.005
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Preliminary Sizing	
Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100


9

Type : Catchment Area

Area (ha)	0.011
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Preliminary Sizing	
Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100


10

Type : Catchment Area

Area (ha)	0.008
-----------	-------

Preliminary Sizing	
Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing	
Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage	Date: 07/05/2026			
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11

Type : Catchment Area

Area (ha)	0.011
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Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100



12

Type : Catchment Area

Area (ha)	0.009
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Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100



13

Type : Catchment Area

Area (ha)	0.01
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Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	100
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	0.840
Time of Concentration (mins)	5
Percentage Impervious (%)	100

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage	Date: 07/05/2026			
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Report Details: Type: Inflows Storm Phase: Phase	Company Address:			



16

Type : Catchment Area

Area (ha)	0.009
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Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	50
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	50



15

Type : Catchment Area

Area (ha)	0.009
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Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	50
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	50



14

Type : Catchment Area

Area (ha)	0.015
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Preliminary Sizing

Volumetric Runoff Coefficient	1.000
Percentage Impervious (%)	50
Time of Concentration (mins)	5

Dynamic Sizing

Runoff Method	Time of Concentration
Summer Volumetric Runoff	1.000
Winter Volumetric Runoff	1.000
Time of Concentration (mins)	5
Percentage Impervious (%)	50

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage		Date: 07/05/2026			
		Designed by: LSP	Checked by: LSP		Approved By: LSP
Report Details: Type: Junctions Storm Phase: Phase		Company Address:			

Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
CP1	Manhole	389692.278	172223.134	66.550	2.683	63.867	Circular	1.200
CP2	Manhole	389693.790	172206.546	65.200	1.500	63.700	Circular	1.200
CP5	Manhole	389693.800	172200.617	65.100	1.500	63.600	Circular	1.200
CP6	Manhole	389705.008	172200.634	64.950	1.490	63.460	Circular	1.200
FC1	Manhole	389711.595	172197.638	64.900	1.531	63.369	Circular	1.200
EX SW MH	Manhole	389721.387	172189.737	65.090	2.430	62.660	Circular	1.200
CP3	Manhole	389699.636	172231.020	65.650	1.840	63.810	Circular	1.200
CP4	Manhole	389701.437	172210.061	65.200	1.600	63.600	Circular	1.200
CP4A	Manhole	389708.263	172205.455	64.900	1.400	63.500	Circular	1.200

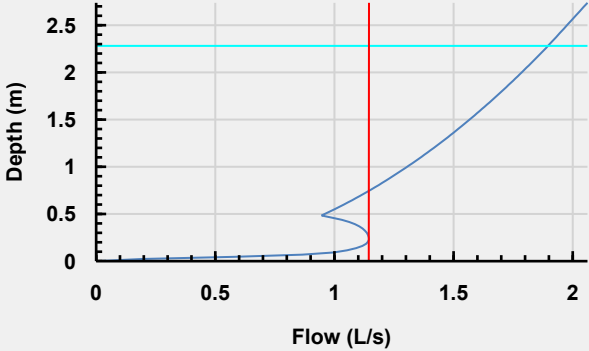
Name	Lock
CP1	None
CP2	None
CP5	None
CP6	None
FC1	None
EX SW MH	None
CP3	None
CP4	None
CP4A	None

Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
CP1	Inlet	1	(None)	No Restriction
	Inlet (1)	4 3	(None)	No Restriction
CP2	Inlet	Pipe	(None)	No Restriction
	Inlet (1)	5	(None)	No Restriction
CP5	Inlet (1)	Pipe (2)	(None)	No Restriction
CP6	Inlet (1)	Pipe (3)	(None)	No Restriction
		Pipe (8)		
FC1	Inlet	Pipe (4)	(None)	No Restriction
EX SW MH	Inlet	Pipe (5)	(None)	No Restriction
CP3	Inlet	12	(None)	No Restriction
		13		
		2		
		9		
		15		
CP4	Inlet	10 Pipe (6)	(None)	No Restriction
CP4A	Inlet	Pipe (9)	(None)	No Restriction

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage		Date: 07/05/2026			
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Report Details: Type: Junctions Storm Phase: Phase		Company Address:			

Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
CP1	Outlet	Pipe	Free Discharge
CP2	Outlet	Pipe (1)	Free Discharge
CP5	Outlet	Pipe (3)	Free Discharge
CP6	Outlet	Pipe (4)	Free Discharge
FC1	Outlet	Pipe (5)	Hydro-Brake®
	Invert Level (m)	63.369	
	Design Depth (m)	2.281	
	Design Flow (L/s)	1.9	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	☒	
	Unit Reference	SHE-0054-1900-2281-1900	
			
CP3	Outlet	Pipe (6)	Free Discharge
CP4	Outlet	Pipe (7)	Free Discharge
CP4A	Outlet	Pipe (8)	Free Discharge

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage	Date: 07/05/2026		
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Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address:		





Tank_west

Type : Tank

Dimensions

Exceedance Level (m)	65.100
Depth (m)	1.450
Base Level (m)	63.650
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	95
Average Slope (1:X)	0.00
Total Volume (m³)	75.092

Depth (m)	Area (m²)	Volume (m³)
0.000	97.95	0.000
0.800	97.95	74.442

Inlets

Inlet (1)

Inlet Type	Point Inflow
Incoming Item(s)	7
Bypass Destination	(None)
Capacity Type	No Restriction

Inlet (2)

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (1)
	14
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (2)
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	15.651

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage	Date: 07/05/2026		
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Tank_east

Type : Tank

Dimensions

Exceedance Level (m)	65.000
Depth (m)	1.450
Base Level (m)	63.550
Freeboard (mm)	0
Initial Depth (m)	0.000
Porosity (%)	95
Average Slope (1:X)	0.00
Total Volume (m³)	58.142

Depth (m)	Area (m²)	Volume (m³)
0.000	75.00	0.000
0.807	75.00	57.499

Inlets

Inlet (2)

Inlet Type	Point Inflow
	Pipe (7)
Incoming Item(s)	6
	11
	16
Bypass Destination	(None)
Capacity Type	No Restriction

Outlets

Outlet

Outgoing Connection	Pipe (9)
Outlet Type	Free Discharge

Advanced

Perimeter	Circular
Length (m)	15.811

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage		Date: 07/05/2026			
Report Details: Type: Connections Storm Phase: Phase		Designed by: LSP	Checked by: 		Approved By: LSP
		Company Address:			

Name	From	To	Length (m)	Connection Type	Slope (1:X)	Manning's n	Colebrook-White Roughness (mm)	Diameter / Base Width (mm)
Pipe	CP1	CP2	16.657	Pipe	99.744		0.6	150
Pipe (1)	CP2	Tank_west	1.738	Pipe	34.757		0.6	150
Pipe (2)	Tank_west	CP5	1.177	Pipe	23.542		0.6	225
Pipe (3)	CP5	CP6	11.209	Pipe	80.061		0.6	225
Pipe (4)	CP6	FC1	7.236	Pipe	79.518		0.6	225
Pipe (5)	FC1	EX SW MH	12.582	Pipe	17.746		0.6	150
Pipe (6)	CP3	CP4	21.036	Pipe	100.170		0.6	150
Pipe (7)	CP4	Tank_east	5.409	Pipe	108.183		0.6	150
Pipe (8)	CP4A	CP6	5.817	Pipe	145.414		0.6	225
Pipe (9)	Tank_east	CP4A	1.183	Pipe	23.662		0.6	225

Name	Upstream Cover Level (m)	Upstream Invert Level (m)	Downstream Cover Level (m)	Downstream Invert Level (m)	Part Family	Lock	Flow Restriction (L/s)	Culvert Type
Pipe	66.550	63.867	65.200	63.700		None		(None)
Pipe (1)	65.200	63.700	65.100	63.650		None		(None)
Pipe (2)	65.100	63.650	65.100	63.600		None		(None)
Pipe (3)	65.100	63.600	64.950	63.460		None		(None)
Pipe (4)	64.950	63.460	64.900	63.369		None		(None)
Pipe (5)	64.900	63.369	65.090	62.660		None	1.6	(None)
Pipe (6)	65.650	63.810	65.200	63.600		None		(None)
Pipe (7)	65.200	63.600	65.000	63.550		None		(None)
Pipe (8)	64.900	63.500	64.950	63.460		None		(None)
Pipe (9)	65.000	63.550	64.900	63.500		None		(None)

Name	Culvert Entrance	Wall Thickness (mm)	Material	Trench Width (mm)	Bedding Material	Surrounding Material
Pipe	(None)	0		0		
Pipe (1)	(None)	0		0		
Pipe (2)	(None)	0		0		
Pipe (3)	(None)	0		0		
Pipe (4)	(None)	0		0		
Pipe (5)	(None)	0		0		
Pipe (6)	(None)	0		0		
Pipe (7)	(None)	0		0		
Pipe (8)	(None)	0		0		
Pipe (9)	(None)	0		0		

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage	Date: 07/05/2026			
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	Report Title: Rainfall Analysis Criteria			
Company Address:				

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	☐

Rainfall

AMA1017_FEH_rainfall		Type: FEH
Site Location	GB 389701 172202 ST 89701 72202	
Rainfall Version	2022	
Summer	☒	
Winter	☒	

Return Period

Return Period (years)	Increase Rainfall (%)
30.0	45.000
100.0	45.000

Storm Durations

Duration (mins)	Run Time (mins)
15	30
30	60
60	120
120	240
180	360
240	480
360	720
480	960
600	1200
720	1440
960	1920
1440	2880

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage	Date: 07/05/2026		
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AMA1017_FEH_rainfall: 30 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
CP1	AMA1017_FEH_rainfall: 30 years: +45 %: 15 mins: Summer	66.550	63.867	63.968	0.101	13.2	0.115	0.000	12.8	5.731	OK
CP2	AMA1017_FEH_rainfall: 30 years: +45 %: 15 mins: Summer	65.200	63.700	63.801	0.101	19.2	0.114	0.000	18.7	8.358	OK
CP5	AMA1017_FEH_rainfall: 30 years: +45 %: 60 mins: Winter	65.100	63.600	63.839	0.239	5.5	0.271	0.000	4.3	7.913	Surcharged
CP6	AMA1017_FEH_rainfall: 30 years: +45 %: 30 mins: Winter	64.950	63.460	63.797	0.337	7.0	0.381	0.000	2.9	7.294	Surcharged
FC1	AMA1017_FEH_rainfall: 30 years: +45 %: 15 mins: Summer	64.900	63.369	63.779	0.410	2.1	0.464	0.000	1.1	1.560	Surcharged
EX SW MH	AMA1017_FEH_rainfall: 30 years: +45 %: 15 mins: Summer	65.090	62.660	62.677	0.017	1.1	0.000	0.000	1.1	1.540	OK
CP3	AMA1017_FEH_rainfall: 30 years: +45 %: 15 mins: Summer	65.650	63.810	64.031	0.221	21.2	0.250	0.000	18.1	9.143	Surcharged
CP4	AMA1017_FEH_rainfall: 30 years: +45 %: 15 mins: Summer	65.200	63.600	63.796	0.196	22.9	0.221	0.000	20.2	10.761	Surcharged
CP4A	AMA1017_FEH_rainfall: 30 years: +45 %: 60 mins: Summer	64.900	63.500	63.881	0.381	10.3	0.430	0.000	10.0	10.742	Surcharged

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage		Date: 07/05/2026		
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		Approved By: LSP		
Report Details: Type: Junctions Summary Storm Phase: Phase		Company Address:		



AMA1017_FEH_rainfall: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Outflow

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
CP1	AMA1017_FEH_rainfall: 100 years: +45 %: 15 mins: Summer	66.550	63.867	63.992	0.125	17.0	0.142	0.000	16.3	7.363	OK
CP2	AMA1017_FEH_rainfall: 100 years: +45 %: 15 mins: Summer	65.200	63.700	63.833	0.133	24.6	0.151	0.000	23.9	10.660	OK
CP5	AMA1017_FEH_rainfall: 100 years: +45 %: 15 mins: Summer	65.100	63.600	63.833	0.233	11.0	0.264	0.000	6.6	5.247	Surcharged
CP6	AMA1017_FEH_rainfall: 100 years: +45 %: 30 mins: Winter	64.950	63.460	63.859	0.399	10.5	0.452	0.000	2.7	9.106	Surcharged
FC1	AMA1017_FEH_rainfall: 100 years: +45 %: 720 mins: Summer	64.900	63.369	64.211	0.842	1.6	0.953	0.000	1.2	94.759	Surcharged
EX SW MH	AMA1017_FEH_rainfall: 100 years: +45 %: 720 mins: Summer	65.090	62.660	62.677	0.017	1.2	0.000	0.000	1.2	94.739	OK
CP3	AMA1017_FEH_rainfall: 100 years: +45 %: 15 mins: Summer	65.650	63.810	64.285	0.475	27.2	0.537	0.000	23.2	11.762	Surcharged
CP4	AMA1017_FEH_rainfall: 100 years: +45 %: 15 mins: Summer	65.200	63.600	63.889	0.289	29.3	0.327	0.000	27.7	13.953	Surcharged
CP4A	AMA1017_FEH_rainfall: 100 years: +45 %: 30 mins: Summer	64.900	63.500	63.902	0.402	13.9	0.455	0.000	13.5	9.485	Surcharged

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage		Date: 07/05/2026			
		Designed by: LSP	Checked by: (blank)		Approved By: LSP
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address: (blank)			



AMA1017_FEH_rainfall: 30 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. Avg. Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Avg. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)
Tank_west	AMA1017_FEH_rainfall: 30 years: +45 %: 600 mins: Summer	64.020	64.020	64.020	0.370	0.370	0.370	5.8	34.458	0.000	0.000	2.2	26.386	
Tank_east	AMA1017_FEH_rainfall: 30 years: +45 %: 600 mins: Summer	64.021	64.021	64.021	0.471	0.471	0.471	7.5	33.527	0.000	0.000	3.1	45.288	195

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage	Date: 07/05/2026		
	Designed by: LSP	Checked by:	Approved By: LSP
	Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		
Company Address:			

Percentag e Available (%)	Status
54.113	OK
42.335	OK

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage		Date: 07/05/2026			
		Designed by: LSP	Checked by: (blank)		Approved By: LSP
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase		Company Address: (blank)			



AMA1017_FEH_rainfall: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Resident Volume

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. Avg. Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Avg. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Half Drain Down Time (mins)
Tank_west	AMA1017_FEH_rainfall: 100 years: +45 %: 720 mins: Summer	64.210	64.210	64.210	0.560	0.560	0.560	7.5	52.087	0.000	0.000	1.4	33.259	435
Tank_east	AMA1017_FEH_rainfall: 100 years: +45 %: 720 mins: Summer	64.210	64.210	64.210	0.660	0.660	0.660	8.6	47.044	0.000	0.000	8.5	62.475	

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage	Date: 07/05/2026		
	Designed by: LSP	Checked by:	Approved By: LSP
	Company Address:		
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase			



Percentag e Available (%)	Status
30.636	OK
19.088	OK

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage		Date: 07/05/2026			
		Designed by: LSP	Checked by: LSP		Approved By: LSP
Report Details: Type: Connections Summary Storm Phase: Phase		Company Address:			



AMA1017_FEH_rainfall: 30 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe	AMA1017_FEH_rainfall: 30 years: +45 %: 15 mins: Summer	Pipe	CP1	CP2	66.550	63.968	0.101	5.731	1.0	0.72	12.8	OK
Pipe (1)	AMA1017_FEH_rainfall: 30 years: +45 %: 15 mins: Summer	Pipe	CP2	Tank_west	65.200	63.801	0.105	8.358	2.1	0.62	18.7	OK
Pipe (2)	AMA1017_FEH_rainfall: 30 years: +45 %: 15 mins: Summer	Pipe	Tank_west	CP5	65.100	63.780	0.155	0.716	0.7	0.05	5.9	OK
Pipe (3)	AMA1017_FEH_rainfall: 30 years: +45 %: 60 mins: Winter	Pipe	CP5	CP6	65.100	63.839	0.225	1.929	0.2	0.07	4.3	Surcharged
Pipe (4)	AMA1017_FEH_rainfall: 30 years: +45 %: 30 mins: Winter	Pipe	CP6	FC1	64.950	63.797	0.225	3.986	0.3	0.05	2.9	Surcharged
Pipe (5)	AMA1017_FEH_rainfall: 30 years: +45 %: 15 mins: Summer	Pipe	FC1	EX SW MH	64.900	63.779	0.017	1.540	1.0	0.03	1.1	Surcharged
Pipe (6)	AMA1017_FEH_rainfall: 30 years: +45 %: 15 mins: Summer	Pipe	CP3	CP4	65.650	64.031	0.150	9.143	1.0	1.02	18.1	Surcharged
Pipe (7)	AMA1017_FEH_rainfall: 30 years: +45 %: 15 mins: Summer	Pipe	CP4	Tank_east	65.200	63.796	0.150	10.761	1.4	1.18	20.2	Surcharged
Pipe (8)	AMA1017_FEH_rainfall: 30 years: +45 %: 60 mins: Summer	Pipe	CP4A	CP6	64.900	63.881	0.225	10.077	0.5	0.23	10.0	Surcharged
Pipe (9)	AMA1017_FEH_rainfall: 30 years: +45 %: 60 mins: Summer	Pipe	Tank_east	CP4A	65.000	63.880	0.225	10.150	0.7	0.1	10.3	Surcharged

AMA1017 - Chippenham EV Hub: Analysis of HDL drainage design HDL-INST-20-500 Rev D Proposed Drainage		Date: 07/05/2026			
		Designed by: LSP	Checked by: LSP		Approved By: LSP
Report Details: Type: Connections Summary Storm Phase: Phase		Company Address:			



AMA1017_FEH_rainfall: 100 years: Increase Rainfall (%): +45: Critical Storm Per Item: Rank By: Max. Flow

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe	AMA1017_FEH_rainfall: 100 years: +45 %: 15 mins: Summer	Pipe	CP1	CP2	66.550	63.992	0.123	7.363	1.0	0.92	16.3	OK
Pipe (1)	AMA1017_FEH_rainfall: 100 years: +45 %: 15 mins: Summer	Pipe	CP2	Tank_west	65.200	63.833	0.150	10.660	2.2	0.79	23.9	OK
Pipe (2)	AMA1017_FEH_rainfall: 100 years: +45 %: 15 mins: Summer	Pipe	Tank_west	CP5	65.100	63.833	0.208	1.020	0.6	0.08	8.2	OK
Pipe (3)	AMA1017_FEH_rainfall: 100 years: +45 %: 15 mins: Summer	Pipe	CP5	CP6	65.100	63.833	0.225	0.772	0.2	0.11	6.6	Surcharged
Pipe (4)	AMA1017_FEH_rainfall: 100 years: +45 %: 30 mins: Winter	Pipe	CP6	FC1	64.950	63.859	0.225	3.935	0.1	0.05	2.7	Surcharged
Pipe (5)	AMA1017_FEH_rainfall: 100 years: +45 %: 720 mins: Summer	Pipe	FC1	EX SW MH	64.900	64.211	0.017	94.739	1.0	0.03	1.2	Surcharged
Pipe (6)	AMA1017_FEH_rainfall: 100 years: +45 %: 15 mins: Summer	Pipe	CP3	CP4	65.650	64.285	0.150	11.706	1.3	1.31	23.2	Surcharged
Pipe (7)	AMA1017_FEH_rainfall: 100 years: +45 %: 15 mins: Summer	Pipe	CP4	Tank_east	65.200	63.889	0.150	13.827	1.6	1.62	27.7	Surcharged
Pipe (8)	AMA1017_FEH_rainfall: 100 years: +45 %: 30 mins: Summer	Pipe	CP4A	CP6	64.900	63.902	0.225	8.980	0.4	0.31	13.5	Surcharged
Pipe (9)	AMA1017_FEH_rainfall: 100 years: +45 %: 30 mins: Summer	Pipe	Tank_east	CP4A	65.000	63.902	0.225	9.469	0.8	0.13	13.9	Surcharged

AMA1017 - Chippenham EV Hub: Analysis of HDL drainag...
HDL-INST-20-500 Rev D Proposed Drainage Strategy

Company Address:

Modified date 07/05/2026
File AMA1017_01.iddx

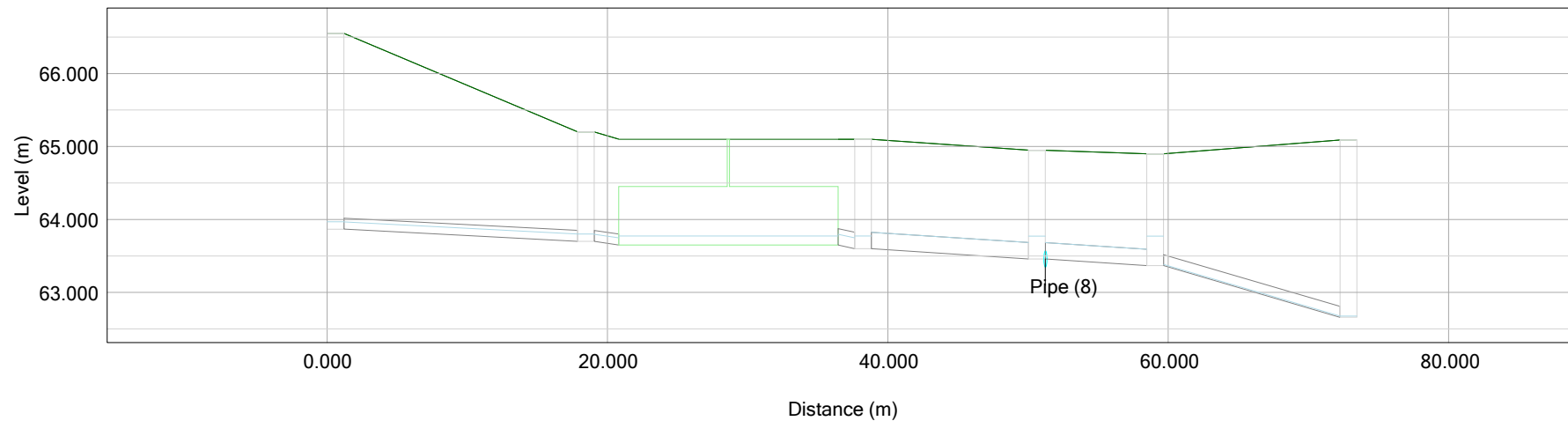
Designed by LSP
Checked by
InfoDrainage 2026.4

Profile - Flow Path

Horizontal Scale 1:458, Vertical Scale 1:91



1/1



Junction	CP1	CP2	CP5	CP6	FC1	EX SW MH
Type	Manhole	Manhole	Manhole	Manhole	Manhole	Manhole
CL (m)	66.550	65.200	65.100	64.950	64.900	65.090
IL (m)	63.867	63.700	63.600	63.460	63.369	62.660
Connection	Pipe	Pipe (1)	Pipe (2)	Pipe (3)	Pipe (4)	Pipe (5)
Type	Pipe	Pipe	Pipe	Pipe	Pipe	Pipe
Curved	No	No	No	No	No	No
Length (m)	16.657	1.738	1.177	11.209	7.236	12.582
Diam (mm)	150	150	225	225	225	150
Height (mm)						
U/S IL (m)	63.867	63.700	63.650	63.600	63.460	63.369
D/S IL (m)	63.700	63.650	63.600	63.460	63.369	62.660
C. Splay (mm)						
SWC	Tank_west					
Type	Tank					
EL (m)	65.100					
BL (m)	63.650					