OMEGA ZONE 8, ST HELENS

Omega St Helens Ltd / T J Morris Ltd

Drainage Strategy Report
OPP DOC. 8.

Omega St. Helens / T.J. Morris Limited

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OPP DOC.8 Drainage Strategy Report

70060349-WSP-ZZ-XX-RP-D-001
AUGUST 2020

PUBLIC

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REPORT (REV05) PUBLIC

PROJECT NO. 70060349

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DATE: AUGUST 2020

WSP

Three White Rose Office Park
Millshaw Park Lane
Leeds
LS11 0DL

Phone: +44 113 395 6200

Fax: +44 113 395 6201

WSP.com

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EXECUTIVE SUMMARY

This Drainage Strategy has been prepared as part of the supporting documentation for the hybrid planning application for both full and outline planning permission of the westward expansion of the Omega Business Park, south of the M62.

The Drainage Strategy has been prepared by WSP on behalf of Omega St. Helens / T.J. Morris Limited (referred to as "the Applicant") in accordance with the guidelines set out in the National Planning Policy Framework (NPPF).

The application site covers an area of approximately 75 hectares (ha) and is classified as a greenfield site. The application site is currently used as agricultural land.

The development proposals consist of the following development (major development):

- Full Planning Permission for the erection of a B8 warehouse, with ancillary offices, associated parking, infrastructure and landscaping; and
- Outline Planning Permission for Manufacturing (B2) and Logistics (B8) development with ancillary offices and associated car parking, landscaping and infrastructure (detailed matters of appearance, layout and scale are reserved for subsequent approval).

As a result of the development proposals the proportion of the application site that is impermeable will increase to 40.600 Ha.

SURFACE WATER DRAINAGE

The available ground investigation data indicates that the application site is underlain by glacial till deposits which will preclude the use of infiltration as a means of surface water disposal.

Where practical the proposed surface water drainage will reflect the existing drainage regime. It is therefore proposed that surface water flows from the development will drain to the watercourses which pass through the application site as the primary means of surface water disposal.

In accordance with the lead local flood authority's design and technical guidance, it is proposed that peak flows leaving the application site are restricted to the existing greenfield run-off rate by means of a series of SUDS features around the Proposed Development.

In order to limit the rate of surface water runoff, the drainage system to each unit will incorporate various SUDS features such as swales and attenuation ponds to restrict and treat surface water run-off. These features will be used to treat, convey and store surface water runoff from impermeable areas for storm events up to and including a 1 in 100 year event plus 40% climate change.

The combination of the cascading conveyance swales, storage swales and attenuation ponds will provide a multi-stage treatment train for surface water run off to enhance the quality of surface water leaving the application site.

The SUDS features will be privately maintained by an appointed management company.

FOUL WATER DRAINAGE

It is proposed to install a new foul water sewer system to serve the application site. United Utilities has confirmed that foul will be allowed to drain to the public foul sewer network at an unrestricted rate. A foul water pumping station will be required to service the Proposed Development.

The foul water pumping station and sewerage proposed in public areas will be designed and constructed in accordance with Sewers for Adoption for adoption and maintenance by United Utilities. The below ground foul water drainage network within the application site boundary will remain in private ownership and will be operated and maintained privately.

1 INTRODUCTION

1.1 APPOINTMENT AND BRIEF

1.1.1. WSP UK Ltd has been commissioned by Omega St. Helens / T.J. Morris Limited (referred to as "the Applicant") to provide a drainage strategy. This will support a planning application for the westward expansion of the Omega Business Park, south of the M62.

1.1.2. A site location plan is included in **Appendix A**.

1.2 PROPOSED DEVELOPMENT

1.2.1. The Proposed Development is subject to a hybrid planning application for both full and outline planning permission and is described below.

1.2.2. Hybrid planning application for the following development (major development):

- Full Planning Permission for the erection of a B8 warehouse, with ancillary offices, associated parking, infrastructure and landscaping; and
- Outline Planning Permission for Manufacturing (B2) and Logistics (B8) development with ancillary offices and associated car parking, landscaping and infrastructure (detailed matters of appearance, layout and scale are reserved for subsequent approval).

1.2.1. External features of the full planning application for the B8 logistics warehouse, referred to as Omega Zone 8 Unit 1, are as follows:

- Overall total 81,570sq.m building;
- A total of 576 car parking spaces;
- 383 HGV parking spaces;
- Service yards;
- An attenuation pond to the north east and west of Unit 1; and
- Inbound and outbound gatehouse.

1.2.2. The outline planning proposals, which will extend to the south of Unit 1 but also include an area of future expansion land for Unit 1 (to the east), are for up to 123,930 sq.m of employment development, spread across the Unit 1 expansion land and three separate warehouse buildings to the south (Units 2, 3 & 4).

1.2.3. Copies of the development proposals are included in **Appendix B**.

1.3 STUDY OBJECTIVE

1.3.1. The objective of the assessment is to develop a drainage strategy of suitable scope and detail to support the planning application for the Proposed Development. In doing so, this assessment will:

- Identify the relevant local and national policy for managing surface water;
- From the above, identify peak surface water flows;
- Establish discharge points for surface water;
- Identify required surface water storage volumes;
- Develop a SuDS strategy for managing the movement and storage of surface water across the application site; and
- Identify a strategy for managing foul water from the application site.

1.4 LIMITATIONS

1.4.1. This report is based on the interpretation and assessment of data provided by third parties.

1.4.2. Whilst every care has been taken to ensure this information is accurate and up-to-date, WSP cannot guarantee the accuracy of third-party data. The findings of this report may change if the data is amended or updated after consultation.

1.4.3. The recommendations made within this report may also be subject to change upon receipt of consultation responses.

2 POLICY & GUIDANCE

2.1 POLICY & GUIDANCE DOCUMENTS

2.1.1. A desk study and data research included review of the following local and national planning policy guidance documents:

- St. Helens Council Lead Local Flood Risk Management Strategy 2014;
- St. Helens Council Preliminary Flood Risk Assessment 2017;
- St. Helens Council Strategic Flood Risk Assessment 2014;
- St. Helens Council Sustainable Drainage Systems (SuDS) 2019 - Design and Technical Guidance Consultation Draft;
- Non-statutory technical standards for sustainable drainage systems, DEFRA 2015;
- The SuDS Manual (CIRIA C753), CIRIA 2015;
- Part H of the Building Regulations HM Government 2015;
- Sewers for Adoption 7th Edition wrc 2012; and
- Environment Agency web-based data

2.2 PART H OF THE BUILDING REGULATIONS

2.2.1. Requirement H3 of the Building Regulations 2000 establishes a preferred hierarchy for surface water disposal. Consideration should first be given to discharge to soakaway, infiltration system and watercourse in that priority order.

2.2.2. Sustainable Drainage Systems (SuDS), for example the use of soakaways and/or permeable hardstanding etc, would be a suitable solution for surface water disposal appropriate in this situation.

2.2.3. If other methods of surface water disposal are not viable and subject to providing satisfactory evidence as to why they have been discounted, site surface water may discharge to the public sewer at a rate of discharge agreed with statutory authorities.

2.3 NON-STATUTORY SUSTAINABLE DRAINAGE TECHNICAL STANDARDS (MARCH 2015)

2.3.1. The Non-Statutory Sustainable Drainage Technical Standards document sets out the technical standards for sustainable drainage systems (SuDS).

2.3.2. The standards state that for greenfield developments the peak runoff rate from the development to any highway drain, sewer or surface water body for the 100% annual probability rainfall event and 1% annual probability rainfall event should never exceed the peak greenfield runoff rate for the same event.

2.3.3. For Greenfield developments, where reasonably practicable, the runoff volume from the development to any highway drain, sewer or surface water body should not exceed the Greenfield runoff volume for the event that has a 1% chance of occurring in any given year. If this is not practical, the runoff volume must be discharged at a rate that does not increase flood risk.

2.3.4. The drainage system must be designed so that unless an area is designated to hold and / or convey water as part of the design, flooding does not occur on any part of the site for events up to and including rainfall events with a 3.3% chance of occurring in any given year, and flooding does not occur during rainfall events with a 1% chance of occurring in any given year in any part of a building

or utility plant susceptible to water. The design of the site must ensure that where reasonably practicable flows resulting from a rainfall in excess of a 1% annual probability rainfall event are managed in exceedance routes that minimise risks to people and property.

2.3.5. Components must be designed to ensure structural integrity of the drainage system, and any adjacent structures of the design lifetime of the development, and the materials which are specified by the design must be of a suitable nature for their intended use.

2.3.6. Pumping should only be used to facilitate drainage for those parts of the site where it is not reasonably practicable to drain water by gravity.

2.3.7. The mode of construction of any communication with an existing sewer or drainage system must be such that the making of the communication would not be prejudicial to the structural integrity and functionality of the system. Any drainage which does occur must be minimised and restricted before the drainage system is classified as complete.

2.4 ST. HELENS COUNCIL SUSTAINABLE DRAINAGE SYSTEMS (SUDS) 2019 - DESIGN AND TECHNICAL GUIDANCE CONSULTATION DRAFT

2.4.1. Development of land has the potential to increase existing flood risk and the cumulative impacts of development on flood risk, if left unmanaged, may result in significant deleterious impact on the local environment. Development planning, ensuring effective use of SuDS to manage and reduce surface water runoff, is considered an essential aspect of all new development proposals.

2.4.2. The guidance document includes a checklist to be used as a basis of the SuDS approval process. This is presented in five sections:

- Application Details
- General Details and SuDS Proposals
- Hydraulic Assessment of SuDS Proposals
- SuDS Discharge Proposals and Agreements
- SuDS Maintenance and Management Proposals

2.5 ST. HELENS COUNCIL SUSTAINABLE DRAINAGE DRAFT GUIDANCE

ADVICE ON POLICY CONSIDERATIONS:

2.5.1. Consider how the development proposal meets national and local planning policies, standards and guidance in relation to the sustainable drainage system, management of surface water flood risk, and climate change. Land Drainage Consent may also be required if a watercourse is going to be affected in the development. Land Drainage Consent is required from the Lead Local Flood Authority (LLFA) for Ordinary watercourse designation and the Environment Agency for Main Rivers designation watercourses.

2.5.2. The minimum surface water pipe size the Lead Local Flood Authority (LLFA) will allow is 150mm (over Building Regulations), this is only relaxed when discharge control units are utilised. Modelling used for a development such as Microdrainage must include the area SAAR values and not the default values provided. For the surface water runoff, the max capacity per gully connection is 200m^2 including carriageway and footways. The Lead Local Flood Authority (LLFA) are not in favour of using permeable surfaces such as bricked driveways and asphalt due to maintenance issues and in cases where no other treatment methods or infiltration is proposed.

CLIMATE CHANGE:

2.5.3. The current climate change value is set at 40%, unless assessed otherwise or new guidance released.

LIFETIME MANAGEMENT AND MAINTENANCE:

2.5.4. A management and maintenance plan for the lifetime of the development should be submitted to ensure that the sustainable drainage system (SuDS) will not pose a future flood risk as a result of poor maintenance. As a minimum this should include details of the arrangements for adoption by the appropriate party, arrangements concerning appropriate funding mechanisms for its on-going maintenance of all elements of the sustainable drainage system (including mechanical components, ongoing inspections, operation costs, regular maintenance, remedial works and irregular maintenance) to secure the operation of the surface water drainage scheme throughout its lifetime.

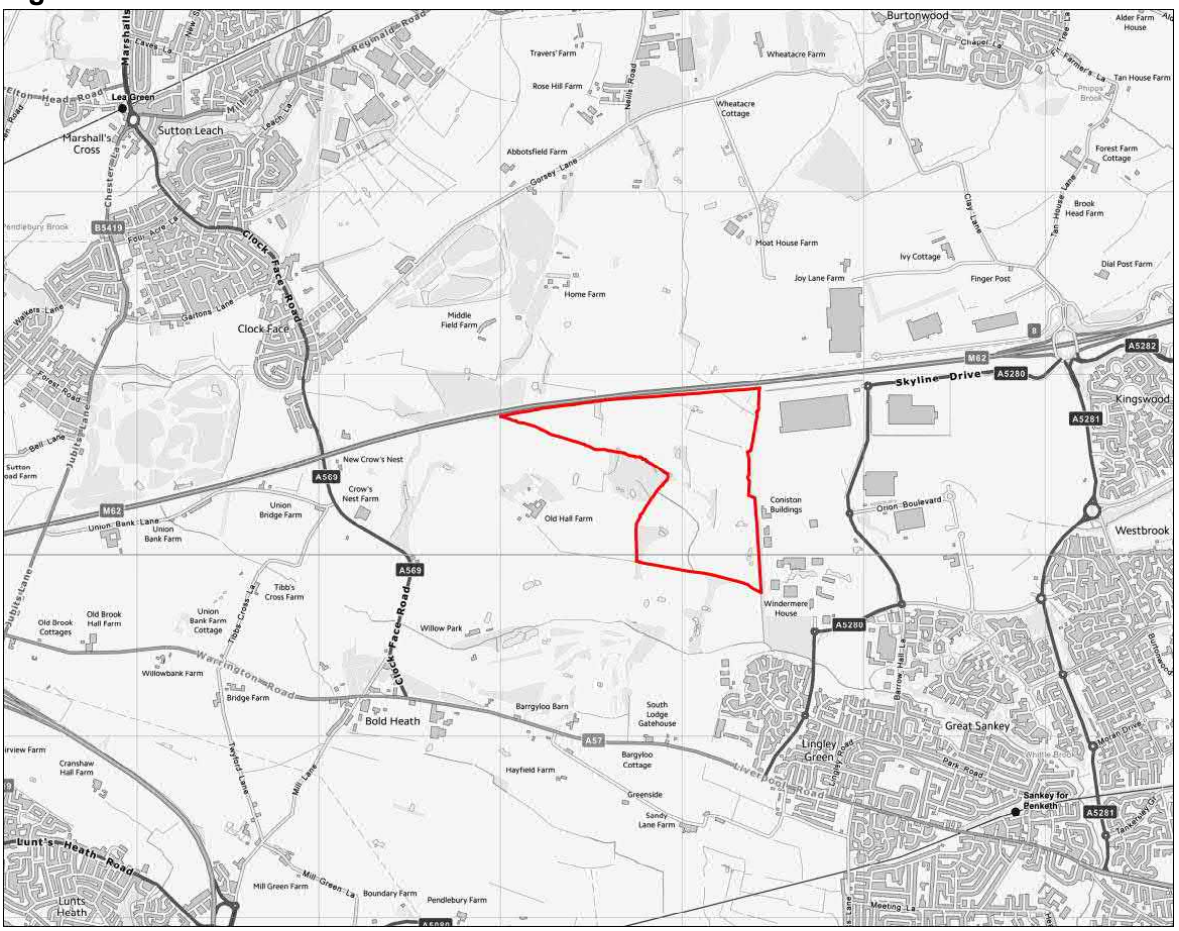
3 CONTEXT & SETTING

3.1 SITE LOCATION

3.1.1. The application site is located approximately 2km west of Junction 8 of the M62 motorway. The nearest postcode is WA5 3UG and the OS grid reference for the centre of the application site is 355146, 390396.

3.1.2. The site location and red line boundary is shown in **Figure 3-1** below and included in **Appendix A**.

Figure 3-1 - Site Location



3.2 SITE DESCRIPTION

3.2.1. The table below describes the general site characteristics.

Table 3-1 – Characteristics of the Site

Characteristic	Description
Area	Approximately 75 ha
Existing Use	Arable land, greenfield
Boundaries	North: M62 motorway and agricultural land East: Omega Business Park and Lingley Mere Business Park South: Whittle Brook and agricultural land beyond which is Lingley Green residential development and Mersey Valley Golf Club West: Agricultural land and farmhouse buildings
Topography	Topographic levels across the application site are generally gently sloping with a slight fall from the north west corner to the south east. Levels range from 29.1m AOD to 18.3m AOD.
Access	The application site is accessed via Skyline Drive in the north. There are two footbridge access points from the north, which cross over the M62 motorway.

3.2.2. The application site lies on the boundary between St. Helens Council and Warrington Borough Council within the St. Helens Council area.

3.3 TOPOGRAPHY

3.3.1. A Topographic Survey was undertaken by Malcolm Hughes Surveyors in March 2019. The survey indicates a high point in the north western corner of the site at 29.07m AOD with the lowest point of 18.33m AOD in the south eastern corner. The low point in the north eastern corner has a level of 21.0m AOD and the low point in the south western corner is at 20.0m AOD.

3.3.2. In the approximate centre of the northern boundary, a footbridge crossing the M62 motorway enters the application site on a raised earthworks platform at approximately 33.0m AOD. This extends for approximately 115m into the site, blending into the natural site levels. The footpath continues across the application site, exiting at the southern boundary.

3.3.3. There are several areas of dense tree growth where the survey could not be completed, OS mapping indicates ponds in these locations.

3.3.4. The survey identified low points scattered through the site which correspond with areas of ponding water shown on OS mapping.

3.3.5. A copy of the topographical survey is included as **Appendix C**.

3.4 GEOLOGY AND HYDROGEOLOGY

3.4.1. British Geological Survey (BGS) maps describe the bedrock geology as Chester Formation - Sandstone, Pebbly (gravelly). Sedimentary Bedrock.

3.4.2. Defra MAGIC Mapping of Environment Agency Groundwater Source Protection Zones indicates that the application site is in a Zone III Total Catchment designation. The Proposed Development is located on Principal Aquifer bedrock.

3.4.3. Soil type mapping included in the St. Helens Council SuDS Design and Technical Guide appendices identifies the site as having glacial and other superficial deposits.

3.5 HYDROLOGY

3.5.1. An Environment Agency main river, Whittle Brook, runs across the application site in a north east to south west direction. Re-alignment of this watercourse is proposed as part of the works.

3.5.2. There are two ordinary watercourses which cross into the application site from the northern boundary. The first crosses in a north to south direction and discharges to Whittle Brook. The second, known as Barrow Brook, crosses the north east corner of the application site before running in a northerly direction along the application site boundary back towards the M62 motorway. The watercourses drain the upstream catchment and are being retained.

3.5.3. The two ordinary watercourses, which are the responsibility of the Local Authority, have a minimum 8m easement on them.

3.5.4. The three watercourses entering the application site from the north are culverted beneath the M62 motorway and revert to open channels once in the application site boundary.

3.5.5. Three smaller unclassified watercourses are identified to originate within the application site boundary. These fall within lower-lying areas with a natural flow path towards Whittle Brook and Barrow Brook.

3.5.6. From a review of the topographical survey, the dominant flow paths follow the natural falls towards the site low points at Whittle Brook to the south and Barrow Brook in the east.

3.6 SEWER INFRASTRUCTURE

3.6.1. United Utilities public sewer record drawings were obtained for the application site and are included in **Appendix D**. The drawings indicate no existing sewers within the application site boundary. The closest public sewers to the site are located within Lingley Mere Business Park.

3.6.2. Construction of an earlier phase of the Omega Business Park is ongoing to the east of the application site where it is expected that there are adoptable sewers being installed. As the works are still incomplete, the new sewers are not yet reflected in the United Utilities record drawings.

3.6.3. An inspection of the topographical survey did not identify any evidence of positive private drainage within the site boundary.

3.6.4. The watercourses entering the application site have culverted crossings beneath the M62 motorway.

3.7 FLOOD RISK

3.7.1. The EA Flood Map for Planning shows that the majority of the development is located within Flood Zone 1, with less than 1 in 1,000 annual probability of flooding from the rivers of the sea (<0.1% Annual Exceedance Probability (AEP)). This classifies the area at a low risk.

3.7.2. Where the Whittle Brook currently flows through the application site, there are bands of land which lie within Flood Zone 2 (areas with between a 1 in 100 and a 1 in 1,000 annual probability of river flooding). This classifies these areas at medium risk.

3.7.3. There are no designated Environment Agency flood defences within the application site.

4 OUTLINE PLANNING APPLICATION SITE DRAINAGE STRATEGY

4.1.1. The Proposed Development is subject to a hybrid planning application for both detailed and outline planning permission. This section describes the proposed surface water drainage strategy for the outline planning application site.

4.1.2. The outline planning proposals are spread across the Unit 1 expansion land and three separate warehouse buildings to the south (Units 2, 3 & 4) as shown in the development proposals included in **Appendix B**.

4.2 SURFACE WATER MANAGEMENT REQUIREMENTS

4.2.1. The NPPF requires that flood risk to land and property is not increased as a result of new built form. Changes in the volume and rate of surface water runoff from development, as a result of increases in impermeable land uses, can increase the risk of flooding to areas downstream unless sufficient steps are taken within a proposed development. Consequently, to reduce the potential for adverse impacts related to increased rates of surface water discharge, the rate of surface water discharged from development proposals, must be limited to the pre-development rate, and should make suitable allowances for climate change over the developments anticipated lifetime.

4.2.2. The Non-Statutory Sustainable Drainage Technical Standards identifies that peak runoff rates should be limited to the Greenfield runoff rates where feasible, and long-term storage should be provided. Exceedance routes should be shown to not impact the safety of people or property.

4.2.3. The Building Regulations (H3) hierarchy states that the priority for discharging surface water runoff from a development is as follows:

- Infiltration into the ground;
- Discharge into a watercourse;
- Discharge into a sewer.

4.2.4. St. Helens Council, SuDS Design and Technical Guidance provides an approach for restricting the peak flow rate from developments:

- The critical duration rainfall event must be used to calculate the required storage volume for the 1 in 100 year rainfall event.
- The flow rate discharges for the 1 in 1 year event must not be greater than either the greenfield runoff rate from the site for the 1 in 1 year event or 2 l/s/ha
- For the 1 in 100 year event must not be greater than either the greenfield mean annual flood for the site or 2 l/s/ha.

4.2.5. In accordance with the Environment Agency climate change allowances, the following increases in rainfall are required to be accounted for over the lifetime of the Development Proposals:

- 20% increase in rainfall to be accommodated within the Development Proposals drainage system; and,
- 40% increase in rainfall to result in no flooding of buildings or vulnerable uses.

4.2.6. A sewer flap or similar non return valve device may be required for the eventual point of discharge from the Proposed Development, in order to prevent surcharging of the proposed drainage system and potential flooding, subject to detailed design.

4.3 EXISTING SURFACE WATER DISCHARGE REGIME

4.3.1. The site currently drains to Whittle Brook in the south and Barrow Brook in the north east via the informal ditches within the site. A plan showing the existing catchment areas and other features is included in **Appendix E**.

SURFACE WATER PEAK RUNOFF RATE

4.3.2. For greenfield developments, the peak runoff rate from the development for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event should never exceed the peak greenfield runoff rate.

4.3.3. The current rate of surface water discharge from the site has been calculated using the Institute of Hydrology Report 124. A summary of the existing greenfield run-off rate is provided in the table below.

Table 4-1 - Existing Catchment Runoff Rates

	Catchment Area (ha)	*Existing Runoff Rates (l/s)			
		QBAR	1 IN 1 YEAR	1 IN 30 YEAR	1 IN 100 YEAR
Total Site Area	74.112	430.6	374.6	730.1	895.7
*based on FEH catchment descriptors					

4.3.4. The Mean Annual Peak Flow Rate, Qbar, for the site has been calculated as 5.8 l/s/ha, Microdrainage runoff calculations are included in **Appendix F**.

SURFACE WATER RUNOFF DISCHARGE VOLUMES

4.3.5. Where reasonably practicable, for greenfield development, the runoff volume from the development in the 1 in 100 year, 6 hour rainfall event should never exceed the greenfield runoff volume for the same event.

4.3.6. The greenfield runoff volume for the 1 in 100 year 6 hour rainfall event for the site has been calculated as 12,492 m^3, Microdrainage calculations are included in **Appendix F**.

4.4 PROPOSED SURFACE WATER DRAINAGE

4.4.1. The general surface water drainage strategy for the Proposed Development will be to ensure that any surface water flows leaving the site replicate that of the current scenario which is currently undeveloped greenfield.

4.4.2. In accordance with the Non-Statutory Sustainable Drainage Technical Standards and the lead local flood authority requirements it is proposed that peak flows leaving the site are restricted to the existing greenfield run-off rate.

4.4.3. Surface water balancing facilities will be provided to ensure that the restricted surface water flows can be stored within the Proposed Development so as not to overburden downstream drainage

infrastructure. This attenuation storage will be provided to retain all surface water run-off onsite for storm events up to a 1 in 100 year return period plus a 40% allowance for climate change in accordance with the NPPF.

4.4.4. SUDS will be provided throughout the site to improve water quality and to provide a means of surface water storage, these will generally be in the form of swales and attenuation ponds.

INFILTRATION TO THE GROUND

4.4.5. The underlying geology is generally formed of glacial and other superficial deposits and therefore it is unlikely that infiltration will provide a suitable method of disposal for surface water.

4.4.6. Where infiltration is not feasible, H3 recommends surface water should be discharged into a watercourse, and this approach is to be adopted for the Development Proposals.

4.4.7. It should also be noted that whilst infiltration can be used for low return period events, less than 1 in 2 year, the drainage strategy would need to include an additional bypass outfall for larger events. As such, the exclusion of infiltration at this stage does not materially change the strategy.

DISCHARGE TO A WATERCOURSE

4.4.8. Whittle Brook and Barrow Brook pass through the site and it is therefore proposed to make drainage connections to these watercourses to mimic the existing catchment characteristics.

4.5 DISCHARGE RATE AND STORAGE VOLUME

4.5.1. Runoff from the Proposed Development plots will be restricted before discharging to the existing watercourses.

4.5.2. It is proposed to attenuate all discharge from the site to the Mean Annual Peak Flow Rate, Qbar, of 5.8 l/s/ha. Discharge will be restricted using flow control devices installed downstream of the attenuation structures.

4.5.3. The attenuation requirements to accommodate the range of storm events up to 1 in 100 year return period plus a 40% allowance for climate change have been assessed using Microdrainage Source Control software. The results are detailed in **Appendix F** and the attenuation volumes are summarised in the table below.

Table 4-2 - Summary of Storage Requirements

Catchment	Proposed Impermeable Area (including highways) (ha)	Limited Discharge Rate (l/s)	*Storage Volume 1 in 100 yr + 40% CC (m^3)
Whittle Brook – Unit 2	9.011	52.3	6,455
Whittle Brook – Unit 3	6.247	36.2	4,460
Whittle Brook – Unit 4	6.398	37.1	4,580
Total	**21.656**	**125.6**	**15,495**

*storage is provided to allow for attenuation up to the 1 in 100 year plus 40% climate change event

4.5.4. From the site masterplan layout in **Appendix B**, the expansion land has no development proposals shown at present and it is therefore not possible to assess the proposed impermeable area and

associated discharge rate and attenuation storage. The full area of expansion land is approximately 5.438ha and ultimately drains to Barrow Brook. Assuming 100% impermeable area, the discharge rate would be 31.5 l/s based on the site Qbar of 5.8 l/s/ha and the attenuation storage volume required would be 3,900 m^3 for the 100 year + 40% climate change storm.

4.5.5. The above storage estimates are indicative. Attenuation requirements will be subject to detailed drainage design, modelling and agreement with the lead local flood authority.

4.6 PROPOSED SUDS APPROACH

4.6.1. The SuDS appraisal method defined in the SuDS Manual C753 has been used to identify the most appropriate methods of providing a sustainable surface water attenuation and conveyance to support the Development Proposals.

4.6.2. The proposed outline planning application site drainage strategy is presented on a layout drawing in **Appendix G**.

4.6.3. In order to limit the rate of surface water runoff, the drainage system to each unit area will incorporate various SUDS features such as swales and balancing ponds. These features will be used to treat, convey and store surface water runoff from impermeable areas for storm events up to and including a 1 in 100 year event plus 40% climate change.

4.6.4. Surface water drainage from each unit will drain to the attenuation storage ponds prior to discharge to the respective watercourses.

4.6.5. In addition to the treatment provided by trapped gullies and the proposed SUDS features, runoff from car parks and service yard areas will be also be treated by oil separators in accordance with Environment Agency Pollution Prevention Guidance (PPG3).

4.6.6. The combination of the swales and attenuation ponds will provide a multi-stage treatment train for surface water run off to enhance the quality of surface water leaving the development site.

4.6.7. The extents of SuDS attenuation ponds shown on the strategy layout are based on an assumed depth of 1.5 m and have been provided to give an indicative estimate of area.

4.6.8. The surface water drainage strategy is prepared in outline only to demonstrate the Proposed Development can meet national and local requirements, i.e. in a sustainable manner without increasing the risk of flooding to neighbouring properties for events up to and including the 1% AEP plus climate change (40%).

4.6.9. Further development of the strategy will be undertaken at the detailed design stage, this will enable the proposed solution to be optimised within the context or the requirements of the NPPF, and regional and local planning policy.

4.7 DRAINAGE SYSTEM MAINTENANCE

4.7.1. Any storage structures, pumping stations and sewerage in public areas will be designed and constructed in accordance with Sewers for Adoption for adoption and maintenance by United Utilities and form part of the public sewer network.

4.7.2. Storage structures and drainage within the site boundary will remain in private ownership and will be operated and maintained privately.

4.7.3. Regular inspection and maintenance of the drainage and SuDS components will ensure their efficient operation and prevent failure. A SuDS Operation and Maintenance Management Plan, specific to the site, will be developed following detailed design. This will also allow manufacturer's recommendations to be incorporated in the SuDS Management Plan.

4.7.4. The maintenance requirements associated with the proposed surface water drainage are detailed in the SuDS Manual CIRIA 753 and are summarised as follows:

- Linear drains and collection gullies – inspected and cleared periodically every 6-12 months or after an observed reduction in performance i.e. evidence of blockages;
- Underground storage – inspection of up and downstream chambers to check for stagnant water/presence of silt build up every 6-12 months. Routine jetting/clearing to be undertaken every 12-24 months;
- Attenuation ponds and swales - Main requirements include mowing along maintenance access routes, amenity areas and across any formed embankment. The remaining areas can be managed as 'meadow'. Grass clippings should be disposed of offsite to remove nutrients and pollutants. Occasionally sediment will require removal when reaching 25 mm depth.
- Flow control chamber – inspected to ensure the device is running clear and has not become blocked, overflow should also be inspected and cleared. Should be undertaken every 3-6 months or after an observable reduction in performance i.e. surcharging upstream, slow drain-down time.

4.7.5. The above represents a typical regime based on the expected drainage system, but will be developed and agreed in detail once the detailed design for the drainage has been finalised,

4.8 WATER QUALITY

4.8.1. With discharge to watercourses, water quality is a high priority and sufficient treatment provided to surface water is expected as part of the drainage strategy for the site. The simple index approach to water quality risk management outlined in Chapter 26 of the SuDS Manual (CIRIA C753) is therefore adopted.

4.8.2. Table 26.2 of C753 outlines pollution hazard indices for different land use classifications and is summarised below.

Table 4-3 - Land Use and Pollution Potential

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydro-carbons
Residential Roofs	Very Low	0.20	0.20	0.05
Other Roofs (commercial / industrial)	Low	0.30	0.20	0.05
Individual Property Driveways, Residential Car Parks, Low Traffic Roads	Low	0.50	0.40	0.40
Commercial yard and delivery areas, non-residential car parking with frequent change	Medium	0.70	0.60	0.70
Sites with heavy pollution (e.g. haulage yards, lorry parks etc.)	**High**	**0.80**	**0.80**	**0.90**

C753, Table 26.2

4.8.3. In order to ensure removal of the pollutant loadings as indicated above, a treatment system of SuDS should be used to ensure no onward pollution of the natural aquatic environment. Table 26.3 of C753, summarised in the table below, outlines the pollution mitigation potential of various SuDS components, the exact performance of a SuDS approach will be dependent on the design and construction of the components selected.

Table 4-4 - Indicative SuDS Mitigation Indices

SuDS Component	TSS	Metals	Hydro-Carbons
Filter Strip	0.40	0.40	0.50
Filter Drain	0.40	0.40	0.40
Swale	0.50	0.60	0.60
Bio-retention system	0.80	0.80	0.80
Permeable Pavement	0.70	0.60	0.70
Detention Basin	0.50	0.50	0.60
Pond	0.70	0.70	0.50
Wetland	0.80	0.80	0.80
Proprietary treatment systems	Must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area		

C753, Table 26.3

4.8.4. C753 identifies that when two SuDS systems are used in series, the second element of the SuDS train will provide 50% of its potential mitigation index.

4.8.5. Based on the SuDS train proposed the combined treatment potential from a SuDS pond or swale and proprietary treatment system will achieve the requirement.

4.9 MANAGEMENT OF RESIDUAL RISK

4.9.1. The storage values calculated at this stage are indicative and are intended to provide enough detail to inform the next stage of design. When the detailed layout of the site is being undertaken, the performance of the SuDS system will be modelled, with adequate storage within the system being provided to ensure flooding does not occur:

- On any part of the site for a 1 in 30 year rainfall event
- During a 1 in 100 year rainfall event in any part of a building (including a basement) or utility plant susceptible to water (e.g. pumping station or electricity sub-station)
- On neighbouring sites during a 1 in 100 year rainfall event.

EXTREME STORM EVENT

4.9.2. There is a risk associated with the exceedance of the capacity of the drainage system during an extreme event in excess for which the drainage system was designed (i.e. the 1 in 100 year + climate change event).

4.9.3. The risk associated with extreme events can be reduced by engineering site levels to ensure flow is directed away from buildings and towards less vulnerable receptors. For example, CIRIA C635 Designing for Exceedance in Urban Drainage states that car parks and road areas should be

designed to occupy lower areas of a site where water may collect, as this reduces the likelihood of water ingress into buildings.

DRAINAGE SYSTEM FAILURE

4.9.4. There is a risk associated with blockage or operational failure of the drainage system which could cause flooding. This could include blockage of pipes and/or obstruction of flow control devices and outfalls.

4.9.5. This risk can be reduced through ensuring that the drainage system and SuDS measures are adequately maintained to ensure the drainage system remains serviceable. This will be addressed in the SuDS Operation and Maintenance Management Plan which will include a regime for periodic inspection of outfalls, flow control devices and manholes. SuDS features will be maintained to remove dead plant material and to ensure inlet and outlets do not become clogged and silted.

OFF-SITE IMPACTS

4.9.6. Surface water runoff from the scheme has the potential to increase flood risk to other areas however, as the surface water management scheme will provide on-site storage for the 1 in 100 year plus climate change event, the risk to off-site locations is considered low. The Proposed Development will not increase the risk of flooding from fluvial sources and the public sewer network to adjacent or downstream areas.

4.10 DEVELOPMENT PHASING

4.10.1. Any proposed development phasing will result in the separated development of individual phases. There is a requirement for each aspect of the Proposed Development to be served by the drainage system in the interim period before the development as a whole is completed. It is proposed that the central network of swales, attenuation features and flow controls be developed in sequence to ensure that each development phase is serviceable. Whilst this is primarily a detailed design consideration, the drainage arrangements for any development phasing should be an upfront consideration.

4.11 FOUL WATER DRAINAGE STRATEGY

4.11.1. A foul water strategy has been outlined in brief below to establish discharge rates, points of connection to the network and to identify any significant constraints.

4.11.2. A pre-development sewer enquiry response from United Utilities confirmed that foul will be allowed to drain to the public foul sewer network at an unrestricted rate.

DISCHARGE RATE

4.11.3. The expected loadings for the Proposed Development have been calculated from values provided in Sewers for Adoption 7th Edition.

4.11.4. The anticipated flows from the Proposed Development are outlined in the table below.

Table 4-5 - Expected Daily Peak Flow

Development Aspect	Area (ha)*	Expected flow (daily peak)^ l/s
Outline Planning Application Site (Units 2-4)	33.745	20.2
Total		20.2
*Excludes Ecological Mitigation Zone ^Based on 0.6 l/s/ha of developable land		

4.11.5. Discharge to the public sewer will be at a peak rate specified by United Utilities.

CONNECTION TO PUBLIC NETWORK

4.11.6. A review of the site topographical levels reveals that a foul water pumping station will be required to service the Proposed Development. This will be located adjacent to the main site access point with a single new connection to the public sewer network on Catalina Approach as shown on the drainage strategy layout in **Appendix G**.

MAINTENANCE AND ADOPTION

4.11.7. The foul water pumping station and sewerage proposed in public areas will be designed and constructed in accordance with Sewers for Adoption for adoption and maintenance by United Utilities and form part of the public sewer network.

4.11.8. The below ground foul water drainage network within the site boundary will remain in private ownership and will be operated and maintained privately.

5 DETAILED PLANNING APPLICATION SITE DRAINAGE STRATEGY

5.1.1. The Proposed Development is subject to a hybrid planning application for both full and outline planning permission. This section describes the proposed surface water drainage strategy for the detailed planning application site.

5.1.2. The detailed planning proposals for the B8 logistics warehouse, referred to as Omega Zone 8 Unit 1, are as follows:

- Overall total 81,570sq.m building;
- A total of 576 car parking spaces;
- 383 HGV parking spaces;
- Service yards;
- An attenuation pond to the north east and west of Unit 1; and
- Inbound and outbound gatehouse.

5.2 SURFACE WATER MANAGEMENT REQUIREMENTS

5.2.1. The NPPF requires that flood risk to land and property is not increased as a result of new built form. Changes in the volume and rate of surface water runoff from development, as a result of increases in impermeable land uses, can increase the risk of flooding to areas downstream unless sufficient steps are taken within a proposed development. Consequently, to reduce the potential for adverse impacts related to increased rates of surface water discharge, the rate of surface water discharged from development proposals, must be limited to the pre-development rate, and should make suitable allowances for climate change over the developments anticipated lifetime.

5.2.2. The Non-Statutory Sustainable Drainage Technical Standards identifies that peak runoff rates should be limited to the Greenfield runoff rates where feasible, and long-term storage should be provided. Exceedance routes should be shown to not impact the safety of people or property.

5.2.3. The Building Regulations (H3) hierarchy states that the priority for discharging surface water runoff from a development is as follows:

- Infiltration into the ground;
- Discharge into a watercourse;
- Discharge into a sewer.

5.2.4. St. Helens Council, SuDS Design and Technical Guidance provides an approach for restricting the peak flow rate from developments:

- The critical duration rainfall event must be used to calculate the required storage volume for the 1 in 100 year rainfall event.
- The flow rate discharges for the 1 in 1 year event must not be greater than either the greenfield runoff rate from the site for the 1 in 1 year event or 2 l/s/ha
- For the 1 in 100 year event must not be greater than either the greenfield mean annual flood for the site or 2 l/s/ha.

5.2.5. In accordance with the Environment Agency climate change allowances, the following increases in rainfall are required to be accounted for over the lifetime of the Development Proposals:

- 20% increase in rainfall to be accommodated within the Development Proposals drainage system; and,
- 40% increase in rainfall to result in no flooding of buildings or vulnerable uses.

5.2.6. A sewer flap or similar non return valve device may be required for the eventual point of discharge from the Proposed Development, in order to prevent surcharging of the proposed drainage system and potential flooding, subject to detailed design.

5.3 EXISTING SURFACE WATER DISCHARGE REGIME

5.3.1. The application site is currently comprised of open fields and has numerous ditches and ponds across its area. They do not appear to be connected to the existing watercourses and therefore it is possible to theorise that they have the potential not to be natural watercourses but are manmade. There is no existing formal drainage within the application site boundary.

5.3.2. There are two existing watercourses to the north east and south west of the Proposed Development. The north eastern channel is classed as an ordinary watercourse coming under the jurisdiction of the local authority, whereas the southern watercourse is classed as main river and is administered by the Environment Agency.

5.3.3. The current rate of surface water discharge from the site has been calculated by use of the IH124 Method. This method is utilized and recommended for developments greater in size of 50 ha. However, as this development has a proposed impermeable area of 18.82 ha, it is proposed to use the ICP SuDS method. This approach uses the IH124 calculation method with the results linearly interpolated using the ratio of the development size to 50 ha.

5.3.4. The topographical survey information shows that overland flow from the north western portion of the site would most likely have found its way into the watercourse to the north with the remainder of this flow most likely reaching the southern main river watercourse. So as not to disrupt the natural catchments of these watercourses, it is proposed to maintain their flows as far as is reasonably practicable. Therefore approximately 2.760 ha of the new developments impermeable area will discharge to the watercourse in the north with 16.200 ha discharging to the south west.

5.3.5. Based on the calculated greenfield runoff rate of 6.06 l/s /ha, a summary of the existing predicted peak run-off rates for the site is provided in the table below.

Table 5-1 - Existing Catchment Runoff Rates

Catchment Area (ha)	Qbar (l/s/ha)	Existing Runoff Rates (l/s)
2.76	6.06	16.7
16.20	6.06	98.3

5.3.6. The Microdrainage runoff calculations are included in **Appendix F**.

5.4 PROPOSED SURFACE WATER DRAINAGE

5.4.1. To attenuate the flows for the north east part of the Proposed Development, which comprises approximately 2.76 ha, a swale approximately 225m in length will be located between the site boundary and the hard standing of the development. It will discharge to the north eastern watercourse by gravity via a flow control device restricted to 16.7 l/s. Stormwater drainage from the building will discharge directly to the swale whereas the drainage from the service yard will

discharge to the swale via a bypass separator or similar approved device to capable of hydrocarbon treatment.

5.4.2. The southern catchment discharging to the watercourse in the south will be split between the car park area, the main building and service yard. The total discharge rate from these areas should not exceed 98.3 l/s. The main car park which comprises approximately 1.80 ha will discharge to the watercourse via gravity with attenuation placed under the car park and a flow control manhole to restrict flows from it. A swale running adjacent to the access road to the car park is required to cater for the lower elevation of the road retrospective to the main carpark and the desire to achieve a gravity discharge. The access is lower than the main carpark and to achieve levels for gravity drainage.

5.4.3. The main building and service yard will discharge via gravity to a large attenuation pond in the west of the Proposed Development. From here water will be pumped to the main watercourse. Due to the scale of the Proposed Development it is not viable to discharge this part of the site to the watercourse via gravity, as to maintain sufficient cover to the pipework would require raising of the proposed on site levels to such an extent (estimated to be at least 2m) that it is deemed impractical due to the need to import large volumes of material, and the environmental impact this would have on the site and the surrounding area during construction. Having a relatively balanced cut and fill on site and pumping the stormwater from the pond is considered more practical and a more environmentally friendly option.

INFILTRATION TO THE GROUND

5.4.4. The Ground Investigation Report (GIR) has confirmed that the underlying geology is Glacial Till which is predominantly clay. Based on the known properties of the strata, this would heavily imply that the geology of the site is unable to support a drainage system where infiltration is its source of discharge.

5.4.5. In the areas where proposed ponds and swales are to be located, ground water has been identified and recorded far below the minimum of 1m below the bed of the attenuation.

DISCHARGE TO A WATERCOURSE

5.4.6. Whittle Brook runs adjacent to the south west boundary of the detailed planning application site, it is proposed to make a direct connection via two new outfalls, one gravity and one pumped. Whittle Brook is classed as a main river so negotiations with the Environment Agency will be required to agree connection details and discharge rates.

5.4.7. Another watercourse, Barrow Brook, sits in the north east corner of the application site, it is proposed to make a gravity connection to this watercourse. This watercourse is not classed as main river and is therefore considered to be classed as an ordinary watercourse. Negotiations with the local authority will be required to agree connection details of discharge rates.

5.5 SURFACE WATER CATCHMENTS

5.5.1. There will be two main surface water catchments the main one discharging to the watercourse to the south west and a second (smaller one) discharging to the north east watercourse.

5.5.2. The main catchment which is discharging to the south west comprises of a total area of 16.20 ha. This catchment will be further divided into two separate discharge points one being the main staff

car park of 1.80 ha and the main building which comprises of 14.40 ha. These will both discharge to the same watercourse but at different locations.

5.5.3. The catchment discharging to the north east comprises of 2.76ha.

5.5.4. The table below summarises the drainage requirements for each catchment.

Table 5-2 - Summary of Surface Water Catchments

Catchment	Drainage Requirements	Drainage Proposals
North eastern 2.76 ha	Building and area of open space service yard - assumed 100% impermeable and entire area will require draining.	▪ Collection and attenuation via an approximately 300m long swale ▪ Discharge via a flow control chamber at 16.7 l/s to the unnamed watercourse.
Southern and western 16.20 ha	Building and area of open space consisting of service yard and car park – assumed 100% impermeable and entire area will require drainage.	▪ Collection and attenuation via large attenuation pond, underground storage tanks. ▪ Discharge via a flow control device and pump to Whittle Brook at no greater than 98.3 l/s.

5.6 DISCHARGE RATE AND STORAGE VOLUME

5.6.1. It is proposed to attenuate all discharge from the site to the equivalent Qbar greenfield runoff rate of 115 l/s. The storage volume calculations are summarised in the table below.

Table 5-3 - Summary of Storage Requirements

Catchment	Area (ha)	Percentage Impermeable (%)	*Discharge Rate (l/s)	**Storage Volume (m^3)
North eastern	2.76	100	16.7	1,894
Southern and Western	16.20	100	98.3	17,133
Total	**18.96**	**100**	**115.0**	**19,027**

*total discharge rate from the site is limited to the existing Qbar rate of 6.06 l/s/ha.
**storage is provided to allow for attenuation up to the 1 in 100 year plus 40% climate change event

5.6.2. The Microdrainage runoff calculations are included in **Appendix F**.

5.7 PROPOSED SUDS APPROACH

5.7.1. The SuDS appraisal method defined in the SuDS Manual C753 has been used to identify the most appropriate methods of providing a sustainable surface water attenuation and conveyance within the constraints of the development and its surroundings to support the Development Proposals. The proposed strategy is presented in **Appendix G**, the attenuation volumes predicted are provided in the table above.

5.7.2. In order to provide the required treatment of runoff, a sequence of SuDS measures will be required. The use of a sequential system of SuDS will reduce the required land take for storage, increase the resilience of the system and increase the scope for providing wider aesthetic benefits.

5.7.3. The drainage strategy developed presents proposed features and the use of specific SuDS measures which will be developed and finalised in detailed design stage. Latent storage contained within the network of conveyance is not included in overall calculation of storage.

5.7.4. The surface water drainage strategy demonstrates that the Proposed Development can meet national and local requirements, i.e. in a sustainable manner without increasing the risk of flooding to neighbouring properties for events up to and including the 1% AEP plus climate change (40%).

5.8 DRAINAGE SYSTEM MAINTENANCE

5.8.1. Any pipework, storage structures, pumping stations etc should be designed and although it is considered a private system and not adoptable, it should be constructed in line with Sewers for Adoption to maintain a minimum construction standard which will be maintained by a private maintenance contractor.

5.8.2. The general maintenance regime of the proposed SuDS storage structures will be in accordance with manufacturer's recommendations and subject to agreement.

5.8.3. Regular inspection and maintenance are required to ensure the effective long-term operation of SuDS; these requirements are detailed in the SuDS Manual CIRIA 753.

5.8.4. A site-specific maintenance schedule will be developed following the detailed design of the drainage system.

5.8.5. The maintenance requirements associated with the proposed surface water drainage are summarised as follows:

- Linear drains and collection gullies – inspected and cleared periodically every 6-12 months or after an observed reduction in performance i.e. evidence of blockages;
- Underground storage – inspection of up and downstream chambers to check for stagnant water/presence of silt build up every 6-12 months. Routine jetting/clearing to be undertaken every 12-24 months;
- Attenuation Ponds and swales – Inspection and clearing out of any debris every 6 months, cutting of grass/reeds once every 12 months.
- Flow control chamber – inspected to ensure the device is running clear and has not become blocked, overflow should also be inspected and cleared. Should be undertaken every 3-6 months or after an observable reduction in performance i.e. surcharging upstream, slow drain-down time.

5.8.6. The above represents a typical regime based on the expected drainage system but should be developed and agreed in detail once the detailed design for the drainage has been finalised. After 12 months the maintenance regime should be looked at and revised as necessary.

5.8.7. The large westerly attenuation pond will include a lower depression which will constantly contain water for wildlife. It is anticipated that this area will not require any maintenance and be left to grow as it wishes.

5.9 WATER QUALITY

5.9.1. With discharge to watercourses, water quality is a high priority and sufficient treatment provided to surface water is expected as part of the drainage strategy for the site. The simple index approach to water quality risk management outlined in Chapter 26 of the SuDS Manual (CIRIA C753) is therefore adopted.

5.9.2. Table 26.2 of C753 details pollution hazard indices for different land use classifications and is summarised below.

Table 5-4 - Land Use and Pollution Potential

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydro-carbons
Residential Roofs	Very Low	0.20	0.20	0.05
Other Roofs (commercial / industrial)	Low	0.30	0.20	0.05
Individual Property Driveways, Residential Car Parks, Low Traffic Roads	Low	0.50	0.40	0.40
Commercial yard and delivery areas, non-residential car parking with frequent change	Medium	0.70	0.60	0.70
Sites with heavy pollution (e.g. haulage yards, lorry parks etc.)	**High**	**0.80**	**0.80**	**0.90**

C753, Table 26.2

5.9.3. In order to ensure removal of the pollutant loadings as indicated above, a treatment system of SuDS should be used to ensure no onward pollution of the natural aquatic environment. Table 26.3 of C753, summarised in the table below, outlines the pollution mitigation potential of various SuDS components, the exact performance of a SuDS approach will be dependent on the design and construction of the components selected.

Table 5-5 - Indicative SuDS Mitigation Indices

SuDS Component	TSS	Metals	Hydro-Carbons
Filter Strip	0.40	0.40	0.50
Filter Drain	0.40	0.40	0.40
Swale	0.50	0.60	0.60
Bio-retention system	0.80	0.80	0.80
Permeable Pavement	0.70	0.60	0.70
Detention Basin	0.50	0.50	0.60
Pond	0.70	0.70	0.50
Wetland	0.80	0.80	0.80
Proprietary treatment systems	Must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area		

C753, Table 26.3

5.9.4. C753 identifies that when two SuDS systems are used in series, the second element of the SuDS train will provide 50% of its potential mitigation index.

5.9.5. The drainage proposal will include bypass separators which is capable of removing 80% of pollutants or other means of removing the hydrocarbons, silts and metals from the drainage prior to discharging into the SuDS features i.e. the ponds and swales. With the SuDS features and the bypass separators this will have the effect of reducing significantly, if not eliminating, the amounts of containments reaching the local watercourses.

5.9.6. The proposed pollution potential of the Proposed Development is considered to be high with a TSS 0.8, Metals 0.8 and Hydro-Carbons 0.9. With the service yard stormwater proceeding through the bypass separators, and the building considered to be low in pollutants, it is proposed that before stormwater reaches the SuDS features that the pollution potential will be reduced to low with a TSS of 0.3, Metals of 0.2 and a hydro-carbons of 0.5. With the SuDS features consisting of swales and an attenuation pond they are well within the range of removing the remaining pollutants.

5.9.7. Based on the SuDS train proposed above it is considered that there will be negligible pollutants being transmitted to the watercourse.

5.10 MANAGEMENT OF RESIDUAL RISK

5.10.1. The storage values calculated at this stage are indicative and are intended to provide enough detail to inform the next stage of design. When the detailed layout of the site is being undertaken, the performance of the SuDS system will be modelled, with adequate storage within the system being provided to ensure flooding does not occur:

- On any part of the site for a 1 in 30 year rainfall event
- During a 1 in 100 year rainfall event in any part of a building (including a basement) or utility plant susceptible to water (e.g. pumping station or electricity sub-station)
- On neighbouring sites during a 1 in 100 year rainfall event.

EXTREME STORM EVENT

5.10.2. There is a risk associated with the exceedance of the capacity of the drainage system during an extreme event in excess for which the drainage system was designed (i.e. the 1 in 100 year + climate change event).

5.10.3. The risk associated with extreme events can be reduced by engineering site levels to ensure flow is directed away from buildings and towards less vulnerable receptors. For example, CIRIA C635 Designing for Exceedance in Urban Drainage states that car parks and road areas should be designed to occupy lower areas of a site where water may collect, as this reduces the likelihood of water ingress into buildings.

DRAINAGE SYSTEM FAILURE

5.10.4. There is a risk associated with blockage or operational failure of the drainage system which could cause flooding. This could include blockage of pipes and/or obstruction of flow control devices and outfalls.

5.10.5. This risk can be reduced through ensuring that the drainage system and SuDS measures are adequately maintained to ensure the drainage system remains serviceable. This will be addressed in the SuDS Operation and Maintenance Management Plan which will include a regime for periodic

inspection of outfalls, flow control devices and manholes. SuDS features will be maintained to remove dead plant material and to ensure inlet and outlets do not become clogged and silted.

OFF-SITE IMPACTS

5.10.6. Surface water runoff from the scheme has the potential to increase flood risk to other areas however, as the surface water management scheme will provide on-site storage for the 1 in 100 year plus climate change event, the risk to off-site locations is considered low. The Proposed Development will not increase the risk of flooding from fluvial sources and the public sewer network to adjacent or downstream areas.

5.10.7. An overland flow Flood Routing Plan is included in **Appendix H**.

5.11 DEVELOPMENT PHASING

5.11.1. As this is a singular building it is assumed it will be built in singular phase however any proposed construction phasing will result in the separated development of individual phases. There is a requirement for each aspect of the Proposed Development to be served by the drainage system in the interim period before the development as a whole is completed. It is proposed that the central network of swales, attenuation features and flow controls are developed in sequence to ensure that each development phase is serviceable. Whilst this is primarily a detailed design consideration, the drainage arrangements for any development phasing should be an upfront consideration.

5.12 FOUL WATER DRAINAGE STRATEGY

5.12.1. A foul water strategy has been developed for the site to establish discharge rates, points of connection to the network and to identify any significant constraints.

5.12.2. The foul drainage will consist of the offices for the building, the sprinkler pump house and the vehicle wash down area. The wash down area wastewater will pass through a separator prior to entering the foul water drainage system.

5.12.3. It is proposed to discharge via gravity to a pumping station at the south eastern boundary of the application site which is being installed by others. The proposed strategy is presented in **Appendix G**.

5.12.4. Due to the large distances between the furthest foul connection point at the vehicle wash area and the proposed pump station, one or more intermediate pumping stations may be required to avoid excessive depths that would arise should all the foul sewers drain down to the single pumping station.

DISCHARGE RATE

5.12.5. The expected loadings for each aspect of the Proposed Development have been calculated using the table of loadings for sewer treatment systems rev 4 by British Water.

5.12.6. The anticipated flows from each aspect of the Proposed Development are outlined in the table below.

Table 5-6 - Expected Daily Peak Flow

Development Aspect	Area m²	Average foul flow	Expected flow (daily peak) l/s
Warehouse	78,450	1.04	6.33
Office (ground and first floor)	3,265	0.56	3.40
*Vehicle Wash down		1.60	9.76
Expansion land warehouse	25,000	0.33	2.02
Expansion land office	1,000	0.17	1.04
Total		3.70	22.55

*Vehicle wash down is based on 100 litres per minute usage.

5.12.7. It is therefore proposed to discharge to the proposed pumping station at a peak flow of 23 l/s.

5.12.8. The need for a pumped foul system means provision of a 24-hour emergency storage capacity in case of pump failure will be required. This will be provided as part of the adoptable pumping station facilities for the overall site.

CONNECTION TO PUBLIC NETWORK

5.12.9. It is proposed to make a single new connection to the private sewer network being built by others.

MAINTENANCE AND ADOPTION

5.12.10. The foul water sewers proposed within the site boundary will be constructed in line with Sewers for Adoption to uphold a minimum construction standard. The new system will be maintained by a private maintenance contractor.

6 CONCLUSIONS

6.1.1. This Drainage Strategy has been prepared as part of the supporting documentation for the hybrid planning application for both full and outline planning permission of the westward expansion of the Omega Business Park, south of the M62.

6.1.2. The Drainage Strategy has been prepared by WSP on behalf of Omega St Helens / T. J. Morris Limited (referred to as 'the Applicant') in accordance with the guidelines set out in the National Planning Policy Framework (NPPF).

6.1.3. The application site covers an area of approximately 75 hectares (ha) and is classified as a greenfield site. The application site is currently used as agricultural land.

6.1.4. The development proposals consist of the following development (major development):

- Full Planning Permission for the erection of a B8 warehouse, with ancillary offices, associated parking, infrastructure and landscaping; and
- Outline Planning Permission for Manufacturing (B2) and Logistics (B8) development with ancillary offices and associated car parking, landscaping and infrastructure (detailed matters of appearance, layout and scale are reserved for subsequent approval).

6.1.5. As a result of the development proposals the proportion of the application site that is impermeable will increase to 40.600 Ha.

6.1.6. According to the Environment Agency's flood map for planning, the Proposed Development is located within flood zone 1 and where the Whittle Brook currently flows through the application site, there are bands of land which lie within flood zone 2.

SURFACE WATER DRAINAGE

6.1.7. The available ground investigation data indicates that the application site is underlain by glacial deposits which will preclude the use of infiltration as a means of surface water disposal.

6.1.8. Where practical the proposed surface water drainage will reflect the existing drainage regime. It is therefore proposed that surface water flows from the Proposed Development will drain to the watercourses which pass through the application site as the primary means of surface water disposal.

6.1.9. In accordance with the lead local flood authority's design and technical guidance, it is proposed that peak flows leaving the application site are restricted to the existing greenfield run-off rate by means of a series of SUDS features around the Proposed Development.

6.1.10. It is proposed to restrict the development surface water run-off to the Mean Annual Peak Flow Rate, Qbar. The figure for Qbar has been calculated using the Institute of Hydrology Report 124.

6.1.11. In order to limit the rate of surface water runoff, the drainage system to each unit will incorporate various SUDS features such as swales and attenuation ponds to restrict and treat surface water run-off. These features will be used to treat, convey and store surface water runoff from impermeable areas for storm events up to and including a 1 in 100 year event plus 40% climate change.

6.1.12. The combination of the cascading conveyance swales, storage swales and attenuation ponds will provide a multi-stage treatment train for surface water run off to enhance the quality of surface water leaving the application site.

6.1.13. The SUDS features will be privately maintained by an appointed management company.

FOUL WATER DRAINAGE

6.1.14. It is proposed to install a new foul water sewer system to serve the application site.

6.1.15. United Utilities has confirmed that foul water will be allowed to drain to the public foul sewer network at an unrestricted rate.

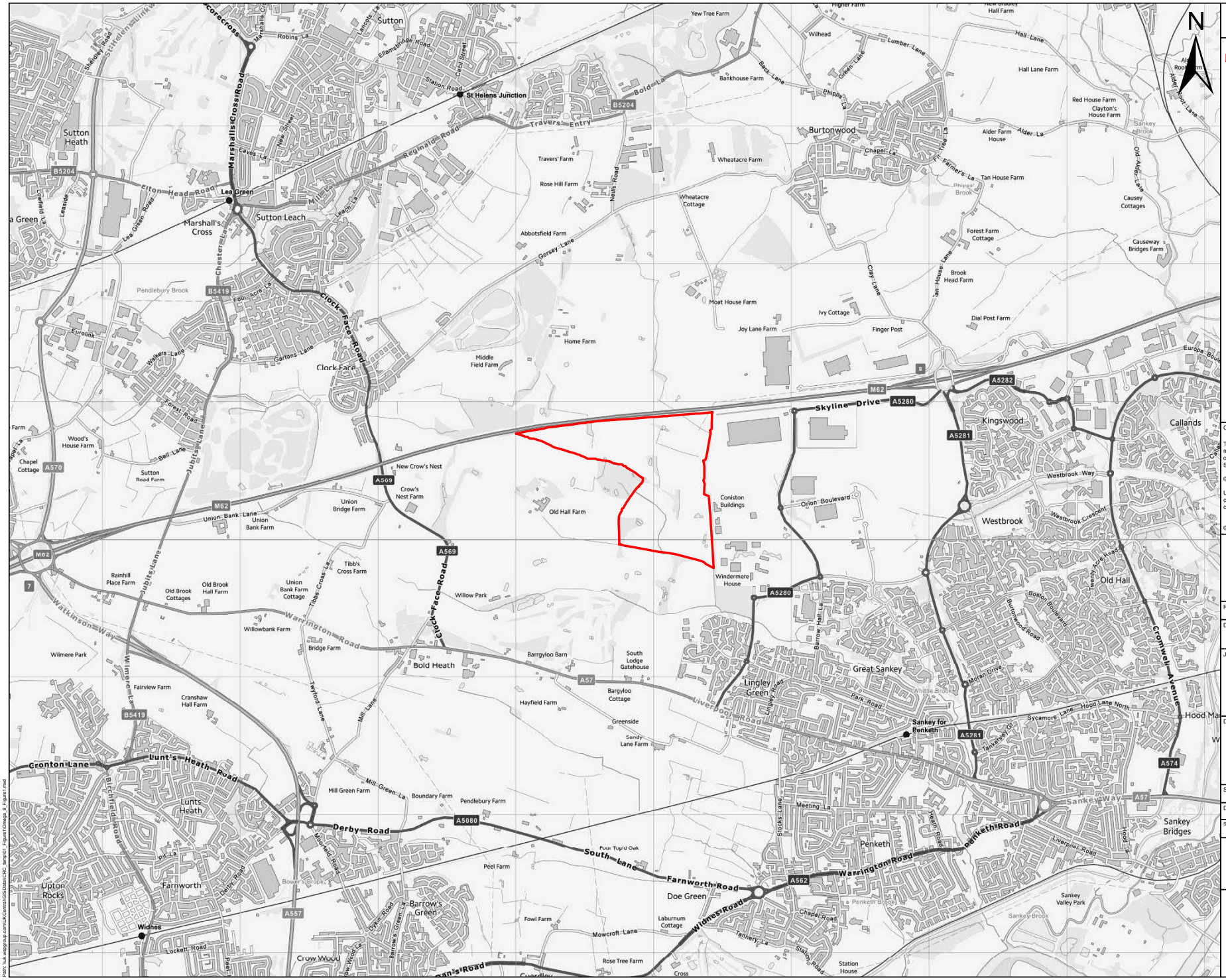
6.1.16. A foul water pumping station will be required to service the Proposed Development.

6.1.17. The foul water pumping station and sewerage proposed in public areas will be designed and constructed in accordance with Sewers for Adoption for adoption and maintenance by United Utilities and form part of the public sewer network.

6.1.18. The below ground foul water drainage network within the application site boundary will remain in private ownership and will be operated and maintained privately.

Appendix A

SITE LOCATION



THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED

Legend

Application Site

Revision Details	By / Check	Date	Suffix

Drawing Status: FINAL

Job Title: Omega Zone 8

Drawing Title: Figure 1.1: Application Site

Scale at A3: 1:25,000

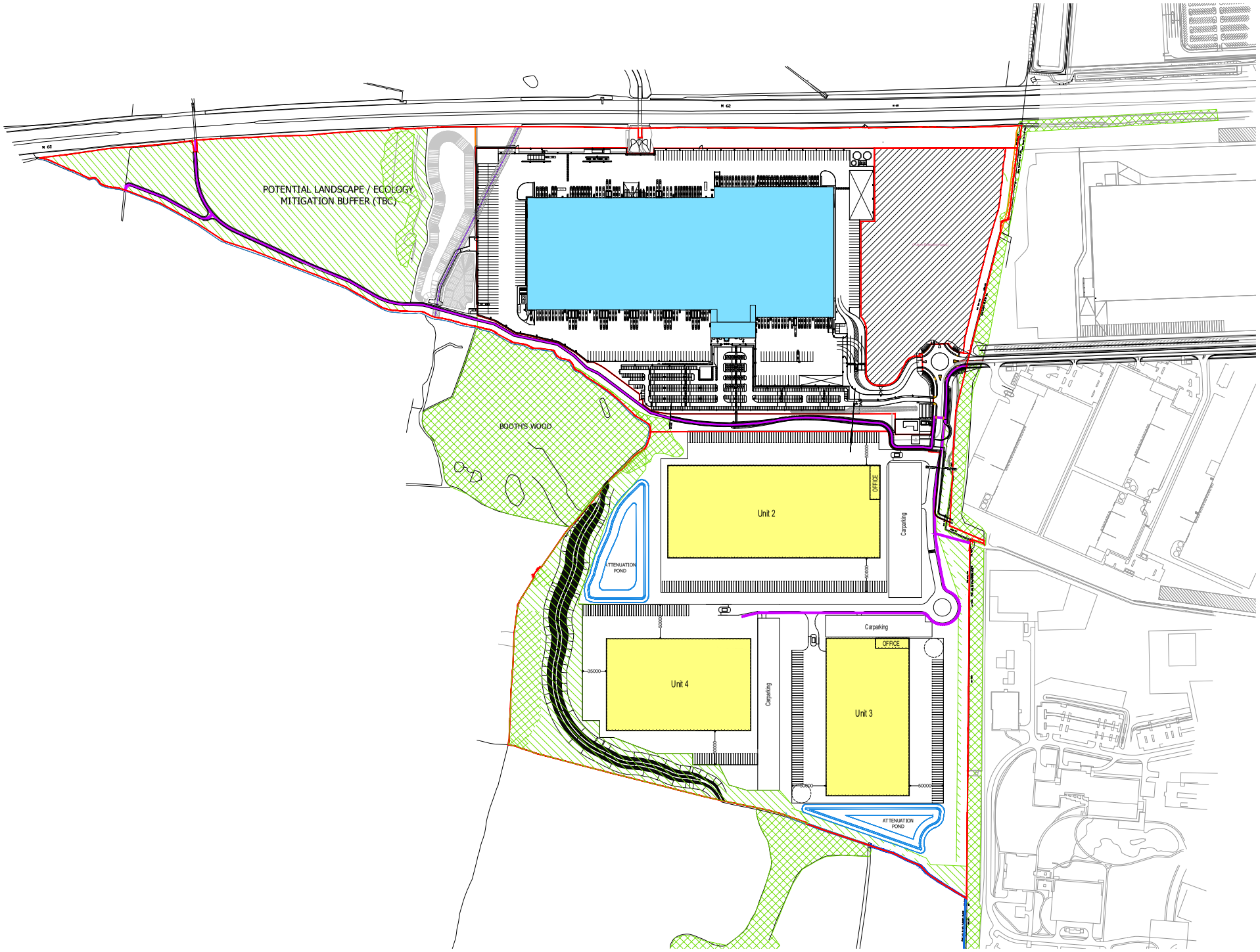
Drawn			
INAK01633			
Stage 1 check	Stage 2 check	Originated	Date
CF	MM	KS	13/12/2019

0 200 400 600 800 1,000
Metres

wsp

Appendix B

DEVELOPMENT PROPOSALS



NOTES

Contractors must verify all dimensions on site before commencing any work or shop drawings. This drawing is not to be scaled. Use figured dimensions only.

Subject to statutory approvals and survey.

Building areas are liable to adjustment over the course of the design process due to the ongoing construction/detailing developments.

Please note the information contained within this drawing is solely for the benefit of the employer and should not be relied upon by third parties.

The CDM hazard management procedures for the Chetwoods aspects of the design of this project are to be found on the "Chetwoods - Hazard Analysis and Design Risk Assessment" and/or drawings. The full project design teams comprehensive set of hazard management procedures are available from the Principle Designer appointed for the project.

North

Notes:

Please note Title Plans have been scaled using Ordnance Survey features which may have altered over time. Complete accuracy cannot be guaranteed without further on-site survey.

Any dimensions given are to be confirmed with site measure.

PEDESTRIAN / CYCLE ROUTE

Rev	Revision Description	Date	Author/Reviewer
SK13	Unit 1 updated	03/08/20	RC/SF

SKETCH

32 Frederick Street,
Birmingham, B1 3HH
+44 (0)121 234 7500
www.chetwoods.com

chetwoods

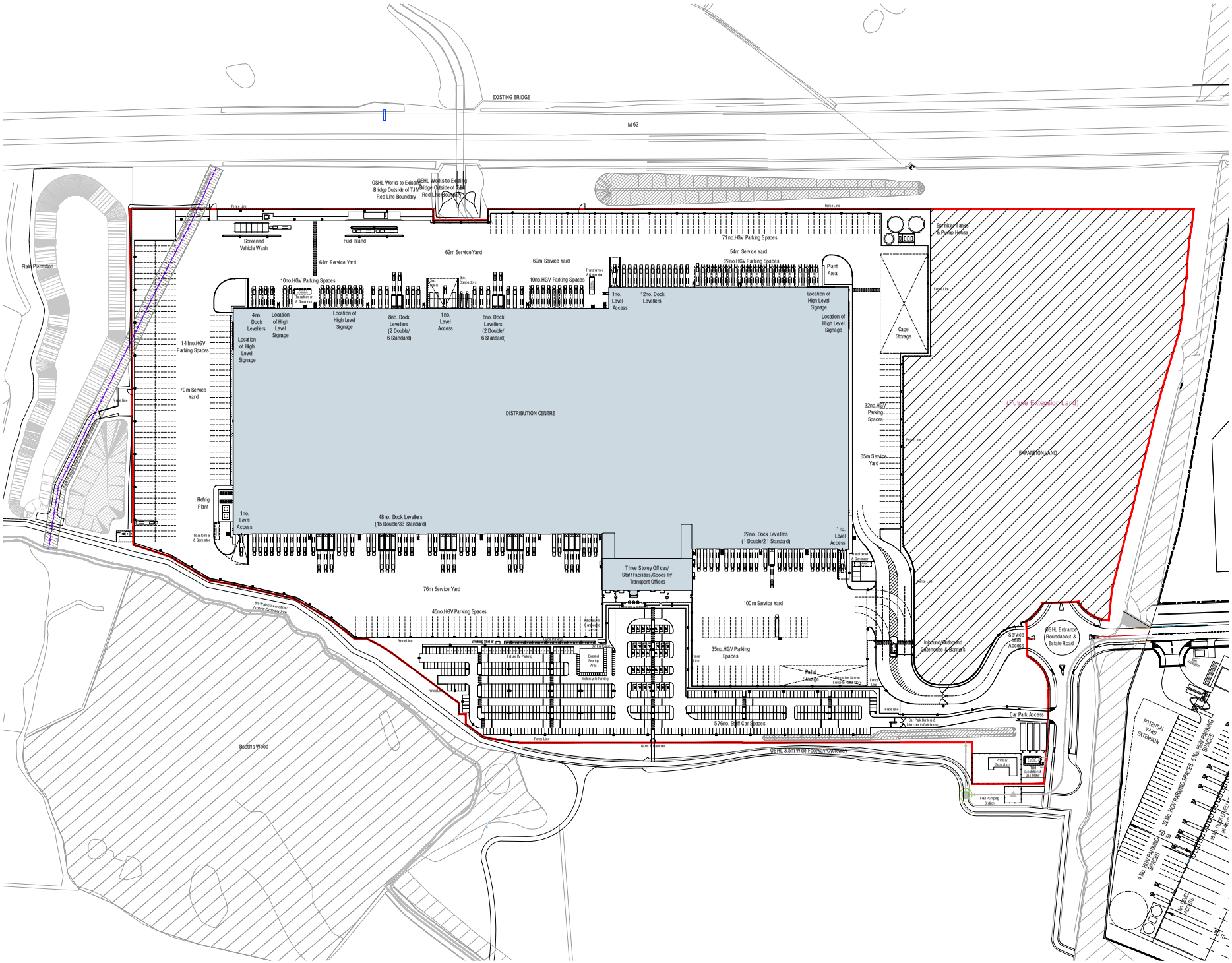
Project
ZONE 8
OMEGA WEST, WARRINGTON

Client
OMEGA ST HELENS LTD / T.J.MORRIS LTD

Drawing Title
INDICATIVE MASTERPLAN
OPP DWG.1

Scale	Size	Drawn	Checked	Date
1:2500	A1	RC	SF	23/10/19

Project	Originator	Zone	Level	Type	Role	Number	Rev.
4150	CA	00	00	DR	A	05100	SK13



notes

Schedule of Accommodation

All areas are approximate gross internal.

Distribution Centre	829,725 sq.ft	77,084 m²
Three Storey Offices/ Staff Facilities/Goods In / Transport Office	48,287 sq.ft	4,486 m²
Overall Total	878,012 sq.ft	81,570 m²

Car Parking	576 spaces
Inc. Disabled Parking	35 spaces
Inc. Future Electric Vehicle	39 spaces
Cycle Parking	156 spaces
Motorcycle Parking	48 spaces

0m 50m 100m

Scale

no.	date	revision	by
G	31-07-20	Balance ponds amended. Footway/cycleway realigned, and site boundary amended to suit.	Km/ Sta
F	24-06-20	Footway/cycleway updated	spp
E	23-04-20	Smoking Shelter relocated	spp
D	20-04-20	Pump station & service road added to balance ponds; Car park layout adjusted; Parking added for sevice vehicles; Adjustments to island to NE corner of building; Scale bar added	CT
C	11-03-20	Post & rail fence added around balance pond area; Fence line adjusted to SE corner adjacent to footpath; Trailer parking extended to SE corner; Car park layout adjusted; Gates added to car park & site entrances	CT
B	20-01-20	Minor amendments	spp
A	18-12-19	Minor amendments	Km/

aja architects llp
1170 Elliott Court
Herald Avenue
Coventry Business Park
COVENTRY CV5 6UB

T: 024 7625 3200
F: 024 7625 3210
E: aja@aja-architects.com
W: www.aja-architects.com

aja architects llp is a limited liability partnership registered in England No. OC336721

client

Omega St Helens Ltd/ TJ Morris Ltd

project

Unit 1
Omega Zone 8
St. Helens

drawing

Proposed Site Layout Plan
UNIT1 DWG 1

scale 1:1250 @ A1 drawn spp

checked aips date 12-12-19

no

$-6385-181 G