

**MANUFACTURING FACILITY  
SAMLESBURY AERODOME**

**PROPOSED CAR PARK  
DEVELOPMENT**

**SURFACE WATER DRAINAGE  
STRATEGY**

**REVISION P01**

**Revised 16/12/2025**

**DECEMBER 2025**

**Project 7274**

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## **Duty Of Care**

This report was prepared on behalf of the client, Wilson Mason Associates, in response to a specific brief. No reliance is to be placed on the content of this report for any use other than that for which it was prepared. This report has been prepared in the light of Legislation and best practice current at the time of writing.

Written approval of TRP Consulting must be obtained in the event that a third party wishes to use or place reliance against the content of this report. A charge may be raised against this approval.

Nothing contained in this report confers or purports to confer a duty of care or benefit of any kind to any third party.

## 1.0 INTRODUCTION

### 1.1 Project Background

TRP Consulting was commissioned by Wilson Mason on behalf of the Client to prepare a surface water drainage strategy for the proposed construction of a new car park on land at Samlesbury Aerodrome, Lancashire. The proposed development site covers an area of approximately 0.221 hectares.

The site is currently a greenfield site with existing services running underneath.

### 1.2 Proposed Development

A layout of the proposed development is shown in Fig 1.1 below. The site consists mainly 60 standard car parking spaces, 6 EV charging spaces, 5 disabled parking and 6 bike parking spaces.



Figure 1.1 Proposed Development

### 1.3 Report and Objectives

The objective of this report is primarily to document the strategy for control and disposal of surface water run off resulting from the proposed development on the site.

The report is to consider the hierarchy of options available for disposal of surface water and the implementation of Sustainable Drainages Systems (SuDs). Details of the plans for the

## 2.0 THE SITE

### 2.1 Site Location and Description

The site is located in Balderston, Blackburn. It is located between Myerscough Smithy Road (A59) to the north and Preston New Road (A677) to the south. The area of Mellor Brook lies just over 1km to the east, Turner Green lies approximately 1.5km to the west and Samlesbury town centre is located almost 4km to the west.

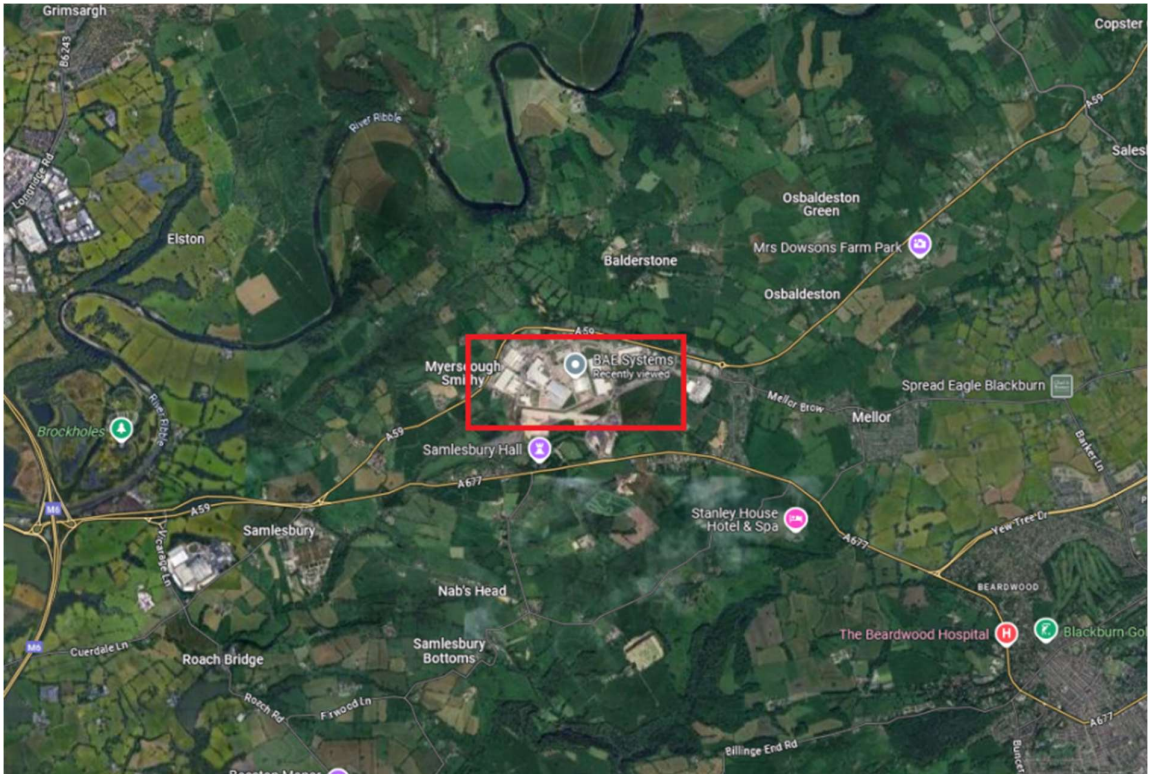


Figure 2.1: Site location

The site was undeveloped open farmland prior to World War 2 when it was developed as an airfield. Following the war, the former airfield was subsequently developed for aircraft component manufacture and assembly.

The facility is now occupied by several manufacturing, office and storage buildings, site roads, disused runways and grassed areas. The surrounding rural area comprises agricultural land and associated farm buildings.

### 2.2 Topography

The topographical survey confirms that the site generally falls from south to north where levels range from 74.70m to 73.65m AOD.

### 3.0 DESK STUDY, CONSULTATION AND INVESTIGATION

#### 3.1 Hydrology

Ordnance Survey mapping and on-site inspection confirm that the closest watercourse is Huntley Brook (flowing North to South) located approximately 230m west of the site. A second watercourse, Mellor Brook is located approximately 800m north of the site and flows westwards.

#### 3.2 Ground Investigation

A ground investigation was undertaken in October 2025. The potential for use of infiltration was considered during the investigation. The superficial strata across the site were confirmed to be made ground of brown ashy gravelly sandy silty clay at depths of 0.2-1.1m. The made ground was underlain by dark brown ashy fragments of stone, clinker and brick. The presence of ashy made ground and a considerable thickness of low permeability clays soil confirmed that infiltration would not provide a suitable means of disposal for surface water run off generated by the development.

#### 3.3 United Utilities Sewer Records & Existing Drainage

The site does not have any UU assets in or around the site. A 150mm diameter surface drain runs along the southern boundary of the site. The drain are joined by the 3 manholes that serve to provide junctions for nearby drainage from areas outside the site boundary. This existing drainage can be seen below in Fig 3.3

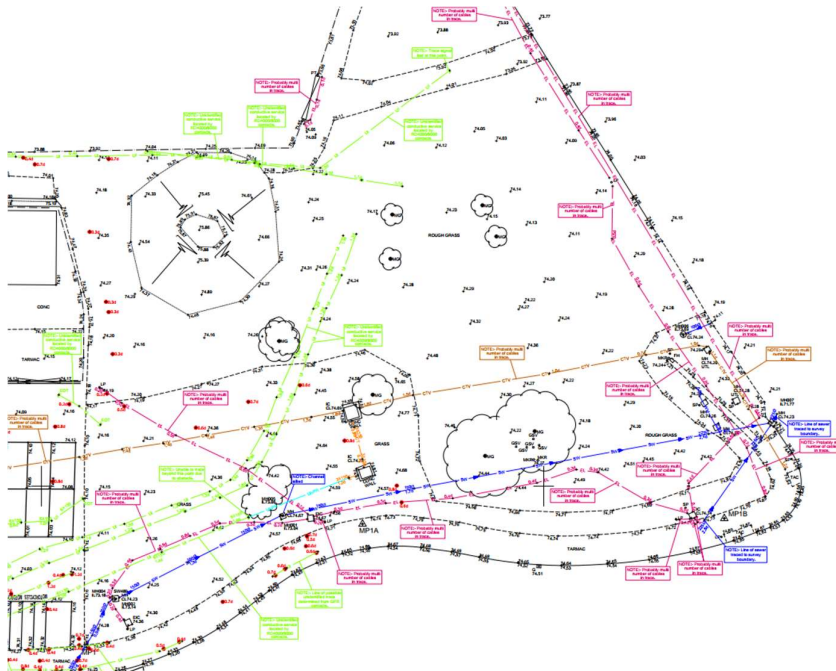


Figure 3.3: Existing site drainage

### 3.4 Flood risk

Environment Agency Flood Mapping indicates the site is located within EA Flood Zone 1. EA Flood Zone 1 land has been assessed as having a minimal 0.1% (1 in 1000 year) chance of flooding from rivers or the sea in any given year.

The probability of flooding from the various sources is summarised in the table below

Source of Flooding	Probability of Flooding
Fluvial and Tidal	Low Probability (less than 1 in 1000 annual probability)
Reservoirs and Canals	Low Probability - Unlikely
Groundwater	Low Probability – Limited Potential
Sewers	Low Probability
Surface Water run-off and Overland Flow	Low Probability

Preliminary assessment of the site and surrounding area has confirmed a low probability of flooding from all sources.

### 3.5 Existing rates of run-off generated by the site

The site of the car park is a greenfield site and according to this, the surface water discharge rates for the new development should not exceed the volume of runoff from the equivalent area in its natural undeveloped or greenfield state for the same rainfall event.

The maximum rate of discharge should be agreed with the Lead Local Flood Authority but should not exceed the 'Qbar' greenfield equivalent rate (based on the proposed positively drained area of the development).

Using the HR Wallingford UKSuDS online tool and the loH124 methodology (Interim Code of Practice for SuDS for sites smaller than 50ha), the average annual greenfield runoff rate ('Qbar') for the development site has been calculated as 1.8l/s. The calculation is provided in Appendix C2.

### 3.6 Surface water disposal options

Development of the site will result in an increase of impermeable areas and therefore a corresponding increase in run-off volumes. The use of SUDs techniques to discharge the additional surface water will be evaluated in this section of the report.

The storm water drainage system for the proposed development will be designed in accordance with the DCG, which requires that any surface water drainage system, should

not surcharge during the 1 in 2-year storm event, and should not flood during a 1 in 30-year storm event (i.e., all run-off contained wholly within the sewerage system during the 1 in 30-year event).

Whilst the DCG requires there be no surface flooding during the 1 in 30-year storm event. It is generally accepted that a degree of surface flooding can be permitted during extreme storm events i.e., 1 in 100 year + climate change. This will be subject to specific areas being designated as flood susceptible and subject to flooding of these areas posing little or no risk to human life and damage to property. Examples of surface areas which might be permitted to flood in such events are:

- Agricultural land
- Recreational land (playing fields etc.)
- Landscaped areas
- Highways
- Car parks
- Other non-inhabited, designated areas

In all cases where surface flooding might be permitted or designed into a scheme, due diligence needs to be given to the NPPF and the need to make potential users of such areas aware of their functionality and purpose, and the requirement to maintain safe egress and access at all times.

The hierarchy of potential methods for surface water disposal from the site is as follows:

- A soakaway: or where that is not practicable.
- A watercourse or river; or where that is not practicable,
- A sewer

The viability of each has been assessed below:

- Soakaway: Regarding the consideration of soakaway infiltration methods for the disposal of surface water, at this stage. Soakaways have been discounted based on the SI findings, which conclude that the disposal of surface water using soakaways is unlikely to be practical on the site due to the presence of low permeability clay on site.
- Watercourse: The nearest watercourse, Huntley Brook, is located 230m away from the development site. This option is not deemed viable due to the distance and the fact that the site wide private surface water network already discharges into th Brook..
- Sewers: The site consists of surface water drainage on the Southern edge. This surface water discharges into Huntley Brook and would provide a viable option for disposal from the development.

There are no foul flows generated on this site.

## 4.0 DETAILED DEVELOPMENT PROPOSALS

The proposed development comprises the design and construction of a new car park on a greenfield site

The general scope of the project comprises:

- Clearance of existing site and grading to proposed subbase levels
- Installation of cover slabs for existing services
- Re-location of existing gas mains
- Construction of hardstanding's
- Drainage and infrastructure associated external areas.

The development will be drained using a combination of gullies and ACO's, be conveyed through 150/225mm diameter pipes, stored in attenuation crates and passed through a bypass klargester fuel and oil interceptor before being discharged to an existing manhole southeast of the site.

### 4.1 Climate Change

The Environment Agency have provided guidance on the increase in peak rainfall intensity that should be applied in flood risk assessments and drainage design to make allowance for the effects of climate change. The EA have provided a range of allowances to be applied to the 1:100 year peak rainfall intensity as shown in the table below.

Allowance Category	Total potential change to 2050	Total potential change to 2070
Upper End	40%	50%
Central	25%	35%

Flood risk assessments should generally assess both the central and upper end allowances to understand the range of impact.

The development is generally assessed as having a minimum 50-year lifetime.

The surface water drainage system to the new development will be designed to account of storms up to and including 1 in 100-year return period and will include 50% increase in peak rainfall intensity to allow for climate change. Climate change should therefore not pose an undue risk to the proposed development

### 4.2 Flood Risk Management Measures

To protect the site and surrounding area from flooding the new below ground drainage systems for the proposed development will be designed for a 1 in 100-year event including a 50% increase in peak rainfall intensity to account for the effects of climate change. All flows

will be accommodated below ground or within designed attenuation features. This will protect the development and adjacent sites from the risk of surface water flooding and overland flow.

#### **4.3 Off Site Impacts**

The proposed drainage strategy is based on containing all run off in the below ground network and storage features without surface flooding or overland flow. The proposed development will not increase flood risk on or off site.

#### **4.4 Residual Risks**

A residual risk will remain from surface water run-off caused by extreme storm events with annual probabilities of less than 1% (1 in 100 year) and in the event of blockages in the site drainage systems.

The maintenance of the on-site drainage systems is the responsibility of the site owners. A drainage maintenance plan to cover the safe operation and maintenance of all drainage systems and SUDS is included in Section 6.0 of this report.

Reference should also be made to British Standard BS 8582:2013: Code of practice for surface water management for development sites regarding the maintenance requirements and programming for maintenance to surface water drainage systems.

#### **4.5 Flood Risk Assessment Summary**

The site is located in Flood Zone 1. Flood Zone 1 is land assessed as having a minimal risk of flooding from rivers and the sea, less than 1 in 1,000 in any year.

As assessment of all potential sources of flooding on the site has been undertaken. The overall risk of flooding to the site has been assessed as low.

## **5.0 PROPOSED SURFACE WATER DRAINAGE STRATEGY**

### **5.1 Existing drainage arrangements**

The development site is served by separate foul and surface water drainage systems that form part of the private site drainage system. Surface water from the entire private site discharges to both Huntly Brook in the west and Mellor Brook in the north.

### **5.2 Existing Run Off Rates**

The total area of the development site is in the region of 0.223 hectares. The development is a greenfield site and flows generated are to be discharged at existing rates.

The existing rate was estimated using the Wallingford procedure and found to be 1.8L/s. Refer to Appendix C2 for the estimated greenfield runoff report.

### **5.3 Proposed Development**

Details of the proposed development are set out in Section 4 with 100% of the site being impermeable car parking.

The total site of 2230 m<sup>2</sup> of site will be drained to the surface water sewer system, attenuated and discharged by way of hydrobrake at 1.8L/s.

This discharge rate to be controlled by a vortex flow control device, and to ease the effect on downstream sewers, the proposed surface water flows from the development site is limited to 1.8L/s for a 1 in 100-year storm + 50% climate change.

### **5.4 Ground Investigations**

In October of 2025, Sub Surface completed a ground investigation report, reference 8256 GI Report 10.10.25, which entailed 5No. trial pits with subsequent in-situ testing, geotechnical laboratory testing, contamination analysis and waste classification.

The site investigation revealed a surface covering of brown ashy gravelly sandy silty clay at depths of 0.2-1.1m. The made ground was underlain by dark brown ashy fragments of stone, clinker and brick.

The ground investigation undertaken by Sub Surface North West Ltd comprised a series of trial pits. The trial pit locations are shown in Fig 5.4 below.



Fig 5.4 Borehole and trial pit location plan

Contamination testing was undertaken as part of the ground investigation. The results of testing confirmed elevated levels of contamination in the upper layer of made ground. Based on the results, the made ground should be disposed of at a Non-Hazardous landfill.

No ground water were encountered in any of the trial pits.

## 5.5 Surface Water Drainage Options

Current guidance recommends that surface water run-off should be controlled as near as possible to its source. The Planning Practice Guidance suggests that the following hierarchy of drainage solutions should be considered:

- To rainwater harvesting systems
- To the ground via infiltration
- To a surface water body
- To a surface water sewer
- To a combined sewer

These options are considered below.

## **Rainwater harvesting systems**

A rainwater harvesting tank is not applicable in this case as the site is a hardstanding car park.

## **Infiltration**

Ground conditions on the site comprise made ground overlaying a consistent band of low permeability clay soils. Infiltration drainage systems have been discounted for disposal of surface water due to the impermeability of the soil.

## **Discharge to a surface water body**

The nearest watercourse, Huntley Brook, is located 230m away from the development site. This option was not deemed viable due to the distance and the fact that the site wide private surface water network already discharges to the Brook.

## **Discharge to a surface water sewer**

The site consists of surface water drainage on the Southern edge. This surface water discharges into Huntley Brook and would provide a viable option for disposal from the development.

## **Preferred surface water disposal option**

The site is not considered to be suitable for use of infiltration drainage systems due to the low permeability soil.

Discharge of surface water to the open watercourse has been ruled out due to the distance the watercourse is from site.

The preferred means of disposal for surface water run-off from the proposed development is discharge to the existing site wide surface water drainage network.

The existing greenfield runoff rate is estimated at 1.8L/s from the Wallingford procedure. The runoff is to be discharged at this rate with attenuation provided for all storm durations up to 1 in 100 year + 50% climate change events.

Additionally, the outfall has been modelled as surcharged to the 0.6m above the invert of the outfall manhole to represent worst-case conditions across the site-wide network. Refer to Appendix C for the fixed surcharge level in the calculations and appendix G for the impermeable areas that contribute to the surface water network.

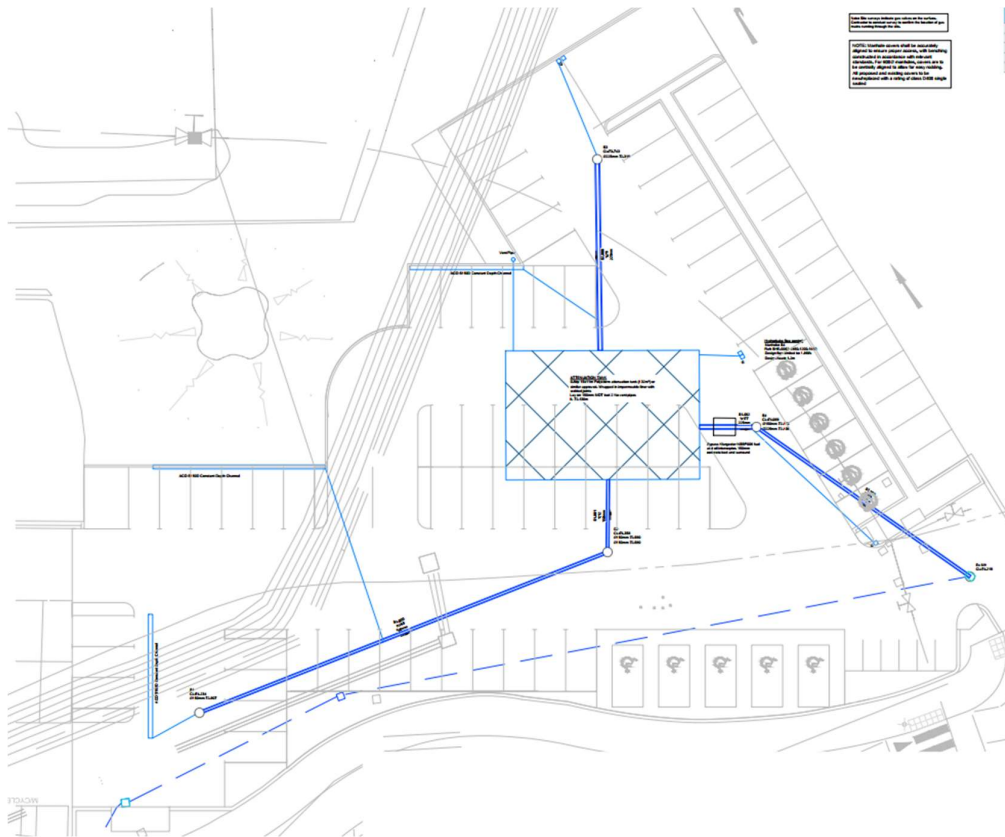


Fig 5.5 Proposed surface water connection to existing sewer

## 5.6 SuDS Selection

SuDS are made up of one or more structures built to manage surface water run-off. They are used in conjunction with good management of the site, to prevent flooding and pollution. There are five general methods of control:

- Prevention
- Filter strips and swales
- Permeable surfaces and filter drains
- Infiltration devices
- Basins and ponds

The assessment of the site has identified some restrictions on the selection of suitable SuDS techniques:

- Ground investigations have confirmed the presence of low permeability soil across site and discounted infiltration as a means of surface water disposal from the site.

The review and selection of suitable SuDS techniques is summarized in the following table

SuDS Techniques		Adopted in Design	Reasons
Source Control	Green/Brown Roofs	No	The development is a car park and does not qualify for the land use required for green/brown roofs.
	Rainwater Harvesting	No	The development is a car park and does not qualify for the land use required for green/brown roofs
	Permeable Pavements	No	The site is considered to have low permeability soils which would require the use of lined permeable paving. Furthermore, the location of underground services restricts the depth of a lined permeable system towards the south edge of the site.
Filtration	Filter Drains	No	Site area not available. Not considered to be viable for the project
	Swales	No	Site area not available. Not considered to be viable for the project
	Dry Swales	No	Site area not available. Not considered to be viable for the project
Infiltration	Infiltration Basin	No	Ground conditions not suitable to support infiltration
	Soakaways	No	Ground conditions not suitable to support infiltration
	Permeable Pavements	No	Ground conditions not suitable to support infiltration
	Infiltration Trench	No	Ground conditions not suitable to support infiltration
Wetland	Infiltration Basin	No	Ground conditions not suitable to support infiltration
Pre-treatment	Swales	No	Not considered to be viable for the project
	Filter Drains	No	Not considered to be viable for the project
Detention	Detention Pond	No	Not considered to be viable for the project
	Below Ground Cellular Storage	Yes	Provides reliable attenuation

The SUDS features incorporated in the design are:

**Detention** - Below ground cellular storage under the access road area. This system attenuates peak runoff flows and is wrapped with an impermeable geomembrane to avoid infiltration, as the ground conditions are not suitable for this surface water disposal.

The attenuation tank has a storage volume of 132m<sup>3</sup> and acts as the primary storage for impermeable areas of the site.

## 5.7 Surface Water Drainage Design Proposals

The site will be provided with new foul and surface water drainage networks discharging to the sewers along the southern boundary of the site.

SuDS features incorporated area in the form below ground cellular storage. This has included in the InfoDrainage model and play a key role in attenuation and delay of the peak rainfall intensity.

The site surface water drainage system will discharge to the 225mm diameter site water sewer. The rate of surface water discharge from the site will be limited to 1.8L/s by use of a hydrobrake.

Attenuation storage will be provided beneath the asphalt hardstanding and will provide 132m<sup>3</sup> of cellular storage wrapped in an impermeable liner with welded joints.

## **5.8 Surface Water Drainage Design Criteria**

The following criteria are to be adopted for design of the new surface water drainage system.

- The surface water drainage network to be checked for a 1 in 1-year return period storm without surcharge
- The surface water drainage network to be checked for a 1 in 30-year return period storm + 40% climate change allowance; with surcharging of pipes permitted
- The surface water drainage network to be checked for a 1 in 100-year return period storm + 50% climate change allowance with all run off accommodated below ground without overland flow.

## **5.9 Surface Water Drainage Design**

An InfoDrainage model has been developed to for the surface water drainage network to the development site.

The new drainage system has been checked for a range of storm durations and return periods up to a 1 in 100-year storm including allowance for a 50% increase in peak rainfall intensity to accommodate climate change. Due to the whole development being converted to hardstanding, there is no requirement for urban creep.

Calculations for the proposed drainage network and simulations for all storms up to 1 in 100-year return period are included in Appendix C1 for reference. The calculations confirm details of the attenuation structures and flow control devices.

The output of the design is shown in schematic layout of the proposed surface water drainage systems is shown on drawing 7274-TRP-ZZ-DR-D-4000-P03 included in Appendix B.

As the development site is used for parking, there is a need for a bypass interceptor. The NSBP006 fuel and oil interceptor is sized for the development site and will site between the attenuation tank and the hydrobrake in the network.

## **5.10 Design for Exceedance**

The current drainage system does not flood during a 1-in-100-year storm event, including a 50% climate change allowance and 10% urban creep. However, consideration has been given to the effects of extreme storm events generating surface runoff in excess of system

capacity, or in the case of system failure, which could potentially cause local flooding and surface flows. Generally, all flow on the site has been directed to fall towards gullies and ACO channels.

The proposed levels are shown in Fig 5.5 below

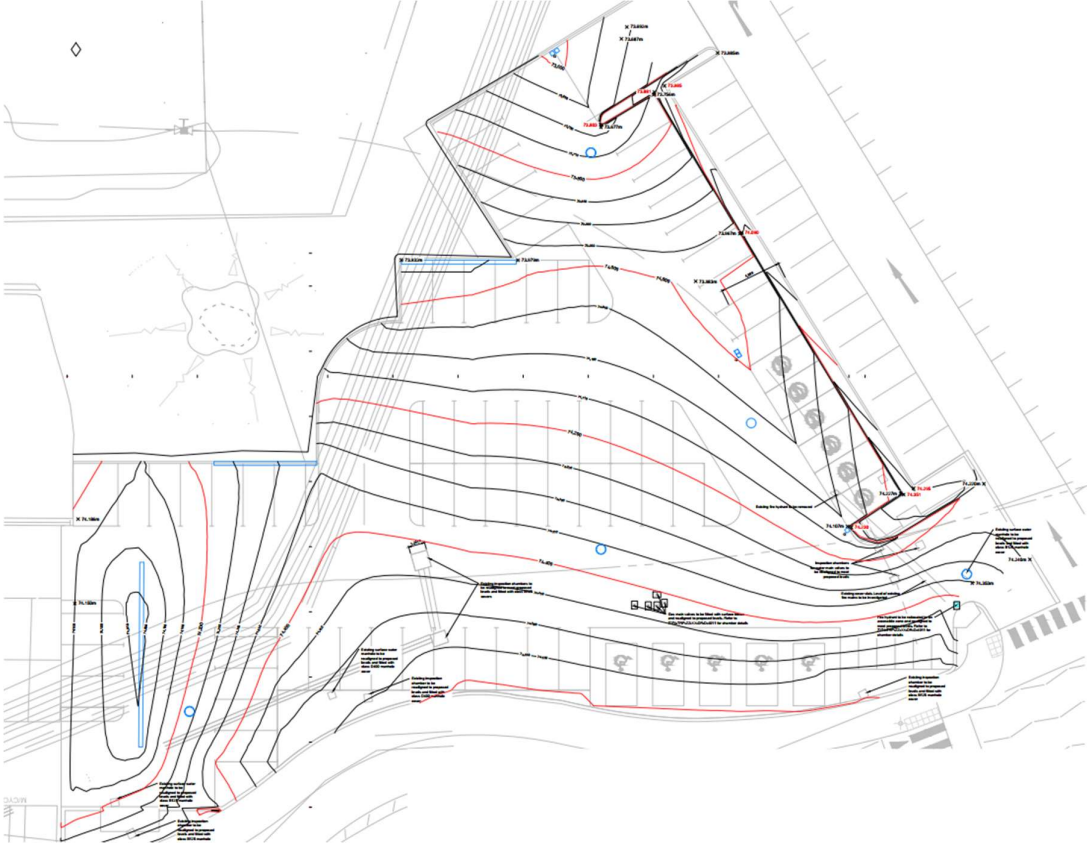


Fig 5.10 Proposed Levels

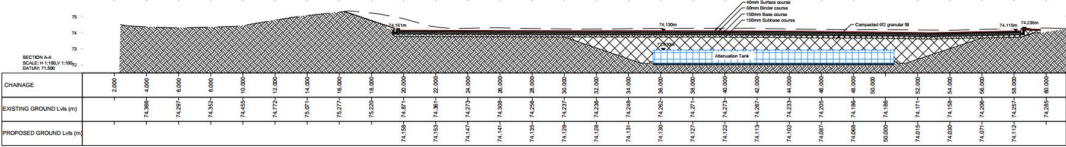


Fig 5.11 Proposed section through car park

## 6.0 SUDS MAINTENANCE AND MANAGEMENT

### 6.1 Introduction

This section sets out the plan for inspection and maintenance of the surface water drainage systems and SuDS (Sustainable Urban Drainage Systems) serving the manufacturing facility.

The maintenance of all SuDs and drainage systems on the site will be the responsibility of Clients site facilities management team.

EMCOR currently provide the FM services on behalf of the Client and will employ suitable trained personnel of suitable experienced specialist subcontractors to undertake the maintenance works

The process will be managed through the implementation of regular monthly inspection combined with regular maintenance, occasional maintenance, and remedial maintenance as appropriate.

The monthly inspections will be based on a specified checklist. Additional inspections will be undertaken after major rainfall events, to check for obstructions/damage and to remove debris and silt.

Details of the drainage systems, inspections and maintenance actions are set out in the following sections

### 6.2 SuDs Components

The following SuDs and conventional drainage features have been incorporated in the surface water drainage design.

The **attenuation storage tank** is used to provide space for temporary below ground storage of surface water run off prior to its controlled release to the main drainage system. In this case the storage tank will be constructed of cellular crate storage units typically 1000 x 500 x 400mm high stacked to create a tank void. The units will be wrapped in an impermeable liner with welded joints to provide a watertight structure designed to keep run off in and ground water out.

**Drainage channels and gullies** provide a means of interception and collection of surface water runoff from roofs and paved areas. Gullies generally appear as small rectangular or circular gratings in the roof or paved areas and incorporate silt traps or trash buckets to collect silt washed into the system. Drainage channels are generally visible as a linear perforated gratings in paved areas. Water is collected in a channel beneath the grating and discharged to the main below ground drainage system by outlet boxes at intervals along the length of the channel. The outlet boxes are generally marked at the surface by short lengths of removable grating and incorporate a silt box to intercept debris washed into the channel. Silt traps to channels and gullies will require to be emptied periodically

**Below ground drainage pipes** collect and convey surface water run-off from the SUDS and collection systems. In this case a network of below ground drainage is provided passing

through a below ground cellular storage structure and finally providing a connection to the adopted sewer network for the attenuated discharge of surface water.

**SuDS flow control system** in this case will take the form of a hydrobrake in the final manhole prior to discharge to the site wide sewer network. Upstream of this manhole, the flow from is restricted at the inlet by a Hydro-Brake, limiting the rate to 1.8L/s. The hydrobrake is designed to limit flows from the site within the private drainage network.

### 6.3 SuDs Design details

Details of the SuDs features incorporated in the design are shown on the below ground drainage drawing 7274-TRP-CR-DR-D-4500 included in Appendix B for reference.

Details of the below ground cellular attenuation tank are shown on drawing 7274-TRP-CR-DR-D-4024.

### 6.4 SuDs Locations and details

#### Below Ground Cellular Storage

The location of the below ground attenuation storage system is highlighted in blue in Fig 6.4 below.

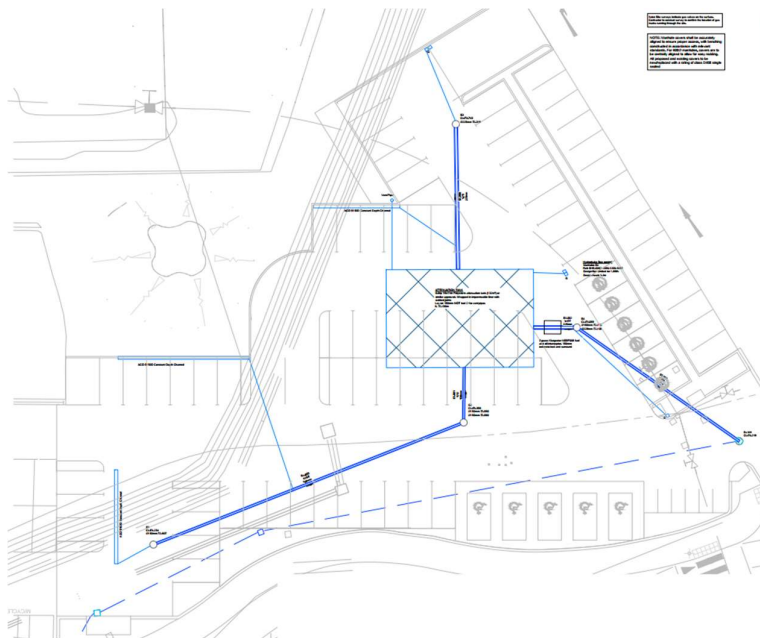


Fig 6.4 Location of below ground attenuation tank

The storage will be provided in the form of below ground cellular storage units wrapped in an impermeable membrane with heat welded joints.

Details of the below ground cellular attenuation tank are also shown on drawing 7274-TRP-CR-DR-D-4024 in Appendix D.

## **6.5 Design Intent**

The site will be provided with new below ground surface water drainage networks discharging to the site wide private sewers in the southwest corner of the site.

The SW will be collected using ACO's and gullies, attenuated and discharged using a hydrobrake into an existing SW network.

The hydrobrake will be provided in the final site manhole to restrict flows to the existing network. The restriction in the discharge will cause surface run off to back up in the below ground drainage system. In order to accommodate the build-up of surface water below ground it will be necessary to provide storage in the drainage system.

Storage will be provided beneath the asphalt hardstanding in the form of below ground cellular storage wrapped in an impermeable liner with welded joints, offering an attenuation volume of 132m<sup>3</sup>.

## 7.0 OPERATION AND MAINTENANCE ACTIVITY CATEGORIES

Maintenance activities can be broadly defined as:

1. regular maintenance and inspection
2. occasional maintenance
3. remedial maintenance

**Regular maintenance** consists of inspections and maintenance carried out to an agreed frequent schedule, including inspections/monitoring, silt or oil removal if required more frequently than once per year, vegetation management, sweeping of surfaces and litter and debris removal. In the first-year regular inspections and maintenance shall be carried out monthly or after any heavy rainfall event. At the end of the first year the frequency of inspections can be review and possible extended to 3 monthly intervals and there may also be initial one-off requirements sometimes referred to as "establishment maintenance", particularly for planting

**Occasional maintenance** comprises tasks that are likely to be required periodically, but on a much less frequent and predictable basis than the regular tasks Section 6.6 summarises the likely maintenance activities required for each SuDS component.

**Remedial maintenance** describes the intermittent tasks that may be required to rectify faults or longer-term deterioration of the SuDS system, although the likelihood of deterioration can be reduced through the implementation of regular maintenance activities. Where remedial work is found to be necessary, it is likely to be due. The likely scope of regular, occasional and remedial maintenance activities are set out in the following table for the main drainage components.

Operation and maintenance activity					
	Gullies and channels	Manholes	Flow Control Devices	Cellular Storage	
Inspection	■	■	■	■	
Litter and debris removal	■	■	■	■	
Grass cutting				■	
Weed and invasive plant control	□	□		□	
Sediment management'	■	■	□	■	
Vegetation replacement					
Vacuum sweeping and brushing					
Structure rehabilitation /repair			□	□	
Infiltration surface reconditioning				□	

**Key**

- will be required
- may be required

## 7.1 Inspection Checklist

The following checklist has been provided as a guide to the scope of regular inspections to be undertaken

INSPECTION CHECKLIST – GENERAL			
Item	Y/N	Details	Action
<b>General inspection</b>			
Ponding or water logging during periods of heavy rainfall			Indicative of potential silting of the drainage system or obstructions within the below ground drainage system Occasional or Remedial maintenance may be required
Fuel spillage or evidence of contamination			Notify supervisor of any hazardous conditions or materials found during inspection.
Have any health and safety risks been identified to either the public or maintenance operatives?			
Is there any deterioration in the surface of permeable or porous surfaces (e.g. rutting, spreading of blocks or signs of ponding water)?			
Balding spots within grass/plant cover or evidence of invasive species of weeds which might affect the performance of brown/green roofs			
Erosion or scour of the grass or landscaped surface or slopes due to localised run off from paved areas			
Damage or displacement of manhole covers and gully gratings			Report any damage, repair or replace covers
<b>Silt/sediment accumulation</b>			
Does permeable or porous surfacing require sweeping to remove silt?			
Accumulation of silt in gullies and drainage channel outlet boxes			Occasional or Remedial maintenance may be required. Jet channels and remove silt from

<b>INSPECTION CHECKLIST – GENERAL</b>			
<b>Item</b>	<b>Y/N</b>	<b>Details</b>	<b>Action</b>
			outlets as part of occasional maintenance
Accumulation of silt in silt trap manholes			Occasional or Remedial maintenance may be required. Jet channels and remove silt from outlets as part of occasional maintenance
Accumulation of silt in manholes and hydrobrake manhole			
<b>System Blockages</b>			
Is there any evidence of any clogging or blockage of outlets or drainage paths?			
Is there evidence of standing water in gullies and drainage channels or surface flows from manhole covers			
<b>Vegetation</b>			
Is the vegetation condition satisfactory (density, weed growth, coverage etc)? (Check against approved planting regime.)			
Does any part of the system require weeding, pruning or mowing? (Check against maintenance frequency stated in approved design.)			Mow amenity grass access paths and verges to 35-50 mm minimum or as specified in the landscape management plan.
Is there any evidence of invasive species becoming established? If yes, state action required			
<b>Infrastructure</b>			
Is there evidence of any accidental damage to the system			
Is there any evidence of cross connections or other unauthorised inflows?			

INSPECTION CHECKLIST – GENERAL			
Item	Y/N	Details	Action
Is there any evidence of tampering with the flow controls			
Are there any other matters that could affect the performance of the system in relation to the design objectives for hydraulic, water quality, biodiversity, and visual aspects? (Specify.)			
<b>Other Observations</b>			
<b>Suitability of Current maintenance regime</b>			
Continue as current Increase maintenance Decrease maintenance			
<b>Next Inspection</b>			
Proposed Date			

In addition to the regular inspections based on the checklist, specific maintenance plans for the drainage components are set out in Section 7.2 below

## 7.2 Operation and maintenance Plan

### 7.2.1 Attenuation storage tank

Regular inspection and maintenance is required to ensure the effective long-term operation of the below ground cellular storage systems.

ATTENUATION STORAGE TANKS		
Maintenance Schedule	Required Actions	Typical Frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly.	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	Remove sediment from silt pit upstream of tank	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good	Annually

<b>ATTENUATION STORAGE TANKS</b>		
<b>Maintenance Schedule</b>	<b>Required Actions</b>	<b>Typical Frequency</b>
	condition and operating as designed	
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

### 7.2.2 SuDS flow control system

<b>MANHOLES SILT PITS AND BELOW GROUND DRAINAGE PIPES</b>		
<b>Maintenance Schedule</b>	<b>Required Actions</b>	<b>Typical Frequency</b>
Regular maintenance	Inspect and check that the hydrobrake & orifice plate is operating correctly. If required, take remedial action	Monthly
	Remove sediment from silt pit upstream of the hydrobrake & orifice plate	As required
Remedial actions	Repair physical damage if necessary	As required

### 7.2.3 Spillage Emergency Actions

Most spillages are likely to be compounds that do not pose a serious risk to the environment if they enter the drainage in a slow and controlled manner with time available for natural breakdown in a treatment system. Small spillages of oil, milk or other known organic substances should be removed where possible using soak mats as recommended by the Environment Agency. Residual elements of spillage can be removed manually from traps of gullies and drainage outlet and silt pits.

In the event of a serious spillage, either by volume or of unknown or toxic compounds, then isolate the spillage with soil, turf or fabric and block outlet pipes from chamber(s) downstream of the spillage with a bung. A bung for blocking pipes may be made by wrapping soil or turf in a plastic sheet or closely woven fabric.

## 8.0 CONCLUSIONS

The site at Samlesbury Aerodrome has an area is around 0.223 hectares.

The site is currently a greenfield site with private drainage assets for the Client.

The proposed development works involve the construction of a new car park.

The site is located in Flood Zone 1. The overall risk of flooding to the site has been assessed as low.

Having reviewed the hierarchy of drainage options for surface water disposal, it is concluded that the site is not suitable for infiltration drainage systems. Discharging surface water to the open watercourse is avoided as the watercourse is greater than 200m away from site.

The development site has existing connections to the site wide private surface water sewer network. It is therefore proposed to make use of the existing connection to the site SW drainage network for disposal of surface water from the development at the existing greenfield runoff rate.

A surface water drainage strategy has been prepared for the development site. It is proposed that surface water discharge is limited to 1.8L/s by use of hydrobrake in the final manhole.

Below-ground cellular storage will be installed beneath the asphalt hardstanding to attenuate runoff volumes during critical storms.

It is considered that the proposed surface water drainage system will not increase the risk of flooding on the site or in the surrounding area.

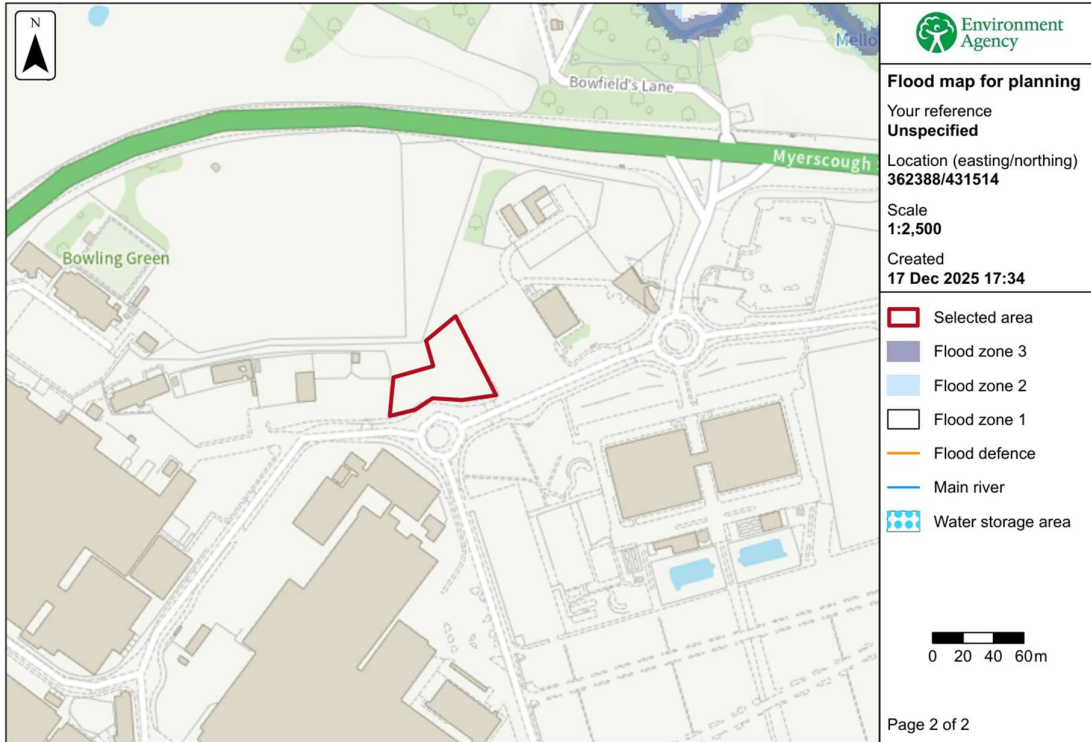
Management of the on-site SuDS/drainage will be the responsibility of the site FM management team and details of proposed inspection and maintenance arrangement have been provided in Section 7.0 of this report

## **APPENDIX A**

**A1 Environment Agency Flood Map**

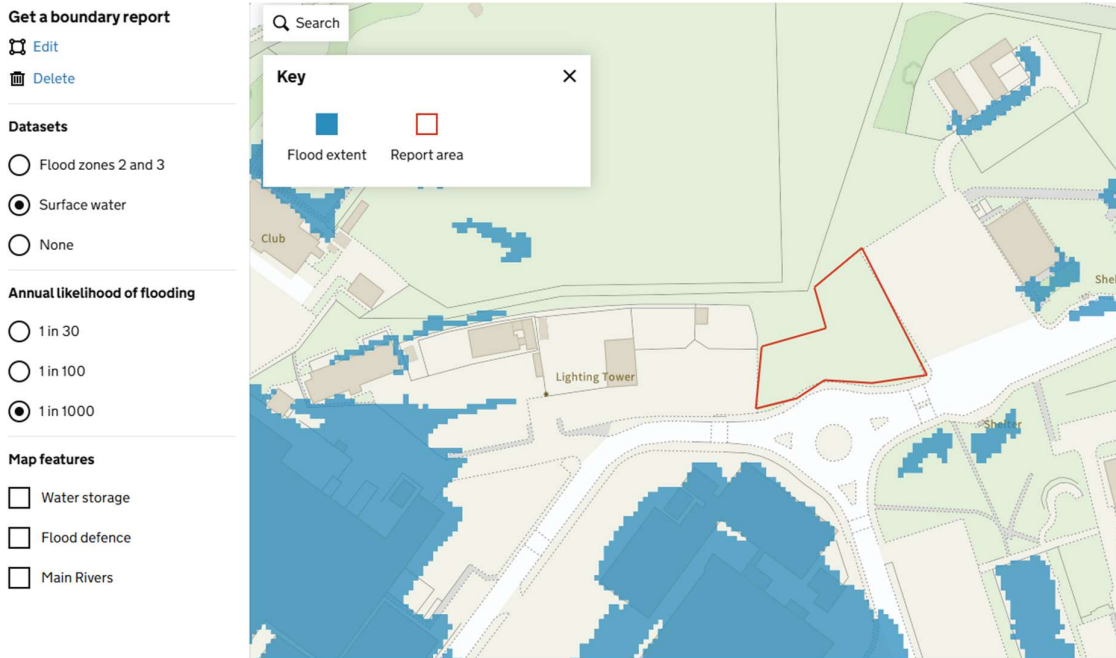
**A2 Environment Agency Surface Water Flood Mapping**

A1 Environment Agency Flood Map



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A2 Environment Agency Surface Water Flood Mapping



**APPENDIX B**

**B1 Proposed Development – Surface and Foul Water GA**

7274-TRP-CR-XX-DR-D-4500



**APPENDIX C**

**C1 TRP Surface Water Drainage Calculations**

**C1 Proposed Network SW Calcs**

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Junctions Storm Phase: Phase	Company Address:		



Name	Junction Type	Easting (m)	Northing (m)	Cover Level (m)	Depth (m)	Invert Level (m)	Chamber Shape	Diameter (m)
S3	Manhole	362393.856	431538.658	73.865	1.200	72.665	Circular	1.200
S2	Manhole	362395.112	431508.730	74.036	1.456	72.580	Circular	1.200
Ex	Manhole	362421.368	431506.853	74.230	2.460	71.770	Circular	1.200
S1	Manhole	362361.147	431494.533	74.157	1.350	72.807	Circular	1.200
S4	Manhole	362407.380	431519.941	74.021	1.916	72.105	Circular	1.200

Name	Lock
S3	None
S2	None
Ex	None
S1	None
S4	None

### Inlets

Junction	Inlet Name	Incoming Item(s)	Bypass Destination	Capacity Type
S3	Inlet (3)	Catchment Area (4)	(None)	No Restriction
S2	Inlet	Pipe	(None)	No Restriction
Ex	Inlet (1)	Pipe (3) (1)	(None)	No Restriction
S1	Inlet	Catchment Area	(None)	No Restriction
S4	Inlet	Pipe (3)	(None)	No Restriction

### Outlets

Junction	Outlet Name	Outgoing Connection	Outlet Type
S3	Outlet	Pipe (1)	Free Discharge
S2	Outlet	Pipe (2)	Free Discharge
S1	Outlet	Pipe	Free Discharge
	Outlet	Pipe (3) (1)	Hydro-Brake®
S4	Invert Level (m)	72.105	
	Design Depth (m)	1.200	
	Design Flow (L/s)	1.86	
	Objective	Minimise Upstream Storage Requirements	
	Application	Surface Water Only	
	Sump Available	<input checked="" type="checkbox"/>	
	Unit Reference	SHE-0062-1860-1200-1860	

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Storm Phase: Phase	Company Address:		



**Cellular Storage**

Type : Cellular Storage

**Dimensions**

Exceedance Level (m)	73.340
Depth (m)	0.800
Base Level (m)	72.130
Number of Crates Long	22
Number of Crates Wide	30
Number of Crates High	2
Porosity (%)	100
Crate Length (m)	0.5
Crate Width (m)	0.5
Crate Height (m)	0.4
Total Volume (m³)	132.410

**Inlets**

**Inlet**

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (1)
Bypass Destination	(None)
Capacity Type	No Restriction

**Inlet (1)**

Inlet Type	Point Inflow
Incoming Item(s)	Pipe (2)
Bypass Destination	(None)
Capacity Type	No Restriction

**Inlet (3)**

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (1)
Bypass Destination	(None)
Capacity Type	No Restriction

**Inlet (2)**

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (2)
Bypass Destination	(None)
Capacity Type	No Restriction


**Inlet (4)**

Inlet Type	Point Inflow
Incoming Item(s)	Catchment Area (3)
Bypass Destination	(None)
Capacity Type	No Restriction

**Outlets**

**Outlet**

Outgoing Connection	Pipe (3)
Outlet Type	Free Discharge

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	
Report Details: Type: Manhole Schedule Storm Phase: Phase	Company Address:		

Name	Cover Level (m) Invert Level (m)	Manhole Size (m)	Connection Details				Type
			Incoming Connections	Connection Type	Connection Invert (m)	Connection Size (mm)	Junction Type
Coordinates (m)	Depth (m)		Outgoing Connections				Cover
S3	73.865 72.665	Diameter / Length: 1.200					Manhole
E:362393.856 N:431538.658	1.200		{a} Pipe (1)	Pipe	72.665	Diam/Width:225	Not Applicable
S2	74.036 72.580	Diameter / Length: 1.200	{1} Pipe	Pipe	72.580	Diam/Width:150	Manhole
E:362395.112 N:431508.730	1.456		{a} Pipe (2)	Pipe	72.580	Diam/Width:225	Not Applicable
Ex	74.230 71.770	Diameter / Length: 1.200	{1} Pipe (3) (1)	Pipe	71.770	Diam/Width:100	Manhole
E:362421.368 N:431506.853	2.460						Not Applicable
S1	74.157 72.807	Diameter / Length: 1.200					Manhole
E:362361.147 N:431494.533	1.350		{a} Pipe	Pipe	72.807	Diam/Width:150	Not Applicable
S4	74.021 72.105	Diameter / Length: 1.200	{1} Pipe (3)	Pipe	72.105	Diam/Width:225	Manhole
E:362407.380 N:431519.941	1.916		{a} Pipe (3) (1)	Pipe	72.105	Diam/Width:100	Not Applicable

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Inflow Summary Storm Phase: Phase	Company Address:		



Inflow Label	Connected To	Flow (L/s)	Runoff Method	Area (ha)	Percentage Impervious (%)	Urban Creep (%)	Adjusted Percentage Impervious (%)	Area Analysed (ha)
Catchment Area	S1		Time of Concentration	0.057	100	0	100	0.057
Catchment Area (1)	Cellular Storage		Time of Concentration	0.026	100	0	100	0.026
Catchment Area (2)	Cellular Storage		Time of Concentration	0.042	100	0	100	0.042
Catchment Area (3)	Cellular Storage		Time of Concentration	0.065	100	0	100	0.065
Catchment Area (4)	S3		Time of Concentration	0.032	100	0	100	0.032
<b>TOTAL</b>		<b>0.0</b>		<b>0.222</b>				<b>0.222</b>

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Network Design Criteria Storm Phase: Phase	Company Address:		



### Flow Options

Peak Flow Calculation	(UK) Modified Rational Method
Min. Time of Entry (mins)	5
Max. Travel Time (mins)	30

### Pipe Options

Lock Slope Options	None
Design Options	Minimise Excavation
Design Level	Level Soffits
Min. Cover Depth (m)	1.200
Min. Slope (1:X)	500.00
Max. Slope (1:X)	40.00
Min. Velocity (m/s)	1.0
Max. Velocity (m/s)	3.0
Use Flow Restriction	<input type="checkbox"/>
Reduce Channel Depths	<input type="checkbox"/>

### Pipe Size Library

#### Default

Add. Increment (mm)	75
Max. Diameter (mm)	0

Diameter (mm)	Min. Slope (1:X)	Max. Slope (1:X)
100	0.00	0.00
150	0.00	0.00

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Network Design Criteria Storm Phase: Phase	Company Address:		



**Manhole Options**

Apply Offset

**Manhole Size Library**

**Default**

**Diameter / Width**

Connection (mm)	Diameter / Length (m)	Width (m)
0	1.200	0.000
375	1.350	0.000
500	1.500	0.000
750	1.800	0.000

**Additional Sizing**

Connection (mm)	900
Diameter / Length (m)	0.900
Width (m)	0.000

**Depth**


Depth (m)	Diameter / Length (m)	Width (m)
0.000	1.050	0.000
1.500	1.200	0.000

**Access**

Depth (m)	Ladder Protrusion (mm)
0.000	130
3.000	230

**Benching Requirements**

Landing Width (mm)	500
Benching Width (mm)	225

Car Park:	Date: 18/12/2025			
	Designed by: AP	Checked by:	Approved By:	
Report Title: Rainfall Analysis Criteria	Company Address:			

Runoff Type	Dynamic
Output Interval (mins)	5
Time Step	Default
Urban Creep	Apply Global Value
Urban Creep Global Value (%)	0
Junction Flood Risk Margin (mm)	300
Perform No Discharge Analysis	<input type="checkbox"/>

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address:		



**FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow**

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FSR: 1 years: +0 %: 15 mins: Winter	0.06	6.4	2.951
Catchment Area (1)	FSR: 1 years: +0 %: 15 mins: Winter	0.03	2.9	1.359
Catchment Area (2)	FSR: 1 years: +0 %: 15 mins: Winter	0.04	4.7	2.177
Catchment Area (3)	FSR: 1 years: +0 %: 15 mins: Winter	0.07	7.3	3.371
Catchment Area (4)	FSR: 1 years: +0 %: 15 mins: Winter	0.03	3.6	1.659

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address:		



**FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Inflow**

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FSR: 2 years: +0 %: 15 mins: Winter	0.06	8.2	3.824
Catchment Area (1)	FSR: 2 years: +0 %: 15 mins: Winter	0.03	3.8	1.761
Catchment Area (2)	FSR: 2 years: +0 %: 15 mins: Winter	0.04	6.1	2.822
Catchment Area (3)	FSR: 2 years: +0 %: 15 mins: Winter	0.07	9.4	4.364
Catchment Area (4)	FSR: 2 years: +0 %: 15 mins: Winter	0.03	4.6	2.147

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address:		



**FSR: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Inflow**

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FSR: 30 years: +40 %: 15 mins: Winter	0.06	21.7	10.097
Catchment Area (1)	FSR: 30 years: +40 %: 15 mins: Winter	0.03	10.0	4.648
Catchment Area (2)	FSR: 30 years: +40 %: 15 mins: Winter	0.04	16.0	7.445
Catchment Area (3)	FSR: 30 years: +40 %: 15 mins: Winter	0.07	24.8	11.520
Catchment Area (4)	FSR: 30 years: +40 %: 15 mins: Winter	0.03	12.2	5.674

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Inflows Summary Storm Phase: Phase	Company Address:		



**FSR: 100 years: Increase Rainfall (%): +50: Critical Storm Per Item: Rank By: Max. Inflow**

Inflow	Storm Event	Inflow Area (ha)	Max. Inflow (L/s)	Total Inflow Volume (m³)
Catchment Area	FSR: 100 years: +50 %: 15 mins: Winter	0.06	30.0	13.912
Catchment Area (1)	FSR: 100 years: +50 %: 15 mins: Winter	0.03	13.8	6.404
Catchment Area (2)	FSR: 100 years: +50 %: 15 mins: Winter	0.04	22.1	10.263
Catchment Area (3)	FSR: 100 years: +50 %: 15 mins: Winter	0.07	34.2	15.870
Catchment Area (4)	FSR: 100 years: +50 %: 15 mins: Winter	0.03	16.8	7.814

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		



**FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth**

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S3	FSR: 1 years: +0 %: 15 mins: Winter	73.86 5	72.66 5	72.694	0.029	3.6	0.032	0.000	3.5	1.665	OK
S2	FSR: 1 years: +0 %: 15 mins: Winter	74.03 6	72.58 0	72.613	0.033	5.9	0.037	0.000	5.8	2.945	OK
Ex	FSR: 1 years: +0 %: 15 mins: Summer	74.23 0	71.77 0	72.370	0.600	1.6	0.000	0.000	1.6	3.007	OK
S1	FSR: 1 years: +0 %: 15 mins: Winter	74.15 7	72.80 7	72.882	0.075	6.4	0.085	0.000	5.9	2.948	OK
S4	FSR: 1 years: +0 %: 1440 mins: Summer	74.02 1	72.10 5	72.529	0.424	5.2	0.480	0.000	1.5	95.059	Surcharged

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		



**FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Depth**

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S3	FSR: 2 years: +0 %: 15 mins: Winter	73.86 5	72.66 5	72.697	0.032	4.6	0.037	0.000	4.5	2.155	OK
S2	FSR: 2 years: +0 %: 15 mins: Winter	74.03 6	72.58 0	72.617	0.037	7.7	0.041	0.000	7.6	3.817	OK
Ex	FSR: 2 years: +0 %: 15 mins: Summer	74.23 0	71.77 0	72.370	0.600	1.6	0.000	0.000	1.6	2.973	OK
S1	FSR: 2 years: +0 %: 15 mins: Winter	74.15 7	72.80 7	72.895	0.088	8.2	0.099	0.000	7.7	3.820	OK
S4	FSR: 2 years: +0 %: 960 mins: Winter	74.02 1	72.10 5	72.561	0.456	5.0	0.516	0.000	1.6	91.584	Surcharged

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		



**FSR: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Depth**

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S3	FSR: 30 years: +40 %: 960 mins: Winter	73.86 5	72.66 5	73.463	0.798	1.2	0.903	0.000	1.2	27.630	Surcharged
S2	FSR: 30 years: +40 %: 960 mins: Winter	74.03 6	72.58 0	73.463	0.883	2.2	0.999	0.000	2.1	49.756	Surcharged
Ex	FSR: 30 years: +40 %: 15 mins: Summer	74.23 0	71.77 0	72.370	0.600	1.6	0.000	0.000	1.6	1.704	OK
S1	FSR: 30 years: +40 %: 960 mins: Winter	74.15 7	72.80 7	73.463	0.656	2.2	0.742	0.000	2.2	49.704	Surcharged
S4	FSR: 30 years: +40 %: 960 mins: Winter	74.02 1	72.10 5	73.462	1.357	3.9	1.535	0.000	1.8	172.994	Surcharged

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Junctions Summary Storm Phase: Phase	Company Address:		



**FSR: 100 years: Increase Rainfall (%): +50: Critical Storm Per Item: Rank By: Max. Depth**

Junction	Storm Event	Cover Level (m)	Invert Level (m)	Max. Level (m)	Max. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
S3	FSR: 100 years: +50 %: 1440 mins: Winter	73.86 5	72.66 5	73.807	1.142	2.4	1.292	0.000	1.2	41.380	Flood Risk
S2	FSR: 100 years: +50 %: 1440 mins: Winter	74.03 6	72.58 0	73.807	1.227	2.2	1.388	0.000	2.1	75.083	Flood Risk
Ex	FSR: 100 years: +50 %: 15 mins: Summer	74.23 0	71.77 0	72.370	0.600	1.6	0.000	0.000	1.6	1.977	OK
S1	FSR: 100 years: +50 %: 1440 mins: Winter	74.15 7	72.80 7	73.807	1.000	2.2	1.131	0.000	2.2	75.046	Surcharged
S4	FSR: 100 years: +50 %: 1440 mins: Winter	74.02 1	72.10 5	73.806	1.701	6.8	1.924	0.000	2.0	279.868	Flood Risk

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		



**FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth**

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FSR: 1 years: +0 %: 1440 mins: Summer	72.516	72.516	0.386	0.386	3.3	63.734	0.000	0.000	5.2	57.914	51.866	OK

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		



**FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Avg. Depth**

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FSR: 2 years: +0 %: 960 mins: Winter	72.554	72.554	0.424	0.424	3.6	69.949	0.000	0.000	5.0	60.121	47.172	OK

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		



**FSR: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Avg. Depth**

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FSR: 30 years: +40 %: 960 mins: Winter	73.463	73.463	1.333	1.333	8.3	152.650	20.181	0.000	3.9	133.794	-15.286	Flood

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Stormwater Controls Summary Storm Phase: Phase	Company Address:		



**FSR: 100 years: Increase Rainfall (%): +50: Critical Storm Per Item: Rank By: Max. Avg. Depth**

Stormwater Control	Storm Event	Max. US Level (m)	Max. DS Level (m)	Max. US Depth (m)	Max. DS Depth (m)	Max. Inflow (L/s)	Max. Residant Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
Cellular Storage	FSR: 100 years: +50 %: 1440 mins: Winter	73.807	73.807	1.677	1.677	9.2	209.370	76.901	0.000	6.8	224.723	-58.122	Flood

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address:		



**FSR: 1 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow**

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe (1)	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S3	Cellular Storage	73.865	72.694	0.043	1.665	1.1	0.03	3.5	OK
Pipe (2)	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S2	Cellular Storage	74.036	72.613	0.045	2.945	1.5	0.04	5.8	OK
Pipe	FSR: 1 years: +0 %: 15 mins: Winter	Pipe	S1	S2	74.157	72.882	0.054	2.948	1.0	0.43	5.9	OK
Pipe (3)	FSR: 1 years: +0 %: 1440 mins: Summer	Pipe	Cellular Storage	S4	73.340	72.516	0.225	28.891	0.1	0.13	5.2	Surcharged
Pipe (3) (1)	FSR: 1 years: +0 %: 1440 mins: Summer	Pipe	S4	Ex	74.021	72.529	0.100	37.217	0.2	0.18	1.5	Surcharged

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address:		



**FSR: 2 years: Increase Rainfall (%): +0: Critical Storm Per Item: Rank By: Max. Flow**

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe (1)	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	S3	Cellular Storage	73.865	72.697	0.053	2.155	1.2	0.05	4.5	OK
Pipe (2)	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	S2	Cellular Storage	74.036	72.617	0.056	3.817	1.6	0.06	7.6	OK
Pipe	FSR: 2 years: +0 %: 15 mins: Winter	Pipe	S1	S2	74.157	72.895	0.062	3.820	1.1	0.55	7.7	OK
Pipe (3)	FSR: 2 years: +0 %: 960 mins: Winter	Pipe	Cellular Storage	S4	73.340	72.554	0.225	35.932	0.1	0.12	5.0	Surcharged
Pipe (3) (1)	FSR: 2 years: +0 %: 960 mins: Winter	Pipe	S4	Ex	74.021	72.561	0.100	43.675	0.2	0.19	1.5	Surcharged

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address:		



**FSR: 30 years: Increase Rainfall (%): +40: Critical Storm Per Item: Rank By: Max. Flow**

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe (1)	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S3	Cellular Storage	73.865	72.718	0.126	5.687	1.4	0.12	12.1	OK
Pipe (2)	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S2	Cellular Storage	74.036	72.636	0.128	10.087	1.9	0.13	17.9	OK
Pipe	FSR: 30 years: +40 %: 15 mins: Winter	Pipe	S1	S2	74.157	73.105	0.150	10.095	1.2	1.31	18.2	Surcharged
Pipe (3)	FSR: 30 years: +40 %: 1440 mins: Winter	Pipe	Cellular Storage	S4	73.340	73.443	0.225	180.025	0.2	0.17	7.1	Flood
Pipe (3) (1)	FSR: 30 years: +40 %: 960 mins: Winter	Pipe	S4	Ex	74.021	73.462	0.100	136.255	0.2	0.22	1.8	Surcharged

Car Park:	Date: 18/12/2025		
	Designed by: AP	Checked by:	Approved By:
Report Details: Type: Connections Summary Storm Phase: Phase	Company Address:		



**FSR: 100 years: Increase Rainfall (%): +50: Critical Storm Per Item: Rank By: Max. Flow**

Connection	Storm Event	Connection Type	From	To	Upstream Cover Level (m)	Max. US Water Level (m)	Max. Flow Depth (m)	Discharge Volume (m³)	Max. Velocity (m/s)	Flow / Capacity	Max. Flow (L/s)	Status
Pipe (1)	FSR: 100 years: +50 %: 15 mins: Winter	Pipe	S3	Cellular Storage	73.865	72.727	0.169	7.824	1.4	0.17	16.7	OK
Pipe (2)	FSR: 100 years: +50 %: 15 mins: Winter	Pipe	S2	Cellular Storage	74.036	72.647	0.172	13.901	2.0	0.18	24.5	OK
Pipe	FSR: 100 years: +50 %: 15 mins: Winter	Pipe	S1	S2	74.157	73.518	0.150	13.918	1.4	1.79	24.9	Surcharged
Pipe (3)	FSR: 100 years: +50 %: 240 mins: Summer	Pipe	Cellular Storage	S4	73.340	73.411	0.225	25.160	0.7	0.65	27.0	Flood
Pipe (3) (1)	FSR: 100 years: +50 %: 1440 mins: Winter	Pipe	S4	Ex	74.021	73.806	0.100	240.149	0.3	0.25	2.0	Flood Risk

**C2 Greenfield Runoff Estimation**



# Greenfield runoff rate estimation tool



www.uksuds.com | Greenfield runoff rate estimation tool (<https://www.uksuds.com/>)

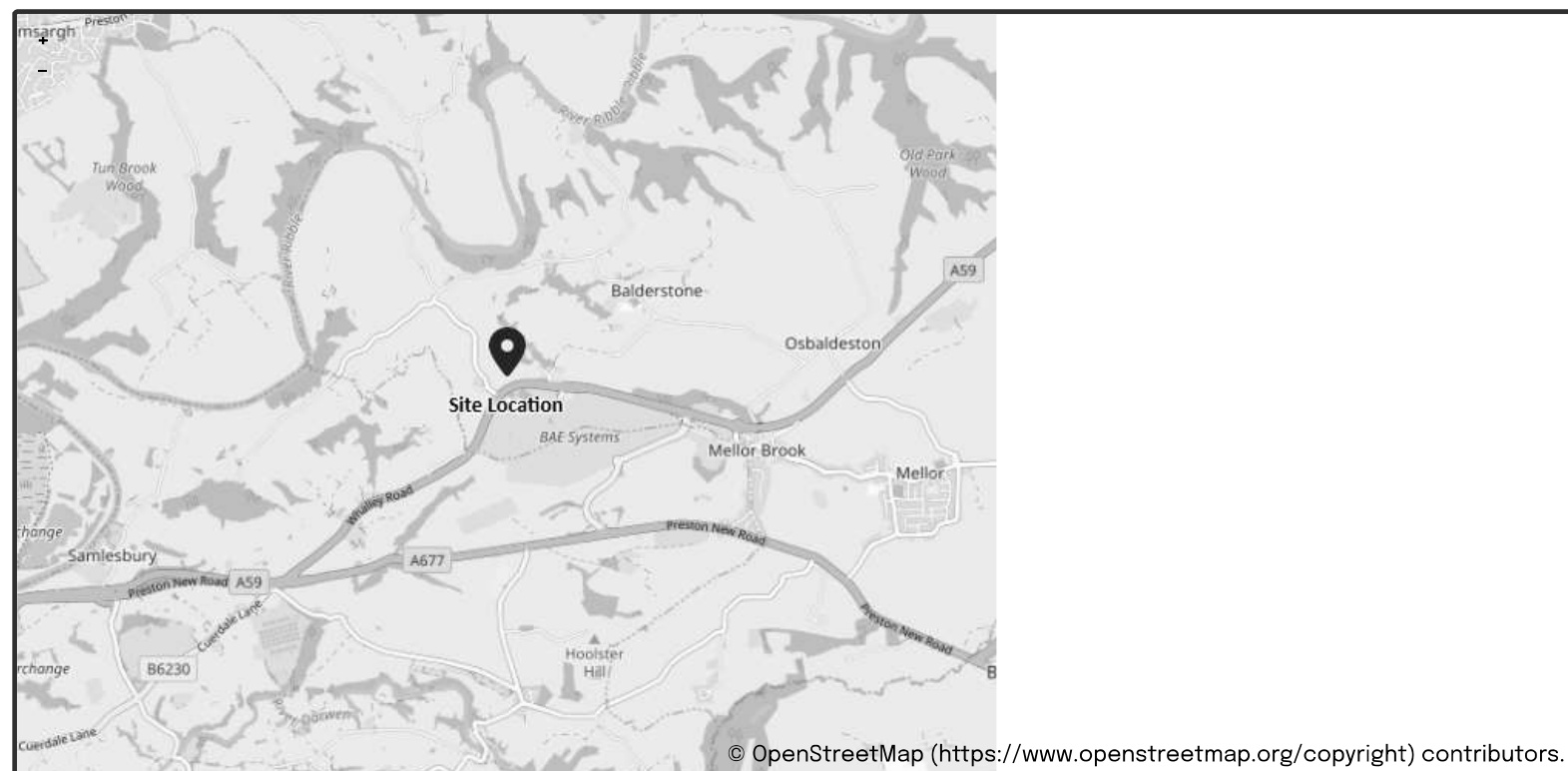
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

## Project details

Date	<input type="text" value="18/12/2025"/>
Calculated by	<input type="text"/>
Reference	<input type="text"/>
Model version	<input type="text" value="2.2.2"/>

## Location

Site name	<input type="text" value="Car Park"/>
Site location	<input type="text"/>



Site easting (British National Grid)	<input type="text" value="362134"/>
Site northing (British National Grid)	<input type="text" value="431577"/>

## Site details

Total site area (ha)	<input type="text" value="0.224"/>	ha
----------------------	------------------------------------	----

# Greenfield runoff

## Method

Method

## IH124

	<u>My value</u>		<u>Map value</u>
SAAR (mm)	<input type="text" value="1060"/> mm	<input type="radio"/>	<input type="text" value="1060"/>
How should SPR be derived?	<input type="text" value="WRAP soil type"/>		
WRAP soil type	<input type="text" value="4"/>	<input type="radio"/>	<input type="text" value="4"/>
SPR	<input type="text" value="0.47"/>		
QBar (IH124) (l/s)	<input type="text" value="1.8"/> l/s		

## Growth curve factors

	<u>My value</u>		<u>Map value</u>
Hydrological region	<input type="text" value="10"/>	<input type="radio"/>	<input type="text" value="10"/>
1 year growth factor	<input type="text" value="0.87"/>		
2 year growth factor	<input type="text" value="0.93"/>		
10 year growth factor	<input type="text" value="1.38"/>		
30 year growth factor	<input type="text" value="1.7"/>		
100 year growth factor	<input type="text" value="2.08"/>		
200 year growth factor	<input type="text" value="2.37"/>		

# Results

Method	IH124	
Flow rate 1 year (l/s)	1.5	l/s
Flow rate 2 year (l/s)	1.6	l/s
Flow rate 10 years (l/s)	2.4	l/s
Flow rate 30 years (l/s)	3.0	l/s
Flow rate 100 years (l/s)	3.7	l/s
Flow rate 200 years (l/s)	4.2	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

## Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.2) developed by HR Wallingford and available at [uksuds.com](https://www.uksuds.com/) (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

**APPENDIX D**

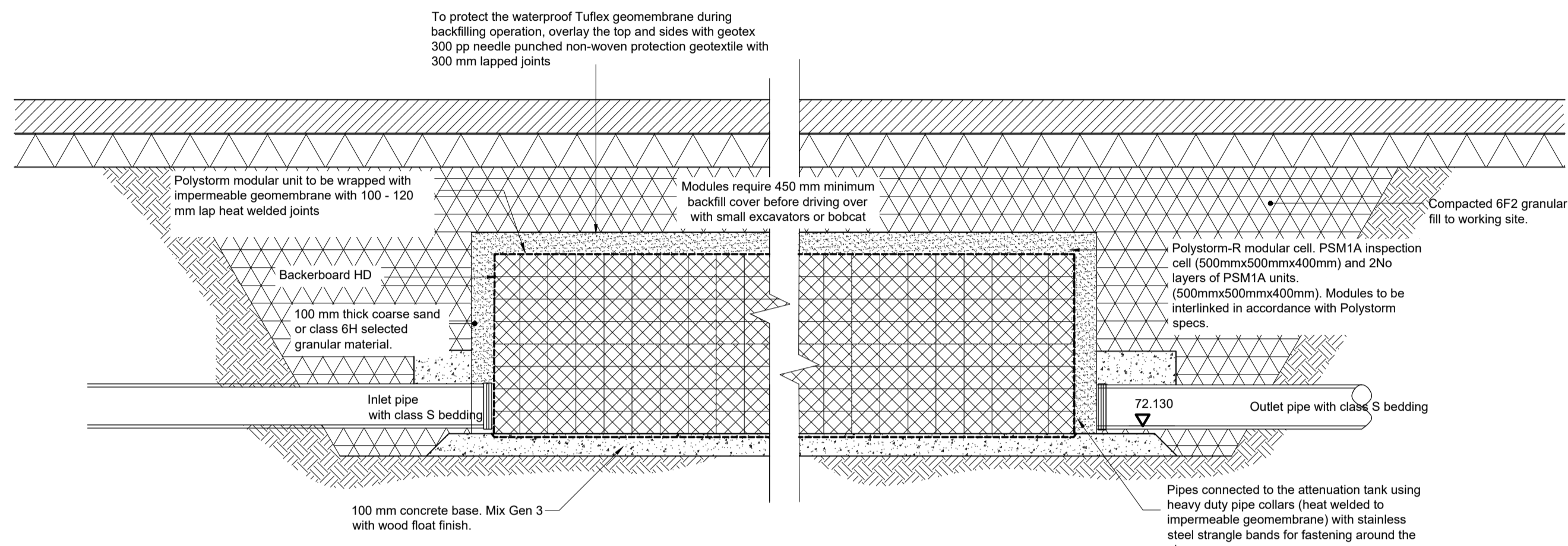
**D1 TRP SuDS Detail Drawings 7274-TRP-ZZ-XX-DR-D-4024**

**GENERAL NOTES**

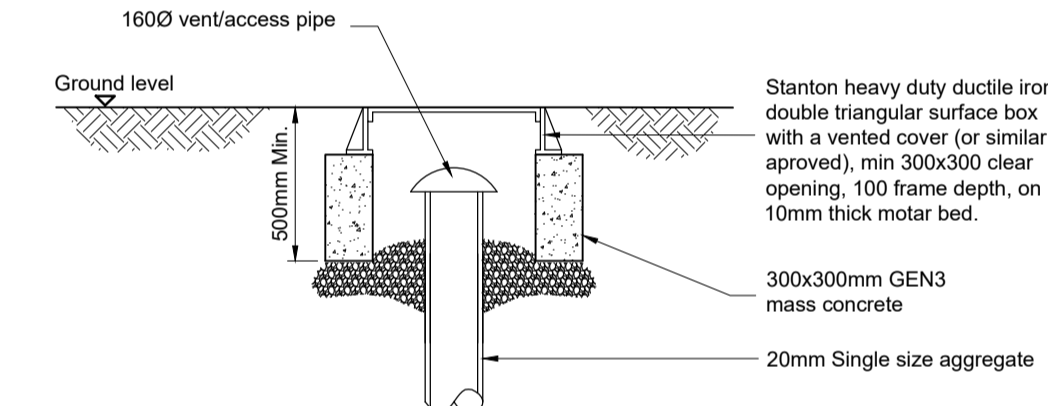
- This Drawing is to be read in conjunction with all relevant Engineer, Architects, Service Engineers and Subcontractor drawings.
- Review all drawings and report any discrepancies to Engineer Consulting prior to commencement.
- Do not scale from this drawing. All dimensions and levels including any abutment to existing structures to be checked on site prior to commencement.
- Work from figured dimensions only.
- No deviation from details shown on this drawing is allowed without Engineers prior permission in writing.
- All work is to be carried out in accordance with the relevant specifications issued by Engineer, British Standard Codes of Practice, Statutory requirements and the Contract Documents.

**DRAINAGE**

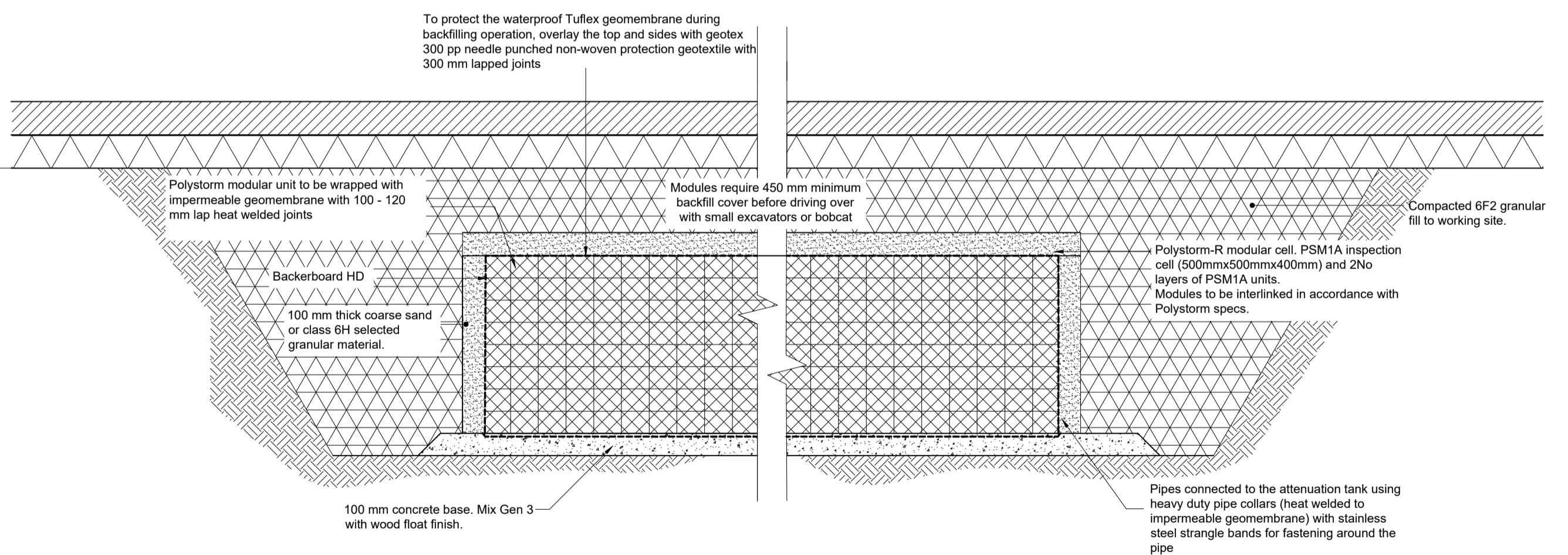
- All drainage to be installed in accordance with the requirements set out in BS EN 752 and the Building Regulations Document H UNO.
- This drawing is to be read in accordance with Engineer drainage details drawing no.: DR-D-4011, DR-D-4012, DR-D-4013 & DR-D-4014
- For details of materials and workmanship refer to the specification. (R12)
- The manhole cover levels shown on the drawing are approximate. Final cover levels are to be adjusted to suit finished paving levels and are to be confirmed with Architect prior to construction.
- The contractor is responsible for checking invert levels and positions of all existing drains, sewers, inspection chambers and manholes shown on this drawing immediately on site establishment. Any discrepancies must be reported immediately.
- Where the new site drainage is to connect into the existing manholes in carriageways and/or existing adopted sewers, the contractor is responsible for all liaison with the relevant statutory undertaker and local authority with regard to road closures, traffic management, permits to work, submission of contractors method statement and risk assessment and other documentation and correspondence associated with the site stage (Part 2) element of the works.
- All below ground concrete to be sulphate resistant cement to Class 3.
- Rocker pipes to be provided at all concrete cased interfaces.
- Maintain adequate protection to drains by providing a minimum cover during the construction period.
- The falls shown on pipe runs are indicative and pipes are to be installed to the invert levels shown on the manhole schedule.
- All pipework to be installed with soffits level (e.g. at changes in pipe size) UNO.
- Surface channel drains to be ACO MultiDrain or similar approved.
- All sump units to linear drainage channels to be fitted with foul air traps.
- All surface water gullies to be trapped.
- Pipe gradients are indicative minimums.
- All surface water branch connections to be 150mm diameter at min falls of 1:100 UNO.
- All foul water branch connections to be 100mm diameter at min falls of 1:40 UNO.
- All drains to be set out to give a minimum clearance of 1.0m to kerb lines
- All pipes from 100-300mm diameter to be Hepworth SuperSleeve or equivalent.
- All pipes above 300mm diameter to be precast concrete to BS 5911-1 Class 120.
- All internal gullies, plumbing connections, soil, stacks, SVP's and all other connections of foul and surface water drains to be fitted with accessible rodding points above slab level
- Rainwater downpipes that do not connect directly to an access point to be fitted with accessible rodding access above ground level.
- All covers and rodding access points to be sealed and screwed tight.
- Access fittings, Inspection Chambers and Manholes to be constructed to dimensions set out in the Building regulations Document H from tables 11 & 12.
- Setting out of all internal gully/plumbing connections to be co-ordinated between the service engineers and the Architect.
- All gullies to be precast concrete to BS 5911-230.
- All manholes to be precast concrete to BS 5911-3.
- All internal manhole covers to be double sealed, lockable and recessed to accept floor finishes where applicable.
- Refer to Architect's drawing for details of any manhole covers which require inset panels.
- Manhole covers shall be orientated to lie parallel/square to the highway.
- Drainage channels in car parks to be fitted with Heelguard ductile iron gratings Grade C250
- The following classes of cover shall be used unless otherwise stated on the drawings:  
A15 - Areas which may be used by pedestrians and cyclists  
B125 - Footways, pedestrian areas and car parks  
D400 - Road gullies  
D400 - Road carriageways, hard shoulders and parking areas  
E600 - Service yard and access
- Upon completion of drainage works, the new drainage system is to be thoroughly cleaned and a CCTV survey performed to confirm no construction debris or blockages remain.



**DETAIL OF ATTENUATION TANK USING POLYSTORM MODULAR UNITS**  
(SCALE 1:20)



**VENT / ACCESS BOX DETAIL**  
(SCALE 1:20)



**CROSS SECTION OF ATTENUATION TANK USING POLYSTORM MODULAR UNITS**  
(SCALE 1:20)

A 3 - 5% CBR HAS BEEN ASSUMED AT SUB-BASE LEVEL. SHOULD THE CBR BE TESTED AND FOUND TO BE LESS THAN 3% THEN PROVIDE 300mm 6F2 CAPPING LAYER BENEATH CONCRETE BLINDING.

THE CONTRACTOR SHALL PROHIBIT THE MOVEMENT OF CONSTRUCTION PLANT ACROSS THE STORAGE TANK AND WHERE NECESSARY PROVIDE ADDITIONAL SUPPORT AND PROTECTION TO THE STRUCTURE. PARTICULARLY POST CONSTRUCTION, TEMPORARY FENCING CAN BE USED TO PROHIBIT TRADE STOCKS, FILLING MATERIALS, HEAVY PLANTS ETC.

**TYPICAL Polypipe NOTES**

- all storage tank drainage works shall be carried out in accordance with the specifications, method statements and recommendations of Polypipe.
- the location, size and depth of all existing drains / sewers and services shall be established by the contractor prior to the commencement of works on site. any discrepancies from the information indicated on these drawings shall immediately be brought to the attention of the engineer.
- the contractor shall allow for the protection, temporary and permanent support and diversion works as necessary, to all existing services to the satisfaction of the public utilities.
- the contractor shall allow for dealing with surface water run-off into excavations and from groundwater by means of sumps, pumping and de-watering as appropriate, in order to keep the excavation as reasonably dry as possible during the construction of the works.
- all levels and dimensions shall be verified on site prior to the commencement of any works, any discrepancies shall immediately be brought to the attention of the engineer.
- the contractor shall take all necessary safety precautions in line with current legislation when working in / near confined spaces, deep excavations and machinery.
- the contractor shall take all necessary safety to protect pedestrians and vehicles from the working areas.
- to protect the Polystorm modular attenuation / storage tank from construction site debris, the contractor shall ensure that stoppers are securely placed in all connections immediately upstream of the tank units, only to be removed once the final cleaning of the roads / drainage has been completed.
- upon completion of the works the contractor shall clean all drainage by jetting, removing all debris from site, no debris shall be permitted to enter the tank storage system.
- number of vent units depends on the size of the tank and to be determined by tank supplier.
- refer to sequence of work document for detailed installation methodology (contact Polypipe).

Rev.	Description	Date	By
C02	Alternative detail omitted	06-11-25 / AP	
C01	Issued for Construction	31-10-25 / AP	

Project: Car Park

Client: [Blank]

Drawing Title: Drainage Details Sheet 4

Project No.	Drawn By	Checked	Date	Scale	Sheet
7274	AP	TR	Jun 25	1/10	A0

Status	Description	Revision
A5	Issue for Construction	C02

Number: 7274-TRP-ZZ-XX-DR-D-4024

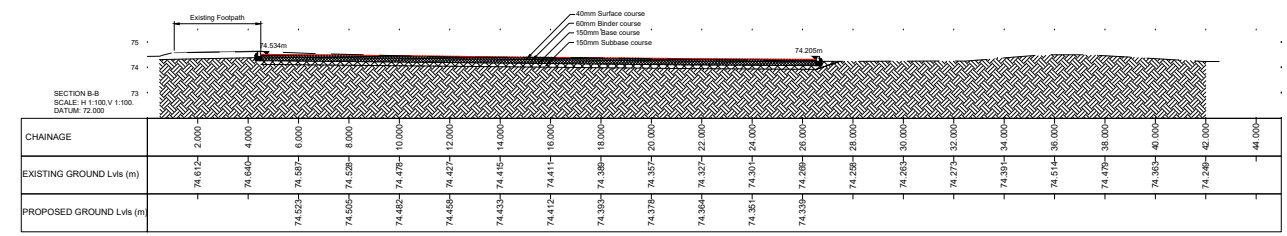
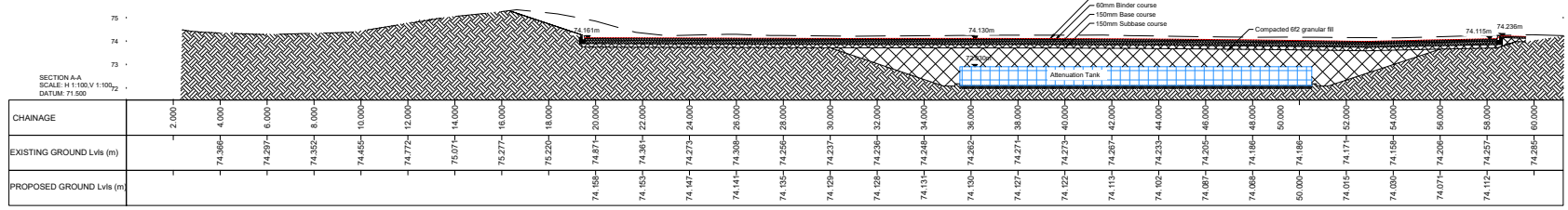
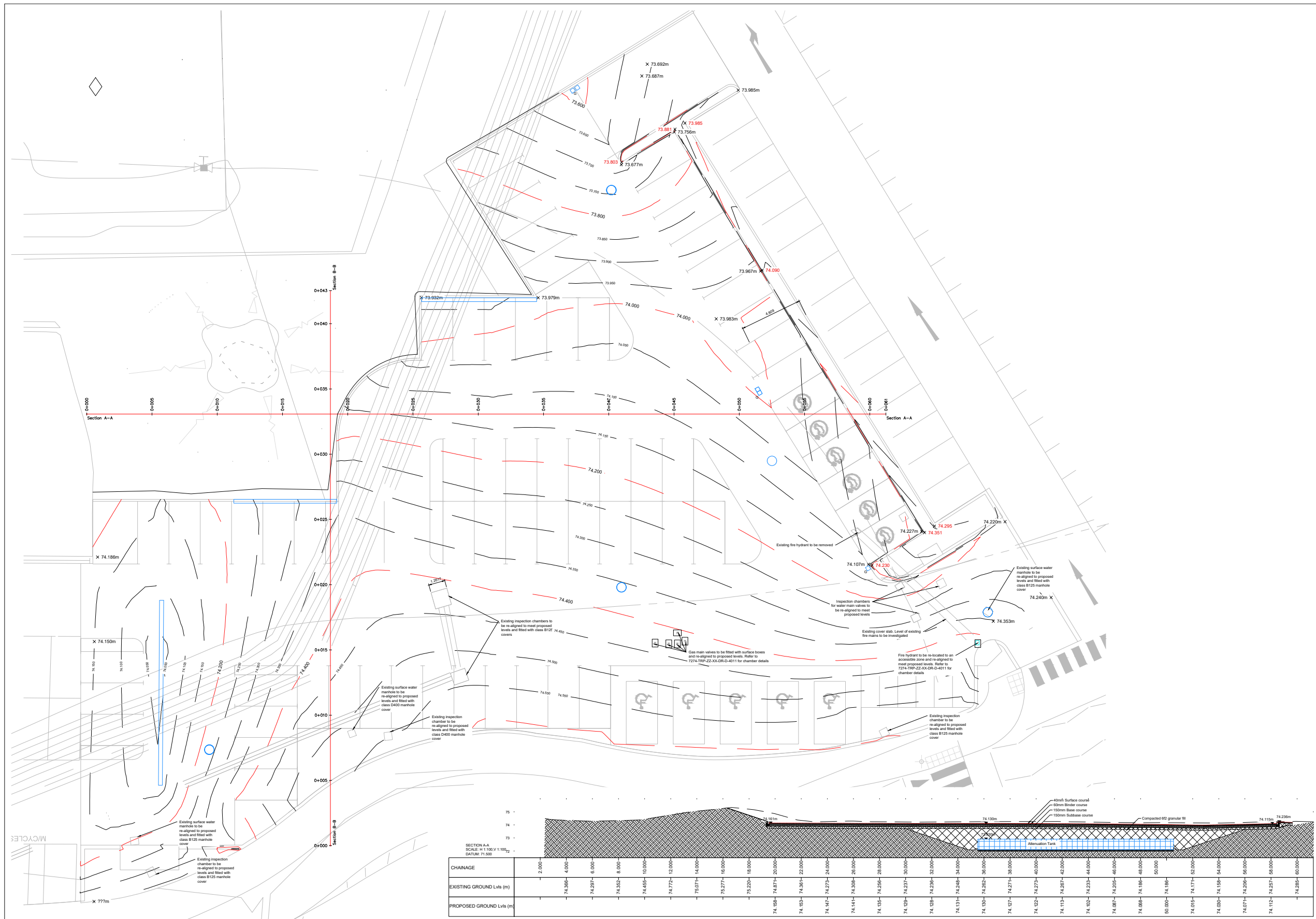
**APPENDIX E**

**E1 TRP Proposed Levels 7274-TRP-ZZ-XX-DR-C-5400 C02**

- General Notes**
- This Drawing is to be read in conjunction with all relevant Engineers, Architects, Services Engineers and Subcontractor drawings.
  - Review all drawings and report any discrepancies to Engineer prior to commencement.
  - Do not scale from this drawing. All dimensions and levels including any abutment to existing structures to be checked on site prior to commencement.
  - Work from figured dimensions only.
  - No deviation from details shown on this drawing is allowed without Engineers prior permission in writing.
  - All work is to be carried out in accordance with the relevant specifications issued by Engineer, British Standard Codes of Practice, Statutory requirements and the Contract Documents.

- LEGEND**
- Proposed manhole location
  - Proposed ACO location
  - G Proposed gully location
  - 72.851 Proposed road level
  - 72.851 Proposed kerb level

**NOTE:** Manhole covers shall be accurately aligned to ensure proper access, with benching constructed in accordance with relevant standards. For 600D manholes, covers are to be centrally aligned to allow for easy rodding. All proposed and existing covers to be new/replaced with a rating of class D400 single sealed.



Rev.	Description	Date	By
001	Notes revised	31-10-2025	AP
002	Buildup revised to heavy access	27-10-2025	AP
003	Issued for Tender	20-06-2025	AP
004	Issued for Information	02-06-2025	AP
005	Issued for Information	21-02-2025	AP

Project: Car Park

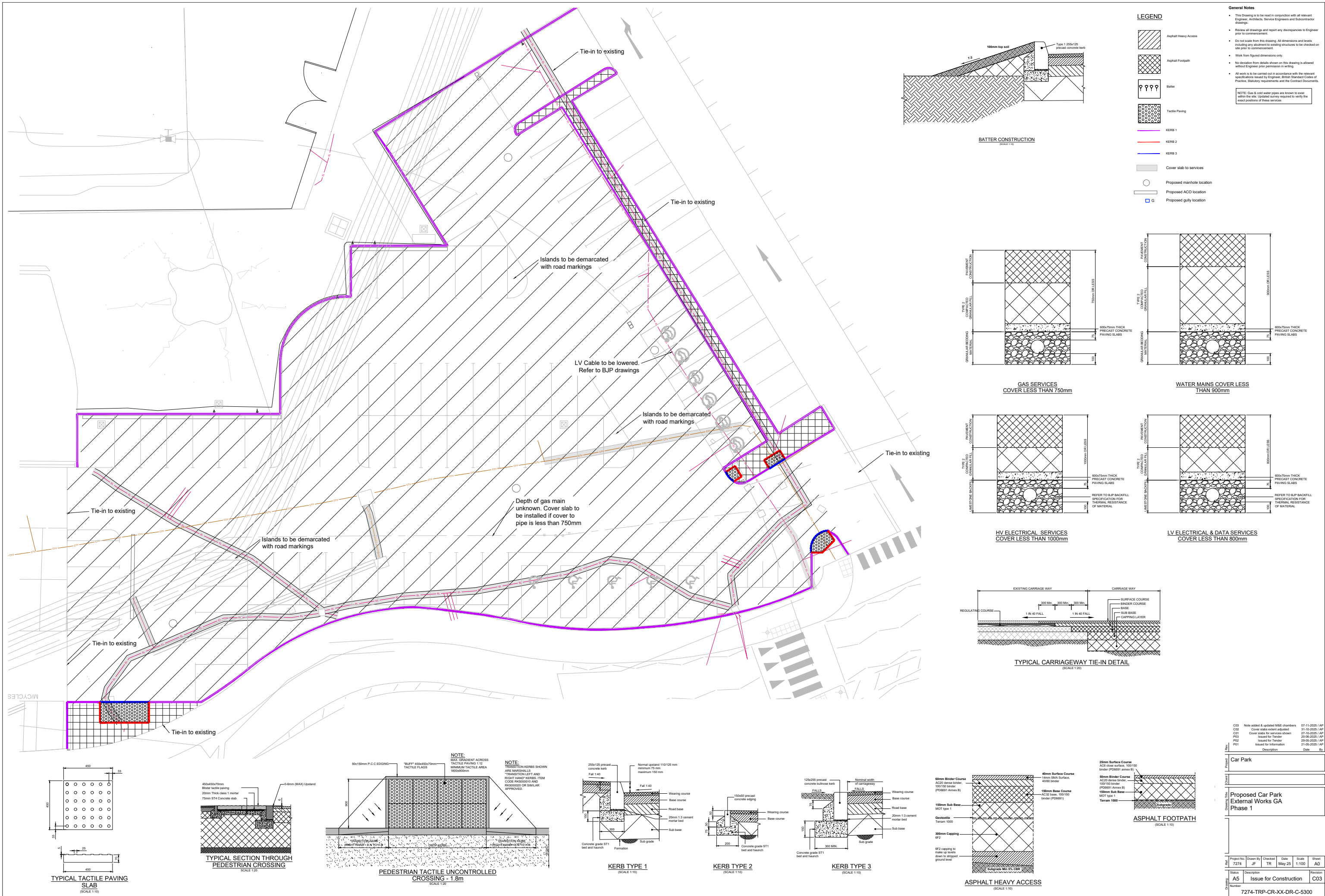
Drawing Title: Proposed Car Park Finished Levels & Sections

Rev.	Project No	Drawn By	Checked	Date	Scale	Sheet
001	7274	AP	TR	May 25	1:100	A0
002	A5	Issue for Construction				C02

7274-TRP-CR-XX-DR-C-5400

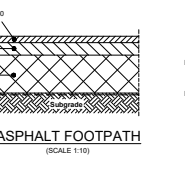
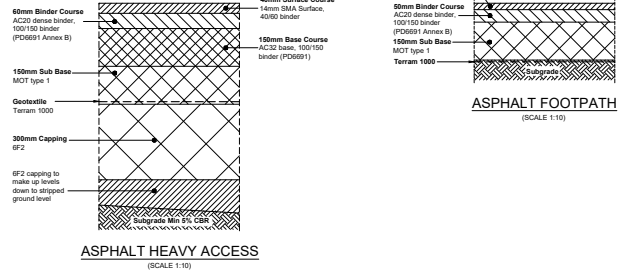
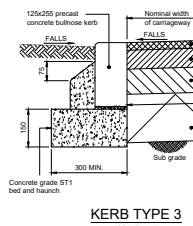
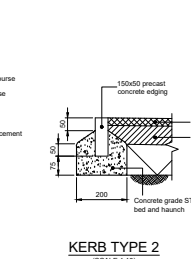
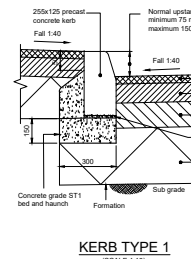
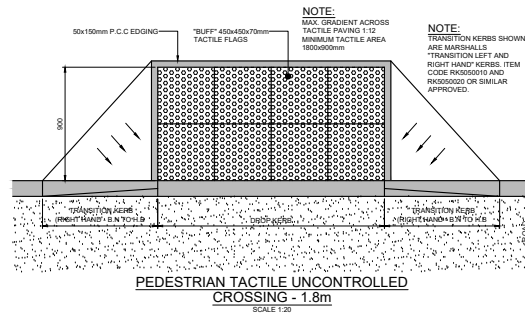
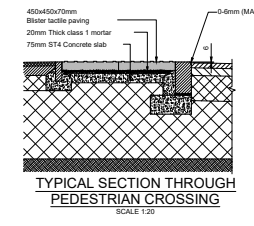
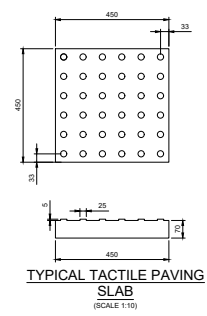
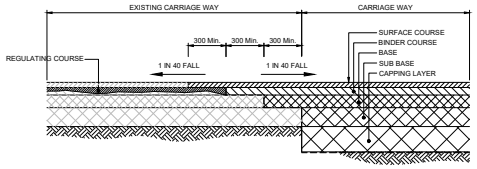
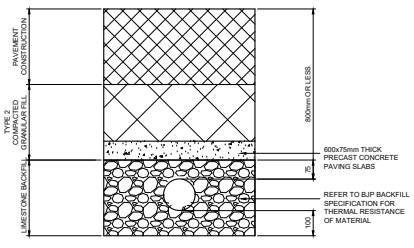
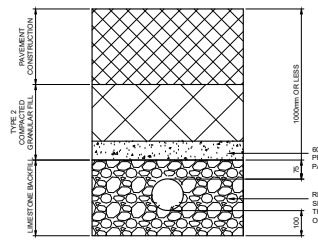
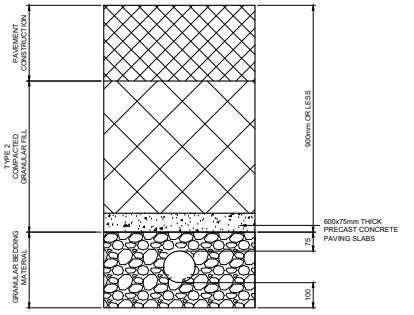
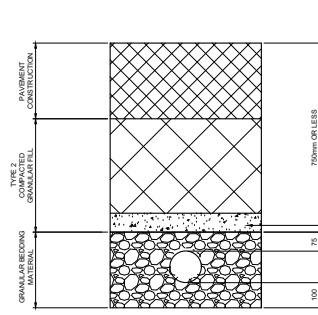
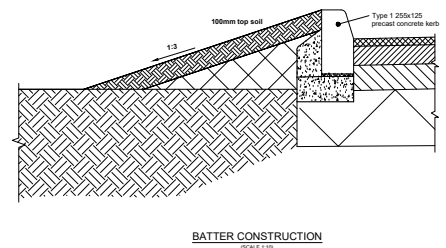
**APPENDIX F**

**F1 TRP Proposed External Works GA 7274-TRP-ZZ-XX-DR-C-5300**



### LEGEND

- Asphalt Heavy Access
- Asphalt Footpath
- Batter
- Tactile Paving
- KERB 1
- KERB 2
- KERB 3
- Cover slab to services
- Proposed manhole location
- Proposed ACO location
- Proposed gully location



### General Notes

- This Drawing is to be read in conjunction with all relevant Engineer, Architects, Service Engineers and Subcontractor drawings.
- Review all drawings and report any discrepancies to Engineer prior to commencement.
- Do not scale from this drawing. All dimensions and levels including any adjustment to existing structures to be checked on site prior to commencement.
- Work from figured dimensions only.
- No deviation from details shown on this drawing is allowed without Engineer prior permission in writing.
- All work is to be carried out in accordance with the relevant specifications issued by Engineer, British Standard Codes of Practice, Statutory requirements and the Contract Documents.

NOTE: Gas & cold water pipes are known to exist within the site. Detailed survey required to verify the exact positions of these services.

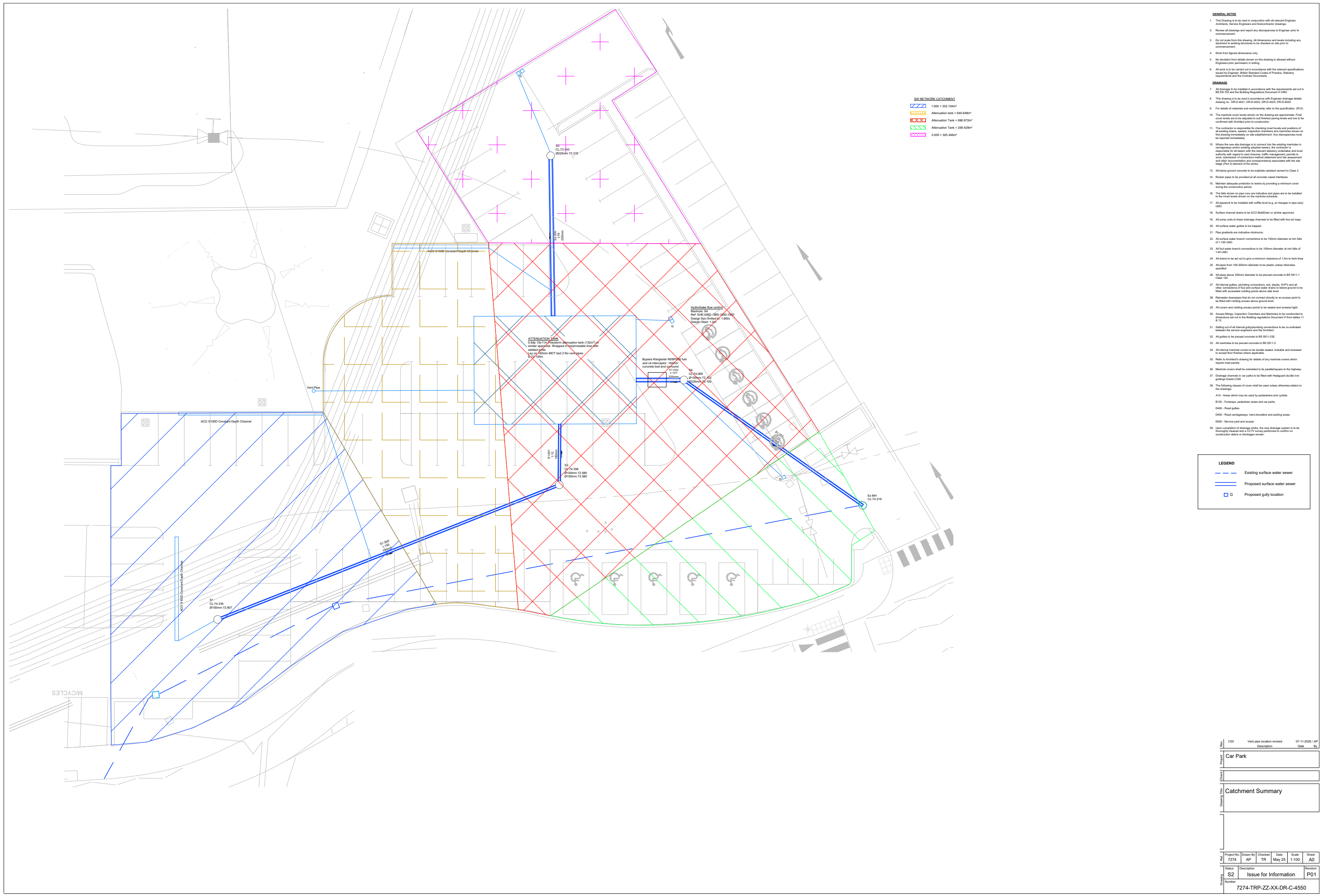
Rev.	Description	Date
C03	Notes added & updated M&E chambers	07-11-2025 / AP
C02	Cover slabs revised adjusted	21-10-2025 / AP
C01	Cover slabs for services shown	23-10-2025 / AP
P03	Issued for Tender	25-05-2025 / AP
P02	Issued for Tender	29-05-2025 / AP
P01	Issued for Information	21-05-2025 / BJ

Rev.	Description	Date
A5	Issue for Construction	C03

7274-TRP-CR-XX-DR-C-5300

**APPENDIX G**

**G1 IMPERMEABLE AREAS CATCHMENT SUMMARY 7274-TRP-CR-XX-DR-D-4550**



**RAIN NETWORK CATCHMENT**

	1,000 + 332,104m <sup>2</sup>
	Attenuation Tank = 842,849m <sup>3</sup>
	Attenuation Tank = 258,972m <sup>3</sup>
	Attenuation Tank = 258,429m <sup>3</sup>
	2,000 + 325,365m <sup>2</sup>

- GENERAL NOTES**
- This Drawing is to be read in conjunction with all relevant Engineer, Architect, Service Engineers and Subcontractor drawings.
  - Review all drawings and report any discrepancies to Engineer prior to commencement.
  - Do not scale from this drawing. All dimensions and levels including any adjustment to existing structures to be checked on site prior to commencement.
  - Work from fixed dimensions only.
  - No deviation from details shown on this drawing is allowed without Engineers prior permission in writing.
  - All work to be carried out in accordance with the relevant specifications issued by Engineer. British Standard Codes of Practice, Statutory requirements and the Contract Documents.
- DRAINAGE**
- All drainage to be installed in accordance with the requirements set out in BS EN 752 and the Building Regulations Document H4 LND.
  - This drawing is to read in conjunction with Engineer drainage details drawing no. DR-D-401, DR-D-402, DR-D-403, DR-D-404.
  - For details of materials and workmanship refer to the specification (R12).
  - The manhole cover levels shown on the drawing are approximate. Final cover levels are to be adjusted to suit finished paving levels and are to be confirmed with Architect prior to construction.
  - The contractor is responsible for checking ground levels and positions of all existing drains, sewers, inspection chambers and manholes shown on this drawing immediately on site establishment. Any discrepancies must be reported immediately.
  - Where the new site drainage is to connect into the existing manholes in conjunction with existing surface sewers, the contractor is responsible for all liaison with the relevant statutory undertaker and local authority with regard to road closures, traffic management permits to work, identification of contractors method statement and risk assessment and other documentation and arrangements associated with the site plan (R12.2).
  - All below ground concrete to be multiple rebar concrete to Class 3.
  - Rocker pipes to be provided at all concrete cover interfaces.
  - Maintain adequate protection to drains by providing a minimum cover during the construction period.
  - The falls shown on pipe runs are indicative and pipes are to be installed to the invert levels shown on the manhole schedule.
  - All pipework to be installed with sufficient level (e.g. at change in pipe size) LND.
  - Surface channel drains to be ACC MaxDrain or similar approved.
  - All sump units to linear drainage channels to be fitted with foot all traps.
  - All surface water gullies to be trapped.
  - Pipe gradients are indicative minimums.
  - All surface water branch connections to be 150mm diameter at min falls of 1:100 LND.
  - All four water branch connections to be 150mm diameter at min falls of 1:80 LND.
  - All ducts to be set out to give a minimum clearance of 1.5m to both sides.
  - All pipes from 100-300mm diameter to be plastic unless otherwise specified.
  - All pipes above 300mm diameter to be precast concrete to BS 5911-1 Class C20.
  - All internal gullies, plumbing connections, soil, stacks, S/Ps and all other connections to four and four water drains to be fitted with accessible rodding points above sub level.
  - Roofwater downpipes that do not connect directly to an access point to be fitted with rodding access above ground level.
  - All covers and rodding access points to be sealed and screened tight.
  - Access fittings, Inspection Chambers and Manholes to be constructed to dimensions set out in the Building Regulations Document H from tables 11 & 12.
  - Setting out of all internal gully/plumbing connections to be co-ordinated between the service engineer and the Architect.
  - All gullies to be precast concrete to BS 5911-3.
  - All manholes to be precast concrete to BS 5911-3.
  - All internal manhole covers to be double sealed, lockable and recessed to avoid floor finishes where applicable.
  - Refer to Architect's drawing for details of any manhole covers which require treat panels.
  - Manhole covers shall be orientated to be perpendicular to the highway.
  - Drainage channels in car parks to be fitted with Highguard ductile iron grating Grade C20.
  - The following classes of cover shall be used unless otherwise stated on the drawings:  
 A15 - Areas which may be used by pedestrians and cyclists  
 B205 - Footways, pedestrian areas and car parks  
 D400 - Road gullies  
 D400 - Road verges, hard shoulders and parking areas  
 E600 - Service yard and access
  - Upon completion of drainage works, the new drainage system is to be thoroughly cleaned and a CCTV survey performed to confirm no construction debris or blockages remain.

**LEGEND**

	Existing surface water sewer
	Proposed surface water sewer
	Proposed gully location

Rev	CD	Vent pipe location revised	07-11-2025	AP		
Project	Car Park					
Client						
Drawing Title	Catchment Summary					
Rev	Project No	Drawn By	Checked	Date	Scale	Sheet
	7274	AP	TR	May 25	1:100	A0
Drawn	S2	Issue for Information				P01
Number	7274-TRP-ZZ-XX-DR-C-4550					