



Legend

Site Boundary

High Risk of Flooding from Surface Water

Medium Risk of Flooding From Surface Water

Low Risk of Flooding from Surface Water

Figure Title		
EA Flood Map for Surface Water		
Project Name		
Waterfold Business Park		
Project No./Filery ID		
1620016197		
Date	Figure No.	Revision
September 2023	7	1.0
Prepared By	Scale	
MH	1:3,000 @A3	
Client		
Tritax Management LLP		
		



Legend

- Site Boundary
- High Risk of Flooding from Surface Water
- Medium Risk of Flooding From Surface Water
- Low Risk of Flooding from Surface Water

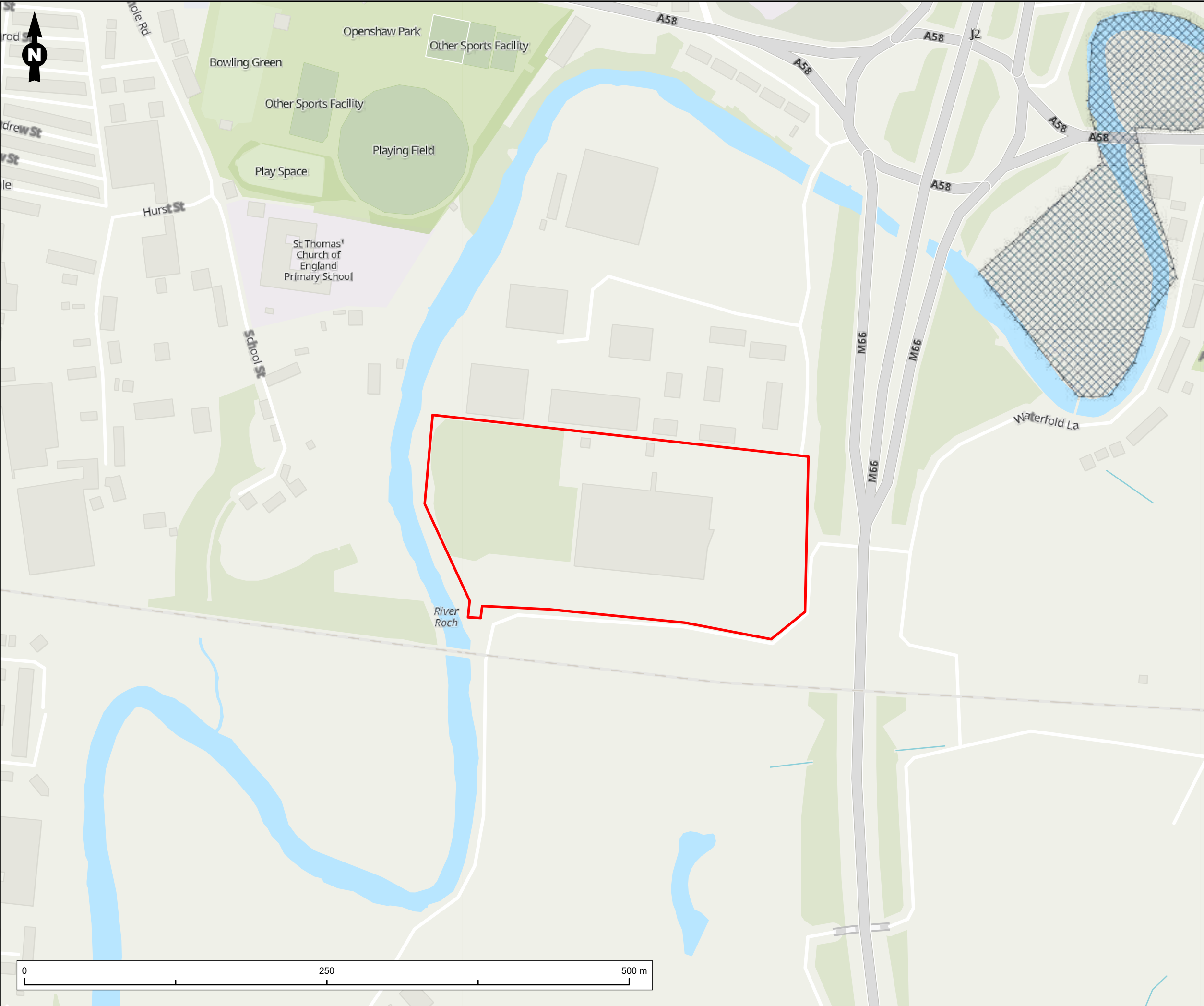
Figure Title
Surface Water Flow Direction

Project Name
Waterfold Business Park

Project No./Filery ID
1620016197

Date September 2023	Figure No. 8	Revision 1.0
Prepared By MH	Scale 1:3,000 @A3	

Client
Tritax Management LLP



Legend

Site Boundary

EA Recorded Flood OutlinesEA Recorded Flood Outlines

Figure Title

Historic Flood Records

Project Name

Waterfold Business Park

Project No./Filery ID

1620016197

Date

September 2023

Figure No.

9

Revision

1.0

Prepared By

MH

Scale

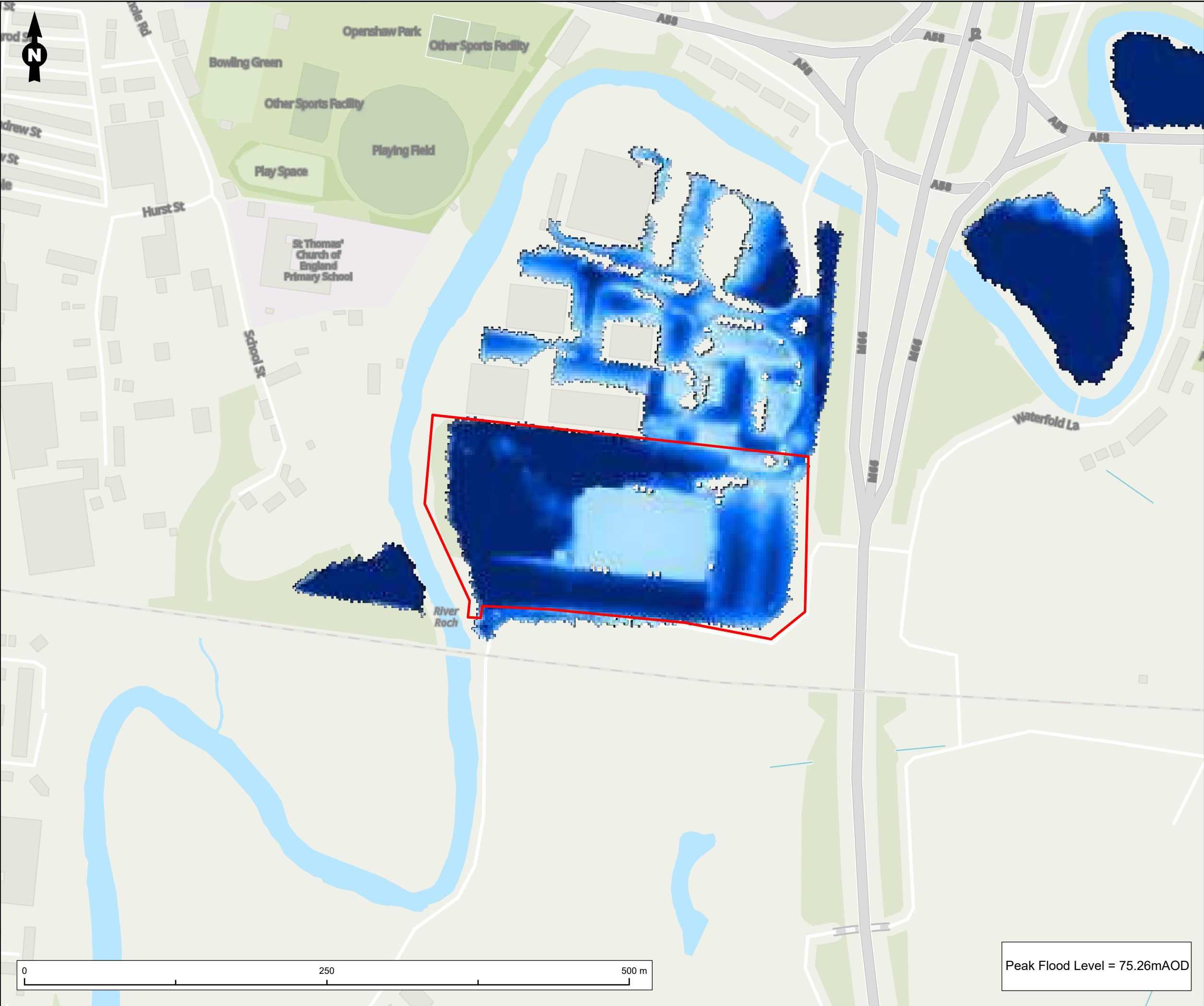
1:3,000 @A3

Client

Tritax Management LLP

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Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

Site Boundary

1 in 1,000 AEP (depth)

>0.5m

0

Figure Title
EA Model 1 in 1,000 AEP

Project Name
Waterfold Business Park

Project No./File ID
1620016197

Date
September 2023

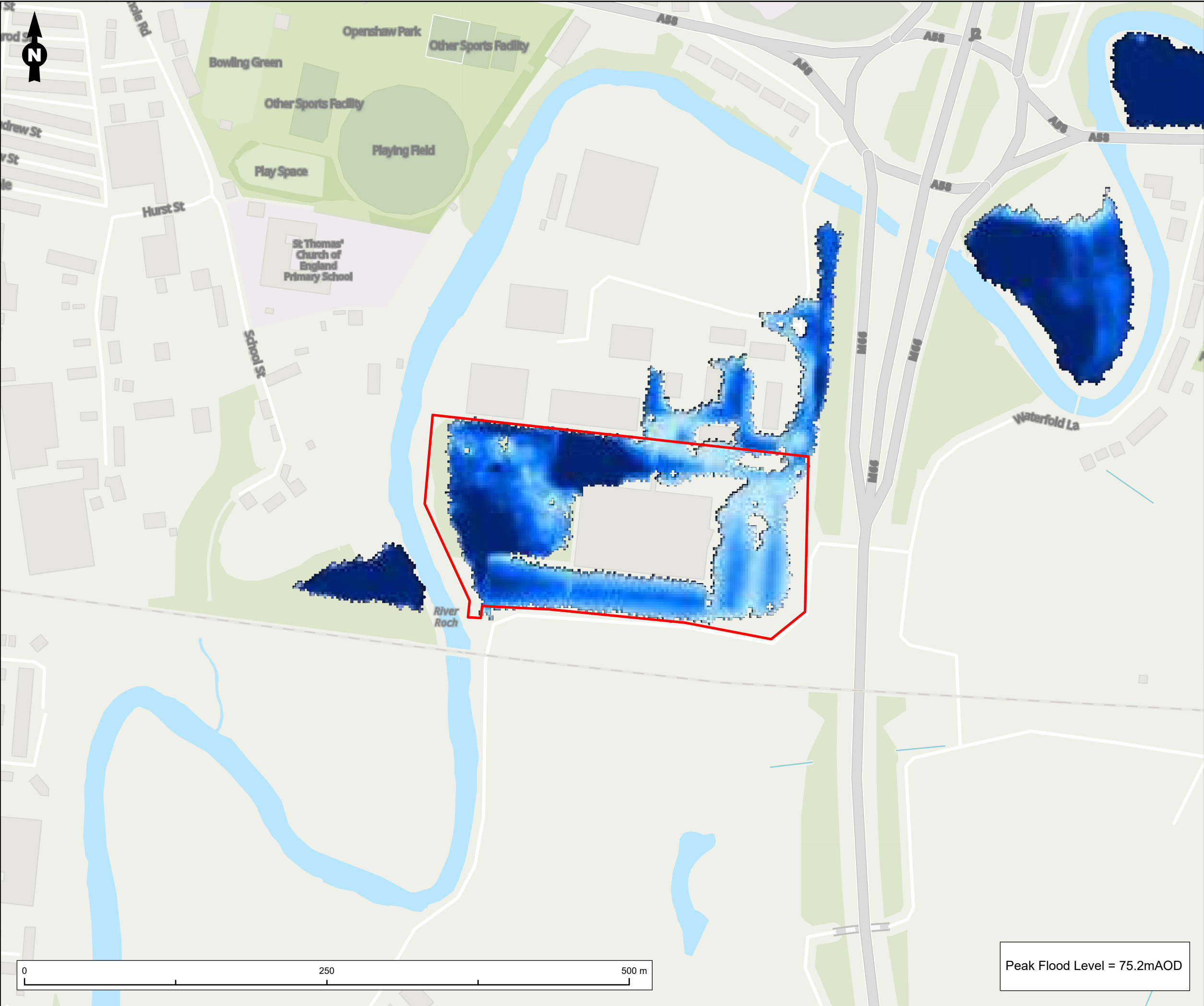
Figure No.
10

Revision
1.0

Prepared By
MH

Scale
1:3,000 @A3

Client
Tritax Management LLP



Legend

Site Boundary

1 in 100 AEP +35% (depth)

>0.5m

0

Figure Title
EA Model 1 in 100 AEP +35%
Climate Change

Project Name
Waterfold Business Park

Project No./File ID
1620016197

Date
September 2023

Figure No.
11

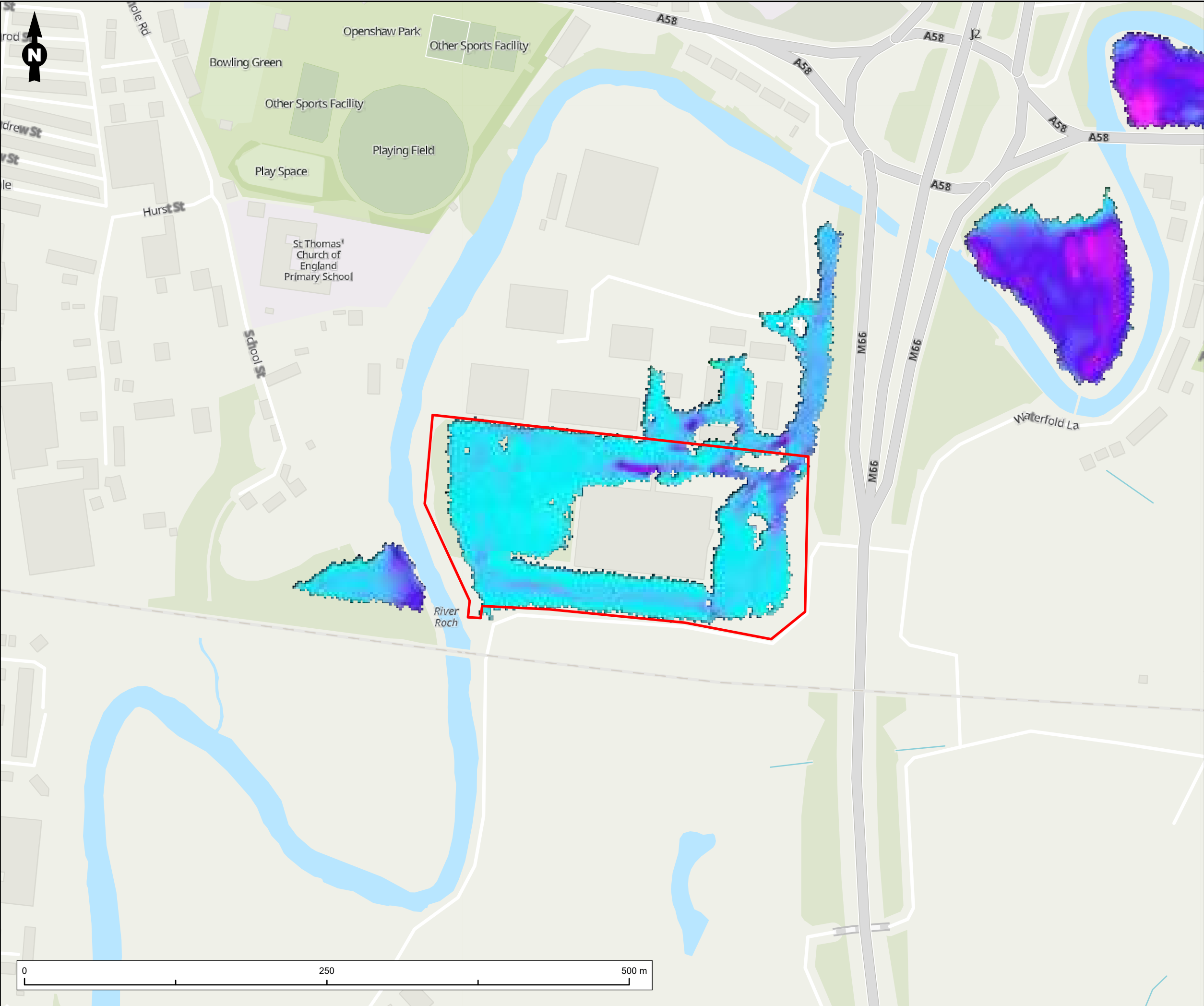
Revision
1.0

Prepared By
MH

Scale
1:3,000 @A3

Client
Tritax Management LLP

Peak Flood Level = 75.2mAOD



Legend

Site Boundary

1 in 100 AEP +35% (Velocity)

>1.5m/s

0

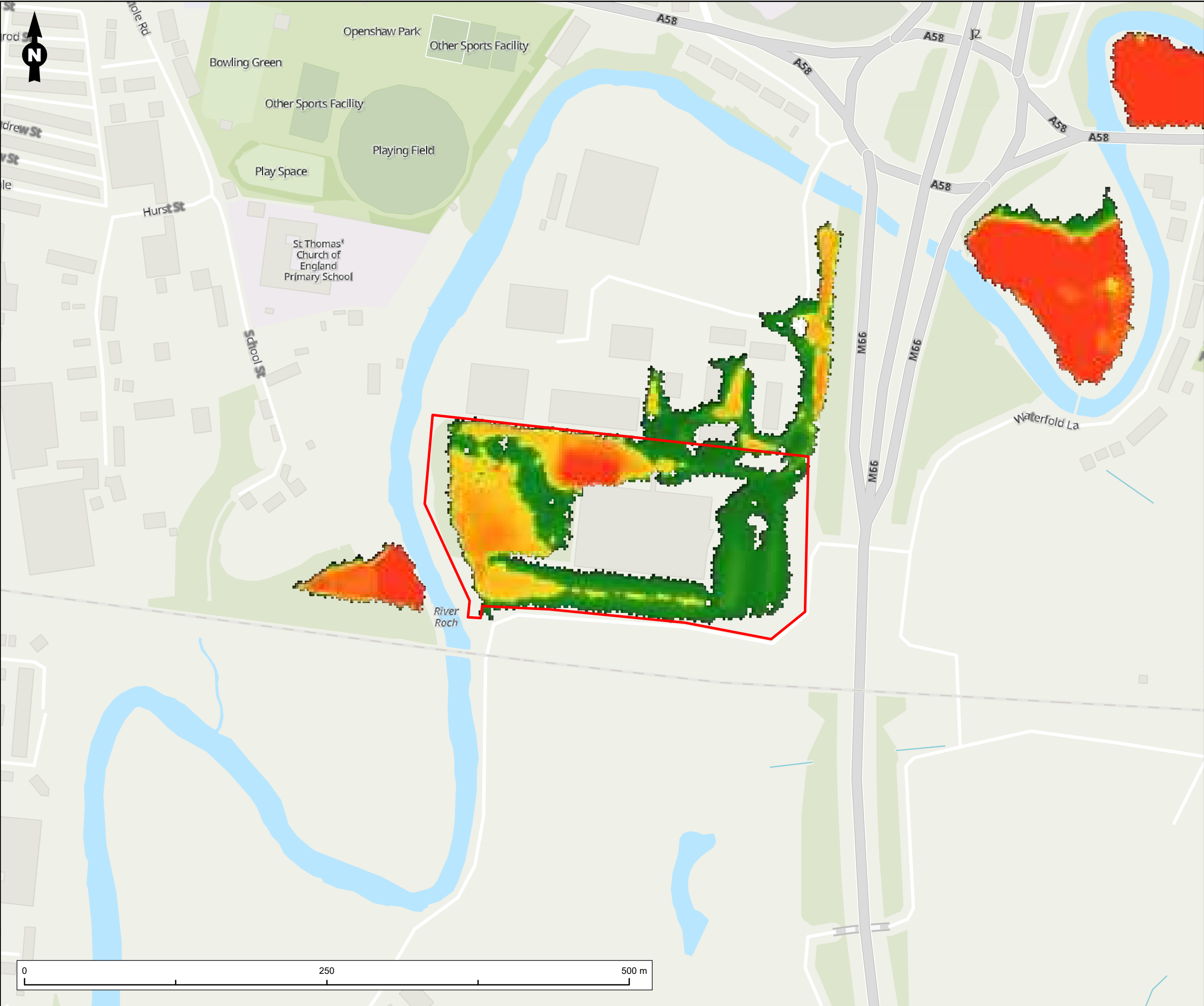
Figure Title
EA Model 1 in 100 AEP +35%
Climate Change (Velocity)

Project Name
Waterfold Business Park

Project No./Fility ID
1620016197

Date October 2023	Figure No. 12	Revision 1.0
Prepared By MH	Scale 1:3,000 @A3	

Client
Tritax Management LLP



Legend

Site Boundary

1 in 100 AEP +35% Hazard Rating (Coefficient)

1.5

0.5

Figure Title

EA Model 1 in 100 AEP +35% Climate Change (Hazard Rating)

Project Name

Waterfold Business Park

Project No./Fility ID

1620016197

Date

October 2023

Figure No.

13

Revision

1.0

Prepared By

MH

Scale

1:3,000 @A3

Client

Tritax Management LLP

RAMBOLL

APPENDIX A

ROCHDALE BOROUGH COUNCIL PRE-APPLICATION RESPONSE

ECONOMY DIRECTORATE

PLANNING AND DEVELOPMENT

Peter Frampton

By Email Only

peter.frampton@framptons-planning.com

Daniela Ripa
Interim Head of Planning Services

Number One Riverside, Smith Street,
Rochdale, OL16 1XU

Telephone: 0300 303 8873

Email:

development.management@rochdale.gov.uk

Our Ref: PREAPP/00003/23

Enquiries to: Rachel Carney

Direct Line: 01706 924342

Date: 30 March 2023

Dear Mr Frampton,

Application No:	PREAPP/00003/23
Application	Pre-Application
Proposal:	Redevelopment of land and buildings for class B2/B8 use
Location:	Land at Waterfold Business Park, Bury, BL9 7BQ

I write further to your enquiry for redevelopment of the former Bibby Distribution site with new B2/B8 units. I note that you have paid for the pre-application enquiry service that includes a meeting. I will contact you separately to arrange for a telephone meeting to discuss your proposals.

Proposed development

Your proposal includes demolition of the existing unit and its replacement with a large single unit or two smaller units. The documents submitted comprise:

- Site Location Plan
- Planning Statement
- Appendix 1 – Outline Masterplan
- Appendix 2 – Proposals Map AL/EMP/19
- Appendix 3 – Site Masterplan – Option 1
- Appendix 4 - Site Master Plan – Option 2
- Appendix 5 – Arboricultural Survey
- Topographical Survey – Sheets 1 and 2

Site and surroundings

The proposal site sits to the south of Waterfold Business Park and it is flanked by the M66 to the east, the East Lancashire Railway to the south and the River Roch to the west. The business park is a relatively modern development that includes a variety of units. To its north there is also a public house and a hotel. The site is currently allocated as defined urban area and a primary employment zone and it is close to the border with Bury.

Principle of development

The proposal site is within a primary employment zone where saved UDP policy EC/2 is relevant alongside Core Strategy Policies E2 and E3. These policies promote the development of industrial, business and warehouse uses and the increase of jobs and prosperity in the area.

The Council note that the most recent use of the site appears to be by Bibby Distribution who used the site for their storage and distribution operations. The last planning application submitted on the site was in 2016 (16/01171/FUL) which was for alterations to the existing warehouse and car park area.

Given the existing use of the site and its land allocation within a primary employment zone, it is considered that the principle of redeveloping the site with new industrial unit/s is acceptable.

Design

Policies P1 and P3 require high quality design in new development. The requirements for high quality design is also clearly set out in the NPPF. Paragraphs 126 of the NPPF states that the creation of high quality, beautiful and sustainable buildings and places is fundamental to what the planning and development process should achieve. Paragraph 130 goes on to state that planning policies and decisions should ensure that developments function well and add to the overall quality of the area, are visually attractive as a result of good architecture, layout and appropriate and effective landscaping and are sympathetic to local character and history, including the surrounding built environment and landscape setting, while not preventing or discouraging appropriate innovation or change. Additionally, Paragraph 134 states development that is not well designed should be refused, especially where it fails to reflect local design policies and government guidance on design.

You have outlined two proposals within your enquiry, a large single unit or two small units. Subject to the impact on the constraints identified below, the Council have no preference to either of the proposals but with any application submitted you should ensure that high quality design is brought forward to ensure that the scheme enhances the visual amenities of the area. This should include the materiality of the buildings and also their setting within high quality landscaped areas.

Noise/disturbance

Policy G9 of the Council's Core Strategy requires that development will reduce all forms of pollution in the area, and to this extent new development should not have impacts that lead to an unacceptable increase in air, water, noise, light or other pollution.

Although the site is currently under industrial use, the extension of development to the west would reduce the distance to the residential properties to the opposite side of the River Roch.

A noise impact statement would be required with any application to demonstrate that the surrounding occupiers would not be subject to any undue harmful disturbances as a result of the development.

Highways and Access

Policy DM1 of the Core Strategy requires that all development provide satisfactory vehicular access with adequate parking, manoeuvring and servicing arrangements, taking into account the proposed use and location.

Policy T2 of the Council's adopted Core Strategy also sets out the type and scale of development that require a Transport Assessment (TA) and Travel Plan (TP) and promotes that development be located in sustainable locations.

The Council's Highway Service have reviewed the proposal and advised that redevelopment of the site will require the submission of a Transport Assessment (TA) with any future application and that the TA must be drafted in line with current guidance.

Any future application should also include a Travel Plan. Highways Services have advised that the site is not in a sustainable location and therefore future TA's and Travel Plans should identify how sustainable access can be improved. Future applications should assess links into the local Bee Network, which can be viewed at <https://mappinggm.org.uk/>. Highway Services are also likely to request a financial contribution towards improvements to the Bee Network as part of the planning application.

As with any industrial development, Highways expect adequate internal turning facilities for HGV's, with appropriate servicing arrangements. Swept path analysis is therefore required with the TA.

Any future application should clearly identify internal parking arrangements and parking provision should be Council standards which are available under Appendix 5 of the Council's Core Strategy Rochdale Core Strategy and copied below.

B2: GENERAL INDUSTRY			
General Industry	1 space per 60m ²	1 space per 700m ² (min 2 spaces)	1 space per 2,800m ² (min 2 spaces)

B8: STORAGE/ DISTRIBUTION			
Storage / Distribution Warehousing	1 space per 100m ²	1 space per 850m ² (min 2 spaces)	1 space per 4,000m ² (min 2 spaces)

There would also be a requirement that parking and loading area etc are SUDs compliant (further advice on drainage and flood risk below) and a Construction Method Statement will be required.

Ecology and Trees

As you have detailed, the western part of the site includes significant tree cover and it is also located immediately adjacent to a greenspace corridor that runs parallel to the River Roch, to the west of the site. In addition, the application site is within the SSSI/SAC Impact Risk Zone

for the Rochdale Canal.

Policy G6 of the Council's Core Strategy requires that development protects and improves green infrastructure and where trees are to be removed, these should be replaced on a 2:1 ratio. Policy G7 also requires that site and features of biodiversity are given full and appropriate recognition and protection and the NPPF under chapter 15 requires that planning decisions contribute to and enhance the natural environment. Additionally, under the Environment Act 2021 all planning permissions (with a few exceptions) will have to deliver at least 10% biodiversity net gain. This requirement will become statutory in November this year (2023).

You have submitted an arboricultural survey and this categorises the majority of the trees on site as C1 (trees of low quality). While the trees may not be of high value any trees lost as a result of the development will be required to be replaced at a minimum ratio of 2:1. As required by the NPPF, loss of any trees should, in the first instance, be avoided. Additionally, an application should be accompanied by a breeding bird survey and a Preliminary Ecological Appraisal (Extended Phase I Survey) which includes an assessment of impacts on the SSSI/SAC Impact Zone from the Rochdale Canal as well as assessment of the site. A full bat assessment of the existing and surrounding trees in addition to bat activity surveys should also be submitted.

In respect of biodiversity net gain, The Greater Manchester Combined Authority ([GMCA](#)) has adopted [guidance](#) on the format of the submission of information. Biodiversity net gain metrics will be required with a future application as well as a biodiversity enhancement management plan.

Contamination

Policy G9 requires that development reduces all forms of pollution in the borough that that all risks associated with contaminated land are identified and appropriately managed, this is particular relevant for this site given the current land use. A Phase I Contaminated Land report will therefore be required with the submission of any planning application on the site. A further Phase II intrusive site investigation should be submitted if this is identified as necessary within the Phase I appraisal.

Drainage and flooding

Policy G8 of the Core Strategy requires that new development does not lead to any form of increased flooding locally or further downstream, does not impeded natural water and flood risk management, is not detrimental to existing or potential flood storage areas, contributes where possible to alleviating existing flood risk, is itself well protected from flood risk and ensures prudent use of water resources.

The proposed development site is located within Flood Zone 2 and 3 and therefore a Flood Risk Assessment will be required with any application. Information on sustainable drainage systems will also be required and as a major development (proposing development of more than 1,000m²) a sequential test is also needed to demonstrate that the development could not be accommodated on a site at lower risk of flooding.

The Council's Drainage Officer has advised that the new development will need to include a system to provide at least 50% brownfield rate reduction in surface water discharge to river

(required under the NPPF).

It is advised that the attenuation system could, for example, include oversized pipes or geocellular tank with a final flow control device. If the new building is smaller, than existing (not indicated in your proposals). Then the provision of grassed or permeable areas may be another way to achieve surface water reduction.

The example 'Rational Method' calculation provided below estimates that flows for the new development would need to be restricted to 22 l/s.

Rational Method - Runoff calcs - SMCann RBC

Assumption is that runoff C_v from tarmac or roof area = 0.9

CIRIA C753

Area of old building sq.m.	7140	sq.m.	"The SuDS Manual"	
Brownfield area (existing and will also be part of development) (hectares)	0.714			
Greenfield area	0			
Total area	0.714	hectares		
	<u>Qbar (YR 2.3 mean annual)</u>	<u>YR 30</u>	<u>YR 100</u>	<u>YR 100 + 30%</u>
Rainfall Intensity (mm/hr)	25	44.2	57.7	75.01
Rational Runoff calculation ($2.78CiA$) = $C_v \times \text{rainfall rate} \times \text{Area}$ (l/s)	44.7	79.0	103.1	134.0
Brownfield area 50% runoff reduction	22.3	39.5	51.5	67.0
Max permitted future discharge to outfall (l/s)	<u>22.3</u>	39.5	51.5	67.0

You are also recommended to speak to the Environment Agency prior to the submission of an application and it is understood they offer their own advice service. The EA will be a statutory consultee on a planning application.

Summary

The principle of developing this site with new B2/B8 units is considered to be acceptable. However there are a number of constraints that will need considered before any application can be supported. Primarily, the impact on the trees and biodiversity of the site requires further consideration – tree loss should be avoided wherever possible, and biodiversity net gain will be required. Additionally, the flood risks of the site require further consideration. At least 50% brownfield rate reduction in surface water discharge to river is required and it is recommended that you seek advice from the Environment Agency prior to the submission of a planning application.

Should you wish to progress to a formal application, I would recommend that the following supporting information be provided:

- Completed application form and fee
- Full plans and elevations and site sections
- Proposed landscaping plan / planting plan
- Transport Statement and Travel Plan



- Arboricultural Impact Assessment including Tree Survey and Tree Protection Plan
- Biodiversity Statement including biodiversity net gain metric calculations and a biodiversity enhancement plan.
- Preliminary Ecological Appraisal (Extended Phase I Survey) including impact on Rochdale Canal SAC/SSSI
- Crime Impact Statement
- Energy and Climate Change Adaptation Statement
- Phase I Contaminated Land Report and possibly a Phase II Report (depending on the results of the Phase I)
- Flood Risk Assessment and Sequential Test
- Sustainable Drainage Assessment and Sustainable Urban Drainage (SuDS) Pro-Forma
- Noise Impact Assessment
- Design and Access Statement
- Planning/Supporting Statement

Please also see the Council's Local List for the Validation of Planning Applications [Validation of Planning Applications – Local List \(rochdale.gov.uk\)](https://www.rochdale.gov.uk/Validation-of-Planning-Applications-Local-List). This provides additional information on the validation process and requirements.

Please note that any advice provided above is an informal opinion only and is made without prejudice to any formal determination which may be given in the event of an application being submitted. In particular, it does not constitute a formal decision of the Council with regard to any future planning applications, which will be subject to wider consultation and publicity, and provides no guarantee of a future decision.

I hope this is of assistance, however, if you have any questions please do not hesitate to contact me using the details above.

Yours Sincerely

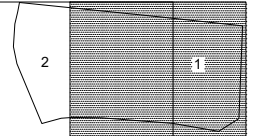
Rachel Carney
Senior Planning Officer

APPENDIX B

SITE TOPOGRAPHIC SURVEY



1. All road channel levels are taken at the bottom of the kerb unless otherwise stated.
2. All top of kerb levels are taken at rear of kerb unless otherwise stated.
3. Boundaries shown whether surveyed or taken from other sources cannot be construed as the legal boundary.



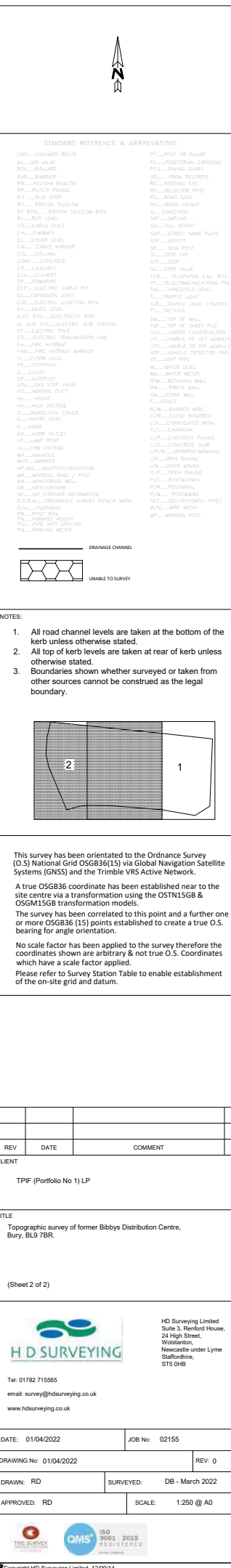
No scale factor has been applied to the survey therefore the coordinates shown are arbitrary & not true O.S. Coordinates which have a scale factor applied.

Please refer to Survey Station Table to enable establishment of the on-site grid and datum.

TPIF (Portfolio No 1) LP

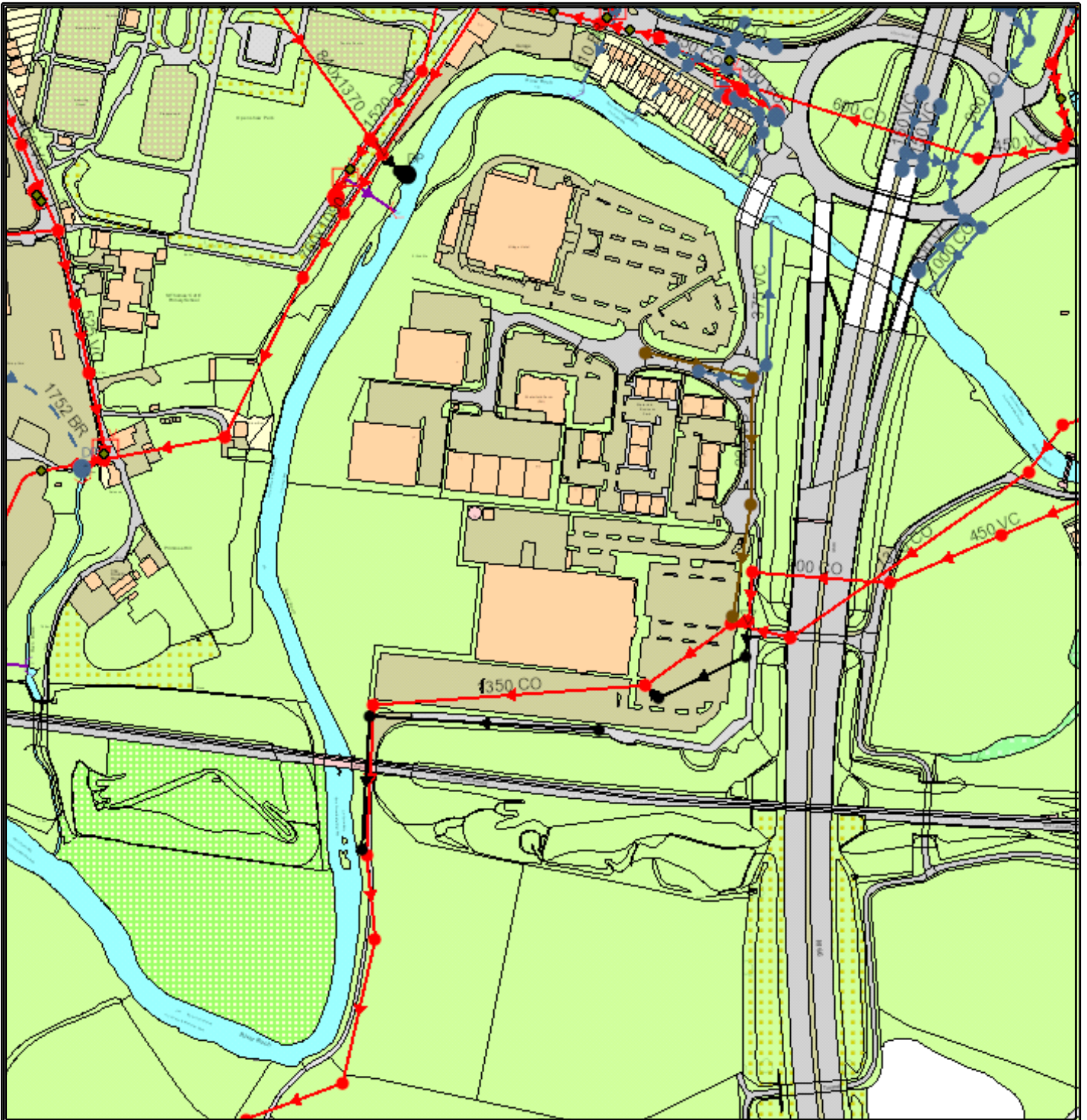
Sheet 1 of 2)





APPENDIX C

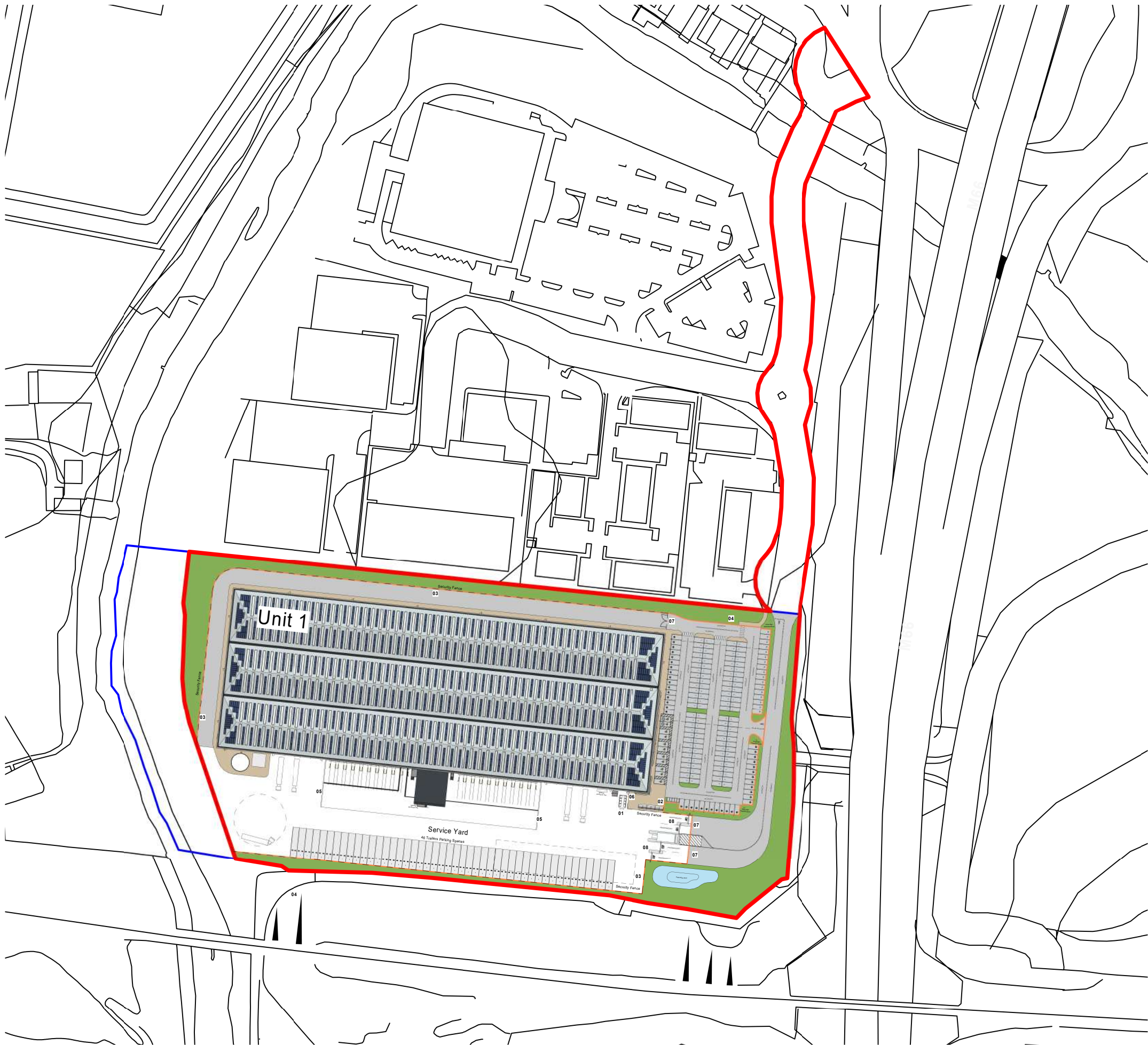
SEWER RECORDS

SEWER RECORD PC WORLD WATERFOLD PARK BURY BL9 7BR


The position of underground apparatus shown on this plan is approximate only and is given in accordance with the best information currently available. The actual positions may be different from those shown on the plan and private pipes, sewers or drains may not be recorded. United Utilities Water Limited will not accept any liability for any damage caused by the actual positions being different from those shown.

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APPENDIX D SITE MASTERPLAN



Planning Site Plan
1 : 1000

Area Schedule:

Warehouse:	16,814m ²	180,983ft ²
GF Core	104.37m ²	1,123.49ft ²
2 St. Offices:	961.64m ²	10,351ft ²
2 St. Hub-Offices:	433m ²	4,663ft ²
Gatehouse:	24m ²	262ft ²

TOTAL (GIA): 18,337m² 197,383ft²

Car Spaces: 180
including 11 Enlarged accessible spaces with 42 spaces provided with electric charging facilities.

Cycle Spaces: 24
Motorcycle Spaces: 5

Dock Doors: 20
including 4 Euro-dock doors
Level Access: 4

Trailers Spaces (17x3.5m): 46
Stacking/Staging Spaces: 11

Planning - Site Area Schedule

Name	Area (Hectares)	Area (Acres)
Demise Line	4.92 hectare	12.15 acres
Net Dev Area	3.64 hectare	8.99 acres
Red Line Boundary	4.98 hectare	12.3 acres

Boundaries

Red Line Boundary

Demise Line

Security Fence



01 WASTE MANAGEMENT STORE
Concrete base with 2.4m high timber palisade fencing with galvanized structure and green roof.



02 BICYCLE STORE
Urban Engineering 'Series A' or similar and approved Polycarbonate transparent sheets with polyester powder coated steel frame.
Colour: White (BS00E55) Sheffield steel cycle racks or similar and approved to accommodate 10 cycles per shelter.
Alternative option green roof cycle store.



03 BOUNDARY SECURITY FENCE
Typical Paladin Fencing:
The perimeter of the service yards will be provided with 2.4m high paladin fencing. Post and panels to be black finish. Fences to be suitably set back from vehicular areas to reduce risk of accidental impact. Fencing / landscaping to be co-ordinated such that a maximum gap beneath fence is 100mm.



04 KNEE RAIL FENCING
Made from softwood guaranteed for 25 years. Galvanised strap for longer life 5 year treatment guarantee Height 1.20m with planed finish.



05 DOCK APRON RETAINING WALL
External retaining walls to the sides of the dock access will be also of fair faced concrete. Armco barrier galvanised mild steel and handrailing is to be provided adjacent to the retaining wall to level access ramps. The barrier uprights are to be surface fixed to the concrete.



06-07 VEHICLE AND PEDESTRIAN GATES:
To security sensitive areas near the main access road, vehicle gate is to be black steel paladin, 2.4m high to BS 1722-12:2006 (including concrete foundations). Gates to hinge open and be able to be held in the open position by providing bolt sleeves. Posts to be square section powder coated black steel with capped tops, cast in concrete bases.



08 MANUAL BARRIER
Manual car park barrier to be provided as indicated. Posts to be square section powder coated black steel with capped tops, cast in concrete bases.

WORK IN PROGRESS



SGP

Architects + Masterplanners

Waterfront House
2a Smith Way
Grove Park
Enderby
Leicester LE19 1SX

t: +44 (0)116 247 0557

www.stephengeorge.co.uk

Waterfold Business Park,
Bury

Drawing Name:
Site Plan

Drawing Stage: Planning

Status: S0

SGP File Ref: 22-244-SGP-ZZ-ZZ-M3-A-00000-Site

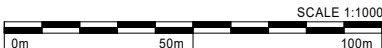
22-244 30/08/23 ELF MMS As @ A1 P6

SGP Project No: Date: Drawn: Team: Initials: Scale: Rev:

Drawing Number:

22-244-SGP-ZZ-ZZ-DR-A- 131001

Project Code Originator Volume Level Type Role Number



APPENDIX E

DRAINAGE STRATEGY PLAN



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Notes

- DO NOT SCALE FROM THIS DRAWING.
- ALL DIMENSIONS ARE MILLIMETRES U.N.O.
- ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM U.N.O.
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.

GEOCELLULAR UNIT 1
CL: 74.80 MAOD
IL: 72.7 MAOD
COVER = 1M
40W X 40L X 1.1D
TOTAL STORAGE

GEOCELLULAR UNIT 2
CL: 74.50 MAOD
IL: 72.30 MAOD
COVER = 1M
15W X 72L X 1.2D
TOTAL STORAGE = 1,231M³

STORAGE POND
CL: 75.00 MAOD
IL: 73.80 MAOD
DEPTH = 1.2M
RETAINED WATER DEPTH = 0.3M
TOTAL STORAGE = 126M³

Rev	FOR PLANNING	09/10	AG
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WATERFOLD BUSINESS PARK

WATERFOLD BUSINESS PARK

tel 0113 245 7552 leeds@ramboll.co.uk
www.ramboll.co.uk

DRAIANGE STRATEGY SKETCH

Project No:	Scale (@A1):	Drawn:	Date:
1620016197	NTS	TH	03/10/23
Drawing No:	Rev:		
REH2023N02766-RAM-DR-00001	A		

APPENDIX F

MICRODRAINAGE CALCULATIONS

Ramboll UK Ltd					Page 1																																																																																																																																					
240 Blackfriars Road London SE1 8NW																																																																																																																																										
Date 27/09/2023 11:16		Designed by THILLAS																																																																																																																																								
File		Checked by																																																																																																																																								
Micro Drainage			Source Control 2020.1																																																																																																																																							
<u>Summary of Results for 100 year Return Period (+40%)</u>																																																																																																																																										
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Micro Drainage		Source Control 2020.1			
Summary of Results for 100 year Return Period (+40%)					
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m³)	Status
60 min Winter	0.533	0.533	24.9	1599.0	O K
120 min Winter	0.670	0.670	24.9	2008.5	O K
180 min Winter	0.746	0.746	24.9	2238.3	O K
240 min Winter	0.795	0.795	24.9	2385.6	O K
360 min Winter	0.862	0.862	24.9	2584.6	O K
480 min Winter	0.901	0.901	24.9	2703.8	O K
600 min Winter	0.926	0.926	24.9	2777.2	O K
720 min Winter	0.940	0.940	24.9	2820.7	O K
960 min Winter	0.950	0.950	24.9	2851.4	O K
1440 min Winter	0.939	0.939	24.9	2816.4	O K
2160 min Winter	0.901	0.901	24.9	2704.4	O K
2880 min Winter	0.846	0.846	24.9	2538.8	O K
4320 min Winter	0.710	0.710	24.9	2129.9	O K
5760 min Winter	0.568	0.568	24.9	1704.1	O K
7200 min Winter	0.450	0.450	24.9	1348.8	O K
8640 min Winter	0.355	0.355	24.9	1066.4	O K
10080 min Winter	0.286	0.286	24.6	857.4	O K
Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)	
60 min Winter	53.779	0.0	1584.6	68	
120 min Winter	34.434	0.0	2037.1	126	
180 min Winter	26.035	0.0	2310.3	184	
240 min Winter	21.190	0.0	2504.8	242	
360 min Winter	15.865	0.0	2804.2	358	
480 min Winter	12.894	0.0	3025.4	474	
600 min Winter	10.965	0.0	3198.5	586	
720 min Winter	9.599	0.0	3336.9	698	
960 min Winter	7.771	0.0	3531.1	912	
1440 min Winter	5.755	0.0	3585.4	1150	
2160 min Winter	4.249	0.0	4656.3	1612	
2880 min Winter	3.420	0.0	4985.8	2080	
4320 min Winter	2.518	0.0	5465.6	2980	
5760 min Winter	2.029	0.0	5992.2	3744	
7200 min Winter	1.716	0.0	6331.4	4464	
8640 min Winter	1.498	0.0	6619.1	5104	
10080 min Winter	1.335	0.0	6859.9	5744	
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Micro Drainage		Source Control 2020.1

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	19.000	Shortest Storm (mins)	15
Ratio R	0.288	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 3.680

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To:	From:	To:	From:	To:
0	4 1.227	4	8 1.227	8	12 1.227

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Model Details

Storage is Online Cover Level (m) 1.500

Tank or Pond Structure

Invert Level (m) 0.000

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	3000.0	1.000	3000.0	1.100	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0218-2490-1000-2490
Design Head (m)	1.000
Design Flow (l/s)	24.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	218
Invert Level (m)	0.000
Minimum Outlet Pipe Diameter (mm)	300
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.000	24.9
Flush-Flo™	0.358	24.9
Kick-Flo®	0.733	21.5
Mean Flow over Head Range	-	20.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	7.4	1.200	27.2	3.000	42.2	7.000	63.6
0.200	21.5	1.400	29.2	3.500	45.4	7.500	65.8
0.300	24.7	1.600	31.2	4.000	48.5	8.000	67.9
0.400	24.8	1.800	33.0	4.500	51.3	8.500	69.9
0.500	24.4	2.000	34.7	5.000	54.0	9.000	71.9
0.600	23.7	2.200	36.3	5.500	56.6	9.500	73.8
0.800	22.4	2.400	37.9	6.000	59.0		
1.000	24.9	2.600	39.4	6.500	61.3		

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