



BELL MUNRO CONSULTING LTD.

**Combined Flood Risk Assessment and Outline
Surface Water Drainage Statement**

**Unit 4
Rishworth Centre,
Dewsbury**

**Revision A
17/07/20**

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CONTENTS

- 1.0 Introduction and Background
- 2.0 Site Details
- 3.0 Site Setting
- 4.0 Consultation
- 5.0 Assessment of Flood Risk
- 6.0 Outline Drainage Strategy
- 7.0 Summary
- 8.0 Disclaimer

1.0 Introduction and Background

- 1.01 This Flood Risk Assessment and Outline Drainage Strategy (FRA) will cover the development site known as Unit 4, Rishworth Centre, Dewsbury.
- 1.02 The development consists of a proposed extension to the existing building, construction of a new service yard access road to the rear and re-configuration of some existing car parking spaces.
- 1.03 Government policy concerning development in flood risk areas is contained within the Department of Communities and Local Government National Planning Policy Framework and accompanying Technical Guidance of March 2012 (revised to the Planning Practice Guidance (PPG), which supersedes Planning Policy Statement 25 (PPS25) 'Development and Flood Risk'. The guidance on Climate Change allowance issued by the Environment Agency in February 2016 has also been considered.
- 1.04 The report will address the vulnerability to flooding from all possible sources and will also consider the impact of the development on surface water runoff accounting for climate change and the potential to increase flood risk elsewhere. The Outline Drainage Strategy will provide an overview of the SuDS techniques which could be considered on the site. The issues of actual flood risk will also be discussed.
- 1.05 BMC has prepared this Flood Risk Assessment (FRA) in line with the NPPF and the PPG where appropriate. The level of detail entered into any flood risk assessment is dependent upon the scale and potential impact of the proposed development, and the vulnerability classification of the proposed land-use.
- 1.06 In considering the proposals the following key principles have therefore been applied:
 - Identification of flood risks.
 - Protection of users of the new development.
 - No increased flood risk to third parties.

2.0 Site Details

- 2.01 Site plan, existing and proposed drawings are provided in the Appendix.
- 2.02 The topography generally shows falls from the North to the South at approximately 1:60.
- 2.03 The proposed site consists of an extension to the existing retail unit with associated car parking and a new service yard access road to the rear.
- 2.04 The site is positioned within a larger retail estate with car parking, highways and retail units around the site.
- 2.05 Ian Farmer Associates have undertaken four window sample boreholes down to a max depth of 5.25m and one rotary borehole to a depth of 8.50m. The borehole logs suggest the ground conditions consist of made ground to varying depths up to a max of 2.5m above a sandy gravelly clay bearing strata.
- 2.06 A survey of the existing below ground drainage is due to be undertaken but has not yet been done by the time of writing this report.

3.0 Site Setting

3.1 Environment Agency's Flood Zone Assessment

3.1.01 The Environment Agency's (EA) website Flood Zone Mapping has been consulted. It is noted this mapping is (often) based on coarse scale modelling and provides only an initial indication of the flood risk to a site. The Environment Agency Flood Zone maps were developed using a very coarse Digital Elevation Map (DEM) and are superseded by a more detailed analysis of modelled flood levels and topographic survey levels. The Flood Zones divide the floodplain into three categories of flood risk, and do not take flood defences into account. The NPPF defines the Flood Zones as:

- Flood Zone 1 – little or no risk, with an annual probability of flooding from rivers and the sea of less than 0.1% (1 in 1000).
- Flood Zone 2 – low risk, with an annual probability of flooding of 0.1 to 1.0% from rivers and 0.1 to 0.5% from the sea.
- Flood Zone 3 – medium to high risk of flooding with an annual probability of flooding of 1.0% or greater from rivers, and 0.5% or greater from the sea.

3.1.02 The Flood Zone Mapping indicates the site as being within Flood Zone 1 in the PPG (paragraph 065, Table 1).

3.1.03 The development site is under 1ha in size, so under current regulations a full Flood Risk Assessment is not necessary to accompany the Planning Application.

3.1.04 The proposed development is for a commercial/non-residential end use and this is classified within the 'Less Vulnerable' category in the PPG (paragraph 066, Table 2).

3.2 The Sequential and Exception Tests

3.2.01 The NPPF does not require that the Sequential Test be applied to development proposals in Flood Zone 1. Since the site is located in Flood Zone 1, a sequential approach should not be required for planning in accordance with Kirklees Council Local Plan Policy 27 (LP27).

3.2.02 The issues of actual flood risk are discussed below. The issues of safety and reduction in flood risk to others required by an Exception Test are also addressed in this document.

3.2.03 The Local Planning Authority (LPA) will make the final decision concerning any planning application.

4.0 Consultation

4.1 Environment Agency

4.1.01 Site is located in Flood Zone 1 which suggests very low risk, with an annual probability of flooding from rivers and the sea of less than 0.1% (1 in 1000).

4.1.02 Low risk of surface water flooding across the site.

4.1.03 No risk from flooding from reservoirs.

4.2 Kirklees Council

4.2.01 Pre-application correspondence received on 23rd March 2020. This report indicates the development site itself is in a Flood Zone 1, with part of the greater site (remaining as existing) being in a Flood Zone 2. Ponding of water before Unit 4 is also identified. One flooding incident has occurred in the Councils record, but this happens at the site entrance and did not affect the proposed development area.

4.3 Yorkshire Water

4.3.01 Typically Yorkshire Water would request conditions for a separate system with only foul draining to foul/ combined sewers and surface water draining to soakaway/ SuDS, watercourse or surface water sewer, with flows restricted to 30% of brownfield rates.

4.3.02 Sewers are recorded on the commercial search maps running through the site, it shows two combined water sewers flowing towards the south and a surface water sewer flowing towards the south.

4.4 Kirklees Council Strategic Flood Risk Assessment (SFRA)

4.4.01 The area of site being developed has no history of flooding from any source.

4.5 Kirklees Council Preliminary Flood Risk Assessment (PFRA)

4.5.01 The Preliminary Flood Risk Assessment (PFRA) for the area indicates that there are no records of flooding for the development area, which conforms with information supplied by the EA.

5.0 Assessment of Flood Risk

5.1 Flood Zones

5.1.01 The detailed flood map provided by the EA indicates that the site is in Flood Zone 1 (see Appendix).

5.2 Sources of Flooding

5.2.01 The risk of flooding from the following flood sources has been considered:

- **Fluvial** – The EA has confirmed that the study area is within Flood Zone 1. Therefore, the flood risk associated with this source is considered **Very Low**.
- **Tidal** – The study area is remote from the sea and tidally influenced water bodies. Therefore, the flood risk associated with this source is considered **Negligible**.
- **Pluvial (Rainfall)** – The surface water flood risk maps show small areas that have the potential to flood during prolonged heavy rainfall. These areas are associated with depressions that are likely to be removed/positively drained following the development process. Therefore, the risk of flooding from surface water flooding is **Very Low** but should be considered further during the detailed design.
- **Surface Water (Overland flow)** – This relates to surface water entering the site. The site is surrounded by impermeable areas in all directions. Any surface water arising from a level above the study area is likely to be intercepted by the highway drains and therefore pose no threat to the development. The flood risk associated with this source is considered **Very Low**.
- **Groundwater** – There are no records for groundwater levels available at the time this report is written but it is noted the Kirklees Council Preliminary Flood Risk Assessment indicates that the site is not in an area susceptible to groundwater flooding. Therefore, the flood risk associated with this source is considered **Very Low**.
- **Sewers** – Commercial drainage search records show a surface water sewer which flows through the car park to the south and two combined sewers which also flow to the south. There are also private sewers beneath the site. The flood risk associated with this source is considered **Very Low**.
- **Artificial** sources – According to the EA online maps, the study area is not at risk from reservoir flooding. Therefore, the flood risk associated with this source is considered **Negligible**.

5.3 Summary of Flood Risk

- 5.3.01 The site is located within Flood Zone 1 and a Negligible to Low risk of flooding from all sources have been identified for the site. It is therefore considered that a strategy for surface water management will be required at the site to mitigate the risk to others. The assessments of a range of measures that are feasible for the site are outlined in the following section.
- 5.3.02 Due to the proposal to reduce finished floor levels by approximately 250mm, the ponding water identified behind Unit 4 will be at a higher level than the proposed building. To mitigate flood risk, a TITAN kerb with a 325mm upstand will line the rear elevation to create a flood barrier. This will ineffect provide more storage for ponding water than the current condition, therefore the flood risk is reduced. For rainfall that falls directly onto the access path behind the kerb and in front of the cladding, a full length Aco drain will be installed to intercept any runoff. A camera survey of the drains is also being undertaken to identify if any blockages are stopping the water being drained via the existing gullies. If any issues are found, remedial works will be proposed.

6.0 Outline Drainage Statement

6.1 SuDS

6.1.01 Building Regulations (Part H), the National Planning Policy Framework, Yorkshire Water and Kirklees Council development control policies and Environment Agency advice notes, require the consideration of sustainable drainage techniques for new developments.

6.1.02 Surface Water drainage should be considered by a prescribed hierarchy aimed at minimising the impact of development. This is considered in more detail later in this report. Surface Water should be designed to discharge to:

1. Infiltration based or sustainable drainage systems
2. Watercourses
3. Surface water sewers
4. Combined water sewers

Guidance on SuDS techniques can be found in the SuDS Manual (Ciria 2015). There are various forms of technique available as summarised below:

Table 6.1.01 Forms of SuDS Drainage

Technique	Description
Trenches	Shallow excavations filled with rubble or stone that create temporary storage and either filter into the ground or convey water to an outlet. Known as 'French drains.'
Swales	Shallow linear vegetated drain ditches which can either convey flows to an outlet or infiltrate via a granular subbase to the substrata.
Pervious Pavements	Material which allows water to permeate into underlying substrata – best utilised on flat sites with permeable substrata. Permeable paving can be used on clay substrata but will require a piped drainage outlet from the sub-base to a positive system.
Geocellular Systems/Tank systems	Modular plastic geocellular systems which have a high void ratio and allow water to be stored below ground. Large diameter pipework or purpose designed tanks to allow below ground storage.

Infiltration Basins	Vegetated depressions which allow water storage and slow infiltration into the ground.
Detention Basins	Surface water storage basins which remain dry when not in use and allow flood water to collect and discharge to a design flow rate.
Ponds	Ponds can provide both attenuation and treatment, together with landscape and ecology value. Runoff through storms is attenuated in an upper level above ambient pond depths.

6.1.03 The use of SuDS techniques is designed to mitigate the impact of development on receiving watercourses or sewers by mimicking pre-development conditions as far as possible. New development should not worsen flooding downstream. Typically it is acknowledged that SuDS shall be designed so as not to exceed the run-off rates from the existing site.

6.1.04 Sustainable Drainage can take many forms depending on the site use, ground conditions and topography. In terms of the hierarchy of sustainable options, infiltration based systems should be considered in the first instance, i.e., soakaways/infiltration swales/basins, and so on. The use of infiltration systems will be subject to the infiltration characteristics of the natural ground below the site and any environmental constraints which may apply, i.e., the sensitivity of the groundwater or risk of increasing water flow through the ground. In this instance, the site may not be suitable for infiltration drainage due to the boreholes showing clay strata. The potential for infiltration will be investigated further by percolation testing which has not been undertaken at the time of writing this report.

6.1.05 Sustainable Drainage in areas of cohesive subsoils can be provided by a range of flow attenuation devices to suit the proposed development, policies of adopting authorities and planning authority requirements.

6.1.06 An assessment of the available SuDS source control, pre-treatment and components mentioned in the SuDS Manual has been completed and is summarised in the table below:

Table 6.1.02 - Site Specific SuDS Consideration

Source Control Feature	Included Y/N	Comment
Green Roof	N	Not appropriate to the form of development which is a traditional retail unit with a lightweight roof.
Soakaways	Y/ N	Soakaway drainage may not be possible due to underlying clay strata subject to testing and detailed design stage.
Water Butts	Y	Potential to use this dependant on the finalised site layout. To be confirmed during detailed design.
Rainwater Harvesting	N	High capital cost and high maintenance and running costs make this form of SuDS inappropriate for this development. New water mains can serve the development, so there is no restriction to supply in this area.
Pre-Treatment Feature		
Silt Traps/Sumps	Y	Hardstanding drainage will feature trapped gullies and sumps which will collect silts and sediments as a pre-treatment feature.
Vortex Separator	N	With the provision of an oil separator there is no requirement under EA Pollution Prevention Guidance to install such features.
Filtration System	N	With the provision of an oil separator there is no requirement under EA Pollution Prevention Guidance to install such features.
Oil Separators	Y	A new oil separator is to be installed for the new service yard access road area of the site.
SuDS Component		
Filter Strips	N	Filter strips are not appropriate in the areas of redevelopment. These systems deal with sheet runoff and require large areas to accommodate. It is also unlikely infiltration is achievable on this site.

Infiltration Trenches	N	Soakaway drainage may not be possible due to underlying clay strata subject to testing and detailed design stage.
Swales	N	These are not appropriate for the development as swales take substantial space due to the batter slopes and require depths to receive flows from any gullies. As swales are typically roadside features, there are no suitable locations for their inclusion within the development.
Bio retention	Y	Potential for this method to be used in area of replacement trees between the proposed new extension and existing building near the new plant compound. This may accept run off from the new service yard access road dependant on final site levels which will be determined at detailed design stage. If used, an oil interceptor unit may be omitted.
Permeable Paving	N	All carpark hardstanding areas are existing except the new service yard access road which will be trafficked by articulated vehicles which are not suited to this wearing course. Soakaway drainage may not be possible due to underlying clay strata subject to testing and detailed design stage.
Geocellular Systems	Y	May be used to take flows generated from the site above the base flow rate.
Infiltration Basin	N	All carpark hardstanding areas are existing and there is not enough space to include this form of SuDS component. Soakaway drainage may not be possible due to underlying clay strata subject to testing and detailed design stage.
Detention Basin	N	Due to the layout of the site, there is insufficient space to accommodate a basin.
Ponds	N	Due to the layout of the site, there is insufficient space to accommodate a pond.
Wetlands	N	Due to the layout of the site, there is insufficient space to accommodate a wetland.
Tanks/Oversized Pipes	Y	A tank or oversized pipe could be utilised as the storage for the development.

6.2 Discharge Method

6.2.01 There is a watercourse (River Calder) around 325m to the South of the site.

6.2.02 As shown on the commercial search drainage maps, there are surface water sewers running adjacent to the site in the car park to the South East of the new development.

6.2.03 Following the hierarchy contained within Part H of the building regulations, NPPF and the SuDS guidance, the surface water discharge strategy should be considered in order of the sustainable hierarchy. The hierarchy and ability of the site to support the particular elements of the hierarchy are discussed below:

Table 6.2.01 - Site Specific SuDS Consideration

NPPF Priority	Discharge Method	Feasibility and Comments
1	Soakaways/ infiltration	Not likely to be feasible – due to the clay bearing strata noted within the window sample borehole and rotary borehole logs. The potential for infiltration will be investigated further at the detailed design stage. The ability of any development to discharge to infiltration drainage is wholly reliant on the ground conditions across the site.
2	Connection to watercourse	Not feasible – due to the distance between site and watercourse, and would require shut down of a large section of car park as well as crossing third party land.
3	Connection to surface water sewer	Most Feasible - Would be feasible on account of the recorded surface water sewers within the site, if infiltration methods are shown to be impractical at detailed design stage.
4	Connection to combined water sewer	Not feasible – due to the proximity of the surface water sewer

6.3 Proposed Foul Water Drainage Strategy

- 6.3.01 The site will have a discharge foul sewerage into the existing on-site combined drainage network. The depth of the drainage is to be determined at detailed design stage to determine whether a pumped system is required. A CCTV survey is required at detailed design stage to determine the condition of the existing drainage system on-site to ensure it is sufficient to accommodate flows from the redeveloped part of the site. The discharge point is to be investigated at detailed design stage.

6.4 Proposed Surface Water Drainage Strategy

- 6.4.01 The development will drain via soakaway between the proposed extension and the existing building in the area of proposed tree planting subject to receipt of infiltration test results.
- 6.4.02 Subject to infiltration not being conducive to the site, the development will require new drainage systems designed to suit the final approved layout of the extension, and in compliance with current Building Regulations and to the approval of the planning authority.
- 6.4.03 It is proposed to limit the surface water flow rates to provide a betterment of at least 30% in the event of soakways not being viable.
- 6.4.04 It is proposed that a connection to the existing surface water drain is made for the redeveloped areas of the site. The depth of the drainage is to be determined at detailed design stage to determine whether a pumped system is required. A CCTV survey is required to determine the condition of the existing drainage system on-site to ensure it is sufficient to accommodate flows from the redeveloped part of the site. The discharge point is to be investigated at detailed design stage.
- 6.4.05 If new surface water flows from the site were unrestricted then the net rate of flow would not provide a betterment of at least 30%. It is proposed that the rate of discharge is limited to provide a 30% betterment based on the existing flow rates calculated in accordance with 6.4.02. An assessment of the existing drainage will be made at detailed design stage.
- 6.4.06 Following current guidance documents, drainage systems should be designed so as not to flood in a storm of 1 in 30-year intensity and flood water from a storm of 1 in 100 years plus climate change should be retained on site without risk to dwellings. Due to the layout and topography of the area, it would not be possible to provide a safe storage area for flood water which exceeded the capacity of the network, so it is recommended that all water is stored in the network.

- 6.4.06 It is suggested a climate change recommendation of 40% is allowed for when calculating storage volumes.
- 6.4.07 To ensure that the 100 year plus 40% climate change event is stored on site, it is suggested a geocellular tank is installed below the proposed service yard. A flow control manhole will limit flows into the existing drainage system and the geocellular storage tank sized accordingly.
- 6.4.08 In the event of the capacity of the tank being exceeded, water will emerge from the tank. It is suggested the finished floor level of the building is set higher than max water level of the drainage system in the 1 in 100 year storm event + 40% for climate change to ensure there is a negligible risk of exceedance flows entering the building.
- 6.4.09 The SuDS Manual also places emphasis on improving water quality. This is also a requirement of Kirklees Councils Local Plan Policy 28. If soakaways are deemed to work on the site, a petrol interceptor will be used to ensure contaminants do not enter the watercourse. If soakaways are not viable, there is potential to include a bio-retention area inbetween the proposed extension and the Pets at Home unit. This area would have an outfall into the drainage network. A bio-retention area exceeds the requirement of Table 26.2 of the SuDS Manual's Pollution Hazard Indices of 'Medium' for commercial yard delivery areas thus complying with the Councils LP28 policy.

6.5 Surface Water Attenuation Requirements

- To be confirmed upon receipt of soakaway test results, pre-development enquiry response and CCTV survey of the existing drainage.

7.0 Summary

- 7.01 The site is shown on published mapping to be located within the Environment Agency's Flood Zone 1. Comparison of topographical data with the EA modelled flood level data indicates that the whole site is in Flood Zone 1 – Very Low Risk of fluvial flooding.
- 7.02 Negligible to Very Low risks of flooding from all sources have been identified from information provided by the consultees.
- 7.03 The development will require new drainage systems designed to suit the final approved layouts, and in compliance with current Building Regulations and to the approval of the planning authority.
- 7.04 The SUDS hierarchy in Building Regulations has been reviewed, and the most likely discharge option for surface water sewers has been specified subject to infiltration testing at detailed design stage. An assessment of SUDS options has been made and relevant SUDS features included in the design strategy.
- 7.05 Flow rates from the redeveloped parts of the site will be limited to in order to provide a 30% betterment and attenuation provided in the form of geocellular storage.
- 7.06 Flows from the 1 in 100-year storm event plus an additional 40% climate change allowance are to be accommodated and stored on site within the sewer network.
- 7.07 Since the site is within Flood Zone 1 no minimum finished floor level is suggested however in the event of design exceedance storms or blockage, a safe exceedance route can be ensured by setting the finished floor level for the building higher than the average level of the hard standing areas. As the floor level of the building is being reduced, the ponding water to the rear of the development will be contained within a TITAN kerb and will eventually enter the drainage network via existing gullies. The drainage will be designed to ensure the water level in the storage for the network does not exceed the finished floor level in all storms up to the 1:100 + 40% for climate change.
- 7.08 Surface water discharge water quality will be ensured by the introduction of a petrol interceptor or bio-retention area to comply with the SuDS manual and the Councils LP28 policy.

8.0 Disclaimer

- 8.01 Bell Munro Consulting have been instructed by New River Retail Ltd to carry out a Flood Risk Assessment and outline Surface Water Drainage Statement in accordance with the National Planning Policy Framework at the site location and produce our findings in a report. This document has been prepared to accompany the planning application for the proposed development site. The purpose of the report is to identify any potential flooding issues and any consequent implications for the proposed development together and to suggest an outline proposed surface water drainage strategy.
- 8.02 This report is reliant on information provided by the Environment Agency, the Client and Yorkshire Water. Bell Munro Consulting is not responsible for any errors or discrepancies that result from third party information.
- 8.03 The drainage proposals noted in this report are outline and full drainage design is to be undertaken by a suitably qualified and competent consultant, experienced in preparing detailed design of a similar scope at detailed design stage.
- 8.04 This report is in our opinion based upon information as it exists at this moment in time and is confined to the terms of our brief. Some aspects considered in this study may be subject to change with time. Therefore, consideration should be given to reviewing such issues to confirm that no changes have taken place, either at the site or within relevant legislation at the detailed design stage.
- 8.05 This report is solely for the use of the addressee and no responsibility can be accepted to any third party for the whole of it or any part of the content.

Report Prepared By:

REDACTED

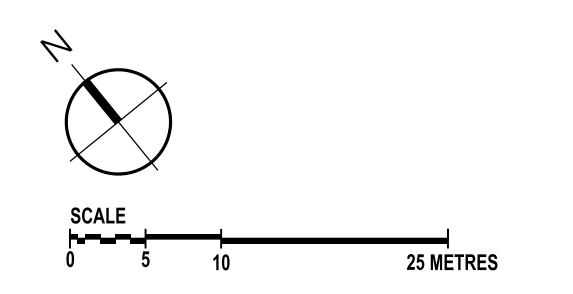
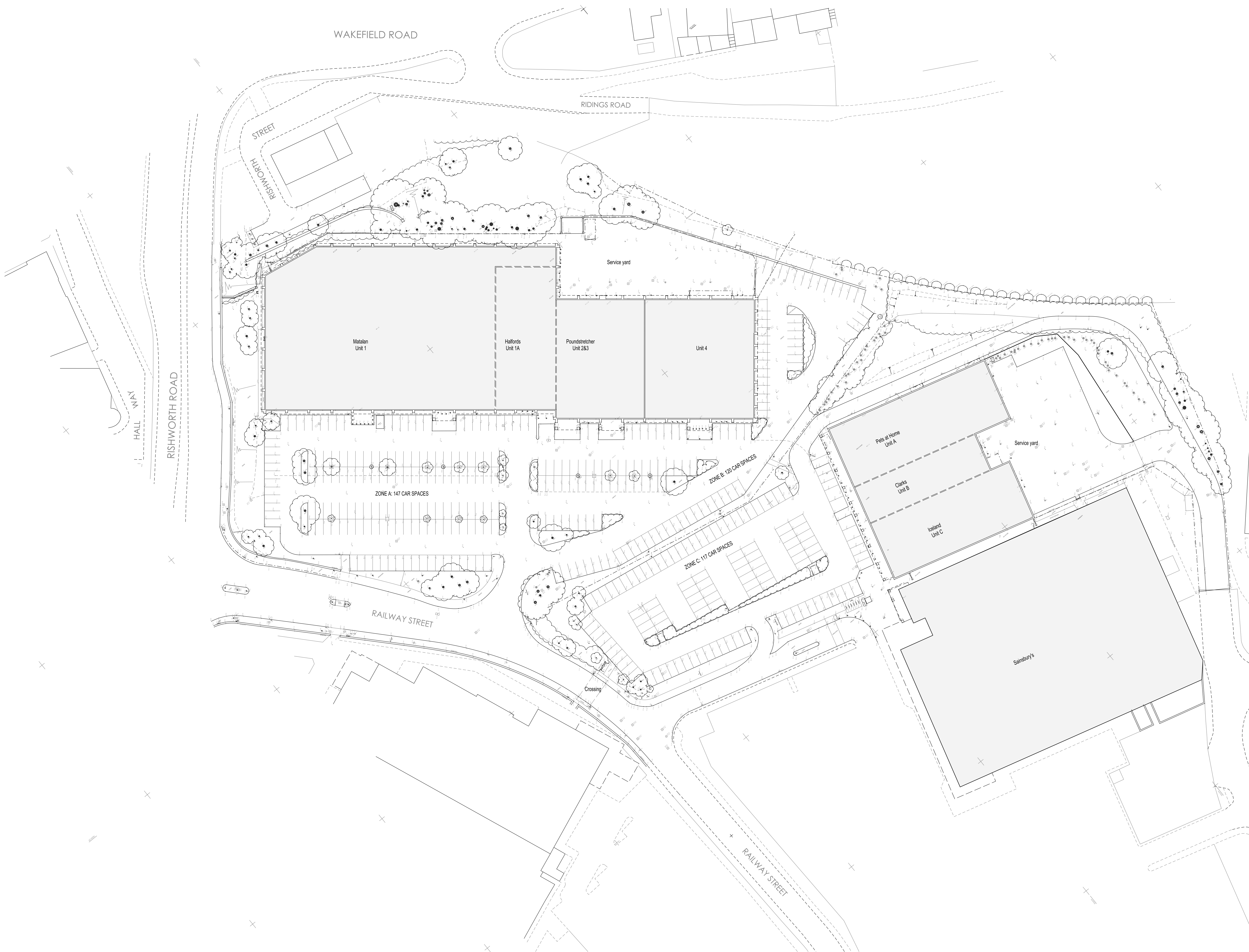
Alan P. C. Morris B.Eng.(Hons.), M.Sc.

Report Approved By:

REDACTED

Christopher J. Munro B.Eng.(Hons.), C.Eng., M.I.Struct.E.

Appendix A - Existing Site Plan

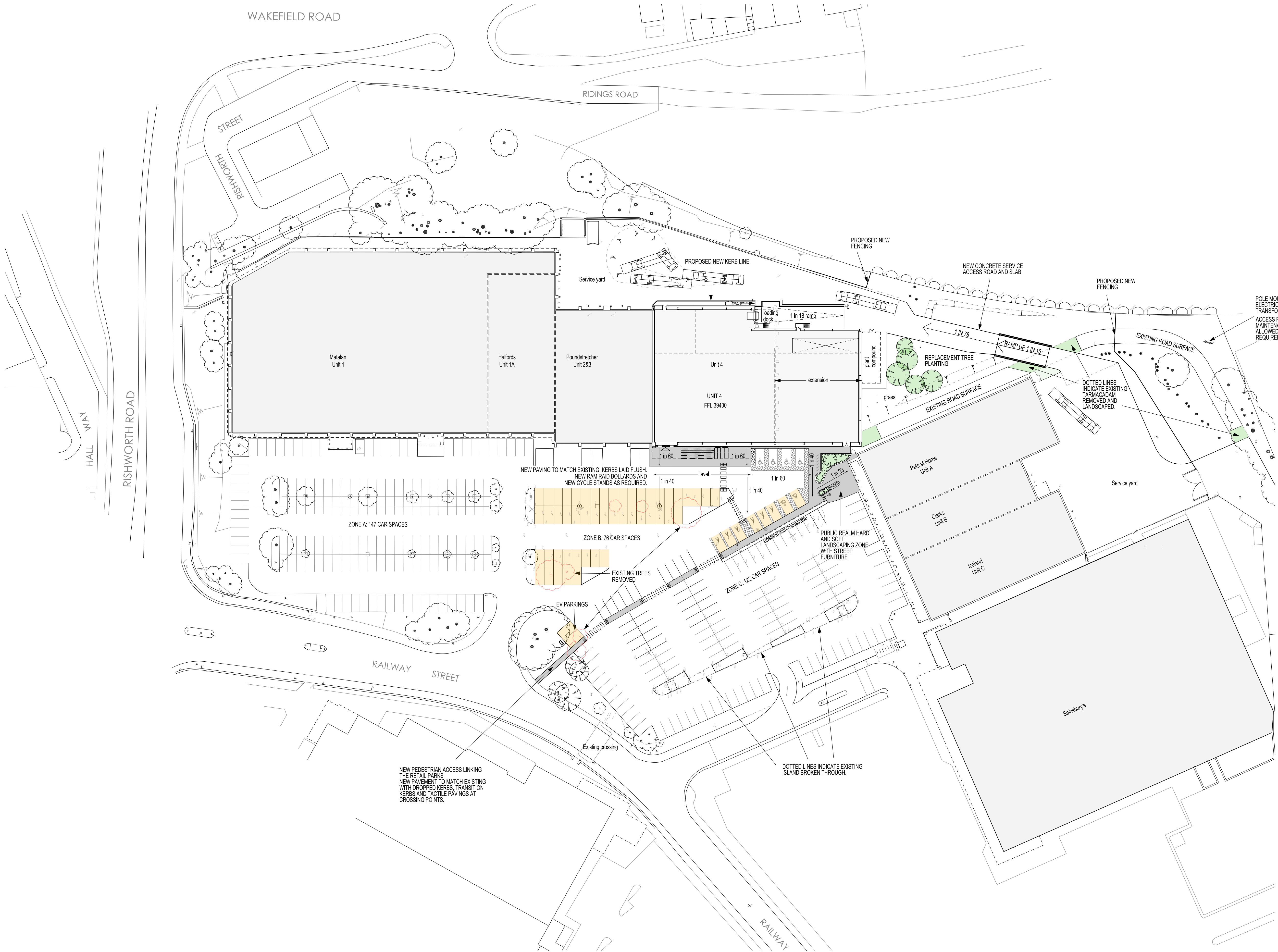


NOTES:
THIS DRAWING IS BASED UPON THE FOLLOWING INFORMATION:
1) TOPOGRAPHICAL SURVEY FROM THP DRAWING REF: 15330-001
SURVEYOR/ DATE: UNKOWN
2) OS MAP

CUSTOMER CAR PARKING:
ZONE A = 147
ZONE B = 120
ZONE C = 117
TOTAL: 384 CAR SPACES

REV.	DATE	NOTES	INT.
CLIENT / PROJECT NEWRIVER RETAIL RISHWORTH CENTRE, DEWSBURY			
DRAWING TITLE EXISTING SITE PLAN			
STATUS PLANNING			
DATE	JULY '20	DRAWN	WNH
SCALE @ A1	1:500		
PROJECT NUMBER	UNIT / BLOCK	CI / SPS CODE	TYPE A NUMBER / REVISION LETTER
DRAWING NO. 10574			
PL 02			
THE RATCLIFFE GROVES PARTNERSHIP			
MANCHESTER 100 MANCHESTER ROAD BURY LANCASHIRE, BL9 6TD www.rgp.co.uk			
LONDON 19 REDFORD ROW LONDON, WC1R 4BB T: 020 7600 6666 E: london@rgp.co.uk			

Appendix B – Proposed Site Plan



KEY:

- CUSTOMER CAR PARKING AREAS RECONFIGURED. PARKING BAY EXTENDED TO 2.5m X 4.8m. NEW WHITE LINE THERMOPLASTIC ROAD MARKINGS.
- NEW PAVEMENT TO MATCH EXISTING WITH DROPPED KERBS, TRANSITION KERBS AND TACTILE PAVINGS AT CROSSING POINTS.
- NEW LANDSCAPED AREAS

CUSTOMER CAR PARKING:

ZONE A =	147
ZONE B =	76
ZONE C =	122
TOTAL:	345 CAR SPACES

PARKING QUOTA ZONE B & C

DISABLED BAYS	9
STANDARD BAYS (OF WHICH 2.5m wide)	183
PARENT AND CHILD	6
TOTAL	198

A	17.07.20	NEW KERB LINE AT SERVICE YARD	WNH
REV.	DATE	NOTES	INT.

CLIENT / PROJECT
NEWRIVER RETAIL
RISHWORTH CENTRE, DEWSBURY

DRAWING TITLE
PROPOSED SITE PLAN

STATUS
PLANNING

DATE	JULY '20	DRAWN	WNH	SCALE @ A1	1:500
PROJECT NUMBER	10574	UNIT / BLOCK	1	TYPE A NUMBER	LETTER

DRAWING NO.	10574	PL 06	A
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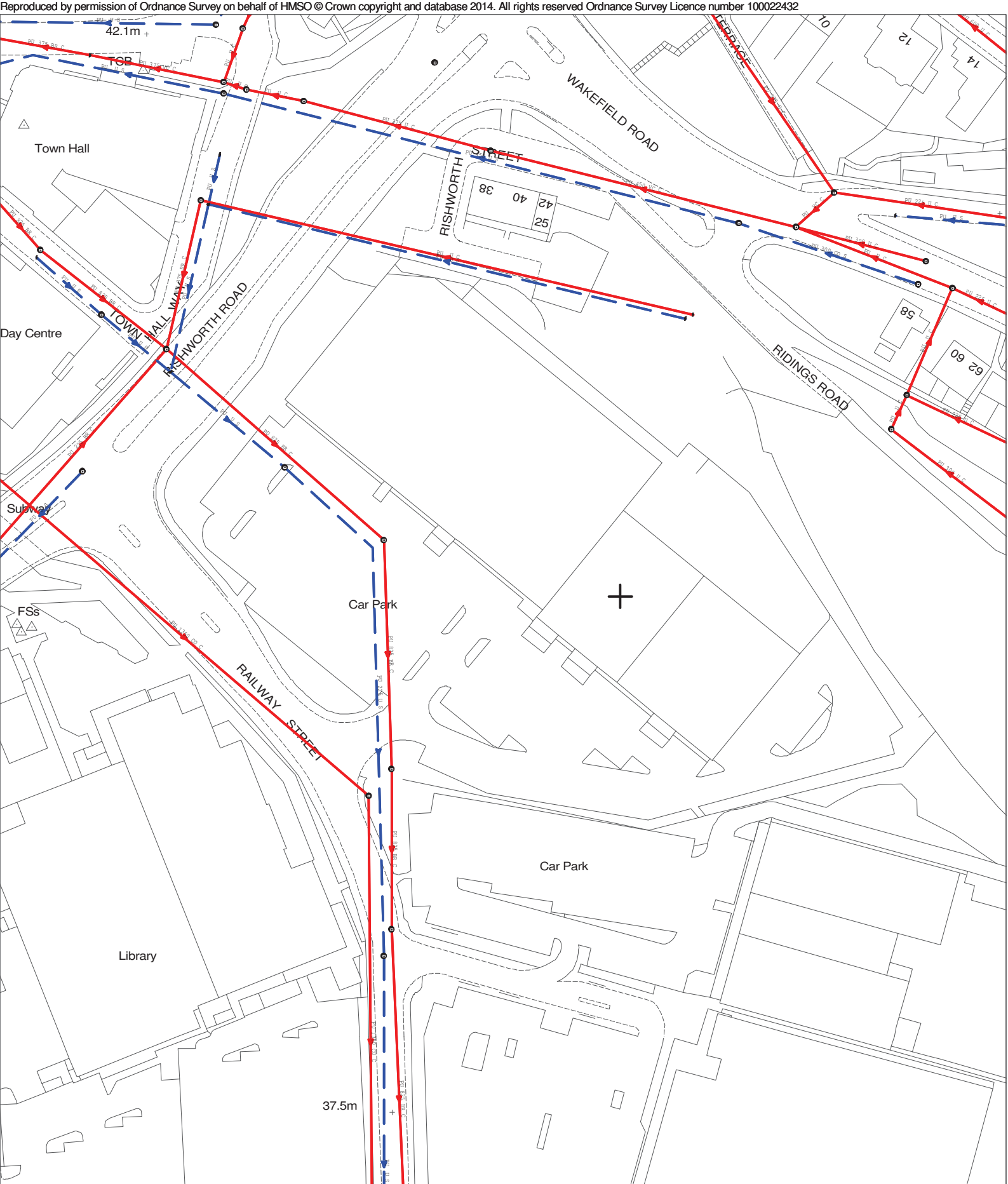
Site Location Plans	L	GA Plans	P	Elevations	E
Sections	S	Details	D	Photoc Colour	C

THE RATCLIFFE GROVES PARTNERSHIP
MANCHESTER
100 MANCHESTER ROAD
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rga
architects

Appendix C – Commercial Search Sewer Records



Public Waste Water Network 02/10/2017 11:57:29 OS Grid Coordinates: 424725 : 421460 Map Name : SE2421SE delaneyg

Appendix D – Environment Agency Flood Maps

Flood map for planning

Your reference
J6957

Location (easting/northing)
424921/421583

Created
15 Jul 2020 11:28

Your selected location is in flood zone 1, an area with a low probability of flooding.

This means:

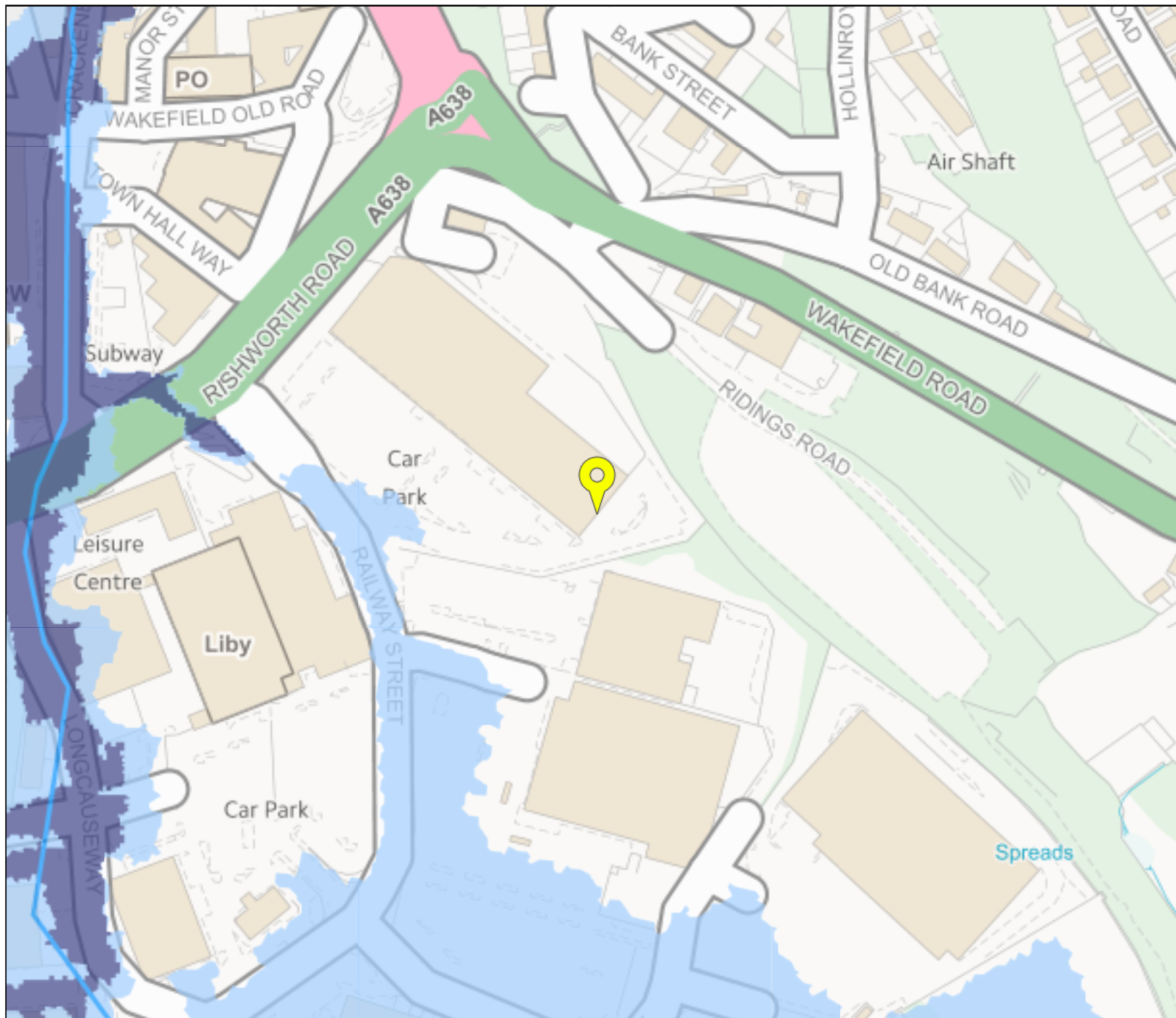
- you don't need to do a flood risk assessment if your development is smaller than 1 hectare and not affected by other sources of flooding
- you may need to do a flood risk assessment if your development is larger than 1 hectare or affected by other sources of flooding or in an area with critical drainage problems

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

The Open Government Licence sets out the terms and conditions for using government data.
<https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>



Flood map for planning

Your reference
J6957

Location (easting/northing)
424921/421583

Scale
1:2500

Created
15 Jul 2020 11:28

-  Selected point
-  Flood zone 3
-  Flood zone 3: areas benefitting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Flood storage area

0 20 40 60m

Appendix E – Kirklees Council SFRA Map

Appendix F – Kirklees Council PFRA Map

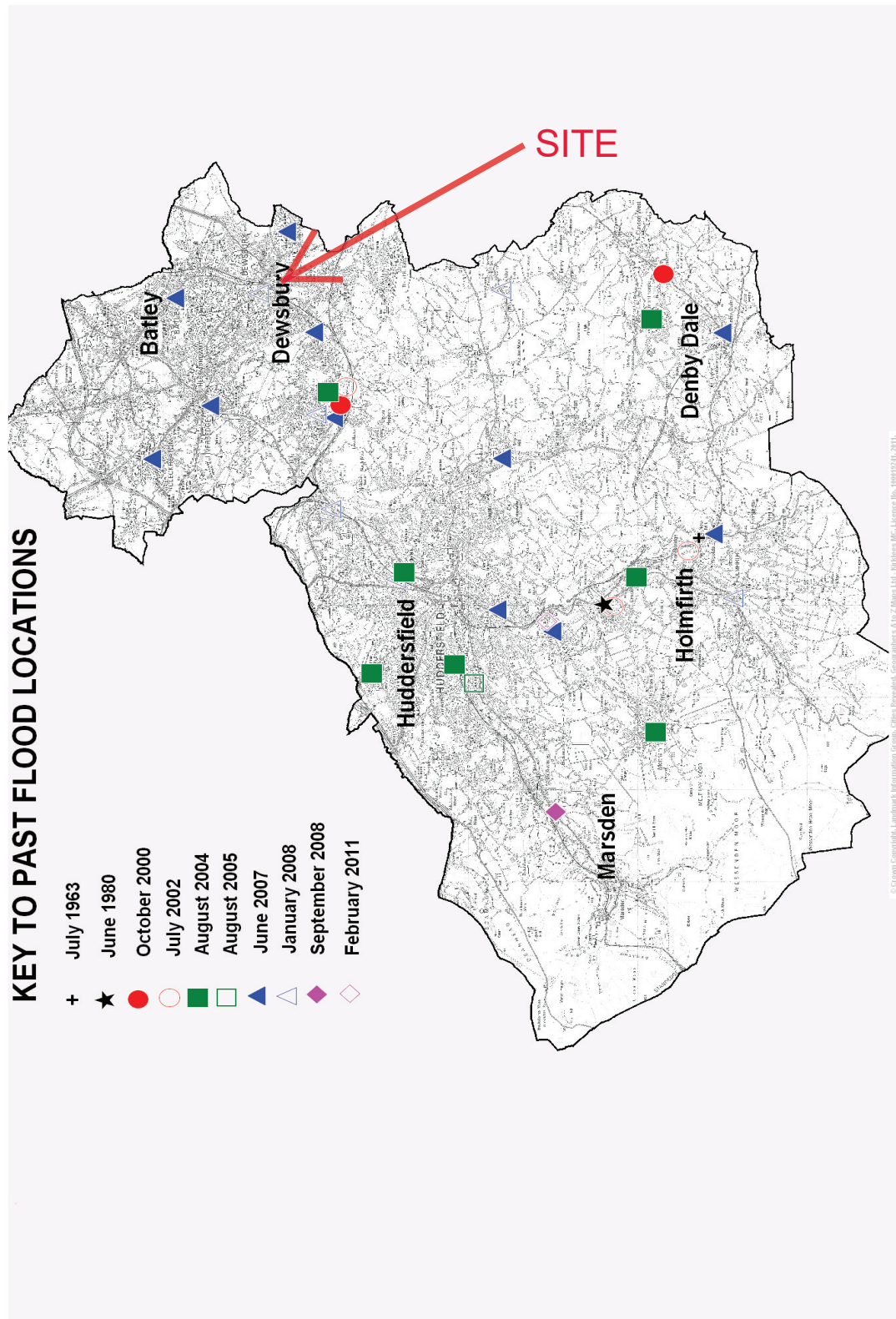


Figure 2 - Past Flood Risk

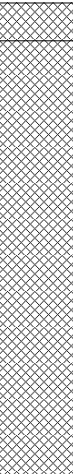
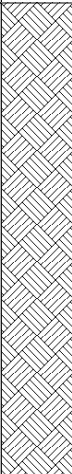
Appendix G – Boreholes



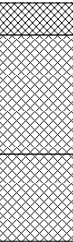
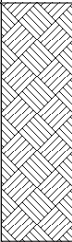
020 Infoterra Ltd & Bluesky, The GeoInformation Group, Map data ©2020

10 m

	Contract Name: Rishworth Centre, Dewsbury, WF12 8EQ			Client: New River REIT Ltd			Borehole ID: WS1		
	Contract Number: 2240156	Date Started: 25/06/2020	Logged By: CL	Checked By:	Status: DRAFT	Sheet 1 of 1			
	Easting:	Northing:	Ground Level:	Plant Used:	Print Date: 03/07/2020	Scale: 1:40			
Dynamic Sample Borehole Log									
Weather:			Termination: Window sampling apparatus refused at 4.915m.			SPT Hammer: N/R, Energy Ratio: N/R			
Samples & In Situ Testing				Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/Installation	
0.00 - 0.10	D1			0.10		MADE GROUND comprising dark brown gravelly TOPSOIL with medium cobble content. Cobbles and gravel are of sandstone.			
0.10 - 0.40	B3			(0.30)					
0.25	ES2			0.40					
0.50 - 1.00	B4			(0.60)		MADE GROUND comprising light brown to grey sandy angular to subrounded fine to coarse GRAVEL of sandstone.			
						(MGR)			
1.00		SPT(S) N=30 (9,10/12,7,5,6)		1.00		MADE GROUND comprising dark grey and brown slightly sandy gravelly CLAY with pockets of black ash. Gravel is angular and subangular fine to coarse of sandstone, brick and concrete.	1		
1.20	ES5			(0.30)					
				1.30		(MGR)			
1.50 - 2.00	B6					MADE GROUND comprising black gravelly ASH fill with pockets of orange brown and grey mottled clay. Gravel is angular and subangular fine to coarse of sandstone and brick.			
						(MGR)			
2.00		SPT(S) N=7 (1,1/1,1,2,3)				Firm brown slightly sandy CLAY.	2		
						From 1.50m; With frequent organic material.			
2.50 - 3.00	B7								
				(3.20)					
3.00 - 3.25	D8	SPT(S) N=6 (1,1/1,1,2,2)					3		
3.00									
3.50 - 4.00	B9								
4.00 - 4.45	D10	SPT(S) N=23 (1,1/2,5,7,9)				From 4.00m; Becomes brown and grey slightly sandy to sandy.	4		
4.00									
4.50	D11			4.50					
4.70		SPT(S) 29 (21 for 75mm/29 for 0mm)		(0.42)		Weathered orange brown gravelly sandy CLAY. Gravel is angular and subangular fine to coarse of sandstone.			
4.80		SPT(S) 29 (21 for 75mm/29 for 40mm)		4.92					
						End of Borehole at 4.92m	5		
							6		
							7		
							8		
Borehole Diameter		Installation		Remarks:					
Depth (m)	Dia (mm)	Depth Top	Base (m)	Dia (mm)	Pipe Type	Groundwater not observed.			
Water Strikes									
Depth Strike	Depth Casing	Depth Sealed	Time (mins)	Rose to (m)	Remarks				
IFA DS Template Issue Number: 3 Issue Date: 30-01-16									

	Contract Name: Rishworth Centre, Dewsbury, WF12 8EQ			Client: New River REIT Ltd			Borehole ID: WS2		
	Contract Number: 2240156	Date Started: 25/06/2020	Logged By: CL	Checked By:	Status: DRAFT				
	Dynamic Sample Borehole Log		Easting:	Northing:	Ground Level:	Plant Used:	Print Date: 03/07/2020	Sheet 1 of 1 Scale: 1:40	
Weather:			Termination: Terminated at 2.50m due to collapsing of borehole.			SPT Hammer: N/R, Energy Ratio: N/R			
Samples & In Situ Testing				Strata Details				Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description		Water Strike	Backfill/ Installation
0.00 - 0.10	D1	SPT(S) N=10 (2,2/3,3,2,2)		0.20		MADE GROUND comprising dark brown gravelly TOPSOIL. Gravel is of sandstone. (MGR)	1		
0.25 - 0.75	B3					MADE GROUND comprising loose light yellow brown slightly sandy angular and subangular fine to coarse GRAVEL of sandstone. (MGR)			
0.50	ES2					From 1.00m; With pockets of brown clay.			
1.00 - 2.00	B4								
1.00				(2.30)					
1.50	ES5								
2.00 - 2.45	D6	SPT(S) N=8 (2,2/2,1,2,3)		2.50		End of Borehole at 2.50m	2		
2.00									
							3		
							4		
							5		
							6		
							7		
							8		
Borehole Diameter		Installation				Remarks: Groundwater not observed.			
Depth (m)	Dia (mm)	Depth Top	Base (m)	Dia (mm)	Pipe Type				
Water Strikes									
Depth Strike	Depth Casing	Depth Sealed	Time (mins)	Rose to (m)	Remarks				
IFA DS Template Issue Number: 3 Issue Date: 30-01-16									

	Contract Name: Rishworth Centre, Dewsbury, WF12 8EQ			Client: New River REIT Ltd			Borehole ID: WS3																																														
	Contract Number: 2240156	Date Started: 25/06/2020	Logged By: CL	Checked By:	Status: DRAFT	Sheet 1 of 1																																															
	Easting:	Northing:	Ground Level:	Plant Used:	Print Date: 03/07/2020	Scale: 1:40																																															
Dynamic Sample Borehole Log																																																					
Weather:			Termination: Target Depth Achieved			SPT Hammer: N/R, Energy Ratio: N/R																																															
Samples & In Situ Testing				Strata Details				Groundwater																																													
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/Installation																																													
0.50	ES1			0.10		Dark brown TOPSOIL. (MGR)																																															
1.00	D2			(0.90)		MADE GROUND comprising dark grey and brown slightly sandy gravelly CLAY. Gravel is angular and subangular fine to coarse of sandstone and brick. (MGR)																																															
1.00	ES3	SPT(S) N=37 (7,7/9,9,10,9)		1.00		MADE GROUND comprising dark grey sandy fine to coarse GRAVEL of coal. (MGR)	1																																														
1.20				(0.60)																																																	
1.60 - 2.00	B4			1.60		MADE GROUND comprising dark grey and brown slightly sandy gravelly CLAY. Gravel is angular and subangular fine to coarse of sandstone and brick. (MGR)																																															
2.00	D5			(0.70)			2																																														
2.00	ES6	SPT(S) N=6 (1,1/1,1,2,2)		2.30		Dark brown slightly gravelly slightly sandy organic CLAY. Gravel is angular and subangular fine to coarse of sandstone.																																															
2.00				(1.90)																																																	
2.50 - 3.00	B7																																																				
3.00	D8						3																																														
3.00 - 4.00	B9	SPT(S) N=6 (1,1/1,1,2,2)																																																			
3.00																																																					
4.00							4																																														
4.20 - 4.50	B10	SPT(S) N=16 (1,1/2,3,5,6)		4.20		Weathered orange brown SANDSTONE.																																															
4.70 - 5.00	B11			(1.05)																																																	
4.80		SPT(S) N=50 (7,9/10,14,13,13)		5.25		End of Borehole at 5.25m	5																																														
							6																																														
							7																																														
							8																																														
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		1.00	5.00		Slotted																																																
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IFA DS Template Issue Number: 3 Issue Date: 30-01-16																																																					

		Contract Name: Rishworth Centre, Dewsbury, WF12 8EQ		Client: New River REIT Ltd		Borehole ID: WS4				
		Contract Number: 2240156	Date Started: 25/06/2020	Logged By: CL	Checked By:			Status: DRAFT		
Dynamic Sample Borehole Log		Easting:	Northing:	Ground Level:	Plant Used:	Print Date: 03/07/2020	Sheet 1 of 1 Scale: 1:40			
		Weather:		Termination: Terminated at 1.26m due to encountering a sandstone obstruction.		SPT Hammer: N/R, Energy Ratio: N/R				
Samples & In Situ Testing				Strata Details			Groundwater			
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description	Water Strike	Backfill/Installation		
0.40	ES1	SPT(S) 50 (9,15/50 for 110mm)		0.17		MADE GROUND comprising ASPHALT. (MGR)	1			
			(0.63)	MADE GROUND comprising dark red grey sandy slightly clayey angular and subangular GRAVEL of sandstone, mudstone and brick. (MGR)						
0.90	ES2		0.80	MADE GROUND comprising dark grey clayey angular and subangular fine to coarse GRAVEL of sandstone and siltstone. (MGR)						
1.00			(0.46)	From 1.00m: Sandstone obstruction.						
				1.26		End of Borehole at 1.26m				
							2			
							3			
							4			
							5			
							6			
							7			
							8			
Borehole Diameter		Installation		Remarks: Groundwater not observed.						
Depth (m)	Dia (mm)	Depth Top	Base (m)						Dia (mm)	Pipe Type
Water Strikes										
Depth Strike	Depth Casing	Depth Sealed	Time (mins)	Rose to (m)	Remarks					
IFA DS Template Issue Number: 3 Issue Date: 30-01-16										

Weather:		Termination: at 8.525m on impenetrable material.				SPT Hammer: N/R, Energy Ratio: N/R					
Samples & In Situ Testing					Strata Details					Groundwater	
Depth	Sample ID	Test Result	Level (mAOD)	Depth (m) (Thickness)	Legend	Strata Description				Water Strike	Backfill/ Installation
0.20	D1			0.10		MADE GROUND comprising ASPHALT. (MGR)					
0.40	C2			0.35		MADE GROUND comprising grey slightly sandy fine to coarse GRAVEL of limestone. (MGR)					
0.50 - 1.00	B3			0.45							
1.00	D4	SPT(S) 1.20m, N=8 (1,2/1,2,2,3)		(1.55)		MADE GROUND comprising dark grey and brown slightly sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse sandstone, mudstone, brick and coal. (MGR)				1	
1.20 - 1.65	B5										
1.20 - 1.70	B5										
1.85	D6	SPT(S) 2.00m, N=11 (5,2/2,2,3,4)		2.00		Brown slightly gravelly slightly sandy CLAY. Gravel is angular to rounded fine to coarse of sandstone.				2	
2.00	C8										
2.00 - 2.45	D7										
2.00 - 2.50	B9	23 blows								3	
2.75	D10										
3.00 - 3.30	U11										
3.00 - 3.50	B12	SPT(S) 4.00m, N=30 (5,8/8,9,7,6)		(4.90)		From 4.10m: Becomes gravelly. Gravel becomes angular and subangular.				4	
3.75	D13										
4.00 - 4.45	D14										
4.10 - 4.50	B15	SPT(S) 5.00m, N=44 (11,13/12,12,9,11)								5	
4.75	D16										
5.00 - 5.45	D17										
5.00 - 5.50	B18									6	
5.75	D19										
6.50 - 6.95	D20	SPT(S) 6.50m, N=50 (9,8/50 for 310mm)		6.90		Very dense brown fine to coarse SAND and angular and subangular fine to coarse GRAVEL of sandstone.				7	
6.50 - 7.00	B21										
7.25	D22	SPT(S) 8.00m, N=50 (10,11/50 for 270mm)		(1.40)						8	
8.00 - 8.45	D23										
8.30 - 8.50	D24										
		SPT(S) 8.50m, 20 (11,13/20 for 75mm)		8.30		Yellow grey SANDSTONE.				9	
				8.53		End of Borehole at 8.525m				10	
Start & End of Shift Observations					Borehole Diameter		Casing Diameter		Remarks:		
Date	Time	Depth (m)	Casing (m)	Water (m)	Depth (m)	Dia (mm)	Depth (m)	Dia (mm)	Observed as damp at 6.90m. 1hr hand digging service pit. 0.5hr cleaning borehole area.		
					8.50	150	8.50	150			
									Water Strikes		
Chiselling					Installation		Strike (m) Casing (m) Sealed (m) Time (mins) Rose to (m) Remarks				
From (m)	To (m)	Duration	Remarks		Top (m)	Base (m)	Type	Dia (mm)			
8.00	8.30	01:00			0.00	1.00	Plain				
					1.00	5.00	Slotted				
HBSI CP Template Issue Number: 3 Issue Date: 27/04/16											

Appendix H – Kirklees Council Pre-Application Response

**Consultation Response from KC,
Lead Local Flood Authority**
2020/20084 at Unit 4, The Rishworth Centre, Railway Street, Dewsbury, WF12 8EQ
Pre application for extension and associated works

Date Responded: 23/03/2020

Responding Officer: Jason Hanks

Responding Ref:01

Contours

Water falling on this site would naturally drain in a south/south-westerly direction. The location that the site sits on has a gradient of roughly 1:14.

Main River Flood Risk

The entire sit sits within flood zone 1. This is the lowest flood risk zone from main river sources.

Flood Zone 1 - land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%)

Parts of Railway Street are in flood zone 2. In an extreme weather event the site could become cut off.

Surface Water Flood Risk

At the location of the extension there is no predicted surface water flooding up to the 1:100 year event and greater. There is some predicted ponding the rear of unit 4, in the event of drainage failure in an extreme weather event this could impact the site.

Flood Incidents

It is Kirklees Councils statutory duty as the LLFA to record all incidents of flooding in the district. This information gives us a wider understanding of flooding issues.

There has been 1 flood incident on Rishworth Road near the junction with Station Street. This occurred in the underpass.

There have also been several minor flooding incidents on Station Street just south of the site. This was caused by blocked gullies on a dip in the road.

Flood Routing/Site Layout

During intense rainfall events drainage systems can often become blocked or overwhelmed. We expect developers to understand where the flow of water will be in these circumstances and avoid unnecessary risk.

Surface Water Drainage Strategy

As this application is for an extension to a previously existing building, it is likely that the same drainage strategy will be utilised for the extension.

In line with all brownfield sites the NPPF requires a betterment of discharge rate for the proposed extension. This is expected to be a minimum of 30% discharge rate in the 1 in 1 year event.

If attenuation span is greater than 1500mm and positioned under highway this is likely to preclude adoption by Kirklees Council. Please speak to our Structures department for more information. Storage in landscaped areas or non-adoptable highway is unaffected.

Section 106 – Management Company

The LPA is obligated under House of Commons Written Statement 161 to ensure the maintenance and management of sustainable drainage for the lifetime of the site. This includes the period from construction up until a date of adoption by the statutory undertaker (Yorkshire Water). There is no guarantee that systems will be adopted even if an agreement is signed to do so. It is vital therefore that an undertaking is ensured in the planning process to maintain these systems to manage flood risk. A detailed maintenance plan including access and safety is expected to be included so it can be enforced against non-compliance.

Temporary Drainage

Run off can increase post soil and vegetation strip and the risk of sediment entering the local drainage systems and watercourse. A plan to manage risk of flooding to nearby property and land and to protect watercourses from pollution will be required.