

DRAINAGE STRATEGY REPORT

**BIKE PARK WALES
GETHIN WOODLAND CENTRE
ABERCANAID
MERTHYR TYDFIL
CF48 1YZ**

Prepared by: Raymond Green

Date: March 2019

Job No: 6655

Revision: A (14th March 2019 Report Rewritten)

 Consulting Civil & Structural Engineers 5 Ty Nant Court, Morganstown, Cardiff, CF15 8LW Tel (029)20488588	Bike Park Wales, Gethin Woodland Centre, Abercanaid, Merthyr Tydfil, CF48 1YZ	Job No : 6655 Job Ref : Drainage Strategy Designed By : RG Checked By : RG Date : March 2019 Revision No : A Calc No : Page No : DR1
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1.0 Introduction

This Drainage Strategy Report explains the initial design process that has been undertaken by Bingham Hall Partnership Limited in advance of the planning application and is intended to explain the design process undertaken to date together with the design intent for the proposed foul and surface water drainage systems serving the proposed development.

1.1 Background and Proposed Development

Bingham Hall Partnership Limited has been commissioned by Bike Park Wales to undertake the Civil and Structural Engineering aspects of the development of their facility at Gethin Wood Centre, Abercanaid, Merthyr Tydfil.

The development will provide the following facilities:

New parking areas for 141 vehicles with 85 in overflow;
36 camping pods and 5 chalets;
shower and toilet block;
trail maintenance yard;
play and picnic area;
new highway access routes;
ground profile works;
drainage infrastructure; and
landscape works.

The proposed site layout is included in Appendix A of this report.

1.2 Site Location

The site is currently operated as the Bike Park Wales facility, the proposed works are associated with the development of the facility to provide the above additional facilities.

The site is located in Gethin Woods approximately 0.5km west of Abercanaid, at a National Grid Reference of 305160, 203410.

The site is irregular in shape and occupies an area of approximately 5 hectares. The boundaries of the site are defined by existing undeveloped and wooded areas to the north, east and west and an extensive network of bike trails and tracks utilised by the bike park to the south and southwest.

The site is on sloping ground towards the base of the valley and falls in a north easterly direction towards the River Taff from an approximate maximum elevation of 260m AOD to an approximate minimum elevation of 220m AOD. Offsite the ground rises more sharply to the southwest to reach a maximum elevation of 471m AOD.

Within the areas of proposed development around the existing building and car park areas the ground level has been reprofiled to form a series of plateaus.

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The areas surrounding the site comprise woodland areas associated with the Bike Park Wales.

The topographical survey is included within appendix B of this report.

2.0 Site Flooding

Bingham Hall Partnership Limited has consulted the website of Natural Resources Wales. The Development Advice Map (as updated 2017) indicates that the subject site is completely located within Zone A. Which in accordance with Technical Advice Note 15 defines an area to be at little or no risk of fluvial or tidal/coastal flooding. Refer to Figure 1 below.

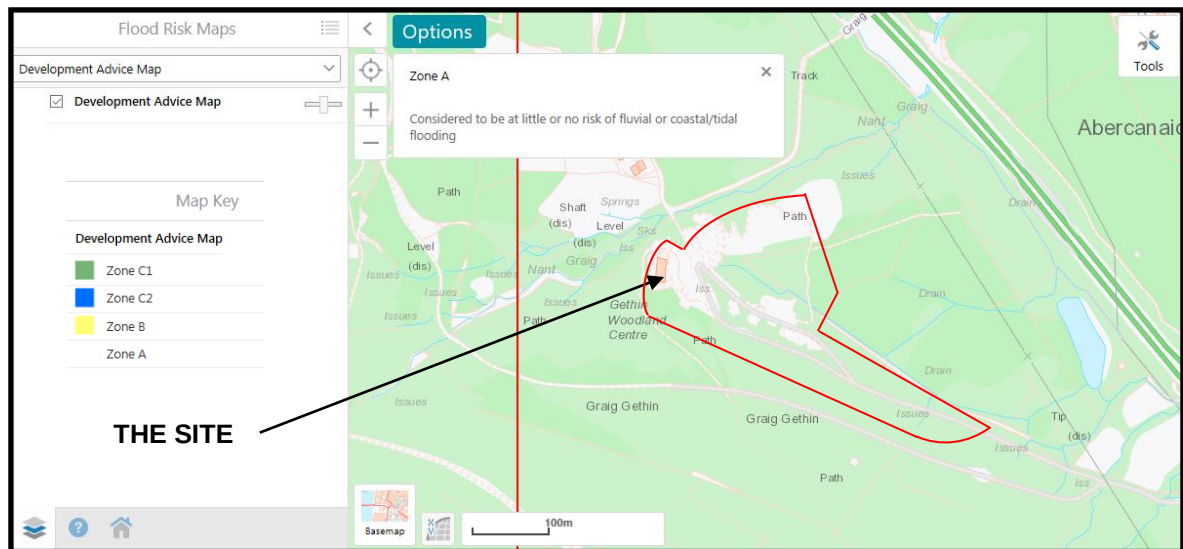


Figure 1 Extract of Development Advice Map (DAM)

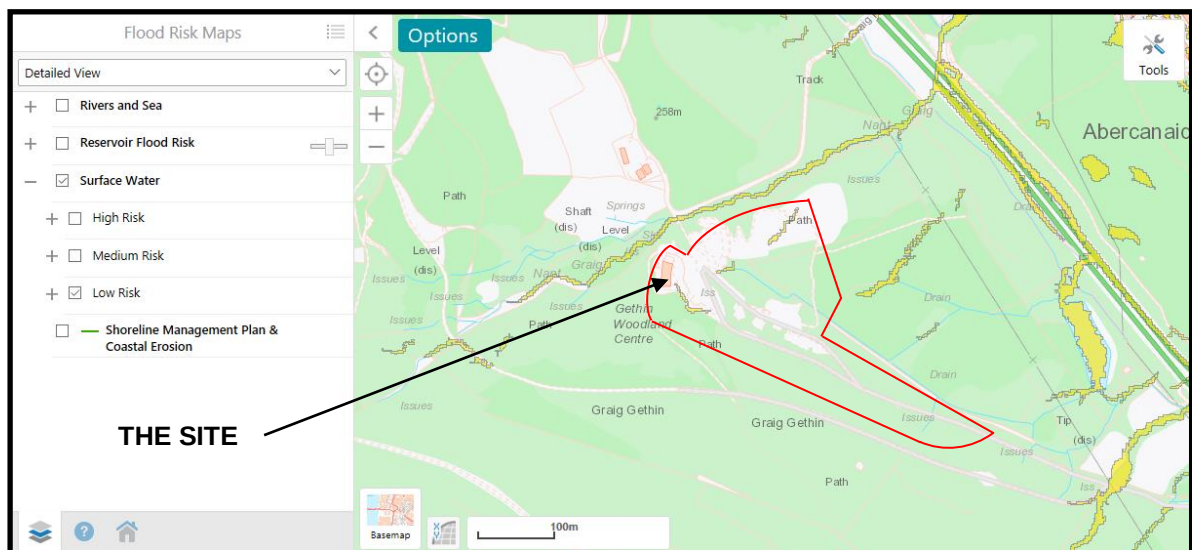


Figure 2 Extract of Natural Resources Wales Surface Water Flood Map

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Further the Natural Resources Wales Surface Water Flood Map has been consulted, refer to Figure 2. The map indicates that the site is essentially outside the surface water flood risk zone, however relatively small local areas of low flood risk are indicated within the site boundary.

3.0 Site Ground Condition Summary

The 1:10,560 scale geological map of the area (SO 00 SE) indicates the site to be underlain by southerly dipping strata of the South Wales Middle Coal Measures Formation of the Carboniferous Period. The dip of strata in the vicinity of the site is indicated to be 6°-10° to the south.

These rocks typically comprise grey productive coal-bearing mudstones/siltstones, with seatearths and minor sandstones.

The conjectural outcrop of the Lower Cwmgorse Marine Band is indicated traversing approximately through the centre of the site on a northwest to southeast trend, while the conjectural outcrop of the underlying Foraminifera and Upper Cwmgorse Marine Bands are indicated just to the north and the south respectively of the site.

A number of conjectural outcrops of various coal seams are indicated in the vicinity of the site.

The known and conjectured outcrops of the Pentre Rider, the Pentre and the Lower Pentre are indicated to the north of the site. Due to the southerly strata dips these seams would be expected to underlie the northern and central parts of the site at shallow depths, deepening in a southerly direction. Former adits and shafts are recorded along these seam outcrops indicating that these seams have been mined underground in the area. The nearest of these adits are less than 200m to the north of the site.

The Graig and Abergorky seams are shown to outcrop (or conjectured to outcrop) approximately through the centre of the site just below the Lower Cwmgorse Marine Band.

Given the southerly dip of the strata, these seams would underlie the southern half of the site at shallow depths. An adit is shown on the Graig/Abergorky outcrop, approximately 150m to the northwest of the site, again indicating that these seams have been mined underground in the area.

The conjectural outcrop of the Hafod seam is indicated to pass beneath the site, running approximately parallel to the south western edge and therefore this seam could also be shallow beneath these parts of the site.

The solid strata are indicated to be overlain by superficial deposits of Devensian Till of the Quaternary Period. These deposits generally comprise a poorly sorted and variable composition of clays, sands and gravel, with some cobbles and occasional boulders. Superficial deposits are not indicated to overly the bedrock along the southwest edge of the site.

Ground investigation works have been carried out on the site and are documented in Integral Geotechniques Site Investigation Report referenced 12329/LW/19/SI dated February 2019.

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The results of the ground investigation works referenced above were consistent with the anticipated geology. Generally, the ground conditions encountered in the exploratory holes comprised topsoil or made/reworked natural ground over superficial deposits consisting of glacial till deposits.

The glacial till comprised of a vertically and laterally variable sequence of medium dense brown to brown grey silty clayey sandy gravel and firm silty sandy gravelly clay. The gravel consisted of siltstone, mudstone and sandstone with cobbles and boulders encountered. The glacial till was encountered at depths of between 0.2m and 1.4m below existing ground level.

An indicative soakaway test was undertaken in one trial pit which recorded no infiltration. However, it should be noted that this initial test should only be regarded as indicative. More extensive, proposed location and depth specific further testing will be undertaken in order to confirm the specific design parameters to inform the final drainage design

4.0 Existing Site Drainage

4.1 Existing Site

The existing site is described in section 1.2 of this report.

4.2 Existing Foul Water Drainage

We understand that the foul water drainage from the site is routed through a local site network to a packaged treatment plant located to the north west of the site. Natural Resources Wales has advised that the treated effluent discharged from the existing treatment plant outfalls to a receiving watercourse named the Nant Graig. The Client has provided us with the details of the packaged treatment plant which indicates that the effluent is treated to 20(BOD)/30(Suspended Solids)/20(NH3) quality.

We understand that flows from the bike wash areas are routed through a local site network to a reed bed also located to the north west of the site. The Client has provided us with the details of the reed bed which indicates that following treatment the bike wash effluent flows, by gravity, from the reed bed to the reed bed level control chamber and onto a manhole connection downstream of the existing foul water treatment facility prior to exiting to the outfall to the above noted watercourse.

4.3 Existing Surface Water Drainage

We understand that the surface water runoff is directed to a series of infiltration and detention/attenuation systems within close proximity to the source of the run off with any residual flows being discharged off site.

5.0 Proposed Site Drainage.

5.1 Foul Water Drainage Proposals

No local public sewers are present.

The development will provide facilities as noted in section 1.1 of this report.

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Generally, the proposed development will be routed through a local site network to a proposed new foul water treatment facility located to the north east of the site. The breakdown of foul effluent proposed for discharge to the new foul water treatment facility is as noted below:-

5 number Cabins/Lodges
2 number Camping Pods converted to Toilets
4 number Shepherd Huts
7 number Motorhomes
32 number camping/land pods
Shower and toilet block

We advise that the 32 number camping/land pods do not have any water or drainage connection and will utilise the proposed shower and toilet block.

Considering that currently no local specific onsite percolation testing has been undertaken, in accordance with Approved Document H, Part H1 of the Building Regulations (for use in Wales), we would propose one of the following options for the proposed foul water treatment facility. The options set out below are preferenced in accordance with the hierarchy as set out in Part H1:

Option (C) (i) Either a septic tank or packaged treatment plant with a secondary form of treatment comprising a drainage field designed and constructed in accordance with BS 6297:2007 + A1:2008. This option is subject to the results of specific onsite percolation testing. Preferred option subject to appropriate consents to be obtained from Natural Resources Wales.

Option (C) (ii) Either a septic tank or packaged treatment plant with an outfall to a watercourse, effluent treated to 20 (BOD)/30 (Suspended Solids) 20 (NH3) quality. This option is to be approved and consented by Natural Resources Wales.

Option (D) A cesspool with a capacity of 45 days foul effluent inflow. This option is to be approved and consented by Natural Resource Wales.

The new bike wash will be routed to the existing reed bed. The Client has advised that the proposed bike wash installations will be subject to no more uses, the additional facility merely reducing the demand on the existing.

The design team will engage with the NRW Permitting Team at the earliest opportunity, at a stage when the design is sufficiently developed in order to obtain both a new permit for the proposed foul water treatment facility, if necessary, and, an appropriate variation to any existing permit with respect to the existing packaged treatment plant.

A copy of the proposed drainage plan is included within Appendix C of this report.

5.2 Sustainable Urban Drainage

The proposed surface water drainage design has considered the sequential approach as defined by Planning Policy Wales Edition 9, CIRIA C753 the Sustainable Urban Drainage Manual and Approved Document H, Part H3 of the Building Regulations (for use in Wales).

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5.3 Surface Water Drainage Proposals.

As noted in the foregoing, an indicative soakaway test was undertaken in one trial pit which recorded no infiltration. However, it should be noted that this initial test should only be regarded as indicative. Further, more extensive, proposed location and depth specific testing will be undertaken in order to confirm the specific design parameters to inform the final drainage design.

Subject to the results of further targeted soakaway testing it is proposed to discharge surface water runoff to ground within the site boundary via the use of various infiltration and detention features/structures. However, if the targeted soakaway tests are not favourable for this proposal the structures will be utilised as infiltration/detention/attenuation structures and may require a connection to an offsite receiving watercourse/drain. Any offsite flows would be designed to balance post development surface water run off to that predevelopment or an agreed rate for all events up to the 1% (1 in 100) storm (including climate change allowance of 30%). The final drainage design parameters would be agreed with all relevant regulators. The above with adequate system maintenance, which will be undertaken by the Bike Park Wales maintenance team, will ensure that surface water run-off will not increase flood risk to the development or third parties for the lifetime of the development.

The foremost proposed surface water drainage proposal of the above paragraph is detailed on the proposed drainage plan a copy of which is included within Appendix C of this report.

6.0 Conclusions

It is the current intention for the surface water runoff from the development to be infiltrated to ground within the boundary of the site, however the final solution is subject to the results of targeted soakaway testing. Should infiltration results indicate the above solution not to be feasible, an offsite discharge to a receiving watercourse/drain may be necessary, in this instance measures will be incorporated into the development to limit off site flows in accordance with the requirements of the regulators and also to minimise the risk of increased flooding of the development itself and third party land. The overall site surface water drainage strategy has fully considered the sequential approach as defined by Planning Policy Wales Edition 9, CIRIA C753 the Sustainable Urban Drainage Manual and Approved Document H, Part H3 of the Building Regulations (for use in Wales). Any connection to watercourses/drains will be subject to obtaining appropriate consents from the regulators.

The foul water drainage options to accommodate the proposed development are indicated in section 5.1 of this report. Effluent discharged to ground or any watercourse will be treated to a 20(BOD)/30(Suspended Solids)/20(NH3) quality. The foul water drainage strategy to accommodate the proposed development has fully considered the sequential approach as defined by Approved Document H, Part H1 of the Building Regulations (for use in Wales). Any connection to watercourses/drains will be subject to obtaining appropriate consents from the regulators.

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Appendix A

- KEY**
- Significant trees to be retained (approximate position)
 - Woodland/shrubs to be retained (approximate extent)
 - Significant trees to be removed (approximate position)
 - Proposed native standard and feathered tree planting
 - Trees proposed as part of earlier application
 - Proposed native tree and shrub mass planting
 - Native tree and shrub mass planting proposed as part of earlier application
 - Proposed fencing
 - Proposed gabion wall with coursed stonework fill
 - Proposed topsoil bund
 - Proposed circulation
 - Existing retained building
 - Proposed building
 - Building proposed as part of earlier application
 - Existing parking
 - Proposed/amended parking or road edge
 - Proposed/amended path/track edge
 - Proposed overflow parking
 - Proposed timber picnic tables
 - Boulders
 - Other proposed features
 - Habitat structure/timber pile
 - Site area (approximate)
 - Area of application P/18/0335 (approximate extent)
 - Raised timber walkway/decking



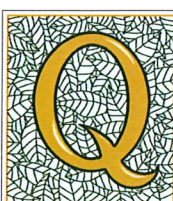
NOTES ON THE LANDSCAPE PROPOSALS

The landscape shown on this masterplan has been designed to create a high quality amenity space that maximises habitat quality.

The design was created in order to fulfill the requirements for additional parking, buildings and other features associated with the expansion of facilities at Bike Park Wales.

The landscape proposals have evolved significantly, in response to adverse effects that were identified as being likely to result from the development of the site in line with the initial plans. The design presented is the result of series of refinements to layout and specification which are intended to avoid or reduce such effects.

SCALE
0 5 10
50m
Scale 1:500 printed at A1



**PETER QUINN
ASSOCIATES**
LANDSCAPE ARCHITECTURE

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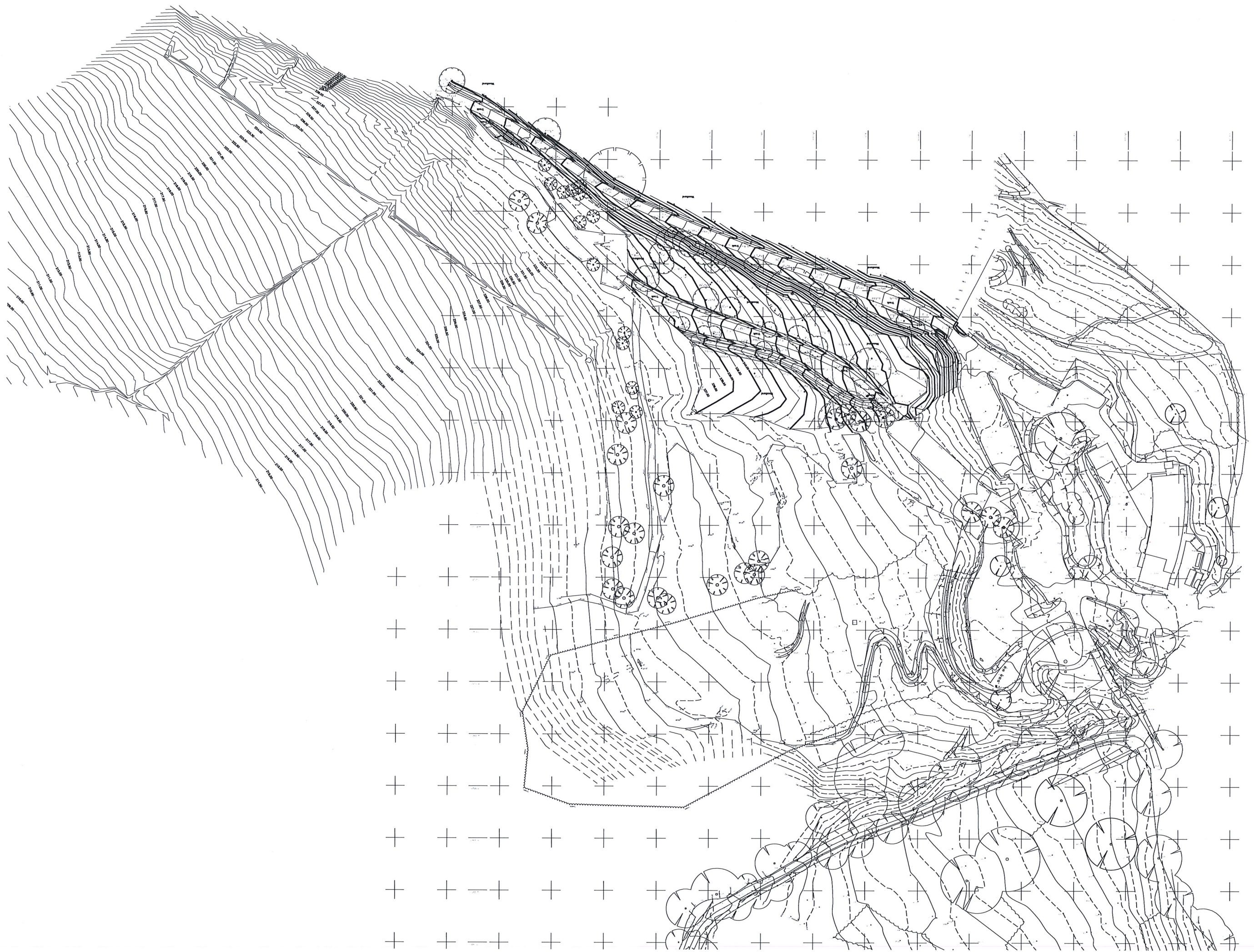
Project title:	Bike Parks Wales, Abercarnaid
Drawing title:	BPW Landscape Masterplan
Client:	Bike Parks Wales
Date:	6th November 2018
Revisions:	Rev A: 8th November 2018 - arboricultural information updated and pods & lodges re-located. Rev B: 19th December 2018 - general amendments to features. Rev C: 17th January 2019 - re-design of van parking area Rev D: 4th March 2019 - refinement of van and overflow parking area and lodges.
Drawing number:	18/461/01 D

BIKE PARK WALES: LANDSCAPE MASTERPLAN



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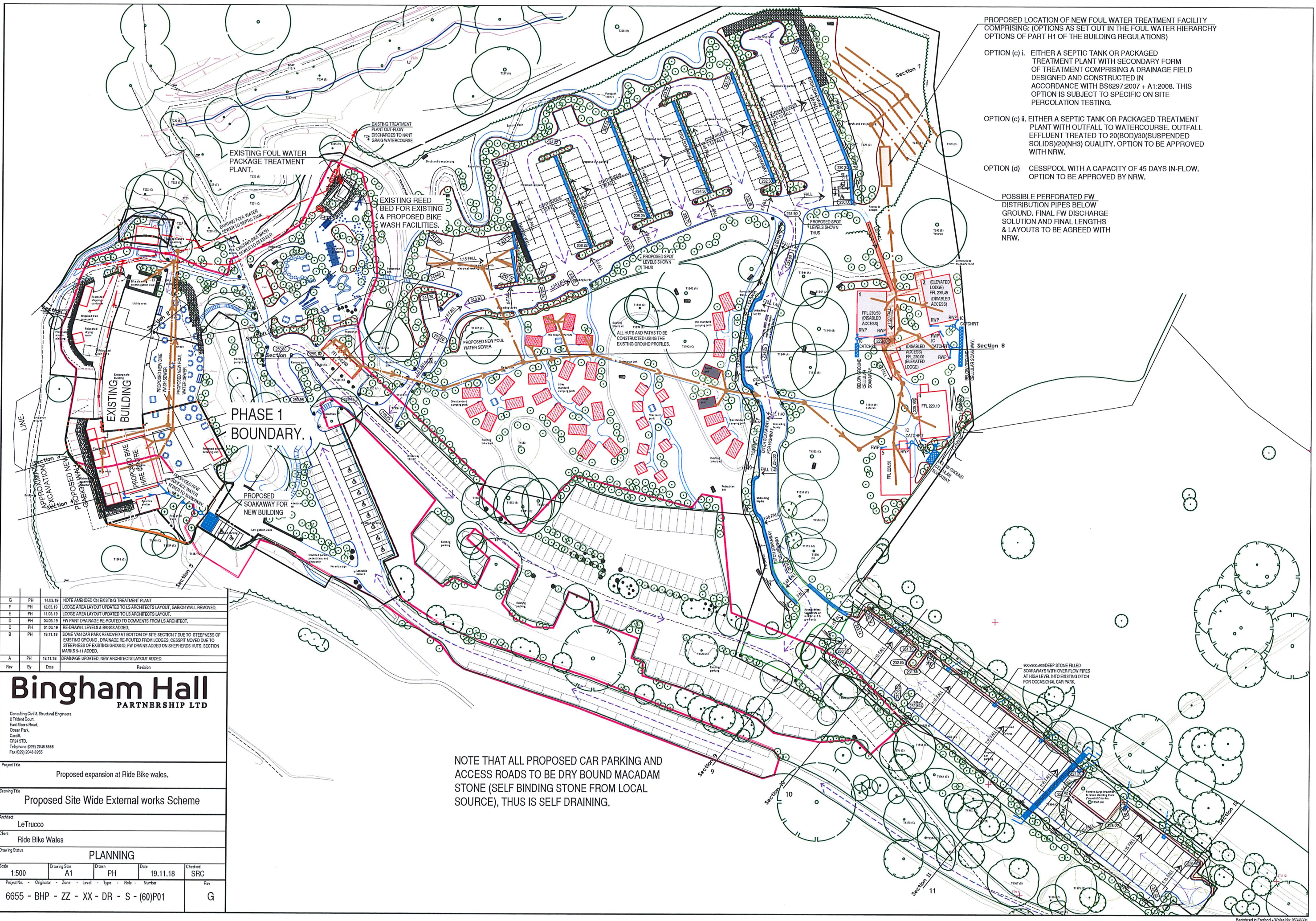
Appendix B



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Appendix C

NOTE: THE PROPERTY OF THIS DRAWING AND DESIGN IS VESTED IN BINGHAM HALL PARTNERSHIP LIMITED AND MUST NOT BE COPIED OR REPRODUCED IN ANY WAY WITHOUT THEIR WRITTEN CONSENT



PROPOSED LOCATION OF NEW FOUL WATER TREATMENT FACILITY COMPRISING: (OPTIONS AS SET OUT IN THE FOUL WATER HIERARCHY OPTIONS OF PART H1 OF THE BUILDING REGULATIONS)

- OPTION (c) i. EITHER A SEPTIC TANK OR PACKAGED TREATMENT PLANT WITH SECONDARY FORM OF TREATMENT COMPRISING A DRAINAGE FIELD DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH BS6297:2007 + A1:2008. THIS OPTION IS SUBJECT TO SPECIFIC ON SITE PERCOLATION TESTING.
- OPTION (c) ii. EITHER A SEPTIC TANK OR PACKAGED TREATMENT PLANT WITH OUTFALL TO WATERCOURSE. OUTFALL EFFLUENT TREATED TO 20(BOD)/30(SUSPENDED SOLIDS)/20(NH3) QUALITY. OPTION TO BE APPROVED WITH NRW.
- OPTION (d) CESSPOOL WITH A CAPACITY OF 45 DAYS IN-FLOW. OPTION TO BE APPROVED BY NRW.

POSSIBLE PERFORATED FW DISTRIBUTION PIPES BELOW GROUND. FINAL FW DISCHARGE SOLUTION AND FINAL LENGTHS & LAYOUTS TO BE AGREED WITH NRW.

G	PH	14.03.19	NOTE AMENDED ON EXISTING TREATMENT PLANT
F	PH	12.03.19	LODGE AREA LAYOUT UPDATED TO LS ARCHITECTS LAYOUT, GABION WALL REMOVED.
E	PH	11.03.19	LODGE AREA LAYOUT UPDATED TO LS ARCHITECTS LAYOUT.
D	PH	04.03.19	FW PART DRAINAGE RE-ROUTED TO COMMENTS FROM LS ARCHITECT.
C	PH	01.03.19	RE-DRAWN LEVELS & BANKS ADDED.
B	PH	19.11.18	SOME VAN CAR PARK REMOVED AT BOTTOM OF SITE SECTION 7 DUE TO STEEPNESS OF EXISTING GROUND. DRAINAGE RE-ROUTED FROM LODGES, CESSPOOL MOVED DUE TO STEEPNESS OF EXISTING GROUND, FW DRAINS ADDED ON SHEPHERDS HUTS, SECTION MARKS 9-11 ADDED.
A	PH	19.11.18	DRAINAGE UPDATED, NEW ARCHITECTS LAYOUT ADDED.
Rev	By	Date	Revision

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Project Title
Proposed expansion at Ride Bike wales.

Drawing Title
Proposed Site Wide External works Scheme

Architect
LeTrucco

Client
Ride Bike Wales

Drawing Status
PLANNING

Scale 1:500	Drawing Size A1	Drawn PH	Date 19.11.18	Checked SRC
Project No. 6655 - BHP - ZZ - XX - DR - S - (60)P01	Zone -	Level -	Type -	Role -

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