SBK

DRAINAGE STATEMENT
Phase 1a

Phase 1a, Lime Kiln Cottage, Welshpool

KIM Properties Ltd

October 2023

SBK-23-118-C-501

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Signed:	[redacted]
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Revision	P02

CONTENTS

APPENDICES

1.0 0 INTRODUCTION

101 SBK was commissioned by KIM Properties Ltd to prepare a Drainage Strategy Design to support the proposed development on the land at Lime Kiln Cottage, Welshpool.

102 The proposed development has obtained full planning approval (22/1137/FUL) from Powys Council for a phased development. However, this Drainage Statement relates to the Phase 1a scheme which involves the provision of an access road and a drive thru refreshment pod with associated car parking.

103 This report will outline the philosophy of the proposed drainage design for the Phase 1a drive-thru café scheme. It is intended to support the discharge of Conditions 6, 7 and 21.

2.00 SITE LOCATION AND DESCRIPTION

2.01 The development site is located approximately 2km north of Welshpool at Buttington Cross Roundabout. The Ordnance Survey National Grid reference to the centre of the site is SJ241089.

2.02 The neighbouring land use is as follows:

- North Future Phases of development, Phase 1b and Phase 2
- East A483
- South Rhalt Lane
- West Montgomery Canal

2.03 A Google Map screenshot of the site location is shown below in Figure 1. A location plan can be found in Appendix 1

Figure 1 - Site location with approximate Phase 1a boundary (source Google Maps)

2.04 The site is currently occupied by a cottage, Lime Kiln Cottage, an access road, historic lime kilns and vegetation. The south-east corner of the site was formerly a copse.

2.05 The site slopes from the north-west to south-east from approximately 76.91mAOD to 73.87mAOD. A topographical survey of the site undertaken by Battlefield Land Surveys Ltd in May 2023 can be found in Appendix 2.

2.06 The nearest watercourse to the site is the Montgomery Canal which is located along the north-west boundary of the site at higher level. The River Severn is located approximately 400m east of the site.

2.07 The Phase 1a site totals an area of approximately 0.28ha which will be used within the drainage assessment.

3.00 DEVELOPMENT PROPOSALS

3.01 The development proposal will provide 1800 sq m of Class A3 floorspace with associated drive thru lane, access road and car parking.

3.02 Figure 2 below shows an extract of the proposed masterplan. The full drawing can be found in Appendix 4.

Figure 2 - Proposed Masterplan (by Rev-A Associates)

4.00 EXISTING GROUND CONDITIONS

4.01 Site Geology and Hydrology

4.011 BEK Enviro Ltd has been commissioned to undertake a desk study and site investigation of the site at Lime Kiln Cottage, document reference BEK-20771-2.

4.02 Ground Conditions

4.02.1 Anticipated Ground Geology

Reference to the BGS Geological Map of Great Britain indicates the majority of the site is underlain by Bedrock Geology of the Forden Mudstone Formation.
The mapping indicates superficial deposits of Glaciofluvial Fan Deposits.

Borehole logs from the site investigation found stiff sandy silty clay to a depth of up to 5.45mBGL. The bedrock was not encountered by the boreholes.

4.02.2 Coal Mining

The Coal Authority Interactive Viewer indicates that the site is not located within a Coal Mining Reported Area.

4.02.3 Hydrogeology (subsurface water features)

MagicMap indicates that the Forden Mudstone Formation underlying the site is a Secondary B Aquifer.
The mapping also indicates that the Glaciofluvial Fan Deposits underlying the site are classified as a Secondary A Superficial Drift Aquifer.

There are no Source Protection Zones within circa 12km of the site boundary, with the nearest being to the north-east in Eyton.

4.02.4 Soakaway Design

Soakaway testing undertaken on the site as part of the site investigation determined that infiltration is not a suitable means of surface water disposal. The soakage test could not produce an infiltration rate as the water level did not drain from the 75% to 25% depth of the trial pit. The BEK soakaway report is contained within Appendix 3.

4.02.5 Hydrology (surface water features)

The nearest watercourse to the site is the Montgomery Canal which is situated along the north-western boundary of it the site at higher level. The River Severn is located approximately 400m east of the site.

4.03 Existing Drainage on the Site

There are no records of any existing drainage on the site, although there is potential for some existing pipework to be located around the cottage.

5.00 EXISTING DRAINAGE

5.01 Severn Trent Water

5.011 Severn Trent Water (STW) has been contacted for information regarding existing public storm and foul water sewers in the vicinity of the site.

5.012 A copy of the STW sewer records can be found in Appendix 5.

5.013 The sewer records provided by STW identify a foul water sewer running in a southerly direction along the private road. The mapping also highlights a private storm water sewer running parallel to the public foul water sewer.

5.014 Additional note:

Since 1st October 2011 many private sewers have been transferred into the ownership of the water authority as public sewers, where two or more properties in separate ownership are served by those sewers. Most of these former private sewers will not be shown on the public sewer records, therefore a full site survey should be carried out prior to any layout design or construction works to identify where these sewers may be and to avoid later delays and possible added costs.

6.00 FLOOD RISK

6.01 The Natural Resources Wales Flood Risk Map shows the site is not a risk of flooding from Rivers or Seas. The mapping does show a small area with a low to medium risk of flooding from surface water and small watercourses. This surface water flood risk area appears to be at the end of the existing access track which has a local depression compared to surrounding levels.

6.02 The risk of flooding from sewers is considered to be negligible as there are no public sewers within the site, and the only sewers which may be present on the site will be serving the existing cottage. These sewers will be decommissioned as part of the works and as such there will be a negligible risk.

6.03 The risk of flooding from groundwater is considered to be negligible as groundwater was not encountered within any of the boreholes up to a depth of 5.45m BGL.

6.04 The risk of flooding from artificial sources such as canals or reservoirs is considered to be low. The Montgomery Canal is located along the north-western boundary of the site. The canal is situated at a higher level than the site however, the topographical survey shows the water level within the canal to be circa 500mm below the towpath level, which would allow for any variances in level. In addition, the embankments of the canal are monitored and maintained by the Canal and River trust and as such it is considered that there is a low risk of the canal breaching into the site.

6.05 Sequential Test

6.05.1 The Sequential Test is intended to direct new development to area of lowest probability of flood risk, and ensure development is in the most appropriate flood zone.

6.05.2 As the development extents of the site are wholly within Flood Zone 1 and the proposed development is classed as less vulnerable, the development can be considered appropriate for the proposed use, and therefore passes the Sequential Test.

6.06 Exception Test

6.06.1 The Exception Test is not required as the site is located within Flood Zone 1 and passes the Sequential Test.

7.00 STORM WATER DESIGN

7.01 The Phase 1a development site has been designed to accommodate up to and including the 1 in 100 year plus 40% allowance for climate change storm event. Refer to drawing SBK-23-118-DR-C-531 rev T03 for further information.

7.02 The Phase 1a development site totals approximately 0.28ha, with approximately 0.155ha impermeable area.

7.03 A greenfield runoff rate has been calculated using the UKSuds website and the IH124 methodology. Table 1 below shows the greenfield runoff rates for the site based on an area of 0.28ha.

Table 1 - Greenfield Runoff Rate

Return Period	Discharge Rate (l/s)
QBAR	1.52
Q1	1.26
Q30	3.04
Q100	3.91

7.04 However, it is considered that the lowest practicable discharge rate to reduce the risk of blockage is 2.0l/s. Therefore, it is proposed to restrict the discharge rate from the development site to 2.0l/s for all storm events up to and including the 1 in 100 year plus 40% allowance for climate change.

7.05 The discharge will be restricted to 2.0l/s via a hydro-brake flow control chamber. The hydro-brake has been sized to restrict the discharge rate to 2.0l/s at a head of 1.10m, which provides an orifice diameter or 66mm.

7.06 The surface water drainage discharge hierarchy is as follows. Discharge from developments should aim to discharge surface water as high up the hierarchy as possible.

1 Surface water is collected for reuse;
2. Into the ground (infiltration);
3. To a surface water body;
4. To a surface water sewer, highway drain, or another drainage system;
5. To a combined sewer.

7.07 Priority Level 1 –Rainwater Collected for re-use. This has not been incorporated within the design as the proposed development class being a refreshment hub drive thru' will not generate sufficient demand for re-use of greywater to justify the inclusion of Rainwater Harvesting.

7.08 Priority Level 2 –Surface water runoff is infiltrated to the ground. Infiltration testing undertaken on the site showed the underlying soil has insufficient permeability to drain the site via infiltration techniques. Refer to BEK Soakaway Report BEK/20771/201023/EG for details of the infiltration testing. The report could not calculate an infiltration rate for the site in accordance with BRE 365 guidance as the water level did not even reach the 75% effective depth level after 6 hours. The report concluded that infiltration is not feasible for the site.

7.09 Priority Level 3 –The site is located adjacent to the Montgomery Canal. However, the canal is at a much higher level than the development site (circa 2m higher) therefore, a gravity connection cannot be made to the canal. An alternative watercourse would be the River Severn to the south-east. However, the River Severn is circa 400m from the site and the route to the river from the site crosses multiple third party land and as such this is not considered to be a feasible discharge location for the size of the development.

7.10 Therefore, it is proposed to discharge at Priority Level 4 to an existing private surface water sewer just south of Rhalt Lane. This private sewer in turn discharges to the Gungrog Brook circa 500m south of the site.

7.11 The proposed development site has rights to discharge into the private sewer as part of the sale agreement. Refer to the land register document CYM677940 for further details.

7.12 Permeable paving is proposed within the car park to provide a source control SuDS feature. Approximately 450m^2 permeable paving will be provided. The sub-base will be 300mm deep and will provide 30% voids for storage. Therefore, the permeable paving will provide 40m^3 attenuation volume. The permeable paving will only drain its own area and as such it can be assumed to comply with interception of the first 5mm of rainfall as per CIRIA C753 Table 24.6.

7.13 Permeable paving is also proposed within the access road to provide a source control SuDS feature. Approximately 390m^2 will be provided. The sub-base will be 300mm deep and will provide 30% voids for storage. Therefore, the permeable paving will provide up to 35m^3 attenuation volume. The permeable paving will only drain its own area and as such it can be assumed to comply with interception of the first 5mm of rainfall as per CIRIA C753 Table 24.6.

7.14 Baffles will be provided within the permeable paving to maximise the storage volume due to the slope of the car park. A 50mm opening within each baffle will be provided to hold back water within each section of sub-base.

7.15 Permeable paving is also proposed within the footpath back-of-house area to provide a source control SuDS feature. Approximately 35m^2 will be provided. The sub-base will be 250mm deep and will provide 30% voids for storage. Therefore, the permeable paving will provide up to 2.5m^3 attenuation volume. The permeable paving will only drain its own area and as such it can be assumed to comply with interception of the first 5mm of rainfall as per CIRIA C753 Table 24.6.

7.16 Runoff from the drive-thru lane will be collected by gullies and channels before passing to a filter drain. The filter drain will convey water to the sub-base of a bio-retention rain garden before discharging back to the piped network.

7.17 Although the infiltration rate of the site is not suitable to discharge surface water, it is proposed for the filter drain to be unlined to allow the first 5mm of rainfall to be intercepted and discharged into the ground.

7.18 Runoff from a small area of the drive-thru lane will drain via a missed kerb and flow into the bio-retention rain garden. The rain garden will be 150mm deep and will be planted to the landscape architects specification. The rain garden will provide biodiversity benefits by providing a suitable habitat for invertebrates. The runoff will percolate through the filter medium and then into the underlying drainage layer before discharging into the piped network. The bioretention rain garden can be assumed to comply with interception of the first 5mm of rainfall as per CIRIA C753 Table 24.6.

7.19 A 250mm deep swale will be provided on the northern edge of the drive thru lane. The swale will take runoff from part of the drive-thru lane which will enter the swale via a dropped kerb and filter strip. The swale will provide biodiversity benefits by providing a suitable habitat. The swale can be assumed to comply with interception of the first 5mm of rainfall as per CIRIA C753 Table 24.6.

7.20 A 300mm deep swale with an underlying filter drain will be provided just to the north of the proposed building. It is proposed to discharge the building roof area into the swale and underlying filter drain. This swale does not comply with the interception requirements of CIRIA C753 Table 24.6 as the area draining into the swale is >5 times the swale area. This is the one SuDS feature on the site which will not provide sufficient interception provision.

7.21 Another 300mm deep swale will be provided to the west of the car park by the site entrance junction. The swale will drain approximately 76m^2 of the access road. Runoff from the road will be collected in a road gully before discharging directly into the swale via a headwall. The swale will have a flow control device to maximise attenuation and water retention within the swale before discharging to the piped network downstream. The swale can be assumed to comply with interception of the first 5mm of rainfall as per CIRIA C753 Table 24.6.

7.22 A cellular storage tank is proposed beneath the car park to provide sufficient volumetric storage to restrict the discharge rate from the development to the greenfield runoff rate. The cellular storage tank will be 45m^2 plan area and 1.0m deep. Cellular storage typically has a porosity of 95% so the tank will provide approximately 43m^3 attenuation.

7.23 The cellular storage tank should have a minimum compressive strength of 400kPa to ensure it can take loading from occasional larger delivery vehicles as well as car traffic.

7.24 The proposed drainage layout is contained within Appendix 6.

7.25 The surface water drainage design has been modelled using Causeway's Flow software and calculations are contained within Appendix 7.

7.26 The hydraulic calculations show there will be no flooding up to and including the 1 in 100 year + 40% climate change event.

7.27 The drainage system has also been modelled for the 1 in 1000 year storm event as a sensitivity test to determine where the system would be exceeded. The model shows that the site would have circa 5m^3 flooding in the 1 in 1000

year storm event and it would flood at the permeable paving manhole (as the lowest point on the site). The flooding would be contained within the kerb and it would drain away once the water levels in the system fall.

7.28 Sustainable Drainage Maintenance

7.28.1 The various SuDS features will remain privately owned and be maintained by the Development's Maintenance team. The exact details of this arrangement will be defined at a later stage and secured at outline stage by condition.

7.28.2 The SuDS operation and maintenance strategy will be in accordance with CIRIA C753 best practice, as tabled below:

Table 2 - SuDS Operation and Maintenance Requirements

Feature	Maintenance Requirement	Description
Gullies, drainage channels, manholes and flow control devices	Remove debris from catchment surface	Quarterly
	Inspect and record silt level within gullies and catchpits	Quarterly
	Inspect flow control chamber for evidence o poor performanc	Monthly for 3 months then annually.
	Remove sediment from gullies, catchpits, flow control sumps.	Annually, or as required by inspection.
Filter Drain / Bioretention rain garden	Remove litter (including leaf litter) and debris from surface, access chambers and pre-treatment devices.	Monthly (or as required)
	Inspect filter drain surface, inlet/outlet pipewor and control systems for blockages, clogging, standing water and structural damage	Monthly
	Inspect pre-treatment systems, inlets and perforated pipework for silt accumulation, and establish appropriate silt removal frequencies	Six monthly
	Remove sediment from pre-treatment devices	Six monthly or as required from inspections
	Clear perforated pipework of blockage	As required. Min every 5 years.
	Remove surface geotextile and replace, and wash or replace overlying filter medium.	Every 5 years, or as required from inspections.
	Assess plants within the bioretention rain garden for disease infection, poor growth, invasive species etc and replace as necessary	Quarterly
	Replace any plants, to maintain planting density	As required
	Remove sediment, litter and debris build up from around inlets or from foreba	Six monthly
	Remove and replace filter medium and vegetation above	As required but likely to be >20 years
	Repair minor accumulations of silt by raking away surface mulch, scarifying surface and replacing mulch	As required
Dry Swale	Remove litter and debris from swale and catchment surface	Quarterly

	Cut grass – to retain grass height within specified design range	Monthly (during growing season)
	Manage other vegetation and remove nuisance plants	Monthly for first year then as required
	Inspect inlets, outlets and perforated pipe for blockages and clear if required	Monthly
	Inspect vegetation coverage	Monthly for six months, quarterly for two years then half yearly
	Inspect filter medium surface for ponding compaction, silt accumulation, record areas where water is ponding for > 48 hour	Monthly
	Inspect for silt accumulation, establish appropriate silt removal frequencie	Half yearly
	Reseed areas of poo vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale treatment area
	Repair erosion or other damage by reseeding	As required
	Relevel uneven surfaces and reinstate design levels	As required
	Scarify and spike topsoil/filter medium layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface	Every two years
	Clear perforated pipework of blockage	As required. Min every 5 years.
Cellular Storage Crates	Remove sediment from pre-treatment catchpit	Annually, or as required by inspection
	Inspect all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed.	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years
Permeable Paving	Brushing and vacuuming (standard cosmetic sweep over whole surface	Annually, after autumn leaf fall.
	Removal of weeds or management using glyphosate applied directly into the weeds by an applicator rather than spraying	Annually or as-required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of surface and upper substructure by remedial sweeping	Every 10 to 15 years, or as required.
	Inspect for evidence of poor operation or weed growth – if required, take remedial action	Quarterly, and 48 hours after large storm events.
Grease Trap	Inspection of grease trap to ensure in good condition and to monitor grease levels	Monthly
	Emptying and safe disposal of fats, oil and grease.	Quarterly (or as required based upon the inspection monitoring schedule

7.29 Water Quality

7.29.1 CIRIA C753 provides the Simple Index Method which is an assessment to check the performance of the proposed SuDS design will provide sufficient water quality treatment in relation to three forms of pollution.

7.29.2 Table 3 below shows the minimum Target Index that the development site will need to achieve. The proposed site will need to meet or exceed the index values of the relevant land use shown below. The access road and car park areas have a medium pollution hazard level, whilst the drive thru lane has a low pollution hazard level.

Table 3 - Minimum Target Index (CIRIA C753)

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Residential roof	Very low	0.2	0.2	0.05
Other roofs (typically commercial / industria	Low	0.3	0.2	0.05
Individual property driveways residential car parks, low traffic roads and non-residential car parking with infrequent change i.e. < 300 traffic movements / day	Low	0.5	0.4	0.4
Commercial yard and deliver areas, non-residential car parking with frequent change, all roads except low traffic roads and trunk roads/motorway	Medium	0.7	0.6	0.7
Sites with heavy pollution, sites where chemicals and fuels are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways	High	0.8	0.8	0.9

7.29.3 Where the mitigation index of an individual SuDS component is insufficient to meet the target Index, two components (or more) in series will be required where:

Total SuDS mitigation index = mitigation index$_1$ + 0.5 (mitigation index$_2$)

7.29.4 Tables 4, 5 and 6 below show the proposed mitigation index values for the site based on runoff from various areas of the site going through the respective treatment train of SuDS features.

Table 4 - Proposed Water Quality Treatment Index (route from drive thru lane)

Pollutant	SuDS Type		Target Index
	Bioretention System	Total	Low
TSS	0.8	0.80	0.5
Metals	0.8	0.80	0.4
Hydrocarbons	0.8	0.80	0.4

Table 5 - Proposed Water Quality Treatment Index (route from drive thru lane)

Pollutant	SuDS Type		Target Index
	Swale	Total	Low
TSS	0.5	0.50	0.5
Metals	0.6	0.60	0.4
Hydrocarbons	0.6	0.60	0.4

Table 6 - Proposed Water Quality Treatment Index (route from permeable paving)

Pollutant	SuDS Type		Target Index
	Permeable Paving	Total	High
TSS	0.7	0.7	0.7
Metals	0.6	0.6	0.6
Hydrocarbons	0.7	0.7	0.7

7.29.5 Tables 4, 5 and 6 above show runoff from all parts of the site exceed the target index values.

8.00 DRAINAGE STRATEGY –FOUL WATER

8.01 The foul water drainage from the proposed Phase 1a development will convey water around the proposed building and to the south of the site where it will discharge into the existing Severn Trent Water public foul water sewer at MH ref 1800.

8.02 The pop ups serving the kitchen area will pass through an external grease trap which will collect any fats, oils and grease to prevent them from passing into the public sewer downstream. Regular maintenance of the grease trap will be required to ensure optimum performance of the grease trap. Maintenance should be in accordance with the manufacturers recommendations but will likely consist of monitoring the levels of grease and to remove the grease and fats once it reaches a certain level.

8.03 A S106 application will be submitted to Severn Trent Water to confirm it is acceptable prior to connecting to the sewer.

8.04 SBK have prepared a foul water strategy drawing which can be found in Appendix 6.

9.00 PLANNING CONDITIONS

Planning Condition 6

9.01 Planning Condition 6 states: “Prior to the commencement of development, including groundworks and ground clearance, evidence shall be submitted to and approved in writing by the Local Planning Authority to demonstrate that any works required for management of surface waters on-site would not affect adversely the structural integrity of the canal embankment taking into account current groundwater levels at the embankment as well as predicted changes to surface water flows. The development shall be carried out in strict accordance with the approved details.”

9.02 The canal is at least 14m north-west of the access road junction with Rhalt Lane. The access road then turns into the site around the Lime Kilns and the nearest other point of development is the end of the Access Road which is 25m away from the Canal bank. The Phase 1a building is approximately 47m away from the Canal bank. In addition, the top of the canal bank level is 76.64m which is approximately 1.7m higher than the proposed building finished floor level of 74.93m.

9.03 The site investigation report did not find any groundwater up to a depth 5.0mBGL which equates to at least 6.5m below ground compared to the canal bank as the testing was undertaken at the Phase 1a site levels which are lower than the canal.

9.04 The proposed surface water drainage strategy for the site will be to discharge to a public sewer, therefore the site will be positively drained. The proposed drainage strategy will accommodate all water within the network up to and including the 1 in 100 year plus 40% climate change event. The proposed drainage strategy will be an improvement to the existing situation and will provide a more robust network which can accommodate much larger storm events than the current site. This will ensure surface water will not have an impact on the canal embankment.

9.05 Therefore, as the proposed site will be positively drained up to and including the 1 in 100 year plus 40% climate change event, coupled with the distance the canal is away from the Phase 1a development site and that the canal is at a higher level than the site. It is considered that the proposed development will not have an impact on the structural integrity of the canal embankment.

Planning Condition 21

9.06 Planning Condition 21 states: “No surface water drainage from the site shall be allowed to discharge onto the county highway at any time during the approved development's lifetime.”

9.07 The proposed drainage design positively drains the full site and will discharge the runoff to a private surface water sewer. The proposed drainage network will provide storage to accommodate storm events up to the 1 in 100 year plus 40% allowance for climate change event. The drainage network has been stress tested based on a 1 in 1000 year storm event, in this scenario the model shows the site would only have 2m3 flooding, which would be contained

within the car park area of the site by the kerb upstands. Therefore, no surface water from the site will discharge onto the county highway.

Planning Condition 7

9.08 Planning Condition 7 states: "*No development shall commence until drainage plans for the disposal of foul and surface water flows (to include calculations) have been submitted to and approved in writing by the Local Planning Authority. The scheme shall be fully implemented in accordance with the approved details prior to the first beneficial use of any phase of the development hereby approved.*"

9.09 This report has been prepared along with the associated appendices to provide the required information for this planning condition to be discharged. Refer to drawing SBK-23-118-DR-C-531 rev T03 for further information.

Appendix 1 –Location Plan

A2

North

1. DO NOT SCALE FROM THIS DRAWING. USE FIGURED DIMENSIONS ONLY.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS STATED OTHERWISE.
3. THE CONTRACTOR IS TO CHECK DRAWINGS AND TO VERIFY ALL DIMENSIONS ON SITE BEFORE COMMENCING ANY WORK OR MAKING ANY SHOP DRAWINGS. ANY DISCREPANCIES ARE TO BE NOTIFIED TO REV-A ASSOCIATES IMMEDIATELY.
4. THIS DRAWING IS THE PROPERTY OF REV-A ASSOCIATES. COPYRIGHT IS RESERVED BY THEM AND THE DRAWING IS ISSUED ON THE CONDITION THAT IT IS NOT COPIED, REPRODUCED, RETAINED OR DISCLOSED TO ANY UNAUTHORISED PERSON, EITHER WHOLLY OR IN PART, WITHOUT THE CONSENT IN WRITING OF REV-A ASSOCIATES.
5. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT BUILDING REGULATIONS AND ALL ASSOCIATED BRITISH STANDARDS.

Phase 1a

Phase 1b

Phase 2

41 Spaces

21 Spaces

18 Spaces

UNIT 1
Class A3
Gross Internal Area
180Sq.M/1940sq.ft

UNIT 2
Class A3
Gross Internal Area
180Sq.M/1940sq.ft

UNIT 3
Class A3
Gross Internal Area
Ground Floor 425Sq.M/4561sqm
First Floor 425Sq.M/4561sqm
Total: 1350Sq.M/14,522sq.ft

MONTGOMERY CANAL

RHALLT LANE

A458

OSWESTRY ROAD

P02	30/11/2022	AC	AA
Update to phasing			
P01	24/06/2022	AC	AA
Updates to layout			
Rev	Date	By	Checked

REV-A ASSOCIATES

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Client

Stephen James Property Ltd

Project Title

Moors Farm, Mixed Use Redevelopment

Date	Drawn By:	Checked By:
27/11/2020	AC	AA
Suitability	Scale	Revision
S0	1:500	P02

Drawing Name

Construction Phase Plan

Drawing Number

SHR17065-REVA-DR-A-014

PLANNING ISSUE

Appendix 2 –Topographical Survey

MONTGOMERY CANAL

R H A L L T L A N E

O S W E S T R Y R O A D

308950N

308900N

308850N

230000E

230250E

Legend

BL	BOLLARD
BS	BUS STOP
CATV	CABLE TV COVER
CL	COVER LEVEL
CPS	CONCRETE PAVING SLAB
DP	DRAIN PIPE
DK	DROP KERB
EL	ELECTRICITY COVER
EP	ELECTRICITY POLE
ER	EARTH ROD
FH	FIRE HYDRANT
FL	FLOOR LEVEL
FS	FLAG STAFF
G	GAS COVER
GLY	GULLY
GSV	GAS STOP VALVE
IC	INSPECTION COVER
IL	INVERT LEVEL
LB	LITTER BIN
LP	LAMP POST
MKR	MARKER
NB	NOTICE BOARD
P	POST
PH	POST HOLE
PLP	PEDESTRIAN LAMP POST
RE	RODDING EYE
RS	ROAD SIGN
STN	SURVEY STATION
STY	STAY WIRE
T	TELECOMMUNICATIONS COVER
TL	TRAFFIC LIGHT
TP	TELEGRAPH POLE
TWL	TOP OF WALL LEVEL
UTL	UNABLE TO LIFT
UTM	UNABLE TO MEASURE
VP	VENT PIPE
WL	WATER LEVEL
WP	WASTE PIPE
WSV	WATER STOP VALVE

FENCE TYPES

B/W	BARBED WIRE
C/B	CLOSE BOARD
P/W	POST AND WIRE
P/R	POST AND RAIL
C/L	CHAIN LINK
C/P	CHESTNUT PALE
C/W	CHICKEN WIRE
M/R	METAL RAIL (SECURITY TYPE)
P/F	PANEL FENCE
C/I	CORRUGATED IRON
I/R	IRON RAILING
RWL	RETAINING WALL

Notes

ANY SERVICES SHOWN ARE AS LOCATED BY EITHER GROUND PENETRATING RADAR (GPR) OR BY RADIODETECTION SCANNER IN EITHER ACTIVE (A) OR PASSIVE MODE (P) DUE TO SUBSOIL CONDITIONS AND OTHER FACTORS THE UNDERGROUND SERVICE INFORMATION SHOWN MAY NOT REPRESENT A COMPREHENSIVE RECORD AND ALL CONTRACTORS SHOULD PROCEED WITH CAUTION BEFORE EXCAVATION

• • —— • • —— • • DENOTES OVERHEAD CABLES

• —— • —— • DENOTES UNDERGROUND SERVICES

LEVELS AT ROAD KERBS ARE TAKEN AT CHANNEL LEVELS UNLESS OTHERWISE REQUESTED

STATION CO-ORDINATES

STN	1	E 324378.696	N 309270.881	H	69.591
STN	2	E 324281.885	N 309296.881	H	76.828
STN	3	E 324245.059	N 309185.299	H	76.636
STN	4	E 324226.287	N 309081.127	H	76.578
STN	5	E 324183.826	N 308989.476	H	76.611
STN	6	E 324141.806	N 308937.129	H	76.661
STN	7	E 324112.461	N 308893.518	H	78.345
STN	8	E 324154.959	N 308855.903	H	74.623
STN	9	E 324221.656	N 308912.220	H	73.438
STN	70	E 324292.709	N 309292.167	H	75.256
STN	71	E 324251.930	N 308865.946	H	72.958
STN	76	E 324158.479	N 308909.818	H	74.323
STN	93	E 324256.854	N 309139.257	H	73.656
STN	94	E 324268.311	N 309179.941	H	74.290
STN	95	E 324276.902	N 309206.261	H	74.338
STN	96	E 324303.462	N 309224.374	H	73.347
STN	97	E 324297.476	N 309246.264	H	73.845
STN	98	E 324302.972	N 309261.983	H	73.554
STN	99	E 324316.704	N 309296.143	H	72.279

BATTLEFIELD LAND SURVEYS LTD
3 YEOMANRY ROAD
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Client	Title
REV-A ASSOCIATES	MOORS FARM OSWESTRY ROAD, WELSHPOOL

Scale	Date	Job No	Dwg No	Rev.
1 : 200	05/05/23	13532	06	–

Surveyed by	Checked	Scanned	Levels are related to . . .
RDL/JS/HP CS/ME	RDL	NO	OS DATUM (VRS)

Appendix 3 –BEK Soakaway Report

GEO-ENVIRONMENTAL CONSULTING ENGINEERS

bEk Enviro Ltd
Suite One | No 3 Mitton Road Business Park
Mitton Road | Whalley | Lancashire | BB7 9YE
01254 377622
mbuckley@bekenviro.co.uk | bekenviro.co.uk

Our Ref: BEK/20771/201023/EG

23 October 2020

Euro Garages Ltd
Euro House
Beehive Trading Park
Haslingden Road
Blackburn
BB1 2EE

To whom it may concern,

Land at the north of Rhallt Lane, Welshpool - BRE 365 Percolation Test

BEK Enviro (BEK) have been commissioned by Euro Garages Ltd to determine soil infiltration rates at the above site using the BRE 365 methodology (2016) to assess the viability of disposal of surface water from the site via infiltration.

Percolation testing was undertaken in accordance with the requirements set out in BRE 365 (2016). A test pit was excavated at the site and an infiltration test was undertaken. The test was undertaken on 03rd October 2020 with dry conditions. The test location is presented on BEK Drawing No 20771-3, a copy of which is presented in Annex B.

In accordance with BRE 365 'the trial pit should be 0.3 to 1 m wide and 1 to 3 m long. It should have vertical sides trimmed square and, if necessary for stability, should be filled with granular material. Fill the pit and allow it to drain three times to near empty; each time record the water level and time filling. Calculate the soil infiltration rate from the time taken for the water level to fall from 75% to 25% effective storage depth in the pit, using the lowest f value of the three test results for design.'

The trial pit was excavated using a JCB 8104 excavator to a maximum depth of 2.00 m with the sides trimmed square. Water was discharged into pit using an ICB water bowser.

The test pit dimensions are as follows:

Test Pit No.	Length (m)	Width (m)	Depth (m)	Area (m^3)
SA1	1.80	0.80	2.00	2.88

Table 1: Test Pit Dimensions

The location of the infiltration test is included within Annex B of this report.

The ground conditions at the location of the test pit generally comprised of made ground overlying firm sandy clay. Water was discharged into the pit and the time taken for the water to infiltration into the soil was recorded as shown within the table below:

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Infiltration Test Results

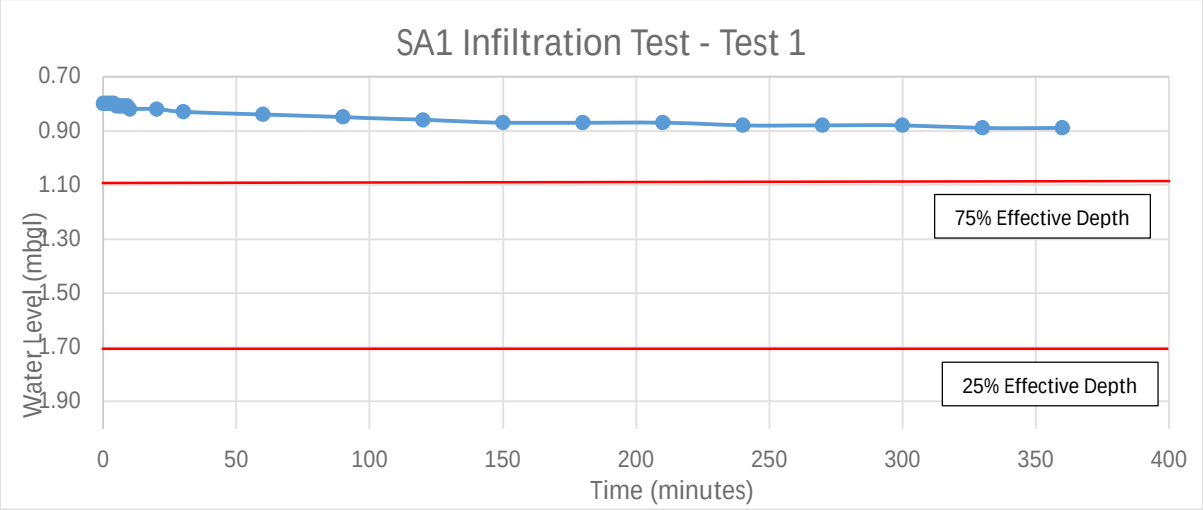
Soakaway Test 1

Depth to water at start of test: 0.80 m

A summary of the percolation test is shown within the table below:

Time (minutes)	Depth to Water (m bgl)	Notes
0	0.80	
5	0.81	
10	0.82	
20	0.82	
30	0.83	
60	0.84	
90	0.85	
150	0.87	
240	0.88	
300	0.88	
330	0.89	
360	0.89	End of test

Table 2: SA1 Infiltration Test



It can be seen from the above table that the water did not reach 75% effective depth after 6 hours of the test. Furthermore, 3 tests are required to be undertaken with the slowest infiltration rate used for design purposes therefore the test is considered to have failed.

Conclusion

An infiltration test trial pit was excavated at the site at Land at the north of Rhallt Lane, Welshpool and a single infiltration tests in accordance with BRE 365 (2016) was undertaken by BEK Enviro on 3rd October 2020.

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After 6 hours of the test, the water level had failed to reach 75% effective depth therefore the test was deemed to have failed and discharge of surface water from the site via infiltration methods is not considered to be viable at the site at Land at the north of Rhallt Lane, Welshpool.

I trust the above is satisfactory. Should you require anything further please do not hesitate to contact the undersigned.

Yours sincerely

[redacted]

MICHAEL BUCKLEY
BSc (Hons) MSc MIEnvSci CEnv

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ANNEX A

Infiltration Test Results

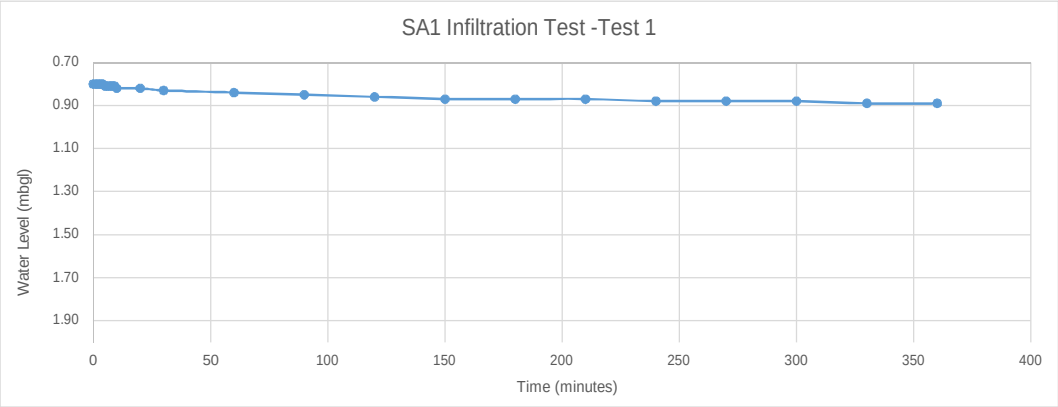
Land north of Rhallt Lane, Welshpool - Infiltration Test SA1 - Test 1

Date: 03/10/2020
Weather: Cloudy

Time (minutes)	Depth (mbgl)
0	0.80
1	0.80
2	0.80
3	0.80
4	0.80
5	0.81
6	0.81
7	0.81
8	0.81
9	0.81
10	0.82
20	0.82
30	0.83
60	0.84
90	0.85
120	0.86
150	0.87
180	0.87
210	0.87
240	0.88
270	0.88
300	0.88
330	0.89
360	0.89

	Length (m)	Width (m)	Depth (m)	Area (m^3)
Pit Dimensions:	1.80	0.80	2.00	2.88

Start water level (mb	0.80
Total Depth of test =	1.20
50% Effective Depth =	0.6
75% Effective Depth (mbgl) =	1.10
25% Effective Depth (mbgl) =	1.70



Soil Infiltration R f) = $\frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$

V_{p75-25} = effective storage volume of water in the trial pit between 75% and 25% effective depth
= 0.86 m^3

a_{p50} = internal surface area of the trial pit up to 50% effective depth and including base area
= 4.56 m^2

t_{p75-25} = time for water to fall from 75% to 25% effective depth

= - mins
= #VALUE! seconds

Soil Infiltration R f) = = **#VALUE!**
= #VALUE! m/s
= #VALUE! m/hour

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ANNEX B

Site Investigation Location Plan