# **Intermodal Logistics Park North Ltd**

# **INTERMODAL LOGISTICS PARK NORTH (ILPN)**

\_\_\_\_\_

Intermodal Logistics Park North (ILPN) Strategic Rail Freight Interchange (SRFI)

**Project reference TR510001** 

**Preliminary Environmental Information Report (PEIR)** 

Appendix 14.1: Flood Risk Assessment (Part 01 of 03)

## October 2025

Planning Act 2008

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

# This document forms a part of a Preliminary Environmental Information Report (PEIR) for the Intermodal Logistics Park North (ILPN) project.

A PEIR presents environmental information to assist consultees to form an informed view of the likely significant environmental effects of a proposed development and provide feedback.

This PEIR has been prepared by the project promoter, Intermodal Logistics Park North Ltd. The Proposed Development is described in Chapter 3 of the PEIR and is the subject of a public consultation.

Details of how to respond to the public consultation are provided at the end of Chapter 1 of the PEIR and on the project website:

https://www.tritaxbigbox.co.uk/our-spaces/intermodal-logistics-park-north/

This feedback will be taken into account by Intermodal Logistics Park North Ltd in the preparation of its application for a Development Consent Order for the project.



## **ADVISORY**

Intermodal Logistics Park North Ltd
Intermodal Logistics Park North Rail Freight Interchange
Newton-le-Willows
Flood Risk Assessment



#### **ADVISORY**

Intermodal Logistics Park North Ltd
Intermodal Logistics Park North Rail Freight Interchange
Newton-le-Willows
Flood Risk Assessment

Birmingham Livery Place, 35 Livery Street, Colmore Business District, Birmingham, B3 2PB T: 0121 233 3322

> Leeds Whitehall Waterfront, 2 Riverside Way, Leeds LS1 4EH T: 0113 233 8000

> > London 11 Borough High Street London, SE1 9SE T: 0207 407 3879

Manchester
11 Portland Street, Manchester, M1 3HU
0161 233 4260

Nottingham Waterfront House, Station Street, Nottingham NG2 3DQ T: 0115 924 1100

July 2025



#### **DOCUMENT ISSUE RECORD**

Document Number:	ILPN-BWB-ZZ-XX-T-W-0002_FRA	Status:	S2	Revision:	P02
BWB Reference:				23339	8_FRA
Author:		Lucy Ree	ves BS	ic (Hons) MC	CIWEM
Checked:	Matthew Day BA (Hons) MSc	FRGS MCI\	NEW C	C.WEM C.Sci	C.Env
Approved:		Chris Doc	ld BEn	g(Hons) IEng	MICE

#### **REVISION CONTROL**

Rev	Date	Comments	Author:	Checked:	Approved:
P01	31/07/25	Draft Issue	LR	MD	CMD
P02	23/10/25	Statutory Consultation	CMD	SR	CMD

#### Notice

All comments and proposals contained in this report, including any conclusions, are based on information available to BWB Consulting Limited during investigations. The conclusions drawn by BWB Consulting Limited could therefore differ if the information is found to be inaccurate or misleading. BWB Consulting Limited accepts no liability should this be the case, nor if additional information exists or becomes available with respect to this scheme.

Except as otherwise requested by the client, BWB Consulting Limited is not obliged to and disclaims any obligation to update the report for events taking place after: -

- (i) The date on which this assessment was undertaken, and
- (ii) The date on which the final report is delivered

BWB Consulting makes no representation whatsoever concerning the legal significance of its findings or the legal matters referred to in the following report.

While all reasonable skill and care have been used in generating this report, there are limitations to the data used in its generation. Model generated data relating to natural hazards includes inherent accuracy limitations, and BWB Consulting Limited does not warrant the accuracy, currency, completeness or reliability of the information in this Report, that it is without fault or error, or that it represents reality. The information presented, and conclusions drawn, are based on statistical data and analysis, and are for guidance purposes only. The study provides no guarantee against flooding, nor of the absolute accuracy of water levels, flow rates, and associated probabilities. Data is current as of July 2025 and is subject to change.

This document and associated models and analysis have been prepared for the sole use of the Client in accordance with the terms of the appointment under which it was produced. Copyright in this document and associated models remain with BWB Consulting Limited and no part of this document and associated models shall be used, copied or reproduced in any form without the prior written permission of BWB. BWB Consulting Limited accepts no responsibility for any use of or reliance on the contents of this document or associated models by any third party and we reserve our rights of redress should it be used without our express written consent.



#### **EXECUTIVE SUMMARY**

This FRA has been prepared on behalf of Intermodal Logistics Park North Ltd to support a Rail Freight Interchange Development Consent Order application. The level of detail included is commensurate and subject to the nature of the proposals at the planning stage of the design process.

This report demonstrates that the proposed development is at an acceptable level of flood risk, subject to the recommended flood mitigation strategies being implemented.

The Environment Agency Flood Map for Planning shows the Main Site and Western Rail Chord are located entirely within Flood Zone 1. There are minor watercourses/drains within the site however the flood risk associated with these is considered to be driven by overland surface water runoff. Therefore to assess potential surface water flood risk to the site, a bespoke 1D/2D hydraulic modelling exercise has been undertaken.

The baseline modelled floodplain identifies several overland flow routes exist within the Main Site, however they are shown to originate within the Order Limits. The modelled flood hazard for the 1 in 1000-year event shows that the peak flood hazard within the site is generally low.

Flow routes will be addressed through development of the site and the drainage strategy which will intercept, store and redirect water via a network of Sustainable Drainage Systems.

It is recommended that finished floor levels are raised a minimum of 150mm above immediate surrounding ground levels where practicable to help mitigate the residual risk of flooding from localised surface water runoff within the development. To facilitate development, ground levels in the Main Site are to be reprofiled to form a series of plateaus. Changes in levels will provide further resilience to the risk of flooding from surface water.

All other potential sources of flood risk were assessed as posing a low risk. The report sets out a number of recommended measures that would increase the development resilience to flood risk and would help manage any residual risks.

In compliance with the requirements of the NPSNN and NPPF and subject to the mitigation measures proposed, the development could proceed without being subject to significant flood risk. Moreover, the proposed development will not increase flood risk to the wider area subject to the suitable management of surface water runoff discharging from the site.



#### **CONTENTS**

EXE	Cutive Summary	
GLC	DSSARY & NOTATION	VI
1.	INTRODUCTION	1
2.	SITE DETAILS AND PROPOSALS	1
3.	FLOOD RISK PLANNING POLICY & GUIDANCE	10
4.	HISTORICAL FLOODING INCIDENTS	19
5.	MAIN RIVERS (FLUVIAL)	21
6.	SURFACE WATER (PLUVIAL) & MINOR WATERCOURSES	23
7.	SEWERS & DRAINAGE SYSTEMS	30
8.	GROUNDWATER	31
9.	OTHER SOURCES OF FLOOD RISK	33
10.	CONCLUSIONS AND RECOMMENDATIONS	35

## **FIGURES**

- Figure 1.1: Site Location
- Figure 1.2: Authority Areas
- Figure 2.1: Main Site Location
- Figure 2.2: Local Watercourse Network
- Figure 2.3: Generalised Topography
- Figure 2.4: Existing Surface Water Drainage Catchments
- Figure 2.5: Proposed Development Component Parts
- Figure 3.1: Flood Map for Planning
- Figure 5.1: 1 in 1000-Year Climate Change Extents (Defended and Undefended)
- Figure 6.1: EA Risk of Flooding from Surface Water (Yearly Chance of Flooding Between 2040 and 2060)
- Figure 6.1: Baseline Direct Rainfall Modelling Results
- Figure 6.2: 1 in 1000-Year Flood Hazard
- Figure 9.1: EA Reservoir Failure Flood Extents



#### **TABLES**

Table 1.1: Site Summary

Table 3.1: Flood Zone Classifications

Table 2.2: Peak River Flow Climate Change Allowances

Table 2.4: Peak Rainfall Climate Change Allowances

Table 2.5: Application of Appropriate Peak Rainfall Climate Change Allowances – New

Development Drainage Design

Table 2.6: Application of Appropriate Peak Rainfall Climate Change Allowances – Catchment

Scale

Table 2.7: Hazard to People

Table 4.1: Summary of Reported Historical Flooding Incidents

Table 10.1: Flood Risk Assessment Summary

### **APPENDICES**

Appendix 1: Topographical Survey

Appendix 2: Proposed Plans

Appendix 3: Hydraulic Model Report



# **GLOSSARY & NOTATION**

Abbreviation / Notation	Definition
AEP	Annual Exceedance Probability. The probability (%) of a flood event occurring in any year
m bgl	metres below ground level
BGS	British Geological Survey
Catchment	The land area that drains (normally naturally) to a given point on a river, drainage system or body of water
DCO	Development Consent Order
DTM	Digital Terrain Model
EA	Environment Agency
FEH	Flood Estimation Handbook. Industry standard guidance on rainfall and river flood frequency estimation in the UK.
Floodplain	Any area of land over which water flows or is stored during a flood event
FRA	Flood Risk Assessment
Freeboard	The height of finished floor levels, top of a bank, floodwall or other flood defence structure, above the design water level. Freeboard can be seen as a safety margin that makes allowance for uncertainty associated with the potentially damaging effects of flood rise or wave action
Hydraulic Model	A mathematical numerical (generally computer based) model of a water/sewer/storm system which is used to analyse the system's hydraulic behaviour
LiDAR	Light Detection and Ranging aerial survey data
LLFA	Lead Local Flood Authority
m AOD	metres Above Ordnance Datum
Main River	A statutory type of watercourse in England and Wales, usually larger watercourses and rivers. The EA can carry out maintenance, improvement or construction work on main rivers to manage flood risk as part of its duties and powers
NPPF	National Planning Policy Framework
NPSNN	National Policy Statement for National Networks
NSIP	Nationally Significant Infrastructure Project
Ordinary Watercourse	A river, stream, ditch, drain, dyke, culvert/pipe (other than a public sewer) and passage through which water flows and which does not form part of a main river
OS	Ordnance Survey



Abbreviation / Notation	Definition
PFRA	Preliminary Flood Risk Assessment. An assessment of floods that have taken place in the past and floods that could take place in the future. It generally considers flooding from surface water runoff, groundwater and ordinary watercourses, and is prepared by the LLFAs
PPG	Planning Policy Guidance. Specifically, the Flood Risk and Coastal Change category
RBMP	River Basin Management Plan
Return Period	A statistical term defining the probability of occurrence of a flood event.  A 1 in 30-year flood is one likely to be equalled or exceeded on average only once in a 30-year period: a flood with a 3.33% AEP
RofRS	Risk of Flooding from Rivers and Sea. A strategic level dataset published by the EA, illustrating the potential probability of flooding from the rivers and sea, including an allowance for climate change
RoFSW	Risk of Flooding from Surface Water. A strategic level dataset published by the EA, illustrating the potential probability of flooding from surface water runoff, including an allowance for climate change
SFRA	Strategic Flood Risk Assessment. A study carried out by one or more local planning authorities to assess the risk of flooding from all sources, now and in the future within a defined area
SDS	Sustainable Drainage Statement
Section 19 Flood Investigation Reports	Under their duties under the Flood and Water Management Act 2010, LLFAs have a duty to publish reports of investigations of flood incidents. A section 19 flood investigation report is a public statement of the circumstances of a historical flood event and what parties have a role in managing the risks. The investigation does not always give an in-depth analysis of the flood risk or mechanisms, but it can provide a valuable record of past events
SRFI	Strategic Rail Freight Interchange
SuDS	Sustainable Drainage Systems. Surface water management techniques that are intended to reduce the risk of flooding and pollution from urban runoff
SWMP	Surface Water Management Plan. These are non-statutory plans which preceded the introduction of the Flood and Water Management Act 2010. They can provide an important evidence base of local flood risk issues which can include critical drainage areas, surface water drains, groundwater, and small watercourses



#### 1. INTRODUCTION

- This FRA has been prepared on behalf of Intermodal Logistics Park North Ltd (the 1.1 Applicant) to support proposals for a new SRFI and associated development on land to the east of Newton-le-Willows, in the jurisdictions of St Helens Borough Council, Wigan Council and Warrington Borough Council.
- 1.2 Under the Planning Act 2008, the proposals qualify as a NSIP. Accordingly, an application for a DCO is to be made to the Planning Inspectorate (PINS), which will examine the DCO application on behalf of the Secretary of State (SoS) for Transport
- 1.3 The level of detail included is commensurate and subject to the nature of the proposals at the planning stage of the design process.
- 1.4 Summary information is included as **Table 1.1**.

Table 1.1: Site Summary	
Site Name	Intermodal Logistics Park North
Location	Newton-le-Willows, in the jurisdictions of St Helens Borough Council, Wigan Council and Warrington Borough Council
NGR (approx.)	SJ610953
Order Limits Area (ha)	210 (approx.)
Development Type	SRFI
Flood Zone Classification	The Main Site and Western Rail Chord – Flood Zone 1
NPPF Vulnerability	Essential Infrastructure – Primary Road & Rail Infrastructure Less Vulnerable – Warehousing & ancillary buildings Water Compatible – Public Open Space, Landscaping, Footpaths & Amenity Areas
Anticipated Development Lifetime*	75 years
Lead Local Flood Authority	St Helens Borough Council Wigan Council Warrington Borough Council

<sup>\*</sup>In accordance with PPG Flood Risk and Coastal Change Paragraph 006

1.5 The site is located on the eastern extent of Newton-le-Willows in an agricultural landscape. The DCO Site is located within the local authority areas of St Helens Borough Council, within the Liverpool City Region Combined Authority, Wigan Council, within the Greater Manchester Region Combined Authority, and Warrington Borough Council. The location of the site is illustrated within Figure 1.1, with the authority areas illustrated in Figure 1.2.



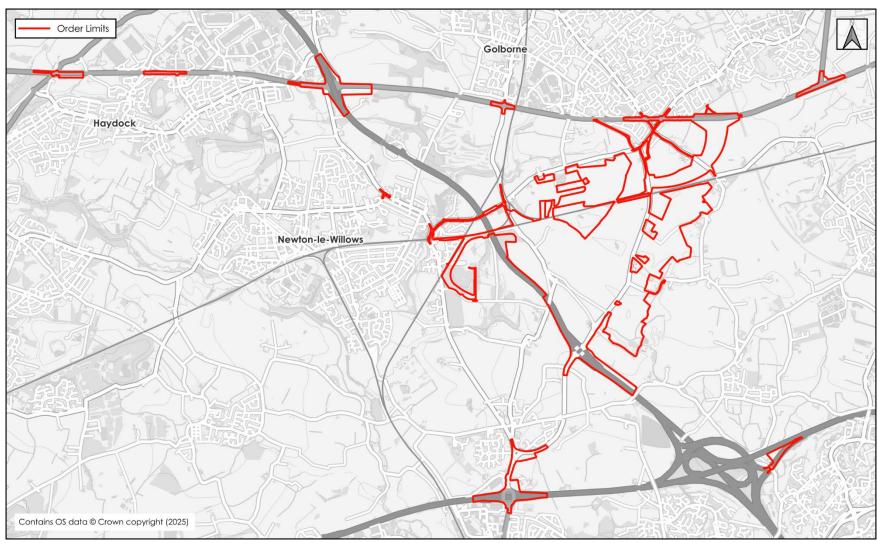


Figure 1.1: Site Location



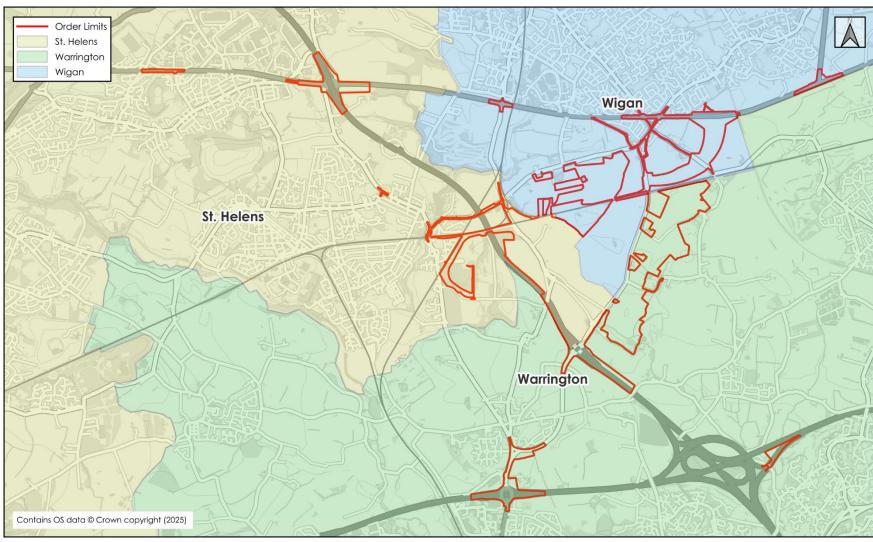


Figure 1.2: Authority Areas



#### Sources of Data

- 1.6 The following sources of data have been reviewed in the preparation of this FRA:
  - i. Topographical Survey by BWB Consulting Limited undertaken in August and October 2024, reference: 233398-BWB-00-ZZ-M2-G-0001
  - ii. EA LiDAR (1m resolution Composite DTM 2022)
  - iii. EA Flood Risk Assessments: Climate Change Allowances
  - iv. EA Flood Map for Planning
  - v. EA RoFSW mapping
  - vi. St Helens Borough Local Plan
  - vii. Greater Manchester Places for Everyone Plan
  - viii. Wigan Local Plan Core Strategy
  - ix. Warrington Local Plan
  - x. St Helens Council SFRA
  - xi. Liverpool City Region Combined SFRA Part A
  - xii. Greater Manchester Level 1 SFRA Update
  - xiii. Greater Manchester Level 2 Hybrid SFRA
  - xiv. Warrington Borough Council Level 1 SFRA
  - xv. Warrington Borough Council Level 2 SFRA
  - xvi. Warrington Borough Council SFRA Addendum
  - xvii.North West RBMP
  - xviii. St Helens Council PFRA
  - xix. Wigan Council PFRA and Addendum
  - xx. Warrington Borough Council PFRA
  - xxi. Warrington Borough Council Surface Water Flooding Evidence Base
  - xxii. Greater Manchester Integrated Water Management Plan
  - xxiii. Section 19 Flood Investigation Reports
  - xxiv. Anecdotal reports of flooding
  - xxv.Surface Water Hydraulic Modelling undertaken by BWB Consulting, reference: 233398-BWB-ZZ-XX-T-W-0001
  - xxvi. United Utilities Sewer Records
  - xxvii.BGS Drift & Geology Maps



#### 2. SITE DETAILS AND PROPOSALS

- 2.1 This document covers two discrete areas (as delineated in 2.1):
  - the Main Site land to the east of the M6 motorway, to the south of the Chat Moss Line and to the west of Winwick Lane incorporating the triangular parcel of land located to the west of Parkside Road and to the north of the Chat Moss Line;
  - the Western Rail Chord land to the west of the M6 motorway, which bisects the DCO Site in a northwest southeast orientation, and to the east of the West Coast Mainline.
- 2.2 The majority of the land contained within the Main Site is bound to the north by the Chat Moss Line (Liverpool-Manchester railway line), to the west by the M6 motorway and to the southeast by Winwick Lane (A579). The Main Site south of the Chat Moss Line is approximately 198 hectares. The Highfield Moss Site of Special Scientific Interest (SSSI) is also adjacent to the north of the Main Site. The full project description is included as Chapter 3 of the PEIR.
- 2.3 The majority of the Main Site is comprised of agricultural fields used for arable crops, with some small patches of woodland in the east. There are also a number of residential properties, farmsteads and two commercial yards within the Main Site. Parkside Road (A573) runs through the DCO Site to the south before passing over the M6 where it provides access to Parkside Link Road West.
- 2.4 The triangular parcel of land located to the north of the Chat Moss Lineforms a proposed amenity area. The Western Rail Chord of the DCO Site is approximately 12 hectares and is bordered to the west by the West Coast Mainline railway, to the north by the Chat Moss Line and to the east by land associated with the former Parkside Colliery. It lies to the north of Parkside Link Road which opened on 30th May 2025. The Western Rail Chord is a rail turn-back facility capable of accommodating trains up to 775m in length. The Western Rail Chord is comprised of scrub land and areas of woodland which are set within the context of an area of redevelopment with commercial uses proposed, which is known as Parkside West.



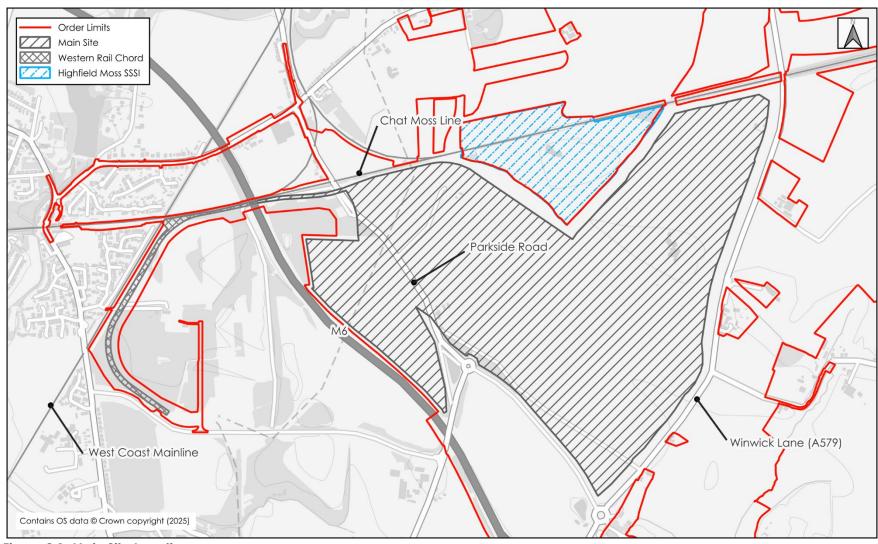


Figure 2.1: Main Site Location



#### Waterbodies & Watercourses

- 2.5 The waterbodies and ditches in and around the Main Site and the Western Rail Chord, are illustrated within **Figure 2.2**.
- 2.6 The Cockshot Brook, a designated EA Main River, is located to the east of the Main Site and flows in a southerly direction. Minor watercourses, which flow from the south east of the Main Site outfall to the Cockshot Brook and the highway drainage associated with Parkside Link Road connect to these minor watercourses.
- 2.7 There are also ditches present along the northern boundary of the Main Site, adjacent to the Highfield Moss SSSI. There are noted to be ditches within the Highfield Moss SSSI, which receive incoming flows from the north of the railway line. A cross-field drain is assumed to drain the SSSI as well as any incoming drainage upstream of this. The drain is understood to discharge via a 525mm culvert which outfalls to a tributary of the Cockshot Brook to the south-east of the DCO Site, beyond the A579. A section of this ditch is understood to be siphoned beneath the Chat Moss Line. Further information on the culvert including a summary of the investigation works is included in the Sustainable Drainage Statement (ref BWB-EWE-ZZ-RP-CD-0520), provided as Appendix 14.2 of the PEIR.
- 2.8 Millingford Brook and Ellam's Brook flow to the north of the Main Site and the Western Rail Chord where they converge and flow to the west of the Western Rail Chord as the Newton Brook.
- 2.9 There are surface water drainage features within the DCO Site, such as attenuation features, culverts and swales associated with the Parkside Link Road. There are small ponds in the north-east of the DCO Site, which ultimately outfall into the Cockshot Brook. However, additional survey will be undertaken to confirm the connection. A culvert is located beneath the A579 (Winwick Lane) within the south of the Main Site. The culvert is associated with the new drainage surrounding Parkside Link Road and ultimately outfalls to the Cockshot Brook.
- 2.10 A culvert is also located to the west of the Main Site, beneath the M6 motorway. The culvert is approximately 450mm in diameter and the west of the site is understood to drain to this culvert.



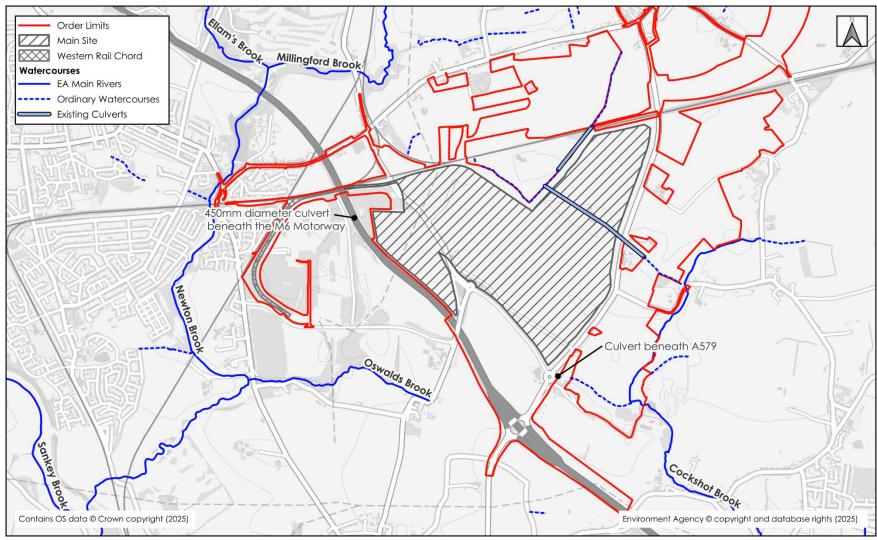


Figure 2.2: Local Watercourse Network



#### **Topography**

2.11 The DCO Site is relatively flat topographically, with the Main Site ranging from approximately 31m AOD to 41m AOD and the Western Rail Chord land ranging from 29m AOD to 36m AOD. The generalised topography of the Main Site and Western Rail Chord is shown in **Figure 2.3** and the topographical survey is included as **Appendix 1**.

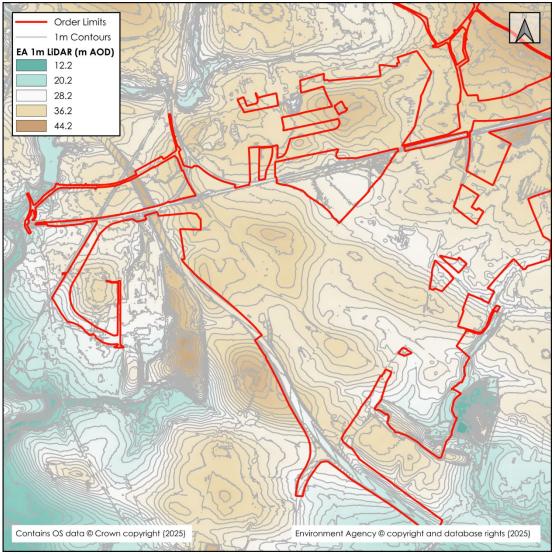


Figure 2.3: Generalised Topography

2.12 A catchment plan is shown in **Figure 2.4**, which outlines the site-wide existing drainage catchments.



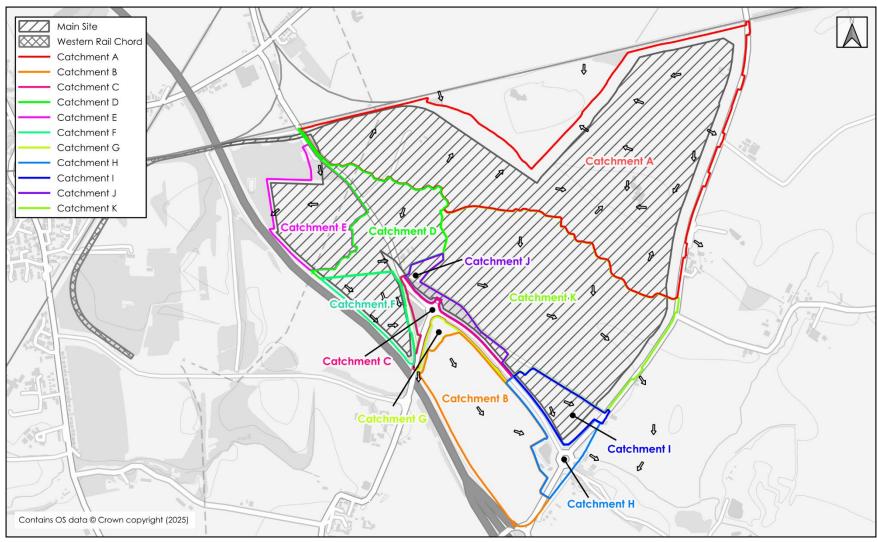


Figure 2.4: Existing Surface Water Drainage Catchments



#### **Proposed Development**

- 2.13 The Proposed Development (the DCO Site) is for a new SRFI and associated development, described below. The Proposed Development is in accordance with a series of development parameters as set out in the Parameters Plan (Appendix 2). The Illustrative Masterplan (Appendix 2) provides a layout demonstrating one way in which the Proposed Development could come forward within these parameters.
- 2.14 The development of the Main Site includes:
  - provision of a logistics park comprising up to c.767,000 square metres (m²) (gross internal area or GIA) of warehousing and ancillary buildings with a total footprint of up to 590,000m² at ground floor level and up to 177,050m² of mezzanine floorspace, comprising a mixture of units with the potential to be rail-connected, rail served and rail accessible units;
  - provision of a rail terminal capable of accommodating up to 16 trains (up to 775m in length) per day, including connections to the mainline and ancillary development such as container storage, cranes for the loading and unloading of shipping containers, Heavy Goods Vehicle (HGV) parking, rail control building, fuelling facilities and staff facilities:
  - a rail turn-back facility within the Western Rail Chord capable of accommodating trains up to 775m in length;
  - New bridges across the Chat Moss Line to enhance connectivity and replace level crossings to improve safety;
  - closure and diversion of two rail level crossings (Parkside No. 1 and Lowton Moss);
  - provision of overnight lorry parking with welfare facilities and HGV fuelling facilities for users of the SRFI;
  - new internal roads and works to existing road infrastructure on the Main Site;
  - closure of existing access and provision of new access to Newton Park Farm and neighbouring properties;
  - new electricity substations;
  - new energy centre(s) and potential for battery storage;
  - provision of roof-mounted photovoltaic arrays and/or canopy photovoltaic arrays over parking areas capable of providing direct energy supply to buildings on which they are mounted and/or distributing and exporting power via the energy centre(s);
  - strategic landscaping and open space, including: bunds up to 3m above the reprofiled ground level, hard and soft landscape works, amenity features and planting;
  - earthworks to regrade the Main Site to provide development plateaus, appropriate access, connections to the railway, development plots and landscape zones;
  - habitat creation, enhancements, compensation and provision of publicly accessible space;
  - an amenity area north of the railway line bounded by rail lines and Parkside Road, providing amenity open space, landscaping and screening as well as heritage interpretation;



- farmland to the north of the Liverpool to Manchester railway and south of the A572 Newton Road for the provision of BNG requirements, new and realigned PRoW and landscaping including tree belts to screen views from the north;
- farmland to the east of Winwick Lane for the reuse of topsoil and landscaping including stopping up gaps in hedgerow and tree belts to screen views from the east;
- noise attenuation measures;
- new pedestrian and cycle access routes and connections and infrastructure including provision of new, diversion and stopping up of existing PRoW where required (see Table 3.4);
- provision of public transport hub;
- demolition of existing on-site structures (including existing residential dwellings / farmsteads and commercial premises);
- utility compounds, plant and service infrastructure;
- security and safety provisions inside the ILPN SRFI including fencing and lighting; and
- drainage works including creation of attenuation ponds and sustainable drainage features.
- 2.15 Highway mitigation works are to be determined through assessment and review with relevant stakeholders, as set out in the Highways Mitigation Options Report.
- 2.16 The gross area for the draft Order Limits is 417.89 hectares (ha). The area of the Main Site and Western Rail Chord is 209.56 ha, with the remainder of the gross area attributable to remote highway works. This FRA focuses on the Main Site and Western Rail Chord.
- 2.17 An illustrative plan is provided within **Figure 2.5** which identifies the approximate extent of the development components parts.



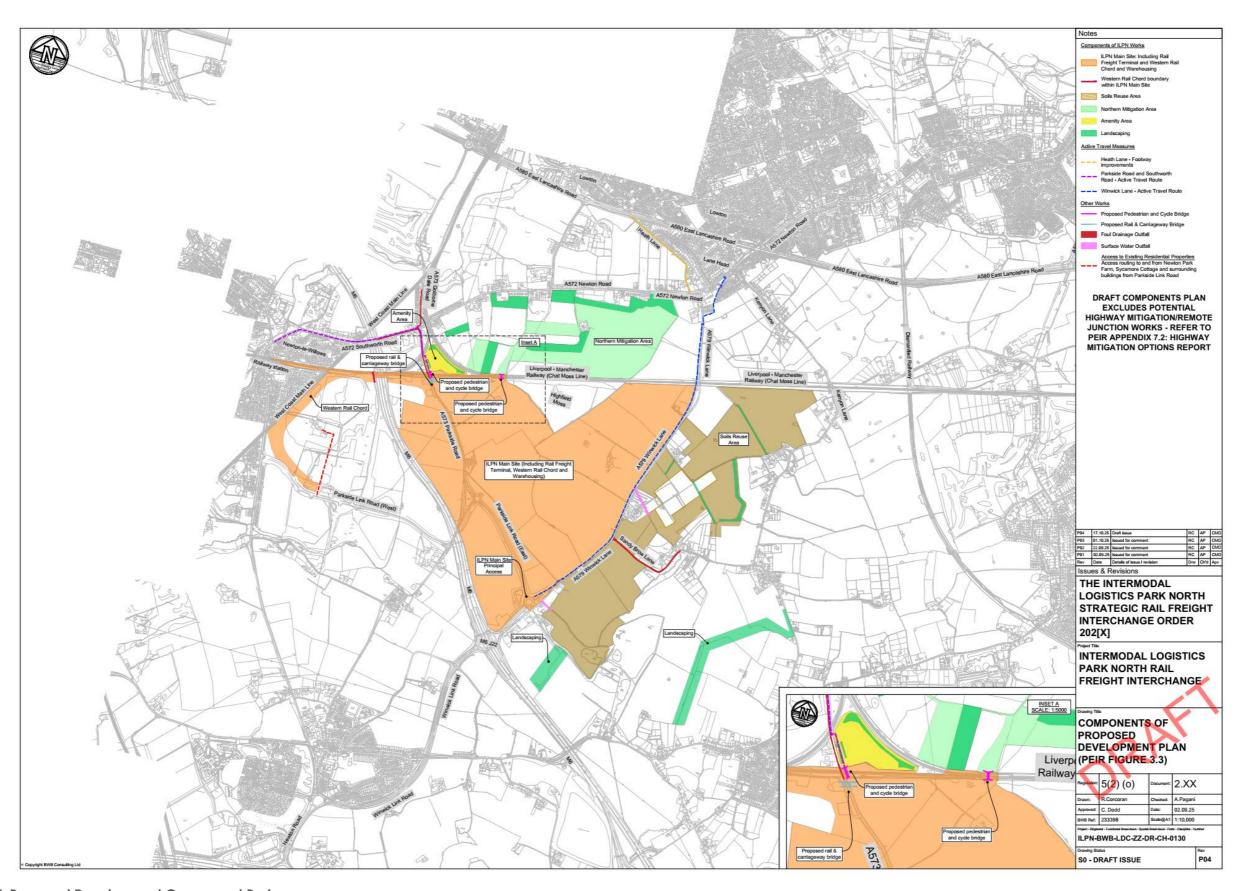


Figure 2.5: Proposed Development Component Parts



#### 3. FLOOD RISK PLANNING POLICY & GUIDANCE

#### **National Policy Statement for National Networks**

- 3.1 The NPSNNF1 provides planning policy guidance for the promoters of nationally significant infrastructure projects. The NPSNN include guidance about the generic, and other, impacts which should be specifically considered in assessing and designing projects. It also sets the context for the examination of proposals by the Planning Inspectorate (PINS).
- 3.2 Paragraph 5.128 highlights the requirement for a FRA to accompany the application and must demonstrate that the project will be safe for its lifetime, without increasing flood risk elsewhere and, where possible, will reduce flood risk overall.
- 3.3 The NPSNN specifically refers to the NPPF for further, more detailed guidance on flood

#### National Planning Policy Framework

- 3.4 The NPPF<sup>2</sup> sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk.
- 3.5 Flood risk is identified as a combination of the probability and the potential consequences of flooding:

#### Flood Risk = Probability x Consequences

- 3.6 The probability is the chance of a flood occurring expressed as a return period or AEP, and the consequences are the potential impacts of the flood (for example: damage to buildings or risk to people's safety).
- 3.7 Potential sources of flood risk are rivers and the sea; direct rainfall on the ground surface resulting in surface water runoff; rising groundwater; overwhelmed sewers and drainage systems; reservoirs; canals and lakes; and other artificial sources.
- 3.8 The NPPF states that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk. Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere. When considering flood risk, the NPPF requires development to account for future climate change.

#### National Planning Practice Guidance – Flood Risk and Coastal Change

3.9 The NPPF is accompanied by the PPG category entitled "Flood Risk and Coastal Change"3. This sets out the vulnerability to flooding of different land uses. It encourages

<sup>&</sup>lt;sup>1</sup> National Policy Statement for National Networks, Department for Transport, March 2024

 $<sup>^2</sup>$  Revised National Planning Policy Framework, Ministry of Housing, Communities & Local Government, amended 2024  $^3$  Planning Practice Guidance: https://www.gov.uk/guidance/flood-risk-and-coastal-change, amended 2022



- development to be located in areas of lower flood risk where possible and stresses the importance of preventing increases in flood risk off site to the wider catchment area.
- 3.10 The PPG requires development to be designed to include flood risk management and resilience against the "design flood" for its lifetime. The PPG also states that all potential sources of flooding should be considered when preparing an FRA.
- 3.11 The "design flood" is an event of a given probability generally defined as:
  - river flooding likely to occur with a 1% AEP (a 1 in 100 chance each year); or
  - tidal flooding likely to occur with a 0.5% AEP (1 in 200 chance each year); or
  - surface water flooding likely to occur with a 1% AEP (a 1 in 100 chance each year),

plus, an appropriate allowance for climate change.

- 3.12 The NPPF and the PPG includes a series of tables that define Flood Zones (Table 1 of the PPG), the flood risk vulnerability classification of development land uses (Annex 3 of the NPPF) and 'compatibility' of development within the defined Flood Zones (Table 2 of the PPG).
- 3.13 This FRA is written in accordance with the NPSSNN, the NPPF and the associated PPG.

#### Flood Map for Planning

3.14 With particular reference to planning and development, and specifically the risk of flooding from rivers and the sea, the Flood Map for Planning identifies Flood Zones in accordance with Table 1 of the PPG. Further details on the Flood Zone classifications are outlined in **Table 3.1**.

Table 3.1: Flood Zone Classifications

Flood Zone	Description
Flood Zone 1 (Low Probability)	Land having less than a 1 in 1000 annual probability of river or sea flooding (<0.1% AEP). All land outside of Flood Zone 2 and 3.
Flood Zone 2 (Medium Probability)	Land having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1% AEP); or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1% AEP).
Flood Zone 3a (High Probability)	Land having a 1 in 100 or greater annual probability of river flooding (>1% AEP); or land having a 1 in 200 or greater annual probability of flooding from the sea (>0.5% AEP). This is represented by "Flood Zone 3" on the Flood Map for Planning.
Flood Zone 3b (The Functional Floodplain)	Flood Zone 3b (The Functional Floodplain) is defined as land where water must flow or be stored in times of flood. This is not identified or separately distinguished from Zone 3a on the Flood Map for Planning.



3.15 The Main Site and Western Rail Chord is shown to be located within entirely within Flood Zone 1, as shown in **Figure 3.1**.

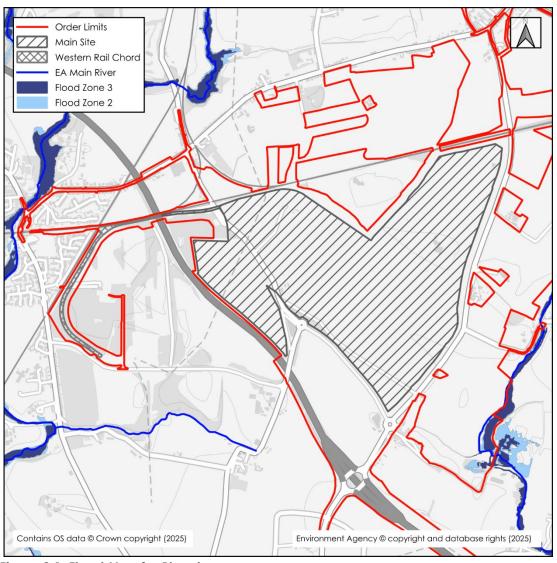


Figure 3.1: Flood Map for Planning

#### Flood Risk Assessments: Climate Change Allowances

- 3.16 Predicted future changes in sea levels, peak river flows, and rainfall intensities caused by climate change are provided by the EA online<sup>4</sup>. A range of projections are applied to regionalised 'River Basin Districts', which are further subdivided into Management Catchments, to provide a series of climate change allowances. The appropriate climate change allowances are determined by a number of factors that include the source of flooding, the current level of risk, the vulnerability of the proposed development and the lifespan of the development.
- 3.17 The Order Limits falls within the Lower Mersey Management Catchment.

<sup>&</sup>lt;sup>4</sup> Flood risk assessments: climate change allowances (Environment Agency, Amended 27 May 2022) Available at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances. Last Accessed March 2025.



#### Peak River Flow

3.18 The relevant peak river flow climate change allowances from the Management Catchments are identified in **Table 3.2**.

Table 3.2: Peak River Flow Climate Change Allowances

Allowance Category	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2125)
Upper End	32%	55%	90%
Higher Central	22%	35%	57%
Central	18%	27%	44%

3.19 The Main Site and Western Rail Chord are located entirely within Flood Zone 1. There are noted to be minor watercourses/drains within the site; however, the flood risk associated with these is considered to be driven by overland surface water runoff. Peak rainfall allowances will therefore be considered for assessing flood risk to the site.

#### Peak Rainfall

3.20 The relevant peak rainfall climate change allowances for the Lower Mersey Management Catchments are identified in **Table 3.3**.

Table 3.3: Peak Rainfall Climate Change Allowances

Allowance		ange anticipated och (2022 to 2060)	Total potential change anticipate for the '2070s' epoch (2061 to 212	
Category	1 in 30-Year	1 in 100-Year	1 in 30-Year	1 in 100-Year
Upper End	35%	40%	40%	45%
Central	20%	25%	30%	30%

3.21 The future increase in rainfall will need to be considered when designing a development to ensure its drainage system is sufficient for its lifetime and that it does not increase flood risk elsewhere. When determining the appropriate allowance(s), the anticipated lifespan of the development should be considered. **Table 3.4** provides a summary of the EA's guidance on determining the appropriate allowance(s).



Table 3.4: Application of Appropriate Peak Rainfall Climate Change Allowances – New Development Drainage Design

	Anticipated Development Lifespan		t Lifespan
Area Assessed	up to 2060	between 2061 and 2100	up to or beyond 2100*
Development Sites^	I	I	I
Assess the 1 in 30-year and 1 in 100-year storm events with the respective climate change allowance(s) applied.	Use the Central	Use the Central	Use the Upper End
Development to be designed so that with the climate change allowance applied to the 1 in 100-year storm:  • there is no increase in flood risk elsewhere • the development will be safe from surface water flooding	Allowance for the 2050s	Allowance for the 2070s+	Allowance for the 2070s <sup>+</sup>

<sup>\*</sup>Includes all residential developments

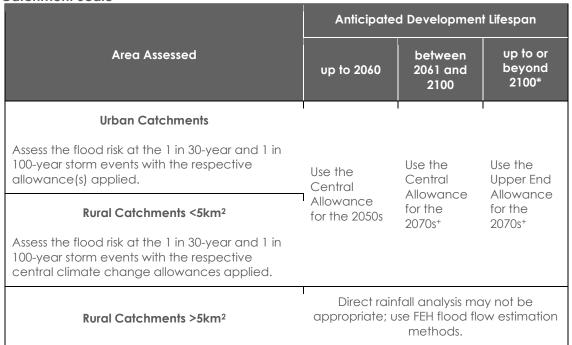
- 3.22 The proposed development has an anticipated lifespan of approximately 75+ years; therefore, based on the EA's guidance, the Upper End allowances for the 2070s epoch (1 in 30-year + 40%CC and 1 in 100-year + 45%CC) will need to be considered in the assessment. As the flood mechanisms for the catchments of the minor watercourses/ditches within and adjacent to the site are considered to be largely influenced by surface water, it is considered that the application of peak rainfall allowances is more appropriate for informing an assessment of flood risk.
- 3.23 When assessing surface water flood risk at a catchment scale, the catchment size, urbanisation, and the anticipated lifespan of the development should be considered when determining the appropriate allowance. **Table 3.5** provides a matrix summarising the EA's guidance on determining the appropriate allowance(s).
- 3.24 The EA's guidance notes that for modelled large areas (greater than 5km²) with rural land use, direct rainfall modelling is unlikely to be appropriate and fluvial flood risk should be assessed. However, as the flood risk to the site is not considered to be fluvial in nature and the catchment is only slightly greater than 5km² (5.8km²), direct rainfall modelling is considered to be appropriate for the study.
- 3.25 The EA's guidance also notes that for NSIPs, a credible maximum climate change scenario may need to be assessed. In these circumstances the following should be used:
  - the H++ climate change scenario for sea level rise
  - the upper end allowance for peak river flow
  - the sensitivity test allowances for offshore wind spend and extreme wave height
  - an additional 2mm for each year on top of sea level rise allowances from 2017 for storm surge

 $<sup>\</sup>label{local food Authority may have local standards that also need to be considered. \\ + unless the 2050s allowance is greater$ 



3.26 The guidance does not provide a credible maximum scenario for rainfall intensity and therefore the assessment is based on the Upper End allowances for the 2070s epoch which are the worst-case scenarios outlined by the EA.

Table 3.5: Application of Appropriate Peak Rainfall Climate Change Allowances – Catchment Scale



<sup>+</sup>unless the 2050s allowance is greater

#### Local Plan

#### St Helens Borough Local Plan

- 3.27 The St Helens Borough Local Plan<sup>5</sup> was adopted in July 2022 and sets out the vision, objectives and strategic and local policies for development in the Borough up to 2037.
- 3.28 Policy LPC12 (Flood Risk and Water Management) notes that the impact of development proposed on flood risk and water management will be considered in accordance with case law, legislation, and the NPPF. The policy also sets out requirements for new developments with respect to flood risk, water quality and sustainable drainage systems.

#### Greater Manchester Places for Everyone Plan

3.29 The Places for Everyone Plan<sup>6</sup> is a joint development plan encompassing the nine Greater Manchester districts, including Wigan.

<sup>&</sup>lt;sup>5</sup> St Helens Borough Local Plan up to 2037 (St Helens Borough Council, 2022)

<sup>&</sup>lt;sup>6</sup> Places for Everyone Joint Development Plan Document for Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan 2022 to 2039 (Greater Manchester Combined Authority, 2024)



- 3.30 Policy JP-S4: Flood Risk and the Water Environment sets out the need for development to be located and designed 'to minimise the impacts of current and future flood risk' as well as expectations for the use of sustainable drainage systems.
- 3.31 Policy JP-G4: Lowland Wetlands and Mosslands is also of relevance, due to the Highfield Moss Site of Special Scientific Interest (SSSI) located immediately adjacent to the DCO Site. It is stated that land adjacent to sensitive wetland habitats should be positively managed in such a way that their hydrology is not adversely affected.

#### Wigan Local Plan Core Strategy

- 3.32 Whilst a number of policies from the Wigan Local Plan Core Strategy<sup>7</sup> have been superseded by the Places for Everyone Plan, this strategy was updated in March 2024 to include the remaining policies. The Wigan Local Plan Core Strategy was first adopted in September 2013 and sets out the spatial vision for the Borough until 2026.
- 3.33 Policy CP 16 (Flooding) has been retained within the Local Plan Core Strategy which sets out the requirements for development with regards to flood risk and surface water run-off.
- 3.34 Wigan Council is preparing a new Local Plan for the period to 2040. The Wigan Borough Local Plan: Initial draft for consultation<sup>8</sup> was published in April 2025. A key draft policy of relevance is *Draft Policy EN10*: Development and flood risk, which includes the requirement for development to be designed such that 'it does not increase the risk of flooding elsewhere' as well as the requirements for sustainable surface water run-off management.

#### Warrington Local Plan

- 3.35 The Warrington Local Plan 2021/22 to 2038/399 was adopted in December 2023 and provides the statutory planning framework for the Borough until 2039.
- 3.36 Policy ENV2 Flood Risk and Water Management sets out general principles for development with relation to flood risk as well as specific requirements for development proposals.

#### Strategic Flood Risk Assessment

- 3.37 The following SFRAs have been reviewed in the production of this FRA:
  - St Helens Council SFRA 10
  - Liverpool City Region Combined SFRA Part A<sup>11</sup> (joint SFRA for the combined authority and covers the administrative area of St Helens Borough Council

<sup>&</sup>lt;sup>7</sup> Wigan Local Plan Core Strategy Remaining Policies (Wigan Council, 2024)

B Wigan Borough Local Plan: Initial draft for consultation (Wigan Council, 2025)

<sup>9</sup> Warrington Local Plan 2021/22 to 2038/39 (Warrington Borough Council, 2023)

<sup>&</sup>lt;sup>10</sup> St Helens Council Strategic Flood Risk Assessment (JBA Consulting, 2014)

Liverpool City Region Combined Authority Strategic Flood Risk Assessment Part A (JBA Consulting, 2023)



- Greater Manchester Level 1 SFRA Update 12 (covers the administrative area of Wigan Council)
- Greater Manchester Level 2 Hybrid SFRA 13
- Warrington Borough Council Level 1 SFRA14
- Warrington Borough Council Level 2 SFRA 15
- Warrington Borough Council SFRA Addendum<sup>16</sup>
- The SFRAs include guidance for development with regards to flood risk, including requirements for site-specific FRAs and for mitigation measures as well as general principles for new developments, such as to ensure that development does not increase flood risk elsewhere and is safe for future users.

#### River Basin Management Plan

3.39 The latest version of the North West RBMP<sup>17</sup> was published in 2022. RBMPs include an assessment of river basin characteristics, a review of the impact of human activities, statuses of waterbodies and an economic analysis of water use and progress since the first plan was published in 2009.

#### Other Relevant Policy and Guidance

This FRA has considered the following documents when assessing sources of flood risk 3.40 and when recommending mitigation and resilience measures.

#### Flood Risk to People and New Developments

- The Flood Risk to People (FD2321/TR1)<sup>18</sup> document was prepared as a research project considering flood hazard and factors that affect it.
- Flood Risk Assessment Guidance for New Development (FD2320/TR2)<sup>19</sup> provides a framework and guidance for assessing and managing flood risks for new developments and sets flood hazard thresholds.
- 3.43 Hazard ratings are derived using the following equation in line with the above:

Hazard Rating = 
$$D * (V+0.5) + DF$$

Where:

D = depth

V = velocity

DF = debris factor

<sup>&</sup>lt;sup>12</sup> Level 1 Strategic Flood Risk Assessment for Greater Manchester - Update (JBA Consulting, 2019)

Greater Manchester Level 2 Hybrid Strategic Flood Risk Assessment (JBA Consulting, 2020)
 Warrington Borough Council Level 1 Strategic Flood Risk Assessment (JBA Consulting, 2018)

Warrington Borough Council Local Plan Site Screening Level 2 Strategic Flood Risk Assessment (JBA Consulting, 2019)
 Warrington Borough Council Strategic Flood Risk Assessment Addendum (Warrington Borough Council, 2021)

<sup>&</sup>lt;sup>17</sup> North West River Basin Management Plan (Environment Agency, 2022)

 <sup>&</sup>lt;sup>18</sup> Flood Risk to People Methodology (FD2321/TR1), Defra/Environment Agency, 2006
 <sup>19</sup> Flood Risk Assessment Guidance for New Development (FD2320/TR2), Defra/Environment Agency, 2005



3.44 A supplementary note<sup>20</sup> provides clarification of the hazard rating thresholds which should be used for development planning and control use. **Table 3.6** identifies the thresholds of the flood hazard categories.

Table 3.6: Hazard to People<sup>21</sup>

Threshold for Flood Hazard Rating	Degree of Flood Hazard	Description
< 0.75	Very Low	Caution  "Flood zone with shallow flowing water or deep standing water"
0.75 - 1.25	Moderate	Danger for some (i.e.: children, the elderly and the infirm) "Danger: Flood Zone with deep or fast flowing water"
1.25 - 2.0	Significant	Danger for most (includes the general public) "Danger: Flood Zone with deep fast flowing water"
2.0 >	Extreme	Danger for all (includes the emergency services) "Extreme Danger: Flood Zone with deep fast flowing water"

<sup>&</sup>lt;sup>20</sup> Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purpose – Clarification of the Table 13.1 of FD2320/TR2 and Figure 3.2 of FD2321/TR1. (http://randd.defra.gov.uk/Document.aspx?Document=FD2321\_7400\_PR.pdf)

<sup>21</sup> 2008, DEFRA. Supplementary Note on Flood Hazard Ratings and Thresholds for Development Planning and Control Purposes.



#### 4. HISTORICAL FLOODING INCIDENTS

A review of the data sources identified in Section 1 was undertaken to identify any 4.1 records of historical flooding incidents within the vicinity of the site. These are summarised within **Table 4.1**.

Table 4.1: Summary of Reported Historical Flooding Incidents

Data Source	of Reported Historical Flooding Incidents  Commentary
EA Recorded Flood Outlines	There are no EA recorded flood outlines within the Order Limits.
SFRA	No historical instances of flooding within the Main Site or Western Rail Chord are referenced within the St Helens Council SFRA <sup>10</sup> , the Liverpool City Region Combined SFRA Part A <sup>11</sup> , the Greater Manchester Level 2 Hybrid SFRA <sup>13</sup> or the Warrington Borough Council Level 1 SFRA <sup>14</sup> , Level 2 SFRA <sup>15</sup> and SFRA Addendum <sup>16</sup> .
	The Greater Manchester Level 1 SFRA Update <sup>12</sup> notes the presence of a surface water flooding hotspot to the east of the Main Site, however, no further information is provided within the SFRA.
PFRA	No historical instances of flooding within the Main Site or Western Rail Chord are referenced within the St Helens Council PFRA <sup>22</sup> , Wigan Council PFRA <sup>23</sup> and Addendum <sup>24</sup> or Warrington Borough Council PFRA <sup>25</sup> .
SWMP	No historical instances of flooding are referenced within the Warrington Borough Council Surface Water Flooding Evidence Base <sup>26</sup> or the Greater Manchester Integrated Water Management Plan <sup>27</sup>
Section 19 Flood Investigation Reports	A Section 19 Flood Investigation published by St Helens Borough Council <sup>28</sup> noted flooding at Vista Road (B5209) in Newton-le-Willows in January 2021. The flooding was understood to be caused by a peak rainfall event creating runoff from rural areas. The urban drainage system became overwhelmed due to rainfall intensity and limited capacity in watercourses due to high water levels. The magnitude and extent of flooding is unknown and the reported flooding location is located away from the Main Site and Western Rail Chord.
	Wigan Council have published eight Section 19 Flood Investigation Reports on their website. No evidence of flooding at the site or in its vicinity was identified.
	Warrington Borough Council have published 10 Section 19 Flood Investigation Reports on their website. No evidence of flooding at the site or in its vicinity was identified.
LLFA Pre- Application Advice	Consultation with Warrington Borough Council raised concerns over existing downstream flooding issues from the site associated with the Cockshot Brook catchment. The magnitude and extent of flooding is not known.

Preliminary Flood Risk Assessment 2017-2023 (St Helens Borough Council, 2017)
 Wigan Council Preliminary Flood Risk Assessment (JBA Consulting, 2011)

Wigan Council Preliminary Hood Risk Assessment [JBA Consulting, 2011]
 Addendum to Preliminary Flood Risk Assessment (Wigan Metropolitan Borough Council, 2017)
 Warrington Preliminary Flood Risk Assessment 2017-2023 (Warrington Borough Council, 2017)
 Environment & Regeneration Surface Water Flooding Evidence Base (Warrington Borough Council, May 2012)
 Integrated Water Management Plan (Greater Manchester Combined Authority, United Utilities and Environment Agency, June 2023)
 St Helens Borough Section 19 Report: Storm Christoph (St Helens Borough Council, 2021)



Data Source	Commentary
Anecdotal Reports	Information received from Network Rail suggests that the Chat Moss Line has previously experienced flooding within the vicinity of the site

4.2 It should be noted that a lack of recorded flooding incidents does not necessarily mean the site and local area have never experienced flooding. Flooding incidents may not have been reported or observed.



## 5. MAIN RIVERS (FLUVIAL)

#### **Probability of Flooding**

- 5.1 Flooding from watercourses occurs when flows exceed the capacity of the channel or conduits, or where a restrictive hydraulic structure is encountered, which leads to water overtopping the banks into the floodplain.
- 5.2 As illustrated within **Figure 3.1**, the entirety of the Main Site and Western Rail Chord is located in Flood Zone 1, which is defined as land at a low probability of flooding from rivers. The nearest EA Flood Zone extents are located approximately 500m south east of the Main Site, attributed to the Cockshot Brook, and 350m west of the Western Rail Chord, associated with the Newton Brook.
- 5.3 According to EA LiDAR, the Main Site and Western Rail Chord is raised at least 2m above the Flood Zones associated with the Cockshot Brook and the Newton Brook respectively. In some areas, intervening topography would prevent flows from reaching the Main Site.
- 5.4 The latest EA Flood Map for Planning includes defended and undefended climate change extents. These include the following scenarios:
  - 0.1% AEP (1 in 1000) Rivers/Sea
  - 1% AEP (1 in 100) Rivers/0.5% AEP (1 in 200) Sea
- 5.5 The climate change scenarios use the 'Central' allowance for the '2080s' epoch for flooding from rivers and the 'Upper End' allowance for flooding from the sea, accounting for cumulative sea level rise to 2125. The mapping does not account for any potential future changes to defence design or operation. This is considered to be the most precautionary data on rivers and sea currently published by the EA and is included in **Figure 5.1**.
- 5.6 The mapping shows the Main Site and Western Rail Chord to be located outside of the 1 in 1000-year defended and undefended climate change extents. Therefore, fluvial flood risk from Main Rivers to the site is not expected to pose a risk now or in the future.
- 5.7 As the flood mechanisms for the catchments of the minor watercourses/ditches within and adjacent to the site are considered to be largely influenced by surface water mechanisms, the flood risk associated with these features is discussed further in **Section** 6.



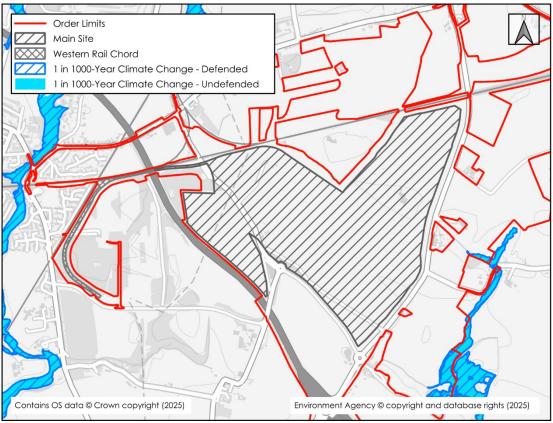


Figure 5.1: 1 in 1000-Year Climate Change Extents (Defended and Undefended)

#### **Flood Mitigation**

- 5.8 The Main Site and Western Rail Chord are located outside of the floodplain associated with Main Rivers. Therefore, no specific flood management or mitigation measures are required in relation to this source of flooding.
- 5.9 Please see **Section 6** for the measures required to manage flood risk from the ditches.

#### Flood Risk

5.10 The development is identified to be located outside of the floodplain of Main Rivers; therefore, it can be concluded that the development is not at flood risk from Main Rivers.

#### Residual Flood Risk & Management

5.11 The available data suggests that the access/egress routes from Parkside Road and Parkside Link Road East, are also identified by the EA mapping to be outside of the river floodplain. Therefore, there are no residual main river flood risks that need to be managed.



#### 6. SURFACE WATER (PLUVIAL) & MINOR WATERCOURSES

#### **Probability of Flooding**

- 6.1 Surface water flooding can occur during prolonged or intense storm events when the infiltration potential of soils, and/or the capacity of drainage infrastructure is overwhelmed leading to the accumulation of surface water and the generation of overland flow routes.
- 6.2 RoFSW mapping has been collated and published by the EA, as shown in **Figure 6.1**; this shows the potential probability of flooding which could 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.

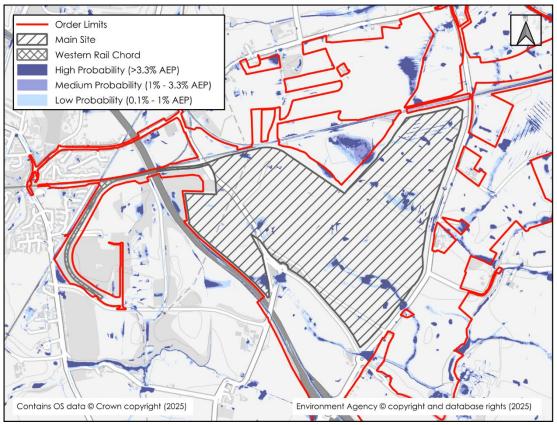


Figure 6.1: EA Risk of Flooding from Surface Water (Yearly Chance of Flooding Between 2040 and 2060)

- 6.3 Three pluvial flow routes, which generally flow in a south easterly direction, are shown within the centre and to the south west of the Main Site. Areas shown to be at a potential risk of surface water flooding generally correlate with the location of existing surface water bodies and topographical low points. The flow routes appear to originate within the site.
- 6.4 As indicated within the EA's RoFSW mapping, the primary source of flood risk to the site is expected to be from surface water runoff and its interaction with the topography/ditches within the vicinity of the site.



#### Site Specific Hydraulic Assessment (Baseline)

- 6.5 To assess the potential surface water flood risk to the site, a bespoke 1D/2D hydraulic modelling exercise has been undertaken.
- 6.6 The bespoke 1D/2D direct rainfall model of the local catchment was prepared by BWB Consulting in January 2025 to identify the flood risk to the site. The details on the hydraulic modelling exercise are included within the Hydraulic Model Report included as **Appendix 3** (reference: 233398-BWB-ZZ-XX-T-W-0001).
- 6.7 The baseline modelled floodplain extents are shown in **Figure 6.1** and the key flood mechanisms are summarised below:
  - i. During all modelled events, flows pool on the southern side of the Parkside Link Road roundabout within an existing topographical low point. Flows are also routed in a southerly direction towards Winwick Lane following valley topography.
  - ii. An overland flow route is formed within the centre of the site during all modelled events. The flow route follows local topography and flows in a south westerly direction towards Winwick Lane and then the Cockshot Brook.
  - iii. Surface water ponding, associated with an existing pond, is shown to be present during all modelled events. In events equivalent to and greater than, the 1 in 100-year + 45%CC event, flows are shown to be routed towards Winwick Lane where flows pool in all modelled events on the northern side of the road.
  - iv. An overland flow route is formed within the north of the site during all modelled flood events. The flow route follows local topography and flows in a south westerly direction to the Highfield Moss SSSI.
  - v. Surface water ponding is shown to be present within the north of the site during all modelled events. The ponding is associated with an existing topographical depression adjacent to, and within, Highfield Moss SSSI.
- 6.8 The flow routes within the Main Site are shown to originate within the Order Limits.
- 6.9 The modelled flood hazard for the 1 in 1000-year event is provided in **Figure 6.2**. This identified that the peak flood hazard within the site is generally low. There are some isolated areas shown to be at a Moderate to Significant hazard, however, these are associated with topographical depressions along the flow routes where water ponds.



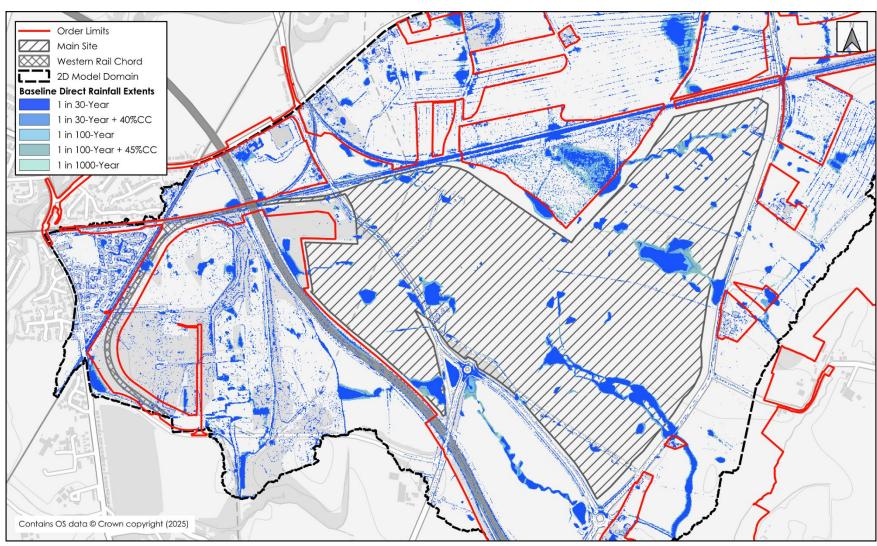


Figure 6.1: Baseline Direct Rainfall Modelling Results



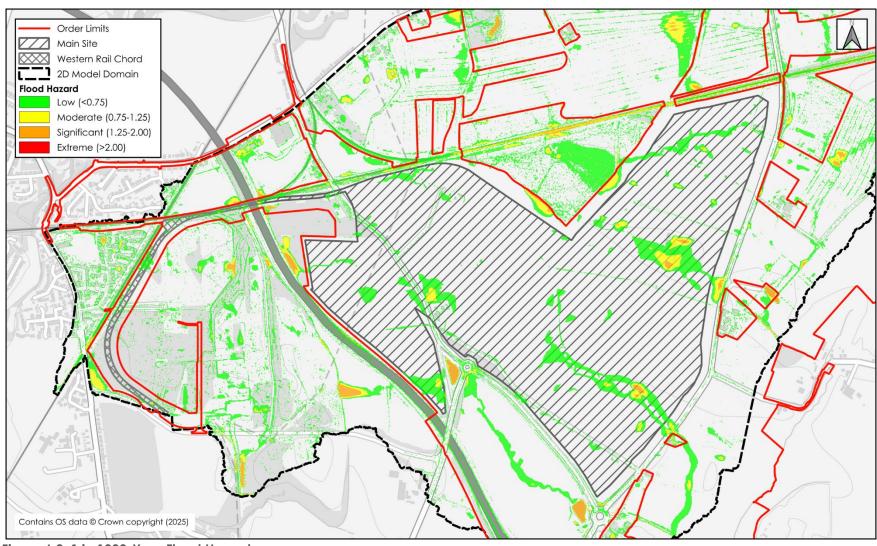


Figure 6.2: 1 in 1000-Year Flood Hazard



- 6.10 Therefore, while areas of the site currently have a high probability of flooding the potential consequence of flooding is low. Nevertheless, the development includes measures to reduce the probability and consequence of flooding to the proposed built development and access locations.
- 6.11 As shown in **Figure 2.2**, a culverted watercourse is understood to be located within the site which flows from the SSSI towards Winwick Lane. The modelling, discussed above, does not represent the culverted watercourse and instead largely represents the flooding mechanisms of surface water flowing overland and being routed through surface features such as topography and ditches. Further development of the model is likely to show a reduction in flood extents attributable to the Main Site in and around Highfield Moss SSSI and as such the current results are considered to be conservative.

#### Culverted Watercourse

- 6.12 Information on a culvert crossing the Main Site, including a summary of the investigation works and drawings is included in the Sustainable Drainage Statement (ref BWB-EWE-ZZ-RP-CD-0520), provided as Appendix 14.2 of the PEIR. A brief description follows;
- 6.13 A culvert flows from the headwall identified on the boundary of the SSSI towards a pond located within the Main Site via a 402m long 525mm diameter culvert. From the surveys that were undertaken, the culvert appears to be in good condition, with no structural or service items recorded.
- 6.14 From the pond it then flows towards the outfall to a tributary of Cockshot Brook via a 387m long 750mm diameter culvert. This culvert has two manholes identified, at approximately half distance and three-quarter distance. From the surveys that were undertaken, the culvert appears to be in reasonable condition, with three grade 3 Service items and two Grade 4 Structural items recorded. A plan was prepared by the surveying company to remediate the issues identified.
- 6.15 Downstream of the Main Site culvert, the drainage survey identifies a 300m length of open watercourse, prior to a 29m long 600mm diameter culvert which ultimately outfalls to Cockshot Brook. A plan was prepared by the surveying company to remediate the issues identified.

#### Flood Risk Mitigation

- 6.16 It is recommended finished floor levels are raised a minimum of 150mm above immediate surrounding ground levels to help mitigate the residual risk of flooding from localised surface water runoff within the development. To facilitate development, ground levels in the Main Site are to be reprofiled to form a series of plateaus. Changes in levels are expected to provide resilience to the risk of flooding from surface water.
- 6.17 Following further investigation of the culverted watercourse, there may be a requirement to raise finished floor levels greater than 150mm. This will be reviewed as any additional assessment progresses.



- 6.18 Additionally, buildings should not be sited in topographical low points. Ground levels should be profiled to encourage runoff and overland flows away from the built development and towards the nearest drainage point.
- 6.19 The existing surface water flow routes appear to be generated within the site and it is anticipated that the flow routes will be addressed through developing the site and intercepting, storing and redirecting water within the proposed drainage strategy.
- 6.20 The proposed development will introduce new impermeable surfaces to the site that will increase the surface water runoff generated. To manage this within the site, surface water drainage infrastructure will be included that will intercept, store and slowly release storm water falling on the built development. This will not only manage the surface water flood risk to the proposed development, but it will also prevent the development from adversely affecting downstream flood risk.

#### Proposed Drainage Strategy

- 6.21 A catchment analysis has been undertaken and is shown in **Figure 2.4**. As part of the catchment analysis, four positive outfalls were identified. Following a review of the outfalls, it is proposed to drain the Main Site to the two main outfalls identified on Winwick Lane which ultimately outfall to the Cockshot Brook. The two further positive outfalls which were identified from the site on the M6, have been discounted as they were not considered to be appropriate.
- 6.22 The discharge rate for each plot has been calculated and pro-rated based on its area. The attenuation requirement for each plot has been calculated on its discharge rate and contributing area (assumed to be 90% of plot area) for the 1 in 100-year + 45% climate change event. The existing drainage strategy is assumed to be conservative as the runoff rate from the site is limited by the capacity of the existing outfalls on Winwick Lane.
- 6.23 Attenuation volumes for the Intermodal Terminal Railport are provided in the sitewide pond, as it is expected to be unfeasible to employ tanks under the slab.

Further information on the drainage strategy is included in the Sustainable Drainage Statement (ref BWB-EWE-ZZ-RP-CD-0520), provided as Appendix 14.2 of the PEIR Flood Risk

6.24 While parts of the site are at a high probability of surface water flooding, the surface water flood risk to the development is considered to be low as post development the topography of the Main Site will change substantially. Therefore the current risk generated from within the Main Site will be mitigated through the site drainage and ground levels formed to direct flows appropriately.

#### Residual Flood Risk & Management

6.25 The wider road network is largely shown to be at a low hazard in the 1 in 1000-year event. Therefore, safe access and egress is expected to be achievable.



- 6.26 The proposed development should be designed with exceedance in mind, and the road network and landscaped areas should be used to convey overland flows above the capacity of the drainage networks towards the SuDS features.
- 6.27 It is recommended that proposed external ground levels are graded, where possible, such that finished floor levels are raised above the general surrounding ground levels, to help direct any overland flows and surface water runoff away from the buildings and towards the nearest drainage point.
- 6.28 In line with riparian responsibilities, it is recommended that the ditch network within the ownership of the site, as well as the associated culvert and hydraulic structures, are regularly inspected, desilted and maintained where necessary to ensure these remain in good operational condition and capable of conveying flows. This should be done in accordance with the latest LLFA and EA riparian guidance and best practice.



#### 7. SEWERS & DRAINAGE SYSTEMS

7.1 Flooding from sewers and drainage systems can occur when the capacity of the infrastructure is exceeded by excessive flows, due to a reduction in capacity because of collapse or blockage, or if the downstream system becomes surcharged. This can lead to flooding from infrastructure onto the surrounding ground via manholes and gullies, which can generate overland flows.

#### **Probability of Flooding**

- 7.2 The local sewerage undertaker is United Utilities. Their mapping has been reviewed and confirms there are no public foul or surface water assets within the Main Site or Western Rail Chord.
- 7.3 There is highway drainage and other drainage infrastructure located within and around the Main Site. Where relevant, this has been captured within the hydraulic modelling and is therefore discussed in **Section 6**.

#### Flood Risk Mitigation

- 7.4 The flood risk management measures previously described to address the surface water flood risk, in **Section 6**, are also applicable to address the flood risk from sewers and drainage systems. This includes the construction of new SuDS as part of the development proposals.
- 7.5 It is proposed to drain foul water from the proposed development separately to surface water.

#### Flood Risk

7.6 Overall, the Main Site and Western Rail Chord is considered to be at a low risk of flooding from sewers and drainage.

#### **Residual Flood Risk**

- 7.7 The residual surface water flood risks, and the recommended measures to help manage these risks, as described in **Section 6**, are also applicable to help address the residual flood risk from sewers and drainage systems. This includes the recommended measures to manage exceedance storm events in the drainage system of the proposed development.
- 7.8 Additionally, it is recommended that an operation and maintenance plan is established prior to occupation to ensure that the drainage systems within the proposed development are inspected and maintained for their lifetime.



#### 8. GROUNDWATER

8.1 Groundwater flooding occurs when the water table rises above ground elevations, or when it rises to depths containing basement level development. It is most likely to happen in low lying areas underlain by permeable geology. This is most common on regional scale chalk aquifers, but there may also be a risk on sandstone and limestone aquifers or on thick deposits of sands and gravels underlain by less permeable strata such as that in a river valley. The presence of springs and/or winterbourne streams near a site are a good indicator that groundwater flooding may be an issue in the area.

#### **Probability of Flooding**

- 8.2 BGS mapping shows the majority of the Main Site to be underlain by Chester Formation (Sandstone) with the west of the Main Site shown to be underlain by Kinnerton Sandstone Formation (Sandstone). The Western Rail Chord is shown to be underlain by Manchester Marls Formation (Mudstone), Collyhurst Sandstone Formation (Sandstone) and Chester Formation (Sandstone).
- 8.3 The Chester Formation is classed as a Principal Aquifer, with The Manchester Marls Formation being classed as a Secondary A Aquifer and the Kinnerton Sandstone Formation being classed as a Secondary B Aquifer.
- 8.4 Superficial deposits of Till, Devensian (Diamicton), Glaciofluvial Ice Contact Deposits, Devensian (Sand and Gravel) and Lacustrine Deposits (Clay and Silt) are expected to be present within the Main Site and Western Rail Chord.
- 8.5 The EA primarily classifies the Devensian Till as a Secondary Undifferentiated Aquifer; Glaciofluvial Ice Contact deposits are classified as a Secondary A Aquifer; and Lacustrine deposits as unproductive strata.
- 8.6 The Areas Susceptible to Groundwater Flooding Mapping, included in the St Helens SFRA indicates the Main Site and Western Rail Chord is generally within a 1km² cell where <25% is at risk of groundwater emergence. The Liverpool City Region Combined SFRA generally indicates that within the Main Site, groundwater levels are between 0.025m and 0.5m below the ground surface in the 100-year return period flood event. Within this zone there is a risk of groundwater flooding to surface and subsurface assets with the possibility of groundwater emerging at the surface locally.
- 8.7 It is noted within the Greater Manchester Level 1 SFRA Update that detailed groundwater information has not been made available for the SFRA but groundwater information will be localised and may differ significantly across Greater Manchester.
- 8.8 A Phase 2 Geo-Environmental and Geotechnical Assessment (ILP-BWB-EGT-XX-RP-LE-0002\_Ph2) is available as Appendix 15.2 to the PEIR. It details extensive groundwater monitoring and concludes that the risk is low.



#### Flood Risk Mitigation

8.10 The flood risk management measures previously described to address the surface water flood risk, in **Section 6**, are also applicable to address the flood risk from groundwater. In particular, measures to manage residual flood risk, such as locating built development outside of topographical low points and profiling ground levels to encourage overland flows away from the built development and towards the nearest drainage point, are applicable. Therefore, no specific flood management or mitigation measures are required in relation to this source of flood risk.

#### Flood Risk

8.11 Based on the available data, the probability of groundwater flooding is considered to be medium. However, following mitigation, the consequence of groundwater flooding in the site is low; therefore the risk of flooding from this source is low.

#### Residual Flood Risk & Management

- 8.12 Although the site is considered to be at low risk of groundwater flooding, there is potential for shallow groundwater to be encountered within the site. It is therefore recommended that groundwater levels are monitored during the construction phase and that the potential to encounter shallow groundwater levels should be considered during any excavations, as well as within the design of the earthworks, foundations and below ground infrastructure.
- 8.13 Should shallow groundwater be encountered, a groundwater specialist should be consulted and appropriate dewatering techniques should be employed as necessary.



#### 9. OTHER SOURCES OF FLOOD RISK

#### Canals

9.1 The Leigh Branch (Leeds & Liverpool) Canal is located approximately 2.4km north of the Order Limits. The data available identifies no flood risk to the site from this source. Therefore, this source has not been considered in any further detail.

#### **Reservoirs & Large Waterbodies**

- 9.2 Flooding can occur from large waterbodies or reservoirs is they are impounded above the surrounding ground levels or are used to retain water in times of flood. Although unlikely, reservoirs and large waterbodies could overtop or breach leading to rapid inundation of the downstream floodplain.
- 9.3 To help identify this risk, reservoir failure flood risk mapping has been prepared by the EA; this shows the largest area that might be flooded if a reservoir were to fail and release the water it holds. The map displays a worst-case scenario and is only intended as a guide. An extract of the mapping is included as **Figure 9.1**.

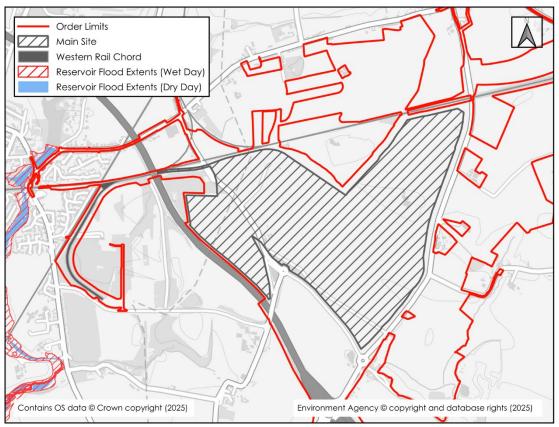


Figure 9.1: EA Reservoir Failure Flood Extents

9.4 There are two flooding scenarios shown on the reservoir flood maps: a 'dry-day' and a 'wet-day'. The 'dry-day' scenario predicts the flooding that would occur if the dam or reservoir failed when rivers are at normal levels. The 'wet-day' scenario predicts how much worse the flooding might be if a river is already experiencing an extreme flood.



- 9.5 The Main Site and Western Rail Chord are shown to be located outside of the flood extents associated with any reservoir failure. The nearest reservoir failure flood extents are located to the west of the Western Rail Chord and are located within the Order Limits and are associated with Willow Park Lake.
- 9.6 The reservoirs within the vicinity of the Order Limits are operated and maintained by the Reservoir Undertaker who have ultimate responsibility for the safety of their reservoir assets. Their responsibilities include regular safety inspections, any necessary design or repairs undertaken where required and an annual statement produced on the operation and maintenance regime.
- 9.7 Based on the safety legislation in place and the maintenance and repair responsibilities of the Reservoir Undertaker, the actual probability of a significant failure is considered to be low. Therefore, the risk of flooding at the site from this source is also considered to be low and has not been considered in any further detail.



#### 10. CONCLUSIONS AND RECOMMENDATIONS

10.1 This report demonstrates that the proposed development is at an acceptable level of flood risk. In compliance with the requirements of the, NPSNN, NPPF and the PPG, and subject to the mitigation measures proposed, the development could proceed without being subject to significant flood risk. Moreover, the development will not increase flood risk to the wider area subject to suitable management of surface water runoff discharging from the site. A summary of the FRA is presented within **Table 10.1**.

Table 10.1: Flood Risk Assessment Summary

Flood Source	Probability	Consequence	Mitigation Measures	Risk	Management of Residual Risk
The Sea	None	None	-	None	-
Main Rivers	None	None	-	None	-
Surface Water & Minor Watercourses	High	Low Flooding is generally of a low hazard	<ul> <li>It is recommended finished floor levels are raised a minimum of 150mm above immediate surrounding ground levels to help mitigate the residual risk of flooding from localised surface water runoff within the development. To facilitate development, ground levels in the Main Site are to be reprofiled to form a series of plateaus. Changes in levels are expected to provide resilience to the risk of flooding from surface water.</li> <li>Following further investigation of the culverted watercourse, there may be a requirement to raise finished floor levels greater than 150mm, this will be reviewed as any additional assessment progresses.</li> <li>Additionally, buildings should not be sited in topographical low points. Ground levels should be profiled to encourage runoff and overland flows away from the built development and towards the nearest drainage point.</li> <li>The existing surface water flow routes appear to be generated within the site and it is anticipated that the flow routes will be addressed through developing the site and intercepting, storing and redirecting water within the proposed drainage strategy.</li> <li>The proposed development will introduce new impermeable surfaces to the site that will increase the surface water runoff generated. To manage this within the site, surface water drainage infrastructure will be included that will intercept, store and slowly release storm water falling on the built development.</li> </ul>	Low	<ul> <li>The proposed development should be designed with exceedance in mind, and the road network and landscaped areas should be used to convey overland flows above the capacity of the drainage networks towards the SuDS features.</li> <li>It is recommended that proposed external ground levels are graded, where possible, such that finished floor levels are raised above the general surrounding ground levels, to help direct any overland flows and surface water runoff away from the buildings and towards the nearest drainage point.</li> <li>In line with riparian responsibilities, it is recommended that the ditch network within the ownership of the site, as well as the associated hydraulic structures, are regularly inspected, desilted and maintained where necessary to ensure these remain in good operational condition and capable of conveying flows. This should be done in accordance with the latest LLFA and EA riparian guidance and best practice.</li> </ul>
Sewers & Drainage Infrastructure	Low	Low	<ul> <li>The flood risk management measures to address the surface water flood risk are also applicable to address the flood risk from sewers and drainage systems.</li> <li>It is proposed to drain foul water from the development separately to surface water. The developer will work with the local sewer operator to ensure that any necessary reinforcement works to the downstream network have been made prior to occupation.</li> </ul>	Low	<ul> <li>The recommended measures to help manage the residual risks from surface water are also applicable.</li> <li>Additionally, it is recommended that an operation and maintenance plan is established to ensure that the drainage systems of the proposed development are inspected and maintained for their lifetime.</li> </ul>



Flood Source	Probability	Consequence	Mitigation Measures	Risk	Management of Residual Risk
Groundwater	Medium	Low	The recommended measures to help manage flood risk from surface water are also applicable to address the flood risk from groundwater.	Low	<ul> <li>The recommended measures to help manage the residual risks from surface water are also applicable.</li> <li>Groundwater levels should be monitored during the construction phase and appropriate dewatering implemented where necessary.</li> <li>The potential to encounter shallow groundwater levels should be considered during any excavations, as well as within the design of the earthworks, foundations and below ground infrastructure.</li> </ul>
Canals	None	None	-	None	-
Reservoirs and waterbodies	Low	Medium	-	Low	<ul> <li>The reservoirs within the vicinity of the Order Limits are operated and maintained by the Reservoir Undertaker who have ultimate responsibility for the safety of their reservoir assets. Their responsibilities include regular safety inspections, any necessary design or repairs undertaken where required and an annual statement produced on the operation and maintenance regime.</li> <li>Based on the safety legislation in place and the maintenance and repair responsibilities of the Reservoir Undertaker, the actual probability of a significant failure is considered to be low.</li> </ul>

Intermodal Logistics Park North Rail Freight Interchange, Newton-le-Willows Flood Risk Assessment July 2025 ILPN-BWB-ZZ-XX-T-W-0002\_FRA

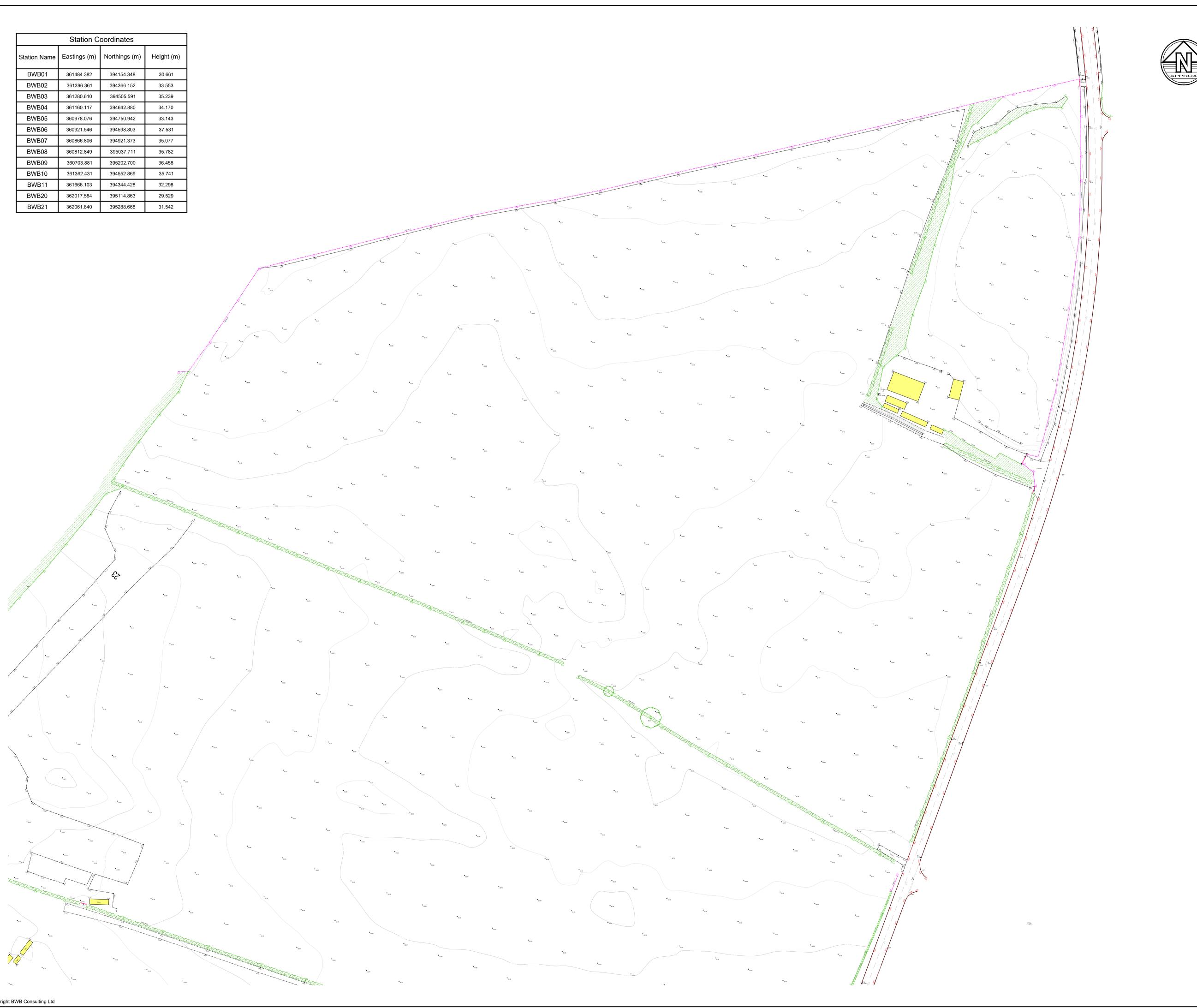


### **APPENDICES**

Intermodal Logistics Park North Rail Freight Interchange, Newton-le-Willows Flood Risk Assessment July 2025 ILPN-BWB-ZZ-XX-T-W-0002\_FRA

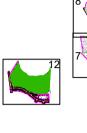


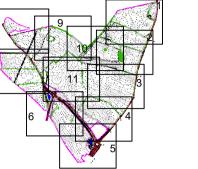
Appendix 1: Topographical Survey



- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects,
- engineers and specialists drawings and specifications. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer
  - No scale factor has been applied to this survey, therefore the os
  - coordinates are to be treated as arbitrary. Please refer to survey station information below for on site control establishment.
  - All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via OS smart net.
  - All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
  - 8. OS license number: 100022432

### Key Plan



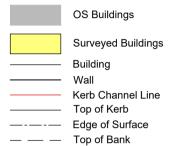


### Legend

C Crest

DC Drainage

Channel



---- Bottom of Bank

Line Marking

Centre Line

Inspection Chamber Flow direction and pipe diameter Station and Name Monitoring Borehole Tree / Bush / Sapling ---- Canopy / Overhang

Extent of Tree Canopy Body of Water Body of Water from OS <sup>+</sup>50.00 Spot Level

Contour Lines

Centre Line ——— Barrier Fence Gate Gate ─── Overhead Powerline ── Overhead Utilities

— — — Assumed Surface Water Drainage Line Surface Water Drainage

Call Box

AP Anchor Point FBW Fence Barbed Wire LB Litter Bin FCB Fence Closed Board LP Lamp Post BG Back Gully BO Bollard FCL Fence Chain Link MH Manhole BS Bus Stop FEL Fence Electric Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve CTV Cable TV FFL Finished Floor Level TCB Telephone

FP Flagpole THL Threshold Level

P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision Issues & Revisions



☐ Nottingham | 0115 924 1100 www.bwbconsulting.com

### Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

### **Existing Site Plan** Sheet 1 of 12

Drawn:	D.Smith		Reviewed:	S.Shreeves	
BWB Ref:	233398	Date:	02.08.24	Scale@A1:	1:1000

### Drawing Status Information

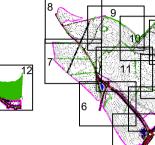
Project - Originator - Zone - Level - Type - Role - Number

233398-BWB-00-01-DR-G-0001



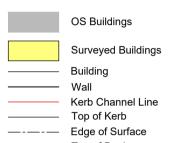
- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer
  - No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
  - station information below for on site control establishment. All coordinates and height data relate to OSGB36(15). Control stations
  - are coordinated by means of GPS receiving real time corrections via OS smart net.
  - All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
  - 8. OS license number: 100022432







### Legend



— — Top of Bank ---- Bottom of Bank ---- Canopy / Overhang — Line Marking Centre Line

<sup>+</sup>50.00 Spot Level — — — Assumed Surface

Centre Line ——— Barrier Fence Gate ──^
Overhead Powerline ── → Overhead Utilities

Water Drainage Line Surface Water Drainage AP Anchor Point FBW Fence Barbed Wire LB Litter Bin BG Back Gully FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole FEL Fence Electric Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post

Contour Lines Inspection Chamber Flow direction and pipe diameter

Station and Name

Monitoring Borehole

Tree / Bush / Sapling

Extent of Tree Canopy

Body of Water from OS

Call Box

Body of Water

FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve FFL Finished Floor Level TCB Telephone FP Flagpole

THL Threshold Level TP Telegraph Post
TS Traffic Signal

P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision Issues & Revisions

BO Bollard BS Bus Stop

C Crest

CTV Cable TV

Channel

DC Drainage



www.bwbconsulting.com

### Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

### **Existing Site Plan** Sheet 2 of 12

Drawn:	D.Smith		Reviewed:	S.Shreeves	
BWB Ref:	233398	Date:	02.08.24	Scale@A1:	1:1000

# Information

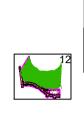
Project - Originator - Zone - Level - Type - Role - Number

233398-BWB-00-02-DR-G-0001 | S2 | P2



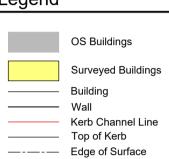
- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer
  - No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
  - station information below for on site control establishment. All coordinates and height data relate to OSGB36(15). Control stations
  - are coordinated by means of GPS receiving real time corrections via OS smart net.
  - All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
  - 8. OS license number: 100022432

### Key Plan





### Legend



Flow direction and pipe diameter Station and Name Monitoring Borehole Tree / Bush / Sapling Extent of Tree Canopy Body of Water

— — Top of Bank --- Bottom of Bank ---- Canopy / Overhang Line Marking Centre Line Watercourse Centre Line ——— Barrier Fence Gate

── → Overhead Utilities

BG Back Gully

BO Bollard BS Bus Stop

C Crest

CTV Cable TV

Channel

DC Drainage

<sup>+</sup>50.00 Spot Level ──^
Overhead Powerline

— — — Assumed Surface Water Drainage Line Surface Water Drainage Mkr Service Marker

Call Box

Body of Water from OS

Contour Lines Inspection Chamber

AP Anchor Point FBW Fence Barbed Wire LB Litter Bin FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole FEL Fence Electric BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve FFL Finished Floor Level TCB Telephone

FP Flagpole

THL Threshold Level

P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision

# Issues & Revisions



www.bwbconsulting.com

### Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

394366.152

394642.880

394598.803

395037.711 395202.700

394552.869 394344.428 395114.863

### **Existing Site Plan** Sheet 3 of 12

Drawn:	D.Smith		Reviewed:	S.Shreeves				
BWB Ref:	233398	Date:	02.08.24	Scale@A1:	1:1000			
Drawing Status								

### Information

Project - Originator - Zone - Level - Type - Role - Number

233398-BWB-00-03-DR-G-0001



- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer
    - No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
    - station information below for on site control establishment. All coordinates and height data relate to OSGB36(15). Control stations
  - are coordinated by means of GPS receiving real time corrections via OS smart net.
  - All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
  - 8. OS license number: 100022432





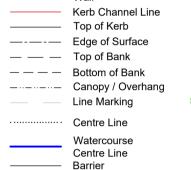
### Legend OS Buildings ----- Wall Kerb Channel Line — Top of Kerb —-—- Edge of Surface — — Top of Bank

Fence

Gate Gate

CTV Cable TV DC Drainage

Channel





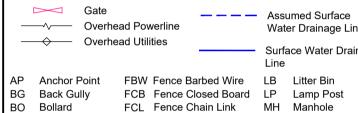
Contour Lines Inspection Chamber Flow direction and pipe diameter

Station and Name

Monitoring Borehole

Water Drainage Line

Surface Water Drainage



				Line	
AP	Anchor Point	FBW	Fence Barbed Wire	LB	Litter Bin
BG	Back Gully	FCB	Fence Closed Board	LP	Lamp Post
во	Bollard	FCL	Fence Chain Link	MH	Manhole
BS	Bus Stop	FEL	Fence Electric	Mkr	Service Marker
вт	British Telecom	FMP	Fence Metal Panel	PB	Post Box
С	Crest	<b>FMR</b>	Fence Metal Railing	PT	Post
CL	Cover Level	FOB	Fence Open Board	RE	Rodding Eye
CMP	Cable Marker	FPW	Fence Post & Wire	SP	Sign Post
	Post	FSP	Fence Steel Palisade	ST	Stop Tap
CCTV	/Security Camera	FWM	Fence Wire Mesh	SV	Stop Valve
CTV	Cable TV	FFL	Finished Floor Level	TCB	Telephone
			Et a constant		O-II D-II

THL Threshold Level DK Drop Kerb GV Gas Valve TL Traffic Light
DP Down Pipe GY Gully TP Telegraph Post
Elec Electric Ht Height TS Traffic Signal
EP Electricity Post IC Inspection Chamber UTS Unable to Survey

P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision

Issues & Revisions



www.bwbconsulting.com

# Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

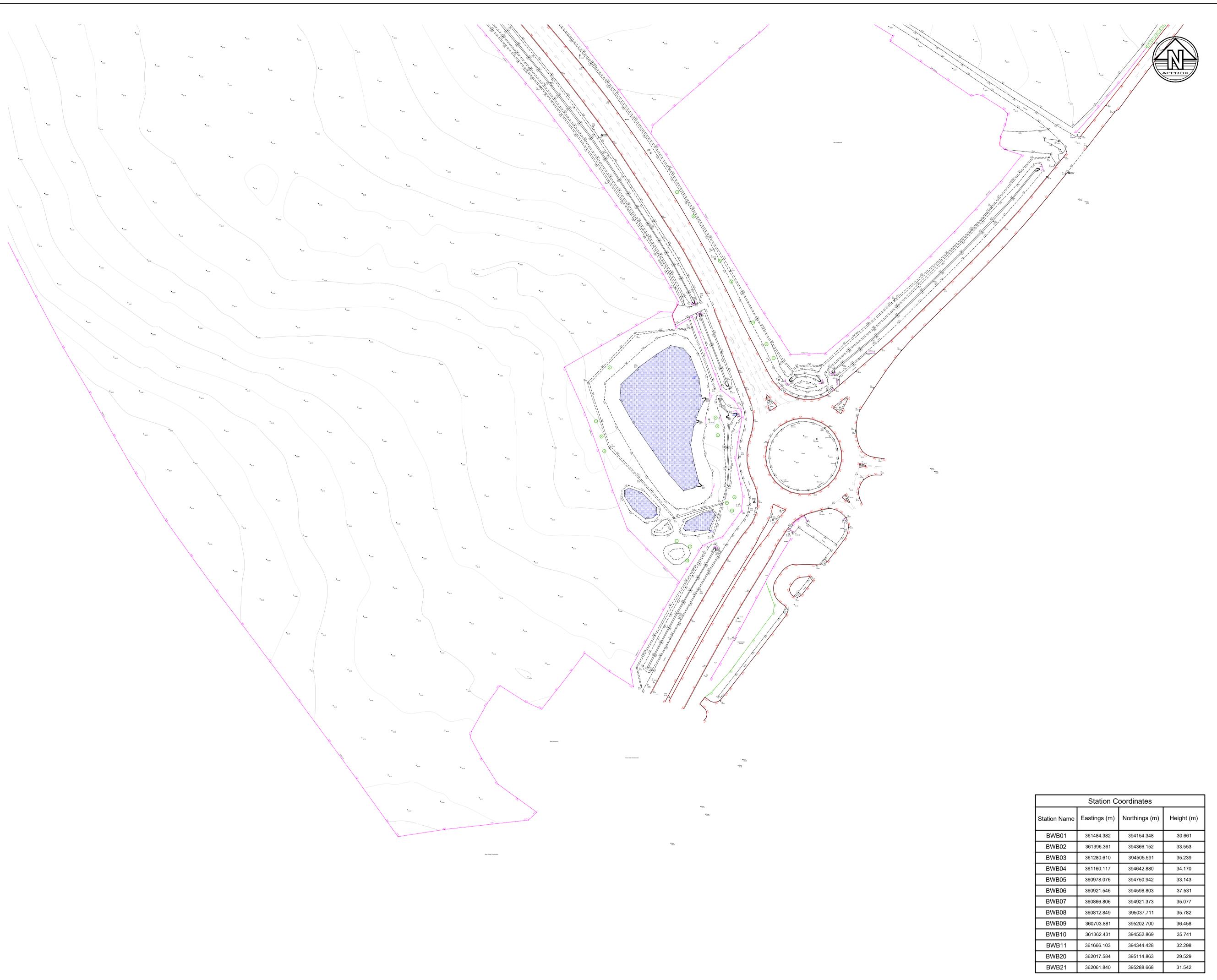
# Existing Site Plan Sheet 4 of 12

Drawn:	D.Smith		Reviewed:	S.Shreeves			
BWB Ref:	233398 Date:		02.08.24	Scale@A1:	1:1000		

# Information

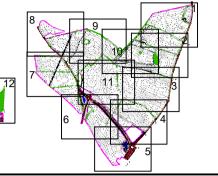
Project - Originator - Zone - Level - Type - Role - Number

233398-BWB-00-04-DR-G-0001 S2 P2

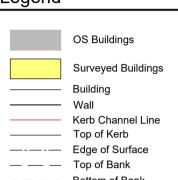


- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer
    - No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
    - station information below for on site control establishment. All coordinates and height data relate to OSGB36(15). Control stations
  - are coordinated by means of GPS receiving real time corrections via OS smart net.
  - All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
  - 8. OS license number: 100022432





### Legend



--- Bottom of Bank ---- Canopy / Overhang Line Marking Centre Line

———— Barrier

Gate

BG Back Gully BO Bollard

BS Bus Stop

CTV Cable TV

Channel

DC Drainage

C Crest

Fence

── Overhead Utilities

Extent of Tree Canopy Body of Water <sup>+</sup>50.00 Spot Level

— — — Assumed Surface Water Drainage Line Surface Water Drainage AP Anchor Point FBW Fence Barbed Wire LB Litter Bin FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box

Call Box

Contour Lines Inspection Chamber Flow direction and pipe diameter

Station and Name

Monitoring Borehole

Tree / Bush / Sapling

FEL Fence Electric FMR Fence Metal Railing PT Post CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve

FFL Finished Floor Level TCB Telephone THL Threshold Level

DK Drop Kerb GV Gas Valve TL Traffic Light
DP Down Pipe GY Gully TP Telegraph Post
Elec Electric Ht Height TS Traffic Signal
EP Electricity Post IC Inspection Chamber UTS Unable to Survey ER Earth Rod IFL Internal Floor Level WL Water Level
FH Fire Hydrant IL Invert Level WM Water Meter
FL Floodlight (as a reduced level) WO Wash Out

P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision Issues & Revisions

www.bwbconsulting.com

Birmingham | 0121 233 3322

### Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

### **Existing Site Plan** Sheet 5 of 12

Drawn:	D.Smith		Reviewed:	S.Shreeves				
BWB Ref:	233398	Date:	02.08.24	Scale@A1:	1:1000			
Describes Obstace								

## Information

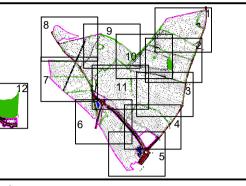
Project - Originator - Zone - Level - Type - Role - Number

233398-BWB-00-05-DR-G-0001

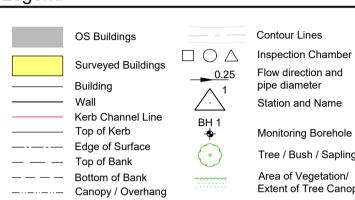


- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
- Any discrepancies noted on site are to be reported to the engineer
  - No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
  - station information below for on site control establishment. All coordinates and height data relate to OSGB36(15). Control stations
- are coordinated by means of GPS receiving real time corrections via OS smart net.
- may occur. More accurate data is only achievable via confined space
- 8. OS license number: 100022432





### Legend



Fence

Line Marking Centre Line

Extent of Tree Canopy Body of Water Body of Water from OS <sup>+</sup>50.00 Spot Level

— — — Assumed Surface Water Drainage Line Surface Water Drainage

Contour Lines

Flow direction and pipe diameter Station and Name

Monitoring Borehole

Tree / Bush / Sapling

Call Box THL Threshold Level

AP Anchor Point FBW Fence Barbed Wire LB Litter Bin FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole FEL Fence Electric Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve FFL Finished Floor Level TCB Telephone

DK Drop Kerb GV Gas Valve TL Traffic Light
DP Down Pipe GY Gully TP Telegraph Post
Elec Electric Ht Height TS Traffic Signal
EP Electricity Post IC Inspection Chamber UTS Unable to Survey

EP Electricity 1 co.

ER Earth Rod IFL Internal Floor Level WL water Level
FH Fire Hydrant IL Invert Level WM Water Meter
(as a reduced level) WO Wash Out P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision

Issues & Revisions



Birmingham | 0121 233 3322 www.bwbconsulting.com

### Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

### **Existing Site Plan** Sheet 6 of 12

Drawn:	D.Smith		Reviewed:	S.Shreeves	
BWB Ref:	233398	Date:	02.08.24	Scale@A1:	1:1000

## Information

Project - Originator - Zone - Level - Type - Role - Number



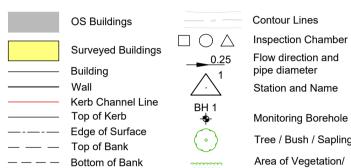
- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- . This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer
  - No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
  - station information below for on site control establishment.
  - All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via OS smart net.
  - All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
  - 8. OS license number: 100022432

### Key Plan





### Legend



Line Marking

———— Barrier

Gate Gate

Crest

Channel

Centre Line Watercourse

Centre Line

Fence

── Overhead Utilities

---- Canopy / Overhang Body of Water Body of Water from OS

───

Overhead Powerline

<sup>+</sup>50.00 Spot Level — — — Assumed Surface Water Drainage Line

 Surface Water Drainage AP Anchor Point FBW Fence Barbed Wire LB Litter Bin FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole FEL Fence Electric Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post

Contour Lines

Flow direction and pipe diameter

Station and Name

Monitoring Borehole

Tree / Bush / Sapling

Area of Vegetation/

Extent of Tree Canopy

FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve FFL Finished Floor Level TCB Telephone FP Flagpole Call Box THL Threshold Level TL Traffic Light TP Telegraph Post
TS Traffic Signal

EP Electricity Post IC Inspection Chamber UTS Unable to Survey ER Earth Rod IFL Internal Floor Level
FH Fire Hydrant IL Invert Level Invert Level WM Water Meter (as a reduced level) WO Wash Out

P1 02.08.24 First Issue Rev Date Details of issue / revision Issues & Revisions



www.bwbconsulting.com

### Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

### **Existing Site Plan** Sheet 7 of 12

Drawn:	D.Smith		Reviewed:	S.Shreeves	
BWB Ref:	233398	Date:	02.08.24	Scale@A1:	1:1000

### Drawing Status Information

Project - Originator - Zone - Level - Type - Role - Number

Station Coordinates

Northings (m)

394154.348

394366.152

394505.591

394642.880

394750.942

394598.803

394921.373

395037.711

395202.700

394552.869

394344.428

395114.863

395288.668

Eastings (m)

361484.382

361396.361

361280.610

361160.117

360978.076

360921.546

360866.806

360812.849

360703.881

361362.431

361666.103

362017.584

362061.840

Station Name

BWB04

BWB20

Station Coordinates								
Station Name	Eastings (m)	Northings (m)	Height (m)					
BWB01	361484.382	394154.348	30.661					
BWB02	361396.361	394366.152	33.553					
BWB03	361280.610	394505.591	35.239					
BWB04	361160.117	394642.880	34.170					
BWB05	360978.076	394750.942	33.143					
BWB06	360921.546	394598.803	37.531					
BWB07	360866.806	394921.373	35.077					
BWB08	360812.849	395037.711	35.782					
BWB09	360703.881	395202.700	36.458					
BWB10	361362.431	394552.869	35.741					
BWB11	361666.103	394344.428	32.298					

362061.840

BWB21

29.529



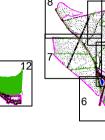
### Notes

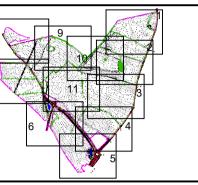
- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects,
- engineers and specialists drawings and specifications. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
- Any discrepancies noted on site are to be reported to the engineer
- No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
- station information below for on site control establishment. All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via
- OS smart net. All manhole data is collected from ground level therefore discrepancies

may occur. More accurate data is only achievable via confined space

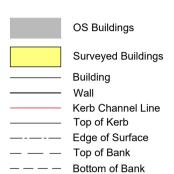
8. OS license number: 100022432

### Key Plan





### Legend



Line Marking

BG Back Gully

Crest

CTV Cable TV

BO Bollard BS Bus Stop

Flow direction and pipe diameter Station and Name Monitoring Borehole Tree / Bush / Sapling ---- Canopy / Overhang

Extent of Tree Canopy Body of Water Body of Water from OS <sup>+</sup>50.00 Spot Level

Contour Lines

Centre Line Barrier Fence Gate — — — Assumed Surface ───

Overhead Powerline ── Overhead Utilities

Water Drainage Line Surface Water Drainage AP Anchor Point FBW Fence Barbed Wire LB Litter Bin FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post

Call Box

FEL Fence Electric CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve FFL Finished Floor Level TCB Telephone FP Flagpole

THL Threshold Level DK Drop Kerb GV Gas Valve TL Traffic Light
DP Down Pipe GY Gully TP Telegraph Post
Elec Electric Ht Height TS Traffic Signal
EP Electricity Post IC Inspection Chamber UTS Unable to Survey

ER Earth Rod IFL Internal Floor Level WL Water Level
FH Fire Hydrant IL Invert Level WM Water Meter
FL Floodlight (as a reduced level) WO Wash Out

 
 P2
 17.10.24
 Langtree (2) Land Added

 P1
 02.08.24
 First Issue
 Rev Date Details of issue / revision Issues & Revisions

☐ Nottingham | 0115 924 1100 www.bwbconsulting.com Tritax Symmetry SRFI North Ltd

## Intermodal Logistics Park North

# Existing Site Plan Sheet 8 of 12

Drawn:	D.Smith		Reviewed:	S.Shreeves	
BWB Ref:	233398	Date:	02.08.24	Scale@A1:	1:1000

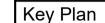
### Drawing Status Information

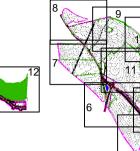
Project - Originator - Zone - Level - Type - Role - Number 233398-BWB-00-08-DR-G-0001 S2 P2

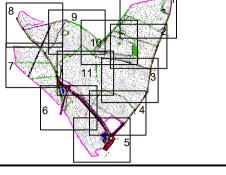


Station Coordinates						
Station Name	Eastings (m)	Northings (m)	Height (m			
BWB01	361484.382	394154.348	30.661			
BWB02	361396.361	394366.152	33.553			
BWB03	361280.610	394505.591	35.239			
BWB04	361160.117	394642.880	34.170			
BWB05	360978.076	394750.942	33.143			
BWB06	360921.546	394598.803	37.531			
BWB07	360866.806	394921.373	35.077			
BWB08	360812.849	395037.711	35.782			
BWB09	360703.881	395202.700	36.458			
BWB10	361362.431	394552.869	35.741			
BWB11	361666.103	394344.428	32.298			
BWB20	362017.584	395114.863	29.529			
BWB21	362061.840	395288.668	31.542			

- Do not scale this drawing. All dimensions must be checked/verified on site. If in doubt ask.
- . This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer
  - No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
  - station information below for on site control establishment.
  - All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via OS smart net.
  - All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
  - 8. OS license number: 100022432







# Legend OS Buildings

---- Canopy / Overhang Line Marking

── Overhead Utilities

BO Bollard

C Crest

DC Drainage

Channel

BS Bus Stop

----- Wall

Contour Lines Flow direction and pipe diameter Station and Name Kerb Channel Line — Top of Kerb —-—- Edge of Surface — — Top of Bank --- Bottom of Bank

Monitoring Borehole Tree / Bush / Sapling Area of Vegetation/ Extent of Tree Canopy Body of Water Body of Water from OS

 Centre Line Centre Line ——— Barrier Fence Gate Gate ──^
Overhead Powerline

<sup>+</sup>50.00 Spot Level — — — Assumed Surface Water Drainage Line Surface Water Drainage

AP Anchor Point FBW Fence Barbed Wire LB Litter Bin BG Back Gully FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole FEL Fence Electric Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve Call Box

CTV Cable TV FFL Finished Floor Level TCB Telephone FP Flagpole THL Threshold Level

DK Drop Kerb GV Gas Valve TL Traffic Light
DP Down Pipe GY Gully TP Telegraph Post
Elec Electric Ht Height TS Traffic Signal
EP Electricity Post IC Inspection Chamber UTS Unable to Survey
ER Earth Rod IFL Internal Floor Level WL Water Level
FH Fire Hydrant IL Invert Level WM Water Meter
FL Floodlight (as a reduced level) WO Wash Out

P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision Issues & Revisions



☐ Nottingham | 0115 924 1100 www.bwbconsulting.com Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

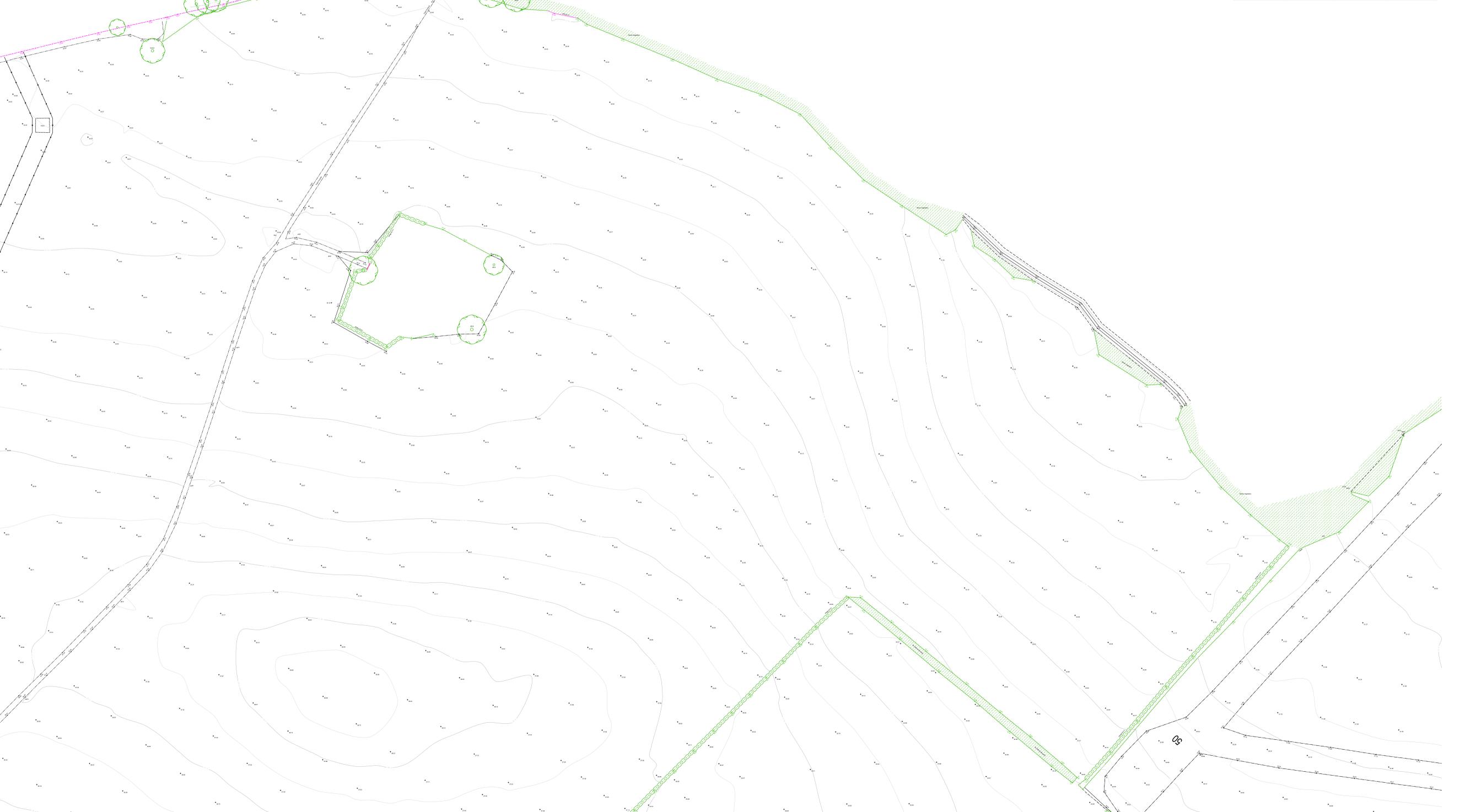
# Existing Site Plan Sheet 9 of 12

Ľ	Drawn:	D.Smith		Reviewed:	wed: S.Shreeves		
	BWB Ref:	233398	Date:	02.08.24	Scale@A1:	1:1000	

# Information

Project - Originator - Zone - Level - Type - Role - Number 233398-BWB-00-09-DR-G-0001 S2 P2

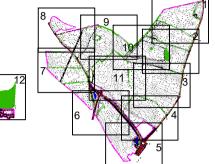
C:\Users\daniel.smith\Desktop\Ongoing Work Dan\233398 - ILP North\233398-BWB-00-ZZ-M2-G-0001-Existing Site 2D Model.dwg



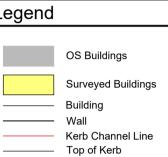


- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects,
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
- Any discrepancies noted on site are to be reported to the engineer
- No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
- station information below for on site control establishment. All coordinates and height data relate to OSGB36(15). Control stations
- are coordinated by means of GPS receiving real time corrections via OS smart net.
- All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
- 8. OS license number: 100022432





### Legend



—-—- Edge of Surface — — Top of Bank --- Bottom of Bank

---- Canopy / Overhang Line Marking Centre Line Barrier Fence

Tree / Bush / Sapling Extent of Tree Canopy Body of Water Body of Water from OS <sup>+</sup>50.00 Spot Level

Contour Lines Inspection Chamber Flow direction and pipe diameter

Station and Name

Monitoring Borehole

Call Box

— — — Assumed Surface ───

Overhead Powerline Water Drainage Line ── Overhead Utilities Surface Water Drainage AP Anchor Point FBW Fence Barbed Wire LB Litter Bin FEL Fence Electric

FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve FFL Finished Floor Level TCB Telephone

FP Flagpole THL Threshold Level DK Drop Kerb GV Gas Valve TL Traffic Light
DP Down Pipe GY Gully TP Telegraph Post
Elec Electric Ht Height TS Traffic Signal
EP Electricity Post IC Inspection Chamber UTS Unable to Survey

ER Earth Rod IFL Internal Floor Level WL Water Level
FH Fire Hydrant IL Invert Level WM Water Meter
(as a reduced level) WO Wash Out

 P2
 17.10.24
 Langtree (2) Land Added

 P1
 02.08.24
 First Issue

 Rev Date Details of issue / revision Issues & Revisions



☐ Nottingham | 0115 924 1100 www.bwbconsulting.com

### Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

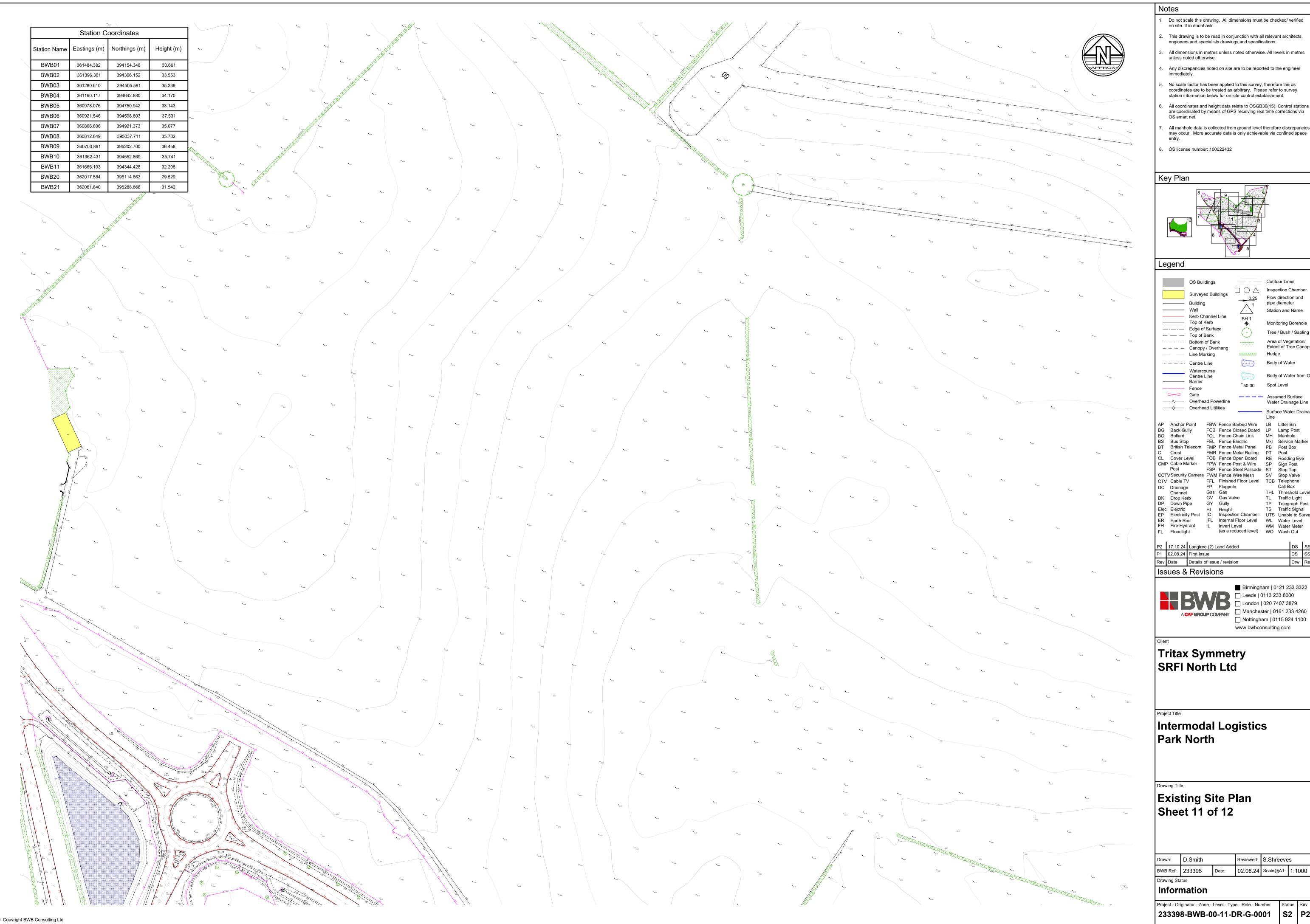
### **Existing Site Plan Sheet 10 of 12**

Drawn:	D.Smith		Reviewed:	S.Shreeve	eves		
BWB Ref:	233398	Date:	02.08.24	Scale@A1:	1:1000		

### Drawing Status Information

Project - Originator - Zone - Level - Type - Role - Number

233398-BWB-00-10-DR-G-0001 S2 P2

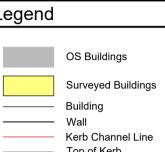


- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects,
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
- Any discrepancies noted on site are to be reported to the engineer
- No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
- station information below for on site control establishment. All coordinates and height data relate to OSGB36(15). Control stations
- OS smart net. All manhole data is collected from ground level therefore discrepancies

### Key Plan



### Legend



Top of Kerb —-—- Edge of Surface — — Top of Bank --- Bottom of Bank ---- Canopy / Overhang Line Marking

Centre Line Barrier Fence

<sup>+</sup>50.00 Spot Level ───

Overhead Powerline

— — — Assumed Surface Water Drainage Line Surface Water Drainage AP Anchor Point FBW Fence Barbed Wire LB Litter Bin FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole FEL Fence Electric Mkr Service Marker

Contour Lines Inspection Chamber Flow direction and pipe diameter

Station and Name

Monitoring Borehole

Tree / Bush / Sapling

Extent of Tree Canopy

Body of Water from OS

Body of Water

BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve FFL Finished Floor Level TCB Telephone FP Flagpole Call Box THL Threshold Level DK Drop Kerb GV Gas Valve TL Traffic Light
DP Down Pipe GY Gully TP Telegraph Post
Elec Electric Ht Height TS Traffic Signal
EP Electricity Post IC Inspection Chamber UTS Unable to Survey

EP Electricity 1 co.

ER Earth Rod IFL Internal Floor Level WL water Level
FH Fire Hydrant IL Invert Level WM Water Meter
(as a reduced level) WO Wash Out P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision

Issues & Revisions



☐ Nottingham | 0115 924 1100 www.bwbconsulting.com

### Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

### **Existing Site Plan Sheet 11 of 12**

Drawn:	D.Smith		Reviewed:	S.Shreeves		
BWB Ref:	233398	Date:	02.08.24	Scale@A1:	1:1000	

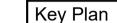
### Drawing Status Information

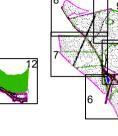
Project - Originator - Zone - Level - Type - Role - Number

233398-BWB-00-11-DR-G-0001 | S2 | P2

Station C	oordinates													
Eastings (m)	Northings (m)	Height (m)												
361484.382	394154.348	30.661		F (2)										
361396.361	394366.152	33.553		*33.16										
361280.610 361160.117	394505.591 394642.880	35.239 34.170	·	30,53										
360978.076	394750.942	33.143												
360921.546 360866.806	394598.803 394921.373	37.531 35.077	nn+ 8											
360812.849	395037.711	35.782	/ ///////											
360703.881 361362.431	395202.700 394552.869	36.458 35.741	2011											
361666.103	394344.428	32.298	ж.											Ĩ <sup>*</sup>
362017.584	395114.863	29.529												
362061.840		31.542								10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		* 3.2 * 3.2	*3.31 *3.32 *3.32 *3.33	
											22.71 A 20.00			

- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- . This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
- Any discrepancies noted on site are to be reported to the engineer immediately.
- No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
- station information below for on site control establishment.
- All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via OS smart net.
- All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
- 8. OS license number: 100022432

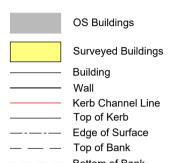




\_\_\_\_0.25

BḤ 1

### Legend



Gate Gate

BO Bollard

DC Drainage

Channel

── Overhead Utilities

---- Bottom of Bank ---- Canopy / Overhang — Line Marking Centre Line Watercourse Centre Line ——— Barrier Fence

Hedge Body of Water ───
Overhead Powerline

Body of Water from OS <sup>+</sup>50.00 Spot Level — — — Assumed Surface Water Drainage Line Surface Water Drainage

Contour Lines

pipe diameter

Flow direction and

Station and Name

Monitoring Borehole

Tree / Bush / Sapling

Area of Vegetation/

Extent of Tree Canopy

AP Anchor Point FBW Fence Barbed Wire LB Litter Bin BG Back Gully FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole BS Bus Stop FEL Fence Electric Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box C Crest FMR Fence Metal Railing PT Post CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve

CTV Cable TV FFL Finished Floor Level TCB Telephone FP Flagpole Call Box THL Threshold Level Gas Gas DK Drop Kerb GV Gas Valve TL Traffic Light
DP Down Pipe GY Gully TP Telegraph Post
Elec Electric Ht Height TS Traffic Signal
EP Electricity Post IC Inspection Chamber UTS Unable to Survey

ER Earth Rod IFL Internal Floor Level WL Water Level
FH Fire Hydrant IL Invert Level WM Water Meter
FL Floodlight (as a reduced level) WO Wash Out

P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision

Birmingham | 0121 233 3322

# Issues & Revisions



☐ Nottingham | 0115 924 1100 www.bwbconsulting.com

## Tritax Symmetry **SRFI North Ltd**

### Intermodal Logistics Park North

### **Existing Site Plan Sheet 12 of 12**

Drawn:	D.Smith		Reviewed:	S.Shreeve	eves		
BWB Ref:	233398	Date:	02.08.24	Scale@A1:	1:1000		

### Drawing Status Information

Project - Originator - Zone - Level - Type - Role - Number 233398-BWB-00-12-DR-G-0001

Station Name | Eastings (m)

BWB01

BWB03

BWB04

BWB05

BWB07

BWB09

BWB10

BWB11

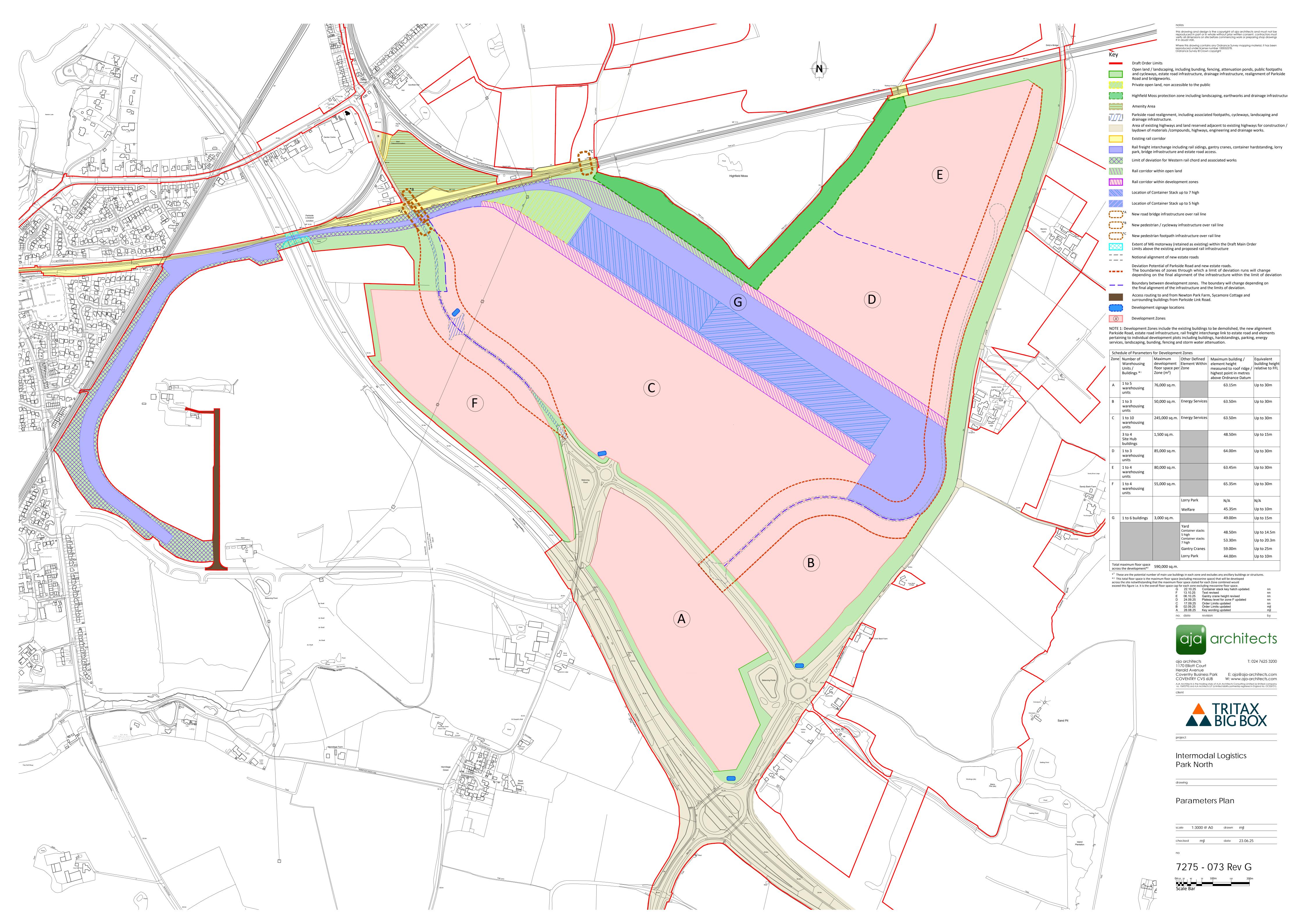
BWB20

BWB21

Intermodal Logistics Park North Rail Freight Interchange, Newton-le-Willows Flood Risk Assessment July 2025 ILPN-BWB-ZZ-XX-T-W-0002\_FRA



**Appendix 2: Proposed Plans** 



Intermodal Logistics Park North Rail Freight Interchange, Newton-le-Willows Flood Risk Assessment July 2025 ILPN-BWB-ZZ-XX-T-W-0002\_FRA



Appendix 3: Hydraulic Model Report



#### **ENVIRONMENT**

Intermodal Logistics Park North Ltd Intermodal Logistics Park North Warrington Hydraulic Model Report



#### **ENVIRONMENT**

Intermodal Logistics Park North Ltd
Intermodal Logistics Park North
Warrington
Hydraulic Model Report

Birmingham Livery Place, 35 Livery Street, Colmore Business District, Birmingham, B3 2PB T: 0121 233 3322

> Cambridge 14-16 High Street, Histon, Cambridge CB24 9JD T: 01223 235 173

Leeds Whitehall Waterfront, 2 Riverside Way, Leeds LS1 4EH T: 0113 233 8000

> London 11 Borough High Street London, SE1 9SE T: 0207 407 3879

Manchester 11 Portland Street, Manchester, M1 3HU 0161 233 4260

Market Harborough 12a Woodcock House, Compass Point Market Harborough, Leicestershire, LE16 9HW T: 01858 455020

> Nottingham Waterfront House, Station Street, Nottingham NG2 3DQ T: 0115 924 1100

> > January 2025



#### **DOCUMENT ISSUE RECORD**

Document Number:	233398-BWB-ZZ-XX-T-W-0001_HMR
BWB Reference:	233398_HMR

Rev	Date	Status	Comment	Author:	Checked:	Approved:			
P01	29.01.25	\$2	Draft Issue	Lucy Reeves BSc (Hons) MCIWEM	Rachel Meredith BSc (Hons) MCIWEM C.WEM	Matthew Day BA (Hons) MSc FRGS MCIWEM C.WEM C.Sci C.Env			
P02	23.10.25	\$2	Statutory Consultation	Chris Dodd BEng(Hons) IEng MICE					

#### Notice

All comments and proposals contained in this report, including any conclusions, are based on information available to BWB Consulting during investigations. The conclusions drawn by BWB Consulting could therefore differ if the information is found to be inaccurate or misleading. BWB Consulting accepts no liability should this be the case, nor if additional information exists or becomes available with respect to this scheme.

Except as otherwise requested by the client, BWB Consulting is not obliged to and disclaims any obligation to update the report for events taking place after: -

- (i) The date on which this assessment was undertaken, and
- (ii) The date on which the final report is delivered

BWB Consulting makes no representation whatsoever concerning the legal significance of its findings or the legal matters referred to in the following report.

All Environment Agency mapping data used under special license. Data is current as of January 2025 and is subject to change.

The information presented, and conclusions drawn, are based on statistical data and are for guidance purposes only. The study provides no guarantee against flooding of the study site or elsewhere, nor of the absolute accuracy of water levels, flow rates and associated probabilities.

This document has been prepared for the sole use of the Client in accordance with the terms of the appointment under which it was produced. BWB Consulting Limited accepts no responsibility for any use of or reliance on the contents of this document by any third party. No part of this document shall be copied or reproduced in any form without the prior written permission of BWB



### **CONTENTS**

GL	OSSARY & NOTATION1
1.	INTRODUCTION2
	Site Description
	Environment Agency (EA) Flood Maps5
	Aims and Objectives
	Approach
	Previous Studies and Available Data
	Assumptions and Limitations
2.	HYDROLOGY10
	Rainfall Hyetographs
	Climate Change11
3.	THE HYDRAULIC MODEL
	Software and Solver
	The 1D Domain
	1D/2D Links
	The 2D Model Domain
	Calibration/Verification16
	Simulation Parameters
	Model Runs
	Stability, Warnings and Messages
4.	BASELINE RESULTS
5.	SENSITIVITY TESTING
	Flow Estimates
	Roughness21
	Downstream Boundary
6.	SUMMARY & RECOMMENDATIONS
	APPENDICES



#### **FIGURES**

- Figure 1.1: Site Location
- Figure 1.2: Existing Topographical Catchments
- Figure 1.3: EA Flood Map for Planning
- Figure 1.4: EA Risk of Flooding from Surface Water Mapping
- Figure 2.1: 1 in 100-Year Event Rainfall Hyetographs for Different Storm Durations
- Figure 4.1: Baseline Direct Rainfall Modelling Results
- Figure 4.2: Baseline Direct Rainfall Model Results and EA Risk of Flooding from Surface Water

Extents

#### **TABLES**

- Table 2.1: Peak Rainfall Allowance for the Lower Mersey Management Catchment
- Table 3.1: 1D Domain Roughness Values
- Table 3.2: Floodplain Roughness Values
- Table 3.3: Runoff Coefficients by Land Use
- Table 3.4: Model Runs
- Table 3.5: Stability Indicators

#### **APPENDICES**

- Appendix 1: Topographical Survey
- Appendix 2: Baseline Model Schematic
- Appendix 3: Baseline Floodplain Maps
- Appendix 4: Sensitivity Testing



#### **GLOSSARY & NOTATION**

**1D** – one-dimensional hydraulic model, good for representing the hydraulics of a definitive channel or flow pathway and hydraulic structure.

**2D** – two-dimensional hydraulic model, good for representing complex flow routing present within the floodplain.

**Catchment** - the land area that drains (normally naturally) to a given point on a river, drainage system or body of water.

**DTM** – Digital Terrain Model

**EA** – Environment Agency

**ESTRY** - a 1D hydraulic modelling software package published by BMT.

**Flood Estimation Handbook (FEH)** – industry standard guidance on rainfall and river flood frequency estimation across the UK.

Floodplain - any area of land over which water flows or is stored during a flood event.

**Hydraulic Model** - a mathematical (generally computer based) model of a water/sewer/storm system which is used to analyse the system's hydraulic behaviour.

LiDAR – Light Detection and Ranging aerial survey data

m AOD – metres above Ordnance Datum

OS - Ordnance Survey

ReFH – Revitalised Flood Hydrograph rainfall-runoff hydrological model

**Return period** - a statistical term defining the probability of occurrence of a flood event. Thus a 1 in 50-year flood is one likely to be equalled or exceeded on average only once in a 50-year period: a flood with a 2.0% annual probability exceedance (AEP).

**Strategic Flood Risk Assessment (SFRA)** - a study carried out by one or more local planning authorities to assess the risk to an area from flooding from all sources, now and in the future.

TUFLOW - a 2D fixed grid hydraulic modelling software package published by BMT.

Watercourse – a natural or man-made open channel for the conveyance of water.

**Z-Shape** – a layer in TUFLOW which can be used to manipulate the 2D model geometry.



#### 1. INTRODUCTION

- 1.1 BWB Consulting Ltd has been commissioned by Intermodal Logistics Park North Ltd (the Client) to undertake a site-specific hydraulic modelling exercise of the surface water flood risk posed to a proposed Strategic Rail Freight Interchange (SRFI) and associated development known as Intermodal Logistics Park (ILP) North, Warrington (NGR: SJ612952).
- 1.2 The proposals qualify as a Nationally Significant Infrastructure Project (NSIP) and accordingly, an application for a Development Consent Order (DCO) is to be made.

#### **Site Description**

- 1.3 the Main Site is defined as land to the east of the M6 motorway, to the south of the Chat Moss Line and to the west of Winwick Lane incorporating the triangular parcel of land located to the west of Parkside Road and to the north of the Chat Moss Line;
- 1.4 The majority of the land contained within the Main Site is bound to the north by the Chat Moss Line (Liverpool-Manchester railway line), to the west by the M6 motorway and to the southeast by Winwick Lane (A579). The Main Site south of the Chat Moss Line is approximately 198 hectares. The Highfield Moss Site of Special Scientific Interest (SSSI) is also adjacent to the north of the Main Site. The full project description is included as Chapter 3 of the PEIR.
- 1.5 The majority of the Main Site comprises agricultural fields used for arable crops, with some small patches of woodland in the east. There are also a number of residential properties, farmsteads and a commercial yard within the Main Site. Parkside Road (A573) runs through the DCO Site to the south before passing over the M6 where it provides access to Parkside Link Road West.
- 1.6 The triangular parcel of land located to the north of the Chat Moss Line and to the east of Parkside Road also forms part of the Main Site.
- 1.7 There are no watercourses mapped within the DCO Site itself, although there are ditches present along the northern boundary of the Main Site, adjacent to Highfield Moss SSSI. There are surface water drainage features within the DCO Site, such as attenuation features and swales associated with the Parkside Link Road, and small ponds in the north east.
- 1.8 The Western Rail Chord of the DCO Site is approximately 12 hectares in size and is bordered to the west by the West Coast Mainline railway, to the north by the Chat Moss Line and to the east by the Parkside West Development. The Western Rail Chord comprises safeguarded land for the rail-turn head to enable trains to be serviced to and from the North and the East.
- 1.9 The Western Rail Chord currently includes scrub land and areas of woodland which are set within the context of an area of redevelopment with commercial uses proposed, which is known as Parkside West, and is currently being promoted through the Town and Country Planning Act process.



1.10 The site location is shown in **Figure 1.1.** 

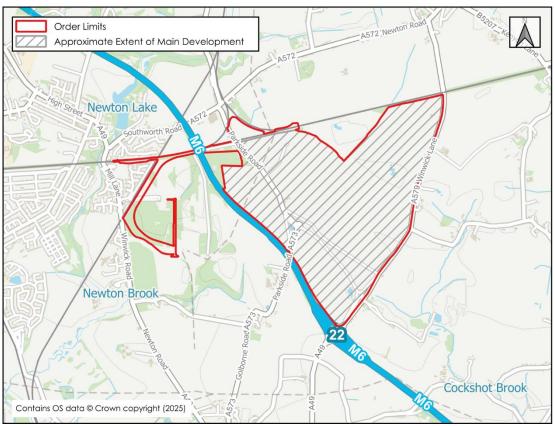


Figure 1.1: Site Location

1.11 A topographical survey has been undertaken and is included as **Appendix 1**. The Main Site can be topographically split into four catchments as shown in **Figure 1.2** and described below:



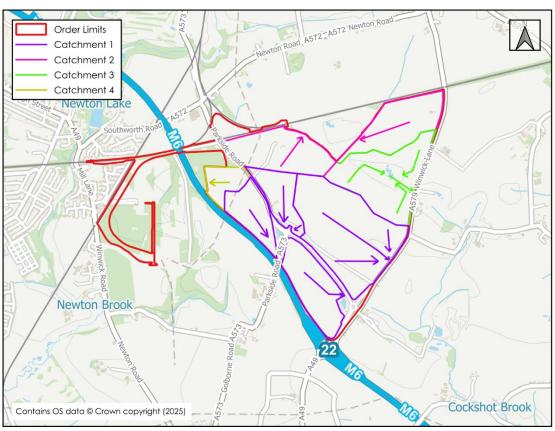


Figure 1.2: Existing Topographical Catchments

- Catchment 1 generally falls in a south easterly direction towards Parkside Link Road and Winwick Lane. Levels are shown to range from approximately 38.7m AOD in the north of the catchment to approximately 29.2m AOD in the east of the catchment. The existing outfall for this catchment is into highway swales and ultimately the Cockshot Brook, located to the south east of the site.
- Catchment 2 generally falls in a northerly and south westerly direction towards Highfield Moss SSSI. Levels are shown to range from approximately 38.7m AOD in the south west to approximately 29.4m AOD in the north.
- Catchment 3 generally falls in a northerly and southerly direction to form valley topography which ultimately falls to the east towards Winwick Lane. Levels are shown to range from approximately 33.7m AOD in the west to 28.7m AOD in the east.
- Catchment 4 is shown to generally fall in a westerly direction towards the M6. Levels are shown to range from approximately 36.1m AOD in the east to approximately 32.7m AOD in the west.



#### **Environment Agency (EA) Flood Maps**

#### Flood Map for Planning

1.12 The EA Flood Map for Planning shows the site to be located entirely within Flood Zone 1, as shown in **Figure 1.3**.

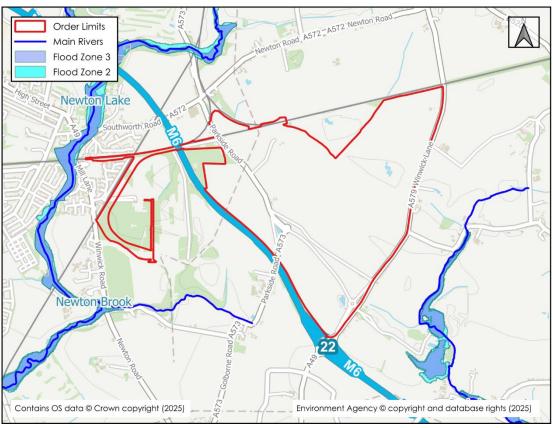


Figure 1.3: EA Flood Map for Planning

#### Risk of Flooding from Surface Water

- 1.13 The EA Risk of Flooding from Surface Water (RoFSW) mapping, shown in **Figure 1.4**, provides an indication of the potential flooding which could occur when rainwater does not drain away through the normal drainage systems or soak into the ground, but lie on or flows over the ground instead.
- 1.14 Three pluvial flow routes, which generally flow in a south easterly direction, are shown within the centre of the site. Areas shown to be at a potential risk of surface water flooding generally correlate with the location of existing surface water bodies and topographical low points. The flow routes appear to originate within the site.



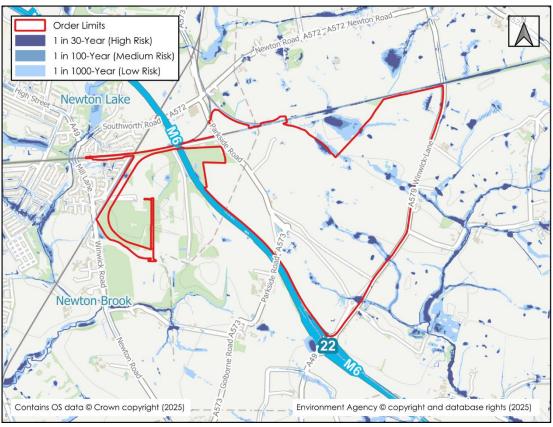


Figure 1.4: EA Risk of Flooding from Surface Water Mapping

#### National Flood Risk Assessment

- 1.15 The EA have been working with local authorities to develop a new National Flood Risk Assessment (NaFRA) and New National Coastal Erosion Risk Map (NCERM). From January 2025, the new data, which shows the risk of flooding from rivers, the sea and surface water has been made available. The Flood Map for Planning Service will be updated using the new NaFRA data in March 2025.
- 1.16 The new data shows the site to remain located outside of any flood extents associated with rivers and sea, including an allowance for climate change. The risk of flooding from surface water is shown to marginally increase when compared to the RoFSW mapping shown in **Figure 1.4**. However, the site specific modelling, detailed below, is considered to supersede national mapping.

#### **Aims and Objectives**

1.17 As identified above, the primary source of flood risk to the site is expected to be from overland surface water runoff. Therefore, a direct rainfall-runoff modelling exercise will be used to identify the potential flood risk that surface water could pose to the site. The following objectives have been identified:



- i. Undertake a hydrological assessment of the local catchment to derive rainfall hyetographs for the study area.
- ii. Construct a 2D direct rainfall model of the site and upstream catchment using TUFLOW.
- iii. Construct a 1D representation of hydraulic structures within ESTRY software, where appropriate.
- iv. Undertake Critical Storm Duration (CSD) testing.
- v. Undertake simulations of the baseline conditions and analyse the results to understand the flooding mechanisms and the predicted flood risk at the site.
- vi. Undertake sensitivity testing of key parameters.

#### Approach

- In order to achieve the objectives identified above, a new 1D/2D ESTRY-TUFLOW direct rainfall model was constructed, based on a site-specific topographical survey, Drainage and Ducting Plans of Parkside Link Road, and EA 1m composite DTM LiDAR.
- 1.19 The direct rainfall model has been produced using standard practice in line with the FEH and EA guidelines.
- Watershed analysis, using LiDAR data, has been completed to determine the catchment boundary upstream of the site.
- 1.21 The area of interest is the Main Site, shown in Figure 1.1. However, it is necessary to extend the model coverage upstream so that all of the contributing runoff is captured.

#### Previous Studies and Available Data

- A flood history review for the catchment has been undertaken using EA recorded flood outlines, SFRAs<sup>1,2,3,4,5,6,7</sup>, Flood Investigation Reports, Chronology of Hydrological Events and online records.
- 1.23 EA historical flood outlines show that there are no historical flood outlines recorded at
- A Section 19 Flood Investigation published by St Helens Borough Council<sup>8</sup> noted flooding at Vista Road (B5209) in Newton-le-Willows in January 2021. The flooding was understood to be caused by a peak rainfall event creating runoff from rural areas. The urban drainage system became overwhelmed due to rainfall intensity and limited capacity in watercourses due to high water levels. The magnitude and extent of flooding is unknown and the reported flooding location is located outside of the modelled catchment.

St Helens Council Strategic Flood Risk Assessment (JBA Consulting, 2014)
 Liverpool City Region Combined Authority Strategic Flood Risk Assessment Part A (JBA Consulting, 2023)
 Level 1 Strategic Flood Risk Assessment for Greater Manchester – Update (JBA Consulting, 2019)

 <sup>&</sup>lt;sup>4</sup> Greater Manchester Level 2 Hybrid Strategic Flood Risk Assessment (JBA Consulting, 2020)
 <sup>5</sup> Warrington Borough Council Level 1 Strategic Flood Risk Assessment (JBA Consulting, 2018)

<sup>&</sup>lt;sup>6</sup> Warrington Borough Council Local Plan Site Screening Level <sup>2</sup> Strategic Flood Risk Assessment (JBA Consulting, 2019)

<sup>&</sup>lt;sup>7</sup> Warrington Borough Council Strategic Flood Risk Assessment Addendum (Warrington Borough Council, 2021)

<sup>8</sup> St Helens Borough Section 19 Report: Storm Christoph (St Helens Borough Council, 2021)



- 1.25 Information received from Network Rail suggests that the Chat Moss Line has previously experienced flooding within the vicinity of the site.
- 1.26 No further previously recorded flood data at the site was identified within the flood history review.
- 1.27 The following additional datasets were used within the hydraulic modelling exercise:
  - EA LiDAR aerial survey. 1m resolution composite DTM (2022).
  - Topographical survey of the study site, undertaken in August and October 2024 (reference: 233398-BWB-ZZ-M3-G-0001).
  - Photographs and observations from site visits undertaken in May and September 2024 by BWB Consulting.
  - A hydrological assessment of rainfall undertaken by BWB Consulting (included as **Section 2**).
  - Drainage and Ducting Plans of Parkside Link Road submitted as part of planning application reference: P/2018/0249/FUL, undertaken May 2018 (reference: PD-RAM-01-00-DR-C-0501 – 0512).

#### **Assumptions and Limitations**

- 1.28 Several assumptions were made during the study which may lead to implications on the modelled results. However, the study has been based on the data available at the time of writing. The key assumptions and limitations are as follows:
  - The modelling exercise has made use of the available data at the time of construction and simulation. The model represents the floodplain and channel conditions at the time of survey.
  - The model contains no formal representation of the conveyance within minor watercourses or ditches other than that captured by the model grid and within the 1D model domain.
  - The 2m resolution of the model may negate any small-scale topographic features, although all the significant features are believed to have been captured.
  - The floodplain levels are derived from LiDAR which has limited accuracy (+/-0.15m). however, this is considered to be sufficient for the purpose of this study.
  - The bare earth DTM does not include for the presence of walls, buildings or other structures. Buildings have been modelled at 300mm above ground level, with a depth varying Manning's roughness coefficient applied, in line with EA methodology. Roads have been lowered by 125mm in line with EA methodology.
  - Infiltration losses have been represented by runoff coefficients applied within the model based on variations in land use. This approach and the values used are in line with industry guidance.
  - Two small areas of highway road drainage (Parkside Link Road roundabout and Parkside Link Road and Winwick Road roundabout) have been explicitly accounted for in the model. No further private drainage, or highway road drainage, has been explicitly included within the model. Adjustments to infiltration coefficients have been applied to account for any losses to these networks. As the areas of highway



drainage accounted for in the model only cover a small area, it was still deemed appropriate to apply infiltration coefficients.

- Where no condition information was available for highway drainage, a roughness value of 0.015 (concrete) was assumed.
- There are several highway structures within the model domain where highways pass above the railway and the M6. Dimensions and invert levels of the structures are based on EA LiDAR.
- The modelling exercise has been undertaken to produce a good representation of flood risk mechanisms in and around the study site. It has not been designed to accurately map flooding in the wider catchment.



#### 2. HYDROLOGY

#### Rainfall Hyetographs

- 2.1 Rainfall hyetographs were derived from FEH22 rainfall data in ReFH2 (version 4.1) using the industry standard FEH Depth Duration Frequency (DDF) model.
- 2.2 Given the rural nature of the study area, and the URBEXT and BFIHOST values of the catchment, the winter storm profile was used for this study. No rainfall losses were applied within ReFH2, these were applied within the hydraulic model instead.
- 2.3 ReFH2 software recommended a storm duration of 5.5 hours. In addition to this, hyetographs were extracted for the 3.5 hour and 7.5 hour duration events to allow for analysis of the CSD.
- 2.4 The rainfall hyetographs for the 1 in 100-year event at the extracted durations are shown in **Figure 2.1** below.

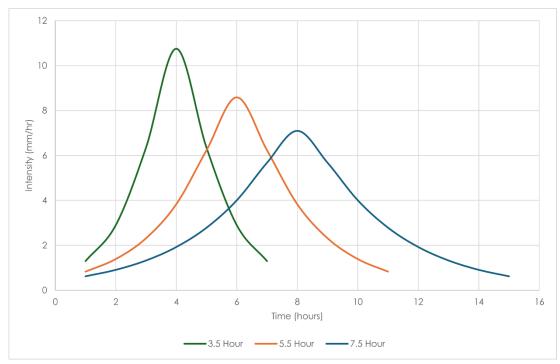


Figure 2.1: 1 in 100-Year Event Rainfall Hyetographs for Different Storm Durations

2.5 CSD testing was undertaken to determine the appropriate storm duration for the study. The testing identified that the 5.5 hour was the most conservative for the modelled depths within the study area. Therefore, this storm duration was used for all subsequent model simulations.



#### **Climate Change**

2.6 Predicted future change in peak river flows caused by climate change are provided by the EA within their online guidance, with a range of projections applied to regionalised 'River Basin Districts'. These districts are further split into 'Management Catchments'. The catchment falls within the Lower Mersey Management Catchment.

Table 2.1 identifies the relevant peak river flow allowances.

Table 2.1: Peak Rainfall Allowance for the Lower Mersey Management Catchment

Allowance Category	anticipated for th	Total potential change anticipated for the '2020s' epoch (2022 to 2060)		ange anticipated och (2061 to 2125)
Calegory	1 in 30-Year	1 in 100-Year	1 in 30-Year	1 in 100-Year
Upper End	35%	40%	40%	45%
Central	20%	25%	30%	30%

- 2.7 When determining the appropriate allowance to assess, the catchment size, land use and anticipated lifespan of the development should be considered.
- 2.8 The development site has an anticipated lifespan of approximately 75+ years and therefore, based on the EA's guidance, the Upper End allowances for the 1 in 30-year (+40%CC) and 1 in 100-year (+45%CC) have been applied to the rainfall hyetographs.
- 2.9 The EA's guidance notes that for modelled large areas (greater than 5km²) with rural land use, direct rainfall modelling is unlikely to be appropriate and fluvial flood risk should be assessed. However, as the flood risk to the site is not considered to be fluvial and the catchment is only slightly greater than 5km² (5.8km²), direct rainfall modelling is considered to be appropriate for the study.

<sup>9</sup> Environment Agency, Flood risk assessments: climate change allowances: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#peak-rainfall-intensity-allowance (Last Accessed: January 2025)



#### 3. THE HYDRAULIC MODEL

3.1 A model schematic is included as **Appendix 2**.

#### Software and Solver

3.2 TUFLOW version 2023-03-AE was used for all model runs. The Heavily Paralysed Compute (HPC) solver was used within a Graphics Processing Unit (GPU) environment. This uses an adaptive timestep to solve the equations. TUFLOW's built in 1D component, ESTRY, was used to model the highway drainage in isolated areas around Parkside Link Road as well as underpasses associated with the railway and the M6.

#### The 1D Domain

#### **Extent**

- 3.3 The drainage associated with the Parkside Link Road in the vicinity of the site has been represented within the 1D domain with invert levels defined by levels provided as part of the Drainage and Ducting Plans (planning application reference: P/2018/0249/FUL) or the topographical survey.
- 3.4 To represent the interaction between the subsurface network and the surface, manhole locations were represented within the model. Each manhole has an assumed diameter of 0.5m. The surface levels in the network were defined by cover levels provided as part of the Drainage and Ducting Plans (planning application reference: P/2018/0249/FUL) or the topographical survey.

#### Hydraulic Structures

3.5 There are several highway structures within the model domain where highways pass above the railway and the M6. To allow flows to pass through the underpass structures, a 1D element, in the form of a 1d\_nwke, was included and represented using a rectangular culvert with dimensions and invert levels of the structures indicated by EA LiDAR.

#### Hydraulic Roughness

- 3.6 Hydraulic roughness has been represented using the Manning's n coefficient. The values applied are based on those stipulated in the literature, using Chow (1959)<sup>10</sup>. This study documents appropriate values based on highway drainage, railway and motorway.
- 3.7 The values applied for different land use types associated with the 1D domain are listed in **Table 3.2**.

 $<sup>^{10}\,</sup>http://www.fsl.orst.edu/geowater/FX3/help/8\_Hydraulic\_Reference/Mannings\_n\_Tables.htm$ 



Table 3.1: 1D Domain Roughness Values

Land Use Type	Manning's n Coefficient
Roads	0.03
Rail	0.05
Highway Drainage	0.015

#### 1D/2D Links

- 3.8 In order to represent the interaction between the subsurface network (local drainage infrastructure isolated to Parkside Link Road) and the 2D domain, manholes were represented within the model as 1D pipe network pits linked to 2D domains. The SX connections are automatically created by setting the Conn\_1D\_2D attribute in the 1d\_nwke layer. A 'C' pit was used which uses zero length circular culverts to calculate the flow transferred between the 1D network and 2D domain. A 'SXZ' command is utilised to allow water to spill into the 2D domain and vice versa.
- 3.9 To represent the interaction between the 2D domain and the 1D highway drainage inlet and outlets 'SX' links were used to connect to the 2D floodplain.
- 3.10 The 1D domain associated with the underpass structures was connected to the 2D domain through 'SX'/'CN' connections.

#### The 2D Model Domain

#### Extent

3.11 A watershed analysis was undertaken to determine the extent of the rainfall catchment. This was used to define the 2D domain for the direct rainfall model.

#### Grid Size and Orientation

- 3.12 The grid cell size should be chosen in order to sufficiently represent the key floodplain topographic features.
- 3.13 The selected grid size of 2m provides a high enough resolution to provide an appropriate representation of overland flow routes.
- 3.14 The orientation of the grid is important for flow routing as flow cannot pass to the neighbouring cell via its corner, only via the cell sides. Therefore, the location line (2d\_loc) was drawn to orientate the grid in the predominant direction of flow (from north east to south west).



#### Floodplain Topography and Amendments

- 3.15 The general floodplain topography is based on the latest available LiDAR data, which was downloaded from the DEFRA Open Survey website at a 1m resolution.
- 3.16 The floodplain topography in the site is based on a topographical survey undertaken in August 2024. This was converted to a Digital Elevation Model (DEM) at a 1m resolution and read into the model.
- 3.17 The following amendments to the base topography were made:
  - In the same manner as the EA's RoFSW methodology, roads and building footprints were adjusted using 2D z-shape layers. Roads were lowered by 125mm to allow for surface water flows to be effectively conveyed and building footprints were raised by 300mm to represent building slab levels.
  - The ditches present along the northern boundary of the Main Site, adjacent to Highfield Moss SSSI, and a select number of swales associated with the Parkside Link Road were reinforced through the use of a 2D z-shape 'GULLY' with a width of 2m. Z-shape points were used to define the levels along the ditches and swales with elevations informed by topographical survey, Drainage and Ducting Plans from the planning portal or LiDAR.
  - A 2D z-shape layer was used to represent the deck of highway/railway structures cut out by LiDAR or areas of the Parkside Link Road which have not been fully represented within LiDAR. The z-shapes were used to smooth the topography between existing points shown on LiDAR or the topographical survey.

#### Floodplain Roughness

- 3.18 Floodplain roughness is defined by the Manning's n coefficient, as per the 1D domain. However, the method in which it is applied differs.
- 3.19 The roughness values were applied using the Land Use types defined within OS Master Map data. The land uses are linked to a coefficient listed in a TUFLOW Materials File (TMF). The values applied for different land use types are listed in **Table 3.2**.

Table 3.2: Floodplain Roughness Values

Land Use Type	Manning's n Coefficient
Long grass	0.035
Land	0.025 - 0.05
Water	0.03
Roads	0.025 - 0.03
Rail	0.05
Woodland	0.08
Buildings	0.015 – 0.5



3.20 A depth varying Manning's roughness value has been applied for buildings. A roughness coefficient of 0.015 was applied for depths up to 30mm to account for shallow flow paths from building roofs and through building drainage. For depths greater than 30mm, a more obstructive roughness coefficient of 0.5 was used to represent the barrier to flow buildings pose.

#### **Boundary Conditions**

3.21 The rainfall hyetographs, discussed in **Section 2**, were applied to the model domain using 2D rainfall 'rf' polygons. Suitable runoff coefficients were applied to the rainfall hyetographs based on land use to represent the losses to interception and infiltration. The values are summarised in **Table 3.3**.

Table 3.3: Runoff Coefficients by Land Use

Land Use Type	Runoff Coefficient
Land	0.35 – 0.8
Water	1.0
Roads	0.75 – 0.9
Rail	0.35
Woodland	0.2
Buildings	0.9 – 0.95

- 3.22 An additional 11mm/hr continuing loss to the ground was applied to the road network, to represent the effects of a highway drainage system. As only a minor area of highway drainage was explicitly included within the model, it was deemed appropriate to include the continuing loss throughout the model domain.
- 3.23 Boundary conditions within the 2D domain are often used to prevent "glass walling" at the downstream extent of the model through use of a "HQ" boundary. This is a flow vs stage relationship automatically defined in TUFLOW when the user inputs a slope value, to allow water to flow out of the model. HQ boundaries were applied to the model where flow routes were expected to continue beyond the 2D domain, to allow water to flow out of the model and prevent flows backing up due to the model extent. The slope value was taken from a gradient approximated from available EA LiDAR at each HQ boundary location.

#### <u>Initial Water Levels</u>

- 3.24 Initial water levels are often applied to features such as lakes, ponds or canals to represent them containing water of a nominal depth at the start of the model run.
- 3.25 Initial water levels were applied to ponds within the model, based on topographical survey data.



#### Calibration/Verification

- 3.26 A lack of detailed flow or level data for the catchment meant that there was limited opportunity to calibrate the model.
- 3.27 Due to the lack of documentation on previous historical instances of flooding, the model cannot be verified against historical events. Sensitivity testing, described in **Section 5**, has been undertaken to mitigate this.
- 3.28 In addition, the results from the hydraulic modelling exercise were compared to the EA RoFSW mapping as a high level verification exercise and the comparison is discussed in **Section 4**.

#### **Simulation Parameters**

- 3.29 An initial timestep of 1.0 seconds was applied to the 2D domain. This is ½ of the model grid size and is in line with industry guidance. A timestep of 0.5 seconds was applied for the 1D domain, this is ½ of the 2D timestep.
- 3.30 The 5.5-hour storm duration was run for 9.5 hours to ensure there was sufficient time for runoff and overland flows to pass through the model and recede.

#### **Model Runs**

3.31 In order to achieve the study objectives, the simulations summarised in **Table 3.4** were completed.

Table 3.4: Model Runs

Model Return Periods Geometry		Comments
Baseline Conditions	1 in 30-Year 1 in 30-Year + 40%CC 1 in 100-Year 1 in 100-Year 1 in 100-Year	Representative of 'as-surveyed' conditions
Roughness +20%	1 in 100-Year	Floodplain and structure roughness increased by 20%
Roughness -20%	1 in 100-Year	Floodplain and structure roughness decreased by 20%
Downstream Boundary +20%	1 in 100-Year	20% increase of gradient at 2D downstream boundaries
Downstream Boundary -20%	1 in 100-Year	20% decrease of gradient at 2D downstream boundaries



#### Stability, Warnings and Messages

3.32 TUFLOW has a number of indicators available to assess the stability of a model. These differ slightly between the Classic and HPC solver (the HPC solver was used for this model). The indicators checked to ensure the model was performing as expected are summarised in **Table 3.5**.

Table 3.5: Stability Indicators

Indicator	Required Checks	Comment
1D negative depths	Significant negative depths indicate that instabilities are present.	No negative depths reported within TUFLOW
Cumulative Mass Error	A value of +/-5% is considered acceptable.	Remained within the acceptable limits.
Velocities	Unusually high velocities or circulating vectors are usually a sign of instabilities.	Reviewed and considered acceptable.
Timestep (dt)	Shows the timestep used to reach a solution over the duration of the model, as the HPC simulation used an adaptive timestep. A timestep lower than 1/10th of a TUFLOW classic timestep is considered to indicate instabilities. A TUFLOW classic timestep is typically up to half of the model grid size, so 1/10th of this value would be 0.1s.	Remained within the acceptable limits.
Nu Values	1.0 or greater may indicate unusually high velocities.	Remained within the acceptable limits.
Nc Values	Higher than 1.0 might indicate unusually high-water depths caused by a low cell elevation.	Remained within the acceptable limits.
Nd Values	0.3 or higher might suggest poor boundary setup.	Remained within the acceptable limits.
High Control Numbers (HCN)	HCN will require timesteps to be repeated if there is an instability.	HCNs were reported across all modelled events. Upon review, these were found to be occurring adjacent to the deck of underpasses. The sudden change in levels from the bridge deck to the underpass creates a weir effect where flows are directed over the edge of the bridge. Given the location of the HCN's, they are not considered to have a material impact on the results within the site



#### 4. BASELINE RESULTS

- 4.1 Peak flood levels and depths were tracked during the simulations to output a maximum across the full model domain. The maximum results were filtered to removed insignificant very shallow water (i.e. depths less than 30mm).
- 4.2 The results from the existing conditions model are mapped within **Appendix 3** and the floodplain extents at the site have been summarised as shown in **Figure 4.1**.
- 4.3 Key flood mechanisms are summarised below for points labelled in **Figure 4.1**.
  - i. During all modelled events flows pool on the southern side of the Parkside Link Road roundabout within an existing topographical low point. Flows are also routed in a southerly direction towards Winwick Lane following valley topography.
  - ii. An overland flow route is formed within the centre of the site during all modelled events. The flow route follows local topography and flows in a south westerly direction towards Winwick Lane and then the Cockshot Brook.
  - iii. Surface water ponding, associated with an existing pond, is shown to be present during all modelled events. In events equivalent to, and greater than, the 1 in 100-year + 45%CC event, flows are shown to be routed towards Winwick Lane where flows pool in all modelled events on the northern side of the road.
  - iv. An overland flow route is formed within the north of the site during all modelled flood events. The flow route follows local topography and flows in a south westerly direction to the Highfield Moss SSSI.
  - v. Surface water ponding is shown to be present within the north of the site during all modelled events. The ponding is associated with an existing topographical depression adjacent to, and within, Highfield Moss SSSI.



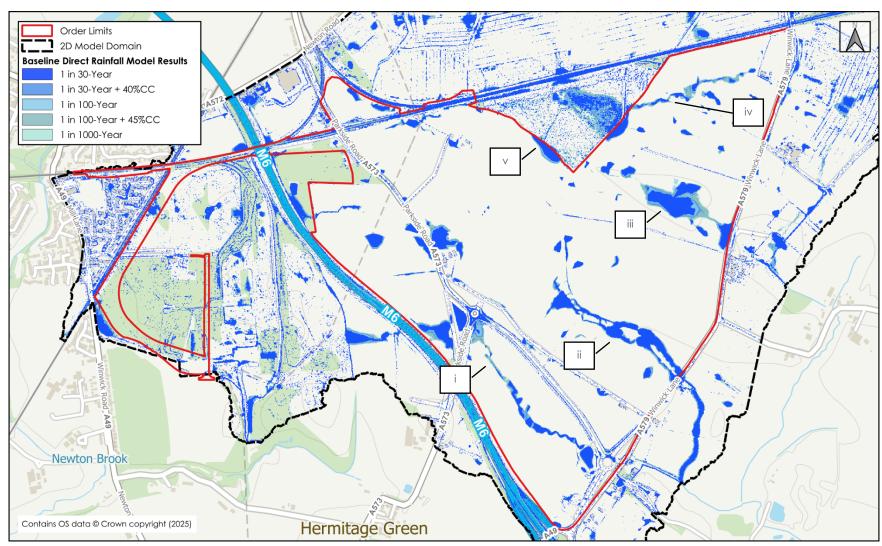


Figure 4.1: Baseline Direct Rainfall Modelling Results



4.4 Comparison of the modelled 1 in 1000-year extents with the EA 1 in 1000-year surface water mapping is shown in **Figure 4.2**. Within the site, the modelled baseline direct rainfall 1 in 1000-year extents are shown to follow similar flow path patterns to the EA's 1 in 1000-year event. The extent of flooding is shown to have increased when compared to the EA's strategic-scale RoFSW mapping. This is thought to be due to the addition of site-specific survey data, updated LiDAR data and hydrological analysis.

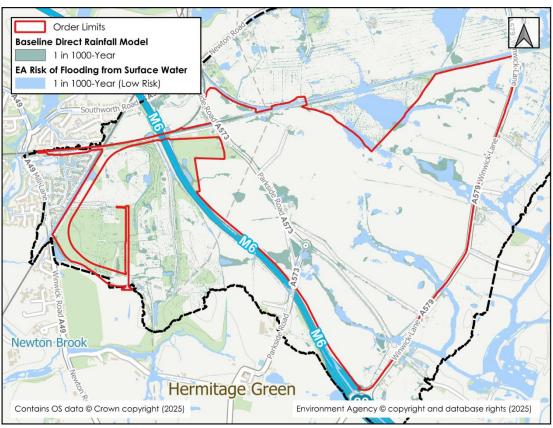


Figure 4.2: Baseline Direct Rainfall Model Results and EA Risk of Flooding from Surface Water Extents

4.5 The bespoke model results are considered more accurate than the EA RoFSW mapping as they are more up to date and are based upon site specific details.



#### 5. SENSITIVITY TESTING

- 5.1 To account for seasonal variations in vegetation and to ensure the robustness of boundary conditions, a series of sensitivity tests were conducted using the 1 in 100-year flood return period event. The difference in peak water level and floodplain extent between the sensitivity test scenarios and the 1 in 100-year baseline event are mapped in **Appendix 4**.
- 5.2 Robust sensitivity analysis also provides improved confidence in the model outputs, particularly in absence of calibration data.

#### Flow Estimates

5.3 As climate change allowances have been assessed and CSD testing undertaken, it was not considered necessary to test further variations on the predicted flood flows.

#### **Roughness**

- 5.4 Increasing and decreasing the roughness values in the floodplain tests how seasonal variation and maintenance regimes may affect the flood risk posed to the site.
- 5.5 A 20% increase in Manning's n roughness coefficient (representative of summer seasonal conditions or a period without maintenance) was shown to have limited impact on the floodplain extents within the site and across the model domain, within the model tolerances.
- 5.6 A 20% decrease in Manning's n roughness (representative of winter seasonal conditions or a period with maintenance) was also shown to have limited impact on the floodplain extents within the site and across the model domain, within model tolerances.
- 5.7 Therefore, the model results are considered to be robust to changes within Manning's n roughness, which increases confidence in the model outputs.

#### **Downstream Boundary**

- 5.8 The downstream HQ boundaries were tested to understand whether they had any implications on flood risk at the study site. Both a 20% increase in slope value (steeper gradient) and a 20% decrease in slope value (flatter gradient) had limited impact on the floodplain extents, within model tolerances.
- 5.9 Therefore, the model results are considered to be robust to changes in the downstream boundary, which increases confidence in the model outputs.



#### 6. SUMMARY & RECOMMENDATIONS

- 6.1 Please note that this conclusion should be read in conjunction with the study limitations and assumptions in **Section 1**.
- 6.2 BWB Consulting Ltd has been commissioned by Intermodal Logistics Park North Ltd (the Client) to undertake a site-specific hydraulic modelling exercise of the surface water flood risk posed to a proposed SRFI and associated development known as ILP North, Warrington.
- 6.3 Rainfall hyetographs were derived from FEH22 rainfall data in ReFH2 (version 4.1) using the industry standard FEH DDF model. CSD testing was undertaken to determine the appropriate storm duration for the study. The testing identified that the 5.5 hour was the most conservative for the modelled depths within the study area. Therefore, this storm duration was used for all subsequent model simulations.
- 6.4 Several overland flow routes are formed within the site during all modelled flood events which flow towards Winwick Road or Highfield Moss SSSI. Surface water ponding is also shown to be present within the site associated with existing ponds or topographical depressions.
- 6.5 Within the site, the modelled baseline direct rainfall 1 in 1000-year extents are shown to follow similar flow path patterns to the EA's 1 in 1000-year event. The extent of flooding is shown to have increased when compared to the EA's strategic-scale RoFSW mapping. This is thought to be due to the addition of site-specific survey data, updated LiDAR data and hydrological analysis.
- 6.6 The modelling has shown that a 20% increase and decrease in Manning's n roughness and downstream boundaries has limited impact on the floodplain extents within the site and across the model domain, within model tolerances. Therefore, the model results are considered to be robust to changes in Manning's n roughness and downstream boundary, which increases confidence in the model outputs.

Intermodal Logistics Park North, Warrington Hydraulic Model Report January 2025 233398-BWB-ZZ-XX-T-W-0001\_HMR

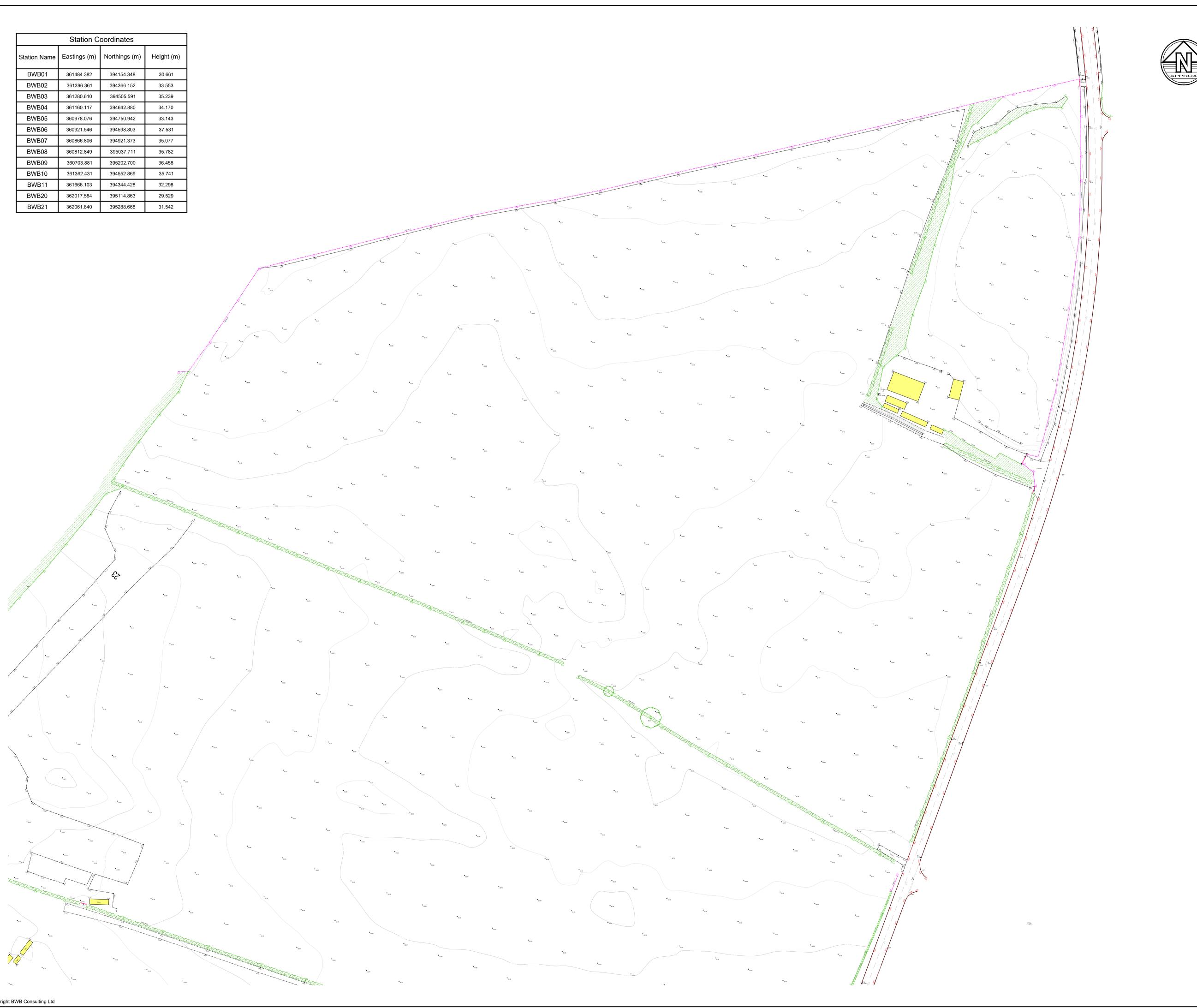


**APPENDICES** 

Intermodal Logistics Park North, Warrington Hydraulic Model Report January 2025 233398-BWB-ZZ-XX-T-W-0001\_HMR

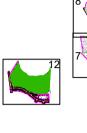


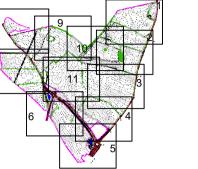
Appendix 1: Topographical Survey



- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects,
- engineers and specialists drawings and specifications. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer
  - No scale factor has been applied to this survey, therefore the os
  - coordinates are to be treated as arbitrary. Please refer to survey station information below for on site control establishment.
  - All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via OS smart net.
  - All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
  - 8. OS license number: 100022432

### Key Plan



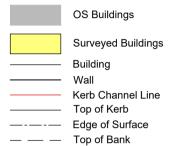


### Legend

C Crest

DC Drainage

Channel



---- Bottom of Bank

Line Marking

Centre Line

Inspection Chamber Flow direction and pipe diameter Station and Name Monitoring Borehole Tree / Bush / Sapling ---- Canopy / Overhang

Extent of Tree Canopy Body of Water Body of Water from OS <sup>+</sup>50.00 Spot Level

Contour Lines

Centre Line ——— Barrier Fence Gate Gate ─── Overhead Powerline ── Overhead Utilities

— — — Assumed Surface Water Drainage Line Surface Water Drainage

Call Box

AP Anchor Point FBW Fence Barbed Wire LB Litter Bin FCB Fence Closed Board LP Lamp Post BG Back Gully BO Bollard FCL Fence Chain Link MH Manhole BS Bus Stop FEL Fence Electric Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve CTV Cable TV FFL Finished Floor Level TCB Telephone

FP Flagpole THL Threshold Level

P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision Issues & Revisions



☐ Nottingham | 0115 924 1100 www.bwbconsulting.com

### Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

### **Existing Site Plan** Sheet 1 of 12

Drawn:	D.Smith		Reviewed:	S.Shreeves	
BWB Ref:	233398	Date:	02.08.24	Scale@A1:	1:1000

### Drawing Status Information

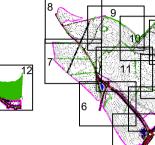
Project - Originator - Zone - Level - Type - Role - Number

233398-BWB-00-01-DR-G-0001



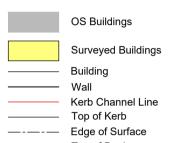
- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer
  - No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
  - station information below for on site control establishment. All coordinates and height data relate to OSGB36(15). Control stations
  - are coordinated by means of GPS receiving real time corrections via OS smart net.
  - All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
  - 8. OS license number: 100022432







### Legend



— — Top of Bank ---- Bottom of Bank ---- Canopy / Overhang — Line Marking Centre Line

<sup>+</sup>50.00 Spot Level — — — Assumed Surface

Centre Line ——— Barrier Fence Gate ──^
Overhead Powerline ── → Overhead Utilities

Water Drainage Line Surface Water Drainage AP Anchor Point FBW Fence Barbed Wire LB Litter Bin BG Back Gully FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole FEL Fence Electric Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post

Contour Lines Inspection Chamber Flow direction and pipe diameter

Station and Name

Monitoring Borehole

Tree / Bush / Sapling

Extent of Tree Canopy

Body of Water from OS

Call Box

Body of Water

FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve FFL Finished Floor Level TCB Telephone FP Flagpole

THL Threshold Level TP Telegraph Post
TS Traffic Signal

P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision Issues & Revisions

BO Bollard BS Bus Stop

C Crest

CTV Cable TV

Channel

DC Drainage



www.bwbconsulting.com

### Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

### **Existing Site Plan** Sheet 2 of 12

Drawn:	D.Smith		Reviewed:	S.Shreeves	
BWB Ref:	233398	Date:	02.08.24	Scale@A1:	1:1000

# Information

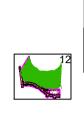
Project - Originator - Zone - Level - Type - Role - Number

233398-BWB-00-02-DR-G-0001 | S2 | P2



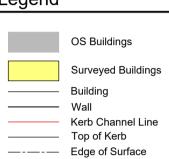
- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer
  - No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
  - station information below for on site control establishment. All coordinates and height data relate to OSGB36(15). Control stations
  - are coordinated by means of GPS receiving real time corrections via OS smart net.
  - All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
  - 8. OS license number: 100022432

### Key Plan





### Legend



Flow direction and pipe diameter Station and Name Monitoring Borehole Tree / Bush / Sapling Extent of Tree Canopy Body of Water

— — Top of Bank ---- Bottom of Bank ---- Canopy / Overhang Line Marking Centre Line Watercourse Centre Line ——— Barrier Fence Gate

── → Overhead Utilities

BG Back Gully

BO Bollard BS Bus Stop

C Crest

CTV Cable TV

Channel

DC Drainage

<sup>+</sup>50.00 Spot Level ──^
Overhead Powerline

— — — Assumed Surface Water Drainage Line Surface Water Drainage Mkr Service Marker

Call Box

Body of Water from OS

Contour Lines Inspection Chamber

AP Anchor Point FBW Fence Barbed Wire LB Litter Bin FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole FEL Fence Electric BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve FFL Finished Floor Level TCB Telephone

FP Flagpole

THL Threshold Level

P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision

# Issues & Revisions



☐ Nottingham | 0115 924 1100 www.bwbconsulting.com

### Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

394366.152

394642.880

394598.803

395037.711 395202.700

394552.869 394344.428 395114.863

### **Existing Site Plan** Sheet 3 of 12

Drawn:	D.Smith		Reviewed:	S.Shreeves		
BWB Ref:	233398 Date:		02.08.24	Scale@A1: 1:1000		
Drawing Status						

### Information

Project - Originator - Zone - Level - Type - Role - Number

233398-BWB-00-03-DR-G-0001



- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer
    - No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
    - station information below for on site control establishment. All coordinates and height data relate to OSGB36(15). Control stations
  - are coordinated by means of GPS receiving real time corrections via OS smart net.
  - All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
  - 8. OS license number: 100022432





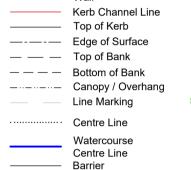
### Legend OS Buildings ----- Wall Kerb Channel Line — Top of Kerb —-—- Edge of Surface — — Top of Bank

Fence

Gate Gate

CTV Cable TV DC Drainage

Channel





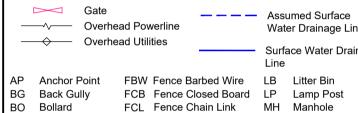
Contour Lines Inspection Chamber Flow direction and pipe diameter

Station and Name

Monitoring Borehole

Water Drainage Line

Surface Water Drainage



				Line	
AP	Anchor Point	FBW	Fence Barbed Wire	LB	Litter Bin
BG	Back Gully	FCB	Fence Closed Board	LP	Lamp Post
во	Bollard	FCL	Fence Chain Link	MH	Manhole
BS	Bus Stop	FEL	Fence Electric	Mkr	Service Marker
вт	British Telecom	FMP	Fence Metal Panel	PB	Post Box
С	Crest	<b>FMR</b>	Fence Metal Railing	PT	Post
CL	Cover Level	FOB	Fence Open Board	RE	Rodding Eye
CMP	Cable Marker	FPW	Fence Post & Wire	SP	Sign Post
	Post	FSP	Fence Steel Palisade	ST	Stop Tap
CCTV	/Security Camera	FWM	Fence Wire Mesh	SV	Stop Valve
CTV	Cable TV	FFL	Finished Floor Level	TCB	Telephone
			Et a constant		O-II D-II

THL Threshold Level DK Drop Kerb GV Gas Valve TL Traffic Light
DP Down Pipe GY Gully TP Telegraph Post
Elec Electric Ht Height TS Traffic Signal
EP Electricity Post IC Inspection Chamber UTS Unable to Survey

P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision

Issues & Revisions



www.bwbconsulting.com

# Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

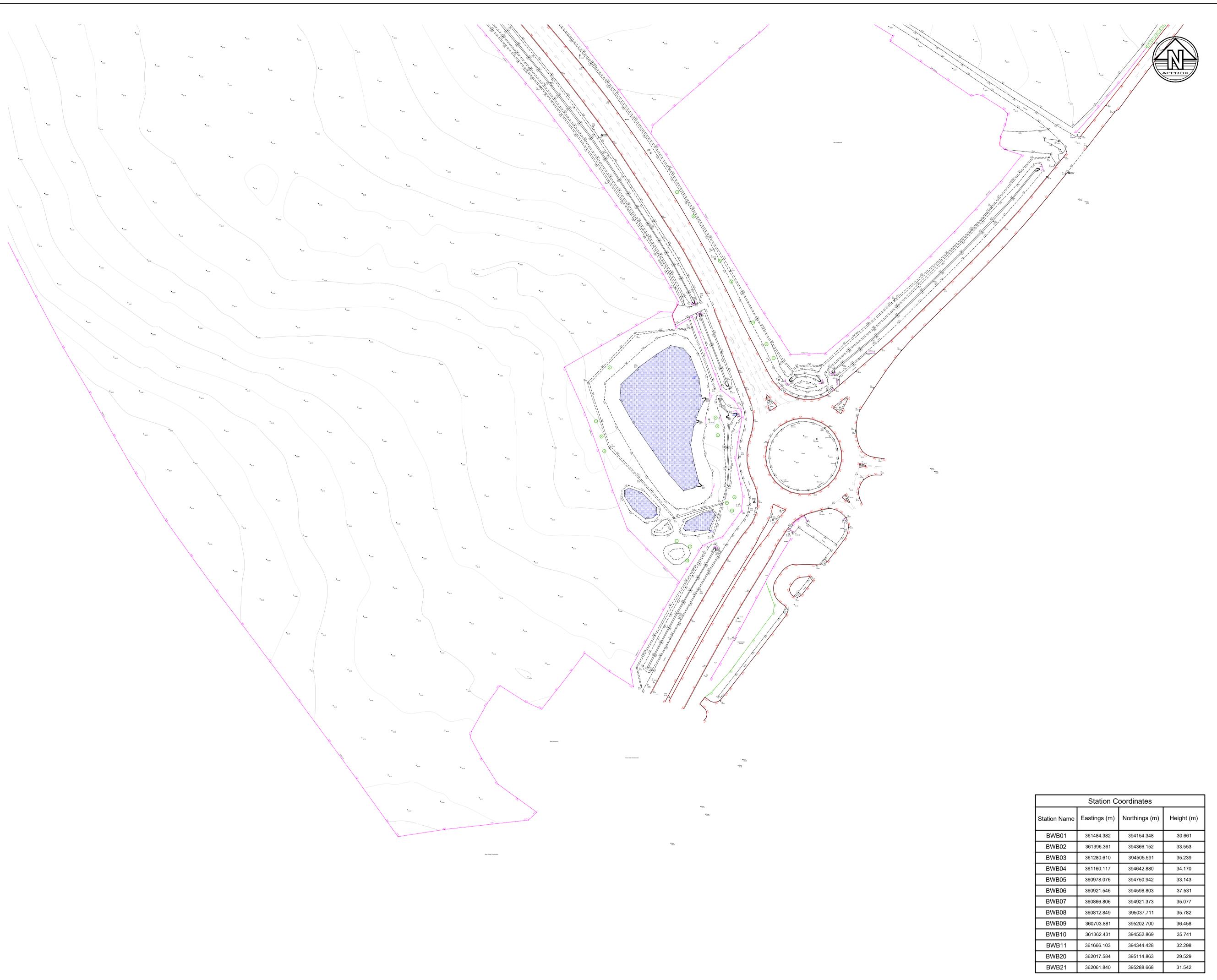
# Existing Site Plan Sheet 4 of 12

Drawn:	D.Smith		Reviewed:	S.Shreeves		
BWB Ref:	233398 Date:		02.08.24	Scale@A1:	1:1000	

# Information

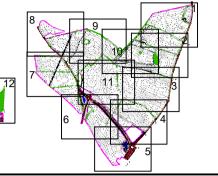
Project - Originator - Zone - Level - Type - Role - Number

233398-BWB-00-04-DR-G-0001 S2 P2

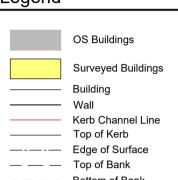


- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer
    - No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
    - station information below for on site control establishment. All coordinates and height data relate to OSGB36(15). Control stations
  - are coordinated by means of GPS receiving real time corrections via OS smart net.
  - All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
  - 8. OS license number: 100022432





### Legend



— — — Bottom of Bank ---- Canopy / Overhang Line Marking Centre Line

———— Barrier

Gate

BG Back Gully BO Bollard

BS Bus Stop

CTV Cable TV

Channel

DC Drainage

C Crest

Fence

── Overhead Utilities

Extent of Tree Canopy Body of Water <sup>+</sup>50.00 Spot Level

— — — Assumed Surface Water Drainage Line Surface Water Drainage AP Anchor Point FBW Fence Barbed Wire LB Litter Bin FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box

Call Box

Contour Lines Inspection Chamber Flow direction and pipe diameter

Station and Name

Monitoring Borehole

Tree / Bush / Sapling

FEL Fence Electric FMR Fence Metal Railing PT Post CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve

FFL Finished Floor Level TCB Telephone THL Threshold Level

DK Drop Kerb GV Gas Valve TL Traffic Light
DP Down Pipe GY Gully TP Telegraph Post
Elec Electric Ht Height TS Traffic Signal
EP Electricity Post IC Inspection Chamber UTS Unable to Survey ER Earth Rod IFL Internal Floor Level WL Water Level
FH Fire Hydrant IL Invert Level WM Water Meter
FL Floodlight (as a reduced level) WO Wash Out

P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision Issues & Revisions

www.bwbconsulting.com

Birmingham | 0121 233 3322

### Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

### **Existing Site Plan** Sheet 5 of 12

Drawn:	D.Smith		Reviewed:	S.Shreeves	
BWB Ref:	233398	Date:	02.08.24	Scale@A1:	1:1000
Describe Otation					

## Information

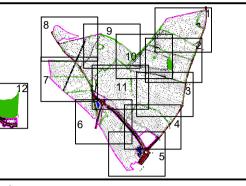
Project - Originator - Zone - Level - Type - Role - Number

233398-BWB-00-05-DR-G-0001

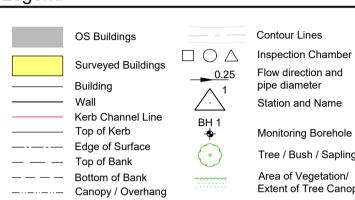


- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
- Any discrepancies noted on site are to be reported to the engineer
  - No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
  - station information below for on site control establishment. All coordinates and height data relate to OSGB36(15). Control stations
- are coordinated by means of GPS receiving real time corrections via OS smart net.
- may occur. More accurate data is only achievable via confined space
- 8. OS license number: 100022432





### Legend



Fence

Line Marking Centre Line

Extent of Tree Canopy Body of Water Body of Water from OS <sup>+</sup>50.00 Spot Level

— — — Assumed Surface Water Drainage Line Surface Water Drainage

Contour Lines

Flow direction and pipe diameter Station and Name

Monitoring Borehole

Tree / Bush / Sapling

Call Box THL Threshold Level

AP Anchor Point FBW Fence Barbed Wire LB Litter Bin FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole FEL Fence Electric Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve FFL Finished Floor Level TCB Telephone

DK Drop Kerb GV Gas Valve TL Traffic Light
DP Down Pipe GY Gully TP Telegraph Post
Elec Electric Ht Height TS Traffic Signal
EP Electricity Post IC Inspection Chamber UTS Unable to Survey

EP Electricity 1 co.

ER Earth Rod IFL Internal Floor Level WL water Level
FH Fire Hydrant IL Invert Level WM Water Meter
(as a reduced level) WO Wash Out P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision

Issues & Revisions



Birmingham | 0121 233 3322 ☐ Nottingham | 0115 924 1100 www.bwbconsulting.com

### Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

### **Existing Site Plan** Sheet 6 of 12

Drawn:	D.Smith		Reviewed:	S.Shreeves		
BWB Ref:	233398	Date:	02.08.24	Scale@A1:	1:1000	

## Information

Project - Originator - Zone - Level - Type - Role - Number



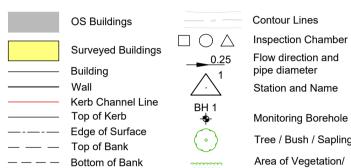
- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- . This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer
  - No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
  - station information below for on site control establishment.
  - All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via OS smart net.
  - All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
  - 8. OS license number: 100022432

### Key Plan





### Legend



Line Marking

———— Barrier

Gate Gate

Crest

Channel

Centre Line Watercourse

Centre Line

Fence

── Overhead Utilities

---- Canopy / Overhang Body of Water Body of Water from OS

───

Overhead Powerline

<sup>+</sup>50.00 Spot Level — — — Assumed Surface Water Drainage Line

 Surface Water Drainage AP Anchor Point FBW Fence Barbed Wire LB Litter Bin FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole FEL Fence Electric Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post

Contour Lines

Flow direction and pipe diameter

Station and Name

Monitoring Borehole

Tree / Bush / Sapling

Area of Vegetation/

Extent of Tree Canopy

FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve FFL Finished Floor Level TCB Telephone FP Flagpole Call Box THL Threshold Level TL Traffic Light TP Telegraph Post
TS Traffic Signal

EP Electricity Post IC Inspection Chamber UTS Unable to Survey ER Earth Rod IFL Internal Floor Level
FH Fire Hydrant IL Invert Level Invert Level WM Water Meter (as a reduced level) WO Wash Out

P1 02.08.24 First Issue Rev Date Details of issue / revision Issues & Revisions



www.bwbconsulting.com

### Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

### **Existing Site Plan** Sheet 7 of 12

Drawn:	D.Smith		Reviewed:	S.Shreeves		
BWB Ref:	233398 Date:		02.08.24	Scale@A1:	1:1000	

#### Drawing Status Information

Project - Originator - Zone - Level - Type - Role - Number

Station Coordinates

Northings (m)

394154.348

394366.152

394505.591

394642.880

394750.942

394598.803

394921.373

395037.711

395202.700

394552.869

394344.428

395114.863

395288.668

Eastings (m)

361484.382

361396.361

361280.610

361160.117

360978.076

360921.546

360866.806

360812.849

360703.881

361362.431

361666.103

362017.584

362061.840

Station Name

BWB04

BWB20

Station Coordinates									
Station Name	Eastings (m)	Northings (m)	Height (m)						
BWB01	361484.382	394154.348	30.661						
BWB02	361396.361	394366.152	33.553						
BWB03	361280.610	394505.591	35.239						
BWB04	361160.117	394642.880	34.170						
BWB05	360978.076	394750.942	33.143						
BWB06	360921.546	394598.803	37.531						
BWB07	360866.806	394921.373	35.077						
BWB08	360812.849	395037.711	35.782						
BWB09	360703.881	395202.700	36.458						
BWB10	361362.431	394552.869	35.741						
BWB11	361666.103	394344.428	32.298						

362061.840

BWB21

29.529



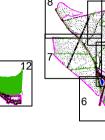
### Notes

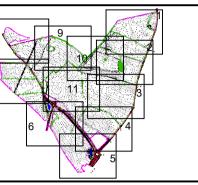
- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects,
- engineers and specialists drawings and specifications. All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
- Any discrepancies noted on site are to be reported to the engineer
- No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
- station information below for on site control establishment. All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via
- OS smart net. All manhole data is collected from ground level therefore discrepancies

may occur. More accurate data is only achievable via confined space

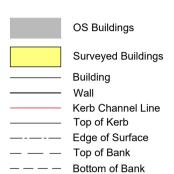
8. OS license number: 100022432

### Key Plan





### Legend



Line Marking

BG Back Gully

Crest

CTV Cable TV

BO Bollard BS Bus Stop

Flow direction and pipe diameter Station and Name Monitoring Borehole Tree / Bush / Sapling ---- Canopy / Overhang

Extent of Tree Canopy Body of Water Body of Water from OS <sup>+</sup>50.00 Spot Level

Contour Lines

Centre Line Barrier Fence Gate — — — Assumed Surface ───

Overhead Powerline ── Overhead Utilities

Water Drainage Line Surface Water Drainage AP Anchor Point FBW Fence Barbed Wire LB Litter Bin FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post

Call Box

FEL Fence Electric CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve FFL Finished Floor Level TCB Telephone FP Flagpole

THL Threshold Level DK Drop Kerb GV Gas Valve TL Traffic Light
DP Down Pipe GY Gully TP Telegraph Post
Elec Electric Ht Height TS Traffic Signal
EP Electricity Post IC Inspection Chamber UTS Unable to Survey

ER Earth Rod IFL Internal Floor Level WL Water Level
FH Fire Hydrant IL Invert Level WM Water Meter
FL Floodlight (as a reduced level) WO Wash Out

 
 P2
 17.10.24
 Langtree (2) Land Added

 P1
 02.08.24
 First Issue
 Rev Date Details of issue / revision Issues & Revisions

☐ Nottingham | 0115 924 1100 www.bwbconsulting.com Tritax Symmetry SRFI North Ltd

## Intermodal Logistics Park North

# Existing Site Plan Sheet 8 of 12

Drawn:	D.Smith		Reviewed:	es		
BWB Ref:	233398 Date:		02.08.24	Scale@A1: 1:1000		

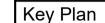
#### Drawing Status Information

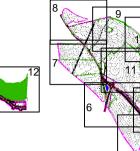
Project - Originator - Zone - Level - Type - Role - Number 233398-BWB-00-08-DR-G-0001 S2 P2

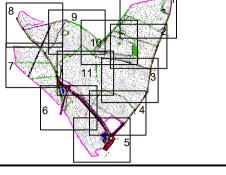


	Station C	oordinates	
Station Name	Eastings (m)	Northings (m)	Height (m
BWB01	361484.382	394154.348	30.661
BWB02	361396.361	394366.152	33.553
BWB03	361280.610	394505.591	35.239
BWB04	361160.117	394642.880	34.170
BWB05	360978.076	394750.942	33.143
BWB06	360921.546	394598.803	37.531
BWB07	360866.806	394921.373	35.077
BWB08	360812.849	395037.711	35.782
BWB09	360703.881	395202.700	36.458
BWB10	361362.431	394552.869	35.741
BWB11	361666.103	394344.428	32.298
BWB20	362017.584	395114.863	29.529
BWB21	362061.840	395288.668	31.542

- Do not scale this drawing. All dimensions must be checked/verified on site. If in doubt ask.
- . This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
  - Any discrepancies noted on site are to be reported to the engineer
  - No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
  - station information below for on site control establishment.
  - All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via OS smart net.
  - All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
  - 8. OS license number: 100022432







# Legend OS Buildings

---- Canopy / Overhang Line Marking

── Overhead Utilities

BO Bollard

C Crest

DC Drainage

Channel

BS Bus Stop

----- Wall

Contour Lines Flow direction and pipe diameter Station and Name Kerb Channel Line — Top of Kerb —-—- Edge of Surface — — Top of Bank ---- Bottom of Bank

Monitoring Borehole Tree / Bush / Sapling Area of Vegetation/ Extent of Tree Canopy Body of Water Body of Water from OS

 Centre Line Centre Line ——— Barrier Fence Gate Gate ──^
Overhead Powerline

<sup>+</sup>50.00 Spot Level — — — Assumed Surface Water Drainage Line Surface Water Drainage

AP Anchor Point FBW Fence Barbed Wire LB Litter Bin BG Back Gully FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole FEL Fence Electric Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve Call Box

CTV Cable TV FFL Finished Floor Level TCB Telephone FP Flagpole THL Threshold Level

DK Drop Kerb GV Gas Valve TL Traffic Light
DP Down Pipe GY Gully TP Telegraph Post
Elec Electric Ht Height TS Traffic Signal
EP Electricity Post IC Inspection Chamber UTS Unable to Survey
ER Earth Rod IFL Internal Floor Level WL Water Level
FH Fire Hydrant IL Invert Level WM Water Meter
FL Floodlight (as a reduced level) WO Wash Out

P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision Issues & Revisions



☐ Nottingham | 0115 924 1100 www.bwbconsulting.com Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

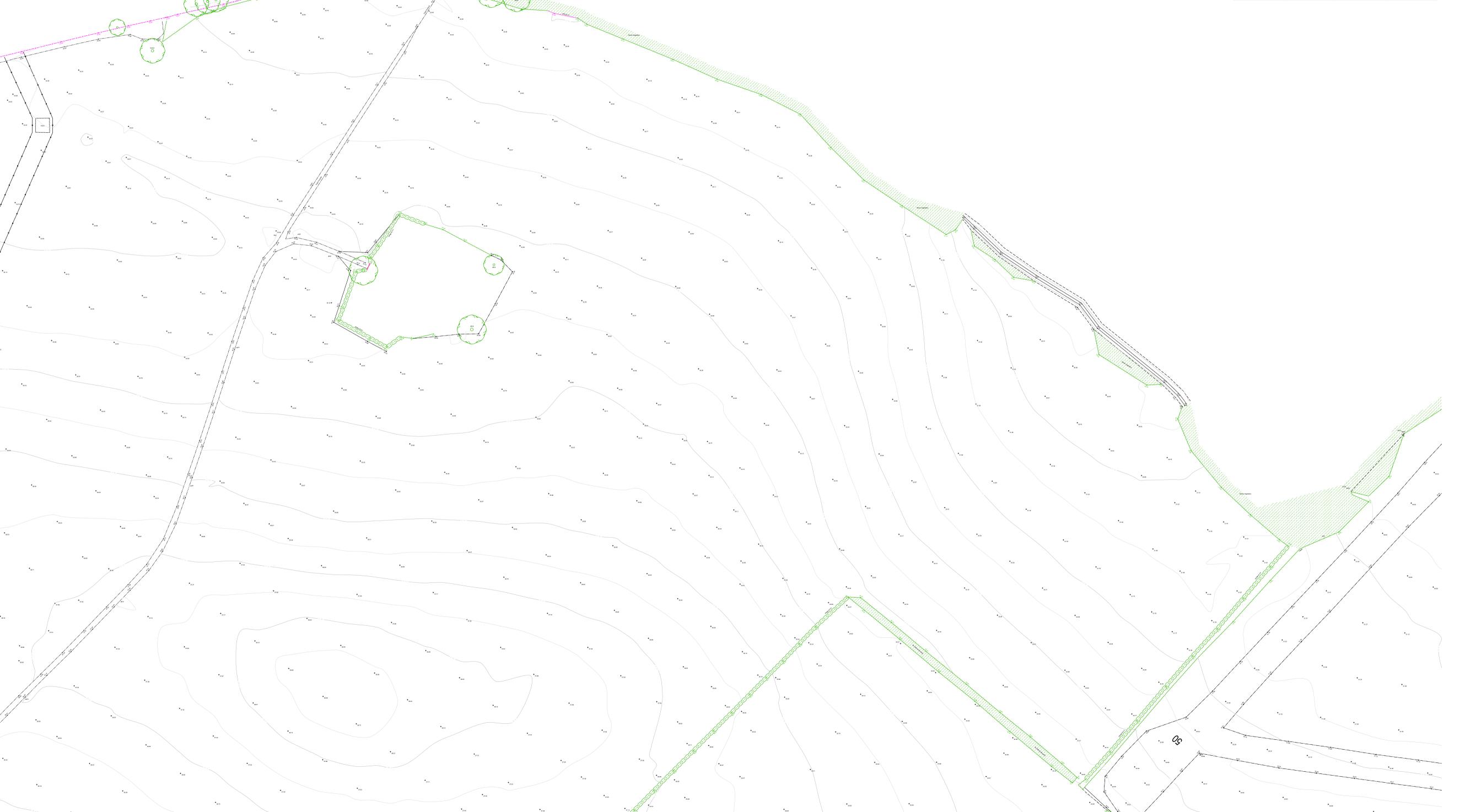
# Existing Site Plan Sheet 9 of 12

Ľ	Drawn:	D.Smith		Reviewed:	s		
	BWB Ref:	233398 Date:		02.08.24	Scale@A1: 1:1000		

# Information

Project - Originator - Zone - Level - Type - Role - Number 233398-BWB-00-09-DR-G-0001 S2 P2

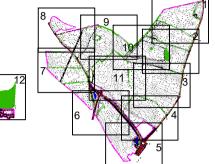
C:\Users\daniel.smith\Desktop\Ongoing Work Dan\233398 - ILP North\233398-BWB-00-ZZ-M2-G-0001-Existing Site 2D Model.dwg



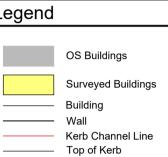


- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects,
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
- Any discrepancies noted on site are to be reported to the engineer
- No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
- station information below for on site control establishment. All coordinates and height data relate to OSGB36(15). Control stations
- are coordinated by means of GPS receiving real time corrections via OS smart net.
- All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
- 8. OS license number: 100022432





### Legend



—-—- Edge of Surface — — Top of Bank --- Bottom of Bank

---- Canopy / Overhang Line Marking Centre Line Barrier Fence

Tree / Bush / Sapling Extent of Tree Canopy Body of Water Body of Water from OS <sup>+</sup>50.00 Spot Level

Contour Lines Inspection Chamber Flow direction and pipe diameter

Station and Name

Monitoring Borehole

Call Box

— — — Assumed Surface ───

Overhead Powerline Water Drainage Line ── Overhead Utilities Surface Water Drainage AP Anchor Point FBW Fence Barbed Wire LB Litter Bin FEL Fence Electric

FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve FFL Finished Floor Level TCB Telephone

FP Flagpole THL Threshold Level DK Drop Kerb GV Gas Valve TL Traffic Light
DP Down Pipe GY Gully TP Telegraph Post
Elec Electric Ht Height TS Traffic Signal
EP Electricity Post IC Inspection Chamber UTS Unable to Survey

ER Earth Rod IFL Internal Floor Level WL Water Level
FH Fire Hydrant IL Invert Level WM Water Meter
(as a reduced level) WO Wash Out

 P2
 17.10.24
 Langtree (2) Land Added

 P1
 02.08.24
 First Issue

 Rev Date Details of issue / revision Issues & Revisions



☐ Nottingham | 0115 924 1100 www.bwbconsulting.com

### Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

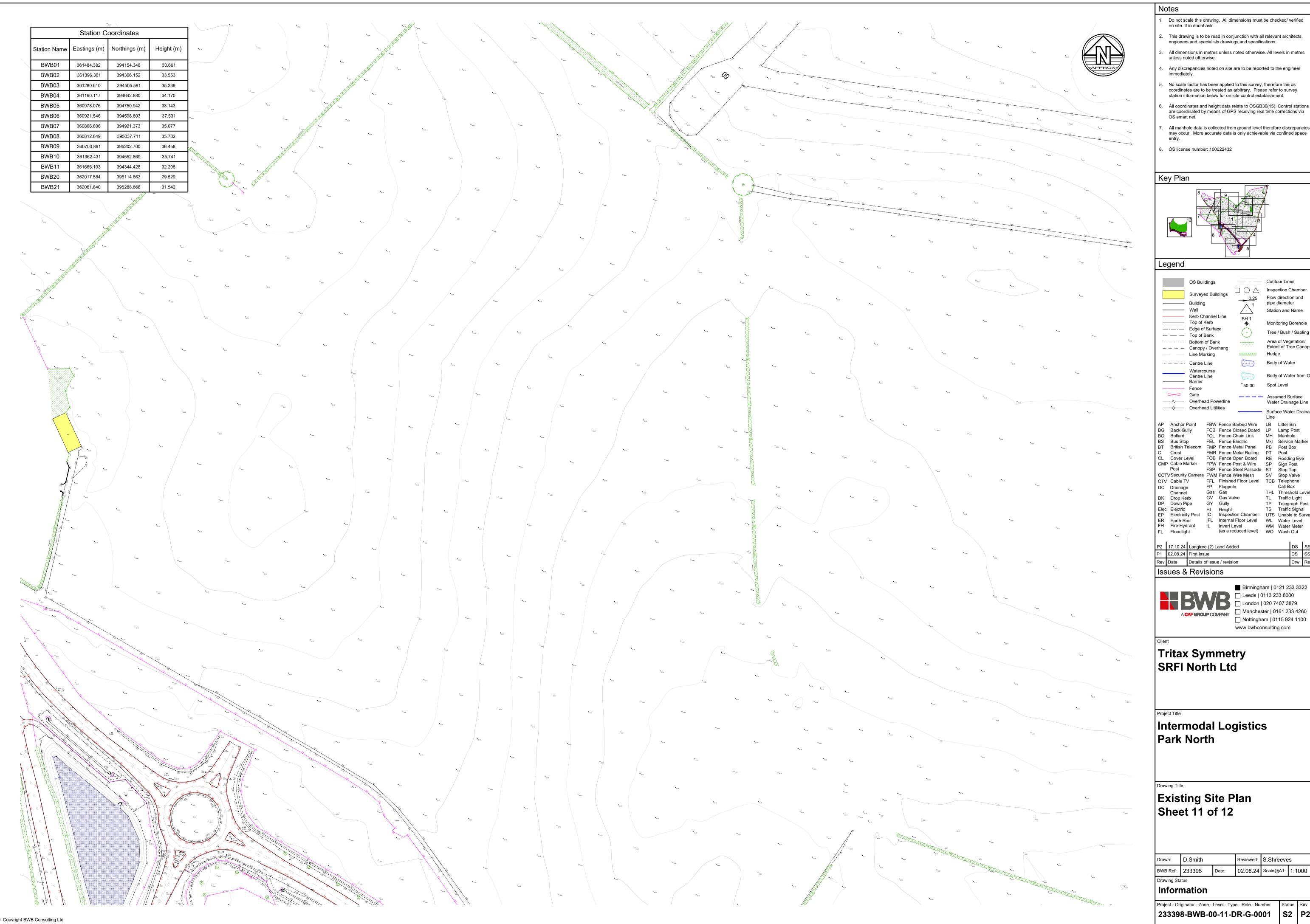
### **Existing Site Plan Sheet 10 of 12**

Drawn:	D.Smith		Reviewed:	S.Shreeve	es		
BWB Ref:	233398 Date:		02.08.24	Scale@A1:	1:1000		

### Drawing Status Information

Project - Originator - Zone - Level - Type - Role - Number

233398-BWB-00-10-DR-G-0001 S2 P2

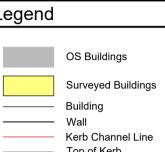


- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- This drawing is to be read in conjunction with all relevant architects,
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
- Any discrepancies noted on site are to be reported to the engineer
- No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
- station information below for on site control establishment. All coordinates and height data relate to OSGB36(15). Control stations
- OS smart net. All manhole data is collected from ground level therefore discrepancies

### Key Plan



### Legend



Top of Kerb —-—- Edge of Surface — — Top of Bank — — — Bottom of Bank ---- Canopy / Overhang Line Marking

Centre Line Barrier Fence

<sup>+</sup>50.00 Spot Level ───

Overhead Powerline

— — — Assumed Surface Water Drainage Line Surface Water Drainage AP Anchor Point FBW Fence Barbed Wire LB Litter Bin FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole FEL Fence Electric Mkr Service Marker

Contour Lines Inspection Chamber Flow direction and pipe diameter

Station and Name

Monitoring Borehole

Tree / Bush / Sapling

Extent of Tree Canopy

Body of Water from OS

Body of Water

BT British Telecom FMP Fence Metal Panel PB Post Box FMR Fence Metal Railing PT Post CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve FFL Finished Floor Level TCB Telephone FP Flagpole Call Box THL Threshold Level DK Drop Kerb GV Gas Valve TL Traffic Light
DP Down Pipe GY Gully TP Telegraph Post
Elec Electric Ht Height TS Traffic Signal
EP Electricity Post IC Inspection Chamber UTS Unable to Survey

EP Electricity 1 co.

ER Earth Rod IFL Internal Floor Level WL water Level
FH Fire Hydrant IL Invert Level WM Water Meter
(as a reduced level) WO Wash Out P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision

Issues & Revisions



☐ Nottingham | 0115 924 1100 www.bwbconsulting.com

### Tritax Symmetry SRFI North Ltd

### Intermodal Logistics Park North

### **Existing Site Plan Sheet 11 of 12**

Drawn:	D.Smith		Reviewed:	S.Shreeves		
BWB Ref:	233398	Date:	02.08.24	Scale@A1:	1:1000	

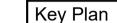
### Drawing Status Information

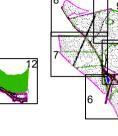
Project - Originator - Zone - Level - Type - Role - Number

233398-BWB-00-11-DR-G-0001

Station C	oordinates													
Eastings (m)	Northings (m)	Height (m)												
361484.382	394154.348	30.661		F (2)										
361396.361	394366.152	33.553		*33.16										
361280.610 361160.117	394505.591 394642.880	35.239 34.170	·	30,53										
360978.076	394750.942	33.143												
360921.546 360866.806	394598.803 394921.373	37.531 35.077	nn+ 8											
360812.849	395037.711	35.782	/ ///////											
360703.881 361362.431	395202.700 394552.869	36.458 35.741	2011											
361666.103	394344.428	32.298	ж.											Ĩ <sup>*</sup>
362017.584	395114.863	29.529												
362061.840		31.542								10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		* 3.2 * 3.2	*3.31 *3.32 *3.32 *3.33	
											22.71 A 20.00			

- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
- . This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
- All dimensions in metres unless noted otherwise. All levels in metres unless noted otherwise.
- Any discrepancies noted on site are to be reported to the engineer immediately.
- No scale factor has been applied to this survey, therefore the os coordinates are to be treated as arbitrary. Please refer to survey
- station information below for on site control establishment.
- All coordinates and height data relate to OSGB36(15). Control stations are coordinated by means of GPS receiving real time corrections via OS smart net.
- All manhole data is collected from ground level therefore discrepancies may occur. More accurate data is only achievable via confined space
- 8. OS license number: 100022432

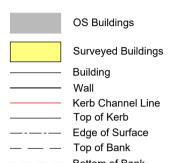




\_\_\_\_0.25

BḤ 1

### Legend



Gate Gate

BO Bollard

DC Drainage

Channel

── Overhead Utilities

---- Bottom of Bank ---- Canopy / Overhang — Line Marking Centre Line Watercourse Centre Line ——— Barrier Fence

Hedge Body of Water ─── Overhead Powerline

Body of Water from OS <sup>+</sup>50.00 Spot Level — — — Assumed Surface Water Drainage Line Surface Water Drainage

Contour Lines

pipe diameter

Flow direction and

Station and Name

Monitoring Borehole

Tree / Bush / Sapling

Area of Vegetation/

Extent of Tree Canopy

AP Anchor Point FBW Fence Barbed Wire LB Litter Bin BG Back Gully FCB Fence Closed Board LP Lamp Post FCL Fence Chain Link MH Manhole BS Bus Stop FEL Fence Electric Mkr Service Marker BT British Telecom FMP Fence Metal Panel PB Post Box C Crest FMR Fence Metal Railing PT Post
CL Cover Level FOB Fence Open Board RE Rodding Eye CMP Cable Marker FPW Fence Post & Wire SP Sign Post Post FSP Fence Steel Palisade ST Stop Tap CCTVSecurity Camera FWM Fence Wire Mesh SV Stop Valve

CTV Cable TV FFL Finished Floor Level TCB Telephone FP Flagpole Call Box THL Threshold Level Gas Gas DK Drop Kerb GV Gas Valve TL Traffic Light
DP Down Pipe GY Gully TP Telegraph Post
Elec Electric Ht Height TS Traffic Signal
EP Electricity Post IC Inspection Chamber UTS Unable to Survey

ER Earth Rod IFL Internal Floor Level WL Water Level
FH Fire Hydrant IL Invert Level WM Water Meter
FL Floodlight (as a reduced level) WO Wash Out

P2 17.10.24 Langtree (2) Land Added
P1 02.08.24 First Issue
Rev Date Details of issue / revision

Birmingham | 0121 233 3322

# Issues & Revisions



☐ Nottingham | 0115 924 1100 www.bwbconsulting.com

## Tritax Symmetry **SRFI North Ltd**

### Intermodal Logistics Park North

### **Existing Site Plan Sheet 12 of 12**

Drawn:	D.Smith		Reviewed:	S.Shreeves			
BWB Ref:	233398 Date:		02.08.24	Scale@A1:	1:1000		

### Drawing Status Information

Project - Originator - Zone - Level - Type - Role - Number 233398-BWB-00-12-DR-G-0001

Station Name | Eastings (m)

BWB01

BWB03

BWB04

BWB05

BWB07

BWB09

BWB10

BWB11

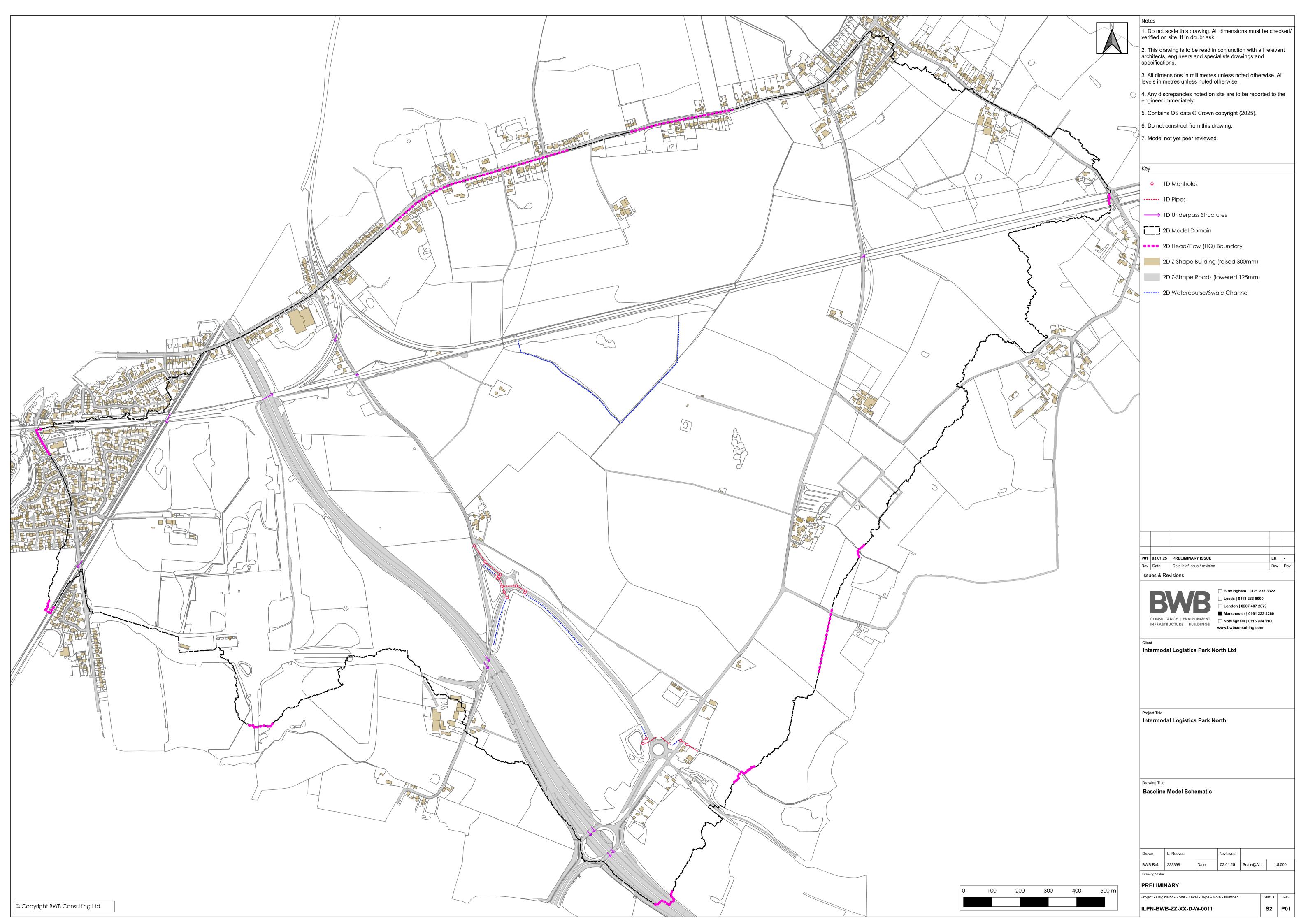
BWB20

BWB21

Intermodal Logistics Park North, Warrington Hydraulic Model Report January 2025 233398-BWB-ZZ-XX-T-W-0001\_HMR



Appendix 2: Baseline Model Schematic



Intermodal Logistics Park North, Warrington Hydraulic Model Report January 2025 233398-BWB-ZZ-XX-T-W-0001\_HMR



Appendix 3: Baseline Floodplain Maps