Coleg Sir Gar, Pibwrlwyd Campus, Carmarthen

Proposed Drainage Strategy

Prepared for:
Welsh Education Partnership (WEPCo)
on behalf of Coleg Sir Gar

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1 Introduction

Stantec have been commissioned by Welsh Education Partnership (WEPCo) on behalf of Coleg Sir Gar to provide civil engineering consultancy services for the proposed redevelopment and expansion of the existing college which is to be situated across the existing campus and the neighbouring field to the east.

This report is required to support the SAB pre-application and PAC submission.

The objectives of the report are to;

- Review the existing drainage arrangements on site for both surface and foul water;
- Assess the feasibility of Sustainable Drainage Systems (SuDS) features within the development to control and discharge surface water runoff in line with the requirements of the statutory National Standards for Sustainable Drainage Systems;
- Assess the options for the disposal of foul water from the development; and
- Provide a preliminary design for surface water (SuDS) systems including indicative sizing of storage/attenuation features and conceptual plan suitable for inclusion in a pre-application submission to the local authority's SuDS Approval Body (SAB) and to support planning.

The following tasks have been undertaken to complete this report;

- A desktop investigation of the site's existing foul and surface water drainage arrangements;
- Outlining anticipated solutions for foul sewage disposal, and the sustainable management of surface water runoff. This includes preliminary calculations, in order that the conceptual designs may be agreed with the relevant authorities;
- Determined the area of impermeable surfaces added by the proposed development and estimated the equivalent greenfield run-off rates for this area;
- Assessed the feasibility of using infiltration as a disposal method, based on available information for the ground and site conditions;
- Estimated the size of storm water storage needed to manage run-off from the site post-development, using industry standard drainage design software (InfoDrainage);
- Identified areas of the site for SuDS and provided general information on their maintenance.

A number of sources of information have been used to compile this drainage strategy. Whilst Stantec believe them to be trustworthy we are unable to guarantee the accuracy of the information that has been provided by others.

This report is based on information available at the time of preparation. Consequently, there is potential for further information to become available. These changes may lead to future alteration to the conclusions drawn in this report for which Stantec cannot be held responsible.

2 Existing Site

2.1 Site Location and Description

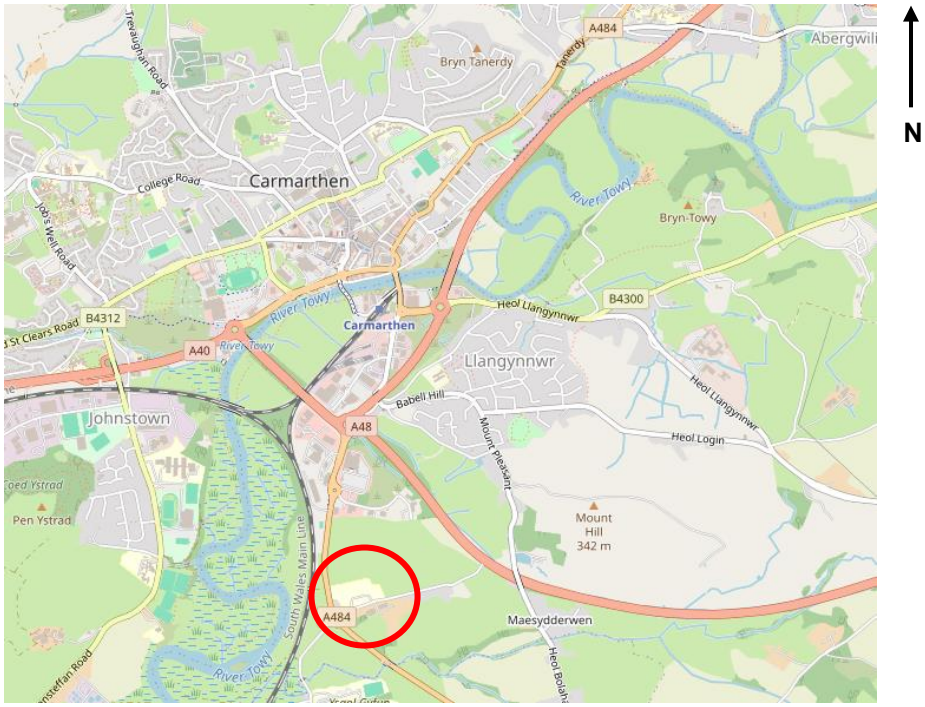


Figure 1: Site Location (ref Open Street Map)

The site is approximately 5.3 hectares (ha) in area and is a mix of brownfield and greenfield. The existing site comprises of existing college buildings occupying the majority of the development area with associated car parking, hardstanding and landscaping. The college also occupies the land south of Pibwrlwyd Lane though this is not currently expected to be affected by works. Neighbouring the site is:

- Undeveloped land to the east (Greenfield);
- Access road (Pibwrlwyd lane) to the south (leading to the A484) followed by existing college buildings;
- Residential property followed by the A484 main road to the west; &
- Undeveloped land to the north (Agricultural fields).

Table 1: Site Information

Address	Pibwrlwyd Lane, Carmarthen, SA31 2NH
Grid Reference	X- 241175, Y- 218304
What3Words	Bump.riches.tape

Figure 2: Site location at greater scale (ref Google Map)

2.2 Flood Risk

In accordance with the Welsh Government's Technical Advice Note (TAN)15, a development of this nature (i.e. school building) is categorised as a Highly Vulnerable Development. National Resources Wales (NRW) Development Advice Map shows the site lies wholly within flood Zone A which is considered to be at little or no risk of fluvial or coastal/tidal flooding. TAN15 states this zone is used to indicate that justification test is not applicable and no need to consider flood risk further. Figure 3 contains an extract of the National Resources Wales (NRW) development advice maps with the site boundary shown in red.

From available National Flood Hazard and Risk Maps information, the site is free from surface water and small watercourse flood risk, Figure 4 contains an extract of the National Resources Wales (NRW) flood risk maps with the site boundary shown in red.

A robust sustainable surface water drainage strategy will also be required to support the design of the development, presenting the on-site surface water drainage infrastructure to protect the site from flooding. Additionally, this must consider the impact on flood risk to land and property outside of the development boundary. New surface water drainage infrastructure should be designed so that the development does not increase the risk of flooding elsewhere.

Reference should also be made to the separate Flood Consequence Assessment report by Stantec, ref 30015-STN-XX-XX-RP-WENV-0001.

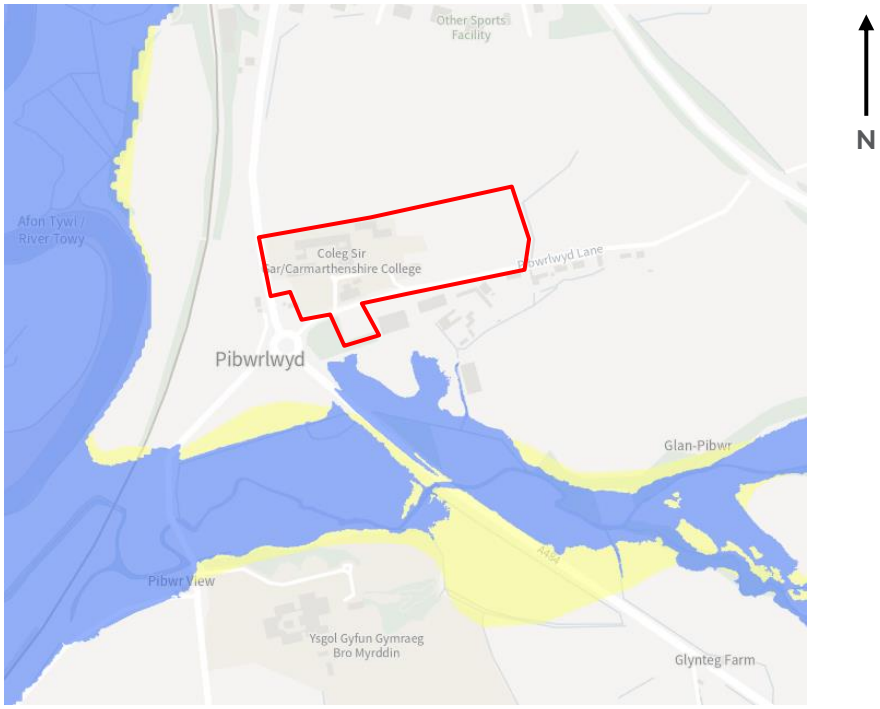


Figure 3: Extract of NRW Development Advice Map

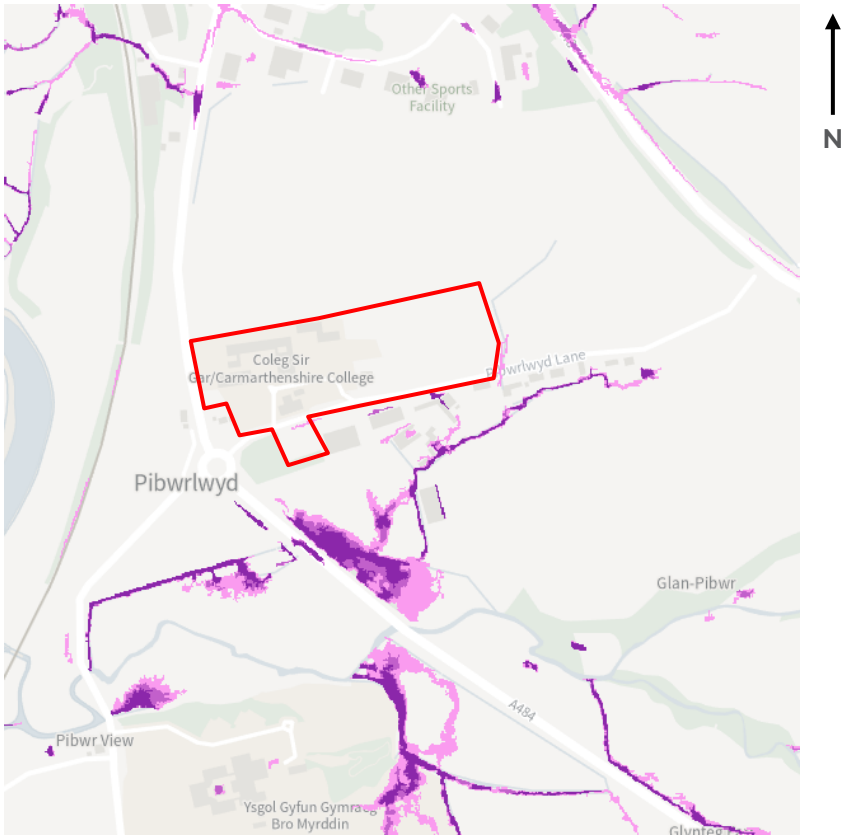


Figure 4: Extract from NRW Flood Risk Map

2.3 Existing Drainage Arrangements

A review of public sewer records complemented with onsite surveys has allowed for an existing drainage plan to be prepared for the site which can be found in Appendix A.

2.3.1 Public Sewers

From available Dwr Cymru Welsh Water (DCWW) asset mapping information (Figure 5) it has been established that existing public foul water sewers are situated in the vicinity of the site.

On the western site boundary is a VC 225mm diameter foul sewer running north to south. On the southern site boundary are two 150mm diameter VC foul sewers; one running east to west and the other running west to east. They eventually combine within the southern campus area of the site and direct flows southwest.

There are no public dedicated surface water sewers shown within the vicinity of the site.

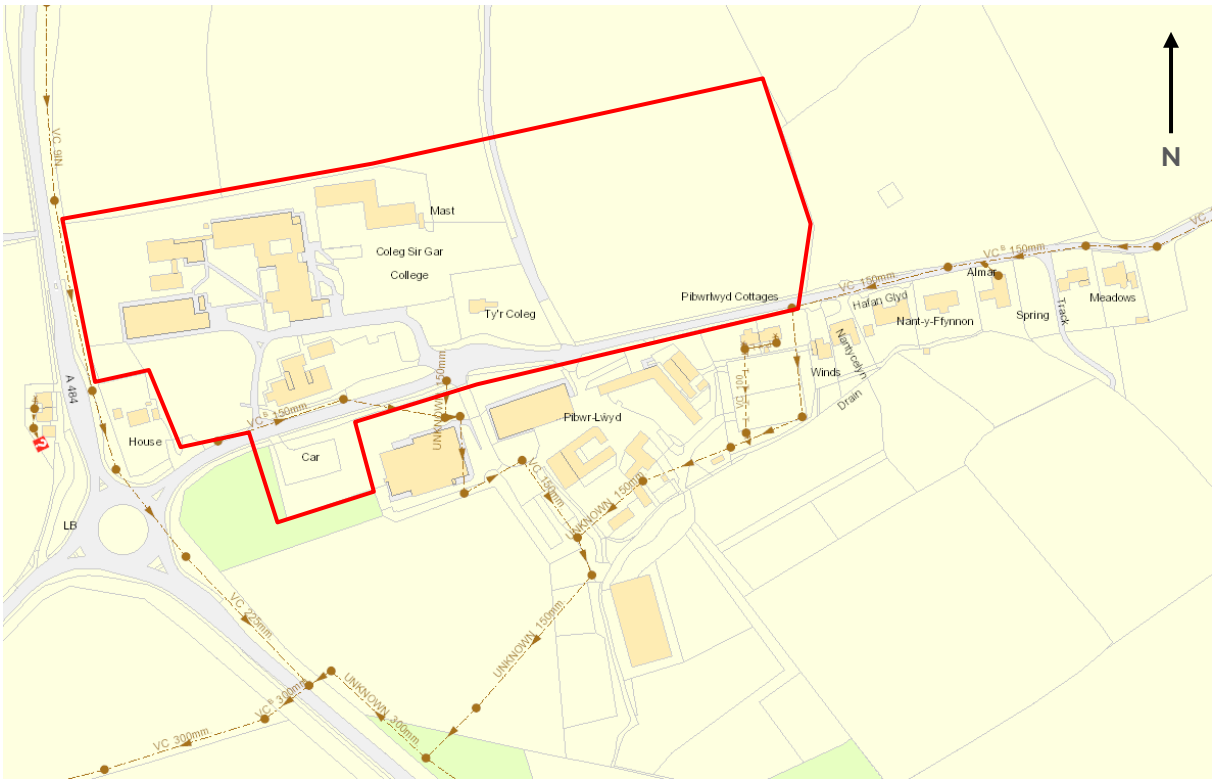


Figure 5: Extract of DCWW Asset Record Mapping

2.3.2 Private on Plot Network

An existing building layout is included in Figure 6 for reference:

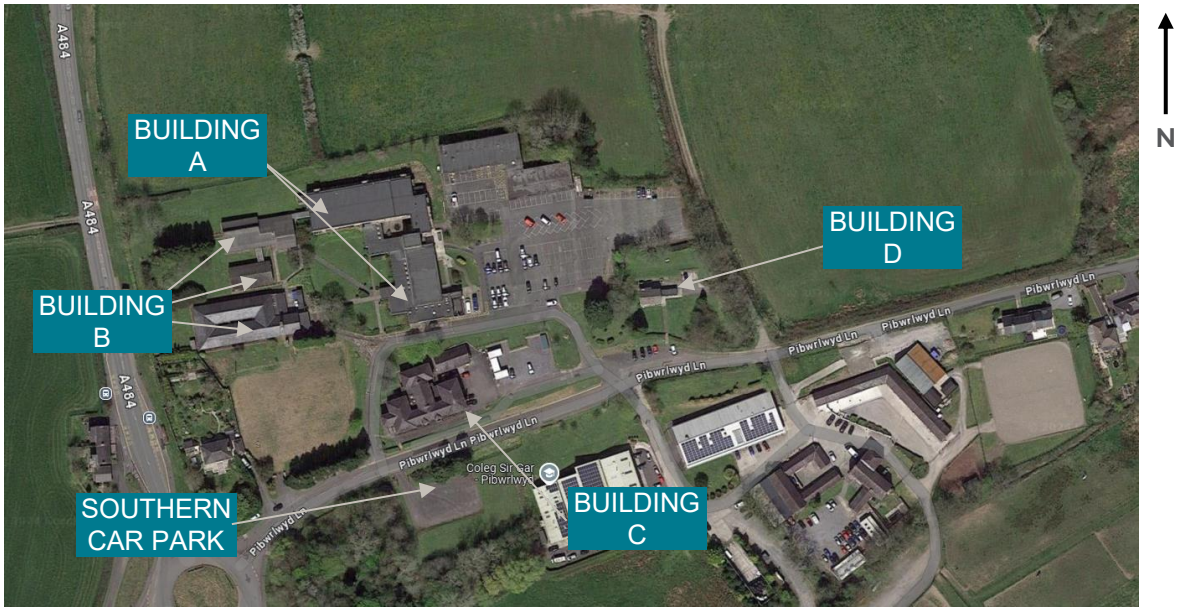


Figure 6: Existing Building Positions

All areas of the existing site are currently served by dedicated private drainage networks. In summary:

2.3.2.1 Surface Water

From the available information it has been identified that a number of dedicated surface water drainage systems serve the site:

- Building A is initially served by a dedicated 150mm diameter surface water drainage system. Survey information suggests that this conveys flows south to the southern campus surface water drainage system.
- Building B is served by a dedicated 100mm diameter surface water drainage system. Surveys of the destination of the surface water drainage system has assumed it flows west and connects to the DCWW public sewer adjacent to the A484.
- Building C and the adjacent access road are initially served by a dedicated 100mm dia. surface water drainage system, but this eventually discharges to the foul drainage making the downstream a combined drainage system. This combined system directs flows west to east outside the site boundary and eventually connects to the DCWW public sewer.
- No surface water drainage system has been identified for Building D. It is assumed surface water runoff flows across land and eventually discharges to the neighbouring blue/green corridor and/or finds its way to the highway drainage.
- No surface water drainage system has been identified for the main car park - there appears to be no formal evidence of an active drainage system and anecdotal evidence is such that runoff flows overland across the car park surface to the south. It is assumed these flows are eventually collected by the highway drainage system that serves Pibwrlwyd Lane and heads west toward the A484.

- The surface water runoff from the Southern Car Park currently flows overland to the south west corner before discharging to the woodland and flood plain beyond via a ditch with no formal outlet arrangements.

The blue/green land drainage corridor between the existing campus and the track associated with the greenfield was determined to discharge to a surface water gully which connects to the southern campus wide piped surface water drainage system. This piped surface water system discharges to a combined ditch and culverted surface water system.

The greenfield runoff is collected by a ditch running east to west along the south boundary before also discharging to the surface water gully and onwards to the south campus surface water system.

2.3.2.2 Foul Water

From the review of the available information, it has been identified that a dedicated foul water drainage system serves the site:

- Building A is primarily served by a dedicated 150mm dia. foul water drainage system. This flows south and crosses Pibwrlwyd Lane where it discharges to the DCWW public foul water sewer.
- Building B and the northwest section of Building A is served by a dedicated 100mm dia. foul water drainage system. This flows south before discharging to a site wide combined drainage system at the southeast corner of Building B. This combined drainage system flows south and crosses Pibwrlwyd Lane where it continues to flow east before eventually discharging to the DCWW foul water sewer.
- The east side of Building C is served by a foul and combined water system. The 100mm dia. foul water drainage serves the north of the building, and the 100mm dia. combined drainage system serves the south of the building. Eventually they separately discharge to the site wide combined drainage system.
- The west side of Building C is served by a dedicated 100mm dia. foul water drainage system. This flows east discharging to the foul water system that eventually discharges to the DCWW foul water sewer.
- Building D is served by a dedicated 100mm dia. foul water drainage system. This flows west discharging to the foul water system that eventually discharges to the DCWW foul water sewer.

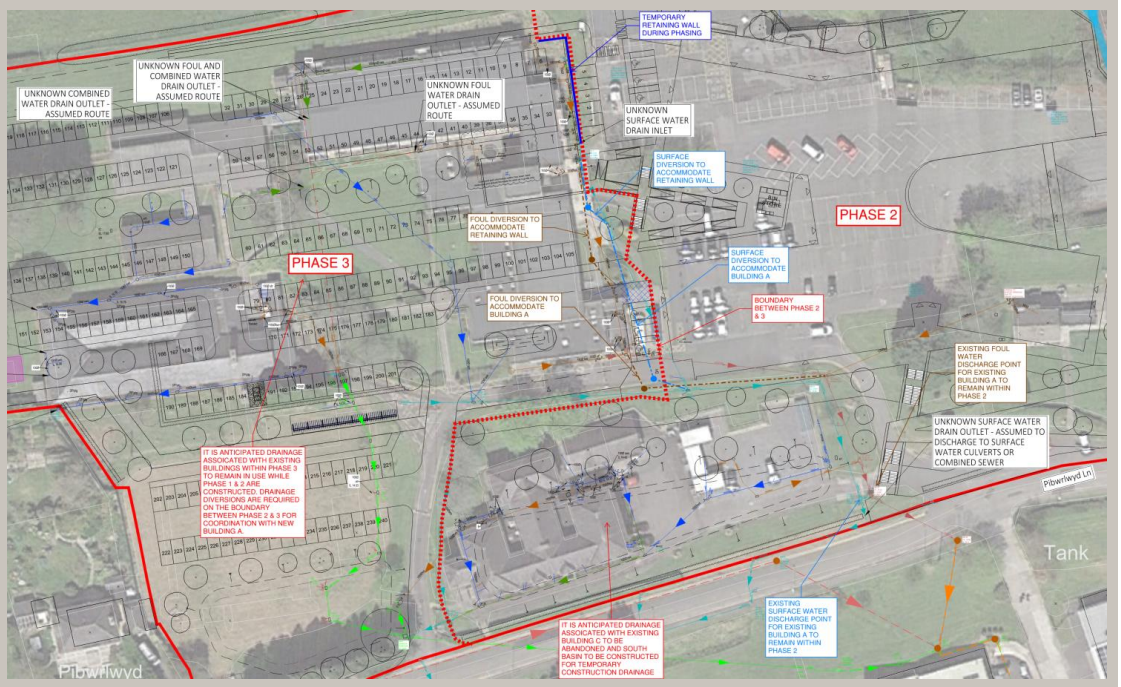
An existing drainage drawing is enclosed in Appendix A. This has been prepared to demonstrate the overall connectivity of the existing site drainage network so it might be considered where appropriate for reuse.

2.3.2.3 Demolition Phase

Demolition Phase

It has been confirmed that all buildings on site are proposed to be demolished to allow for the proposed development. The exact phasing of this is yet to be confirmed.

Once established, a review of the existing drainage will be required to determine how the phasing of existing drainage diversions, removal/grubbing up or capping off is implemented as some buildings will need to remain functioning for longer than others. Initial review of the diversion requirements of the existing drainage can be seen below.



It is anticipated that the overall majority of the existing drainage within the red line site boundary will ultimately be removed as part of the full demolition works with the exception of proposed discharge locations for the foul water and potentially some existing culverts. Any existing drainage serving and passing through Pibwrlwyd Lane will also remain.

2.3.3 Highway Drainage

Pibwrlwyd Lane is served by highway gullies. At the junction with the A484 the gullies connect to the highway drainage system that continues south adjacent to the A484. It has been identified that several gullies along Pibwrlwyd lane connect to the private drainage system which ultimately discharges to the DCWW foul sewerage system although there is evidence to suggest that this was a more recent modification to the network and that all of the road used to discharge to the highway network which heads west offsite. The gullies outside the existing track entrance to the greenfield discharge to the private drainage system through the southern campus. This piped surface water system discharges to a combined ditch and culverted surface water system.

2.4 Existing Contributing Areas and Run-Off Rates

In accordance with the statutory Sustainable Drainage Systems Standards for Wales (SDSSW) – designing, constructing, operating and maintaining surface water drainage systems:

> *G2.24 For previously developed sites, site runoff rates should be reduced to the greenfield rates wherever possible. Because the critical duration for the attenuation storage system for the proposed development will be much longer than the storm duration used for sizing pipework for the previously developed site, there is a risk that, by allowing previously developed runoff rates to occur (for a much longer duration) receiving watercourse damage and flood risk could be made considerably worse. Thus, betterment of at least 30% should be considered as a minimum requirement (this will need to be established and agreed with the drainage approving body) and strong consideration should still be given to controlling volumes of runoff to greenfield equivalents.*

2.4.1 East & West Site Areas

To determine the existing contributing areas runoff rates the full site has been divided into two parts; Eastern Site (2.24ha) & Western Site (3.01ha) split primarily by the existing ditches adjacent to the access track. The Eastern Site is predominately existing Greenfield. The Western Site is an existing brownfield site containing the existing college campus and associated buildings and car parking.

The existing greenfield run-off rates have been calculated for each part of the site using FEH data and the 'Greenfield Runoff Rate Estimation' tool from HR Wallingford. Table 2 summarises the runoff rates for each return period (1, 30, 100, & QBar). Calculations detailing the derivation of the values in the table are included in Appendix B.

Table 2: Existing Greenfield Run-Off Rates by Return Period – East & West Site Areas

Area	Qbar (l/s)	1 in 1 years (l/s)	1 in 30 years (l/s)	1 in 100 years (l/s)
Full Site (5.25ha)	55.9	49.2	99.4	121.8
East Site (2.249ha)	23.8	21	42.4	52
West Site (3.01ha)	32	28.2	57	69.8

For context, the existing brownfield run-off rates from West Site have been calculated and Table 3 summaries the runoff rates for each return period (2, 30 & 100). Calculations detailing the derivation of the values in the table are available in Appendix C.

Table 3: Existing Brownfield Run-Off Rates by Return Period – East & West Site Areas

Return Period	Runoff Rate (l/s)
1 in 2 years	230.5
1 in 30 years	470.2
1 in 100 years	577.6

2.4.2 Southern Works

Pibwrlwyd Lane Widening

The site area for work within Pibwrlwyd Lane adopted highway is circa 0.08ha which is predominately existing road, footway and grass verge. The existing brownfield run-off rates have been calculated and Table 4 summaries the runoff rates for each return period (2, 30 & 100).

Table 4: Existing Brownfield Run-Off Rates by Return Period – Pibwrlwyd Lane

Return Period	Runoff Rate (l/s)
1 in 2 years	11.2
1 in 30 years	22.8
1 in 100 years	28.0

Coach Drop Off

The site area for the coach drop off is circa 0.16ha which is predominately an existing car park and grass verge. The existing greenfield run-off rates have been calculated using FEH data and the 'Greenfield Runoff Rate Estimation' tool from HR Wallingford which resulted in a **QBar run-off rate of 1.7l/s**.

The existing brownfield run-off rates have been calculated and Table 5 summaries the runoff rates for each return period (2, 30 & 100).

Table 5: Existing Brownfield Run-Off Rates by Return Period – Coach Drop Off

Return Period	Runoff Rate (l/s)
1 in 2 years	22.4
1 in 30 years	45.6
1 in 100 years	56.0

3 Proposed Development

3.1 Development Proposals

The design brief is to redevelop the existing college campus and expand; consisting of a single massing multi-storey building to be situated on the existing college grounds and three additional single storey workshop buildings to be situated upon the undeveloped field to the east.

The proposed buildings are to be situated within both the eastern undeveloped area and in the same location as the currently existing college buildings post demolition, as such, phasing of works is to be coordinated to ensure continued operation of the existing facility during construction.

The proposed southern works of the site is to redevelop an existing car park into a coach drop off area and widen a section of Pibwrlwyd Lane.

Externally, there are various built elements present on the occupied site consisting of buildings, modular units, access roads, and car parking areas.

3.2 Foul Water Drainage

It is proposed to discharge foul water flows from Eastern Site directly to the existing DCWW foul water sewer at the south east corner. It is proposed to discharge foul flows from Western Site to the existing foul water chamber at the south of the site before continuing to discharge to the DCWW foul water sewer via the existing connection from the previous development. This will be subject to DCWW consent and approval via S106 Agreement. There are no foul flows anticipated for the Southern Works area.

All on site sewerage systems will be designed and constructed to comply with building regulations requirements with any adopted elements in accordance with the latest edition of “Sewers for Adoption” and any of the adopting authority’s (DCWW) specific requirements.

3.3 Surface Water Drainage

The aim of the surface water drainage strategy is to mimic the natural catchment processes as closely as possible and adopt the principles of water management schemes as stated in Section 2 of the Sustainable Drainage Systems Standards for Wales (SDSSW) document, 2018. Schedule 3 of the Flood and Water Management Act has been implemented by the Welsh Government which requires any development of more than 1 unit or where the construction area is greater than 100m² to comply with the SuDS Approving Bodies (SAB’s) design guidance and ministers’ standards which will require all sites to adopt SuDS in their design. The standards are listed below:

- S1 – Surface Water Runoff Destination
- S2 – Surface Water Runoff Hydraulic Control
- S3 – Water Quality
- S4 – Amenity
- S5 – Biodiversity
- S6 – Design of Drainage for Construction, Operation and Maintenance

The Standards listed will need to be met by the design to comply with the SDSSW. S1 is a hierarchy standard with standards S2-S6 being fixed.

The proposed SuDS & drainage strategy layout can be found in Appendix D.

3.3.1 S1 - Surface Water Run-off Destination

In determining a suitable methodology for disposal of surface water flows from this development, it is necessary to explore the technical options outlined under Standard S1 of the SDSSW 2018 document published by Welsh Government. This states that disposal should be made through the hierarchical approach which are, in order of preference; surface water runoff collected for use, infiltration methods, discharge to surface water body, discharge to a surface water sewer, highway sewer or another drainage system and finally discharge to a combined sewer.

Table 6 presents the discharge hierarchy considering all the available information obtained in preparation of this report.

Table 6: Surface Water runoff discharge hierarchy appraisal

Level	Destination Option	Means	Considerations
1.	Collected for Re-use	Collection, temporary storage and reuse (e.g. rainwater harvesting)	• The suitability of this option will depend on the proposed water usage of the development, if the development has low grey water demand, the collection of water for reuse would not be economical or feasible. If not maintained properly or there being periods of very low demand the rainwater harvesting system, this can lead to legionella concerns. • The team evaluated the use of rainwater harvesting and its appropriateness for implementation on the scheme and it was determined unsuitable for the scheme, refer to Rainwater Harvesting Technical Note - CR0301-HYD-01-XX-RP-N-00008 in Appendix E for further details.
2.	Infiltrates to Ground	Infiltration SuDS techniques (e.g. infiltration basin)	• Phase 2 Geo-Environmental Assessment Report determined that the site is superficial Till deposits over bedrock deposits of the Tetragraptus Beds. • Soakaway testing has been undertaken as part of a site investigation. Tests on the Western Site where the existing college buildings are located either failed or resulted in an infiltration rate of 4.36x10-6 m/s or less. Tests on the Eastern Site, the greenfield site, all failed. Tests on the Southern Works Site resulted in infiltration rates of 5.49x10-5, 6.19x10-5 & 9.16x10-5 m/s. • Based on the infiltration test results, infiltration is deemed unsuitable as a sole means of surface water discharge for the Western & Eastern Site. However, the SuDS features will be sought to be unlined where appropriate to benefit from any available infiltration capacity that will assist with interception purposes. • The infiltration results for the Southern Works Site only are deemed suitable to pursue an infiltration to ground system for the run-off destination.
3.	Discharge to surface water body	Conveyance via SuDS techniques (e.g. swale) or piped outfall	• Within the vicinity of the site is a network of existing culverted watercourse / ditch courses and associated ditches connecting the culverts. Between the Eastern and Western Site is an existing blue green corridor with two existing ditches which discharge to a culvert below Pibwrlwyd Lane and onwards to the culvert network.

			• It is proposed to discharge the Eastern Site to the existing ditch courses that will be improved before it passes below Pibwrlwyd Lane via an existing culvert network that discharges to watercourses to the south of the site that ultimately pass forward flows to the existing culvert under the A484. • It is proposed to discharge Western Site to a new culvert below Pibwrlwyd Lane near the existing junction. A new conveyance swale will pass forward flows to the existing culvert under the A484 that ultimately discharges to the river Towy via the Nant Pibwr.
4.	Discharge to surface water sewer	Piped connection	• Based on the above information, there is no need to consider discharging into a public surface water sewer system for the Western & Eastern Site. • The Pibwrlwyd Lane widening works as part of the Southern Works area is proposed to continue to discharge to the highway drainage network.
5.	Discharge to combined water sewer	Piped connection	• Based on the above information there is no need to consider discharging into a combined public sewer system

Considering the appraisal of the surface water runoff destination for the Coleg Sir Gar development, it is proposed that connections to the existing surface water bodies are to be pursued for the Western and Eastern Site, connections to the highway drainage network will continue for the Pibwrlwyd Lanes works and the coach drop off works will discharge to the ground. The above approach will potentially see the removal of a significant quantity of surface water runoff from the public sewer network (subject to further surveys to prove the existing drainage regime). This represents a significant betterment over the existing drainage regime if realised.

3.3.2 S2 - Surface Water Run-off Hydraulic Control

This standard requires surface water to be managed to prevent as far as possible any discharge from the development for rainfall events of less than 5mm and that the surface water runoff rate and volume for up to a 1 in 100-year return period should be managed to protect people, properties, and the receiving water body. Consideration is also required to the risk associated with runoff from events greater than a 1 in 100-year return period with mitigating proposals developed for the scheme.

3.3.2.1 Interception of Run-off

Interception will need to be considered under the statutory standards. Interception aims to mimic greenfield runoff conditions by preventing runoff from the majority of all small rainfall events leaving the site. This can contribute to reducing pollution load to receiving surface water bodies. Meeting the interception criterion is not expected during particularly wet periods, when permeable surfaces and subsoils are saturated, so a suggested target is that 80% compliance should be achieved during the summer and 50% in winter. Reference should be made to Table G2.1 in the Statutory Standards for Sustainable Drainage Systems 2018 document published by Welsh Government for details of interception mechanisms and their assumed compliance with the standards.

Table 7 summarises the strategy for achieving interception compliance for the scheme outlining the source of runoff and the feature that will intercept it:

Table 7: Interception Strategy Summary

Area (source of runoff)	SuDS feature (for interception compliance)
Building (roofs)	Rain garden areas / permeable paving / basins
MUGA	Permeable paving
Road	Basins
Parking bays/Car Park Aisle	Permeable paving
MEP Area	Rain gardens
Footways	Permeable Paving / rain gardens / basins
Pibwrlwyd Lane	Swale
Coach Drop Off	Infiltrates to ground

The features have been sized in order to comply with the applicable standard and the aforementioned Table G2.1. In coordination with the landscape architect these have been integrated into the site layout considering levels, access, maintenance, etc. This can be seen by the proposed SuDS & drainage strategy layout included in Appendix D.

3.3.2.2 Hydraulic Control and Storage

In order to meet the standards, this report has adopted the simple approach outlined in the statutory standards of restricting all runoff from the new build element of the development site for all return periods up to and including the 1 in 100-year event to the current QBar return period as given in Table 2 and Section 2.4.2 of this report. It is proposed each sub catchment of the site, Eastern, Western, Pibwrlwyd Lane & Coach Drop Off will have their own respective discharge rate and discharge location. The Eastern site is proposed to be restricted to a maximum discharge rate of 23.8l/s and Western Site is proposed to be restricted to a maximum discharge rate of 32l/s. The Pibwrlwyd Lane adopted highway works will continue to discharge at an unrestricted rate and the Coach Drop Off area will be infiltrate to ground.

In accordance with statutory guidelines, the development of this site should not increase flood risk elsewhere and as such, all runoff from impermeable areas on site should be contained within the site boundary for up to and including a 1 in 100-year design period storm, plus 40% climate change allowance.

East & West Site Areas

Surface water flows from the proposed development would need to be attenuated via flow control chambers to maximise on-site storage provided for surface water runoff for all rainfall events up to and including a 1 in 100-year event with 40% allowance for climate change. Given the proposed site usage and topography, storage in the form of basins and permeable paving is achievable for the site. Basins and permeable paving have been distributed throughout the site to provide attenuation nearer to source, this also prevents the requirement of a much larger single storage feature at the lowest point of the site. Each storage feature has a flow control chamber to maximise

the storage throughout the site. The basin depths have also been limited where possible with shallower features further up the site.

It is proposed to discharge surface water runoff from the development via gravity at two locations - one for each sub catchment. The Western Site is proposed to discharge via a new culvert below Pibwrlwyd Lane and swale route to the existing culvert below A484. The Eastern Site is proposed to discharge to the existing ditch within the blue green corridor at the centre of the site which eventually discharges to the culvert below A484 via an existing culvert and ditch system. Runoff rates are to be restricted to the QBar greenfield runoff rate stated in Table 2 for the development site, this will need to be agreed with the adopting SAB authority.

For the purposes of this report, storage has been modelled within InfoDrainage and the overall attenuated impermeable area for the development has been taken as 1.13ha for Eastern Site and 1.66ha for Western Site. The maximum discharge is assumed at 23.8l/s for Eastern Site and 32l/s for Western Site for all rainfall events up to and including the 100-year return period with 40% allowance for climate change. The storage required has been calculated and is summarised in Table 8 below.

Table 8: Development Storage Summary – East & West Site Areas

SuDS Feature	Approximate Area (m2)	Attenuated Discharge Rate (l/s)	Storage Provided (m3)
North East Basin	342	2.7	160
Mid East Basin 1	378	-	149
Mid East Basin 2	497	6.1	200
South East Basin 1	760	-	497
South East Basin 2	390	16.8	239
South Basin	1311	13.9	1033
South West Basin	677	15.1	515
MUGA	192	0.4	14
North East Car Park	1078	2.1	285
North West Car Park	598	1.3	139
Mid East Car Park	979	2.1	194
Mid West Car Park	601	1.3	100

Southern Works

The minor widening works to Pibwrlwyd Lane will continue to discharge to the highway drainage network. This will be at an unrestricted rate as existing, but the flows will be conveyed, intercepted and treated by swales.

The development of the coach drop off would need to be attenuated via the infiltration rate available to maximise on-site storage provided for surface water runoff for all rainfall events up to and including a 1 in 100-year event with 40% allowance for climate change. Given the proposed site usage and topography, storage in the form of an infiltration cellular storage tank is achievable for the site.

It is proposed to discharge surface water runoff from the coach drop off to the ground via infiltration. An overflow from the cellular storage tank will be provided which will discharge to the greenfield to the south using the same discharge location at the Western Site. This will need to be agreed with the adopting SAB authority.

For the purposes of this report, storage has been modelled within InfoDrainage and the overall attenuated impermeable area for the development has been taken as 0.16ha for the coach drop off. The maximum discharge is assumed at 5.49x10-5 m/s with a factor of safety of 5, as suggested by Table G1.1 in the SuDS Standards for Wales, for all rainfall events up to and including the 100-year return period with 40% allowance for climate change. The storage required has been calculated and is summarised in Table 9 below.

Table 9: Development Storage Summary – Southern Works

SuDS Feature	Approximate Area (m2)	Attenuated Discharge Rate (m/s)	Storage Provided (m3)
Cellular Storage Tank	200	5.49x10-5	191

3.3.2.3 Exceedance Flows and Flood Pathways

> *"It is inevitable that as a result of extreme rainfall the capacities of sewers, covered watercourses and other drainage systems will be exceeded on occasion. Periods of exceedance occur when the rate of surface runoff exceeds the drainage system inlet capacity, when the pipe system becomes overloaded, or when the outfall becomes restricted due to flood levels in the receiving water. Underground conveyance cannot economically or sustainably be built large enough for the most extreme events and, as a result, there will be occasions when surface water runoff will exceed the design capacity of drains. When drainage exceedance capacity is exceeded the excess water (exceedance flow) is conveyed above ground, and will travel along streets and paths, between and through buildings and across open space. Indiscriminate flooding of property can occur when this flow of water is not controlled." (CIRIA C753).*

Flood-flow pathways would be designed to convey the overland flows from rainfall events above a 1 in 100 year return period to suitable areas of open space, such as watercourses, landscaped areas, car parking areas and other hard surfaced areas in order to protect properties against flooding. Consideration should also be given to exceedance pathways from storage areas in the event of extreme rainfall or failure with allowance made to convey flows away from properties both on and off the site.

In the event of an extreme rainfall beyond the designed storm events, or poor maintenance of the surface water drainage system, flooding will occur within low points and valleys within the external areas, before re-entering the surface water network through road drainage or flowing offsite to the local watercourses once the storm subsides.

3.3.2.4 Flood Risk to People

> *"People are at risk of suffering death or serious injury when flooding occurs. People are unable to stand in deep or fast flowing floodwater. Once they are unable to stand, there is a high risk of death or serious injury. Adults are unable to stand in still floodwater with a depth of about 1.5m or greater, although this is obviously affected by the height of a person. The depth of flowing floodwater where people are unable to stand is much less. For example, some people will be at risk when the water depth is only 0.5m, if the velocity is 1m/s (about 2 mph). If the velocity increases to 2m/s (about 4 mph) some people will be unable to stand in a depth of water of only 0.3m. Most people will be unable to stand when the velocity is 2m/s and the depth is 0.6m." (Defra/ Environment Agency, FD2321/TR2).*

During the detailed design, a hydraulic model will be built to assist the design of the proposed surface water drainage networks. When an extreme storm event is simulated within the model, potential flooding locations will become evident and the flood flow pathways can be designed/defined based on the proposed layout and levels of the hard areas and landscaping. The depth and velocity of the overland flood water can be determined and then compared with *'Combinations of flood depth and velocity that cause danger to people*' in the Defra / EA Flood Risks to People publication. The velocity and depth as described above would then give a category of flood hazard and the corresponding risk to people. If the risk is deemed to be too high, then the design would require reassessment.

3.3.3 S3 - Water Quality

This standard requires treatment of surface water runoff to prevent negative impacts on the receiving water quality and/or to protect downstream drainage systems including sewers. The only exception to this standard is where drainage connects directly to a combined sewer, where the quality requirements are limited to preventing the discharge of oil and sediments to the sewer system.

The development discharges runoff to an existing culvert system, ground and highway drainage. The aim of the surface water management strategy with regards to water quality is to follow the guiding principles of the SDSSW and use simple, natural processes that promote biodiversity and long-term sustainability. As such, it employs a SuDS management train approach, providing drainage components in series.

The management trains to be used on the project will be assessed using the Simple Index Assessment (SIA) tool available publicly (http://www.ukSuDS.com/drainage-calculation-tools/water-quality-assessment-for-SuDS-developments) which is built around the principles for simple assessment outlined in CIRIA C753 to assess the levels of treatment provided by the proposals.

Planting within the SuDS features should form part of the water quality strategy. SuDS components like rain gardens, green roof, wetland, basins, swales and permeable paving provide water quality improvements by reducing sediment and contaminants from runoff either through settlement or biological breakdown of pollutants as part of their interceptor function, so only robust and tolerant species of planting should be specified. Once these species establish this will decrease the flow rate of water travelling through and filter pollutants and contaminants before entering the downstream network.

The main southern basins have the integration of a meandering low flow channels and settlement forebay to improve the management of the runoff water quality.

3.3.4 S4 - Amenity

This standard requires that the design of the surface water management system should maximise amenity benefits.

The primary amenity focus of the SuDS scheme should be to improve the health and well-being of the pupils, staff and visitors. The scheme is based on accessible natural forms that mimic natural landscapes found within the region and the vegetated bioretention planting areas are designed with locally contextual species that will encourage natural colonisation. Other key amenity benefits should include improving air quality around the development, increasing carbon sequestration, and improving water quality through removal of pollutants via the rain gardens, permeable paving and basins. The SuDS features being distributed throughout the site will help the accessibility of the nature based landscaped areas for all to enjoy enhancing the local environment.

3.3.5 S5 - Biodiversity

This standard requires that the surface water management system should maximise biodiversity benefits. The SuDS scheme's biodiversity strategy will revolve around increasing the overall biodiversity of the site and ecological value. The inclusion of plant species that will enhance the general eco system and simultaneously act as a water filtration system to clean pollutants and contaminants will be used where possible.

The plant species selected should be both locally contextual and appropriate for the varied habitat zones including primary characteristics that shall ensure:

- Good soil binding and filtration species
- Minimised erosion
- Improved filtration via dense root and stem species
- Tolerance to seasonal variations including droughts and inundations
- Good suspended solids retention
- Pollutant tolerant
- Emergent and pioneering species for natural ecological colonisation
- The creation of diverse, self-sustaining, and resilient ecosystems for high species biodiversity
- Support for local and regional habitat strategies

In general, the proposed rain garden areas, swales and basins will be the focal habitat points for the site and will enhance the site over the current site layout by adding areas of water and damp and vegetated soils. Exposed areas of the rain gardens will attract certain species and shaded areas under adjacent buildings and trees will further enhance the varied ecosystem potential.

3.3.6 S6 - Design of Drainage for Construction and Maintenance and Structural Integrity

The surface water drainage system will be designed with the overriding ethos of simplicity in construction, use and maintenance. This then allows a very simple translation from the principles described within standard S6, namely that all elements of the surface water drainage system should be designed so that they can be constructed, as well as maintained and operated "…easily, safely, cost-effectively, in a timely manner, and with the aim of minimising the use of scarce resources and embedded carbon (energy)." (SDSSW).

The proposed system will not be offered for adoption as it will serve privately owned properties, therefore the maintenance of the drainage will be managed and maintained by the estates team who will be responsible for all inspection and maintenance activities. The exception to this is the Pibwrlwyd Lane works, these will be offered for adoption as it will serve public highway, therefore the maintenance of the drainage will be managed and maintained by the local authority.

Information with regards to the construction methodology and requirements of the proposed system have been established and will be further developed as part of the detailed design stage of the project, likewise the maintenance requirements and regime of the proposed system has been developed and will be developed into the full maintenance strategy for the site during the next phase of design development. This will be developed in conjunction with the client's maintenance team, as it is not considered appropriate for these details to be developed by the design team in isolation from the end users. This will then need to be confirmed and submitted for approval to the SAB prior to construction commencing on site.

4 Statutory Approvals

4.1 Water Authority

4.1.1 Pre-Planning Advice (PPA)

A pre planning advice application was submitted to DCWW and their response can be found in Appendix F. Notably at the time of the response, DCWW concluded that flows generated by the proposed development can be accommodated within the public foul sewerage system.

4.1.2 Section Agreements

Works associated with new connections or amendments to the existing public sewer network require water authority consent. As such:

- Any connection to a public sewer is subject to confirmation of available downstream capacity and a Section 106 agreement with DCWW - the detail of which should also include any proposed changes to the existing chamber to accept new connections.
- A Section 104 agreement may also be required to any drainage that serves more than one curtilage which is unlikely required for this development but may be required as a result of future northern land parcel development and to be confirmed subject to the requirements of the client in terms of the provisions to be made in the on-site design.

Changes to the adopted Pirbwrlwyd Lane road drainage will be picked up via a S278/38 highway agreement.

4.2 SuDS Approval Body

The proposed development is subject to the Schedule 3 requirements and therefore subject to SAB approval. The role of the SAB is also to adopt SuDS features and maintain them for the lifetime of the development; although in this case the SuDS features will not be adopted by the SAB as the development will fall within the single managed curtilage.

Early engagement with the SAB is recommended to ensure feedback is taken account of at an early stage to provide confidence that an agreeable surface water drainage strategy can be adequately accounted for in the spatial planning of any development.

A SAB pre-application consultation has been made, consultation meeting held on 07/01/25. A copy of the meeting minutes are included in Appendix G and should be referred to for specific feedback ahead of making a full SAB application for which approval is required before construction can commence.

The SAB were supportive of the proposed SuDS solution with a number of points taken away which have been sought to be incorporated into the design during Stage 3. Any outstanding are to be picked up in Stage 4 ahead of a full SAB application.

5 Conclusion

It is considered that the proposed SuDS and drainage layout has been well considered based on a detailed appraisal of the existing drainage arrangements and site constraints/conditions. As part of the proposals a scheme of SuDS is proposed which will provide interception, water quality, flow reduction, amenity and biodiversity benefits in line with best practice and the applicable national standards. A gravity based foul drainage solution is also proposed. As such, it is considered that the proposed means of drainage for the proposed development do not constitute a barrier to planning permission.

Appendices

Appendix A – Existing Drainage

KEY

- SITE BOUNDARY
- IDENTIFIED WATERCOURSE/DITCH FROM MAPPING
- IDENTIFIED WATERCOURSE/DITCH FROM OS MAPS
- ASSUMED WATERCOURSE/DITCH ROUTE
- IDENTIFIED WATERCOURSE/DITCH FROM TOPO
- IDENTIFIED WATERCOURSE/DITCH FROM SITE VISIT
- ASSUMED DRAINAGE STRUCTURE BASED ON VISUAL INSPECTION
- ASSUMED FOUL WATER DRAIN ROUTE
- ASSUMED COMBINED WATER DRAIN ROUTE

EXISTING DRAINAGE KEY (FROM UTILITY SURVEY)

- SURFACE WATER DRAIN
- ASSUMED SURFACE WATER DRAIN
- FOUL WATER DRAIN
- COMBINED WATER DRAIN
- G GULLY

EXISTING DRAINAGE KEY (FROM CCTV SURVEY)

- SURFACE WATER DRAIN
- FOUL WATER DRAIN
- COMBINED WATER DRAIN

EXISTING DRAINAGE KEY (FROM SITE VISIT - VISUAL POSITIONS ONLY)

- SURFACE WATER DRAIN

EXISTING PUBLIC SEWERS KEY (FROM DCWW RECORDS)

- FOUL WATER SEWER

EXISTING PUBLIC SEWERS KEY (FROM CCTV SURVEY)

- FOUL WATER SEWER

NOTES:

1. DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT PROJECT DRAWINGS AND WITH THE HEALTH AND SAFETY INFORMATION PROVIDED AND/OR WITHIN THE PRE-CONSTRUCTION INFORMATION.
2. USE OF THIS DRAWING DOES NOT ABSOLVE THE CLIENT FROM HIS RESPONSIBILITIES UNDER THE HEALTH AND SAFETY: THE CONSTRUCTION DESIGN AND MANAGEMENT REGULATIONS 2015. THE PRINCIPAL DESIGNER IS REQUIRED TO CONTACT HYDROCK CONSULTANTS PRIOR TO PERMITTING THIS DRAWING TO BE USED IN CONNECTION WITH ANY CONSTRUCTION WORKS.
3. INFORMATION REGARDING THE LOCATION AND DEPTH OF EXISTING SERVICES CANNOT BE GUARANTEED BY THE STATUTORY UNDERTAKER.
4. THE DRAWING SHALL BE USED FOR THE INTENDED PURPOSE ONLY AND THIS DRAWING HAS BEEN BASED ON INFORMATION PROVIDED BY OTHER PARTIES AND HYDROCK DO NOT WARRANT THE ACCURACY OF THIS INFORMATION. DIMENSIONS SHALL NOT BE SCALED FROM THE DRAWING AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL DIMENSIONS AND LEVELS ON SITE FOR THE ACTUAL SETTING OUT OF THE WORKS. DIMENSIONS MARKED 'DIMENSIONS TO BE SITE CHECKED' ARE SUBJECT TO CONFIRMATION BY THE CONTRACTOR BEFORE THE WORKS COMMENCE.
5. ALL FIGURED LEVELS ARE IN METRES AND RELATED TO EXISTING SURVEY GRID & DATUM UNLESS NOTED OTHERWISE
6. ALL FIGURED DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
7. CONFLICTING INFORMATION SHOWN ON THE ENGINEER'S DRAWINGS OR DISCREPANCIES BETWEEN THE INFORMATION GIVEN BY THE ENGINEER AND THAT PROVIDED BY OTHERS MUST BE REFERRED TO THE ENGINEER BEFORE THE WORKS COMMENCE.
8. GEO MAPPING MAY BE OFFSET FROM ACTUAL POSITION.

REVISIONS

Rev.	Revision Notes	Date	Drawn By	Checked | Approved
P05	PAC Issue	19/09/25	SP	CD | CD
P04	RIBA Stage 3 (WEPCo Stage 2) Issue	25/07/25	SP	CD | CD
P03	Updated following additional site walkover	29/11/24	SP	CD | CD
P02	RIBA Stage 2 (WEPCo Stage 1) Issue	06/11/24	HS	SP | CD
P01	First Issue	01/12/23	FA	SP | CD

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e: cardiff@hydrock.com

CLIENT
WEPCO ON BEHALF OF COLEG SIR GAR

PROJECT
MIM- COLEG SIR GAR

TITLE
EXISTING CATCHMENT WIDE DRAINAGE CONNECTIVITY PLAN

HYDROCK PROJECT NO.: C-30015
SCALE @ A0: NTS
STATUS DESCRIPTION: SUITABLE FOR INFORMATION
STATUS: S2
DRAWING NO.: CR0301-STN-XX-XX-DR-C-0400
REVISION: P05

Appendix B – Greenfield Runoff Calculations

Greenfield runoff rate estimation tool

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

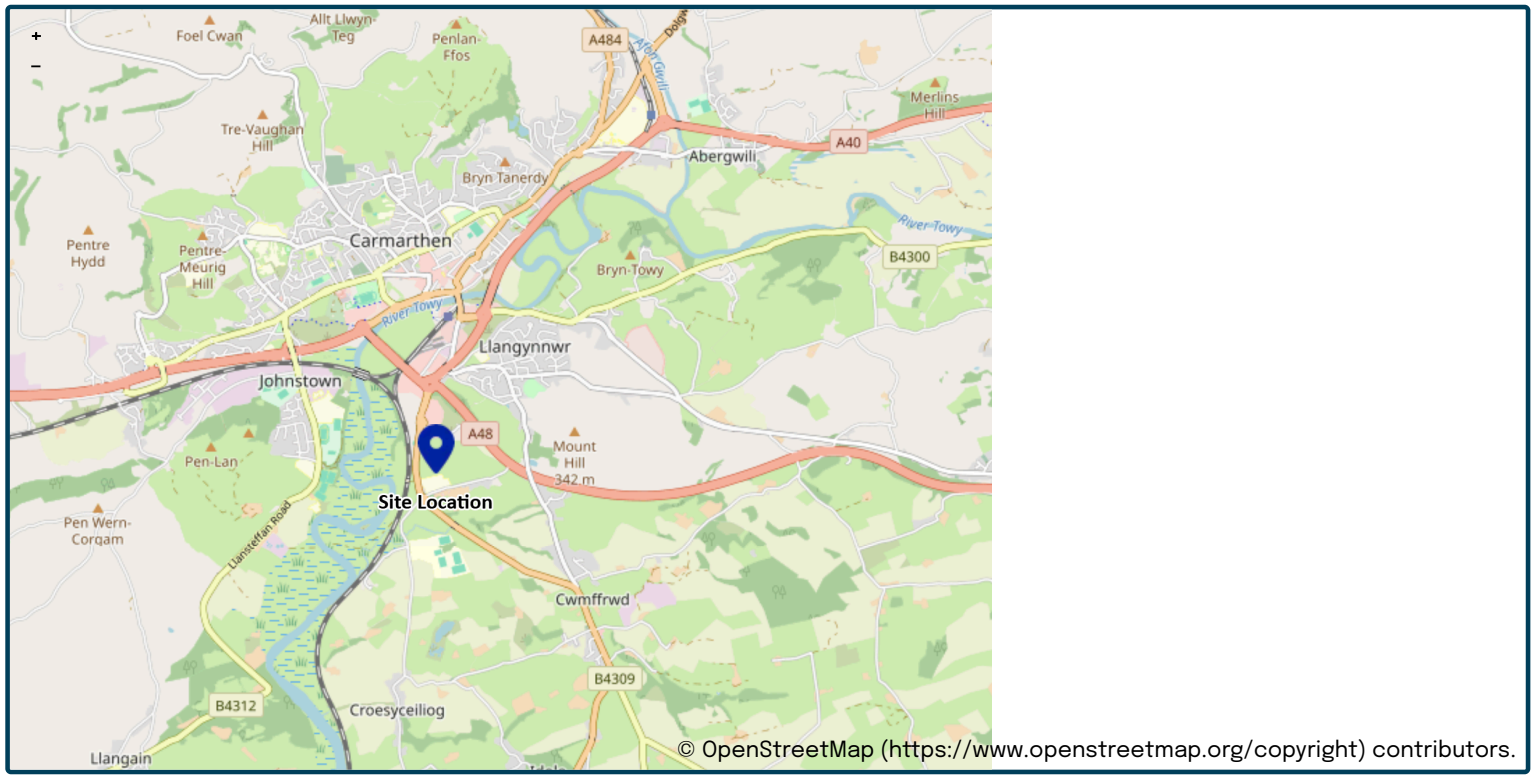
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	18/09/2025
Calculated by	SP
Reference	CSG
Model version	2.1.2

Location

Site name	CSG
Site location	Coach Drop Off



Site easting (British National Grid)	241143
Site northing (British National Grid)	218192

Site details

Total site area (ha)	0.16 ha

Greenfield runoff

Method

Method	FEH statistical

FEH statistical

	My value		Map value
SAAR (mm)	1264 mm		1303
BFIHOST	0.493		
QMed-QBar conversion	1.075		1.075
QMed (l/s)	1.58 l/s		
QBar (FEH statistical) (l/s)	1.7 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)	1.5 l/s
Flow rate 2 year (l/s)	1.6 l/s
Flow rate 10 years (l/s)	2.4 l/s
Flow rate 30 years (l/s)	3.0 l/s
Flow rate 100 years (l/s)	3.7 l/s
Flow rate 200 years (l/s)	4.2 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

Greenfield runoff rate estimation tool

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

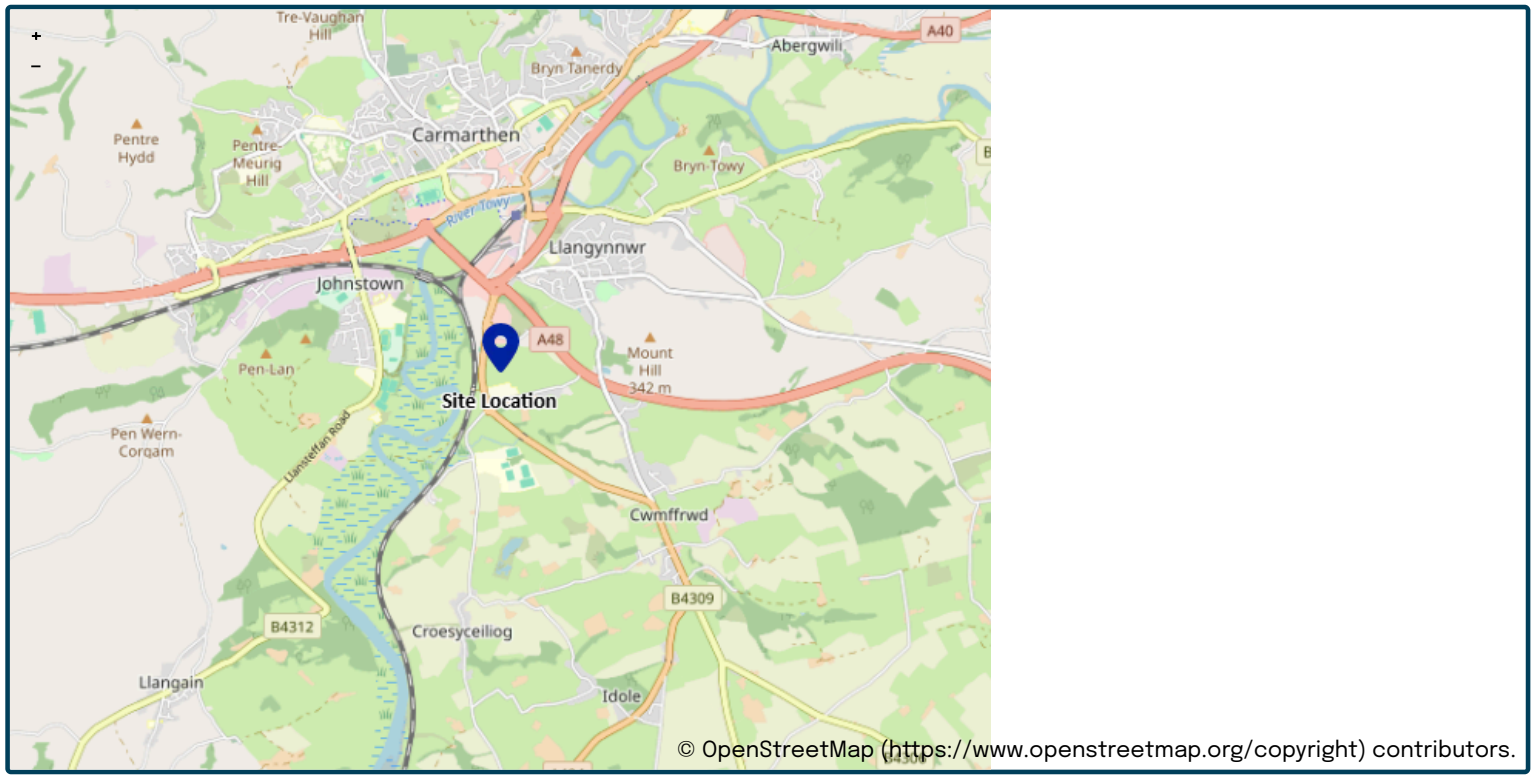
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). 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	01/07/2025
Calculated by	SP
Reference	Coleg Slr Gar
Model version	2.0.1

Location

Site name	Coleg Sir Gar - East Site
Site location	Carmarthen



Site easting	241115
Site northing	218272

Site details

Total site area (ha)	2.24 ha

Greenfield runoff

Method

Method	FEH statistical

FEH statistical

	My value		Map value
SAAR (mm)	1264 mm		1303
BFIHOST	0.493		
QMed-QBar conversion	1.075		1.075
QMed (l/s)	22.2 l/s		
QBar (FEH statistical) (l/s)	23.8 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)	21 l/s
Flow rate 2 year (l/s)	22.2 l/s
Flow rate 10 years (l/s)	33.8 l/s
Flow rate 30 years (l/s)	42.4 l/s
Flow rate 100 years (l/s)	52 l/s
Flow rate 200 years (l/s)	58.6 l/s

Disclaimer

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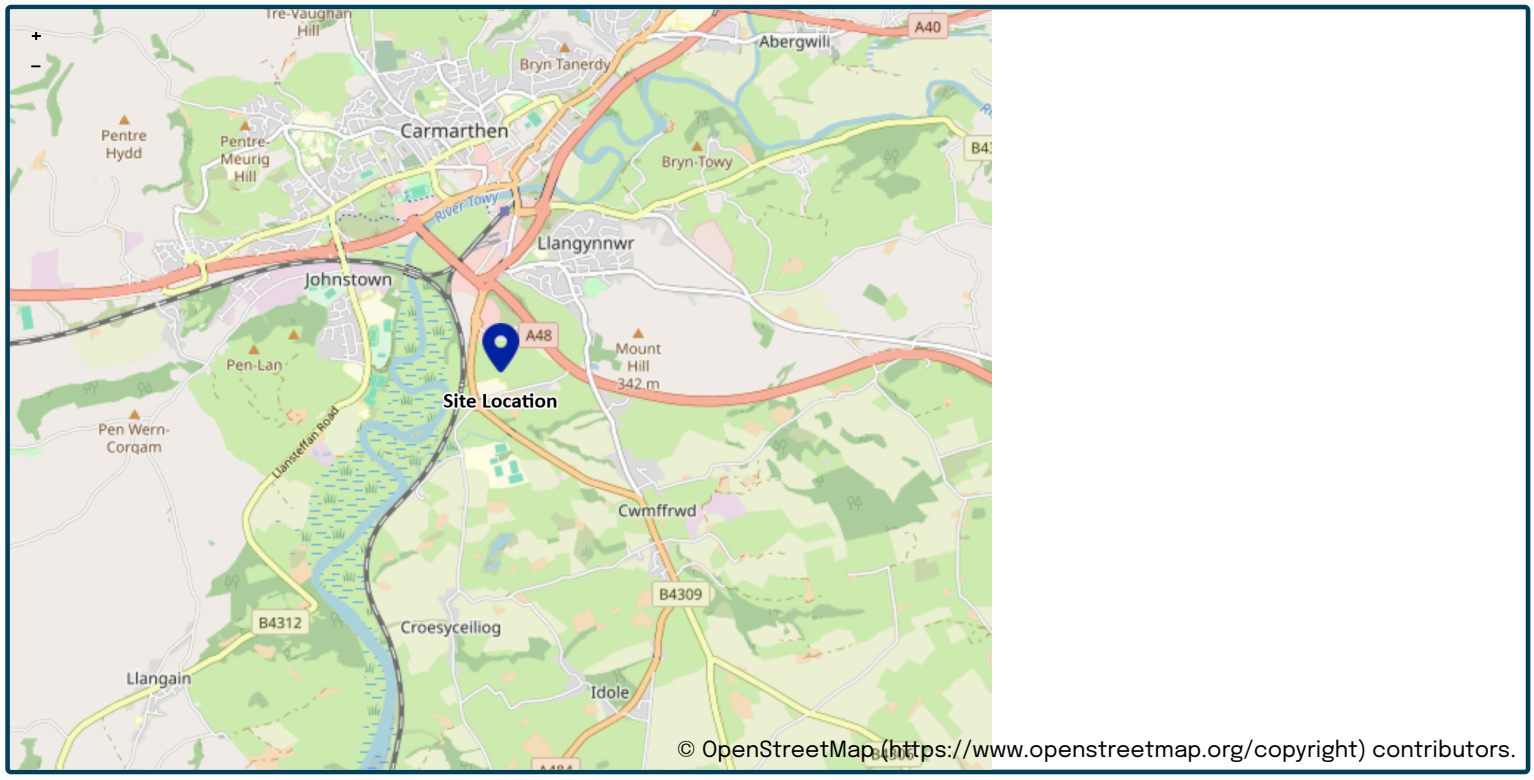
Project details

Date	18/09/2025
Calculated by	
Reference	
Model version	2.1.2

Location

Site name	CSG
Site location	Pibwrlwyd Lane



Site easting (British National Grid)	241214
Site northing (British National Grid)	218238

Site details

Total site area (ha)	0.08 ha

Greenfield runoff

Method

Method	FEH statistical

FEH statistical

	My value		Map value
SAAR (mm)	1264 mm		1303
BFIHOST	0.493		
QMed-QBar conversion	1.075		1.075
QMed (l/s)	0.79 l/s		
QBar (FEH statistical) (l/s)	0.85 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)	0.7 l/s
Flow rate 2 year (l/s)	0.8 l/s
Flow rate 10 years (l/s)	1.2 l/s
Flow rate 30 years (l/s)	1.5 l/s
Flow rate 100 years (l/s)	1.9 l/s
Flow rate 200 years (l/s)	2.1 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

Greenfield runoff rate estimation tool

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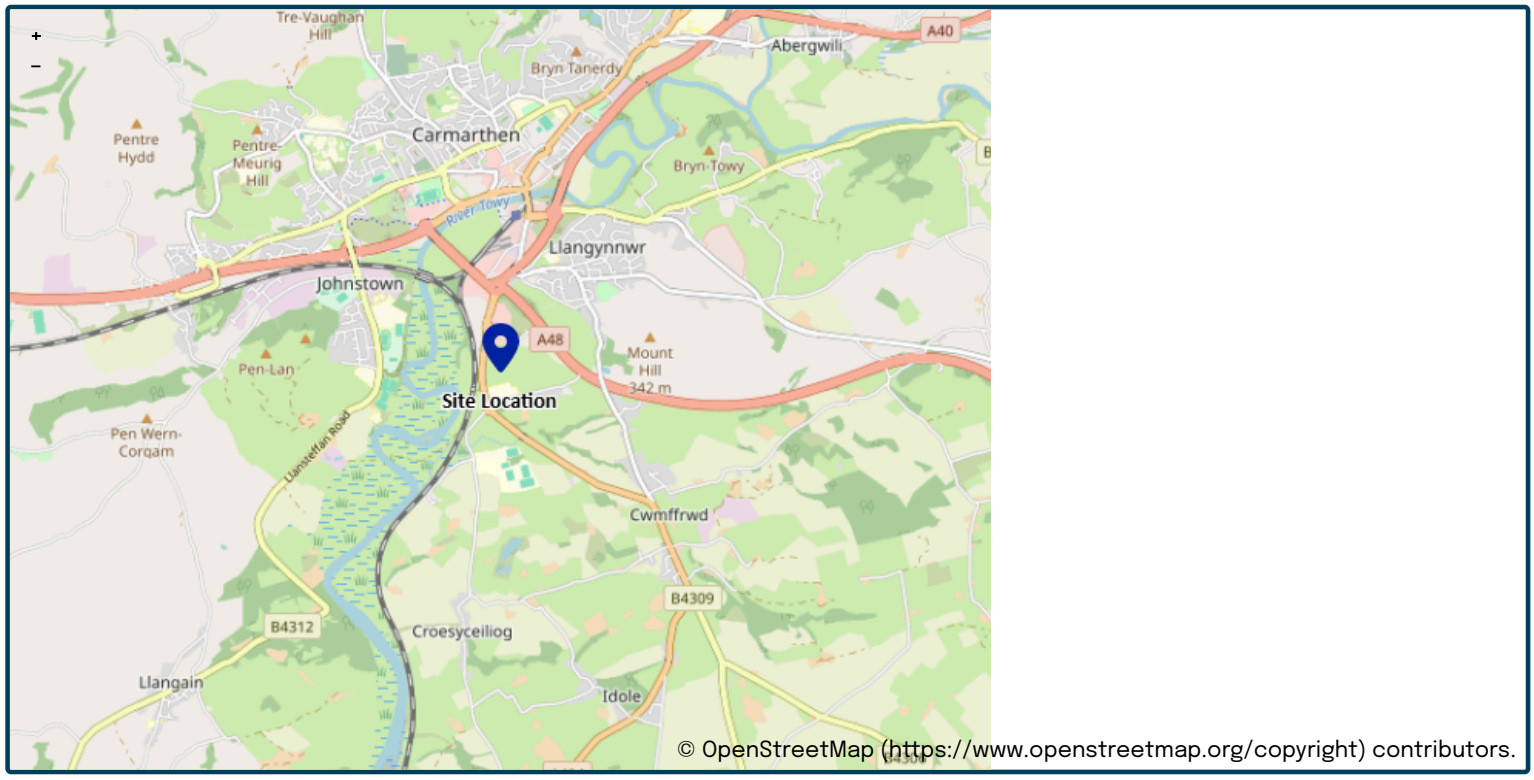
Project details

Date	01/07/2025
Calculated by	SP
Reference	Coleg Slr Gar
Model version	2.0.1

Location

Site name	Coleg Sir Gar - West Site
Site location	Carmarthen



Site easting	241115
Site northing	218272

Site details

Total site area (ha)	3.01 ha

Greenfield runoff

Method

Method	FEH statistical

FEH statistical

	My value		Map value
SAAR (mm)	1264 mm		1303
BFIHOST	0.493		
QMed-QBar conversion	1.075		1.075
QMed (l/s)	29.8 l/s		
QBar (FEH statistical) (l/s)	32 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)	28.2 l/s
Flow rate 2 year (l/s)	29.8 l/s
Flow rate 10 years (l/s)	45.5 l/s
Flow rate 30 years (l/s)	57 l/s
Flow rate 100 years (l/s)	69.8 l/s
Flow rate 200 years (l/s)	78.8 l/s

Disclaimer

Project:	Date:		
Coleg Sir Gar Existing Brownfield Runoff	04/11/2024		
	Designed by:	Checked by:	Approved By:
	SP	CD	CD
Report Details: Type: Inflow Summary Storm Phase: Phase	Company Address: Hydrock now Stantec		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area (1)	Manhole		Time of Concentration	0.046	100	0	100	0.046
Catchment Area (3)	Manhole		Time of Concentration	0.055	100	0	100	0.055
Catchment Area (5)	Manhole (1)		Time of Concentration	0.060	100	0	100	0.060
Catchment Area (7)	Manhole (5)		Time of Concentration	0.028	100	0	100	0.028
Catchment Area (9)	Manhole (2)		Time of Concentration	0.026	100	0	100	0.026
Catchment Area (11)	Manhole (2)		Time of Concentration	0.270	100	0	100	0.270
Catchment Area (13)	Manhole (2)		Time of Concentration	0.016	100	0	100	0.016
Catchment Area (15)	Manhole (3)		Time of Concentration	0.047	100	0	100	0.047
Catchment Area (17)	Manhole (3)		Time of Concentration	0.207	100	0	100	0.207
Catchment Area (19)	Manhole (4)		Time of Concentration	0.482	100	0	100	0.482
TOTAL		**0.0**		**1.238**				**1.238**

Project:	Date:		
Coleg Sir Gar Existing Brownfield Runoff	04/11/2024		
	Designed by: SP	Checked by: CD	Approved By: CD
Report Title: Rainfall Analysis Criteria	Company Address: Hydrock now Stantec		

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	☐

Project:	Date:		
Coleg Sir Gar Existing Brownfield Runoff	04/11/2024		
	Designed by:	Checked by:	Approved By:
	SP	CD	CD
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Hydrock now Stantec		

FEH: 2 years: Increase Rainfall (%): +0: 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
Manhole	FEH: 2 years: +0 %: 15 mins: Summer	17.010	16.310	16.310	0.000	18.9	0.000	0.000	18.9	8.532	OK
Manhole (1)	FEH: 2 years: +0 %: 15 mins: Summer	16.420	15.720	15.720	0.000	11.1	0.000	0.000	11.1	5.019	OK
Manhole (2)	FEH: 2 years: +0 %: 15 mins: Summer	15.540	12.660	12.660	0.000	58.0	0.000	0.000	58.0	26.145	OK
Manhole (3)	FEH: 2 years: +0 %: 15 mins: Summer	13.420	12.400	12.400	0.000	47.4	0.000	0.000	47.5	21.378	OK
Manhole (4)	FEH: 2 years: +0 %: 15 mins: Summer	12.910	11.920	11.920	0.000	89.7	0.000	0.000	89.7	40.422	OK
Manhole (5)	FEH: 2 years: +0 %: 15 mins: Summer	18.500	17.500	17.500	0.000	5.3	0.000	0.000	5.3	2.376	OK

Project:	Date:		
Coleg Sir Gar Existing Brownfield Runoff	04/11/2024		
	Designed by:	Checked by:	Approved By:
	SP	CD	CD
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Hydrock now Stantec		

FEH: 30 years: Increase Rainfall (%): +0: 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
Manhole	FEH: 30 years: +0 %: 15 mins: Summer	17.010	16.310	16.310	0.000	38.6	0.000	0.000	38.6	17.406	OK
Manhole (1)	FEH: 30 years: +0 %: 15 mins: Summer	16.420	15.720	15.720	0.000	22.7	0.000	0.000	22.7	10.245	OK
Manhole (2)	FEH: 30 years: +0 %: 15 mins: Summer	15.540	12.660	12.660	0.000	118.3	0.000	0.000	118.4	53.325	OK
Manhole (3)	FEH: 30 years: +0 %: 15 mins: Summer	13.420	12.400	12.400	0.000	96.8	0.000	0.000	96.8	43.608	OK
Manhole (4)	FEH: 30 years: +0 %: 15 mins: Summer	12.910	11.920	11.920	0.000	183.0	0.000	0.000	183.0	82.452	OK
Manhole (5)	FEH: 30 years: +0 %: 15 mins: Summer	18.500	17.500	17.500	0.000	10.7	0.000	0.000	10.7	4.839	OK

Project:	Date:		
Coleg Sir Gar Existing Brownfield Runoff	04/11/2024		
	Designed by:	Checked by:	Approved By:
	SP	CD	CD
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Hydrock now Stantec		

FEH: 100 years: Increase Rainfall (%): +0: 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
Manhole	FEH: 100 years: +0 %: 15 mins: Summer	17.010	16.310	16.310	0.000	47.4	0.000	0.000	47.4	21.381	OK
Manhole (1)	FEH: 100 years: +0 %: 15 mins: Summer	16.420	15.720	15.720	0.000	27.9	0.000	0.000	27.9	12.585	OK
Manhole (2)	FEH: 100 years: +0 %: 15 mins: Summer	15.540	12.660	12.660	0.000	145.3	0.000	0.000	145.4	65.499	OK
Manhole (3)	FEH: 100 years: +0 %: 15 mins: Summer	13.420	12.400	12.400	0.000	118.8	0.000	0.000	118.9	53.562	OK
Manhole (4)	FEH: 100 years: +0 %: 15 mins: Summer	12.910	11.920	11.920	0.000	224.7	0.000	0.000	224.8	101.277	OK
Manhole (5)	FEH: 100 years: +0 %: 15 mins: Summer	18.500	17.500	17.500	0.000	13.2	0.000	0.000	13.2	5.946	OK

Project:	Date:		
Coleg Sir Gar Existing Brownfield Runoff	04/11/2024		
	Designed by:	Checked by:	Approved By:
	SP	CD	CD
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Hydrock now Stantec		

FEH: 100 years: Increase Rainfall (%): +40: 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
Manhole	FEH: 100 years: +40 %: 15 mins: Summer	17.010	16.310	16.310	0.000	66.4	0.000	0.000	66.4	29.922	OK
Manhole (1)	FEH: 100 years: +40 %: 15 mins: Summer	16.420	15.720	15.720	0.000	39.1	0.000	0.000	39.1	17.613	OK
Manhole (2)	FEH: 100 years: +40 %: 15 mins: Summer	15.540	12.660	12.660	0.000	203.5	0.000	0.000	203.5	91.689	OK
Manhole (3)	FEH: 100 years: +40 %: 15 mins: Summer	13.420	12.400	12.400	0.000	166.4	0.000	0.000	166.4	74.991	OK
Manhole (4)	FEH: 100 years: +40 %: 15 mins: Summer	12.910	11.920	11.920	0.000	314.6	0.000	0.000	314.7	141.783	OK
Manhole (5)	FEH: 100 years: +40 %: 15 mins: Summer	18.500	17.500	17.500	0.000	18.5	0.000	0.000	18.5	8.319	OK

Project:	Date:		
Coleg Sir Gar Southern Works Existing Brownfield Runoff	18/09/2025		
	Designed by: SP	Checked by:	Approved By:
Report Details: Type: Inflow Summary Storm Phase: Phase	Company Address: Stantec		

Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Coach Drop Off	Coach Drop Off		Time of Concentration	0.16	100	0	100	0.16
Pibwrlwyd Lane	Pibwrlwyd Lane		Time of Concentration	0.08	100	0	100	0.08
TOTAL		**0.0**		**0.24**				**0.24**

Project:	Date:		
Coleg Sir Gar Southern Works Existing Brownfield Runoff	18/09/2025		
	Designed by:	Checked by:	Approved By:
	SP		
Report Details: Type: Network Design Criteria Storm Phase: Phase	Company Address: Stantec		

Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	500.00
Max. Slope (1:X)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	☐
Reduce Channel Depths	☐

Manhole Options

Apply Offset	☐

Project:	Date:		
Coleg Sir Gar Southern Works Existing Brownfield Runoff	18/09/2025		
	Designed by:	Checked by:	Approved By:
	SP		
Report Title:	Company Address:		
Rainfall Analysis Criteria	Stantec		

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

FEH

Type: FEH

Site Location	GB 241246 218309 SN 41246 18309
Rainfall Version	2022
Summer	☑
Winter	☑

Return Period

Return Period (years)	Increase Rainfall (%)
2.0	0.000
30.0	0.000
100.0	0.000
100.0	40.000

Storm Durations

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

Project:	Date:		
Coleg Sir Gar Southern Works Existing Brownfield Runoff	18/09/2025		
	Designed by: SP	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Stantec		

FEH: 2 years: Increase Rainfall (%): +0: 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
Pibwrlwyd Lane	FEH: 2 years: +0 %: 15 mins: Summer	10.000	8.000	8.000	0.000	11.2	0.000	0.000	11.2	5.034	OK
Coach Drop Off	FEH: 2 years: +0 %: 15 mins: Summer	10.000	8.000	8.000	0.000	22.3	0.000	0.000	22.4	10.071	OK

Project:	Date:		
Coleg Sir Gar Southern Works Existing Brownfield Runoff	18/09/2025		
	Designed by: SP	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Stantec		

FEH: 30 years: Increase Rainfall (%): +0: 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
Pibwrlwyd Lane	FEH: 30 years: +0 %: 15 mins: Summer	10.000	8.000	8.000	0.000	22.8	0.000	0.000	22.8	10.269	OK
Coach Drop Off	FEH: 30 years: +0 %: 15 mins: Summer	10.000	8.000	8.000	0.000	45.6	0.000	0.000	45.6	20.541	OK

Project:	Date:		
Coleg Sir Gar Southern Works Existing Brownfield Runoff	18/09/2025		
	Designed by: SP	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Stantec		

FEH: 100 years: Increase Rainfall (%): +0: 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
Pibwrlwyd Lane	FEH: 100 years: +0 %: 15 mins: Summer	10.000	8.000	8.000	0.000	28.0	0.000	0.000	28.0	12.615	OK
Coach Drop Off	FEH: 100 years: +0 %: 15 mins: Summer	10.000	8.000	8.000	0.000	56.0	0.000	0.000	56.0	25.233	OK

Project:	Date:		
Coleg Sir Gar Southern Works Existing Brownfield Runoff	18/09/2025		
	Designed by: SP	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address: Stantec		

FEH: 100 years: Increase Rainfall (%): +40: 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
Pibwrlwyd Lane	FEH: 100 years: +40 %: 15 mins: Summer	10.000	8.000	8.000	0.000	39.2	0.000	0.000	39.2	17.664	OK
Coach Drop Off	FEH: 100 years: +40 %: 15 mins: Summer	10.000	8.000	8.000	0.000	78.4	0.000	0.000	78.4	35.325	OK

Appendix C – Brownfield Runoff Calcuations

Appendix D – Drainage Strategy

KEY
EAST SITE BOUNDARY
WEST SITE BOUNDARY
PLANNING BOUNDARY
PROPOSED
SURFACE WATER DRAIN
SURFACE WATER PERFORATED DRAIN
SURFACE WATER LINEAR DRAIN
SURFACE WATER MANHOLE (WITH 300mm CATCHPIT)
SURFACE WATER INSPECTION CHAMBER (WITH 300mm CATCHPIT)
SURFACE WATER FLOW CONTROL CHAMBER (WITH 300mm CATCHPIT)
SURFACE WATER VEGETATED HEADWALL (VHW) / HEAD WALL (HW)
SURFACE WATER RODDING EYE
SURFACE WATER BACK DROP
PERMAVOID DISTRIBUTION CELLS
RAIN GARDEN
PERMEABLE SURFACING
EXTENT OF PERMEABLE PAVING SUBBASE
BASIN
STONE STORAGE LAYER
FILTER TRENCH
INDICATIVE PROPOSED ROUTE OF EXISTING DITCHES
ACO LINEAR DRAIN - ACCESS UNIT
ACO LINEAR DRAIN - SUMP UNIT
ACO LINEAR DRAIN - DOWNPIPE CONNECTER
ROAD GULLY
LOW FLOW SWALE
RENO MATTRESS OR STONE EROSION PROTECTION
INDICATIVE SWALE ROUTE
FOUL WATER DRAIN
FOUL WATER MANHOLE
FOUL WATER INSPECTION CHAMBER
FOUL WATER SOIL CONNECTION
FOUL WATER YARD GULLY
FOUL WATER GULLY
FOUL WATER BACK DROP
RE-ROUTED DITCH COURSE
EXISTING
BLUE/GREEN CORRIDOR
IDENTIFIED WATERCOURSE/DITCH FROM MAPPING
SURFACE WATER DRAIN
SURFACE WATER GULLY
DCWW FOUL WATER SEWER
DCWW FOUL WATER MANHOLE
FOUL WATER DRAIN
FOUL WATER MANHOLE
OS NORTH
SEE INSET
WEST SITE DISCHARGE LOCATIONS
1. SOUTH BASIN DISCHARGE
DISCHARGES TO THE WEST SITE SURFACE WATER CONVEYANCE NETWORK TO DISCHARGE POINT.
2. SOUTH WEST BASIN DISCHARGE
DISCHARGES TO THE WEST SITE SURFACE WATER CONVEYANCE NETWORK TO DISCHARGE POINT.
3. TOTAL WEST SITE DISCHARGE
THE PROPOSED DISCHARGE FROM LOCATION 1 & 2 IS TO THE WEST SITE SURFACE WATER CONVEYANCE NETWORK AT A TOTAL DISCHARGE RATE RESTRICTED TO GREENFIELD Qbar RATE = 32l/s.
THIS SURFACE WATER CONVEYANCE NETWORK IS TO DISCHARGE TO A NEW CULVERT UNDER PIBWRLWYD LANE. THIS NEW CULVERT IS TO DISCHARGE TO A NEW CONVEYANCE SWALE TO THE REAR OF THE EXISTING CAR PARK. THIS NEW SWALE IS TO DISPERSE THE RESTRICTED FLOW TO THE GREENFIELD TO FIND A NATURAL ROUTE TO THE EXISTING CULVERT UNDER THE A484 WHICH ULTIMATELY ALLOWS FLOWS TO DISCHARGE TO THE RIVER. THIS NATURAL DISPERSAL METHOD WAS ADVISED BY SAB DURING THE SAB PRE-APPLICATION PROCESS.
EROSION/SCOUR PROTECTION TO BANK - RENO MATTRESS OR SIMILAR
FLOW CONTROL CHAMBER RESTRICTED DISCHARGE TO 15.1l/s FOR ALL STORMS UP TO AND INCLUDING 1 IN 100 YEAR + 40%
FLOW CONTROL CHAMBER RESTRICTED DISCHARGE TO 2.1l/s FOR ALL STORMS UP TO AND INCLUDING 1 IN 100 YEAR + 40%
FLOW CONTROL CHAMBER RESTRICTED DISCHARGE TO 1.3l/s FOR ALL STORMS UP TO AND INCLUDING 1 IN 100 YEAR + 40%
FLOW CONTROL CHAMBER RESTRICTED DISCHARGE TO 0.4l/s FOR ALL STORMS UP TO AND INCLUDING 1 IN 100 YEAR + 40%
FLOW CONTROL CHAMBER RESTRICTED DISCHARGE TO 2.7l/s FOR ALL STORMS UP TO AND INCLUDING 1 IN 100 YEAR + 40%
FLOW CONTROL CHAMBER RESTRICTED DISCHARGE TO 6.1l/s FOR ALL STORMS UP TO AND INCLUDING 1 IN 100 YEAR + 40%
PERMEABLE PAVING FOR INTERCEPTION & WATER QUALITY BENEFITS
PERMEABLE SURFACING FOR INTERCEPTION & WATER QUALITY BENEFITS
RAIN GARDEN FOR INTERCEPTION, WATER QUALITY, BIODIVERSITY & AMENITY BENEFITS
EXISTING BLUE GREEN CORRIDOR WITH ASSOCIATED DRAINAGE DITCHES TO BE MAINTAINED. ROUTE TO BE CONFIRMED AND COORDINATED WITH LANDSCAPE. CULVERTING TO BE LIMITED TO ABSOLUTE MINIMUM. ORDINARY WATERCOURSE CHANGES ARE SUBJECT TO CONSENT & APPROVAL BY CCC.
NORTH EAST BASIN 750mm DEEP BASIN IL: 24.500 VEGETATED HEADWALL INLET AND OUTLETS WITH RENO MATTRESS OR STONE EROSION PROTECTION (APPROX 2m²) PROVIDES INTERCEPTION, WATER QUALITY, ATTENUATION, BIODIVERSITY & AMENITY BENEFITS
FC04 - HYDROBRAKE FLOW CONTROL CHAMBER CL: 14.404 IL: 12.958 H: 0.79m Q: 13.9l/s
SOUTH WEST BASIN 1000mm DEEP BASIN IL:12.000 VEGETATED HEADWALL INLET AND OUTLETS WITH RENO MATTRESS OR STONE EROSION PROTECTION (APPROX 2m²) SETTLEMENT FOREBAY 10% OF BASIN BASE AREA (0.3m DEEP WITH 1:3 BANKS) AT VHW16, 17 & 19 HEADWALLS TO BE INCLUDED PROVIDES INTERCEPTION, WATER QUALITY, ATTENUATION, BIODIVERSITY & AMENITY BENEFITS.
SOUTH BASIN 1000mm DEEP BASIN IL:13.000 VEGETATED HEADWALL INLET AND OUTLETS WITH RENO MATTRESS OR STONE EROSION PROTECTION (APPROX 2m²) SETTLEMENT FOREBAY 10% OF BASIN BASE AREA (0.3m DEEP WITH 1:3 BANKS) AT VHW12, 13 & 14 HEADWALLS TO BE INCLUDED PROVIDES INTERCEPTION, WATER QUALITY, ATTENUATION, BIODIVERSITY & AMENITY BENEFITS.
REFER TO DRAWING CR0301-STN-XX-XX-DR-C-6000 FOR SOUTHERN WORKS DRAINAGE STRATEGY
EXISTING FOUL CHAMBER TO BE RETAINED. FOOTWAY TO BE ADJUSTED TO SUIT LOCATION OR CHAMBER LID RELOCATED TO SUIT.
EXISTING GULLY SERVING THE EXISTING DITCH TO BE REPLACED WITH A NEW MANHOLE. RE-PROFILED DITCH TO CONNECT TO NEW MANHOLE.
EXISTING DRAINAGE TO BE UPSIZED IF REQUIRED
SN41183201 CL:13.92 IL:12.11

GENERAL NOTES:

1. DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT PROJECT DRAWINGS AND WITH THE HEALTH AND SAFETY INFORMATION PROVIDED AND/OR WITHIN THE PRE-CONSTRUCTION INFORMATION.
2. USE OF THIS DRAWING DOES NOT ABSOLVE THE CLIENT FROM HIS RESPONSIBILITIES UNDER THE HEALTH AND SAFETY: THE CONSTRUCTION DESIGN AND MANAGEMENT REGULATIONS 2015. THE PRINCIPAL DESIGNER IS REQUIRED TO CONTACT STANTEC CONSULTANTS PRIOR TO PERMITTING THIS DRAWING TO BE USED IN CONNECTION WITH ANY CONSTRUCTION WORKS.
3. BEFORE COMMENCEMENT OF ANY WORKS ASSOCIATED WITH THE DRAWING REFER TO ALL RELEVANT HEALTH AND SAFETY INFORMATION FOR THE WORKS INCLUDING RESIDUAL RISK INFORMATION.
4. THE CONTRACTOR SHOULD COMPLY WITH HS(G) 47 "AVOIDING DANGER FROM UNDERGROUND SERVICES" WHEN PLANNING, LOCATING AND EXCAVATING AROUND EXISTING SERVICES. IT IS KNOWN THAT EXISTING UTILITY COMPANY UNDERGROUND SERVICES AND APPARATUS ARE PRESENT WITHIN THE PROPOSED WORKS AREA AND IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE EXISTING SERVICES ON SITE ACCURATELY.
5. INFORMATION REGARDING THE LOCATION AND DEPTH OF EXISTING SERVICES CANNOT BE GUARANTEED BY THE STATUTORY UNDERTAKER.
6. THE DRAWING SHALL BE USED FOR THE INTENDED PURPOSE ONLY AND THIS DRAWING HAS BEEN BASED ON INFORMATION PROVIDED BY OTHER PARTIES AND STANTEC DO NOT WARRANT THE ACCURACY OF THIS INFORMATION. DIMENSIONS SHALL NOT BE SCALED FROM THE DRAWING.
7. ALL FIGURED LEVELS ARE IN METRES AND RELATED TO EXISTING SURVEY GRID & DATUM UNLESS NOTED OTHERWISE
8. ALL FIGURED DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
9. CONFLICTING INFORMATION SHOWN ON THE ENGINEER'S DRAWINGS OR DISCREPANCIES BETWEEN THE INFORMATION GIVEN BY THE ENGINEER AND THAT PROVIDED BY OTHERS MUST BE REFERRED TO THE ENGINEER BEFORE THE WORKS COMMENCE.

DO NOT SCALE

REVISIONS

Rev.	Revision Notes	Date	Drawn By	Checked | Approved
P01	PAC ISSUE	19/09/25	SP	CD | RB

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CLIENT
WEPCo ON BEHALF OF COLEG SIR GAR

PROJECT
MIM - COLEG SIR GAR

TITLE
DRAINAGE STRATEGY
SHEET 1

HYDROCK PROJECT NO.
C-30015

SCALE @ A1
1:500

STATUS DESCRIPTION
SUITABLE FOR INFORMATION

STATUS
S2

DRAWING NO.
CR0301-STN-XX-XX-DR-C-4000

REVISION
P01


KEY
EAST SITE BOUNDARY
WEST SITE BOUNDARY
PLANNING BOUNDARY
PROPOSED
SURFACE WATER DRAIN
SURFACE WATER PERFORATED DRAIN
SURFACE WATER LINEAR DRAIN
SURFACE WATER MANHOLE (WITH 300mm CATCHPIT)
SURFACE WATER INSPECTION CHAMBER (WITH 300mm CATCHPIT)
SURFACE WATER FLOW CONTROL CHAMBER (WITH 300mm CATCHPIT)
SURFACE WATER VEGETATED HEADWALL (VHW) / HEAD WALL (HW)
SURFACE WATER RODDING EYE
SURFACE WATER BACK DROP
PERMAVOID DISTRIBUTION CELLS
RAIN GARDEN
PERMEABLE SURFACING
EXTENT OF PERMEABLE PAVING SUBBASE
BASIN
STONE STORAGE LAYER
FILTER TRENCH
INDICATIVE PROPOSED ROUTE OF EXISTING DITCHES
ACO LINEAR DRAIN - ACCESS UNIT
ACO LINEAR DRAIN - SUMP UNIT
ACO LINEAR DRAIN - DOWNPIPE CONNECTER
ROAD GULLY
LOW FLOW SWALE
RENO MATTRESS OR STONE EROSION PROTECTION
INDICATIVE SWALE ROUTE
FOUL WATER DRAIN
FOUL WATER MANHOLE
FOUL WATER INSPECTION CHAMBER
FOUL WATER SOIL CONNECTION
FOUL WATER YARD GULLY
FOUL WATER GULLY
FOUL WATER BACK DROP
RE-ROUTED DITCH COURSE
EXISTING
BLUE/GREEN CORRIDOR
IDENTIFIED WATERCOURSE/DITCH FROM MAPPING
SURFACE WATER DRAIN
SURFACE WATER GULLY
DCWW FOUL WATER SEWER
DCWW FOUL WATER MANHOLE
FOUL WATER DRAIN
FOUL WATER MANHOLE
OS NORTH
EXISTING BLUE GREEN CORRIDOR WITH ASSOCIATED DRAINAGE DITCHES TO BE MAINTAINED. ROUTE TO BE CONFIRMED AND COORDINATED WITH LANDSCAPE. CULVERTING TO BE LIMITED TO ABSOLUTE MINIMUM. ORDINARY WATERCOURSE CHANGES ARE SUBJECT TO CONSENT & APPROVAL BY CCC.
NORTH EAST BASIN 750mm DEEP BASIN IL: 24.500 VEGETATED HEADWALL INLET AND OUTLETS WITH RENO MATTRESS OR STONE EROSION PROTECTION (APPROX 2m²) PROVIDES INTERCEPTION, WATER QUALITY, ATTENUATION, BIODIVERSITY & AMENITY BENEFITS
FLOW CONTROL CHAMBER RESTRICTED DISCHARGE TO 2.7l/s FOR ALL STORMS UP TO AND INCLUDING 1 IN 100 YEAR + 40%
15,000l WASHDOWN & SILT SEPARATOR CL: 24.749 BASE IL: 21.492 INCOMING IL: 23.432 OUTLET IL: 23.382
RAIN GARDEN FOR INTERCEPTION, WATER QUALITY, BIODIVERSITY & AMENITY BENEFITS
MID EAST BASIN 2 500mm DEEP BASIN IL:18.274 VEGETATED HEADWALL INLET AND OUTLETS WITH RENO MATTRESS OR STONE EROSION PROTECTION (APPROX 2m²) PROVIDES INTERCEPTION, WATER QUALITY, ATTENUATION, BIODIVERSITY & AMENITY BENEFITS.
MID EAST BASIN 1 500mm DEEP BASIN IL:18.300 VEGETATED HEADWALL INLET AND OUTLETS WITH RENO MATTRESS OR STONE EROSION PROTECTION (APPROX 2m²) PROVIDES INTERCEPTION, WATER QUALITY, ATTENUATION, BIODIVERSITY & AMENITY BENEFITS.
FLOW CONTROL CHAMBER RESTRICTED DISCHARGE TO 6.1l/s FOR ALL STORMS UP TO AND INCLUDING 1 IN 100 YEAR + 40%
FLOW CONTROL CHAMBER RESTRICTED DISCHARGE TO 2.1l/s FOR ALL STORMS UP TO AND INCLUDING 1 IN 100 YEAR + 40%
PERMEABLE PAVING FOR INTERCEPTION & WATER QUALITY BENEFITS
FC04 - HYDROBRAKE FLOW CONTROL CHAMBER CL: 14.404 IL: 12.958 H: 0.79m Q: 13.9l/s
SOUTH EAST BASIN 1 750mm DEEP BASIN IL:15.000 VEGETATED AND BESPOKE HEADWALL INLETS AND OUTLETS WITH RENO MATTRESS OR STONE EROSION PROTECTION (APPROX 2m²) RETAINING WALL TO NORTHERN EDGE TO BE DEVELOPED TO INCLUDE INLET LOCATIONS SETTLEMENT FOREBAY 10% OF BASIN BASE AREA (0.3m DEEP WITH 1:3 BANKS) TO BE INCLUDED PROVIDES INTERCEPTION, WATER QUALITY, ATTENUATION, BIODIVERSITY & AMENITY BENEFITS.
SOUTH EAST BASIN 2 750mm DEEP BASIN IL:14.750 VEGETATED AND BESPOKE HEADWALL INLETS AND OUTLETS WITH RENO MATTRESS OR STONE EROSION PROTECTION (APPROX 2m²) RETAINING WALL TO NORTHERN EDGE TO BE DEVELOPED TO INCLUDE INLET LOCATIONS PROVIDES INTERCEPTION, WATER QUALITY, ATTENUATION, BIODIVERSITY & AMENITY BENEFITS.
PERMEABLE PAVING FOR INTERCEPTION & WATER QUALITY BENEFITS
FLOW CONTROL CHAMBER RESTRICTED DISCHARGE TO 16.8l/s FOR ALL STORMS UP TO AND INCLUDING 1 IN 100 YEAR + 40%
RAIN GARDEN FOR INTERCEPTION, WATER QUALITY, BIODIVERISTY & AMENITY BENEFITS
EXISTING GULLY SERVING THE EXISTING DITCH TO BE REPLACED WITH A NEW MANHOLE. RE-PROFILED DITCH TO CONNECT TO THE NEW MANHOLE.
EXISTING FOUL CHAMBER TO BE RETAINED. FOOTWAY TO BE ADJUSTED TO SUIT LOCATION OR CHAMBER LID RELOCATED TO SUIT.
EAST SITE DISCHARGE LOCATIONS
1. MID EAST BASIN DISCHARGE
DISCHARGES TO THE RE-PROFILED DRAINAGE DITCH VIA A NEW HEADWALL.
2. SOUTH EAST BASIN DISCHARGE
DISCHARGES TO THE RE-PROFILED DRAINAGE DITCH VIA A NEW HEADWALL.
3. TOTAL EAST SITE DISCHARGE
THE PROPOSED DISCHARGE FROM LOCATION 1 & 2 IS TO THE RE-PROFILED DRAINAGE DITCH AT RESTRICTED RATES.
THE RE-PROFILED DRAINAGE DITCH IS TO DISCHARGE VIA A NEW CONNECTION AND NEW CHAMBER REPLACING THE EXISTING GULLY CONNECTION. THE NEW CHAMBER IS TO CONTINUE TO USE THE EXISTING CULVERT PASSING UNDER PIBWRLWYD LANE.
EAST SITE TOTAL DISCHARGE RATE IS RESTRICTED TO GREENFIELD Qbar RATE = 23.8l/s.
EXISTING DRAINAGE TO BE UPSIZED IF REQUIRED
PERMEABLE PAVING FOR INTERCEPTION & WATER QUALITY BENEFITS
RAIN GARDEN FOR INTERCEPTION, WATER QUALITY, BIODIVERSITY & AMENITY BENEFITS
FLOW CONTROL CHAMBER RESTRICTED DISCHARGE TO 15.1l/s FOR ALL STORMS UP TO AND INCLUDING 1 IN 100 YEAR + 40%
SOUTH BASIN 1000mm DEEP BASIN IL:13.000 VEGETATED HEADWALL INLET AND OUTLETS WITH RENO MATTRESS OR STONE EROSION PROTECTION (APPROX 2m²) SETTLEMENT FOREBAY 10% OF BASIN BASE AREA (0.3m DEEP WITH 1:3 BANKS) AT VHW12, 13 & 14 HEADWALLS TO BE INCLUDED PROVIDES INTERCEPTION, WATER QUALITY, ATTENUATION, BIODIVERSITY & AMENITY BENEFITS.
REFER TO DRAWING CR0301-STN-XX-XX-DR-C-6000 FOR SOUTHERN WORKS DRAINAGE STRATEGY
SN41182201 CL:13.62 IL:12.11
EXF01 CL:15.53 IL:12.69
BIN STORE
Drain

GENERAL NOTES:

1. DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT PROJECT DRAWINGS AND WITH THE HEALTH AND SAFETY INFORMATION PROVIDED AND/OR WITHIN THE PRE-CONSTRUCTION INFORMATION.
2. USE OF THIS DRAWING DOES NOT ABSOLVE THE CLIENT FROM HIS RESPONSIBILITIES UNDER THE HEALTH AND SAFETY: THE CONSTRUCTION DESIGN AND MANAGEMENT REGULATIONS 2015. THE PRINCIPAL DESIGNER IS REQUIRED TO CONTACT STANTEC CONSULTANTS PRIOR TO PERMITTING THIS DRAWING TO BE USED IN CONNECTION WITH ANY CONSTRUCTION WORKS.
3. BEFORE COMMENCEMENT OF ANY WORKS ASSOCIATED WITH THE DRAWING REFER TO ALL RELEVANT HEALTH AND SAFETY INFORMATION FOR THE WORKS INCLUDING RESIDUAL RISK INFORMATION.
4. THE CONTRACTOR SHOULD COMPLY WITH HS(G) 47 "AVOIDING DANGER FROM UNDERGROUND SERVICES" WHEN PLANNING, LOCATING AND EXCAVATING AROUND EXISTING SERVICES. IT IS KNOWN THAT EXISTING UTILITY COMPANY UNDERGROUND SERVICES AND APPARATUS ARE PRESENT WITHIN THE PROPOSED WORKS AREA AND IT IS THE CONTRACTORS RESPONSIBILITY TO LOCATE EXISTING SERVICES ON SITE ACCURATELY.
5. INFORMATION REGARDING THE LOCATION AND DEPTH OF EXISTING SERVICES CANNOT BE GUARANTEED BY THE STATUTORY UNDERTAKER.
6. THE DRAWING SHALL BE USED FOR THE INTENDED PURPOSE ONLY AND THIS DRAWING HAS BEEN BASED ON INFORMATION PROVIDED BY OTHER PARTIES AND STANTEC DO NOT WARRANT THE ACCURACY OF THIS INFORMATION. DIMENSIONS SHALL NOT BE SCALED FROM THE DRAWING.
7. ALL FIGURED LEVELS ARE IN METRES AND RELATED TO EXISTING SURVEY GRID & DATUM UNLESS NOTED OTHERWISE
8. ALL FIGURED DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
9. CONFLICTING INFORMATION SHOWN ON THE ENGINEER'S DRAWINGS OR DISCREPANCIES BETWEEN THE INFORMATION GIVEN BY THE ENGINEER AND THAT PROVIDED BY OTHERS MUST BE REFERRED TO THE ENGINEER BEFORE THE WORKS COMMENCE.

DO NOT SCALE

REVISIONS

Rev.	Revision Notes	Date	Drawn By	Checked | Approved
P01	PAC ISSUE	19/09/25	SP	CD | RB

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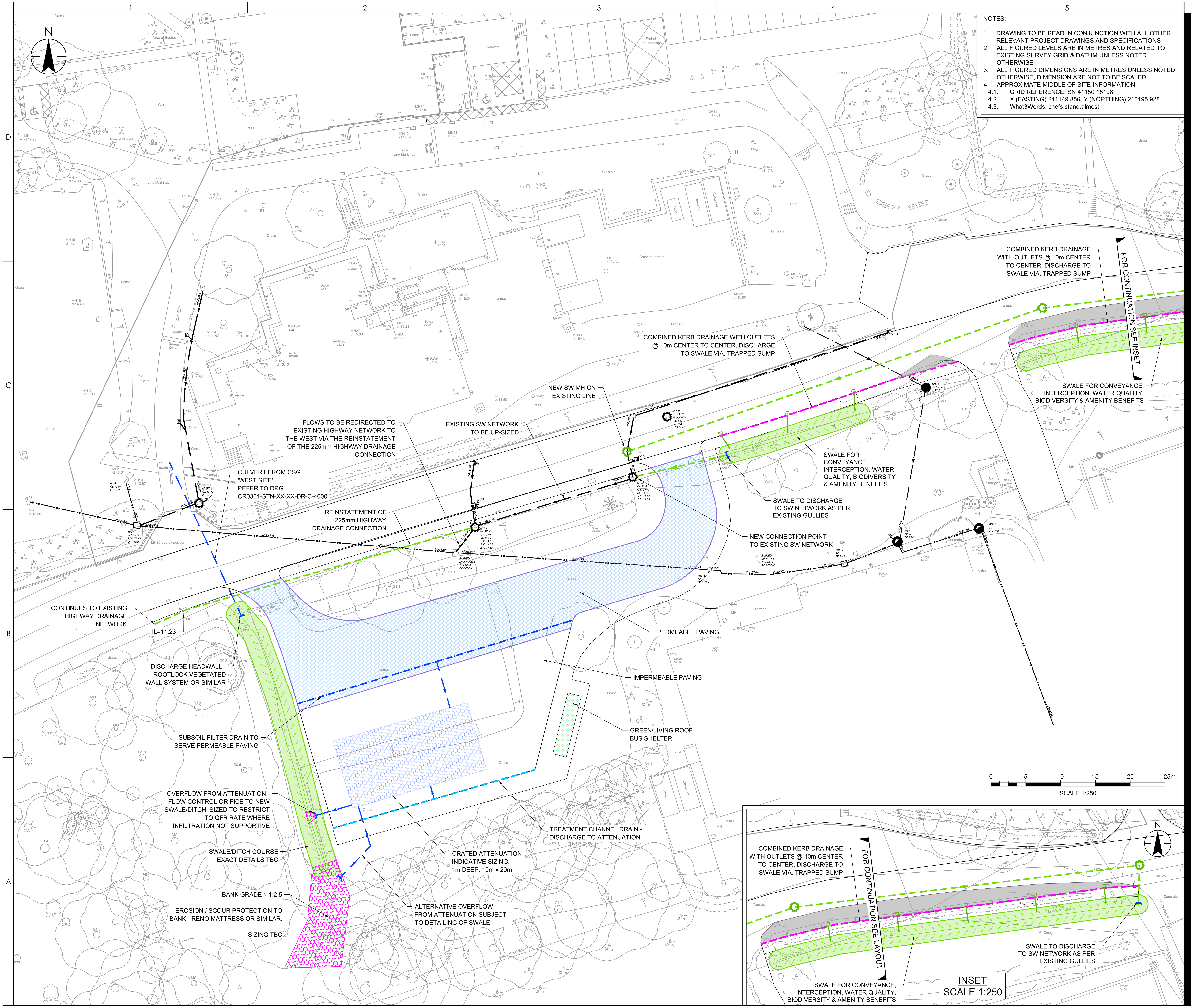
CLIENT
WEPCo on BEHALF OF COLEG SIR GAR

PROJECT
MIM - COLEG SIR GAR

TITLE
DRAINAGE STRATEGY SHEET 2

HYDROCK PROJECT NO. C-30015
SCALE @ A1 1:500
STATUS DESCRIPTION SUITABLE FOR INFORMATION
STATUS S2
DRAWING NO. CR0301-STN-XX-XX-DR-C-4001
REVISION P01

Filename: U:\333700534\01_WIP\DR_Drawing\C\CR0301-STN-XX-XX-DR-C-4000_P01 - Drainage Strategy.dwg



COMBINED KERB DRAINAGE WITH OUTLETS @ 10m CENTER TO CENTER. DISCHARGE TO SWALE VIA. TRAPPED SUMP
FOR CONTINUATION SEE INSET
SWALE FOR CONVEYANCE, INTERCEPTION, WATER QUALITY, BIODIVERSITY & AMENITY BENEFITS
NEW SW MH ON EXISTING LINE
FLOWS TO BE REDIRECTED TO EXISTING HIGHWAY NETWORK TO THE WEST VIA THE REINSTATEMENT OF THE 225mm HIGHWAY DRAINAGE CONNECTION
EXISTING SW NETWORK TO BE UP-SIZED
SWALE FOR CONVEYANCE, INTERCEPTION, WATER QUALITY, BIODIVERSITY & AMENITY BENEFITS
CULVERT FROM CSG 'WEST SITE' REFER TO DRG CR0301-STN-XX-XX-DR-C-4000
SWALE TO DISCHARGE TO SW NETWORK AS PER EXISTING GULLIES
REINSTATEMENT OF 225mm HIGHWAY DRAINAGE CONNECTION
NEW CONNECTION POINT TO EXISTING SW NETWORK
CONTINUES TO EXISTING HIGHWAY DRAINAGE NETWORK
IL=11.23
PERMEABLE PAVING
DISCHARGE HEADWALL - ROOTLOCK VEGETATED WALL SYSTEM OR SIMILAR
IMPERMEABLE PAVING
SUBSOIL FILTER DRAIN TO SERVE PERMEABLE PAVING
GREEN/LIVING ROOF BUS SHELTER
OVERFLOW FROM ATTENUATION - FLOW CONTROL ORIFICE TO NEW SWALE/DITCH. SIZED TO RESTRICT TO GFR RATE WHERE INFILTRATION NOT SUPPORTIVE
TREATMENT CHANNEL DRAIN - DISCHARGE TO ATTENUATION
SWALE/DITCH COURSE EXACT DETAILS TBC
CRATED ATTENUATION INDICATIVE SIZING: 1m DEEP, 10m x 20m
BANK GRADE ≈ 1:2.5
ALTERNATIVE OVERFLOW FROM ATTENUATION SUBJECT TO DETAILING OF SWALE
EROSION / SCOUR PROTECTION TO BANK - RENO MATTRESS OR SIMILAR.
SIZING TBC
0 5 10 15 20 25m
SCALE 1:250
COMBINED KERB DRAINAGE WITH OUTLETS @ 10m CENTER TO CENTER. DISCHARGE TO SWALE VIA. TRAPPED SUMP
FOR CONTINUATION SEE LAYOUT
SWALE TO DISCHARGE TO SW NETWORK AS PER EXISTING GULLIES
SWALE FOR CONVEYANCE, INTERCEPTION, WATER QUALITY, BIODIVERSITY & AMENITY BENEFITS
INSET
SCALE 1:250

NOTES:

1. DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT PROJECT DRAWINGS AND SPECIFICATIONS
2. ALL FIGURED LEVELS ARE IN METRES AND RELATED TO EXISTING SURVEY GRID & DATUM UNLESS NOTED OTHERWISE
3. ALL FIGURED DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE, DIMENSION ARE NOT TO BE SCALED.
4. APPROXIMATE MIDDLE OF SITE INFORMATION
   - 4.1. GRID REFERENCE: SN 41150 18196
   - 4.2. X (EASTING) 241149.856, Y (NORTHING) 218195.928
   - 4.3. What3Words: chefs.stand.almost

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Colour Disclaimer

This drawing has been documented in colour. This drawing is required to be printed in colour. Failure to do so may result in loss of information. Black and white printing may be used if specific black and white documents have been obtained from Stantec.

PROPOSED KEY

- ASPHALT - CARRIAGEWAY WIDENING
- PERMEABLE BLOCK PAVING - ROAD
- GREEN LIVING ROOF/BUS SHELTER
- CRATED ATTENUATION
- SURFACE WATER SEWER
- SURFACE WATER PERFORATED DRAIN
- SURFACE WATER LINEAR DRAIN
- SURFACE WATER KERB DRAIN
- SURFACE WATER SWALE
- HIGHWAY DRAINAGE
- HIGHWAY SURFACE WATER MANHOLE
- SURFACE WATER HEADWALL
- SURFACE WATER OUTLET
- RENO MATTRESS/SCOUR PROTECTION

EXISTING KEY

- SURFACE WATER SEWER
- SURFACE WATER MANHOLE
- SURFACE WATER GULLY
- FOUL WATER SEWER
- FOUL WATER MANHOLE
- COMBINED WATER SEWER
- COMBINED WATER MANHOLE

Issued/Revision		By	Appd	DD.MM.YYYY
P01	FIRST ISSUE	-	-	-

Dwn.	Dsgn.	Chkd.	DD.MM.YYYY
LTW/AJW	JW	MB	2025.09.18

Issue Status

S2 - FOR INFORMATION

This document is suitable only for the purpose noted above. Use of this document for any other purpose is not permitted.

Client/Project Logo

WEPco

Client/Project

WEPCO ON BEHALF OF COLEG SIR GAR

COLEG SIR GAR - COACH DROP OFF

PIBWRLWYD LANE, MAESYDDERWEN, LLANGUNNOR, CARMARTHEN, WALES, SA31 2NH, UNITED KINGDOM

Title

SOUTHERN WORKS PROPOSED DRAINAGE LAYOUT

Project No.	A1 Scale
333700534	1:250

Revision	Drawing No.
P01	CR0301-STN-XX-XX-DR-C-6000

Appendix E – Rainwater Harvesting Technical Note

Technical design note

Project name	Coleg Sir Gar		
Design note title	Rainwater Harvesting Viability Assessment		
Document reference	CR0301-HYD-01-XX-RP-N-000008		
Author	Harry Egan		
Revision	P01		
Date	3 June 2025	Approved	✓

1. Purpose of Technical Design Note

The following technical note has been produced to assess the viability of installing a rainwater harvesting system at the proposed Coleg Sir Gar, Pibwrlwyd Campus, Carmarthen.

Due to the limited amount of water usage required within the workshops', only Building A has been investigated as part of this rainwater harvesting study.

This note has been produced in line with the design requirements set out within BS16941 and following engagement with StormSaver Ltd who are an industry leading specialist.

2. Sizing Rainwater Harvesting Tanks

2.1 Sizing Tank(s) Based Upon Rainfall

The following table summarises the process followed to estimate the required tank size for the college, based upon annual rainfall within the area.

Table 1: Tank Sizing Methodology - Rainfall

Parameter	Value	Comment
Site Location	SA31 2NH	-
Local Annual Rainfall (mm)	1,021	From MET Office data
Total Roof Area (m^2)	3,500	Assuming both the north and south roof of Building A can be used for collection.
Filter Coefficient	0.9	Industry Standard, BS 16941
Run-off Coefficient	0.8	Based of BS 16941 and proposed roof pitch
Total Harvested Water (m^3/year)	3,392	-
Defined Period for Collection	0.05	Sized to provide 18 days storage out of 365, estimated drought period.
Tank Size - Calculated (m^3)	167.3	-
Tank Size - Proposed (m^3)	100	Note the largest tanks typically provided by manufacturers are 100m^3.

2.2 Sizing Tank(s) Based Upon Usage

The following table summarises the process followed to estimate the required tank size for the college, based upon building occupancy and anticipated usage.

Table 2: Tank Sizing Methodology - Usage

Parameter	Value	Comment
Number of Building Occupants	1,700	The number of students given by the client during the initial brief.
Flush Volume (l)	4.5	-
Flushes/Day	1.3	Education premises, BS 16941
Defined Period for Collection (days)	18	Sized to provide 18 days storage out of 365, estimated drought period.
Tank Size - Calculated (m^3)	179.01	-
Tank Size - Proposed (m^3)	100	Note the largest tanks typically provided by manufacturers are 100m^3.

Due to the design of the building the demand for water is larger than the amount of rainwater that can be collect from the roof.

As such a mains water connection will need to be provided to supplement the rainwater collected from the roof.

Despite the building being able to collect over 100,000L of rainwater, the increase in efficiency (water delivered vs water collected) drastically slows down as the tank size increases. As such, it has been suggested by StormSaver to utilise a 64,000L tank. As seen in the graph below, increasing the tank size from 64,000L to 100,000L only increases the efficiency by 5%

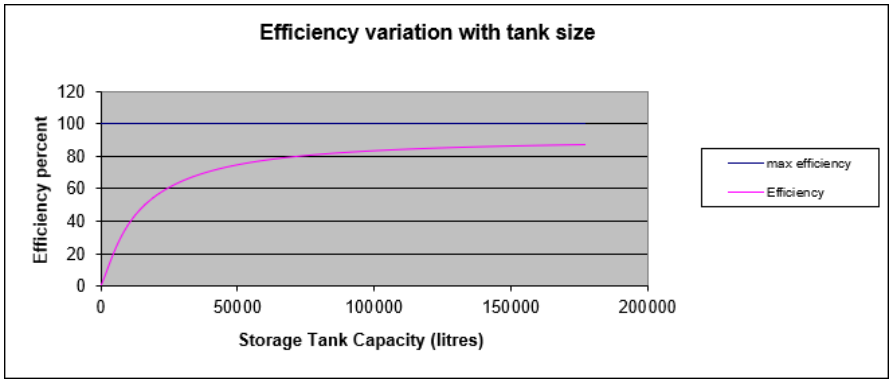

Figure 1 - Efficiency of tanks with increasing size

Table 3 - Optimal Tank Size

Parameter	Value	Comment
Design Tank Size (m^3)	64	Sized based on optimum efficiency
Percentage of rainwater run off used (%)	62.87	-
Efficiency (%)	78	-

3. Rainwater Harvesting System Financial Assessment

From the results of Section 2 it can be seen that the most efficient tank size is circa 64m^3.

The following table provides an estimate on the cost associated with the installation and ongoing maintenance of the system, offset against the anticipated annual savings from water recovery.

Table 4: Rainwater Harvesting Financial Assessment

Parameter	Value	Comment
Tank Size - Proposed (m^3)	64	-
Tank Capital Cost	£52,000	Including ancillary equipment, excluding building pipework. Estimated from StormSaver May 202.
Water Saving (m^3/year)	2,022	BS 16941 & StormSaver Ltd
Unit Cost of Water (£/m^3)	£1.46	DCWW
Annual Saving from Water Harvesting	£2,952	-
Annual Maintenance Cost	£3,000	Average figure, industry
Payback Period	N/A	-

It should be noted that this figure does not include for the cost associated with any pipework distribution within the building, which will negatively impact the financial aspect of the installation. The figure also doesn't include for any reduction in size of the potable water tank as this is deemed to be negligible.

The cost associated with any pumping electricity has been deemed negligible when compared to a non-rainwater harvesting system and has been excluded from the calculation. However, further pumping power will be required, due to the proposed system above only providing 78% of the total load, mains water provision will need to be provided in addition to the provision outlined above.

4. Rainwater Harvesting System Carbon Assessment

The following table presents the anticipated operational energy savings attributable to a rainwater harvesting system, whereby rainwater offsets the need for (and associated carbon savings of) potable water.

It is important to note that this is a carbon saving associated with operational usage only (i.e. water offset) and does not include any embodied carbon that will be generated by the manufacture and installation of the rainwater harvesting equipment. It also does not include any pumping power associated with the system, however for the purposes of this assessment this has been deemed negligible when compared to a system that does not use a rainwater harvesting system.

Table 5: Rainwater Harvesting Carbon Assessment

Parameter	Value	Comment
Water Saving (m^3/year)	2,022	BS 16941 & Stormsaver Ltd
Potable Water Carbon Factor (kg/m^3)	0.344	2024 Government Conversion Factors
Carbon Savings (kg/year)	695	This is equivelent to 20m2 of Photovoltaic Panels (based on a 220kWh/m2/year yield and a carbon factor of 0.1630

5. Summary

Based upon the information assessed above, a rainwater harvesting system comprising 64m^3 tank would be optimally sized for Coleg Sir Gar, based upon both assessment of annual rainfall in the area and of anticipated usage.

However, this would not provide enough water for the building and a supplementary mains water supply would need to be provided to top-up the rainwater collected.

Although there are positives of utilising rainwater through the associated carbon savings, this does not out way the negatives of the system. Justification for exclusion of a rainwater harvesting system is as follows:

- It is anticipated that the rainwater system will not provide payback
- As the building cannot provide 100% of the flushing demand via the rainwater, a supplementary mains water supply will need to be provided, this will reduce the efficiency of the rainwater harvesting system by introducing further power demand into the building above a 'traditional' system.
- Due to the levels associated with the proposed site, the collection of rainwater from both the north and south roof will be challenging and as such, the full roof area may not be able to be harvested, further reducing the efficiency of the system.
- There is inadequate space within the building/above ground and the installation of a submerged tank with a 64m^3 volume is not possible in an appropriate location (i.e. ease of access/maintenance) on such a spatially constrained and challenging site.
- The planned operational lifetime of the school is 75 years, meaning any rainwater system shall need to be replaced 3 times over the same period.
- Unmaintained/poorly maintained systems can cause staining in toilets and pose a health and safety issue for the building occupants through increased risk of contamination and amplification of bacterial growth.

Following a high-level assessment of the scheme, cannot be recommended for inclusion within the Coleg Sir Gar scheme due to the reasons outlined above.

Appendix F – DCWW PPA

Dŵr Cymru
Welsh Water

Developer Services
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CF30 0EH

Tel: +44 (0)800 917 2652
Fax: +44 (0)2920 740472
E.mail: developer.services@dwrcymru.com

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Miss Stephanie Parry
Hydrock
3rd Floor Wharton Place
13 Wharton Street
Cardiff
CF10 1GS

Date: 19/11/2024
Our Ref: PPA0009040

Dear Miss Parry

Grid Ref: 241210 218306
Site Address: Pibwrlwyd Lane, Carmarthen
Development: College campus

I refer to your pre-planning enquiry received relating to the above site, seeking our views on the capacity of our network of assets and infrastructure to accommodate your proposed development. Having reviewed the details submitted I can provide the following comments which should be taken into account within any future planning application for the development.

Firstly, we note that the proposal relates to a proposed Redevelopment of a College Campus and comprises of a potential windfall development with no allocated status in the Local Development Plan (LDP). Accordingly, whilst it does not appear an assessment has been previously undertaken of the public sewerage system, we offer the following comments as part of our appraisal of this development.

Public Sewerage Network

The proposed development site is located in the immediate vicinity of a foul only sewerage system, which drains to Parc Y Splott Waste water Treatment Works (WwTW).

You are advised that some public sewers and lateral drains may not be recorded on our maps of public sewers because they were originally privately owned and were transferred into public ownership by nature of the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011. The presence of such assets may affect the proposal. In order to assist you may contact Dwr Cymru Welsh Water on 0800 085 3968 to establish the location and status of the apparatus in and around your site. Please be mindful that under the Water Industry Act 1991 Dwr Cymru Welsh Water has rights of access to its apparatus at all times.

Surface Water Drainage

As of 7th January 2019, this proposed development is subject to Schedule 3 of the Flood and Water Management Act 2010. The development therefore requires approval of Sustainable Drainage Systems (SuDS) features, in accordance with the 'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems'. As highlighted in these standards, the developer is required to explore and fully exhaust all surface water drainage options in accordance with a hierarchy which states that discharge to a combined sewer shall only be made as a last resort. Disposal should be made through the hierarchical approach, preferring infiltration and, where infiltration is not possible, disposal to a surface water drainage body in liaison with the Land Drainage Authority and/or Natural Resources Wales.

It is therefore recommended that the developer consult with Carmarthenshire County Council as the determining SuDS Approval Body (SAB), in relation to their proposals for SuDS features. Please note, DCWW is a statutory consultee to the SAB application process and will provide comments to any SuDS proposals by response to SAB consultation. Please refer to further detailed advice relating to surface water management included in our attached Advice & Guidance note.

In addition, please note that no highway or land drainage run-off will be permitted to discharge directly or indirectly into the public sewerage system.

Foul Water Drainage – Sewerage Network

We have considered the impact of foul flows generated by the proposed development and concluded that flows can be accommodated within the public foul sewerage system. We advise that the flows should be connected to the 150mm foul sewer between manholes SN41180201 and SN41181201.

However, should you wish for an alternative connection point to be considered please provide further information to us in the form of a drainage strategy, preferably in advance of a planning application being submitted

Should a planning application be submitted for this development we will seek to control these points of communication via appropriate planning conditions and therefore recommend that any drainage layout or strategy submitted as part of your application takes this into account.

You may need to apply to Dwr Cymru Welsh Water for any connection to the public sewer under Section 106 of the Water industry Act 1991. However, if the connection to the public sewer network is either via a lateral drain (i.e. a drain which extends beyond the connecting property boundary) or via a new sewer (i.e. serves more than one property), it is now a mandatory requirement to first enter into a Section 104 Adoption Agreement (Water Industry Act 1991). The design of the sewers and lateral drains must also conform to the Welsh Ministers Standards for Foul Sewers and Lateral Drains and conform with the publication "Sewers for Adoption"- 7th Edition. Further information can be obtained via the Developer Services pages of www.dwrcymru.com.

Sewage Treatment

No problems are envisaged with the Waste Water Treatment Works for the treatment of domestic discharges from this site.

Water Supply

We anticipate this development will require the installation of a new single water connection to serve the new premise. The provisions of Section 45 of the Water industry Act 1991 apply. We therefore rely on the Local Planning Authority to control the delivery of any required reinforcement or offsite works by way of planning condition at planning application stage.

Capacity is currently available in the water supply system to accommodate the development. there is sufficient capacity available to serve the development without causing detriment to existing customers' supply as demands upon our water systems change continually.

I trust the above information is helpful and will assist you in forming water and drainage strategies that should accompany any future planning application. I also attach copies of our water and sewer extract plans for the area, and a copy of our Planning Guidance Note which provides further information on our approach to the planning process, making connections to our systems and ensuring any existing public assets or infrastructure located within new development sites are protected.

Please note that our response is based on the information provided in your enquiry and should the information change we reserve the right to make a new representation. Should you have any queries or wish to discuss any aspect of our response please do not hesitate to contact our dedicated team of planning officers, either on 0800 917 2652 or via email at **developer.services@dwrcymru.com**

Please quote our reference number in all communications and correspondence.

Yours faithfully,

Rhys Evans
Planning Liaison Manager
Developer Services

<u>Please Note</u> that demands upon the water and sewerage systems change continually; consequently the information given above should be regarded as reliable for a maximum period of 12 months from the date of this letter.

Appendix G – SAB Pre-Application Meeting Minutes

Hydrock now Stantec

Minutes and actions

Coleg Sir Gar SAB Pre-Application

Microsoft Teams, 7 January 2025

Attendees	Chris Dolecki (CD)	Stephanie Parry (SP)
	Robert Northcott (RN)	Jessica Jones (JJ)
Apologies	Dan McCarthy Stott (DM)	

Item	Notes	Action
1.	***Coleg Sir Gar SAB Pre-Application***	
	• RN revisited pre-application email comments response and reiterated that the level of information provided at the pre-application stage would be satisfactory for full application consideration. • RN was complimentary of the strategy and considerations made in the scheme in the concept design presented and confirmed it covered key considerations necessary such as discharge destination. • CD explained the need to hold off full application at this stage in the project programme whilst there was design development to undertake through RIBA Stages 3/4a and planning to ensure that the submission presented the final scheme. • Considering the SAB standards:	
a.	***Standard S1 -Surface Water Runoff Destination***	
	• CD described the existing ditch courses adjacent to the track and the proposal to discharge the Eastern side/catchment of the site via these. Proposing to maintain this arrangement so as not to risk sterilising land allocated in the draft local development plan to the north of the site also. CD presented the catchment assessment work and Greenfield runoff rate estimation undertaken to date. • RN confirmed the suitability of the discharge location of the eastern site catchment and was agreeable to the proposals to re-route and better integrate with the proposed masterplan. RN confirmed that flood defence consent is not required noting that the ditches in question did not have a formal designation. The proposals for re-routing and culverting (where necessary) the existing ditch courses would be acceptable and RN noted that the existing ditch capacity is to be maintained. No specific easement applies. • RN noted the route of the existing ditch and watercourse to Nant Pibwr River requires review (**HYD action**) and will check back to ensure there are no reported problems associated with the A484 culvert/s (**RN action**) as this could increase the attenuation requirements on site. CD confirmed existing regime would at least be maintained and no worsening. • CD described the proposal to discharge the Western side of the site to the college land to the south via a piped/culverted system below Pibwrlwyd Lane and then open ditch/swale. • RN was agreeable to the proposed discharge location of the Western site. On the basis that the flood plain land to the south has CSG ownership (**HYD action to reconfirm**) then discharge and dispersal to the rear of the car park would be acceptable, indeed preferred by RN. This would provide a more natural approach (i.e no formal ditch required to south - **HYD action**).	

- CD explained that infiltration could not be used as the main discharge destination but the SuDS features will be unlined where possible and any infiltration potential will be used. RN agreed.

b. ***Standard S2 - Surface Water Runoff Hydraulic***

- SP confirmed the proposed discharge rate would be Q_{Bar} for all storms up to and including the 1 in 100 year + 40% storm event - RN confirmed this approach.

c. ***Standard S3 - Water Quality***

- RN acknowledged proposed SuDS features throughout site layout to help achieve interception and water quality improvements including use of permeable paving.

d. ***Standard S4 & S5 - Amenity & Biodiversity***

- RN generally content with the scheme proposals and suggested to submit the landscaping drawings that have been subject to consultation and approved by the local authority ecology department as part of the planning application for the Full SAB application.

e. ***Standard S6 - Construction, Operation & Maintenance***

- Non SAB adoptable - stays with CSG estates management. RN in agreement.

Stantec

Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.

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