Rimington Leisure Park– Site Extension

Flood Risk Assessment and Drainage Strategy

Prepared on behalf of

Rimington Leisure Park Ltd
March 2020

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Registered Office:

Document control

Document:	Flood Risk Assessment and Drainage Strategy Report	
Project:	Rimington Leisure Park – Site Extension	
Client:	Rimington Leisure Park Ltd	
Job Number:	A114917	
File Origin:	\\manchester32\Jobs\2019\A114917 Rimington Leisure Park\Docs\Reports\Flood Risk Reports	
Revision:	V1	
Date:	12/03/2020	
Prepared by	Checked by	Approved By
L. Beattie	M. Khan	L. Baran
Description of Revision		
Revision:		
Date:		
Prepared by	Checked by	Approved By
Description of Revision		
Revision:		
Date:		
Prepared by	Checked by	Approved By
Description of Revision		

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1. Introduction

WYG have been appointed by Rimington Leisure Park Ltd to prepare a Flood Risk Assessment (FRA) and an Outline Drainage Strategy in support of a planning application for the proposed extensions of an existing caravan park at Rimington Leisure Park (Holgates). The planning application area is currently farmland and there is a need to expand the current caravan site to accommodate 62 new static caravans, a store building and yard, a children's play area and treatment plants across two land parcels.

The main objective of the Flood Risk Assessment (FRA) are as follows:

- Confirm that the proposed development will not be subject to an unacceptable flood risk;
- Demonstrate that the proposed development will not increase risk of flooding elsewhere;
- Confirm that satisfactory strategies to deal with surface water are achievable for the proposed development.

1.1 Site Location

1.1.1 Rimington Caravan Park is located off Cross Hill Lane, Rimington, BB7 4EF. Rimington Leisure Park is a mix of undeveloped land and an existing caravan park.

1.1.2 The northern Parcel A (Extension 1) is bound by undeveloped land to the east and west, a residential dwelling and undeveloped land to the north and the existing leisure park to the south.

1.1.3 The southern Parcel B (Extension 2) is bound by undeveloped land to the northwest, southwest and southeast and the existing leisure park to the east. Eel beck runs through the middle of the two proposed developments as indicated on **Figure 1.1**.

1.1.4 The proposals comprise 62 new static caravans, a store building and yard, a children's play area and treatment plants across two land parcels at the existing Rimington Leisure Park. Proposed extension 1 is situated to the North-west of the existing caravan site. The second proposed extension is to the west of the existing park which is highlighted in **Figure 1.1**.

1.1.5 The proposed development site is located approximately 4km North East of Rimington Village and 20km north of Burnley.

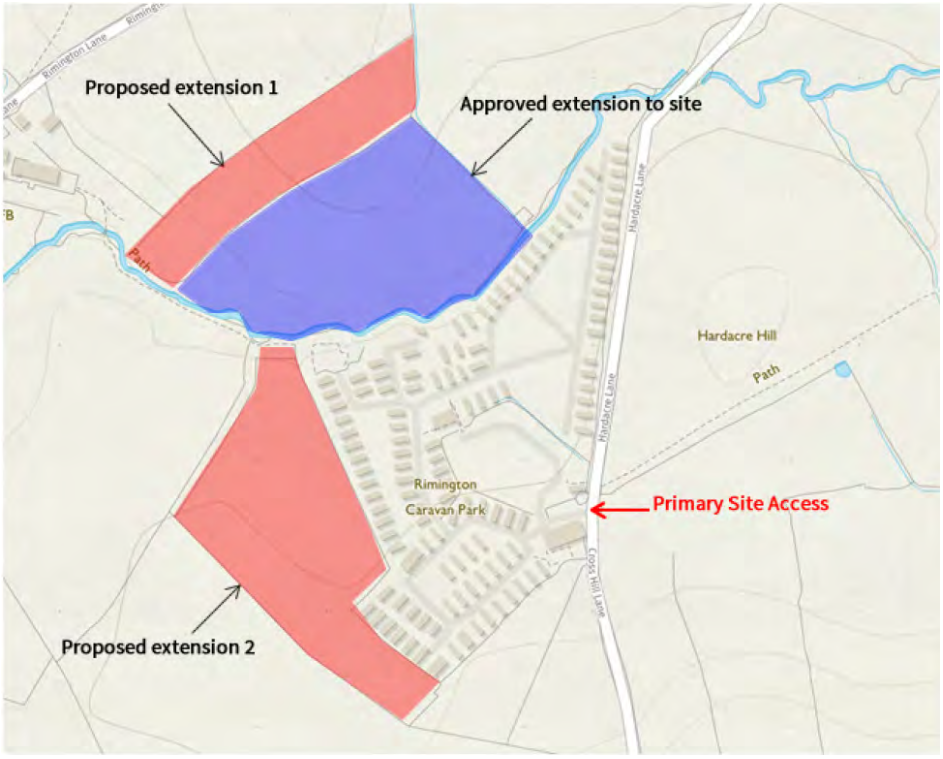


Figure 1.1- Indicative boundaries for Approved Extension and Development proposals

1.1.6 The site is accessed off Cross Hill Lane. The existing site access is a simple priority T-junction. Just north of the site access, Cross Hill Lane becomes Hardacre Lane. Hardacre Lane extends north from the site access to a priority-controlled junction with the A682. The site is approximately 2.3km north east of the Rimington Village.

1.1.7 The approximate Ordinance Survey (OS) grid reference for the centre of the site is 382512 (Easting), 446970 (Northing). The location of the site is shown in **Figure 1.2**.

Figure 1.2 Extract of Site Location Plan

1.2 Site Context

1.2.1 The site comprises the proposed extension to the existing caravan park which is achievable over two parcels of land as shown in **Appendix C**.

1.2.2 The existing site area is classified as a greenfield site.

Run-off Area	Area (m^2)	Area (ha)
Parcel A – Extension 1	10805	1.08
Parcel B - Extension 2	19720	1.97

Table 1.1 Existing Greenfield Site Areas

Run-off Area	Area (m^2)	Area (ha)	Proposed Caravan Spaces
Proposed Extension - Parcel A Roads and Spaces	872	0.0872	15
Proposed Extension - Parcel B Roads and Spaces	2108	0.2108	47

Table 1.2 Proposed Hardstanding Site Areas

1.3 Planning Policy Contexts

1.3.1 The National Planning Policy Framework (NPPF) incorporates the planning system objectives set out by the Government to promote sustainable development, avoiding flood risk and accommodating the impact of climate change.

1.3.2 The development proposal exceeds 1 hectare in area and therefore will require a Flood Risk Assessment, in accordance with NPPF.

1.3.3 The NPPF categorises the caravan park development as 'less vulnerable' in Table 1: Flood Risk Vulnerability classification within the technical guidance to the NPPF. Table 2: Flood Risk Vulnerability and Flood Zone 'Compatibility' within the NPPF confirms that this type of land use is appropriate for Flood Zone 1, providing there is no increase in flood risk elsewhere due to the proposals. Rimington Leisure Park is located in Flood Zone 1.

1.4 Local Policy

1.4.1 In accordance with the Flood and Water Management Act (2010) Section 9, the Local Lead Flood Authority (LLFA) are responsible for managing the localised flood risk. Ribble Valley Borough Council (RVBC) have produced a Strategic Flood Risk Assessment (SFRA, 2017). The

strategy sets out to identify local flood risks, how they can be managed and their approach to flood risk affecting infrastructure. The accompanying site-specific FRA applies the guidance contained within the SFRA alongside current national policy.

1.5 Third Party Consultation

1.5.1 The preparation of this report has involved consultation with the following interested parties; Lancashire County Council (LCC), Environment Agency (EA) and United Utilities (UU).

1.5.2 LCC have been consulted as the (LLFA). The NPPF advises that consultation should be undertaken with the LLFA and the EA to provide guidance on flood issues at a strategic level and meet the requirements for the planning application for Rimington Leisure Park, Flood Risk Assessment and Drainage Strategy. LCC were contacted to discuss localised flooding and asked for any information that could support the Flood Risk Assessment. The Eel beck identified running through the Rimington Leisure Park is managed by the LLFA and therefore discharge consents will be required for any proposed discharges into the ditch.

1.5.3 The Environment Agency have also been consulted with regards to the site location and requests for any information that would be useful to for the Flood Risk Assessment were made. However, there are no main rivers near the development site and therefore this will not affect the EA. Please refer to **Appendix D**.

1.5.4 The United Utilities developer services were contacted to discuss whether UU have records of any historical flood issues in the areas and any background information required for the FRA. However, the surface water connection would not be feasible unless all other options have been exhausted. Therefore, this option will not be explored any further.

2. Flood Risk Assessment

2.1 Topography

2.1.1 The topography throughout the site falls towards the Eel Beck running along the centre of the application area. The surface water runoff has been shown in **Figure 2.1**.

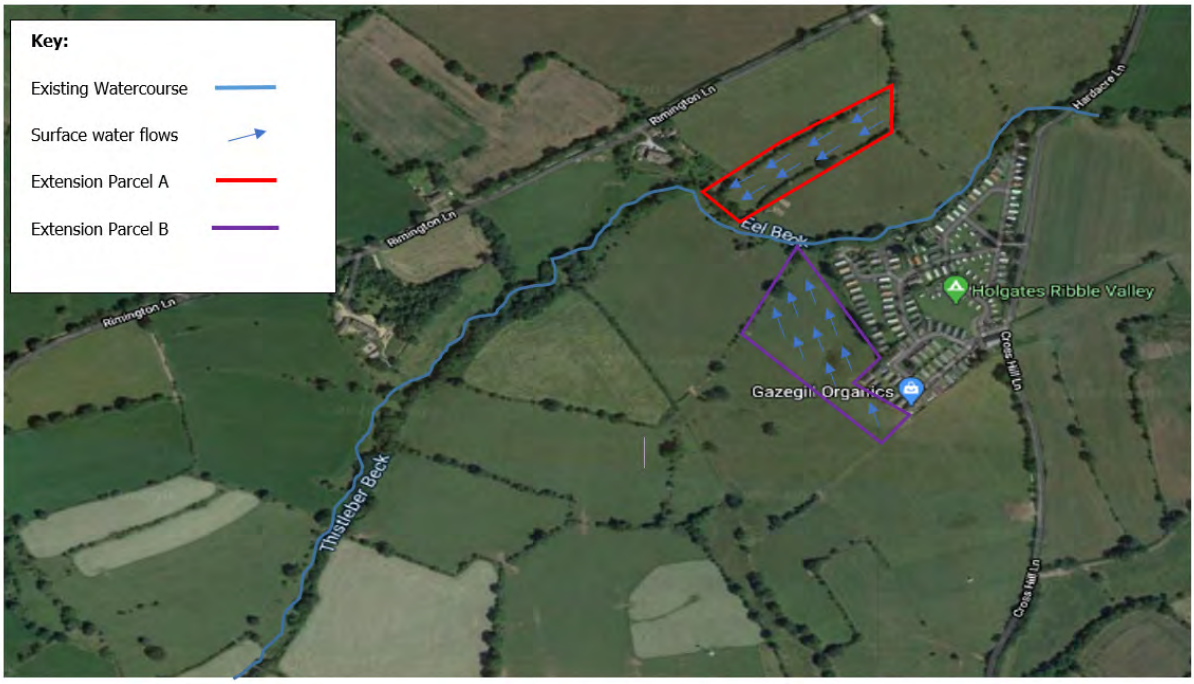


Figure 2.1 General Topography (Extract from Google Maps)

2.1.2 The topographical levels have been included in **Appendix B**. It is proposed to utilise the existing offsite drainage for surface water disposal at the existing greenfield rate of discharge (Refer to **Appendix E**).

2.1.3 The ground elevations at the lowest part of the site for Parcel A is approximately 140m above Ordnance Datum (AOD) and the site rises to approximately 151mAOD east of the proposed extension 1.

2.1.4 The ground elevations at the lowest part of the site for Parcel B is approximately 140m above Ordnance Datum (AOD) and the site rises to approximately 154mAOD south of the proposed extension 2.

2.2 Development Proposal

2.2.1 The site currently has permission for 200 caravans. Of the 200 consented units, 120 static caravans and 50 touring pitches for caravans at the site are operational. Work is under way to deliver a further 30 units. The previous application reference is 3/2013/0059.

2.2.2 A masterplan of the proposed extension and associated developments at Rimington Leisure Park has been presented in **Appendix C** shown in **Figure 2.2** (below). The proposed development area is shown in red and the previous application that has been approved is shown in blue. The proposed works comprise:

- 62 static caravans, a store building and yard and a children's play area;
- Construction of a new road to access the static caravans;
- New treatment plant and a landscaped area.

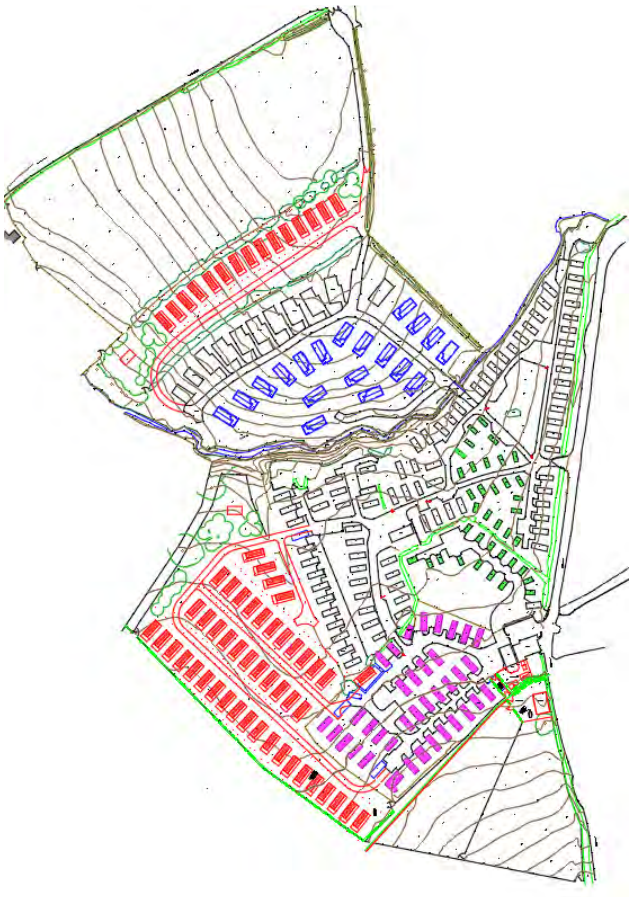
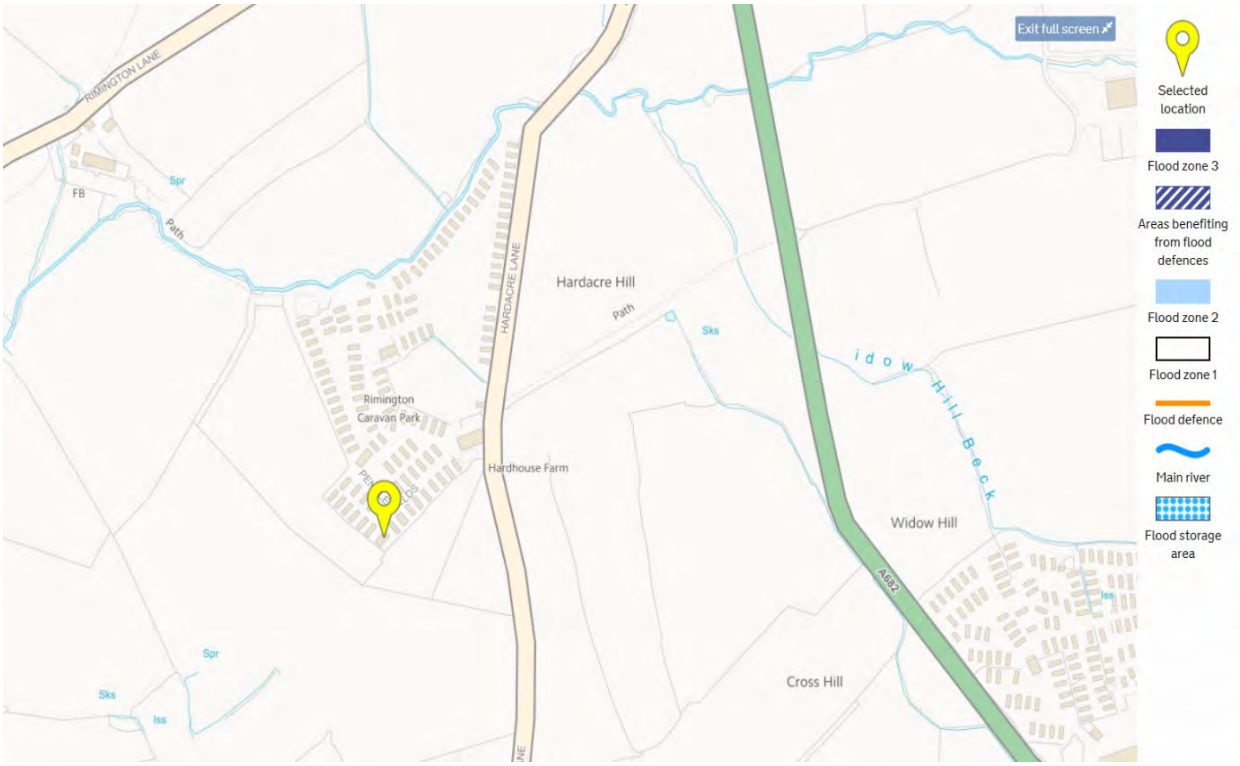


Figure 2.2 Proposed Planning Layout (Extract)

2.3 Flood Mapping & Watercourses

2.3.1 A review of the Environment Agency's (EA) Flood Map (Rivers and Sea) – see **Figure 2.3** indicates that the proposed development is located within Flood Zone 1 and therefore the annual probability of flooding from rivers is <0.1% (less than 1 in 1000 years).

2.3.2 In accordance with Table 3 of the NPPF Technical Guidance document: Flood Risk and Coastal Change, the exception test in not required for development as it is within in Flood Zone 1.



2.3 EA Flood Maps (Rivers and Sea Extract)

2.3.3 The EA Flood Map (Rivers and Sea) indicates that the nearest Main River (River Ribble) is approximately 2.5km north west of the site. The existing watercourse known as Eel Beck, which flows through the centre of the development site and ultimately flow back into the River Ribble. The Eel beck is a ditch which is classed as an ordinary watercourse.

Surface Water

2.3.4 The EA Flood Map for Surface Water (FMfSW) classifies the risk from surface water flooding using the following four categories:

- **Very Low** – Less than a 0.1% probability of occurrence in any given year;
- **Low** – Between a 0.1%-1% probability of occurrence in any given year;
- **Medium** – Between a 1%-3.3% probability of occurrence in any given year; and
- **High** – Greater than a 3.3% probability of occurrence in any given year.

2.3.5 The EA 'Risk of Flooding from Surface Water' map – see **Figure 2.4.** shows that the majority of the site is at very low risk of surface water flooding, meaning it has less than a 0.1% annual probability of occurrence. The EA map identifies isolated areas at low risk which do not represent a risk to the site. However, the Eel beck which flows through the central region of the existing Leisure Park, indicates high surface water flood risk, the watercourse is at a low level and the caravan spaces will be positioned away from the Eel Beck in the areas of low risk.

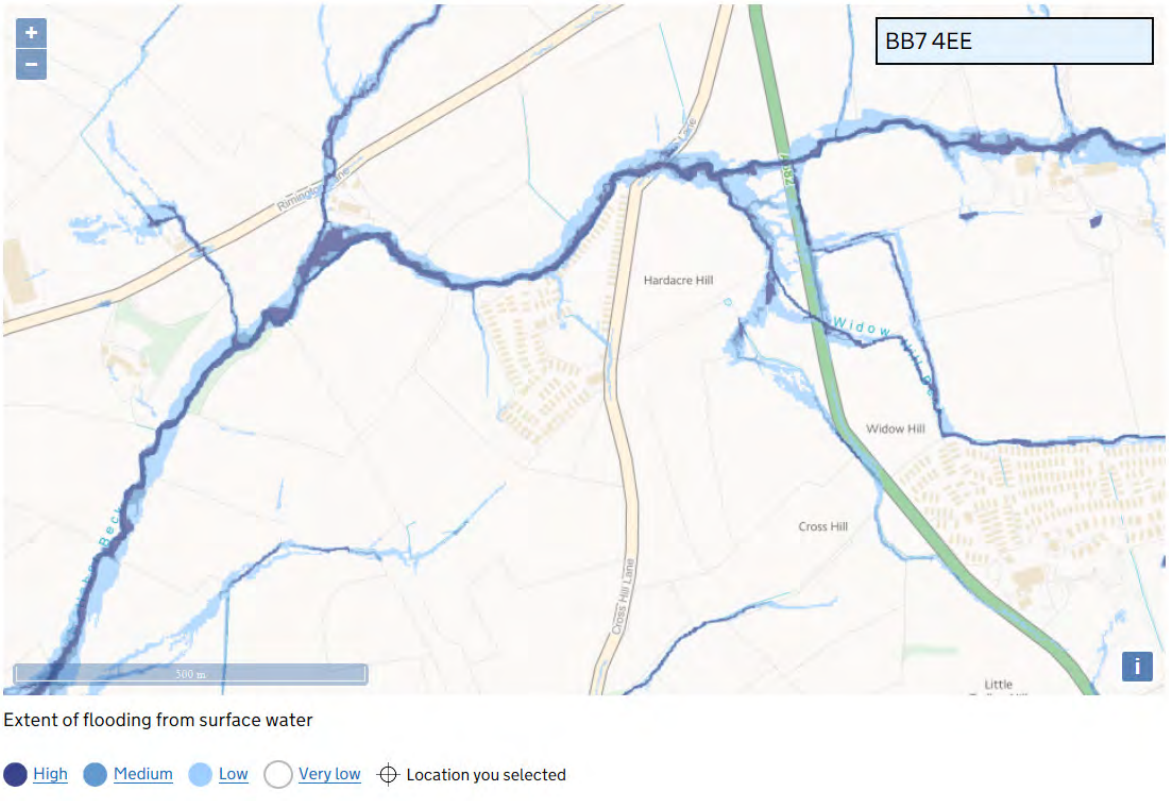


Figure 2.4 EA Flood Maps EA (Surface Water Extract)

Tidal Flood Risk

2.3.6 The tidal / coastal flooding generally results from a combination of high tides and stormy conditions. If low atmospheric pressure coincides with a high tide, a tidal surge may occur which can cause potentially serious flooding.

2.3.7 Due to the location of the subject site, this form of flooding will not occur and therefore it is concluded that there is no risk from this mode of flooding. On this basis, tidal / coastal flooding is not considered further.

Fluvial Flood Risk

2.3.8 River (fluvial) flooding generally occurs when a watercourse cannot cope with the water draining into it from the surrounding land. This can happen, for example, when heavy rain falls on an already waterlogged catchment or when blockages occur in culverts, channels and flood corridors. The EA map indicates that the proposed site has no risk of fluvial flooding. This is consistent with the topographical levels in relation to the local watercourses and distance away from the main River Ribble.

2.4 Localised Flooding

2.4.1 There are flood risk areas on the map across the central region of the proposed development site. However, Lancashire County Council (LCC) have not expressed any concerns that the local area floods from an open watercourse and Surface Water Flooding.

2.4.2 The existing occupiers have stated that they have no recollection of any flood incidents.

2.5 Geology

2.5.1 Ground Water flooding can occur from three main sources:

- Raised water tables;
- Seepage and percolation;
- Recovery or Rebound.

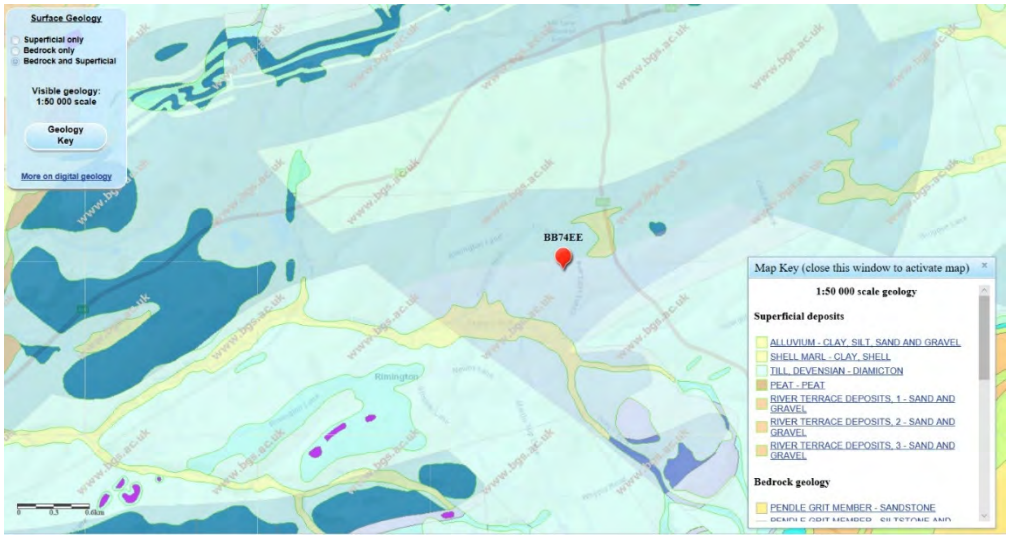
2.5.2 If the groundwater levels are naturally close to the surface, then this can present a flood risk during times of intense rainfall. No groundwater flooding has been shown on the Environment Agency groundwater mapping data.

2.5.3 Seepage and percolation occur in embankments above ground level. The water travels through the embankment material and emerges on the opposite side. There are no significant embankments close to the application area. Therefore, there are no reports of problems with Ground Water flooding.

2.5.4 Ground Water recovery or rebound occurs where the water table has been artificially depressed by abstraction. When the abstraction stops the water table makes, a recovery to its original level. As with the seepage scenario the likelihood of flooding from this source is low.

2.5.5 The superficial deposits beneath the proposed development area are shown as Devensian till deposits. These deposits are underlain by bedrock of the Mudstorm formation.

Figure 2.5 Geology of Britain (Surface Geology Extract)



2.5.6 The ground is not located within a Source Protection Zone. However, it is located within a groundwater vulnerability zone.

2.5.7 A site walkover was undertaken in February 2020, and the trenches identified there was approximately 150-200mm of topsoil and the sub-soil was clay. This was the general findings across the development site.

2.6 Flood Risk Summary

2.6.1 A summary of the potential flood risks has been tabulated in **Table 2.1**;

Table 2.1 Flood Risk Summary

Potential Flood Source	Overall Flood Risk				
	None	Very Low	Low	Medium	High
Tidal		x			
Fluvial		x			
Pluvial			x		
Groundwater		x			
Public Sewers	x				
Artificial	x				
Roads		x			

2.6.2 Based on the information above the site does not suffer from flooding and is overall classed as a low risk site.

3. Drainage Strategy

3.1 Pre-development Surface Water Run-off

3.1.1 The surface water run-off rates have been calculated using the Modified Rational method and the IH124 Greenfield run-off method. The Rainfall catchment characteristics have been selected using the Flood Studies Report (FSR).

3.1.2 The total application site area is approximately 3.05ha and is currently 100% pervious. The annual return period using IH124 has been calculated to be 28.6l/s. The peak flow during a 1 in 100 year return period is approximately 59.5l/s. Refer to **Appendix E**.

3.1.3 The extension is split into two separate surface water catchments; The surface water runoff flows across the 150-200mm of top-soil and ultimately discharges freely into the Eel Beck. The undulations in the ground convey the existing surface water flows towards the lowest parts of the site. The road elevations are higher, and the surface water runoff which drains via gullies into the greenfield areas and migrates towards the Eel Beck.

3.1.4 The previous planning application have accepted the existing drainage arrangement based on the ground conditions (clay) and the insignificant increase in impermeable area.

3.2 Post-development Surface Water Run-off

3.2.1 The natural soils and existing landscaping soils are considered Devensian till, clayey material and therefore the material used for the contouring is likely to be of a similar nature. This will provide similar run-off characteristics to the existing soils. The static caravan slabs will be made of concrete and gravel in some areas.

3.2.2 The surface water runoff rate will mimic the existing greenfield run-off rates. The catchment areas have been split below:

Run-off Area	Impermeable Area (m^2)	Area (ha)	Qmax (l/s)
Proposed Extension - Parcel A Roads and Spaces	872	0.0872	0.88
Proposed Extension - Parcel B Roads and Spaces	2108	0.2108	2.04

Table 3.1 Catchment Split

3.3 Sustainable Urban Drainage System (SuDS)

3.3.1 In accordance with the NPPF, sustainable urban drainage systems (SuDS) should be incorporated in to designs to manage surface water, to reduce the downstream flows to both the watercourse and sewage systems.

3.3.2 SuDS can be used to improve the water quality, water quantity and to facilitate the flows. Where possible peak water surface discharge rates should be reduced.

3.3.3 SuDS should be used instead of the conventional method of buried pipe work wherever practical and possible. Opportunities should be considered to provide soft landscaping on the development site.

3.3.4 Surface water run-off can be reduced by SuDS such as swales, permeable paving and other treatment methods. However, there are no impermeable areas within the application areas.

3.3.5 The drainage strategy will discuss feasible options for the SuDS method stated above.

4. Surface Water Management

4.1.1 There are no reports of any previous flooding and therefore the existing surface water management would be sufficient.

4.1.2 The drainage strategy associated with extension site has been considered utilising the following documentation: NPPF, Sewers for Adoption.

4.1.3 The three methods that have been reviewed for the management of the surface water discharge are as follows:

- Discharge via infiltration;
- Discharge into the watercourse;
- Discharge into public sewer system.

4.2 Discharge via Infiltration

4.2.1 Based on the BGS mapping data and soil type information, the site is expected to be of low permeability. Where the caravan extension slabs are being developed will have similar characteristics as the clay, and will only increase the runoff time taken to reach the watercourse.

4.3 Discharge to Watercourse

4.3.1 The EA's mapping data identifies the Eel beck flowing through the Rimington Leisure Park.

4.3.2 There will be no surface water outfalls and the site will runoff into the watercourse.

4.3.3 The principles outlined above are based on the existing lay of the land and how the current greenfield site drains.

4.4 Discharge to Public Sewer

4.4.1 In accordance with the Local Flood Risk Management Strategy (LFRMS), connection to the public sewer is the last option and this will only be considered if all other surface water management methods have been exhausted.

4.4.2 This option is not feasible due to the existing surface water management and will not be explored any further. There are also no public sewers located within the caravan site.

4.5 Climate Change

4.5.1 The climate change in the UK varies by region and changes significantly. The NPPF technical Guidance Table 5 states that the recommended national precautionary sensitivity ranges for increase of peak rainfall intensity is 40%. The impact of climate change means that there is likely to be an increase average sea levels.

4.5.2 To manage the risks associated with the long-term impacts of climate change, the peak rainfall intensity of the 1 in 100 year rainfall events is to be increased by 40% in accordance with the recommendations given in the NPPF Technical Guidance. However, the proposed extension is insignificant and therefore climate change will not be considered. The proposed surface water flows will mimic the existing site conditions.

4.6 Proposed Foul Water

4.6.1 As there are no existing public or known foul sewers serving the area it will be necessary to drain the caravans via a gravity drainage system to a privately maintained sewage treatment plant which will discharge treated effluent into the existing watercourse.

4.6.2 There will be two sewer treatment plants located within of the application site (one for each parcel) and a permit will be required from the Environment Agency for the discharge of the treated effluent from each.

4.6.3 The sewage treatment plant is to be a GRAF Professional 100 Einwohner 2 x Carat XXL 22000 Litre (47 spaces), Klaro XL 35 EW - Tankdom Maxi 2 x Carat XL 8500 L (15 spaces) Treatment Plant or similar approved (at detailed design stage) and details of the proposed treatment plant are contained within **Appendix F**.

5. Conclusion

5.1 Summary

5.1.1 The application site area and the existing leisure park is situated in Flood Zone 1 and therefore the risk from flooding from rivers and the sea is considered very low.

5.1.2 There are no public sewers serving the development site or any of the adjacent properties.

5.1.3 It is proposed to drain the foul drainage from the development site into a privately maintained sewage treatment plant located within each parcel of Land, which will discharge the treated effluent into the existing watercourse. A permit will be required from the Environment Agency for the discharge of the treated effluent from each sewage treatment plant outfall.

5.1.4 The existing surface water from the site falls from two parcels of land (Extension 1 and 2) and drains to an existing watercourse central part of the site.

5.1.5 The total site area is 100% pervious. The annual return period (QBAR) has been calculated using IH124 is calculated to be 28.6l/s. The discharge from the extension areas:

i) Extension 1 – 0.88 l/s (QBar)

ii) Extension 2 – 2.04 l/s (QBar)

5.1.6 The impermeable area increase is insignificant and will not need to be restricted.

5.1.7 LCC were contacted to discuss localised flooding and asked for any information that could support the Flood Risk Assessment.

5.1.8 There are flood risk areas on the map across the central region of the proposed development site. However, LCC have not expressed any concerns that the local area floods from an open watercourse and surface water flooding. The caravans and sewage treatment plants will be located away from the ordinary watercourse at a higher level.

5.1.9 The existing occupiers have stated that they have no recollection of any flood incidents.

5.1.10 Based on the information above the preferred option would be to allow the surface water to drain into the existing watercourse central of the application area. The surface water run-off from each catchment will mimic the existing flows. The surface water run-off will be discharged freely into the Eel beck

5.1.11 The roads will runoff into the existing Greenfields and any low spots will be captured by gullies which will have a lateral connection into the fields.

5.1.12 The minimum development control standard for flood risk has been taken into consideration when determining the existing peak flow discharge rate.

5.1.13 The proposed development will not cause any long-term impacts of climate change. The peak rainfall intensity will mimic the existing conditions.

5.1.14 This report has been prepared in consultation with the relevant parties and incorporates their comments where possible. The Flood Risk Assessment is in accordance with the 'The National Planning Policy Framework (NPPF), Planning Practice Guidance (PPG) document: Flood risk and coastal change' issued by the Department of Communities and Local Government and therefore can be considered appropriate for the planning application.

5.2 Recommendations

5.2.1 In relation to the proposed sewage treatment plant, a Part 6.5a permit will be required to be obtained from the Environment Agency.

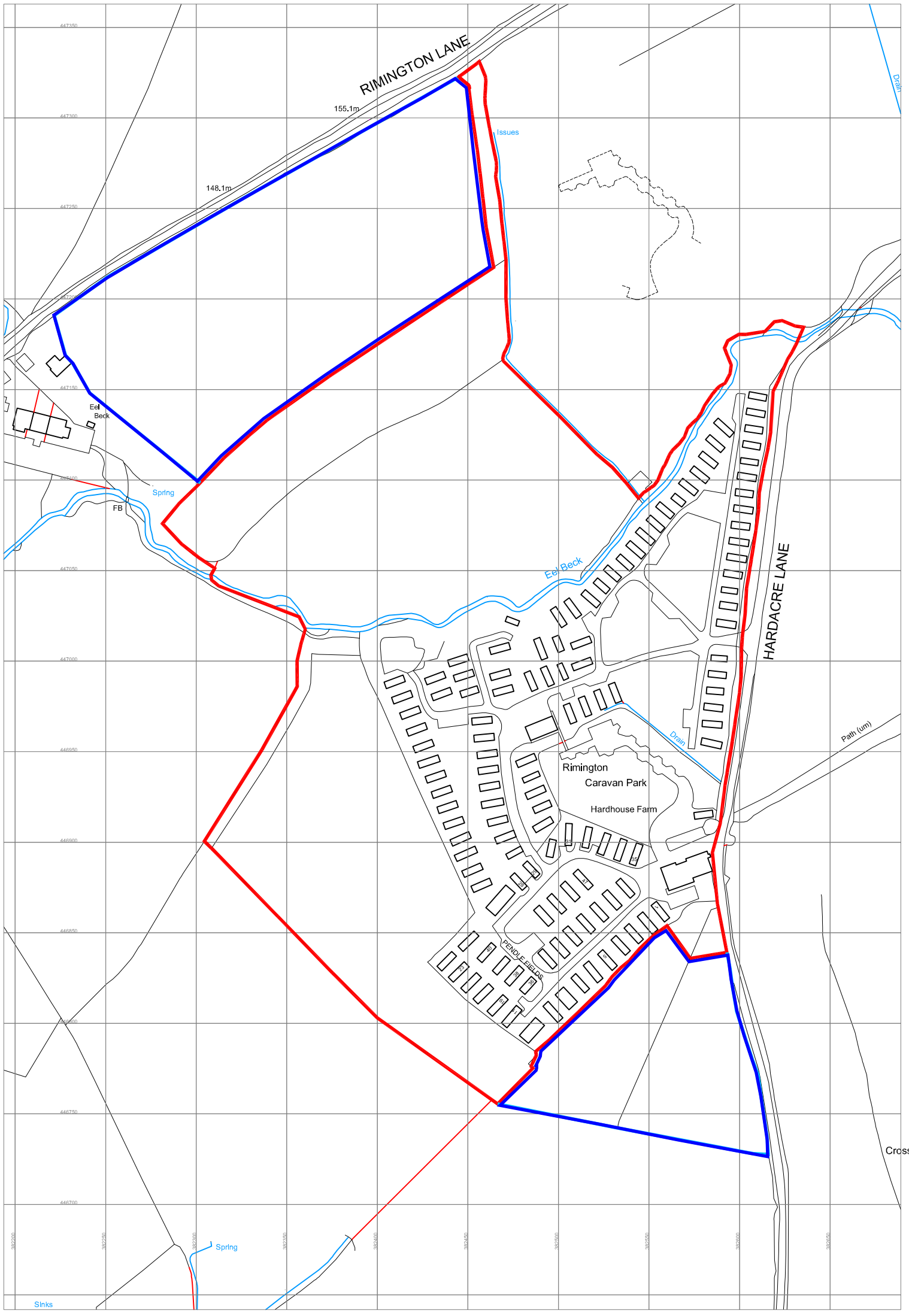
5.2.2 All new on-site drainage will be designed and constructed in accordance with;

- Sewers for Adoption – 7th Edition;
- Civil Engineering Specification for the Water Industry – 7th Edition.

Appendix A – Site Location

Site Location Plan

Proposed alterations &
extension to Rimmington
Leisure Park
Hardacre Lane
Rimmington BB7 4EE



10 0 10 20 30 40 50
Metres

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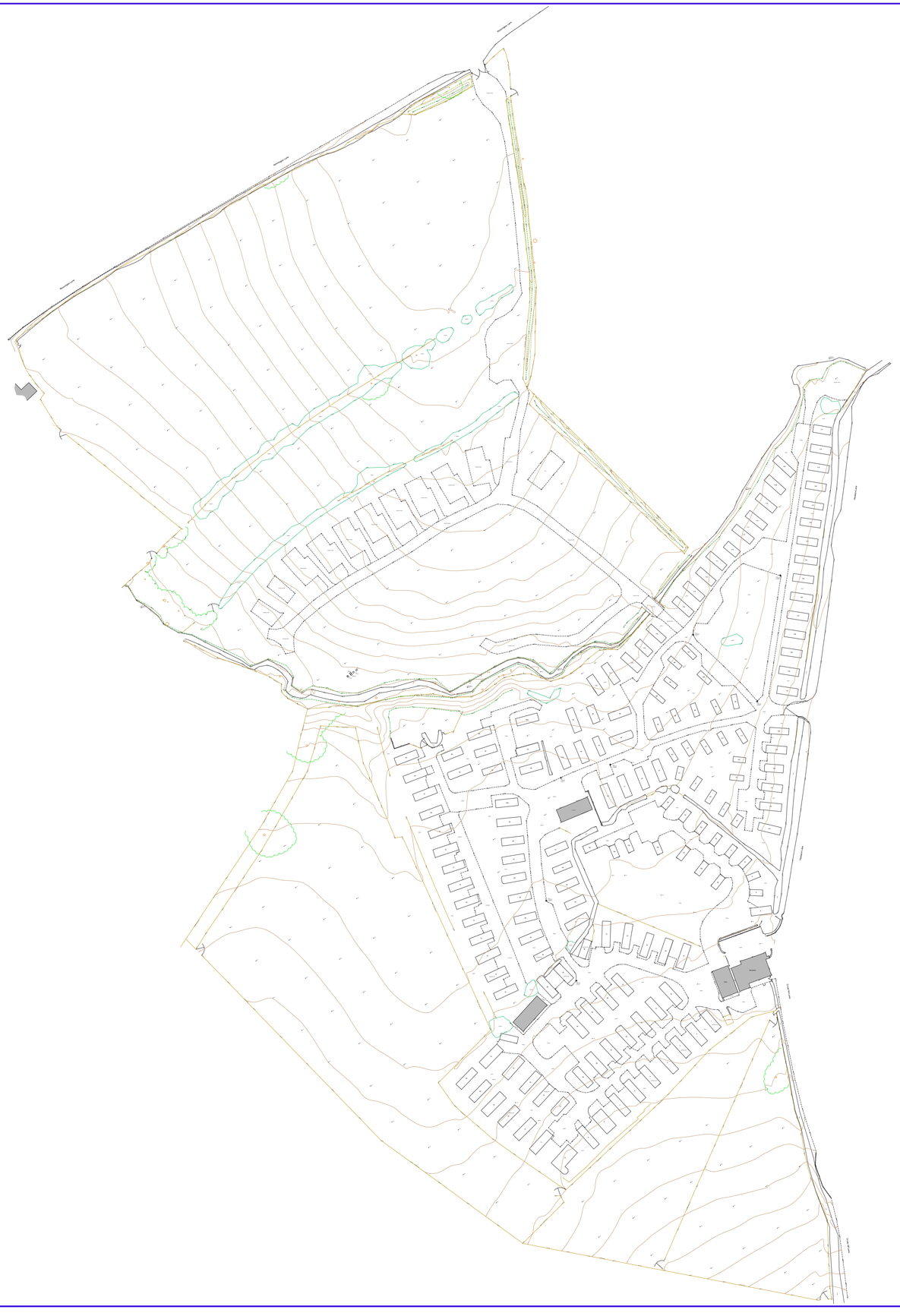
Site Location Plan
dwg.no.SK-RLP-001
Scale 1:2500 @ A4

Appendix B – Topographical Survey



Notes

All Dimensions to be checked on site. Walls shown on plans are not to be assumed to be solid & should be checked for thickness, construction, load bearing capacity & stability.

North

0 2 4 6 8 10 12 14 16 18 20

Metres

ABBREVIATIONS

CL Cover Level
MH Man Hole

NOTE

All levels and coordinates relate to OSGB36(15) using GNSS data.

Levels defining edge of carriageway are observed at channel (bottom of kerb).

Rev.0 Description. Issued

TriCAD Solutions Ltd.
BUILDING & LAND SURVEYORS
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tel 01254 614055 fax 01254 209754 e-mail sales@tricadsolutions.co.uk

Site Address

Rimington Leisure Park
Hardacre Lane
Rimingyon. BB7 4EE

Project Description

Site Survey

Drawing Title

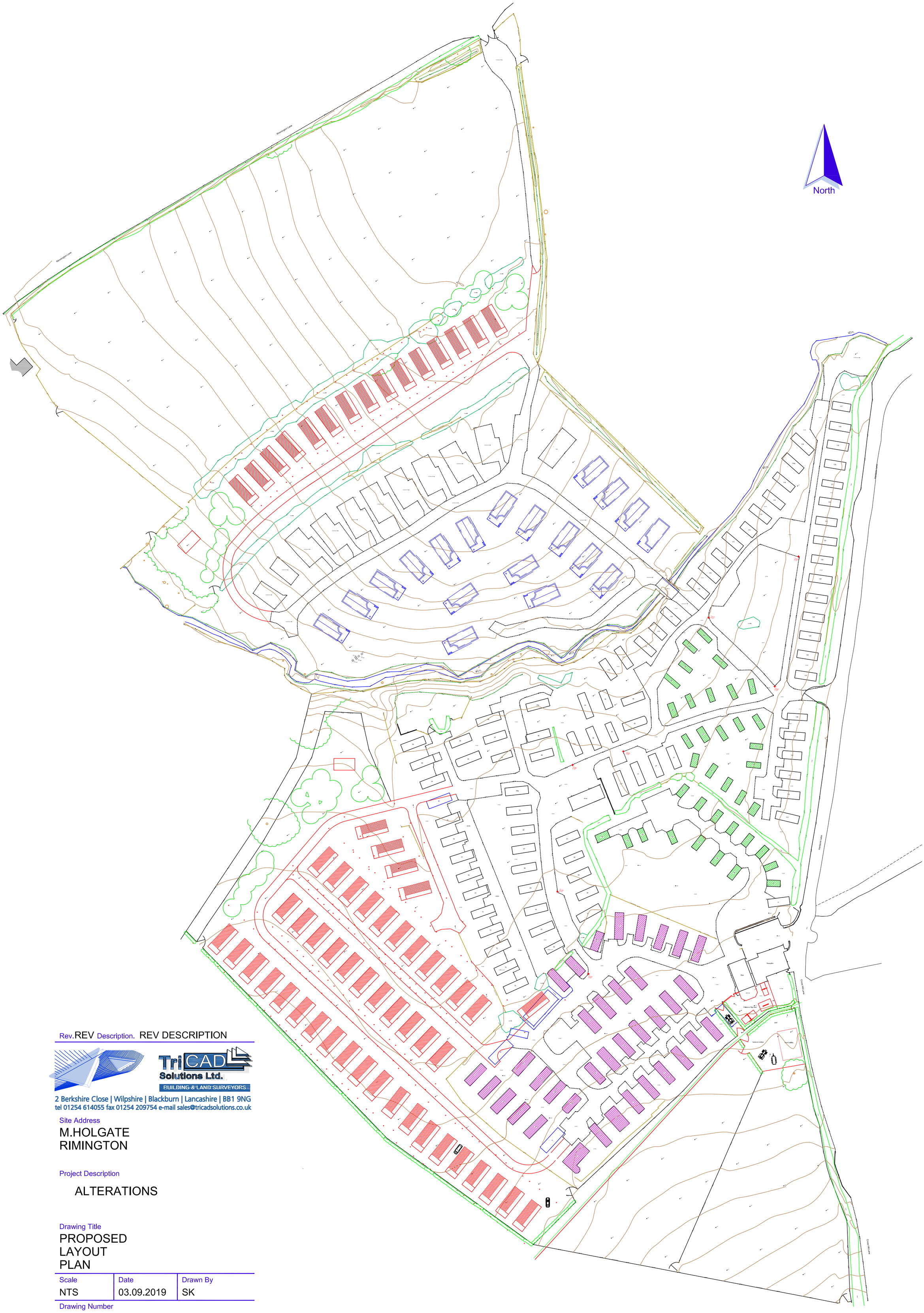
Existing Site Layout

Scale	Date	Drawn By
NTS@A1	28/05/2019	MW

Drawing Number

TRI-2678-17

Appendix C – Masterplan



Rev.REV Description. REV DESCRIPTION

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Site Address

M.HOLGATE
RIMINGTON

Project Description

ALTERATIONS

Drawing Title

PROPOSED
LAYOUT
PLAN

Scale	Date	Drawn By
NTS	03.09.2019	SK

Drawing Number

SK-S-100A

Appendix D – Correspondence

United Utilities Water Limited
Developer Services & Metering
2nd Floor, Grasmere House
Lingley Mere Business Park
Lingley Green Avenue
Warrington
WA5 3LP

Planning.liaison@uuplc.co.uk

Ribble Valley Borough Council
Council Offices, Church Walk
Clitheroe
BB7 2RA

Your ref: 3/2019/1011
Our ref: DC/19/5443
Date: 06-JAN-20

Dear Sir/Madam,

Location: Rimington Caravan Park, Hardacre Lane, Rimington BB7 4EE
Proposal: change of use of land to form extensions to existing caravan site for the siting of a further 62 holiday caravans and engineering works

With regards to the above development proposal, United Utilities Water Limited ('United Utilities') wishes to provide the following comments.

Drainage

In accordance with the National Planning Policy Framework (NPPF) and the National Planning Practice Guidance (NPPG), the site should be drained on a separate system with foul water draining to the public sewer and surface water draining in the most sustainable way.

We request the following drainage conditions are attached to any subsequent approval to reflect the above approach detailed above:

Condition 1 – Surface water

No development shall commence until a surface water drainage scheme has been submitted to and approved in writing by the Local Planning Authority. The drainage scheme must include:

- ***(i) An investigation of the hierarchy of drainage options in the National Planning Practice Guidance (or any subsequent amendment thereof). This investigation shall include evidence of an assessment of ground conditions and the potential for infiltration of surface water;***
- ***(ii) A restricted rate of discharge of surface water agreed with the local planning authority (if it is agreed that infiltration is discounted by the investigations); and***
- ***(iii) A timetable for its implementation.***

The approved scheme shall also be in accordance with the Non-Statutory Technical Standards for Sustainable Drainage Systems (March 2015) or any subsequent replacement national standards.

The development hereby permitted shall be carried out only in accordance with the approved drainage scheme.

Reason: To promote sustainable development, secure proper drainage and to manage the risk of flooding and pollution.

Condition 2 – Foul water

Foul and surface water shall be drained on separate systems.

Reason: To secure proper drainage and to manage the risk of flooding and pollution.

The applicant can discuss any of the above with **Developer Engineer, Thomas Bethell**, by email at wastewaterdeveloperservices@uuplc.co.uk.

Please note, United Utilities are not responsible for advising on rates of discharge to the local watercourse system. This is a matter for discussion with the Lead Local Flood Authority and / or the Environment Agency (if the watercourse is classified as main river).

If the applicant intends to offer wastewater assets forward for adoption by United Utilities, the proposed detailed design will be subject to a technical appraisal by an Adoptions Engineer as we need to be sure that the proposal meets the requirements of Sewers for Adoption and United Utilities' Asset Standards. The detailed layout should be prepared with consideration of what is necessary to secure a development to an adoptable standard. This is important as drainage design can be a key determining factor of site levels and layout. The proposed design should give consideration to long term operability and give United Utilities a cost effective proposal for the life of the assets. Therefore, should this application be approved and the applicant wishes to progress a Section 104 agreement, we strongly recommend that no construction commences until the detailed drainage design, submitted as part of the Section 104 agreement, has been assessed and accepted in writing by United Utilities. Any works carried out prior to the technical assessment being approved is done entirely at the developers own risk and could be subject to change.

Management and Maintenance of Sustainable Drainage Systems

Without effective management and maintenance, sustainable drainage systems can fail or become ineffective. As a provider of wastewater services, we believe we have a duty to advise the Local Planning Authority of this potential risk to ensure the longevity of the surface water drainage system and the service it provides to people. We also wish to minimise the risk of a sustainable drainage system having a detrimental impact on the public sewer network should the two systems interact. We therefore recommend the Local Planning Authority include a condition in their Decision Notice regarding a management and maintenance regime for any sustainable drainage system that is included as part of the proposed development.

For schemes of 10 or more units and other major development, we recommend the Local Planning Authority consults with the Lead Local Flood Authority regarding the exact wording of any condition. You may find the below a useful example:

Prior to occupation of the development a sustainable drainage management and maintenance plan for the lifetime of the development shall be submitted to the local planning authority and agreed in writing. The sustainable drainage management and maintenance plan shall include as a minimum:

a. *Arrangements for adoption by an appropriate public body or statutory undertaker, or, management and maintenance by a resident's management company; and*
b. *Arrangements for inspection and ongoing maintenance of all elements of the sustainable drainage system to secure the operation of the surface water drainage scheme throughout its lifetime.*

The development shall subsequently be completed, maintained and managed in accordance with the approved plan.

Reason: To ensure that management arrangements are in place for the sustainable drainage system in order to manage the risk of flooding and pollution during the lifetime of the development.

Please note United Utilities cannot provide comment on the management and maintenance of an asset that is owned by a third party management and maintenance company. We would not be involved in the discharge of the management and maintenance condition in these circumstances.

Water Supply

If the applicant intends to obtain a water supply from United Utilities for the proposed development, we strongly recommend they engage with us at the earliest opportunity. If reinforcement of the water network is required to meet the demand, this could be a significant project and the design and construction period should be accounted for.

To discuss a potential water supply or any of the water comments detailed above, the applicant can contact the team at **DeveloperServicesWater@uuplc.co.uk.**

Please note, all internal pipework must comply with current Water Supply (water fittings) Regulations 1999.

United Utilities' Property, Assets and Infrastructure

Where United Utilities' assets exist, the level of cover to the water mains and public sewers must not be compromised either during or after construction.

For advice regarding protection of United Utilities assets, the applicant should contact the teams as follows:

Water assets – DeveloperServicesWater@uuplc.co.uk
Wastewater assets – WastewaterDeveloperServices@uuplc.co.uk

It is the applicant's responsibility to investigate the possibility of any United Utilities' assets potentially impacted by their proposals and to demonstrate the exact relationship between any United Utilities' assets and the proposed development.

A number of providers offer a paid for mapping service including United Utilities. To find out how to purchase a sewer and water plan from United Utilities, please visit the Property Searches website; https://www.unitedutilities.com/property-searches/

You can also view the plans for free. To make an appointment to view our sewer records at your local authority please contact them direct, alternatively if you wish to view the water and the sewer records at our Lingley Mere offices based in Warrington please ring 0370 751 0101 to book an appointment.

Due to the public sewer transfer in 2011, not all sewers are currently shown on the statutory sewer records and we do not always show private pipes on our plans. If a sewer is discovered during construction; please contact a Building Control Body to discuss the matter further.

Should this planning application be approved the applicant should contact United Utilities regarding a potential water supply or connection to public sewers. Additional information is available on our website http://www.unitedutilities.com/builders-developers.aspx

Yours faithfully

Tracy Churchman
United Utilities
Developer Services and Metering

mossroor.khan

From: CMBLNC Info Requests <Inforequests.cmblnc@environment-agency.gov.uk>
Sent: 20 February 2020 10:53
To: mossroor.khan
Subject: CL162002KR - Rimington Caravan Park, Hardacre Lane, Rimington BB7 4EE

Dear Mossroor

This site is located in Flood Zone 1, meaning the estimated risk of flooding from rivers/sea is less than 0.1% (1 in 1000) in any given year. We therefore do not have any relevant modelling information to provide for a product 4. For further information on flood zones, please visit the Flood Map for Planning on the gov.uk website: https://flood-map-for-planning.service.gov.uk/.
The Environment Agency has no record of previous flooding in this area.

For further guidance on producing a flood risk assessment in Flood Zone 1, please see the link below.
https://www.gov.uk/guidance/flood-risk-assessment-in-flood-zone-1-and-critical-drainage-areas

Surface Water Maps can be viewed online at https://flood-warning-information.service.gov.uk/long-term-flood-risk/map or can be downloaded using the Data.gov.uk Web Map Service. For further information relating to the risk of flooding from surface water, please contact the Lead Local Flood Authority Lancashire County Council.

Thanks

Karen

Karen Rooke
Customers and Engagement Officer, Cumbria and Lancashire
Environment Agency | Ghyll Mount, Gillan Way, Penrith 40 Business Park, Penrith, Cumbria, CA11 9BP

inforequests.cmblnc@environment-agency.gov.uk

From: Enquiries, Unit
Sent: 20 February 2020 09:10
To: mossroor.khan@wyg.com
Subject: Ref 200220/BH02 FW: Rimington Caravan Park, Hardacre Lane, Rimington BB7 4EE

Good Morning

I have passed your e-mail to the local customer team who will deal with your request.

The Freedom of Information Act and Environmental Information Regulations state that a public authority must respond to requests for information within 20 working days, but we aim to respond to all enquiries as quickly as we can.

You can find more information about our service commitment by clicking on the link below:

https://www.gov.uk/government/publications/environment-agency-customer-service-commitment

You can contact our customer team directly on the contact details below, or call the National Customer Contact Centre on 03708 506506 who will transfer you to the area team.

Please quote your enquiry reference 200220/BH02 in any correspondence with us regarding this matter.

Customers and Engagement
Environment Agency
Cumbria and Lancashire Area
Lutra House
Dodd Way
Walton Summit
Bamber Bridge
PRESTON
PR5 8BX

Kind Regards

Becki Holmes
Customer Service Adviser
National Customer Contact Centre – Part of Operations, Regulation, and Customer
Environment Agency

(Tel: 03708 506 506
: Web Site: www.gov.uk/environment-agency

Click an icon to keep in touch with us:-

From: mossroor.khan [mailto:mossroor.khan@wyg.com]
Sent: 17 February 2020 11:24
To: Enquiries, Unit <enquiries@environment-agency.gov.uk>
Subject: Rimington Caravan Park, Hardacre Lane, Rimington BB7 4EE

RE: Rimington Caravan Park, Hardacre Lane, Rimington BB7 4EE

To whom it may concern,

Please could you confirm whether you have any information that you feel would be valuable to include in my Flood Risk Assessment for the above site (location plan attached), including details of historical flooding and any surface water plans; this would be greatly appreciated. Please could you also let me know if you have any information on outfalls/discharges to watercourse in the vicinity of the proposed development site.

The development site is at Rimington Caravan Park and comprises of the extensions to existing caravan site for the siting of a further 62 holiday caravans and associated engineering works, demolition of existing building, erection of extension to facilities building, creation of new children's play area, erection of storage building and retention of access track.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards
Mossroor Khan
Highway and Infrastructure Engineer

WYG
Quay West at MediaCityUK, Trafford Wharf Road, Trafford Park, Manchester, M17 1HH
Tel: +44 161 874 4673

www.wyg.com

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mossroor.khan

From: Enquiries, Unit <enquiries@environment-agency.gov.uk>
Sent: 20 February 2020 09:10
To: mossroor.khan
Subject: Ref 200220/BH02 FW: Rimington Caravan Park, Hardacre Lane, Rimington BB7 4EE
Attachments: Rimington Leisure Park-ECAD-SK-S-1.1A-Site South-1.500 @ A1.pdf

Good Morning

I have passed your e-mail to the local customer team who will deal with your request.

The Freedom of Information Act and Environmental Information Regulations state that a public authority must respond to requests for information within 20 working days, but we aim to respond to all enquiries as quickly as we can.

You can find more information about our service commitment by clicking on the link below:

https://www.gov.uk/government/publications/environment-agency-customer-service-commitment

You can contact our customer team directly on the contact details below, or call the National Customer Contact Centre on 03708 506506 who will transfer you to the area team.

Please quote your enquiry reference 200220/BH02 in any correspondence with us regarding this matter.

Customers and Engagement
Environment Agency
Cumbria and Lancashire Area
Lutra House
Dodd Way
Walton Summit
Bamber Bridge
PRESTON
PR5 8BX

Kind Regards

Becki Holmes
Customer Service Adviser
National Customer Contact Centre – Part of Operations, Regulation, and Customer
Environment Agency

(Tel: 03708 506 506
: Web Site: www.gov.uk/environment-agency

Click an icon to keep in touch with us:-

From: mossroor.khan [mailto:mossroor.khan@wyg.com]
Sent: 17 February 2020 11:24
To: Enquiries, Unit <enquiries@environment-agency.gov.uk>
Subject: Rimington Caravan Park, Hardacre Lane, Rimington BB7 4EE

RE: Rimington Caravan Park, Hardacre Lane, Rimington BB7 4EE

To whom it may concern,

Please could you confirm whether you have any information that you feel would be valuable to include in my Flood Risk Assessment for the above site (location plan attached), including details of historical flooding and any surface water plans; this would be greatly appreciated. Please could you also let me know if you have any information on outfalls/discharges to watercourse in the vicinity of the proposed development site.

The development site is at Rimington Caravan Park and comprises of the extensions to existing caravan site for the siting of a further 62 holiday caravans and associated engineering works, demolition of existing building, erection of extension to facilities building, creation of new children's play area, erection of storage building and retention of access track.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards
Mossroor Khan
Highway and Infrastructure Engineer

WYG
Quay West at MediaCityUK, Trafford Wharf Road, Trafford Park, Manchester, M17 1HH
Tel: +44 161 874 4673

www.wyg.com

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mossroor.khan

From:	mossroor.khan
Sent:	28 February 2020 12:39
To:	Suds
Cc:	Chris.dunderdale@lancashire.gov.uk
Subject:	FRM1272 - Rimington Caravan Park
Attachments:	IMG_7128.JPEG; IMG_7123.JPEG; IMG_7124.JPEG; IMG_7125.JPEG; LLFA Response.cleaned.pdf; Rimington Caravan Park - Septic Tank; IMG_7113.JPEG

Hi Chris,

Further to my conversation with your colleague Helen, Please can you confirm the following:

1. The images above are of ground for the approved planning permission for the additional lodges on the site. The pics show the site is 150-200mm topsoil and the ground below is clay. Do we still need to undertake these test as this has been approved on the adjacent land 20m away. https://www.ribblevalley.gov.uk/site/scripts/planx_details.php?appNumber=3%2F2013%2F0059
2. Can the owners undertake the percolation tests or does this need to be undertaken by specialist contractors?
3. Is a pre-application required because the client has informed me that fees has already been paid and this is not pre-application and is part of your response 3/2019/1011?
4. Do you have a specific approved septic tank or can we supply any as long as they are certified?

Please can you also respond to my previous email with regards to any historical flooding incidents for my FRA. I appreciate the current extreme weather conditions make it difficult for LCC to respond and therefore will await response at your earliest convenience.

Kind regards
Mossroor Khan
Highway and Infrastructure Engineer

WYG
Quay West at MediaCityUK, Trafford Wharf Road, Trafford Park, Manchester, M17 1HH
Tel: +44 161 874 4673

www.wyg.com

mossroor.khan

From: mossroor.khan
Sent: 26 February 2020 11:23
To: Chris.dunderdale@lancashire.gov.uk
Subject: Rimington Caravan Park - Septic Tank
Attachments: SK-S-100A-site layout plan-PROP.pdf

RE: Rimington Caravan Park, Hardacre Lane, Rimington BB7 4EE

Hi Chris,

Please could you confirm whether you have any information that you feel would be valuable to include in my Flood Risk Assessment for the above site (location plan attached), including details of historical flooding and any surface water plans; this would be greatly appreciated. Please could you also let me know if you have any information on outfalls/discharges to watercourse in the vicinity of the proposed development site.

The development site is at Rimington Caravan Park and comprises of the extensions to existing caravan site for the siting of a further 62 holiday caravans and associated engineering works, demolition of existing building, erection of extension to facilities building, creation of new children's play area, erection of storage building and retention of access track.

Please do not hesitate to contact me with the details below to discuss further should you require additional information or clarification. I was hoping to meet you on site to understand the ground conditions i.e. saturated/ boggy etc. Also I wanted to discuss the application process to get the FW discharged into the brook. Do you need EA consent or just LLFA?

Kind Regards

Mossroor Khan
Highway and Infrastructure Engineer

WYG
Quay West at MediaCityUK, Trafford Wharf Road, Trafford Park, Manchester, M17 1HH
Tel: +44 161 874 4673

www.wyg.com

Appendix E – Drainage Calculation and Treatment Works

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Mossroor Khan
Site name:	Rimington Caravan Park
Site location:	Rimington, Clitheroe

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.

Site Details

Latitude:	53.91828° N
Longitude:	2.26768° W
Reference:	2998160248
Date:	Feb 26 2020 15:04

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 2.616

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm):	1235	1235
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	24.54	24.54
1 in 1 year (l/s):	21.35	21.35
1 in 30 years (l/s):	41.72	41.72
1 in 100 year (l/s):	51.04	51.04
1 in 200 years (l/s):	58.16	58.16

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	Mossroor Khan
Site name:	Rimington Leisure Park (Holgate)
Site location:	Rimington, Clitheroe

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.

Site Details

Latitude:	53.90381° N
Longitude:	2.25662° W
Reference:	1110550562
Date:	Mar 11 2020 17:07

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 0.298

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm):	1283	1283
Hydrological region:	10	10
Growth curve factor 1 year:	0.87	0.87
Growth curve factor 30 years:	1.7	1.7
Growth curve factor 100 years:	2.08	2.08
Growth curve factor 200 years:	2.37	2.37

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	2.92	2.92
1 in 1 year (l/s):	2.54	2.54
1 in 30 years (l/s):	4.97	4.97
1 in 100 year (l/s):	6.08	6.08
1 in 200 years (l/s):	6.93	6.93

mossroor.khan

From: David Stagg <dstagg@grafuk.co.uk>
Sent: 03 March 2020 08:59
To: mossroor.khan
Cc: Flavia Urso
Subject: RE: Rimington Caravan Park - Septic Tank
Attachments: SK-S-100A-site layout plan-PROP.pdf; 35 PE_2017_Graf_Carat XL8500_20_30_20.pdf; Klaro XL 35 PE System (2x8500).pdf; Klaro XXL 100 PE System (2x22000).pdf; 100 PE_2018_Graf_Carat XXL_2x22000_20_30_20.pdf; CE_Klaro Professional.pdf

Morning Mossroor,

Thank you for sending this information over to me.
Based on putting two separate systems in place, you will require:

15 x 2/3 = **30/45** PE Plant
47 x 2/3 = **94/141** PE Plant

Please see the attached documents on our 35 PE and 100 PE plants which will be suitable for the initial project plans.
(NB: I have also detailed the system sizes shown you need to make an allowance of 3 people per plot.

In England, CE certification only applies up to 50 PE plants. Please see the attached certification in relation our Klaro plant which can be given to Lancashire County Council to show compliance of the system.

It would be worth speaking to the local flood association to see if they have any history with the land flowing in and around the brook. This will help you make an informed decision to whether this is a viable method of discharge.
Due to the sizes of the systems (the amount of waste which is treated and discharge by each system per day), you will need consent from the EA for each system's discharge.

I hope this information is helpful, if you have any further questions in relation to this, then please feel free to contact me.

Kind Regards,

David.
David Stagg
Technical Product Specialist

Graf UK Limited | Regen House | Beaumont Road | Banbury | OX16 1RH
T: 01608 661500 | F: 01295 211333 | E: dstagg@grafuk.co.uk | www.grafuk.co.uk

From: mossroor.khan <mossroor.khan@wyg.com>
Sent: 25 February 2020 11:48
To: Info <info@grafuk.co.uk>
Subject: Rimington Caravan Park - Septic Tank

Ref: Hardacre Ln, Rimington, Clitheroe BB7 4EE

Morning David,

Thank you for taking my call earlier. The proposals are for a caravan park extension comprising of 62 additional spaces. The site layout plan identifies these spaces in RED. We are proposing two tanks due to the location of the brook, one to take 15 spaces and another for the remaining 47. The caravans spaces will predominantly be for static caravans which take 2 people. The touring caravans take 3 people however, we should assume only 2 people per space for now.

Please can you provide me with the following information:

- Certification of products and confirmation tanks have been accepted by Lancashire County Council before.
- Specify the size of the tank based on the no. of people. Please provide product information and calculations.
- What is the application process to get the FW discharged into the brook. Do you need EA consent or Just LLFA?

Any other information you feel that would add value to my application would be much appreciated.

Kind regards
Mossroor Khan
Highway and Infrastructure Engineer

WYG
Quay West at MediaCityUK, Trafford Wharf Road, Trafford Park, Manchester, M17 1HH
Tel: +44 161 874 4673

www.wyg.com

Technical data sheet for GRAF Professional wastewater treatment plant

GRAF UK
Target House, Thorpe Way Ind Est
Oxfordshire OX16 4SP
Tel. (01608) 661500
Email: info@grafuk.co.uk

plant size — 35 PE

Maximum hydraulic load	Qd	5,25	m³/d
Maximum organic load	Bd	2,10	kg/d

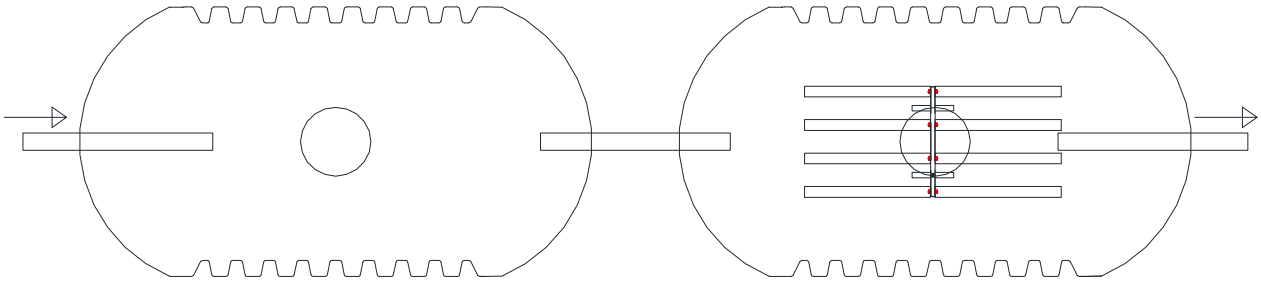
Design according to EN 12566-3

effluent values:

	BOD5	COD	SS	NH4N	Ntot	P	colif. germs
<	20 mg/l		30 mg/l	20 mg/l			

Total tank capacity: 16,4 m³

air compressor	type:	rotary vane			DT 4.16
	installed motor power				0,55 kW
	power consumption at 0,3 bar				0,74 kW
	motor design		50 Hz	1~	230 V
calculated maximum daily operating time					12,9 h/d



symbolic representation

stage	number	container, material	diameter width [m]	length [m]	water depth maximum [m]	volume maximum [m³]
ss + b	1	Carat XL 8.500L, PE	2,04	3,50	1,81	8,2
sbr	1	Carat XL 8.500L, PE	2,04	3,50	1,81	8,2

calculation for GRAF Professional wastewater treatment plant according to EN 12566-3

basic data / project data

customer	GRAF UK	date	09.11.2017
project		editor	alk
type of waste water	domestic		
specialties			

base of calculation

	BOD5	COD	SS	NH4N	Ntot	P	colif. germs
outlet	**< 20 mg/l**		**< 30 mg/l**	**< 20 mg/l**			

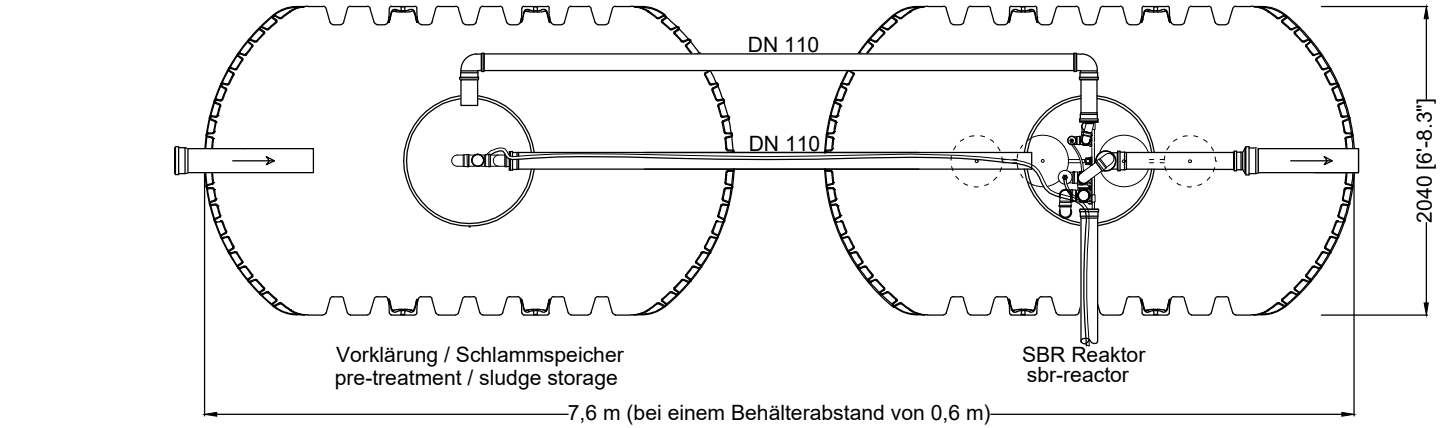
population equivalent					35	PE
wastewater	Q_d	at Q_{PE}	150	l/(PE*d)	5,25	m³/d
waste load	BOD5	B_d	60	g/(PE*d)	2,10	kg/d
waste load	COD		120	g/(PE*d)	4,2	kg/d
cleaning cycles per day					4	

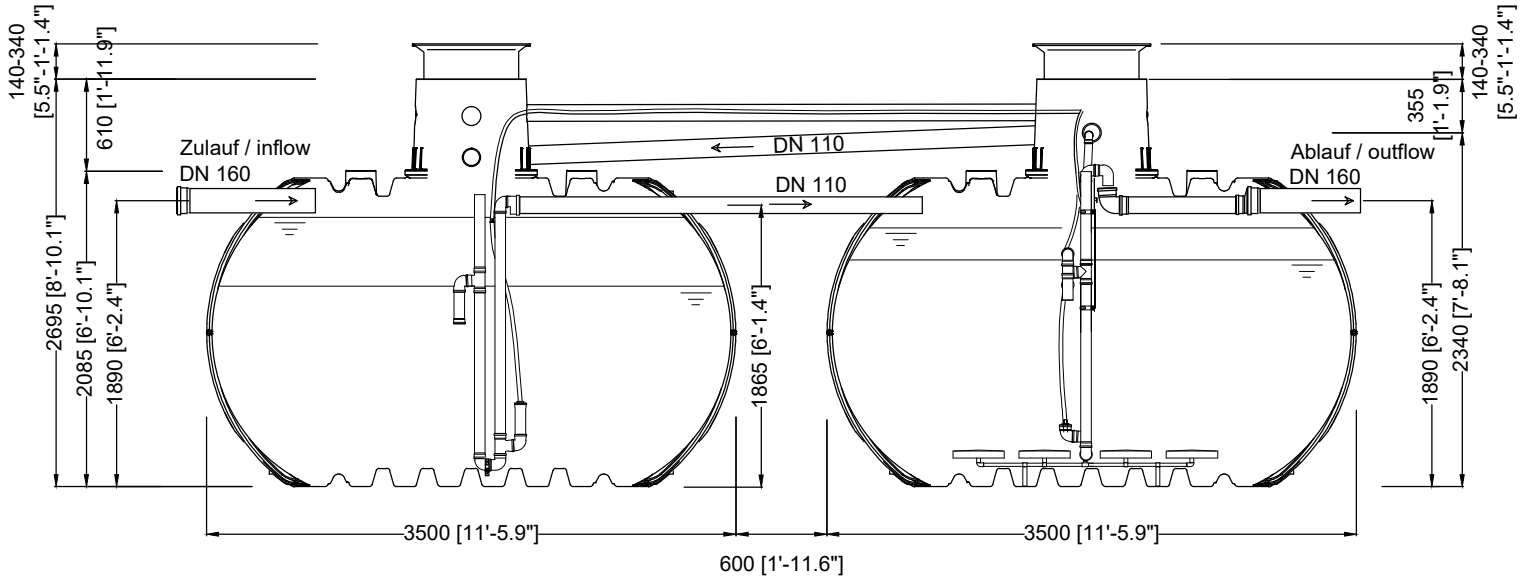
1. Stage: sludge storage and buffer

type of container			Carat XL 8.500L	
number of containers / proportion of chambers			100%	
width			2,04	m
length			3,50	m
water depth			1,81	m
total area			7,14	m²
sludge storage (ss)	required volume	35PEx250l/(PE*a)x(7/12) =	5,10	m³
	required water depth		1,15	m
	selected water depth		1,24	m
	removal interval		7	months
buffer (b)	percentage of daily load		50%	
	required volume		2,63	m³
	required water depth		0,58	m
	selected water depth		0,58	m
	selected volume	50% =	2,63	m³
overall (ss + b)	required water depth		1,67	m
	required volume	5,1m³ + 2,63m³ =	7,73	m³
	existing total volume	5,58m³ + 2,63m³ =	8,21	m³

2. Stage: biological treatment (SBR)

type of container			Carat XL 8.500L	
number of containers / proportion of chambers			100%	
width			2,04	m
length			3,50	m
water depth			1,81	m
total area			7,14	m²
reactor	required average volume		6,36	m^3
before loading phase	required minimum volume		5,71	m^3
	required minimum water depth		1,26	m
	selected minimum water depth		1,27	m
	selected average volume		6,40	m^3
after loading phase	existing volume		7,06	m^3
	existing water depth		1,51	m
	total water depth		1,81	m
existing total volume	V_{BB}		8,21	m^3
BOD5 volume load	B_R		0,33	kg/(m³*d)





D

Klaro XL 35 EW - Tankdom Maxi
2 x Carat XL 8500 L / 2 x 2245,4 gal.

Artikel-Nr.
product no.
article no.
articulo no.
107755

GB	ES	FR
Klaro XL 35 inh. TD-Maxi 2 x Carat XL 8500 L / 2 x 2245,4 gal.	Klaro XL 35 PE Cúpula Maxi 2 x Carat XL 8500 L / 2 x 2245,4 gal.	Klaro XL 35 EH Maxi-dôme 2 x Carat XL 8500 L / 2 x 2245,4 gal.

gezeichnet, drawn ISC	Gewicht, weight 2 x 380 kg	revision	
Datum, date 2018.03.27	Toleranz, tolerance +/- 3%	Maßstab, scale M 1:50	Einheiten, units mm [inch] gal. = US gal.

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Technical data sheet for GRAF Professional wastewater treatment plant

Graf UK Ltd
Regen House, Beaumont Road, Ba
Oxfordshire OX16 1RH
Tel. (01608) 661500
Email: info@grafuk.co.uk

Plant size 100 PE

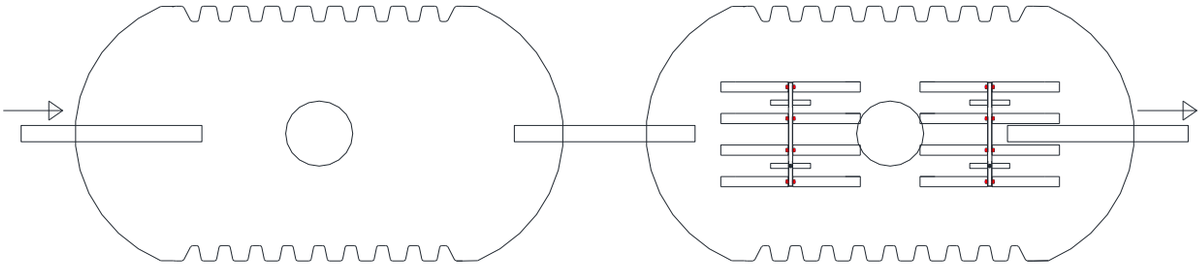
Maximum hydraulic load	Qd	15,00	m³/d
Maximum organic load	Bd	6,00	kg/d

Design according to ATV-A122

effluent values:

	BOD5	COD	SS	NH4N	Ntot	P	colif. germs
<	20 mg/l		30 mg/l	20 mg/l			

Total tank capacity:					44,3	m³
air compressor	type:	rotary vane			DTN 41	
	installed motor power				1,50	kW
	power consumption at 0,3 bar				1,50	kW
	motor design		0,7 bar	50 Hz 3~	380	V
calculated maximum daily operating time					11,9	h/d



symbolic representation

stage	number	container, material	diameter width [m]	length [m]	maximum water depth [m]	volume maximum [m³]
ss + pt + b	1	Carat XXL 22.000L, PE	2,50	6,14	2,31	22,1
sbr	1	Carat XXL 22.000L, PE	2,50	6,14	2,31	22,1

calculation for GRAF Professional wastewater treatment plant according to ATV-A122

basic data / project data

customer	Graf UK Ltd	date	*17.01.2018*
project		editor	MUS
type of waste water	domestic		
specialties			

base of calculation

	BOD5	COD	SS	NH4N	Ntot	P	colif. germs
outlet	**< 20 mg/l**		**< 30 mg/l**	**< 20 mg/l**			

population equivalent				100	PE
wastewater	at Q_{PE}	150 l/(PE*d)		15,0	m³/d
infiltration water		0 %		0,0	m³/d
total daily inflow	Q_d			15,0	m³/d
daily peak factor				10	h/d
hourly volume of wastewater				1,5	m³/h
waste load BOD5	B_d	60 g/(PE x d)		6,00	kg/d
waste load BOD5 after primary treatment	B_d	40 g/(PE x d)		4,00	kg/d
cleaning cycles per day				4	

1. Stage: sludge storage, pre-treatment and buffer

type of container			Carat XXL 22.000L	
number of containers / proportion of chambers			100%	
width			2,50	m
length			6,14	m
water depth			2,31	m
total area			15,36	m²
sludge storage (ss)				
specific sludge storage volume			250	l/(PE*a)
removal interval			6,0	months
required volume	100PE x 250l/(PE*a) x 6/12months	=	12,50	m³
required water depth			1,33	m
retention period	(22,13m³ - 12,5m³ - 5,05m³) / 1,5m³/h	=	3,05	h
primary treatment (pt)				
required volume			2,40	m³
required water depth			0,19	m
overall (ss + pt)				
required water depth			1,52	m
selected water depth			1,70	m
buffer (b)				
percentage of daily load			33%	
required volume	33% x 15 m³/d	=	5,00	m³
required water depth			0,61	m
selected water depth			0,61	m
selected volume	34% total daily inflow	=	5,05	m³
overall (ss + pt + b)				
required water depth			2,13	m
required volume	12,5m³ + 2,4m³ + 5m³	=	19,90	m³
existing total volume	14,7m³ + 2,4m³ + 5,1m³	=	22,13	m³

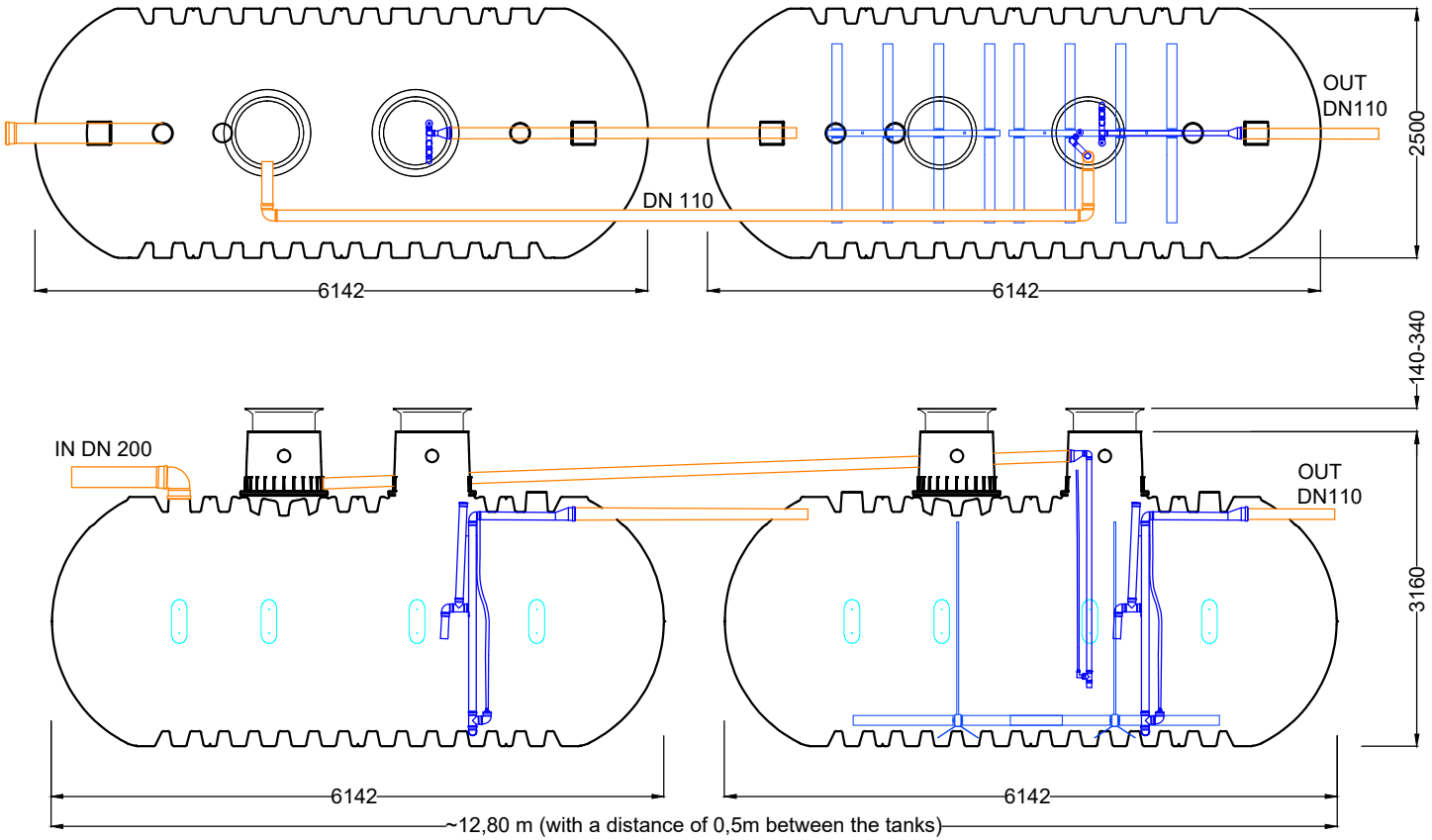
calculation for GRAF Professional wastewater treatment plant according to ATV-A122

basic data / project data

customer	Graf UK Ltd	date	*17.01.2018*
project		editor	MUS
type of waste water	domestic		
specialties			

2. Stage: biological treatment (SBR)

type of container			Carat XXL 22.000L	
number of containers / proportion of chambers			100%	
width			2,50	m
length			6,14	m
water depth		Wd max =	2,31	m
total area			15,36	m²
required volume		4kg/d / 0,2kg/(d*m³) =	20,00	m³
required water depth			1,98	m
BOD5 volume load Br		4kg/d / 22,13m³ =	0,18	kg/(m³*d)
BOD5 sludge loading B	$_{TS}$	≤	0,05	kg/(kg*d)
sludge index	ISV		100,00	ml/g
total solids	TS_{BB}	≤	4,00	kg/m³
oxygen concentration	C_{O}	≥	2,00	mg/l
selected water depth before loading phase		Wd max - 33% x 15 m³/d =	1,70	m
water depth after loading phase		Wd min + 25% x 15 m³/d =	2,09	m
existing total volume			22,13	m³



D

GRAF Professional 100 Einwohner
2 x Carat XXL 22000 Liter

Artikel-Nr.
product no.
article no.
articulo no.

GB
GRAF Professional 100 Pe
2 x Carat XXL 22000 Liter

ES

FR

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gezeichnet, drawn ISC	Gewicht, weight -	revision	
Datum, date 2015.11.03	Toleranz, tolerance +/- 3%	Maßstab, scale M 1:75	Einheiten, units mm [inch] gal. = US gal.

CE

Otto Graf GmbH, Carl-Zeiss-Str. 2-6, 79331 Teningen

2018

EN 12566-3/A2:2013-01

Packaged domestic wastewater treatment plant
for treatment of domestic wasterwater

SBR-treatment plant Klaro Professional for 4-50 inhabitants
Material: Polypropylene (PP)

Effectiveness of treatment		
Treatment efficiency ratios (at tested organic daily load BOD5=0,39 kg/d)	COD:	91,9%
	BOD5:	95,9%
	SS:	94,4%
Ammonia nitrogen	NH4-N:	65,4%
Treatment capacity (nominal designation)		
Nominal organic daily load (BOD5)	0,06	kg/d*PE
Nominal hydraulic daily flow (QN)	0,15	m³/d*PE
Watertightness (water test)	passed	
Crushing resistance (pit test)	passed	
Durability	passed	
Reaction to fire	Class E	
Release of dangerous substances	NPD	

Appendix F – Feasibility Plan

proposed planting to augment existing hedge

proposed pitches for 13' x 40' vans & decking

proposed new tarmac roads to serve proposed pitches

existing approved pitches

approved pitches to be constructed

proposed area for new treatment plant with proposed planting screening

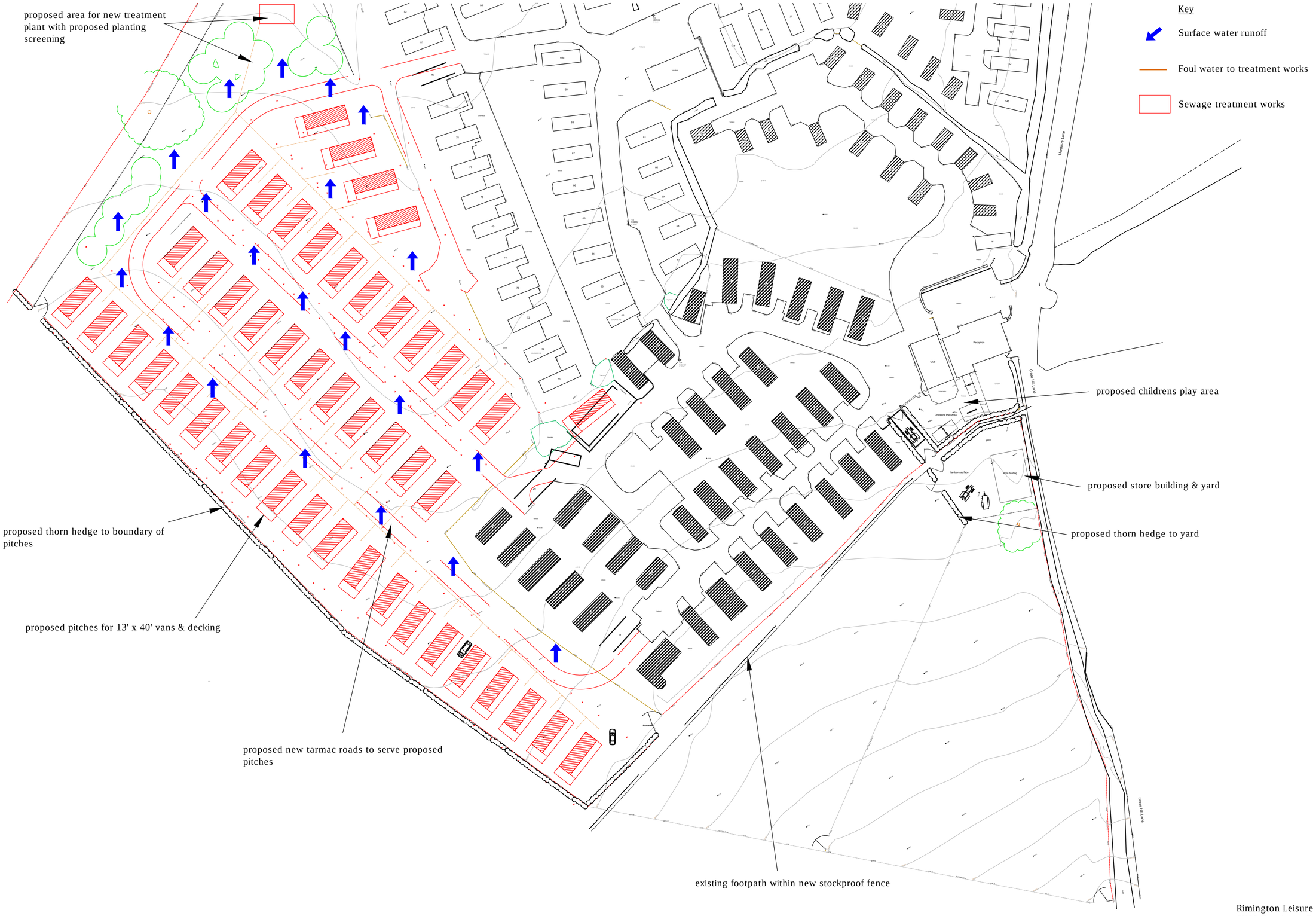
Key

Surface water runoff

Foul water to treatment works

Sewage treatment works

Rimington Leisure Park
SK01 Feasibility Plan
Sheet 1 of 2



Rimington Leisure Park
SK02 Feasibility Plan
Sheet 2 of 2

Appendix G – Site Photos