

MCCARTHY HAULAGE ABBEY ROAD WREXHAM INDUSTRIAL ESTATE

SERVICE YARD EXTENSION

DRAINAGE STRATEGY

1.0 INTRODUCTION

1.1 Background

- 1.1.1 This Drainage Strategy has been prepared to support a planning application relating to the proposed extension to the service yard within the existing boundary of the storage and distribution unit at 2 Elm Point, Abbey Road North, Wrexham Industrial Estate.
- 1.1.2 The purpose of the proposed development is to increase trailer parking provision at the site. Caulmert has been appointed to prepare a drainage strategy for surface and foul water drainage from the proposed extension, and this report sets out the approach that will be taken.
- 1.1.3 The proposed extension to the service yard is within the existing boundary of the storage and distribution unit. The wider site is accessed off Abbey Road in the north-eastern area of Wrexham's Industrial Estate. The grid reference is SJ385504 (338520, 350478). A site location plan is at Figure 1.

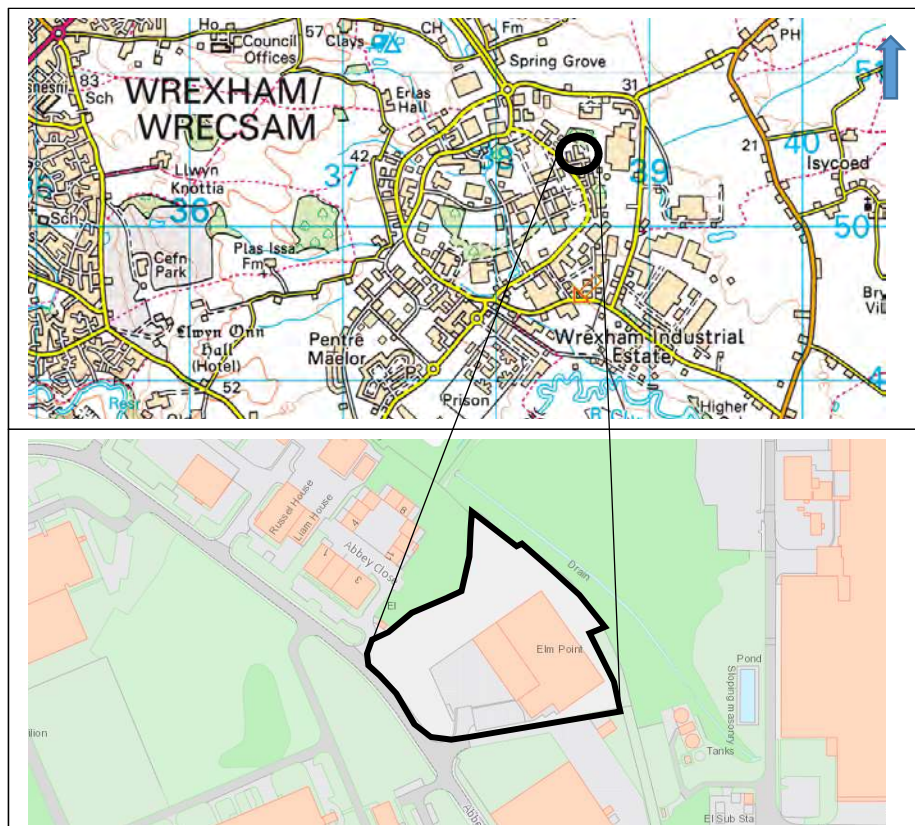


Figure 1 – Site Location (bounded in black)

1.2 Existing Site

- 1.2.1 The wider development site (outlined in black in Figure 2, below) is broadly rectangular in shape covering an area of approximately 1.60ha. It was a brownfield site that has been remediated. The site is now occupied by a 2,900m² distribution warehouse with associated transportation and drainage infrastructure that was completed in 2019.



Figure 2 – Development Site Boundary

- 1.2.2 Planning permission (Reference 2019/0593) was granted in October 2019 for an extension to the existing industrial warehouse together with the associated service yard. This has been termed the Phase 2 Extension of the site that will be formed against the north elevation of the existing warehouse.
- 1.2.3 A topographical survey has been undertaken in December 2020 and is provided in Appendix A. The survey shows the existing service yard to slope towards an existing drainage channel beneath the canopy of the distribution warehouse. The slope is mono-pitch at a gradient of 1:67. The floor level of the distribution warehouse is 29.36mAOD. Ground levels to the north and west of the existing service yard are generally between 28mAOD and 29mAOD.
- 1.2.4 The public sewer record indicate a 150mm diameter combined water sewer in the northwest corner of the site and broadly parallel with the northern site boundary.

1.3 Existing Flood Risk

- 1.3.1 The wider site is represented on the current NRW Flood Risk Assessment map. The site is within Flood Zone A and as such represents a low risk (> 0.1% AEP) of fluvial flood. The NRW

map also shows there is some risk of surface water flooding within the wider site, although its boundary with Abbey Road appears to be at a low risk. Extracts from the NRW's map is at Figure 3.

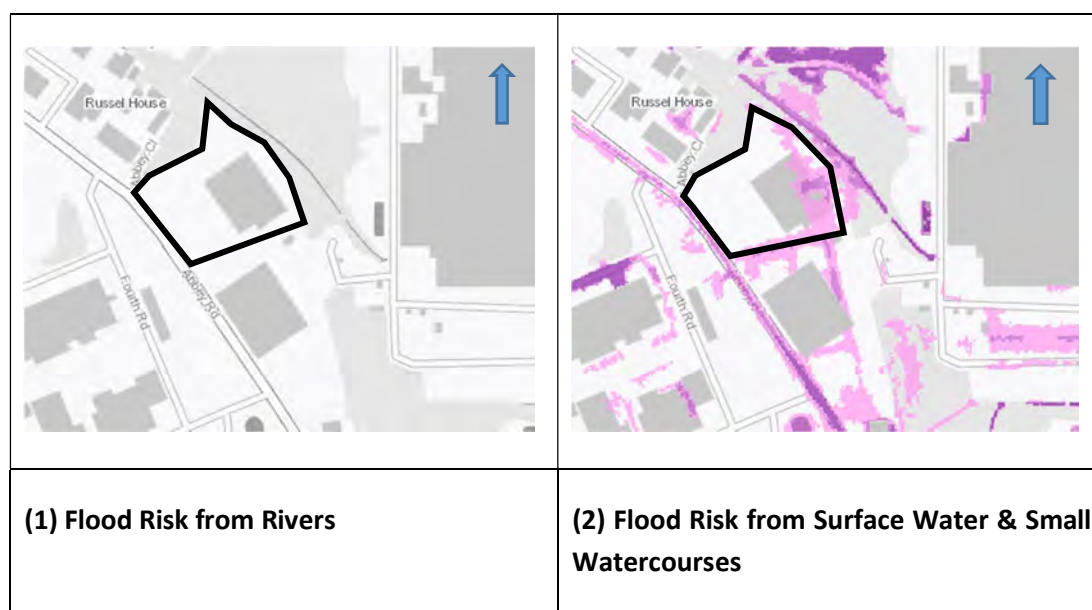


Figure 3 – Flood Risk (NRW Flood Risk Assessment Wales – accessed January 2021)

1.4 Proposed Development

1.4.1 The proposed development will comprise an extension of the existing delivery yard area. This extension will be to the west of the existing yard, and will front the Abbey Road. Access to the extended service yard will be via the existing wider site access from Abbey Road.

1.4.2 The proposed yard extension would form an additional 1,000m² of impermeable area within the site boundary. Following the construction of this proposal, the split between the permeable and impermeable areas of the 1.60ha site will then be:

- Phase 1 Warehouse and External Areas = 7,125m²
- Phase 2 Warehouse and Service Yard extension = 2,225m²
- Proposed extension of Service Yard = 1,000m²
- Remaining areas of site – assumed to be non-surfaced = 5,650m²

2.0 PROPOSED DRAINAGE

2.1 Foul Water Connection

2.1.1 The proposed yard extension will not generate any foul water flow and a connection to public foul water sewerage will not be necessary.

2.2 Surface Water Management

2.2.1 Surface water runoff from the proposed service yard extension will be managed sustainably.

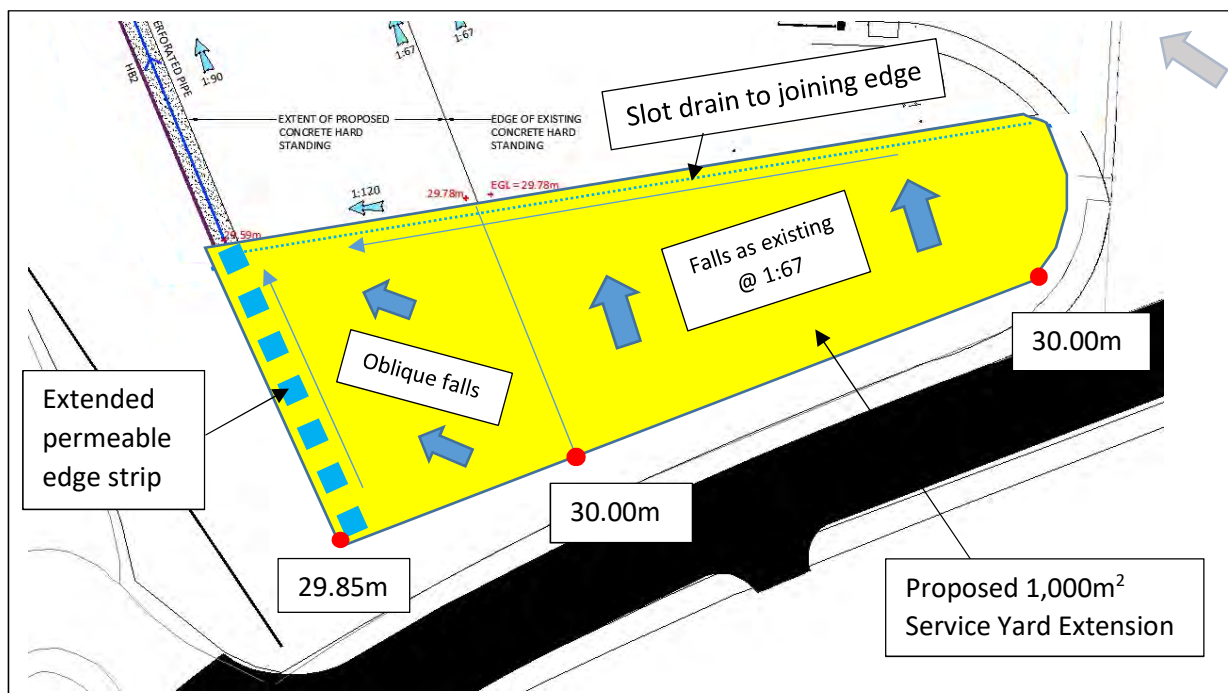


Figure 4 – Proposed Drainage Arrangement (based on Caulmert drawing number 3631-CAU-XX-XX-DR-C-5100)

- 2.2.2 The drainage strategy should also accord with the operational requirements of the service yard. This requirement is for the safe and predictable movement of laden heavy goods vehicles and associated loading/offloading equipment. The service yard surface will be a durable, impermeable material set to falls that do not compromise vehicle operation.
- 2.2.3 The provisional surface water arrangement is provided at Figure 4. This allows for a slot/channel drain along the eastern side of the extension that will intercept runoff. The drain will connect to the perforated pipe beneath the permeable paving edge strip at the north of the slab. The paving will be extended to the northwest corner of the extension, with the adjacent slab angled to obliquely drain to the permeable paving and the slot/channel drain.
- 2.2.4 Installed material strengths should achieve an equivalent highway Class F loading (900kN test load). This criterion is required to counter high point loading and the lateral effects of vehicle movements during loading and unloading operations. The attainment of this criterion is likely to prevent the installation of other forms of surfacing (such as block paving) and channel bioremediation drainage products.

3.0 PROJECT APPROACH TO SUSTAINABLE DRAINAGE

3.1 SuDS Standards

- 3.1.1 This section summarises the outline design for the disposal of surface water from the site. The approach outlined in the Sustainable Drainage Systems Standards for Wales (SuDS Standards) and the CIRIA SuDS manual seek to manage the quality and quantity of rainwater runoff close

to where it falls, and to allow its use in a manner which provides amenity benefits and encourages biodiversity.

3.1.2 The SuDS Standards have requirements that need to be addressed. These are:

- S1 - Surface water runoff destination
- S2 - Surface water runoff hydraulic control
- S3 - Water Quality
- S4 - Amenity
- S5 - Biodiversity
- S6 - Construction, operation and maintenance

3.1.3 Subsequent paragraphs of this section outline how these objectives can be achieved at the application site within the outline drainage design for the development.

3.2 S1 - Surface Water Runoff Destination

3.2.1 The Welsh Government standard has five priority levels for surface water runoff. These are:

- Priority 1: Surface water runoff collected for use
- Priority 2: Surface water runoff is infiltrated to ground
- Priority 3: Surface water runoff is discharged to a surface water body
- Priority 4: Surface water runoff is discharged to a surface water sewer, highway drain or another drainage system
- Priority 5: Surface water runoff is discharged to a combined sewer

Information gleaned from the previous phases of development has been considered against these priorities as below.

Priority 1: Runoff Collected for Use

3.2.2 The proposed development will not have any requirement for water re-use. The provision of a harvesting system would not be of benefit to the development.

Priority 2: Infiltration to Ground

3.2.3 Ground investigation was carried out by E3P at the development site in March 2018. Infiltration tests were carried out across the site, which returned very low or zero rates of infiltration. The geotechnical advice provided by E3P confirmed that the ground is not suitable for using infiltration as a means of managing surface water flow.

3.2.4 The trial pits excavated as part of the investigation revealed relatively shallow made ground over clay (drift deposits).

Priority 3: Discharge to a Surface Water Body

- 3.2.5 There is a watercourse to the east of the application site and within third party land. Access through the land to the watercourse has not been forthcoming, and this means of disposal is not pursued further.

Priority 4: Discharge to a Surface Water Sewer

- 3.2.6 There is a surface water sewer serving a section of the industrial estate that passes through the neighbouring unit's land. The sewer outfalls to the watercourse at the east of the site. Surface water from the Phase 1 development and the Phase 2 extension is pumped to outfall in this sewer, and it is the preferred means of disposal of surface water from the proposed service yard extension.

Priority 5: Discharge to a Combined Sewer

- 3.2.7 This priority will not be necessary for the proposed development.

3.3 S2 - Surface Water Runoff Hydraulic Control

- 3.3.1 The Phase 1 development installed a surface water management system that comprised storage and limited discharge. The storage was formed by multiple Tubosider units beneath the service yard. Discharge from the storage units is via a pump rated at a maximum output of 8.7l/s. This management system was determined from the Phase 1 flood consequence assessment (Muir Associates Ltd dated February 2018).
- 3.3.2 The Phase 2 extension to the Phase 1 development allowed for a similar surface water management system. The additional 2,225m² of impermeable area was able to be accommodated by the surface water infrastructure installed for Phase 1. This form of management for Phase 2 has received SAB approval (Reference SAB_FUL_2019_0801).
- 3.3.3 A 1,000m² extension to the service yard, with an assumed rainfall intensity of 50mm/hr, would produce a runoff of up to 14l/s. The estimated Greenfield runoff value for the 1.60ha site is 6.7l/s based on the 1 in 1 year return period and a SOIL type of 4. This equates to a Greenfield flow rate of approximately 0.4l/s for the service yard extension.
- 3.3.4 Attenuation storage for surface water from the 1,000m² service yard extension will be provided by a combination of a) voids within the stone under the porous paving edge strip, and b) storage provided as part of the Phase 1 development.
- 3.3.5 The storage at the site will be designed to prevent runoff from the site for rainfall events with a return period of up to the 1 in 100 event plus 30% climate change allowance.

3.4 S3 - Water Quality

- 3.4.1 Phase 1 drainage is reliant on oil separators and silt traps as the physical barriers against pollution prevention. Because of the required ground levels, the Phase 2 Warehouse Extension will also follow a similar pollution prevention regime. The service yard extension, as part of the Phase 2 works, incorporates a broad line of permeable paving over an aggregate

sub-base, which will provide opportunity for interception, sedimentation and treatment of captured pollutants within the surface water.

3.4.2 The sources of rainwater to be discharged from the proposed service yard extension, and their potential for contamination, will be assessed using the simple index approach as described in the SuDS Manual. The predicted pollution hazard index (C753 Table 26.2 for a medium hazard level) should be equal or less than the pollution mitigation index (C753 Table 26.3) for the extended line of permeable paving.

3.4.3 Consideration should be given to supplementing the surface water runoff quality by installing proprietary bioremediation channels such as the Innolet/D-Rainclean. Any such component should be able to withstand vehicular traffic equivalent to Class F loading.

3.5 S4 - Amenity

3.5.1 The nature of the site precludes the attraction of public interest. The existing warehouse contains food products and commercially-sensitive materials, and operates heavy machinery throughout. The proposed service yard extension will continue to discourage public attention for these operational and safety reasons.

3.6 S5 - Biodiversity

3.6.1 There has been an Ecology Statement prepared for the Phase 1 development, undertaken by Marches Ecology in November 2017. The Statement noted various ecological issues that required mitigation consequential to the initial Phase 1 construction, including those for great crested newts, and noted the presence of a nearby badger sett. It also noted that habitat at parts of the site was designed for the benefit of grizzled and dingy skipper butterflies.

3.6.2 A subsequent Ecological Assessment has been produced in support of this planning application, which sets out mitigation, compensation, and enhancement measures to ensure the proposed service yard extension does not result in any long-term adverse effects upon protected species or the overall biodiversity value or function of the site, specifically the pre-existing ecological mitigation area.

3.6.3 It is anticipated that the proposed drainage strategy would contribute to the ecologically mitigated areas on occasion of exceedance flow to the areas adjacent to the service yard.

3.7 S6 - Design of Drainage for Construction, Operation and Maintenance

3.7.1 The SuDS proposed for the development is readily manageable and will be retained within the ownership of the developer.

3.7.2 Inspection and maintenance guidance will be prepared for the SuDS system and provided to the developer and as part of the SAB application for the service yard extension.

4.0 EXCEEDANCE FLOW PATHS

4.1 Flood Risk Assessment

4.1.1 Sections 1.3 and 3.3 refers to flood risk within the 2018 flood consequence assessment.

4.2 Exceedance Routing

4.2.1 Exceedance flow from the proposed service yard extension will be able to flow via a drop kerb to adjacent land to the north of the service yard. This drop kerb arrangement will be formed as part of the Phase 2 warehouse extension works.

5.0 CONCLUSION

5.1 Foul Drainage

5.1.1 The development will not generate foul water flow. A connection to public sewerage will not be necessary.

5.2 Surface Water Drainage

5.2.1 Surface water runoff from the service yard extension will be intercepted by a slot/channel drain that will outfall to a linear granular feature along the north edge of the service yard.

5.2.2 The table below summarises how the drainage strategy for the proposed development will address the standards and priorities contained in the Sustainable Drainage System Standards for Wales.

Standard	Comments
S1 – Destination	
Priority 1 – Re-use	- No demand for non-potable water. - Rainwater harvesting not beneficial to development.
Priority 2 – Infiltration	- Non-permeable ground for infiltration drainage. - Permeable paving edge strip above gravel trench will provide some opportunity for infiltration of shallow depth rainfall.
Priority 3 – Discharge to surface water body	There is no permission to access the nearby watercourse close to the site.
Priority 4 – Discharge to surface water sewer	The surface water sewer on adjacent land outfalls into the watercourse east of the site and is a suitable destination for site runoff.
Priority 5 – Discharge to combined sewer	Discounted as not required.
S2 – Runoff Hydraulic Control	
	- Service Yard extension to comprise an impermeable surface. - Surface water to be attenuated via existing storage capacity and pumped outlet.

	• Attenuation to be designed for 1 in 100 year storm event plus a 30% allowance for climate change.
S3 – Water Quality	
	• Edge strip of permeable paving over a granular sub-base to provide satisfactory pollution hazard index. • Consideration of supplementary bioremediation control from adequate-strength proprietary products.
S4 – Amenity	
	• Warehouse operation precludes requirement.
S5 – Biodiversity	
	• Ecological measures to be formed as part of the wider site mitigation work.
S6 – Construction, Operation & Maintenance	
	• Detailed design proposal to form SAB application. • Development owner and operator to be provided with maintenance guidance.

5.3 Flood Risk

- 5.3.1 According to the 2018 flood consequence assessment, the wider site has a low flood risk. Contemporary NRW flood risk mapping suggests that there is a low risk of flood from surface water and small watercourses to the east of the wider site.
- 5.3.2 A flood exceedance route exists from the service yard extension to the ecological mitigation area to the north of the yard.

5.4 Outline Drainage Proposal

- 5.4.1 Figure 4 within this report illustrates the outline drainage layout for the service yard extension site. The context of this proposed arrangement can be seen by reference to the Phase 1 and Phase 2 drainage plans attached as Appendix B

Appendices

- A Topographical Survey
- B Existing Site Drainage:-

- (1) Phase 1 development installation (Muir Associates drawing number DMS620-200)
- (2) Phase 2 development proposal (Caulmert drawing number 3631-CAU-XX-XX-DR-C-5100)

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Status	Planning Issue	

REVISION HISTORY

Rev No	Date	Paragraph	Change History
P0	25/01/2021	-	Planning Issue
P1	28/04/2021	-	Minor Amendment
P2			
P3			

Appendix A
Topographical Survey

Appendix B

Existing Site Drainage

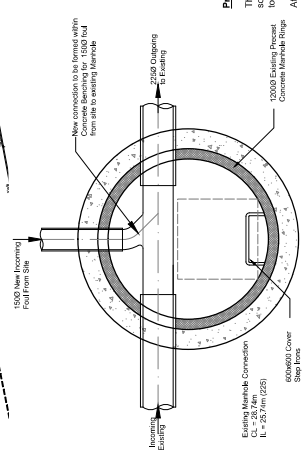
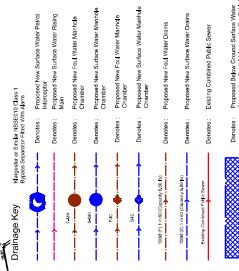
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- Materials**
1. **City Parks:** The City Parks Department has a list of 100 parks with a total area of 1,000 acres. The parks are located in the city of Chicago and have a total area of 1,000 acres. The parks are located in the city of Chicago and have a total area of 1,000 acres.
 2. **Standard of British Standards:** The British Standards Institution (BSI) is a not-for-profit organization that develops and publishes standards for products, services, and systems. The standards are used by manufacturers and consumers to ensure quality and safety.
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Storm Water Attenuation Tank Below Ground
Storage Capacity of 955m³ Required For the
1 in 100 Year + 30% Climate Change Design
Outlet Flow to be pumped at a Flow Rate of
8.70 l/s



The existing ground conditions on site are firm clay beneath made ground. As a result the use of soakaways for the site will not be effective and the use of below ground attenuation will be required to satisfy the total required surface water discharge rate of 8.70 l/s.

Attenuation for the proposed development will be achieved by means of below ground storage to achieve the 1 in 100 year rainfall event + 30% climate change allowance.

New Connection to
Existing Manhole Detail
1:20

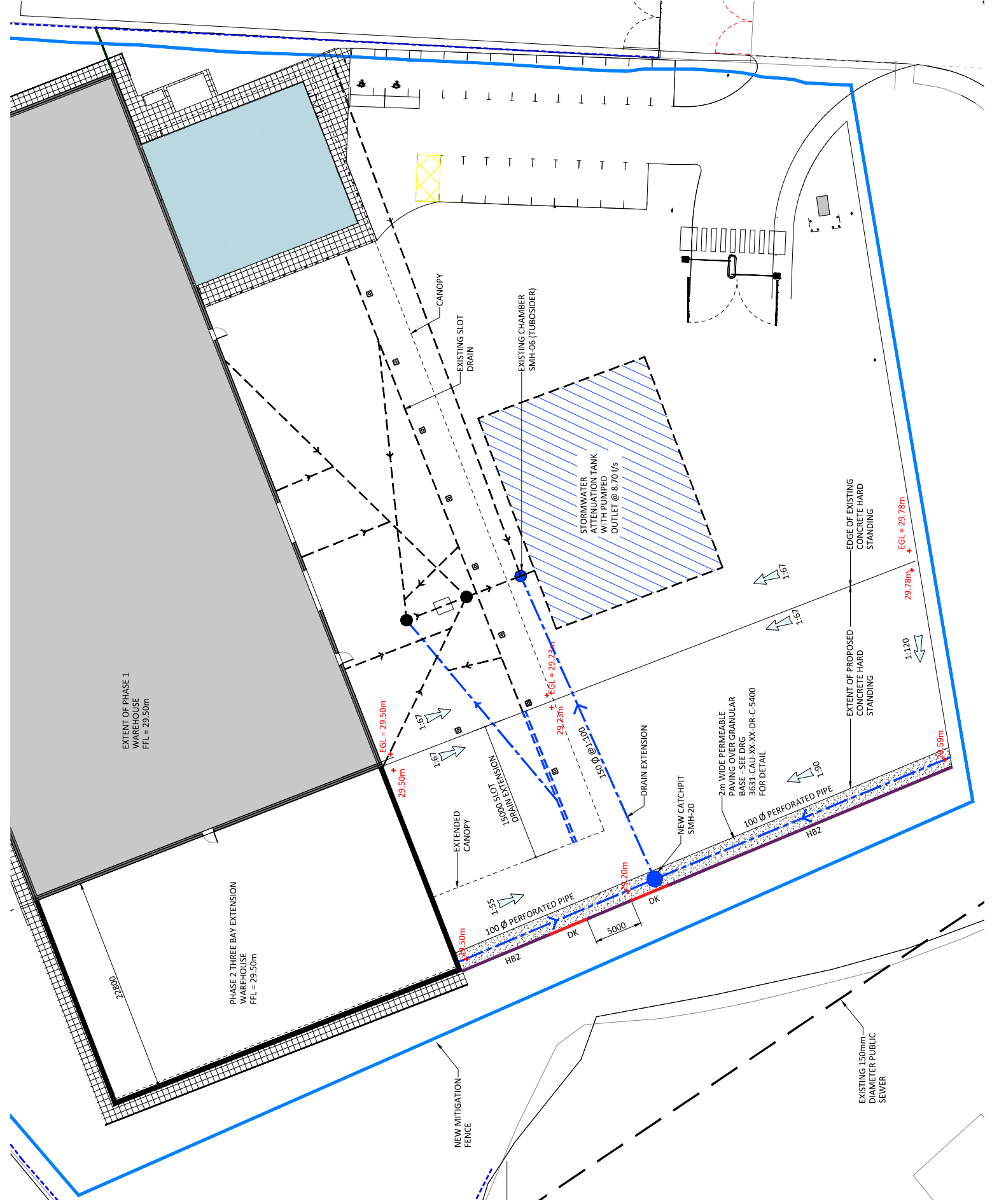
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NOTE

1. DO NOT SCALE FROM THIS DRAWING. WORK FROM DIMENSIONS. DIMENSIONS ARE IN METRES AND MILLIMETRES AND ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM U.N.O.
2. NO VARIATION FROM THE DETAILS SHOWN ON THIS DRAWING WILL BE ALLOWED WITHOUT THE PRIOR PERMISSION IN WRITING.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALIST DRAWINGS AND SPECIFICATIONS.
4. THE SPECIFICATION IN ALL RESPECTS SHALL BE IN ACCORDANCE WITH THE CURRENT WREXHAM CBC SPECIFICATION AND CONSTRUCTION PUBLICATION IN FORCE IN THE COUNTY AT THE TIME OF CONSTRUCTION.

LEGEND

- HB2 HB2 KERB
- DK DROP KERB
- XXXX PROPOSED LEVELS
- XXXX SLOPE LEVEL
- XXXX EXISTING DRAINAGE (AS SHOWN ON MUR ASSOCIATED LID DRAWING DMS 620 200, REV P4)
- XXXX PROPOSED DRAINAGE



REV	DATE	BY	AP	DATE	STATUS
PO2	16.07.19	DA	LLM	SBB	16.07.19
PO1	14.05.19	DA	LLM	SBB	14.05.19
REV	MODIFICATIONS	BY	RE	AP	DATE
PURPOSE OF ISSUE					
FOR INFORMATION					
S2					

CLIENT:
M+I INVESTMENT PARTNERSHIPS LTD

PROJECT:
ABBEY ROAD, WREXHAM

TITLE:
SAB APPLICATION

DRAWN BY	REVIEWED BY	AUTHORISED BY	SCALE @ A2
DA	LLM	SBB	1:1250
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14.05.2019		3631	P02
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