



PROPOSED ELECTRICAL VEHICLE CHARGING POINTS AT PARRS WOOD, MANCHESTER

FLOOD RISK ASSESSMENT

JULY 2025

REPORT REF: 3832/RE/07-25/01

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CONTRACT

Evans Rivers and Coastal Ltd has been commissioned by Bethell Utility Services Ltd to carry out a Flood Risk Assessment for proposed electrical vehicle charging points at Parrs Wood, Manchester.

QUALITY ASSURANCE, ENVIRONMENT AND HEALTH AND SAFETY

Evans Rivers and Coastal Ltd operates a Quality Assurance, Environmental, and Health and Safety Policy.

This project comprises various stages including data collection; depth analysis; and reporting. Quality will be maintained throughout the project by producing specific methodologies for each work stage. Quality will also be maintained by providing specifications to third parties such as surveyors; initiating internal quality procedures including the validation of third party deliverables; creation of an audit trail to record any changes made; and document control using a database and correspondence log file system.

To adhere to the Environmental Policy, data will be obtained and issued in electronic format and alternatively by post. Paper use will also be minimised by communicating via email or telephone where possible. Documents and drawings will be transferred in electronic format where possible and all waste paper will be recycled. Meetings away from the office of Evans Rivers and Coastal Ltd will be minimised to prevent unnecessary travel, however for those meetings deemed essential, public transport will be used in preference to car journeys.

The project will follow the commitment and objectives outlined in the Health and Safety Policy operated by Evans Rivers and Coastal Ltd. All employees will be equipped with suitable personal protective equipment prior to any site visits and a risk assessment will be completed and checked before any site visit. Other factors which have been taken into consideration are the wider safety of the public whilst operating on site, and the importance of safety when working close to a water source and highway. Any designs resulting from this project and directly created by Evans Rivers and Coastal Ltd will also take into account safety measures within a "designers risk assessment".

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1. INTRODUCTION

1.1 Project Scope

1.1.1 Evans Rivers and Coastal Ltd has been commissioned by Bethell Utility Services Ltd to carry out a Flood Risk Assessment for proposed electrical vehicle charging points at Parrs Wood, Manchester.

1.1.2 It is understood that this Flood Risk Assessment will be submitted to the Planning Authority as part of a planning application. Specifically, this assessment intends to:

- a) Review any literature and guidance specific to this area such as the SFRA;
- b) Assess the flood risk from all sources to people and property and propose mitigation measures accordingly;
- c) Review existing evacuation and warning procedures for the area;
- d) Report findings and recommendations.

1.1.3 This assessment is carried out in accordance with the requirements of the National Planning Policy Framework (NPPF) dated 2025. Other documents which have been consulted include:

- DEFRA/EA document entitled *Framework and guidance for assessing and managing flood risk for new development Phase 2 (FD2320/TR2)*, 2005;
- Communities and Local Government 2007. *Improving the Flood Performance of New Buildings*. HMSO.
- DEFRA/EA document entitled *The flood risks to people methodology (FD2321/TR1)*, 2006;
- EA *Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purpose*, 2008;
- National Planning Practice Guidance – Flood Risk and Coastal Change.
- UK Government's climate change allowances guidance.
- Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA, Level 1 SFRA, dated 2010.
- Manchester City, Salford City and Trafford Councils Level 2 Hybrid SFRA, Level 2 SFRA, dated 2011.

2. DATA COLLECTION

2.1 To assist with this report, the data collected included:

- Ordnance Survey 1:10,000 street view map obtained via Promap (Evans Rivers and Coastal Ltd OS licence number 100049458).
- British Geological Survey, *Online Geology of Britain Viewer*.
- British Geological Survey, *Groundwater Susceptibility Map*.
- 1:625,000 *Hydrogeological Map of England and Wales*, published in 1977 by the Institute of Geological Sciences (now the British Geological Survey).
- Filtered LIDAR data at 1m resolution.

3. SITE CHARACTERISTICS

3.1 Existing Site Characteristics and Location

- 3.1.1 The site is located at Parrs Wood, Manchester. The approximate Ordnance Survey (OS) grid reference for the site is 385496, 390192 and the location of the site is shown on Figure 1.

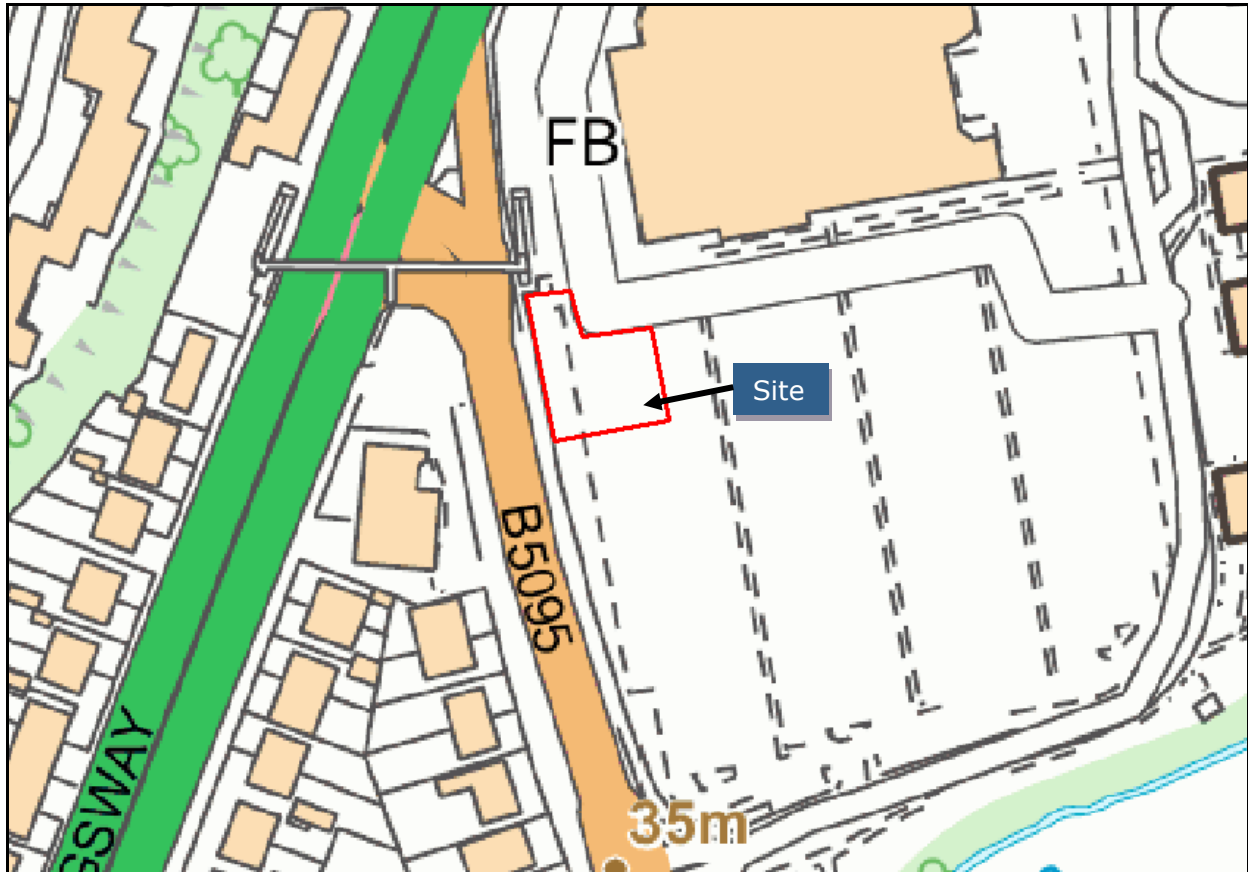


Figure 1: Site location plan (Source: Ordnance Survey)

- 3.1.2 The site comprises an area of hardstanding currently used as a car park. The site is accessed from the north via an access road which leads onto Kingsway.
- 3.1.3 Filtered LIDAR data at 1m resolution has been obtained in order to determine and illustrate the topography across the site and surrounding area (Figure 2).
- 3.1.4 It can be seen that there is little variation in ground levels across the site and the site is typically set at 37.70m AOD.

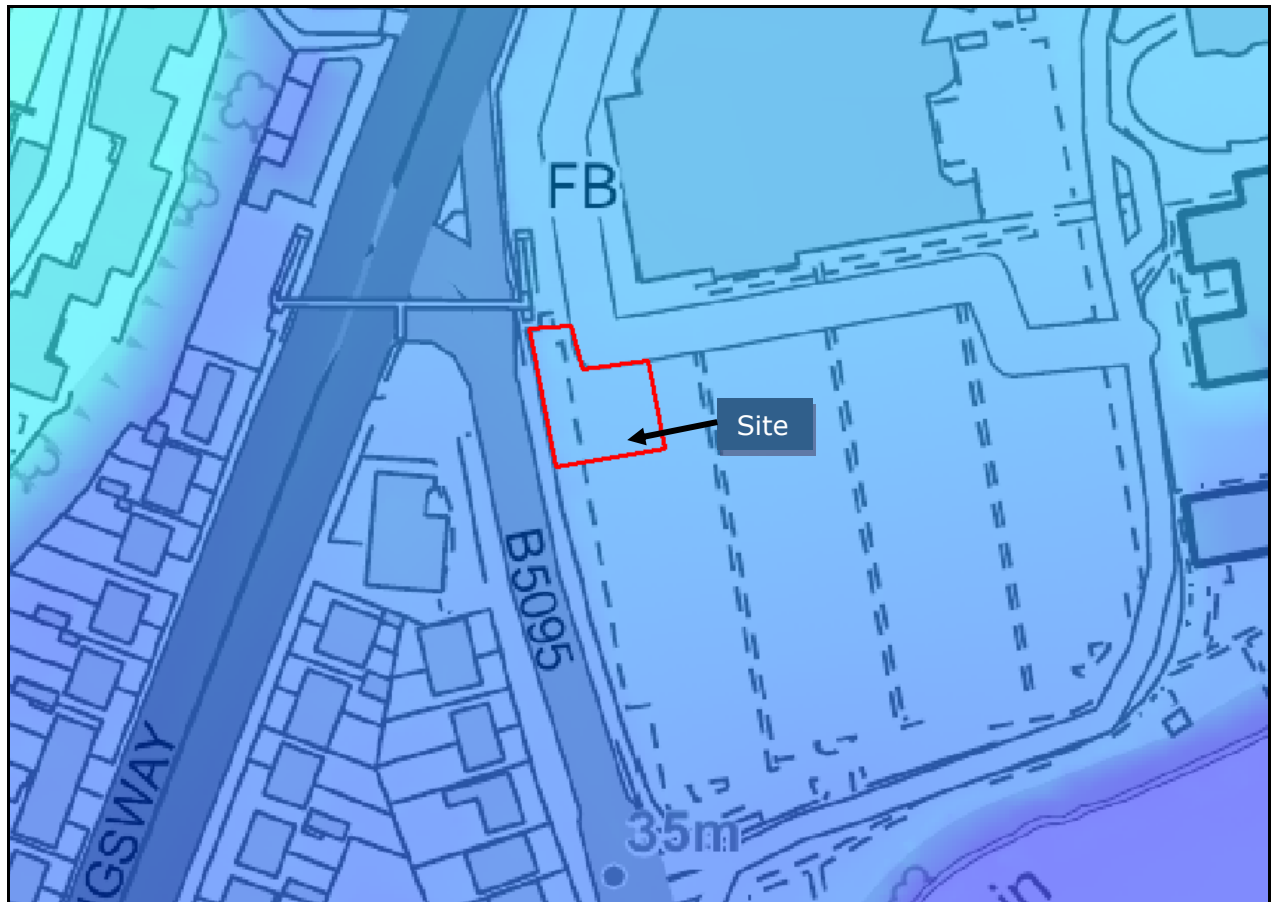


Figure 2: LIDAR survey data where higher ground is denoted as orange and yellow colours and lower areas denoted by blue and green colours

3.2 Site Proposals

- 3.2.1 It is the Client's intention to provide electric vehicle charging points across the site in addition to a substation as shown on Drawing Number 0910302/A.

4. SOURCES OF FLOODING

4.1 Fluvial

- 4.1.1 The DEFRA Flood Map for Planning and associated data was updated on 25th March 2025 (Figure 3) with pdf guidance entitled *Flood Zones Product Description*.
- 4.1.2 This map shows that the site is located within the NPPF Flood Zone 1, 'Low Probability' which comprises land as having less than a 1 in 1000 year annual probability of fluvial or tidal flooding (i.e. an event more severe than the extreme 1 in 1000 year event). NPPF states that all uses of land are appropriate in this zone.

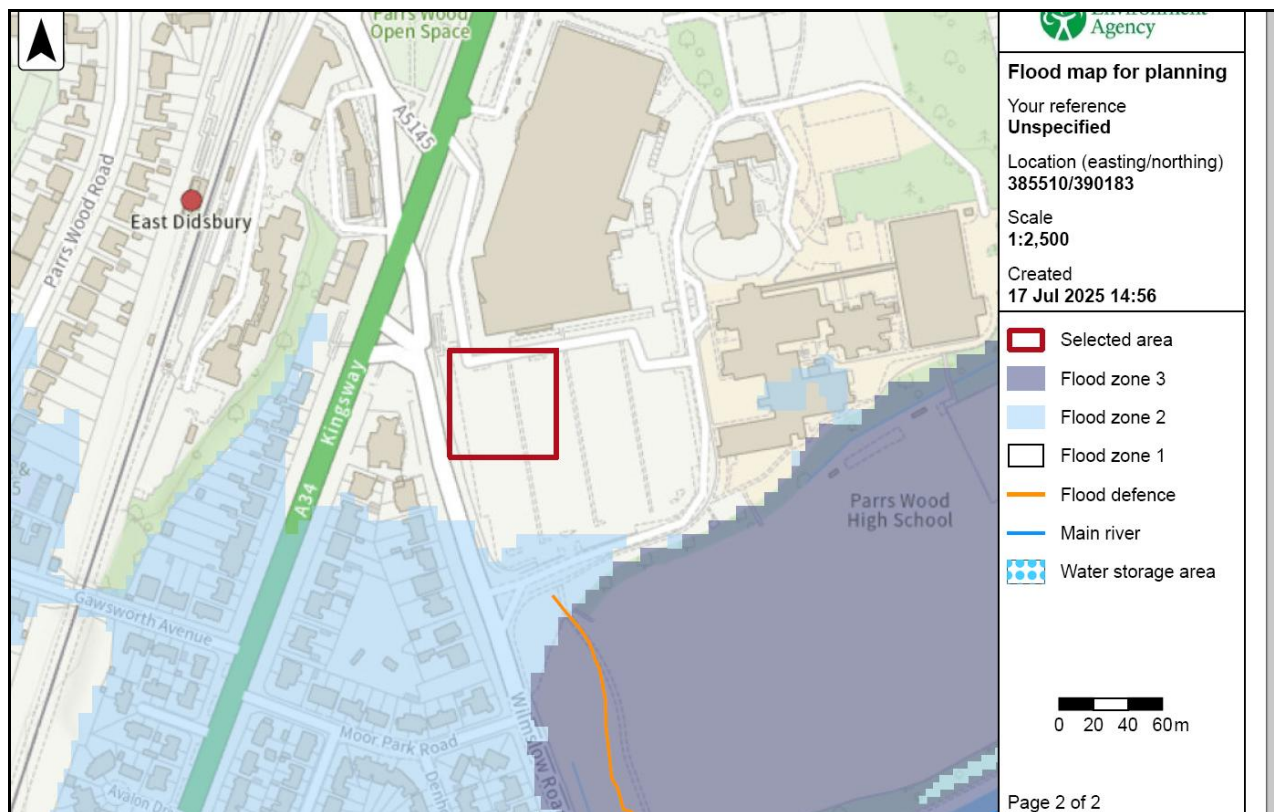


Figure 3: Flood Map for Planning

4.2 Groundwater Flooding

Soil and Geology at the Site

- 4.2.1 It can be seen from the various soil and hydrogeological data, listed in Section 2, that the soil types and geology across the site comprise sand and gravel.

Groundwater Flooding Potential at the Site

- 4.2.2 The 'Check the long term flood risk for an area in England' at <https://www.gov.uk/check-long-term-flood-risk> states that flooding from groundwater is unlikely in this area.
- 4.2.3 Map GW_2.1 of the SFRA shows that there is a very low groundwater flooding risk at the site.

- 4.2.4 It is considered that the groundwater flood risk at the site will be low, and the existing hardstanding will confine the water table reducing its potential to rise.

4.3 Surface Water Flooding and Sewer Flooding

- 4.3.1 Map SS_4.5 of the SFRA shows that the site is located within the Didsbury Critical Drainage Area (CDA). Table 5-1 of the SFRA states that 3 postcode areas with over 10 properties affected in the DG5 register.
- 4.3.2 The SFRA states that this CDA is bounded by the Mersey to the south and Chorlton Platt Gore and Cringle Black Brook to the north. The surface water flood hotspots identified in the Didsbury CDA are linked to lost watercourses.

DEFRA Risk of flooding from surface water (RoFSW)

- 4.3.3 The DEFRA Risk of flooding from surface water (RoFSW) map and associated data was updated on 28th January 2025 with pdf guidance entitled *RoFSW Product Description*. It now supersedes previous datasets and can be viewed at <https://www.gov.uk/check-long-term-flood-risk> and <https://environment.data.gov.uk/explore/b5aaa28d-6eb9-460e-8d6f-43caa71fbe0e> with the raw GIS data being available at <https://environment.data.gov.uk/explore/b5aaa28d-6eb9-460e-8d6f-43caa71fbe0e?download=true>.
- 4.3.4 The DEFRA Data Services Platform states that the Risk of Flooding from Surface Water (RoFSW) map is an assessment of where surface water flooding may occur when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead.
- 4.3.5 The DEFRA Data Services Platform also states that RoFSW is a probabilistic product, meaning that it shows the overall risk, rather than the risk associated with a specific event or scenario. In externally published versions of this dataset, risk is displayed as one of four likelihood bandings:
- High - greater than or equal to 1 in 30 (3.3%) chance of flooding in any given year;
 - Medium - less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance of flooding in any given year;
 - Low - less than 1 in 100 (1%) but greater than or equal to 1 in 1000 year (0.1%) chance of flooding in any given year.
 - Very Low – less than 1 in 1000 year (0.1%) chance of flooding in any given year (also denoted by the mapping as 'Unavailable').
- 4.3.6 The DEFRA Data Services Platform 'Announcements' section states that while the previous RoFSW Depth datasets showed the maximum depth of flooding from surface water that could result from a flood with a 0.1%, 1% and 3.3% chance of happening in any given year, the new RoFSW Depth datasets show the annual chance of flooding beyond a specific depth, for depths at intervals from 20cm to 120cm.
- 4.3.7 For example, the 20cm dataset shows a map of likelihood of flooding beyond 20cm depth within the 4 likelihood bands. The depths are as follows:
- 0.2m
 - 0.3m
 - 0.6m
 - 0.9m
 - 1.2m

- 4.3.8 Where the mapping shows an area with no depth results, despite it being located within a risk banding, this has been interpreted as denoting a flood depth of <0.2m.
- 4.3.9 Information has also been created which indicates the possible impacts of climate change on future risk in line with the guidance at <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#when-to-use-climate-change-allowance>.
- 4.3.10 For surface water flood risk the mapping considers the 'Central' allowance for the 2050s epoch (2040-2060) and can be viewed at <https://www.gov.uk/check-long-term-flood-risk> and <https://environment.data.gov.uk/explore/e5b38de2-99b3-44ee-b10c-b244926878ef>, with the raw GIS data being available at <https://environment.data.gov.uk/explore/e5b38de2-99b3-44ee-b10c-b244926878ef?download=true>.
- 4.3.11 The associated climate change depths within the 4 likelihood bands are the same as the non-climate change depths set out above.
- 4.3.12 The DEFRA Risk of flooding from surface water (RoFSW) map and associated data (Figures 4, 5 and 6) shows that there is a Very Low surface water flood risk at the site and when accounting for future climate change.

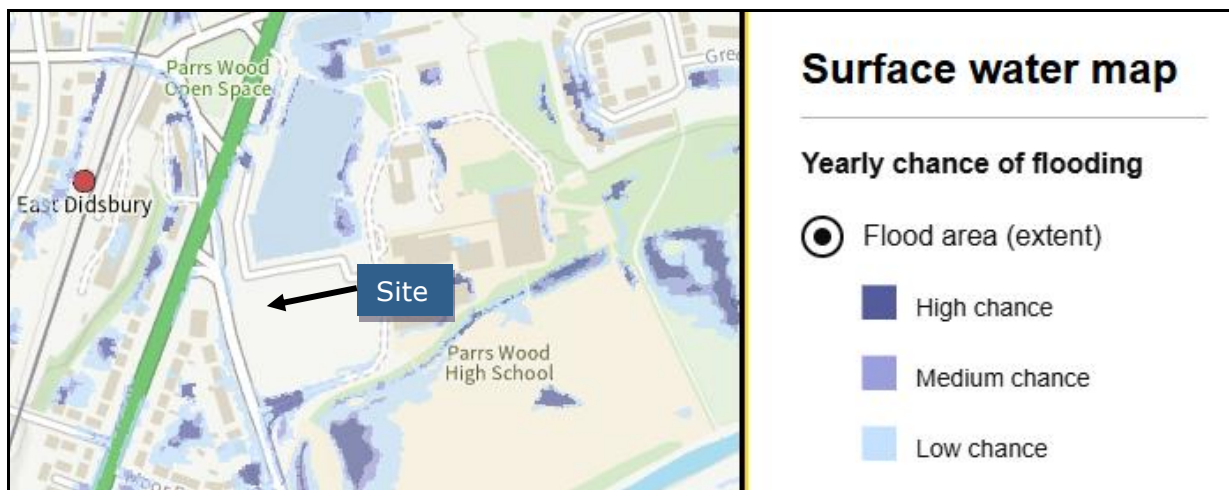


Figure 4: DEFRA Risk of flooding from surface water (RoFSW) map from
<https://www.gov.uk/check-long-term-flood-risk>

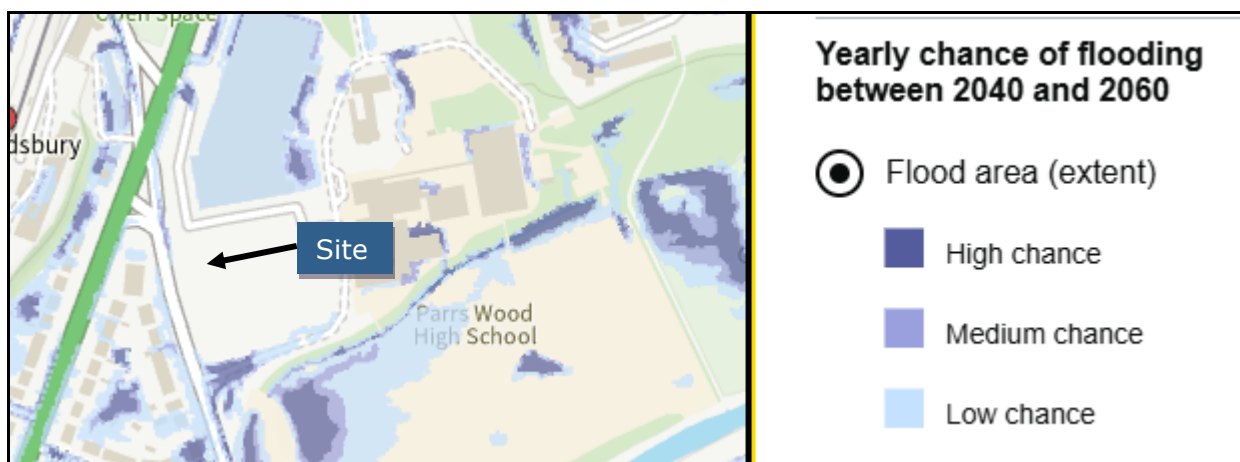


Figure 5: DEFRA Risk of flooding from surface water (RoFSW) map data with climate change from
<https://www.gov.uk/check-long-term-flood-risk>

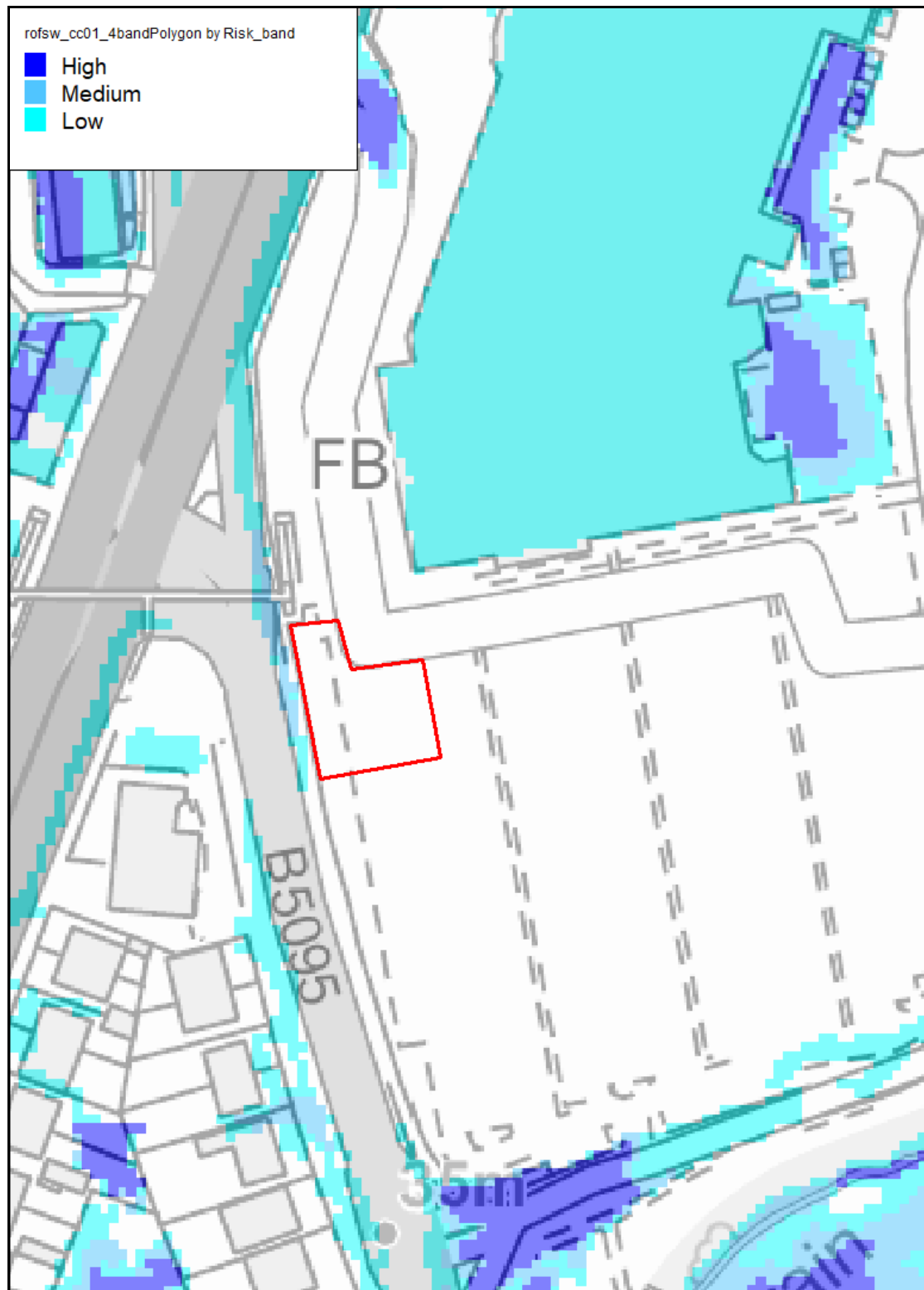


Figure 6: DEFRA Risk of flooding from surface water (RoFSW) map data with climate change from <https://environment.data.gov.uk/explore/e5b38de2-99b3-44ee-b10c-b244926878ef?download=true>

Reducing Vulnerability to the Hazard

- 4.3.13 Maintenance personnel will only be occupying the site infrequently and during normal working hours, and the risk will therefore be reduced. The number of visits to the site will be low and for maintenance and monitoring purposes.
- 4.3.14 The proposals do not require any employees to be permanently located at the site (only a small amount of visits for monitoring and maintenance purposes). In this regard, the number of people accessing the site will represent a very minor increase from the existing function of the land and those visits will be short and pre-planned.
- 4.3.15 Flood Warnings for surface water flooding do not currently exist, however, the site management should sign up to the Met Office weather warning system <https://www.metoffice.gov.uk/public/weather/warnings>.
- 4.3.16 Maintenance workers will be asked to check the weather warnings before visiting the site and will postpone any visit if there is a flood risk identified across the wider area.

Safe Access/Egress

- 4.3.17 Figure 6 above shows that during climate change events there would be a Very Low across the site and within the vicinity.
- 4.3.18 It is understood from the DEFRA Data Services Platform 'Announcements' section that the previous 'hazard' dataset will be replaced in the future.
- 4.3.19 Therefore, in the interim, in order to determine the flood hazard, the hazard categories outlined in Table 13.1 of *FD2320/TR2* (Figure 7), which is defined by the depth and velocity of the floodwater and the ability of people to evacuate once flooding occurs, has been used (assuming <0.5 m/s velocity). It should be noted that the white cells shown on Figure 7 denote a *Very low* hazard.

Table 13.1 Danger to people for different combinations of depth and velocity

Velocity (m/s)	Depth of flooding (m)											
	0.05	0.10	0.20	0.30	0.40	0.50	0.60	0.80	1.00	1.50	2.00	2.50
0.00												
0.10												
0.25												
0.50												
1.00												
1.50												
2.00												
2.50												
3.00												
3.50												
4.00												
4.50												
5.00												

(Source Table 13.1 of FD2320/TR2)

Key:

- Danger for some
- Danger for most
- Danger for all

Figure 7: Hazard Classification

4.3.20 The depth data indicates that during climate change events, the depth across the wider area would be $\leq 0.2\text{m}$ (Figure 8).

4.3.21 Therefore, the flood hazard to people leaving the site would be *Very low*.

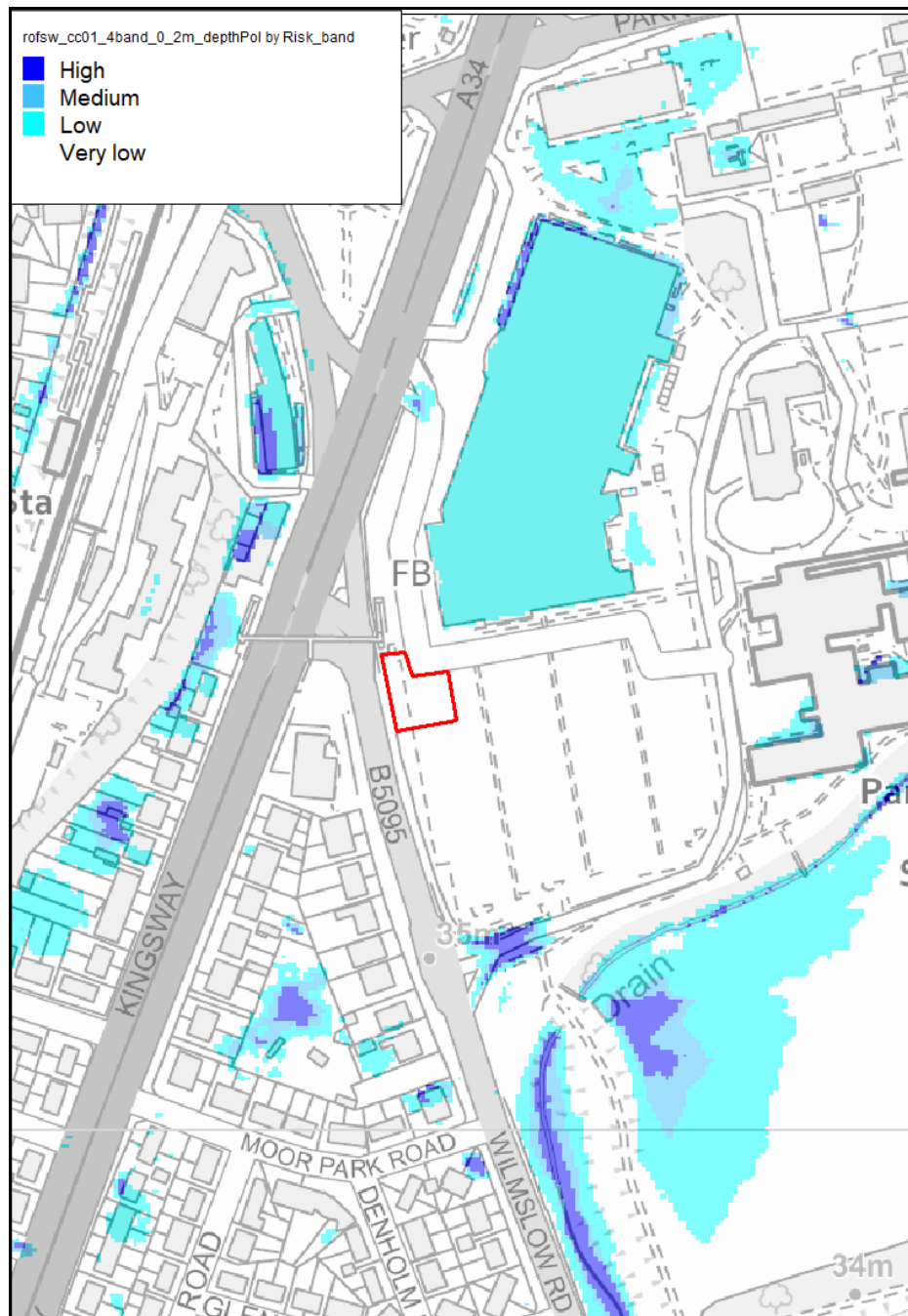


Figure 8: DEFRA Risk of flooding from surface water (RoFSW) 0.2m depth map data with climate change from <https://environment.data.gov.uk/explore/e5b38de2-99b3-44ee-b10c-b244926878ef?download=true>

4.4 Reservoirs, Canals And Other Artificial Sources

- 4.4.1 The failure of man-made infrastructure such as flood defences and other structures can result in unexpected flooding. Flooding from artificial sources such as reservoirs, canals and lakes can occur suddenly and without warning, leading to high depths and velocities of flood water which pose a safety risk to people and property.
- 4.4.2 The 'Check the long term flood risk for an area in England' at <https://www.gov.uk/check-long-term-flood-risk> shows that the site is at risk from reservoir flooding.
- 4.4.3 However, as the information associated with the maps suggest, flooding from reservoirs is extremely unlikely and such features are regularly inspected by qualified engineers under the Reservoir Act 1975.

5. CONCLUSIONS

- The site is located within the NPPF Flood Zone 1.
- The DEFRA Risk of flooding from surface water (RoFSW) map and associated data shows that there is a Very Low surface water flood risk at the site and when accounting for future climate change.
- Safe access/egress is available at all times.
- It is considered that there is a low risk of groundwater flooding and from reservoirs.

6. BIBLIOGRAPHY

- i. ADAS 1980. MAFF Report 5, *Pipe size design for field drainage*.
- ii. Balmforth, D., et al. 2006. *Designing for exceedance in urban drainage – good practice, Report C635*. London: CIRIA.
- iii. Bettess, R. 1996. *Infiltration drainage – Manual of good practice, Report C156*. London: CIRIA.
- iv. BRE 1991. Digest 365. *Soakaway Design*.
- v. British Standards Institute 2013. BS8582:2013 *Code of practice for surface water management for development sites*.
- vi. Communities and Local Government 2018. *National Planning Policy Framework*.
- vii. Communities and Local Government 2012a. Technical Guidance to the *National Planning Policy Framework*.
- viii. DEFRA 2015. *Sustainable Drainage Systems – Non statutory technical standards for sustainable drainage systems*.
- ix. DEFRA/EA 2013. *Rainfall runoff management for developments*.
- x. DEFRA/EA 2005. *Framework and guidance for assessing and managing flood risk for new development, Phase 2, Flood and Coastal Defence R&D Programme, R&D Technical Report FD2320/TR2*. Water Research Council.
- xi. DEFRA/Jacobs 2004. *Strategy for Flood and Coastal Erosion Risk Management: Groundwater Flooding Scoping Study (LDS), Final Report, Volumes 1 and 2*.
- xii. Dickie et al. 2010. *Planning for SUDS – Making it happen. Report C687*. London: CIRIA
- xiii. DOE 1981. *The Wallingford Procedure: Design and Analysis of Urban Storm Drainage*. HR Wallingford.
- xiv. DOE 1981a. *Modified Rational Method: The Wallingford Procedure*. HR Wallingford.
- xv. Geological Society of London 2006. *Groundwater and Climate Change*. Geoscientist magazine, Volume 16, No 3.
- xvi. HR Wallingford 2005. *Use of SUDS in high density developments*, Report SR 666.
- xvii. HR Wallingford 2002. *Guide for the Drainage of Development Sites*, Report SR 574.
- xviii. Interpave 2010. *Understanding permeable paving: Guidance for designers, planners and local authorities*
- xix. Interpave 2010a. *Permeable pavements – guide to the design construction and maintenance of concrete block permeable pavements*

- xx. Institute of Geological Sciences 1977. *Hydrogeological Map of England and Wales*, 1:625,000. NERC.
- xxi. Martin, P. et al. 2001. *Sustainable urban drainage systems – best practice guide, Report C523*. London: CIRIA.
- xxii. Martin, P. et al. 2000. *Sustainable urban drainage systems - Design manual for England and Wales, Report C522*. London: CIRIA.
- xxiii. National SUDS Working Group. 2004. *Interim Code of Practice for Sustainable Drainage Systems*.
- xxiv. NERC 2009. *Flood Estimation Handbook* [CD-ROM], Version 3. Institute of Hydrology.
- xxv. NERC 1975. *Flood Studies Report (FSR)*. Institute of Hydrology.
- xxvi. Newman, A.P. 2004. *Protecting groundwater with oil-retaining pervious pavements: historical perspectives, limitations and recent developments*. Quarterly Journal of Engineering Geology and Hydrogeology.
- xxvii. Pratt, C., Wilson, S., and Cooper, P. 2002. *Source control using constructed pervious surfaces; hydraulic, structural and water quality performance issues, Report C582*. London: CIRIA.
- xxviii. Reed, R., Faulkner, D. and Bayliss, A. 1999. *Flood Estimation Handbook (FEH)*, 5 Volumes. Institute of Hydrology.
- xxix. Soil Survey of England and Wales 1983. *Soil Map of East England (Sheet 4)*, 1:250,000. Cranfield University.
- xxx. Water UK 2012. *Sewers for Adoption 7th Edition, A design and construction guide for developers*. Water Research Council.
- xxxi. Wilson, S., Bray, R. and Cooper, P. 2004. *Sustainable Drainage Systems; hydraulic, structural and water quality advice, Report C609*. London: CIRIA.
- xxxii. WinDes 2020. *Micro Drainage*. Version 2020.1.
- xxxiii. Woods-Ballard., et al. 2015. *The SUDS Manual, Report C753*. London: CIRIA.
- xxxiv. Woods-Ballard., et al. 2007. *The SUDS Manual, Report C697*. London: CIRIA.

DRAWINGS



1:500 SCALE BAR

REV	DESCRIPTION		REV BY	APP	DATE
A	GENERAL REVISIONS		KP	AM	06.06.25
ADDRESS PARRS WOOD MANCHESTER M20 5PG		PROJECT NAME	DRAWN BY	 RAW CHARGING NETWORK LTD 43 PALACE STREET LONDON SW1E 5HL	
		LANDSEC PORTFOLIO	KP		
		DRAWING TITLE	SCALE (@ A3)		
		PROPOSED BLOCK PLAN	1 TO 500		
		DRAWING NO	REV		
	091 03 02	A			



