National Grid

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Bryncir – Drainage Technical Note
PTNO-WSP-SS50-C00484-TEC-CP-000001-P02

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Prepared for

Mick Tuke

National Grid,
Pentir Substation,
LL57 4ED

Prepared by

WSP UK – Great Grid Upgrade
Birmingham (Mailbox)

Quality control	Name	Date	Signature
Prepared by:	Daniel Packman	15/09//25	Daniel Packman
Reviewed by:	Vic Mohun	15/09/25	Mohun, Vic (UKVNM400) Digitally signed by Mohun, Vic (UKVNM400) DN: cn=Mohun, Vic (UKVNM400), ou=Active, email=Vic.Mohun@wsp.com Date: 2025.09.16 12:29:15 +01'00'
Approved by:	Richard Whinnett	15/09/25	Digitally signed by Richard.Whinnett@wsp.com DN: cn=Richard.Whinnett@wsp.com Reason: PP. for Bruce Kirkpatrick (PD) Date: 2025.09.16 11:38:31 +01'00'

Revisions

Rev	Date	Details
P01	2025-09-10	First Issue
P02	2025-09-16	Minor Update to Names

Table of contents

1. Introduction

WSP UK Ltd (WSP) has been commissioned by National Grid to provide a drainage Technical Note outlining preliminary surface water drainage details, a potential drainage option and guidance on what would be required for a future compliant SAB application for a proposed substation at Bryncir.

The site is currently agricultural land located to the south of the A487 near the settlement of Bryncir. The site masterplan area is approximately 1.8ha and is largely permeable. The site is located at National Grid Reference: 248626, 343054.

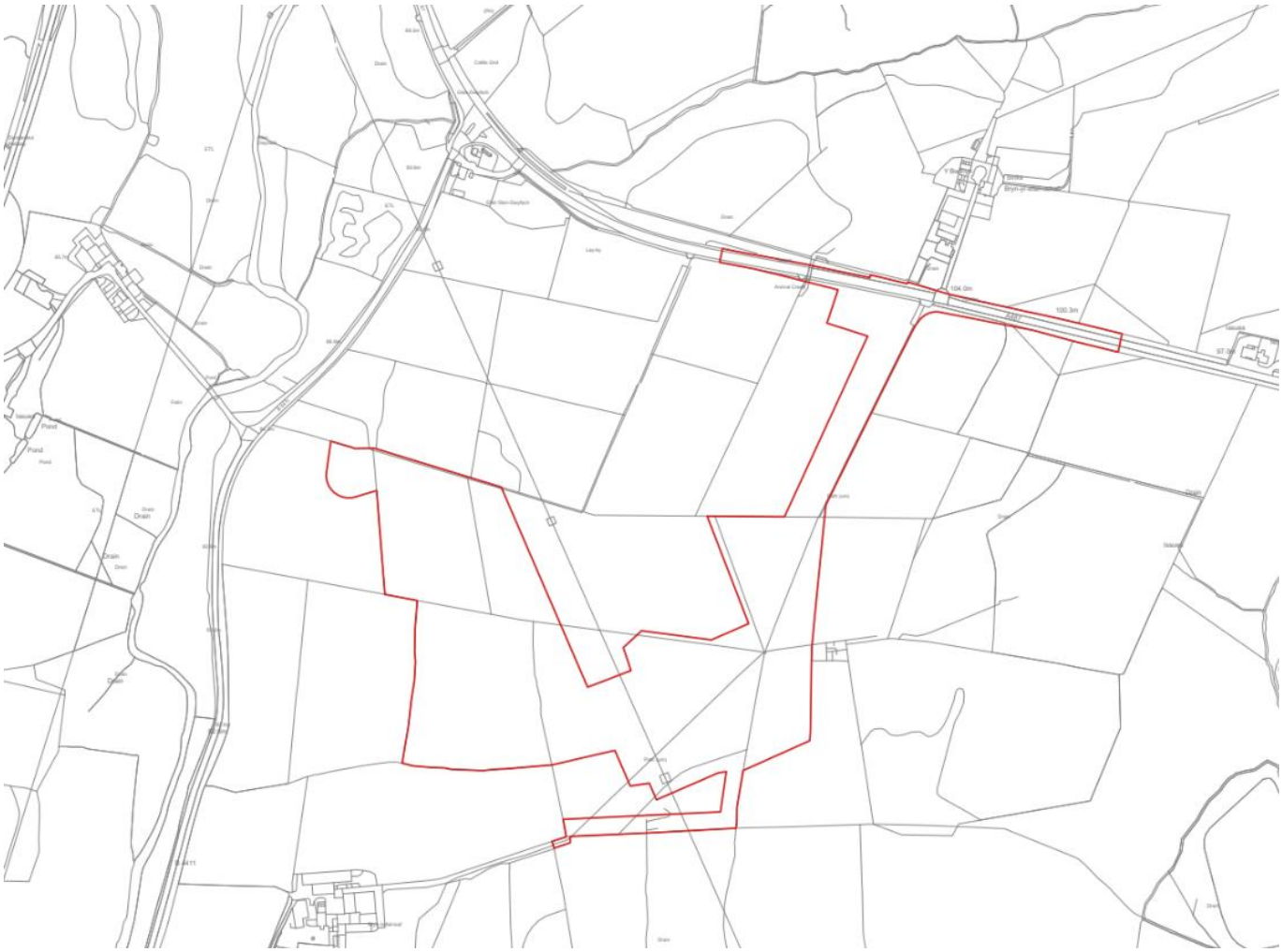


Figure 1 - Bryncir Location Plan

1.1 Proposed Development

A secure compound is required to accommodate the single electrical transformer that would 'step down' the 400 kV voltage of the Pentir –Trawsfynydd circuit to a voltage of 132 kV, ready for connection to SPEN DB overhead line.

The compound footprint dimensions are approximately 100x150 metres and will be surfaced with stone chippings. Under normal operating conditions the site will be unmanned but amenities will be provided on site for the times the site is visited for routine visual checks as part of a monthly inspection. Whilst external lighting will be installed at the substation for emergency work during hours of darkness, the substation will not normally be lit.

The proposed site can be separated the following catchments areas:

Table 1 – Catchment Areas

Catchment	Area (ha)
Substation	1.10
Access Road	0.29
Landscaped Areas	0.41
Total	1.80

This Technical Note only considers and provides a potential strategy for surface water flows generated by the site. Foul water flows, firewater management and any other form of runoff from the site are outside the scope of this document but solutions can be provided as a part of an detailed drainage strategy.

2. Site Setting

2.1 Geology and Hydrogeology

The British Geological Society (BGS) Onshore Geo Index indicates that some areas of the site are underlain by superficial deposits of Glacial fluvial Sheet Deposits, which are comprised of sand and gravels. Other areas of the site are underlain by superficial deposits of Peat. An onsite ground investigation would be required to accurately determine the boundaries between these superficial deposits.

The bedrock beneath the site is the Llanbedrog Volcanic Group, which is comprised of Tuff and sandstone. The western edge of the site may be underlain by the Dwyfach Formation, which is made up of mudstone, sandstone and siltstone. As with the superficial deposits a ground investigation would be required to establish the extent of the Dwyfach Formation.

DEFRA's Magic Map indicates that the bedrock is classified as a Secondary B aquifer and that the site is not located within a source protection zone.

A ground investigation coupled with infiltration testing to BRE365 standards will be required to establish the actual below ground conditions at the site.

2.2 Hydrology

There are no watercourses or surface water bodies located within the site. To the south of the site there is a drainage ditch, which appears to collect runoff from the site and the adjacent areas. The ditch flows towards the southwest and discharges into the Afon Dwyfach, which is located approximately 740m to the southwest of the site. The Afon Dwyfach flows in a southerly direction. This is indicated in Figure 2 further below.

2.3 Flood Risk

The National Resources Wales (NRW) Flood Map for Planning indicates that the site is located within Flood Zone 1. The map indicates that a surface water flow path traverses the site from north to south, which is then intercepted by the drainage ditch and conveyed towards the Afon Dwrfor. For further flood risk information please refer to the Flood Consequences Assessment (PTNO-WSP-ZZZZ-ZZZZZZ-RPT-ES-000002).

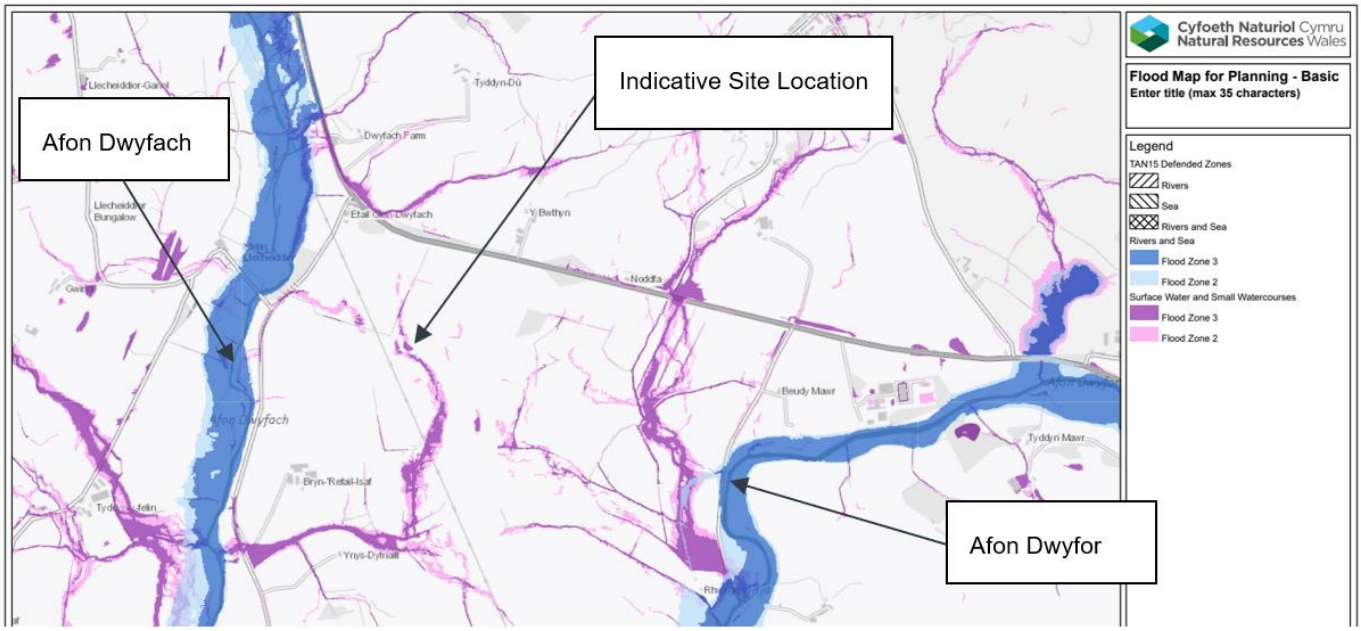


Figure 2- NRW Fluvial and Surface Water Flood Map

2.4 Existing Drainage

The land within the site falls from north to south with flows being directed towards the drainage ditch located at the southern edge of the site. The site is comprised of agricultural fields with several derelict farm buildings; as such the site can generally be regarded greenfield.

The UK SUDS Tools website has been used in conjunction with FEH-22 rainfall data to calculate the greenfield runoff rates for the total site area of 1.8ha and this is summarised in Table 2 below.

Table 2 – Greenfield Runoff Rates

Return Interval	Runoff Rate (l/s)
1 in 1 year	24.4
1 in 2 year	25.8
1 in 30 year	49.4
1 in 100 year	60.5

The calculation outputs from the UK SuDS Tools website can be found in Appendix A of this Technical Note.

3. Potential Surface Drainage Option

3.1 Drainage Hierarchy

It is a requirement of the SAB to consider the drainage hierarchy when determining the surface water runoff destination with priority given to the higher levels. The hierarchy is as follow:

- Surface water runoff collected for use.
- Surface water runoff is infiltrated to ground.
- Surface water runoff is discharged to a surface water body.
- Surface water runoff is discharged to a surface water sewer, highway drain, or another drainage system.
- Surface water runoff is discharged to a combined sewer.

It is recommended that the client considers potential uses for collected rainwater within the site as this will present a stronger application for SAB approval, but it is understood that this is not always feasible on a remote site which may not be manned at all times.

For this Technical Note it has been assumed that infiltration is not possible within the site. A ground investigation will be required by the SAB as evidence to determine the infiltration characteristics of the ground within the site prior to submission of the application. Should these tests indicate that infiltration is feasible the drainage design can be updated to incorporate infiltration SuDS assets.

For this preliminary surface water drainage strategy, the drainage ditch located at the south of the site has been selected as the surface water runoff destination, which complies with the third level of the drainage hierarchy. It is recommended that the Client consults with the Lead Local Flood Authority and DCWW to determine if either organisation has assets within the area, which could potentially act as alternative discharge locations should the drainage ditch not be feasible.

3.2 Proposed Discharge Rates

It is recommended that the SAB are consulted regarding post development discharge rates prior to the design of the surface water drainage network. For this Technical Note it has been assumed that restricting flows to the greenfield Qbar rate, pro-rated for the impermeable area of the site, is sufficient. The approximate total impermeable area of the site is 1.39ha and therefore the proposed restricted discharge rate for surface water runoff will be 22.9 l/s for all storms up to and including the 1 in 100 year plus 40% climate change.

3.3 Proposed Attenuation

Using the UK SuDS Tool Surface Water Storage Volume Design Tool and FEH22 rainfall data, it has been estimated that a storage volume of 1021m³ will be required onsite to attenuate surface water runoff. It is recommended that this volume is provided in the form of above ground features such as basins and swales as the SAB prefer at surface storage techniques. For the purposes of this Technical Note, it has been assumed that this storage volume will be provided in the form of a basin located to the south of the proposed electrical infrastructure. The use of partial or total infiltration on site (subject to favourable BRE 365 testing) will determine the final attenuation capacity required for this development. Design guidance for the basin can be found within the CIRIA 753 SuDS Manual.

For this Technical Note it has been assumed that runoff generated by the access road will be collected within a linear SuDS feature such as a swale or filter drain that runs along the side of the proposed road. Depending on the cross-sectional fall of the road both sides of the road may need to be lined or gullies can convey runoff from the road to the SuDS feature. It has also been assumed that this runoff will be conveyed around the site to the single attenuation basin located at the south of the site. If required, the estimated storage volume could be pro-rated to provide a second basin closer to the road.

The storage calculations output from the UK SuDS tools website can be found in Appendix A of this Technical Note.

3.4 Proposed Discharge Location

A topographical survey conducted Centara in August 2023 identified a drainage ditch in the southern portion of the site. Online map data indicates that this ditch flows towards the southwest and discharges in the Afon Dwyfach. It is proposed that restricted flows from the site are discharged into the drainage ditch from the basin via a swale.

It is recommended that the Client consults with the Lead Local Flood Authority and DCWW to identify whether either organisation has assets within the local area that may provide alternative discharge solutions should it be determined that the drainage ditch is unviable. It should be noted that asset owners will likely have their own connection requirements and may require a different restricted discharge rate, which will impact the drainage design.

It should also be noted that if assets are located beneath the A487 to the north of the site a surface water pumping solution will likely be required due to local topography.

A preliminary drainage layout can be found in Appendix B of this Technical Note.

3.5 Drainage Summary

- The site is comprised of agricultural land and so they development is a greenfield development.
- The total proposed impermeable area is approximately 1.39ha.
- The proposed restricted discharge rate for all storms up to and including the 1 in 100 year plus 40% climate event is 22.9l/s. This has been pro-rated from the Qbar greenfield runoff rate.
- The attenuation volume required for the proposed impermeable area has been estimated to be 1021m³. This has been provided in the form of a basin.
- The proposed discharge location has been identified as the drainage ditch located at the south of the site.

3.6 Considerations for an Outline Drainage Strategy

The scope of this Technical Note has been the collection, storage and conveyance of surface water but wider considerations will be required for the production of an outline drainage strategy.

Given the proposed site use, one consideration will need to be surface water contamination risk and therefore and water quality improvements measures. This is typically determined through the pollution indices approach, where common site uses are assigned three pollution indices for suspended solids, hydrocarbons and metals. The CIRIA 753 SuDS Manual's Simple Index Approach contains examples of these requirements:

TABLE 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

Figure 3 - Table 26.2 from the CIRIA C753 SuDS Manual

It is recommended that the client liaises with the SAB officer to determine at what hazard level they would place the site, but it is assumed that this will a medium to high hazard. Various SuDS features are then assigned treatment indices, which need to total up to be greater than each individual pollution indices. This means that by providing a robust management train of various SuDS features it is possible to demonstrate that the site will provide water quality improvements to the surface water runoff generated by the site.

If the site contains a form of fire prevention system consideration will need to be given to the discharge or disposal of water generated by the prevention system.

As discussed in previous sections a ground investigation report will be required to satisfy the requirements of SAB officer. It is recommended that the investigation is conducted as early as possible within the design process to better inform the proposed drainage strategy. It is also recommended drainage design team are consulted to provide suitable locations for infiltration trial pits.

Amenity and biodiversity benefits will also need to be considered for the site. Typically providing soft engineered SuDS features at the surface will satisfy these requirements as the promote wildlife and break up continuous areas of hardstanding. The maintenance requirements of these SuDS features and the traditional below drainage will need to be documented for the SAB officer. They will also expect to see a maintenance plan to ensure that the proposed drainage system will remain fully operational for the lifespan of the proposed development.

Typically, for a substation the following may generally be required and are provided for guidance purposes only:

- Oil separators,
- Shutdown system in form of Penstock Valves located upstream and downstream to each oil separator,
- Sampling chamber placed immediately downstream of every oil separator and at, or before the final discharge point to the watercourse,
- Sump or a tank downstream of every oil separator.

The final details will need to be confirmed following the findings of a drainage strategy and consultations with the pre-SAB.

4. Recommendations

4.1 Stakeholder Consultations

It is recommended that the drainage design team engages with the various relevant stakeholders as early as possible within the design process as their responses can heavily impact the drainage design. Contacting the Lead Local Authority and SAB officer early within the process will allow them to advise the design team on any specific requirements or preferences to be included within the detail design, which tends to make them more amenable.

The more information that can be obtained from stakeholders reduces the number of assumptions that need to be made during the design process. This will reduce the chance that the SAB application will fail due to unforeseen issues. This is normally undertaken during the Pre-SAB submission stage where an outline surface water drainage strategy is submitted as part of the pre-SAB for formal comments (see section 4.3).

4.2 Ground Investigation

The SAB will require evidence to whether infiltration is viable within the site before accepting discharge methods from a lower level in the hierarchy. To determine this infiltration testing to BRE 365 standards will be required across the site. Typically, trial pits are located where SuDS features are specified and at the same depth as the invert level but testing may also be required at other locations just in case areas of infiltration can be located elsewhere. This may especially be required for this site as the geology beneath appears to be variable.

Infiltration testing may determine that the surface water runoff can fully or partially be discharged from the site via infiltration-based SuDS features. If this is the case, then the approach can be amended to incorporate said structures into the design.

4.3 SAB Application Requirements

Both the SAB pre-application and full application processes require that the proposed drainage strategy complies with 6 standard principles. These principles are:

- Surface Water Runoff Destination
- Surface Water Runoff Hydraulic Control
- Water Quality
- Amenity
- Biodiversity
- Design of Drainage for Construction and Maintenance and Structural Integrity

The potential drainage option presented in this Technical Note aims to satisfy these requirements through the inclusion of soft engineered surface based drainage features and through restricting flows to greenfield Qbar. Further consideration may be required regarding water quality as the level of treatment required prior to discharge will be dependent upon the types of activities occurring within the site.

The specific information and evidence required for the SAB pre-application are less defined than the requirements of the full application but it is recommended that as much evidence as possible from the full requirements list is submitted at the pre-application stage to give the SAB officer an opportunity to comment on all the evidence available. The requirements for the full application are as follows:

- Flood Consequences Assessment
- Detailed geotechnical factual and interpretive report
- Detailed whole site SuDS drainage design proposals
- Detailed SuDS assets maintenance plan
- Unstable and contaminated land reports
- Water quality treatment and pollution prevention strategy and plan
- Landscape plan
- Construction phasing plan
- Information and communications plan

- CDM regulations 2015 file
- Statutory consents and permissions
- Title documents
- Technical drawings:
- Catchment plans
  - Site location plans
  - Drainage layouts
  - General engineering layout drawings
  - Cross sections
  - Landscaping layouts
  - Any specialist drawings

During consultation with the SAB officer, it may be determined that certain items are not required or due to site specifics additional evidence is required. As such it is again recommended that the SAB officer is consulted early within the design process to avoid abortive work or missing evidence.

Appendix A – Outline Calculations

Greenfield runoff rate estimation tool

www.uksuds.com | Greenfield runoff rate estimation tool (https://www.uksuds.com/)

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

Project details

Date	29/07/2025
Calculated by	DP
Reference	Bryncir
Model version	2.1.2

Location

Site name	Brnycir
Site location	

Site easting (British National Grid)	248951
Site northing (British National Grid)	342717

Site details

Total site area (ha)	1.8 ha

Greenfield runoff

Method

Method	FEH statistical

FEH statistical

	My value		Map value
SAAR (mm)	1473 mm		1473
BFIHOST	0.437		
QMed-QBar conversion	1.075		1.075
QMed (l/s)	25.81 l/s		
QBar (FEH statistical) (l/s)	27.75 l/s		

Growth curve factors

	My value		Map value
Hydrological region	9		9
1 year growth factor	0.88		
2 year growth factor	0.93		
10 year growth factor	1.42		
30 year growth factor	1.78		
100 year growth factor	2.18		
200 year growth factor	2.46		

Results

Method	FEH statistical
Flow rate 1 year (l/s)	24.4 l/s
Flow rate 2 year (l/s)	25.8 l/s
Flow rate 10 years (l/s)	39.4 l/s
Flow rate 30 years (l/s)	49.4 l/s
Flow rate 100 years (l/s)	60.5 l/s
Flow rate 200 years (l/s)	68.3 l/s

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

Disclaimer

Surface water storage volume design tool

www.uksuds.com | Surface water storage volume design tool (https://www.uksuds.com/)

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	30/07/2025
Calculated by	DP
Reference	Bryncir
Model version	2.1.2

Location

Site name	Bryncir
Site location	

Site easting (British National Grid)	248967
Site northing (British National Grid)	342956

Site areas

Total site area (ha)	1.1	ha

Roof area

Total roof area (ha)	0.04	ha
Contributing roof area (ha)	0.04	ha
Non-contributing roof area (ha)	0	ha

Paved area

Total paved area (ha)	1.06	ha
Contributing paved area (ha)	1.06	ha
Non-contributing paved area (ha)	0	ha

Grass / vegetated area

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

Total area

Total contributing area (ha)	1.1	ha

Contributing areas with urban creep allowance

Urban creep allowance factor	+0% (no creep)

Storage design parameters

Storage base shape	Circular	
Storage design depth (m)	1.2	m
Storage side slope (1 in x)	1 in 3	
Storage voids ratio (%)	100% (all voids)	
Storage volume design return period (years)	1:100 years	

Discharge flow rate from the site

Method

Type of site	Greenfield
Specify the method	FEH statistical

FEH statistical

	My value		Map/default value
SAAR (mm)	1473 mm		1473
BFIHOST	0.437		
QMed (l/s)	15.77 l/s		
QMed-QBar conversion	1.075		1.075
Total area for greenfield runoff calculation (ha)	1.1 ha		1.1
QBar (l/s)	16.96 l/s		
Hydrological region	9		9
Return period (years)	Qbar (1:2.3 years)		
Growth curve factor	1		
Flow rate (FEH statistical) (l/s)	16.96 l/s		

Final discharge rate

Runoff calculation method	FEH statistical
Design flow rate (l/s)	16.96 l/s

Blockage risk

Specify the method	Flow rate
Minimum discharge flow rate to prevent blockage	1l/s

	My value		Calculated value
Design orifice diameter (mm)	86 mm		86
Flow rate of orifice (l/s)	16.63 l/s		

Rainfall and runoff

Rainfall input type	FEH22 CSV file
	FEH_Point_Rainfall_FEH22_AM_248598_342879.csv
Distance from FEH location to site (km)	0.4 km
Climate change allowance factor	140%

Model results

- **Maximum discharge flow rate:** 16.6 (l/s)
- **Outflow orifice diameter:** 86 (mm)
- **Storage base diameter:** 26 (m)
- **Storage base area:** 532 (m^2)
- **Storage total volume:** 832 (m^3)
- **Storage total water volume:** 832 (m^3)
- **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	900	10.6	0.51	306	306
2	900	11.4	0.58	353	353
10	720	13.9	0.85	548	548
30	720	15.3	1.01	677	677
100	720	16.6	1.20	832	832
200	720	17.5	1.32	935	935

Please note runoff estimation and storage volume estimation are subject to uncertainty. Storage volume results are therefore reported to the nearest 1 m^3 value, unless storage volumes are less than 10 m^3, in which case, storage volumes are provided to 1 decimal place.

Disclaimer

Appendix A - Rainfall Depths

Rainfall depths (mm) with climate change

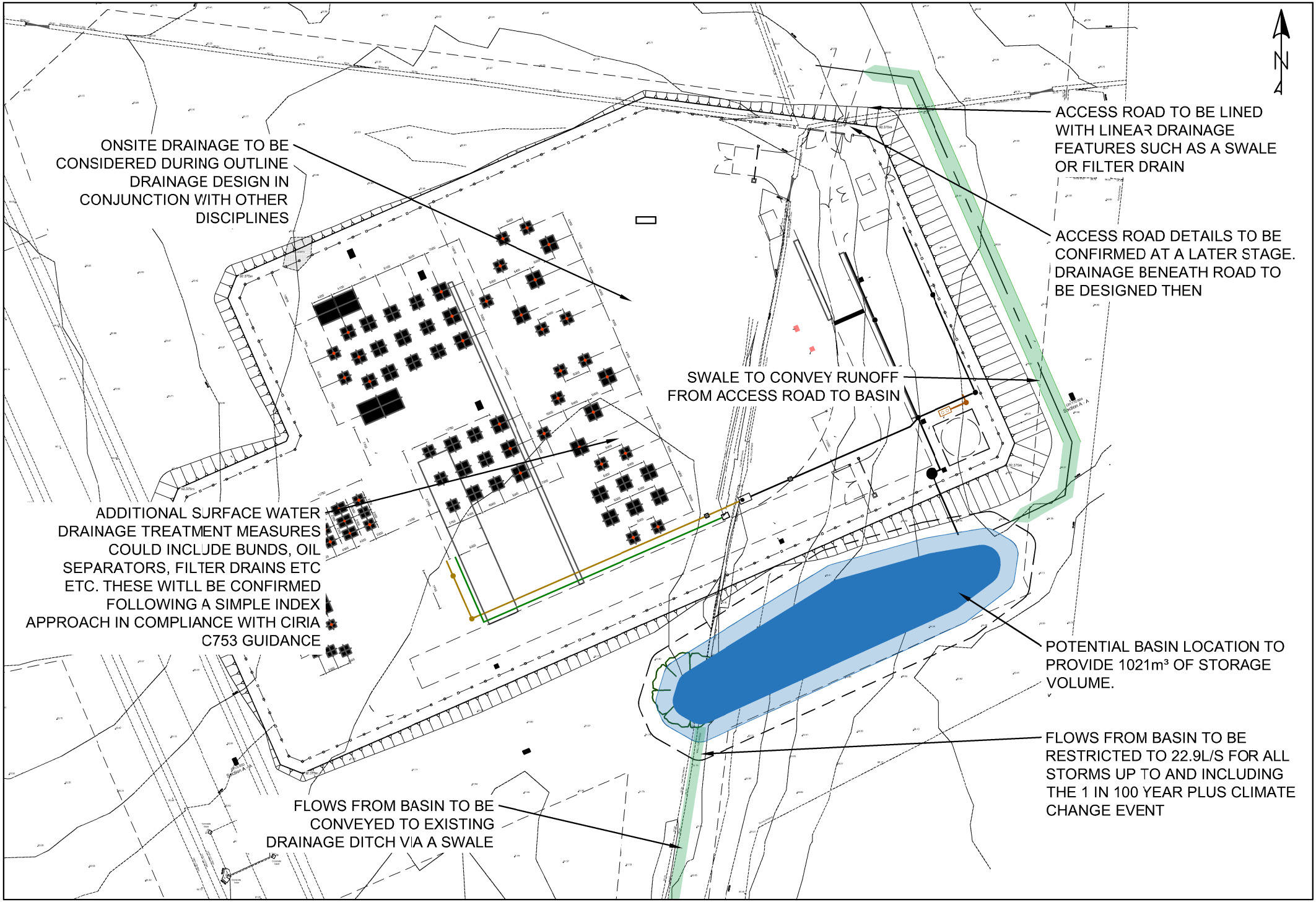
Duration (minutes)	Duration (hours)	1 years	2 years	10 years	30 years	100 years	200 years
15	0.25	7.26	9.52	18.31	23.66	29.69	33.43
30	0.5	10.03	13.19	25.55	33.57	42.71	48.48
60	1	13.39	17.67	34.57	45.79	58.87	67.17
120	2	20.24	25.03	43.74	55.83	69.92	78.90
180	3	25.22	30.37	50.27	62.99	77.83	87.36
240	4	29.28	34.68	55.48	68.68	84.14	94.12
360	6	35.76	41.48	63.59	77.57	93.98	104.55
540	9	42.79	48.92	72.55	87.44	104.85	116.13
720	12	48.11	54.57	79.42	95.03	113.25	125.10
900	15	52.44	59.16	84.99	101.22	120.18	132.54
1080	18	56.15	63.10	89.80	106.57	126.17	138.94
1440	24	62.31	69.65	97.99	115.64	136.26	149.67
1800	30	67.32	75.04	104.78	123.17	144.56	158.37
2160	36	71.73	79.79	110.78	129.84	151.89	165.98
2880	48	79.43	88.12	121.37	141.60	164.70	179.20
3600	60	86.32	95.56	130.86	152.12	176.05	190.79
4320	72	92.69	102.45	139.68	161.92	186.58	201.53
5040	84	98.72	108.98	148.05	171.23	196.60	211.75
5760	96	104.49	115.23	156.11	180.22	206.30	221.66

Rainfall depths (mm) without climate change

Duration (minutes)	Duration (hours)	1 years	2 years	10 years	30 years	100 years	200 years
15	0.25	5.19	6.80	13.08	16.90	21.21	23.88
30	0.5	7.16	9.42	18.25	23.98	30.51	34.63
60	1	9.56	12.62	24.69	32.71	42.05	47.98
120	2	14.46	17.88	31.24	39.88	49.94	56.36
180	3	18.01	21.69	35.91	44.99	55.59	62.40
240	4	20.91	24.77	39.63	49.06	60.10	67.23
360	6	25.54	29.63	45.42	55.41	67.13	74.68
540	9	30.56	34.94	51.82	62.46	74.89	82.95
720	12	34.36	38.98	56.73	67.88	80.89	89.36
900	15	37.46	42.26	60.71	72.30	85.84	94.67
1080	18	40.11	45.07	64.14	76.12	90.12	99.24
1440	24	44.51	49.75	69.99	82.60	97.33	106.91
1800	30	48.09	53.60	74.84	87.98	103.26	113.12

Duration (minutes)	Duration (hours)	1 years	2 years	10 years	30 years	100 years	200 years
2160	**36**	51.24	56.99	79.13	92.74	108.49	118.56
2880	**48**	56.74	62.94	86.69	101.14	117.64	128.00
3600	**60**	61.66	68.26	93.47	108.66	125.75	136.28
4320	**72**	66.21	73.18	99.77	115.66	133.27	143.95
5040	**84**	70.51	77.84	105.75	122.31	140.43	151.25
5760	**96**	74.64	82.31	111.51	128.73	147.36	158.33

Appendix B – Outline Layout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ONSITE DRAINAGE TO BE CONSIDERED DURING OUTLINE DRAINAGE DESIGN IN CONJUNCTION WITH OTHER DISCIPLINES
ACCESS ROAD TO BE LINED WITH LINEAR DRAINAGE FEATURES SUCH AS A SWALE OR FILTER DRAIN
ACCESS ROAD DETAILS TO BE CONFIRMED AT A LATER STAGE. DRAINAGE BENEATH ROAD TO BE DESIGNED THEN
SWALE TO CONVEY RUNOFF FROM ACCESS ROAD TO BASIN
ADDITIONAL SURFACE WATER DRAINAGE TREATMENT MEASURES COULD INCLUDE BUNDS, OIL SEPARATORS, FILTER DRAINS ETC ETC. THESE WITLL BE CONFIRMED FOLLOWING A SIMPLE INDEX APPROACH IN COMPLIANCE WITH CIRIA C753 GUIDANCE
POTENTIAL BASIN LOCATION TO PROVIDE 1021m³ OF STORAGE VOLUME.
FLOWS FROM BASIN TO BE RESTRICTED TO 22.9L/S FOR ALL STORMS UP TO AND INCLUDING THE 1 IN 100 YEAR PLUS CLIMATE CHANGE EVENT
FLOWS FROM BASIN TO BE CONVEYED TO EXISTING DRAINAGE DITCH VIA A SWALE

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