14554 Super Flyers Factory, Bolton

Drainage Strategy & Maintenance Report

Booth King Partnership Limited

Revision P02 – 13th October 2023

Prepared by:

Approved by:

Contents

1. Introduction

1.1. Scope

Booth King Partnership Ltd have been appointed by Super Flyers Factory Ltd to develop Civil and Structural Engineering design proposals for the extension to the existing single storey portal framed Super Flyers factory building in Sharples Vale, north of Bolton.

Proposals comprise deconstruction of existing canopy structure and construction of a new steel framed extension, resurfacing / reprofiling / expansion of site car parking (including potential construction of appropriate boundary structures) and installation of new surface water drainage network for the building extension and car parking.

No new foul drainage is required as part of the proposals.

This report identifies the drainage strategy to be employed on site, and how this is to be managed and maintained over time to ensure that the system continues to work satisfactorily.

1.2. Executive Summary

1. The site is currently occupied by a single storey industrial building with a lean-to canopy. The footprint of the structure is approximately 750m^2.
2. The remainder of the site is hardstanding used for car parking and materials storage.
3. Proposals include the construction of a new factory extension and resurfacing/ reprofiling / limited expansion of the existing site hardstanding for car parking.
4. The site ownership boundary is approximately 0.24Ha.
5. The application boundary is 0.14Ha. This excludes the existing factory building footprint and gravel margin to its side and rear perimeter.
6. A 3-storey former industrial building, Shaprles Vale Mill - which once occupied the central portion of the new proposed parking, is confirmed to have been demolished under separate planning permission.
7. The existing surface water drainage network, serving the hardstanding and factory roof, is assumed to discharge directly to Astley Brook. TBC by further drainage survey.
8. The proposed surface water drainage network is designed to serve the area of hardstanding in the proposed condition and the proposed extension roof. Runoff from the site hardstanding has been diverted from the existing network such that it can be suitably treated prior to discharge.
9. The runoff is treated via a Class 1 alarmed by-pass separator and temporarily stored in a below ground wrapped geo-cellular attenuation tank prior to discharge at a controlled rate. The preliminary volume of attenuation storage required is 50m^3.
10. The existing discharge rate, associated with the site hardstanding catchment has been calculated to be 34.4 l/s (1in100 year + 40%CC) and 16.6 l/s (1in1 year).
11. Proposed discharge rate has been limited to 8.3l/s (1in100 year + 40%CC) as a 50% betterment over the existing 1in1 year discharge rate.
12. The discharge is restricted through use of a hydro-brake flow control device fitted in the final manhole. Design head is 2m.

13. Discharge is to be direct into the natural watercourse, Astley Brook. Details of the outfall are to be developed in accordance with Environment Agency requirements. Invert level of the outfall is positioned at just above the 1in100 year + 35% CC river level. Proposed discharge to Astley Brook and outfall details to the approval the Environment Agency.

14. Infiltration has been considered but currently assessed to be unsuitable for use given the presence of made ground and the potential for contaminated soils underlying the site. Infiltration devices can be introduced as a means of discharging runoff volumes, in total or in part, subject to the results of an intrusive investigation and geo-environmental characterisation of the site. A falling head permeability test will be included as part of intrusive investigation.

15. No alterations to the foul network are proposed and no additional foul drainage points are required as part of the proposals.

16. Sustainable Drainage Systems (SuDS) are to be implemented and maintained for the lifetime of the building.

1.3. Site Location

The site is located north of Bolton in Sharples Vale at Asltey Lane, BL1 6NR (E: 371072, N:411216). The site is generally at approximately 104mAOD but slopes from a maximum 105mAOD at the entrance to a minimum 103mAOD to the SE.

Figure 1: Site Location Plan

1.4. Existing Site Description

The site is approximately 0.24Ha in area. The application boundary does not include the existing factory building and is approximately 0.14Ha in area.

The site is accessed via Astley Lane from its west boundary. The site is bounded by a scrap yard to the north and north west, further scrap storage and reservoir to the east, natural watercourse Astley Brook to the south and a residential property to the south west.

The site is currently occupied by the Superflyers Sweets Factory. The factory is a single storey portal framed structure with an open sided lean to canopy at its south-east corner. The factory is served by hardstanding occupying approximately half of the site. The south of the site, beyond the hardstanding is lined with trees and falls rapidly towards Astley Brook.

There is a prevailing fall across the site form the NW to the SE. The site levels drop more rapidly toward the SE before falling dramatically toward the watercourse.

A 3-storey former industrial building, Shaprles Vale Mill - which once occupied the central portion of the new proposed parking, is confirmed to have been demolished under separate planning permission (Ref. AB/S81/22/4794).

1.5. Geo-Environmental Conditions

A Preliminary Desktop Study has been undertaken for the site. The study was carried out by NX Consulting in February 2023, report reference NX557. Please refer to NX Consulting's report for full details.

Key findings of the report are as summarised in the following sub-sections.

1.5.1. Geotechnical

The report indicates that a thickness of made ground would be expected on site given its development history. Based on historical borehole logs, underlying the fill a superficial deposit of Till comprising firm to stiff clay, cobbles and lenses of sand is expected above a bedrock of Pennine Lower Coal Measures Formation largely comprising mudstone, siltstone and sandstone at depth.

The property lies within the potential zone of influence of recorded workings in 1 seam of coal. The most recent underground working in the area was in 1959. These workings are reported to have occurred on site and in the surrounding area. Any ground movement due to this coal mining activity should have stopped.

Due to uncertainty and the possibility of the proposed building being affected by shallow unrecorded underground mining within the Doe Coal seam in the south of site, there is a low to medium risk present to the site and the proposed development.

1.5.2. Hydrological

Historical borehole logs (from the BGS website) reviewed showed slow water seepage to 2.5mbgl. The risk of flooding from groundwater is considered low.

The site does not lie within 250m of a groundwater abstraction zone.

The site does not lie within 500m of a groundwater source protection zone.

1.5.3. Contamination

The site is not included on the list for sites designated as contaminated land.

An intrusive site investigation including suitable sample testing is to be undertaken to confirm the presence/concentrations of identified potential contaminants.

Potential contamination sources affecting the site were identified as heavy metals, PAHs, sulphate, asbestos containing material, petroleum hydrocarbons PCBs, solvents and gas (carbon dioxide, methane and depleted oxygen) arising from the historic industrial uses of the site and the surrounding area.

Hazardous ground borne gas associated with potential made ground / infilled gravel pits, coal mining and radon gas.

The proposed building footprint and car park covers the entire site and as such migration pathways of potential contaminants to end users are restricted.

2. Flood Risk Assessment

A flood risk assessment has been prepared by JBA Consulting in February 2023, report reference JTI-JBAU-XX-XX-RP-Z-0001-S1-P01-Stockleys_FCA.

The assessment concluded that the site's flooding risk from various sources is as summarised in the table below.

Source of risk	Level of flood risk at the site
Fluvial	Low
Tidal	n/a
Surface water	Low
Groundwater	Low to moderate
Sewers	Very low
Reservoirs	Very low
Canals	Very low

Figure 2: Flood Risk Summary (JBA Consulting)

3. Below Ground Drainage Strategy

3.1. Performance Objectives

The below ground drainage network is designed to convey water from the building extension and hardstanding to a suitable outfall. The principle objective is for surface water (from rainfall) to be separated from foul water flows, and conveyed to separate outfalls. Where possible, in line with the National Planning Policy, Sustainable Drainage Systems (SuDS) should be used for restricting surface water flows off site.

The current building roof is drained via a series of eaves level gutters into RWPs and conveyed via a network of pipes and chambers before being discharged at an uncontrolled rate into the watercourse at the south of the site – this is to be confirmed by further drainage survey. The existing surface water drainage system that serves the building on site is to be maintained as built and serviced only as part of the proposals. Runoff from the car parking area is to be diverted from this existing network and into the new proposed network.

The existing car park is drained by a network of dish drains which are assumed to discharge, untreated, via buried pipe to the outfall location and into the watercourse at the south of the site – this is to be confirmed by further drainage survey. Again, this is to be improved via development whereby the car park run off will be collected in the proposed SW drainage network and treated prior to discharge to the watercourse.

3.2. Foul Drainage

The existing foul water drainage network is unaffected by the proposals. There are no additional foul water points to be incorporated into the design and there is no additional foul water being added to the network. The existing foul water network is, therefore, to be maintained as built and serviced only as part of the proposals.

3.3. Surface Water

3.3.1. Sustainable Drainage Systems (SuDS)

The National Planning Policy Framework states that Sustainable Drainage Systems (SuDS) should be used for restricting surface water flows off site.

The Flood and Water Management Act 2010 requires new developments and redevelopments in England and Wales to have drainage plans for surface runoff approved by the Sustainable Drainage Systems Approval Body (SAB) where the construction work would have drainage implications. The SAB is responsible for adopting and maintaining new SuDS that serve more than one property and have been constructed as approved and function as designed.

The current National Standards for Sustainable Drainage Systems require all new developments, where practicable (excluding single properties), to implement SuDS. The standards set out appropriate design criteria based on four main parameters:

1. Runoff Destination hierarchy (in order of preference);
    a. To ground;
    b. To surface water body;
    c. To road drain or surface water sewer;
    d. To combined sewer

2. Peak flow rate and volume (pre and post development)

3. Water Quality (based on potential hazards arising from development and sensitivity of the runoff destination)

4. Function (design; flood risk; operation and maintenance)

3.3.2. Ground Conditions

The NX Consulting Ltd desktop study report indicates the presence of made ground on site beneath the proposed development. Due to the ground conditions, disposal of runoff via ground infiltration is considered unsuitable at this stage albeit this could be confirmed otherwise, subject to the findings of intrusive investigation and testing.

The nearest watercourse is Astely Book, 3m south of the site. The existing site's surface water drainage network is assumed to discharge directly into the watercourse (TBC). It is therefore considered suitable to discharge the proposed surface water drainage into Astley Brook.

3.3.3. Outfall Location

The intention is discharge surface water runoff from the car parking surface and the roof of the proposed extension directly into the natural watercourse, Astley Brook, located to the southern boundary of the site. The location along the boundary is relatively flexible at this stage, requiring further investigation of the existing outfalls and liaison with the Environment Agency.

The Environment Agency Product 4 Flood Risk Data shows maximum water level 1in100 year storm event +35% Climate Change to be 101.57mAOD at the approximate location of the proposed outfall. As such a suitable invert level of 101.600mAOD has been proposed for the outfall. Headwall details to be developed with EA.

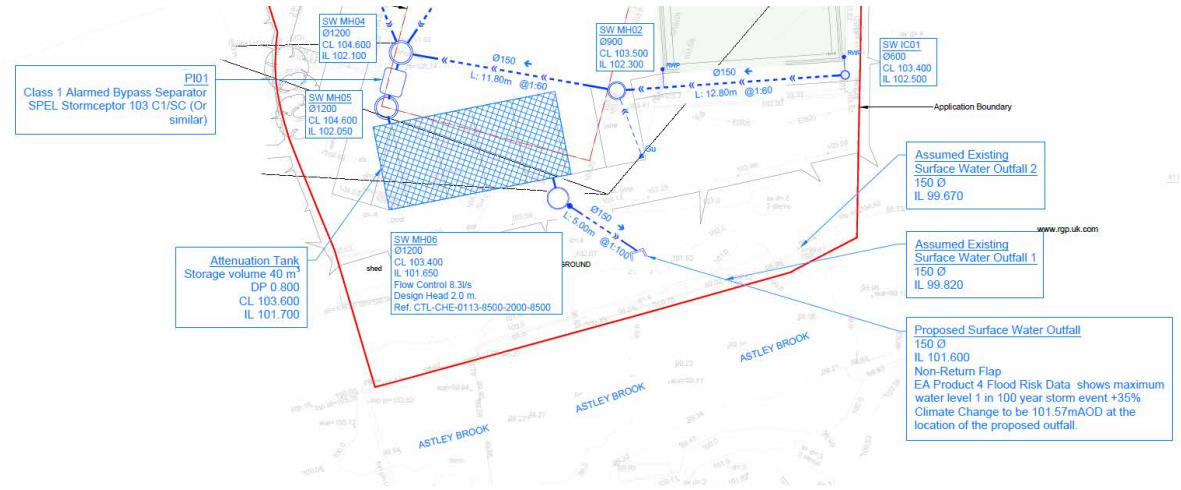


Figure 3: Proposed Surface Water Outfall

3.3.4. Assessment of surface water flows (existing and proposed)

The below ground surface water network collects water from the roofs and surface car parking on site.

The surface water flows have been fully analysed for the existing hard standing and roof area included in the extent of the proposed extension. The proposed surface water flows have been designed to accommodate run off from the expanded hardstanding, roof extension and a portion of Astley Lane where it falls toward the site entrance.

The on-site network has been sized using the Causeway Flow with the following design criteria:

- No surcharging within the system for storm with a return period of 1:1 years;
- No surface water flooding for storms with a return period of 1:30 years;
- No surface water flooding for storms with a return period of 1:100-year;
- Controlled water flooding for storms with a return period of 1:100-year + 40% increase for climatic change.
- Existing drainage simulation shows 16.6 l/s discharge contribution from the area of existing car parking and building for the 1 in 1 year storm event and we are proposing 8.3 l/s, a 50% betterment over the peak 1 in 1 year discharge rate.

3.3.5. Pre-Development Discharge Rates

1 in 1 year	16.6 l/s
1 in 30 years	33.3 l/s
1 in 100 years	34.4 l/s
1 in 100 years + 40%cc	34.4 l/s

3.3.6. Post-Development Discharge Rates

1 in 1 year	4.6 l/s
1 in 30 years	6.7 l/s
1 in 100 years	6.7 l/s
1 in 100 years + 40%cc	8.2 l/s

3.4. Supporting drawings and calculations

A full set of calculations are provided with this submission analysing the surface water network and verifying the above flow rates for the existing and proposed arrangements. The proposed drainage network is shown on drawing no. 14554-BKP-ZZ-ZZ-DR-C-0500 (Rev. P01).

3.5. Standards and Regulations

All elements of the works will be designed in accordance with the latest relevant British Standards and the Building Regulations and will comply with any relevant statutory or Local Authority requirements. Specifically, the below ground foul and surface water drainage systems will comply with:

- BS 752 Part 1 to 7;
- Local Authority Requirements;
- The SuDS manual by CIRIA;
- Building Regulations Part H;
- 7th Edition Sewers for Adoption.

4. Maintenance Requirements

The Drainage network has been designed with minimal maintenance in mind. The maintenance is generally of a 'common sense' approach and is to comprise:

Regular day to day care: - litter collection, grass cutting and checking the inlets and outlets where water enters or leaves a drainage feature.

Occasional tasks: - managing vegetation in wet areas and removing any silt that builds up in the drainage features.

Remedial work: - repairing damage when, and where, necessary.

Specific recommendations for each feature are provided in the following sections and should be referred to in the first instance if there are any issues. Please contact Booth King Partnership Ltd. if any further advice is required.

During the works the Contractor, subject to agreement from their client, will ensure that all drains on which the proposed drainage works rely will be jetted out and made good as required to ensure correct operation.

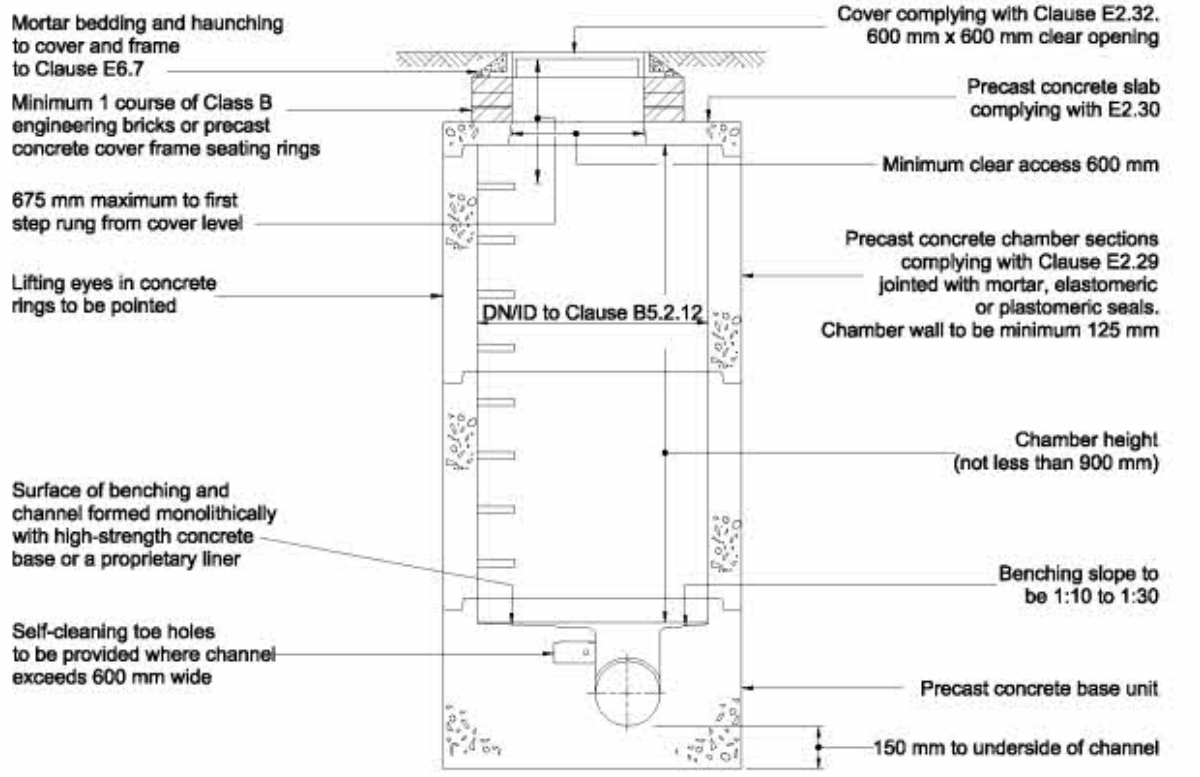
Maintenance Activity	Required Action	Frequency
Inspection	Inspect for sediment and debris in pre-treatment component such as gullies, sump units and catch pits.	Monthly for the first year and on a 6-monthly basis thereafter.
Gutters	Clear gutters and any leaf guards.	On a 6-monthly basis or as required following inspection regime.
Sump Units	Remove all obstructions and debris from all sump units (gullies, channels and catch pits).	On a 6-monthly basis or as required following inspection regime.
Pipe Work	Inspect all pipework for all silt accumulation and high pressure jet any pipe work which has silt accumulation. Care is to be taken that any silts within the pipework are not flushed into the attenuation tank using chamber bungs.	On a 6-monthly basis or as required following inspection regime.
Manholes	Covers should be lifted and inspected for litter and debris to ensure that the runs are free-flowing.	On a 6-monthly basis or as required following inspection regime.
Flow Control	Check flow control manhole to ensure emptying is occurring. Little to no water should be present after consecutive days of dry weather). Check function of the emergency drain down. Check for build up of debris and silt. Clear and remove as necessary.	6 monthly basis. After extreme events.
Attenuation Tank	Ensure that ventilation pipework is free of obstruction. If jetting through the tank is required, this must be done following the jetting and clearance of upstream sumps.	6 monthly basis. After extreme events.
Petrol Interceptor	Check the integrity of the interceptor and all its mechanical parts. Inspect the filters and repair or replace, where necessary. Assess the amount of contaminants that have collected in the tank. Service all electrical systems, interceptor management systems and alarms etc. Examine the coalescing device (if there is one) and replace, if required. Have all silt and contaminants removed and disposed in accordance with regulations. Maintain industry standard documentation. Keep logs of any inspections, maintenance, incidents, services and contaminant removal activities. Ensure any contaminants are removed and transported in accordance with relevant legislation.	6 monthly basis. After extreme events.

Appendix A – Typical Manhole Details

For maintenance requirements, please refer to product manual.

The manual provides information on the specifications, installation details, typical applications and Technical Support information. Please refer to this documentation in the first instance for any future maintenance.

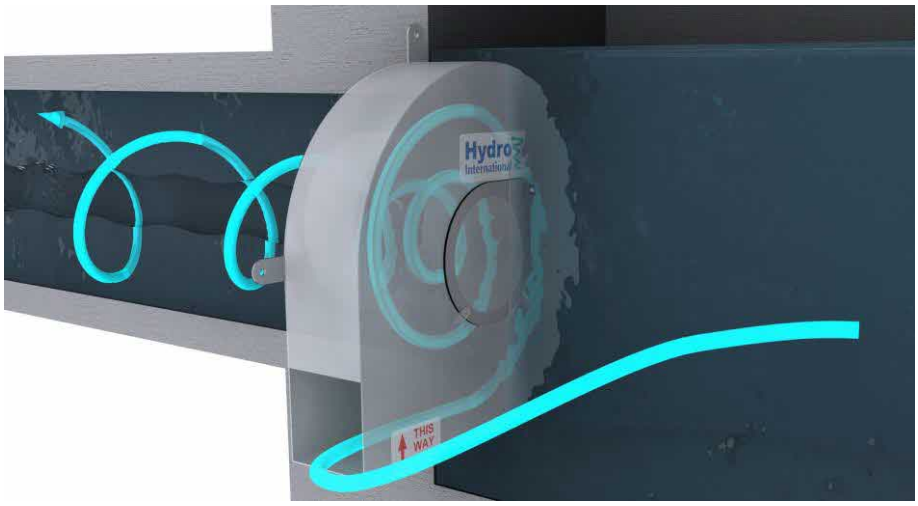
Figure B 9
Typical manhole detail – Type B
Depth from cover level to soffit of pipe 1.5 m to 3 m
Rigid material construction without concrete surround



Appendix B – Hydro-Brake Flow Control Device

For maintenance requirements, please refer to product manual.

The manual provides information on the specifications, installation details, typical applications and Technical Support information. Please refer to this documentation in the first instance for any future maintenance.



Appendix C – Attenuation Storage

For maintenance requirements, please refer to product manual.

A geo-cellular crate storage structure is envisaged to be used for stormwater storage for the application of stormwater attenuation.

Lightweight materials combined with robust design make it easy to transport, quick to install and extremely durable, even beneath high-traffic areas such as roads, car parks and warehouse yards.

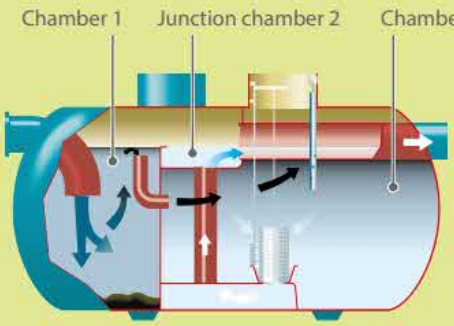
Access shafts can be easily constructed during installation of the storage system to enable inspection and maintenance.

The channels between the vertical struts allow access for CCTV inspection, maintenance and cleaning and ensures that the storage volume of the system isn't compromised by the build-up of silts.

Appendix D – By-pass Separator

For maintenance requirements, please refer to product manual.

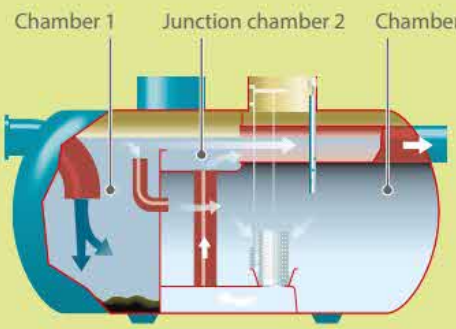
The manual provides information on the specifications, installation details, typical applications and Technical Support information. Please refer to this documentation in the first instance for any future maintenance.



Flow according to nominal size (NSB)

The polluted surface water first enters the primary chamber where silt settles out and is retained. The fuel, oil and other pollutants lighter than water, rise to the surface and are efficiently skimmed off and transferred to the separation chamber.

All flows within the nominal size pass through the separation chamber, where the quiescent conditions allow the pollutants to separate out efficiently. Water from the cleanest zone in the separation chamber flows through a coalescer unit, to remove smaller globules of oil, up to the junction chamber and thence to the outlet.

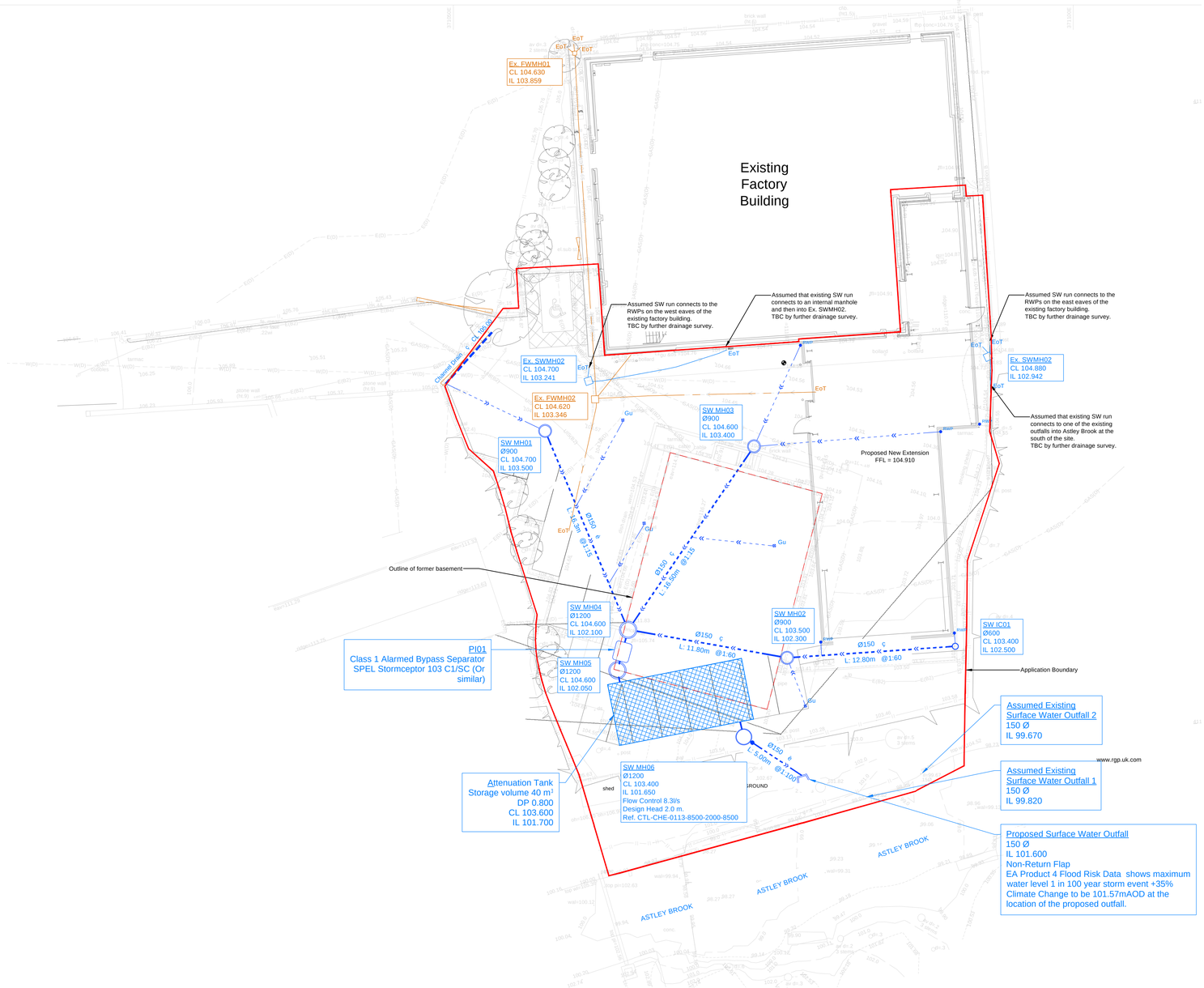


Storm flows above NSB

During a storm the level in the primary chamber rises and the stormwater passes over the weir into the junction chamber and to the outlet.

The design keeps the turbulence within the separation chamber to a minimum which avoids disturbing the contaminants retained.

Appendix E – Drainage Layout



DRAINAGE NOTES

1. All levels shown are in meters and are relative to Ordnance Survey Datum.
2. Invert levels of all existing chambers and connection points are to be confirmed and Engineer advised prior to commencement of any Drainage Works.
3. Concrete bed and surround is required to all gully leads and to all pipes in highways / hardstanding where cover to pipe < 1200mm
4. All pipes to be either extra strength V.C to BS 65 or PVC to BS 5481 ' UPONOR ULTRARIB' or concrete pipes Class 120 to BS 5911.
5. All works and materials are to be in accordance with UK Building Regulations 'Approved Document H'.
6. All penetrations in the slab are shown indicatively on this drawing. Reference is to be made to Architect's dimensioned floor layout and details.
7. Type 2 rodding access is to be provided at all pop ups.

Storm Event	Existing Flow rates	Proposed Flow rates
1	16.6 l/s	4.6 l/s
30	33.0 l/s	6.7 l/s
100	34.4 l/s	6.7 l/s
100 + 40% cc	34.4 l/s	8.2 l/s

DRAINAGE STRATEGY:

Foul Water

The existing foul water drainage network is unaffected by the proposals. There are no additional foul water points to be incorporated into the design and there is no additional foul water foul being added to the network. The existing foul water network is, therefore, to be maintained as built and serviced only as part of the proposals.

Surface Water

The existing site surface water drainage network collects surface water run off via a series of rainwater down pipes and linear channel drains. the runoff is then conveyed via a piped network of chambers before being discharged directly into the natural water course, Astley Brook, to the south of the site. TBC.

The existing surface water drainage system that serves the building on site is to be maintained as built and serviced only as part of the proposals. Runoff from the car parking areas are to be diverted from this existing network and into the new proposed network.

New surface water drainage network is to be installed to collect surface water runoff associated with the new roof extension and car parking.

Water is to be collected via rainwater down pipes, trapped gullys and linear channel drains. The runoff is conveyed via a piped network of chambers before being treated in a bypass separator.

The runoff is stored in an online attenuation tank during storm events and discharged at a controlled rate of 8.2 l/s through a hydro-brake manhole and into the natural water course, Astley Brook, to the south of the site.

IMPORTANT NOTE:

Proposal to discharge to the natural watercourse is to be approved by the Environment Agency.

NOTES

1. Do not scale from this drawing.
2. This drawing is copyright and is sent to you in confidence. It must not be copied, used or disclosed, in whole or in part, to third parties without written permission. It remains the property of Booth King Partnership Ltd. and must be returned on request.
3. This drawing is to be read in conjunction with all relevant contractual documents.
4. Anyone using this drawing must be aware of their legal duties under the CDM Regulations 2015, refer to the HSE website for further information. BKPL are not Principal Designers.
5. All dimensions shown on this drawing are in millimeters unless noted otherwise.
6. If the Contractor consider that they do not have sufficient information to safely complete the works detailed on this drawing, they should contact the Engineer.
7. All works are to be carried out in accordance with the Building Regulations (as amended) and to the approval of Building Standards.

LEGEND

- Ex. SW Drain
- Ex. SW Chamber
- Ex. FW Drain
- Ex. FW Chamber
- Pr. SW Drainage Channel
- Pr. SW Drain. 100Ø UNO.
- Pr. SW Chamber
- Pr. SW Petrol Interceptor Class 1 alarmed bypass separator
- Pr. SW Attenuation Tank HGV rated geo-cellular crated system
- Gu — Pr. Trapped Road Gully
- RWP — Pr. Rainwater Downpipe

NOTE:

Drawing to be read in conjunction with BKPL Drainage Strategy & Maintenance Report. Report No. 14554.

NOTE:

Phase 1 Site Investigation undertaken by NX Consulting Ltd in February 2023. Report No. NX557.

NOTE:

Flood Risk Assessment undertaken by JBA Consulting in February 2023. Report No. JTI-JBUA-XX-XX-RP-Z-0001-S1-P00.0-Stockley_Sweets_FCA.

IMPORTANT NOTE:

The topographical and buried services shown on this drawing were provided to Booth King Partnership Ltd have not verified this information and therefore we cannot guarantee its accuracy. The position and alignment of services may differ from that shown and buried services may be present.

The contractor must verify the location of all buried services before any excavation or surfacing works begin. Damage to existing services could present a major health and safety risk plus associated commercial penalties.

NOTE:

SVP, pop up positions and rain water pipes to be confirmed by the architect.

REV.	DATE	REVISION DETAILS	INITIALS
P03	12.10.23	Updated to suit latest Arch plan	LH
P02	09:03:23	Issue for Planning	LH
P01	08.03.23	Preliminary Issue for Comment	LH

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PROJECT:
Super Flyers Factory
Bolton

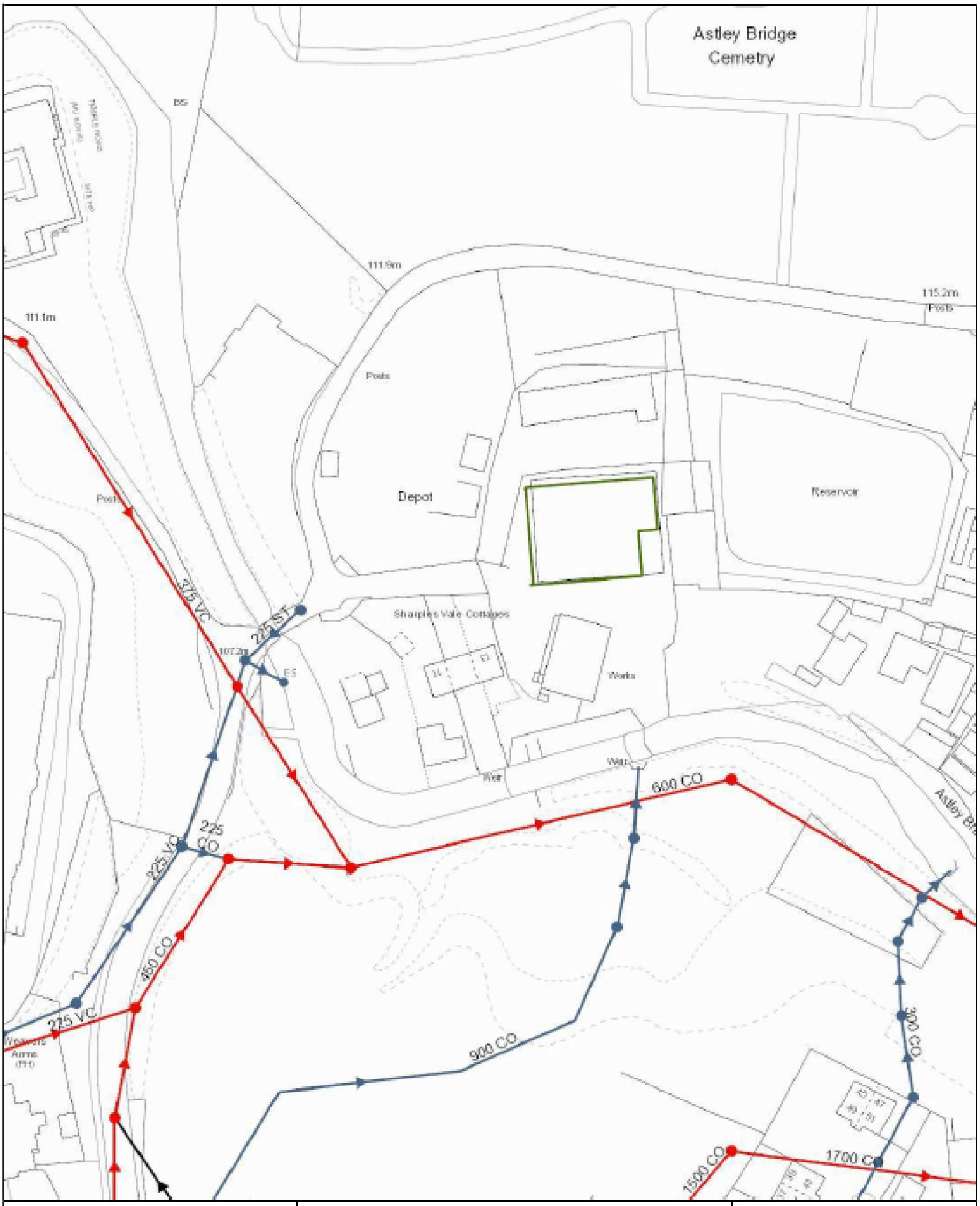
TITLE:
Surface Water
Drainage GA

SCALE @ A1:	DRAWN:	DATE:	REVISION:	STATUS:
1:50	LH	Mar 2023	P03	S2

DRAWING No:
14554-BKP-ZZ-ZZ-DR-C-0500

Appendix F – Drainage Calculations

Appendix G – UU Record Map



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Date:	22/09/2022

SEWER RECORDS

United Utilities
Water for the North West

Address or Site Reference: U22-7982

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