Surface Water Discharge Management Plan

Llandarcy Asphalt Plant - Environmental Permit Application

G D Harries & Sons Ltd.

Prepared by:

SLR Consulting Limited

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SLR Project No.: 416.065010.00001

2 November 2023

Revision: Draft 01

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
	31 October 2023			
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Basis of Report

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1.0 Introduction

1.1 Report Context

SLR Consulting Limited (SLR) has been instructed by G D Harries & Sons Ltd. (G D Harries) to prepare an environmental permit application for discharge of site surface water from the proposed Llandarcy Asphalt Plant to the Red Jacket Pil. The site is located at the former E M Edwards Works, Llandarcy, SA10 6JY (hereafter referred to as 'the site').

This Surface Water Discharge Management Plan is reviewed and updated on an annual basis or as a result of a number of circumstances including, but not limited to, the following:

- issuance of a varied environmental permit by Natural Resources Wales (NRW);
- a change to the site's drainage and discharge arrangements;
- a change in site layout;
- a significant substantiated complaint; or
- a change to any legislation or guidance documents applicable to the activity.

This document is supplemented by the following documents prepared in support of the environmental permit variation application:

- Application Forms A, B2, B6 and F1.

1.2 Site Location

The site is located at the former E M Edwards Works, Llandarcy, SA10 6JY, centred on National Grid Reference (NGR) SS 72665 94748. The village of Llandarcy is located 1.06km northwest and the City of Swansea lies 7.15km to the east.

To the north, east and west, the site is immediately bounded by industrial and commercial properties. Red Jacket Pil is located adjacent to the southern site boundary, beyond this is lies a woodland area.

The site is accessed via an unnamed road which leads off the B4290.

1.3 Report Structure

This report describes the operating techniques and management system that are implemented at the facility to ensure compliance with the conditions of the EP. The report has been drafted to satisfy the requirements of NRW Guidance and is divided into the following sections.

- Section 1 Introduction;
- Section 2 Non-Technical Summary;
- Section 3 Management;
- Section 4 Operations;
- Section 5 Inspection and Maintenance;
- Section 6 Emissions and Monitoring; and
- Section 5 Information.

1.4 Document Revision History

Any changes to the management plan are labelled in chronological order and the date of the change recorded. All records of the changes are listed in the revision history table below:

Any changes to the management plan are labelled in chronological order and the date of the change recorded. All records of the changes are listed in the revision history table below:

Version	Reason for Revision	Date of Revision	Signature of Site Manager
1.0	First Version of Document Finalised and Released		

2.0 Non-Technical Summary

Natural Resources Wales have advised G D Harries & Sons Ltd that an environmental permit for a surface water discharge activity is required due to the risk of surface water runoff from the site containing sediments or hydrocarbons from the asphalt plant.

Surface water runoff from the area of hardstanding serving the Plant is to be drained to the Red Jacket Pil, a tidally influenced watercourse, via a sustainable drainage system, incorporating catchpits, swales and a Class 1 oil interceptor.

The surface water management plan has been drafted as part of the environment permit application. The purpose of this management plan is to describe how the discharge activity will be managed in compliance with the environmental permit being applied for.

This management plan includes a summary of G D Harries & Son’s management structure, monitoring and maintenance of the drainage system and discharge and procedures in the event of an incident or non-compliance.

3.0 Management

3.1 Management System

G D Harries operate an accredited Environmental Management System to ISO 14001:2015.

The management system operated by G D Harries will ensure that;

- the risks that the activities pose to the environment are identified;
- the measures that are required to minimise the risks are identified;
- the activities are managed in accordance with the management system;
- performance against the management system is audited at regular intervals; and

- the EP is complied with.

A summary of the Environmental Management System is included as Appendix A to the application forms in Section 2 of the application.

3.2 Management Structure and Responsibilities

The Site Manager is responsible for day to day operations and compliance with the EP, included as Appendix A to this report. This will include the following responsibilities:

- Operational controls;
- Maintenance;
- Record-keeping;
- Emergency action plans; and
- Notifications to NRW.

3.3 Technical Competence and Training

The site is managed by sufficient staff, competent to operate the site. The management system ensures the following:

- All staff have clearly defined roles and responsibilities;
- Records are maintained of the skills required for each post;
- Records are maintained of the training and relevant qualifications undertaken by staff to meet the requirements of each post; and
- Operations are governed by standard operating instructions.

An assessment of staff training needs will be carried out to identify the posts for which specific environmental awareness training is needed, and to determine the scope and level of such training. The assessment of training needs is reviewed on an annual basis.

The training programme will ensure that relevant staff are aware of the following:

- Regulatory implications of the permit for the site and their specific work activity;
- All potential environmental effects from operations under normal and abnormal circumstances;
- The need to report deviations from the permit; and
- Prevention of accidental emissions and the action to be taken should accidental emissions occur.

3.4 Managing Documentation and Records

Controls are in place to ensure that all documents within the scope of the Environmental Management System (EMS) are issued, revised and maintained in a consistent fashion.

The documents that are included within the scope of the controls are as follows:

- Policies;
- Responsibilities;
- Targets;
- Maintenance records;
- Procedures;

- Monitoring records;
- Results of audits;
- Results of reviews;
- Complaints and incident records; and
- Training records.

3.5 Reporting Non-Compliance and Taking Corrective Action

Non-compliances detected at the site will be reported, investigated and rectified. Staff will maintain awareness of non-compliances in the following areas:

- Actual or potential non-compliance with conditions of the environmental permit;
- Incidents, accidents and emergencies; and
- Complaints.

The action taken in response to the non-conformance may include:

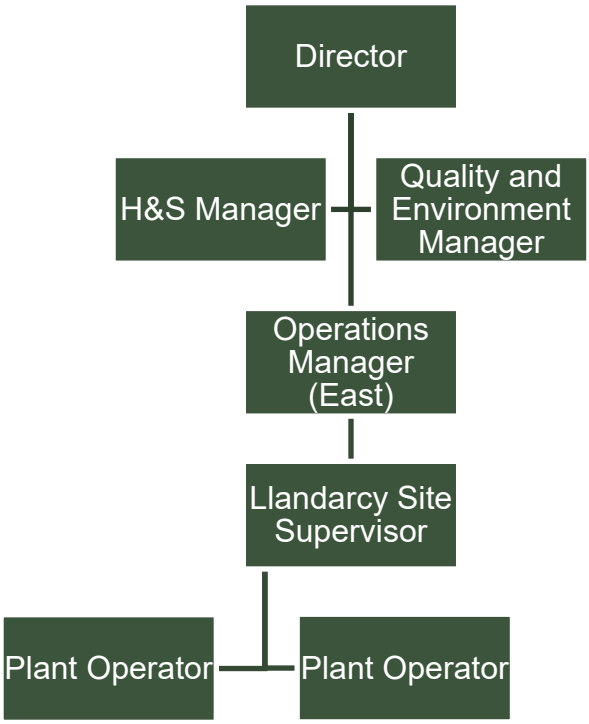
- Obtaining additional information on the nature and extent of the non-conformance;
- Discussing and testing alternative solutions;
- Modifying procedures and responsibilities;
- Seeking approval for additional resources and training; and
- Contacting suppliers and contractors (as applicable).

3.6 Auditing and Legal Compliance

As part of the EMS, a formalised internal auditing procedure is adhered to, therefore ensuring the facility is audited at defined intervals and that the progress of corrective and preventative action is monitored.

3.7 Monitoring, Measuring and Reviewing Environmental Performance

A formalised management structure reviews environmental performance, an ensures any necessary actions are taken. The management structure consists of the following tiers:



The document is to be updated when there is a change in management structure.

3.8 Operational Control, Preventative Maintenance and Calibration

The EMS contains operational procedures that will ensure effective control of site operations, the use of approved suppliers and contract services, the maintenance of operational equipment and the calibration of monitoring equipment.

3.9 Design and Construction Quality Assurance

All relevant elements of the site are designed in accordance with recognised standards, methodologies and practices.

The design process will use a risk-based approach and will be appropriately documented using drawings, specifications and methods statements to provide an adequate audit trail.

Construction Quality Assurance (CQA) plans will govern construction activities necessary in the future. These CQA plans will be prepared by competent and suitably qualified persons.

A competent and suitably qualified person will supervise the construction activities.

3.10 Hazards

The following hazards have been identified:

- Contaminated run-off;
- Loss of containment- spillage and leakage;
- Flooding; and
- Security and vandalism

The following sections summarise the measures necessary to minimise the potential causes and consequences of accidents.

3.10.1 Contaminated run-off

The Site Manager will be responsible for implementing risk management measures in accordance with operational and management procedures.

Aggregates will be stored in covered storage bays to help minimise the risk of elevated concentrations of suspended solids within the surface water runoff.

The operational area is to be drained by channel drains and two sections of swale separated by a Class 1 oil interceptor. Catchpits will be installed at the end of the principle channel drain runs, prior to discharge to the first section of the swale. The second section of swale is to be constructed along the southern boundary of the site with a final discharge to the Red Jacket Pil.

To prevent contaminated run off from the car park, this part of the site will be locally regraded and resurfaced as required to drain to a filter strip/ shallow swale along the southern site boundary. It will then drain via the Class 1 oil interceptor and the swale to the Red Jack Pil.

The following measures will be implemented to prevent contaminated run-off:

- Run off from the roof of the proposed covered aggregate bays will be collected and used as a source of washdown water.
- Catchpits will be installed to retain larger fractions of suspended solids.
- The swales will treat runoff as close as is practical to the source prior to discharge to the Red Jacket Pil via a Class 1 interceptor and secondary swale; and
- A daily recorded site inspection will be undertaken looking for any signs of silt or other pollutants reaching the watercourse.

3.10.2 Loss of containment- spillage and leakage

Diesel and Adblue bunded tanks will be positioned on site where accessible to HGV vehicles. The Plant also has three large storage units holding bitumen and PMB, all three storage units are bunded.

There is also the potential for fuel spillage from vehicles.

The following measures will be adopted on site to prevent any potential spillage and leakages:

Storing oils, fuels and chemicals

- Fuels, chemicals, and oils will be stored in bunded tanks;
- The storage and refuelling areas will be located away from the watercourse;
- Refuelling will be carried out in designated areas with spill kits and drip trays;
- Spill kits and drip trays will be securely locked when not in use and usage will be recorded; and
- Tanks will be stored in a compound which will be locked when not in use.

Refuelling Protocol

- The site will have a designated bunded refuelling area;
- Refuelling will not be carried out close to the watercourse; and

- Emergency spill kits will be kept at the refuelling point.

The site will be monitored for any spillages associated with vehicle movements and any identified incidents will be cleaned up as soon as they are identified.

The result of any inspections or investigations as a result of complaints will be recorded in the site Diary.

The Site Manager will be responsible for implementing risk management measures.

3.10.3 Flooding

The site lies in a Flood Zone 1, which is classified as “Land having a less than 1 in 1,000 annual probability of river or sea flooding”.

The Site Manager is responsible for the management of the site in the event of flooding.

Further details on the potential flood risk has been discussed within the Drainage Impact Assessment (Appendix C).

3.10.4 Security and vandalism

In order to prevent unauthorised access, the site is located within a fenced compound provided with access gates.

The following measures will be implemented on site to improve security:

- No stacking materials against the site boundary or fence as this may help vandals and thieves to scale it;
- Within the site ensure that materials that are potentially hazardous to the environment are well secured. Lock fuel outlets when not in use;
- Secure plant to prevent vandalism;
- Immobilise plant and equipment overnight;
- Control the movement of people on and off site by using site passes; and
- Position the Project Manager’s office to give a good view of the site.

In the event that damage is sustained repairs are made by the end of the working day. If this is not possible, suitable measures will be taken to prevent any unauthorised access to the site and permanent repairs are affected as soon as practicable.

The Site Manager will be responsible for managing security on site. This includes inspecting the site at the commencement of each day.

4.0 Operations

4.1 Site Operations

The proposed development is for an asphalt plant which would be used to serve local contacting companies and provide material to Gerald D Harries & Sons Ltd’s own asphalt contracting division.

Planning permission for the development reference P2021/1019 comprising the ‘Construction and operation of proposed Asphalt Plant together with aggregates storage area, weighbridge, offices and ancillary infrastructure works’ was granted by Neath Port Talbot County Borough Council on 18 October 2021.

Activities of note to be undertaken at the site include:

- The operation of the asphalt plant;

- Storage of aggregates; and
- Storage of chemicals and fuels.

A copy of the site development plan is enclosed as Appendix 04 to Appendix C.

4.2 Surface Drainage System Design

Surface water runoff from the area of hardstanding serving the Plant is to be drained to the Red Jacket Pil, a tidally influenced watercourse, via a sustainable drainage system incorporating catchpits, swales and a Class 1 oil interceptor The area of hardstanding to serve the operational areas of the Asphalt plant and the roof of the Aggregate Store extends to 6400m² and the drained area of the car park is 765m².

The general arrangement of the drainage system is shown in Drawings 01, 02 and 03.

- Surface water from the operational areas of the site will be captured in Aco drains and then directed to catch pits;
- Surface water from the car park will be captured in a filter strip which will drain into a catch pit;
- Water from the operational areas will flow from the catch pits into a swale and into a 450 mm diameter pipe. Water from the car park will also flow directly from the catch pit into the 450mm diameter pipe;
- A pollution control valve will be installed within the pipe prior to a Class 1 Full Retention Interceptor;
- Water will then flow from the interceptor in to a further swale; and
- Water will exit the swale into a 450mm diameter pipe which has a sampling chamber prior to a headwall for outfall into the Red Jacket Pil.

4.2.1 Maximum discharge

There is no maximum flow or discharge rate as the flow and discharge rate is dependent on rainfall intensity.

4.3 Drainage Impact Assessment

A Drainage Impact Assessment was prepared to support the application for Sustainable Drainage Approving Body (SAB) approval. A copy is enclosed as Appendix C.

5.0 Inspection and Maintenance

The proposed inspection and maintenance regime for the operation of the surface water drainage system at the Asphalt Plant is detailed within the Drainage Maintenance Plan (Appendix B).

6.0 Emissions and Monitoring

6.1 Flow

The discharge rate is entirely rainfall dependent. As such, no flow monitoring is proposed.

6.2 Quality

A sampling chamber is provided at OS grid reference SS7264694752 to enable visual inspection and spot sampling of the discharge quality. G D Harries would propose to

undertake a visual inspection for oil and grease on a monthly basis and spot sampling of suspended solids on a quarterly basis.

7.0 Information

All relevant notifications and submissions to NRW regarding the site are made in writing and will quote the EP reference number and the name of the permit holder.

Records are maintained for at least 2 years, however in the case of off-site environmental effects, and matters which affect the condition of land and groundwater the records are kept until EP surrender. Duty of Care records are kept for a minimum of 2 years.

7.1 Reporting and Notifications

7.1.1 Changes in Technically Competent Persons

NRW will be informed in writing of any changes in the technically competent management of the site and the name of any incoming person, together with evidence that such person has the required technical competence.

7.1.2 Relevant Convictions

NRW will be notified of the following events:

- G D Harries & Sons Ltd being convicted of any relevant offence; and
- Any appeal against a conviction for a relevant offence and the results of such an appeal.

7.1.3 Notification of Change of Operator's or Holder's Details

NRW will be notified of the following:

- Any change in the operator's trading name, registered name or registered office address; and
- Any steps taken with a view to the company going into administration, entering into a company voluntary arrangement or being wound up.

7.1.4 Adverse Effects

NRW will be notified without delay following the detection of the following:

- Any malfunction, breakdown or failure of equipment or techniques;
- Any accident;
- Fugitive emissions which have caused, are causing or may cause significant pollution; and
- Any significant adverse environmental and health effect.

Appendix A Summary of Environmental Management System

QUENSH Policy

Quality assurance policy statement

GD Harries & Sons Ltd (The Organisation) is committed to providing a world class quality product and service. The Organisation extracts and supplies aggregates, asphalt and concrete and also provides civil engineering and construction services.

Under leadership of top management, The Organisation will achieve this by:

- Implementing, maintaining, resourcing and improving a customer-focussed quality management system that is appropriate to the purpose and context of the organisation and the requirements of ISO 9001:2015
- Managing the risks, developing the opportunities and meeting the needs and expectations of interested parties
- Ensuring that the system continues to be effective and compliant with the needs of both our customers and the Company
- Communicating the system to all interested parties, providing and developing resources that are competent to deliver our objectives at all levels of The Organisation
- Supporting our strategic direction to produce aggregate, asphalt, concrete products and supply Civil Engineering products and services that will meet our customers' focus and requirements in all respects and remain fit for the stated purpose
- Improving the quality of products and services provided and providing a framework to set quality objectives that includes a commitment to satisfy applicable requirements to ensure that aggregates, asphalt and concrete are produced to conform to relevant specifications and installed in accordance with the requirements of the Highways Agency Sector Scheme 16.

In order to assist in the accomplishment of these objectives the company has established, and will maintain and implement, efficient programmes and procedures for all functions which will comply, as a minimum, with the requirements of ISO 9001:2015 and, as appropriate, National Highways Sector Scheme 16, BS EN 13108 Part 21, BS EN 13043, BS EN 12620, BS EN 13242, BS EN 206 and BS8500:2015.

The company will review this policy at least annually and revise it as often as is appropriate.

Nick Cleary
Construction Services Director
Issue 1.09
Reviewed 1st September 2023

QUENSH Policy

Environmental policy statement

GD Harries & Sons Ltd (The Organisation) is committed to the continual Environmental improvement of its quarries, processing plants, asphalt plants, concrete plants, surfacing, construction and haulage operations.

The Organisation will achieve this by:

- Setting and communicating environmental objectives and targets; and reviewing them
- Taking into account of the purpose and context of the organisation, including the nature, scale and environmental impacts of its activities, products and services
- Maintaining a commitment to the protection of the environment, including prevention of pollution and meeting our permit and compliance obligations
- Complying with all applicable legal requirements to which the Company subscribes
- Training all staff in the relevant aspects and impacts and their Environmental duties and encourage suggestions for improvements
- Paying due regard to increasing environmental pressures and meeting (and exceeding wherever possible) all relevant environmental requirements and codes of practice
- Assessing in advance, the environmental impact of any new significant facilities, or operations, and mitigating against that impact, wherever possible
- Taking any opportunity to minimise the impact of our construction works and to reuse, recycle materials and remove waste
- Conserving resources by monitoring and controlling the use of energy and resources
- Procuring, planning and delivering our construction activities so as to continually reduce material, fuel and carbon usage- within our customers' remits
- Regularly auditing site-based activities, to ensure compliance with the environmental policy and the environmental management system.

This environmental policy will be reviewed on an annual basis in the light of operational experience gained during the implementation of the environmental management system.

Nick Cleary
Construction Services Director
Issue 1.09
Reviewed 1st September 2023

QUENSH Policy

Health and Safety policy statement

GD Harries & Sons Ltd (The Organisation) is committed to eliminating hazards, reducing risk and providing a safe working environment for our employees and others who may be affected by our activities.

Compliance with legislation is the minimum acceptable standard and we are committed to achieving the highest levels of health and safety performance and continual improvement.

The Organisation implements and communicates a comprehensive Occupational Health and Safety (OHS) management system aligned to ISO 45001 that is designed to identify hazards and risks and mitigate or eliminate them.

Responsibilities for health and safety are defined in our Health and Safety Management System. The day-to-day management of health and safety is a responsibility of managers at all levels but overall responsibility rests with the Director.

The Organisation will achieve our OHS objectives by:

- Setting and communicating OHS objectives and targets; and reviewing them
- Training all staff in the relevant aspects and impacts of their OHS duties
- Fully engaging with our workforce and interested parties and consulting with our personnel on OHS matters.

  We recognise that successful health and safety management can only be achieved with the support and commitment of our employees. All employees will be actively encouraged to take ownership of health and safety and empowered to assist in decision making.
- Encouraging a culture of safety, surveillance, care and reporting of hazards
- Implementing occupational, behavioural and wellbeing schemes to protect the safety of our personnel
- Ensuring that our OHS systems comply with legislative requirements
- Ensuring that this policy and its systems are implemented and maintained at all levels throughout the organisation and changes to the systems are communicated
- Learning from best practice and day-to-day activities in order to continually improve our performance and prevent reoccurrence of incidents
- Ensuring that the system continues to be effective and compliant with the needs of both our Organisation and interested parties
- Ensuring that all employees have the appropriate systems, equipment, training/instruction and skills to undertake the roles required and are aware of their OHS responsibilities to themselves, other workers and all of those affected by our activities.

The OHS is delivered through our Health and Safety Policy and associated forms and documents, which are made available to all. Compliance with this policy is a condition of employment.

The company will review this policy at least annually and revise it as often as is appropriate in response to changes and learning.

Nick Cleary
Construction Services Director
Issue 1.04
Reviewed 1st September 2023

Appendix B Drainage Maintenance Plan

LLANDARCY ASPHALT PLANT

Drainage Maintenance Plan

Prepared for: G D Harries and Sons Ltd.

SLR Ref: 407.V64136.00001
Version No: Issue 4
August 2023

BASIS OF REPORT

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DOCUMENT REFERENCES

DRAWINGS

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Drawing 007 Rev 0: Drainage Details Sheet 1 of 3

1.0 INTRODUCTION

This plan has been prepared to document the inspection and maintenance regime to ensure the proper operation of the surface water drainage system serving the Asphalt Plant (the Plant) at the former E M Edwards Works, Llandarcy, Skewen, Neath.

Surface water runoff from the area of hardstanding serving the Plant is to be drained to the Red Jacket Pil, a tidally influenced watercourse, via a sustainable drainage system incorporating catchpits, swales and a Class 1 oil interceptor.

The general arrangement of the drainage system is shown by Drawings 003 and 004 and details of the elements of the system by Drawings 005, 006 and 007[1].

The elements of the drainage system comprise:

- Catchpits draining to;
- A swale draining to;
- A Class 1 oil interceptor draining to;
- A swale draining to;
- An outfall to the Red Jacket Pil via a tide flap.

In addition, the car park to the rear of the existing workshop will drain to the full retention Class 1 Oil Interceptor via a filter stip.

The inspection and maintenance regimes for each of these elements is set out in the following sections of this plan.

[1] To be replaced with as constructed drawings when available

2.0 Post Construction Responsibility

Following completion of the works, the responsible person for the operation and maintenance of the sustainable drainage systems will be:

Andrew Sainty
Operations Manager (East)
G. D Harries and Sons
Rowlands View
Templeton
Narberth
Pembrokeshire
SA67 8RG

Tel: 01834 860464
Mob: 07555 639230
e-mail: Andrew.Sainty@gdharries.co.uk

If there is a change in the responsible person, the SAB will Be notified in writing.

3.0 PIPEWORK, CHANNELS AND CHAMBERS

Maintenance Schedule	Required Action	Minimum Frequency	By whom	Method
Regular maintenance	Ensuring drainage intakes are clear of debris/silt.	Monthly (or as required)	G D Harries	Visual inspection and removal of debris / silt manually
Occasional maintenance	Jet clean sewer lines, gully tails and kerb channels to remove grease, grit, sediment and other debris to ensure conveyance capacity is not compromised.	Every 2 years	Specialist contractor to be appointed by G D Harries	Method statement to be agreed with G D Harries
Intermittent maintenance	CCTV survey of sewer lines to identify any defects/signs of performance degradation such as: • Cracked / deteriorating pipes; • Leaking joints/seals at manholes; • High water lines showing regular high stage in pipes (sign of lack of capacity or downstream constraint); and • Suspected infiltration or exfiltration.	Every 2 – 5 years	Specialist contractor to be appointed by G D Harries	Method statement to be agreed with G D Harries
Remedial actions	Repair defects using suitable methods. Effective temporary repairs may be sufficient in short term until scheduled/capital improvements can be made.	As required	Specialist contractor to be appointed by G D Harries	Method statement to be agreed with G D Harries
Monitoring	Record areas of surface ponding / intake bypassing / surcharging (photos, inundated areas, depths) during extreme storm events and investigate the reasoning for this post-storm.	As required	G D Harris	Refer any such incidents back to the scheme designer

4.0 CATCHPITS

Maintenance Schedule	Required Action	Typical Frequency	By whom	Method
Regular Maintenance	Remove any accumulated silt in the invert of the chamber.	As required, based on regular weekly inspections	G D Harries	Grating designed to allow silt removal using a mini excavator
Monitoring	Check for blockage in outlet pipe to swale	As part of weekly inspection	G D Harries	Visual inspection

5.0 SWALE

Maintenance Schedule	Required Action	Typical Frequency	By whom	Method
Regular Maintenance	Remove litter and debris	Monthly, or as required	G D Harries	Manual litter picking
	Cut grass – to retain grass height within specified design range	Monthly (during growing season), or as required	Landscape contractor to be appointed by G D Harries	Grass cutting
	Manage other vegetation and remove nuisance plants	Monthly at start, then as required		Manual removal
Monitoring	Inspect inlets, outlets and overflows for blockages, and clear if required	Monthly	G D Harries	Visual inspection
	Inspect vegetation coverage	Monthly for 6 months, quarterly for 2 years, then half yearly	G D Harries	Visual inspection
	Inspect for silt accumulation, establish appropriate silt removal frequencies	Weekly	G D Harries	Visual inspection
Occasional Maintenance	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required	As required or if bare soil is exposed over 10% or more of the swale treatment area	Landscape contractor to be appointed by G D Harries	Specification and method statement to be agreed with G D Harries
Remedial Actions	Repair erosion or other damage by returfing or reseeding	As required	Landscape contractor to be appointed by G D Harries	Specification and method statement to be agreed with G D Harries
	Relevel uneven surfaces and reinstate design levels			
	Remove build-up of sediment.		G D Harries	Manual or with a mini-excavator with suitable 'ditching' bucket.

6.0 FILTER STRIP

Maintenance Schedule	Required Action	Typical Frequency	By whom	Method
Regular Maintenance	Remove litter and debris	Monthly (or as required)	G D Harries	Manual
	Cut the grass – to retain grass height within specified design range	Monthly (during growing season), or as required	Landscape contractor to be appointed by G D Harries	Grass cutting
	Manage other vegetation and remove nuisance plants	Monthly (at start, then as required)	Landscape contractor to be appointed by G D Harries	Specification and method statement to be agreed with G D Harries
	Inspect filter strip surface to identify evidence of erosion, poor vegetation growth, compaction, ponding, sedimentation and contamination (eg oils)	Monthly (as start, then half yearly)	G D Harries	Visual inspection
	Inspect silt accumulation rates and establish appropriate removal frequencies	Monthly (at start, then half yearly)	G D Harries	Visual inspection
Occasional Maintenance	Reseed areas of poor vegetation growth; alter plant types to better suit conditions, if required	As required or is bare soil is exposed over >10% of the filter strip area	Landscape contractor to be appointed by G D Harries	Specification and method statement to be agreed with G D Harries
Remedial Actions	Repair erosion or other damage by re-turfing or reseeding	As required	Landscape contractor to be appointed by G D Harries	Specification and method statement to be agreed with G D Harries
	Relevel uneven surfaces and reinstate design levels	As required	Landscape contractor to be appointed by G D Harries	Specification and method statement to be agreed with G D Harries
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip	As required	G D Harries	Manual or with a mini-excavator with suitable 'ditching' bucket.

7.0 POLLUTION CONTROL CHAMBER

Maintenance Schedule	Required Action	Typical Frequency	By who	Method
Regular Maintenance	Remove any accumulated silt in the invert of the chamber.	As required, based on inspections	Approved contractor [a].	Using gully sucker or similar
	Remove any debris from flow control device.	As required, based on inspections	G D Harries	The chamber should be considered a **CONFINED SPACE** so if man entry is required to remove debris this should be completed by competent personnel, or a specialist contractor.
	Check operation of pollution control valve.	Monthly	G D Harries	Valve to be fully closed and opened again.
Occasional Maintenance	Service pollution control valve	In accordance with manufacturers recommendations	Specialist contractor	Method statement to be provided by the contractor
Monitoring	Monitor accumulation of silt in the invert of the chamber.	Monthly for first six months and then, provided there are no significant accumulations, quarterly from then on	G D Harries	Visual inspection
	Check for blockage of flow control device (this should be obvious as the lagoon will not drain down and the chamber will be full of water)			Visual inspection

8.0 CLASS 1 OIL INTERCEPTOR

Maintenance Schedule	Required Action	Typical Frequency	By who	Method
Regular Maintenance	Remove any accumulated silt and contaminants.	As required, based on inspections	Approved specialist contractor	Method statement to be agreed with G D Harries
Monitoring	Check the integrity of the interceptor and all its mechanical parts.	Every 3 to 6 months or in accordance with manufacturers recommendations	Approved specialist contractor	Method statement to be agreed with G D Harries
	Inspect the filters and repair or replace, where necessary			
	Assess the amount of contaminants that have collected in the tank	Every 3 to 6 months or in accordance with manufacturers recommendations **or** following heavy rainfall	G D Harries	Visual inspection

10.0 HEADWALLS AND TIDE FLAP

Maintenance Schedule	Required Action	Typical Frequency	By whom	Method
Regular Maintenance	Remove any accumulated silt from the apron of the headwall.	As required, based on inspections	G D Harries	Method statement to be prepared by G D Harries to reflect working adjacent to the Red Jacket Pil
	Check operation of tide flap. Ensure freely opening and seating properly.	Monthly	G D Harries	

11.0 ACCESS

The Asphalt Plant is to be laid entirely to hardstanding and therefore there will be no impediment to access.

Access to the headwall and tide flap to be restricted to authorised personnel only working to an agreed method statement and risk assessment due to the proximity to the Red Jacket Pil.

12.0 RECORD KEEPING

G D Harries will maintain a record of inspections, actions arising and regular and occasional maintenance work.

13.0 PERSONNEL

Inspections, record keeping and management of the maintenance of the SuDS elements will be completed by a competent person, or persons, appointed by G D Harries' UK Operations Manager.

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Appendix C Drainage Impact Assessment

LLANDARCY ASPHALT PLANT

Drainage Impact Assessment

Prepared for: G D Harries and Sons Ltd.

SLR Ref: 407.V64136.00001
Version No: Issue 3
May 2023

BASIS OF REPORT

This document has been prepared by SLR with reasonable skill, care and diligence, and taking account of the manpower, timescales and resources devoted to it by agreement with G D Harries and Sons Ltd. (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

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Drawing 004: Drainage General Arrangement Sheet 2 of 2

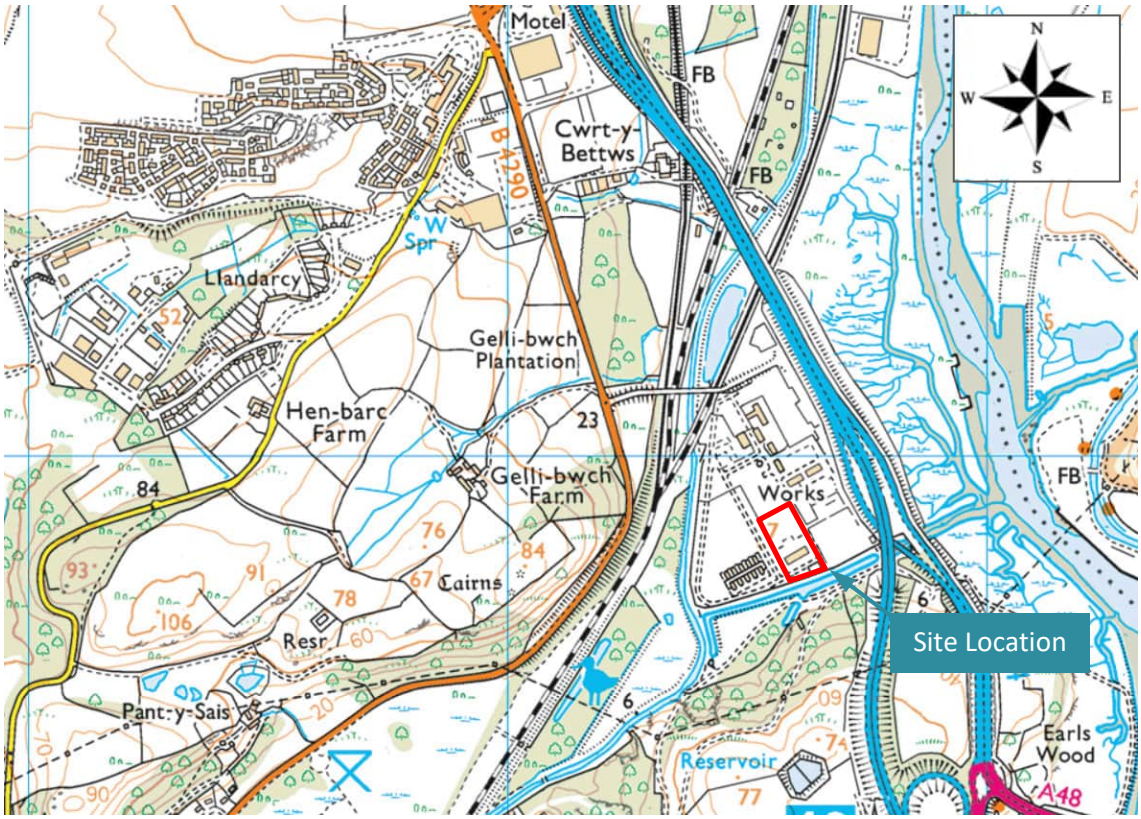
Drawing 005: Drainage Details

1.0 INTRODUCTION

1.1 Terms of Reference

SLR Consulting Limited (SLR) was appointed by G D Harries and Sons Ltd. (GDH) to prepare a Drainage Impact Assessment (DIA) to support an application for Sustainable Drainage Approving Body (SAB) Approval – Wales for the proposed development of an Asphalt Plant at the former E M Edwards Works, Llandarcy, Skewen, Neath, SA10 6JY (the Site) as shown by Figure 1-1 and Drawing 001.

Figure 1-1: Site Location Plan



This report has been prepared under the guidance and direction of a SLR Technical Director who specialises in surface water management and drainage design. A site visit was completed on 14 June 2022.

1.2 Pre-application Consultations

1.2.1 June 2021

A pre-application submission was made to the Neath Port Talbot County Borough Council SAB on 10 June 2021 by JBA Consulting (JBA) on behalf of GDH. A copy of the SAB response to the pre-application is enclosed at Appendix 01.

1.2.2 July 2022

SLR was subsequently retained by GDH to develop the preliminary sustainable drainage prepared by JBA following the granting of planning permission. As part of the review, SLR has recommended a different approach

to the management of surface water runoff, and in particular addressing water quality issues, and it was therefore considered prudent to seek the views of the SAB on the revised design before seeking formal approval.

A second pre-application submission was therefore made in July 2022. A copy of the SAB response to the second pre-application is enclosed at Appendix 02.

1.3 Site Location

The Site is located at the former E M Edwards Works, Llandarcy, Skewen, Neath at National Grid Reference SS725948 as shown by Figure 1-1 and Drawing 001.

The Site is bounded to the south by the Red Jacket Pil and on all other sides by industrial development.

1.4 Existing Site Uses

The Site extends to approximately 1.2 hectares (ha) and is currently laid almost entirely to hardstanding. The site is occupied by a workshop building and garage as shown by the topographic site survey enclosed at Appendix 03.

Access to the Site is from an internal industrial estate road.

1.5 Proposed Development

Planning permission for the development reference P2021/1019 comprising the '*Construction and operation of proposed Asphalt Plant together with aggregates storage area, weighbridge, offices and ancillary infrastructure works*' was granted by Neath Port Talbot County Borough Council on 18 October 2021.

A copy of the site development plan is enclosed at Appendix 04.

2.0 SITE APPRAISAL

2.1 Topography

A topographic site survey was completed by GDH in May 2022 and is enclosed at Appendix 03.

With reference to the survey, the Site is essentially flat with a very shallow fall from a level of circa 7.3m above Ordnance Datum (AOD) at the northern boundary to circa 7.1mAOD at the southern boundary adjacent to the Red Jacket Pil.

2.2 Hydrological Features

As noted in Section 1.0, the Red Jacket Pill flows to the west along the southern boundary of the Site joining the Afon Nedd that flows in a southerly direction approximately 400m to the west.

The Tennant Canal for the western side of the wider industrial site approximately 250m to the west of the Site,

2.3 Existing Drainage Arrangements

The topographic survey indicates that there is some surface water drainage infrastructure serving the Site, however, it has not been possible to establish where it drains.

A decision has been taken not to commit significant resources to cleansing and tracing the existing drainage system at this stage as it is unlikely that it could be adapted to serve the new operational development area.

Where the drainage system serves parts of the site that are not to be redeveloped, such as the workshop building, the existing drainage will be retained. The only exception is car park to the rear of the workshop building that is to be refurbished. As part of these works, new drainage arrangements are to be provided and integrated into the system serving the proposed operational area described in this DIA.

2.4 Geological and Hydrogeological Features

A Geotechnical and Geoenvironmental Investigation completed by Terra Firma in March 2021 reported that the Site is underlain by the *Birthdir Member – Sandstone* with a superficial deposit of *Tidal Flat Deposits - Clay, Silt And Sand*. The site investigation also recorded an approximate depth of 2.2m of made ground overlying the Tidal Flat Deposits.

Soakage tests completed in the made ground within the proposed operational area indicate an infiltration rate in excess of 3×10^{-3} ms^{-1}.

The report states that:

> *'Leachate testing has identified elevated concentrations of copper, lead, mercury, and selenium. However, these concentrations are relatively low and suggest that although the slag-rich soils contain high concentrations of metals and metalloids, the contaminants are not easily mobilised by leaching. It is also considered that the concentrations recorded by leachate testing in the laboratory are likely to be higher than those borne out in the field'*

and

> *'The use of soakaway stormwater drainage is therefore considered viable on site in the locations and depths tested'.*

With respect to the use of soakaways as a means of surface water disposal the report concludes:

> *'Based on the leachate test results (discussed in Section 7.3.2) it has been demonstrated that the use of soakaways is unlikely to significantly mobilise contaminants from the made ground. Groundwater was*

recorded at 3.0m below ground level in TP06. The shallow groundwater could therefore influence the use and depth of soakaway drainage. It is recommended that the groundwater level is monitored prior to soakaway design to check whether it is tidal, or whether it is influenced by rainfall'.

The use of soakaways as a means of surface water disposal is considered in Section 4.3.1.

3.0 FLOOD RISK

A Flood Consequence Assessment (FCA) was prepared by JBA and submitted in support of the Planning Application.

The FCA identified that the Site is located in Flood Zone C2 defined by TAN15[1] and described as areas at risk of flooding '*Without significant flood defence infrastructure*'.

However, the FCA concludes that the proposed development satisfies the requirements of the Justification Test, including managing flood risk in line with the acceptability criteria. The development therefore complies with the aims of TAN15 and Planning Policy Wales.

A copy of the FCA is enclosed at Appendix 05.

[1] Welsh Government, 2004. *Technical advice note (TAN) 15: development and flood risk*

4.0 CLIMATE CHANGE

4.1 Anticipated Lifetime of Development

In line best practice guidance, a conservative 75-year lifetime of development has been assumed for proposed development.

4.2 Peak Rainfall Intensity Allowance

The most recent advice on climate change is provided by the Welsh Government[2].

An extract of *Table 3 - Change to extreme rainfall intensity compared to a 1961-90 baseline* is reproduced as Table 4-1.

Table 4-1: Change to extreme rainfall intensity compared to a 1961-90 baseline

Applies across all of Wales	Total potential change anticipated for 2020s (2015-2039)	Total potential change anticipated for 2050s (2040-2069)	Total potential change anticipated for 2080s (2070-2115)
Upper estimate	10%	20%	40%
Central estimate	5%	10%	20%

The SAB response to the JBA pre-application submission indicates that a **30%** increase in peak rainfall allowance should be used for the design of the surface water drainage infrastructure. This has been adopted for the revised drainage scheme design presented in this assessment.

4.3 Tidal Flood Risk

As discussed at Section 3.0, the tidal flood risk to the Site has been considered by JBA in the FCA submitted in support of the planning application. However, the SAB response to the JBA pre-application submission advised that the sustainable drainage scheme should consider tide locking for the 5% (1 in 20) or 4% (1 in 25) AEP tidal flood event.

Extreme sea levels for a range of AEPs around the coastline of the UK are provided by the Coastal Flood Boundary (CFB) dataset, as published June 2021[3]. Extreme sea levels are provided at a series of locations along the coastline and in major estuaries, with each location assigned a chainage. As shown on **Error! Reference source not found.**, the closest data point to the Site is Chainage 484_3 in the Neath Estuary. The estimated 'present day' extreme sea levels are summarised in Table 4-2.

Taking a precautionary approach, the 4% (1 in 25) AEP tidal flood level has been adopted for the analysis.

[2] Welsh Government, September 2021. *Flood Consequences Assessments: Climate change allowances*
[3] Environment Agency, June 2021. *Coastal Design Sea Levels - Coastal Flood Boundary Extreme Sea Levels (2018)*

Figure 4-1: Extract from the Coastal Flood Boundary dataset

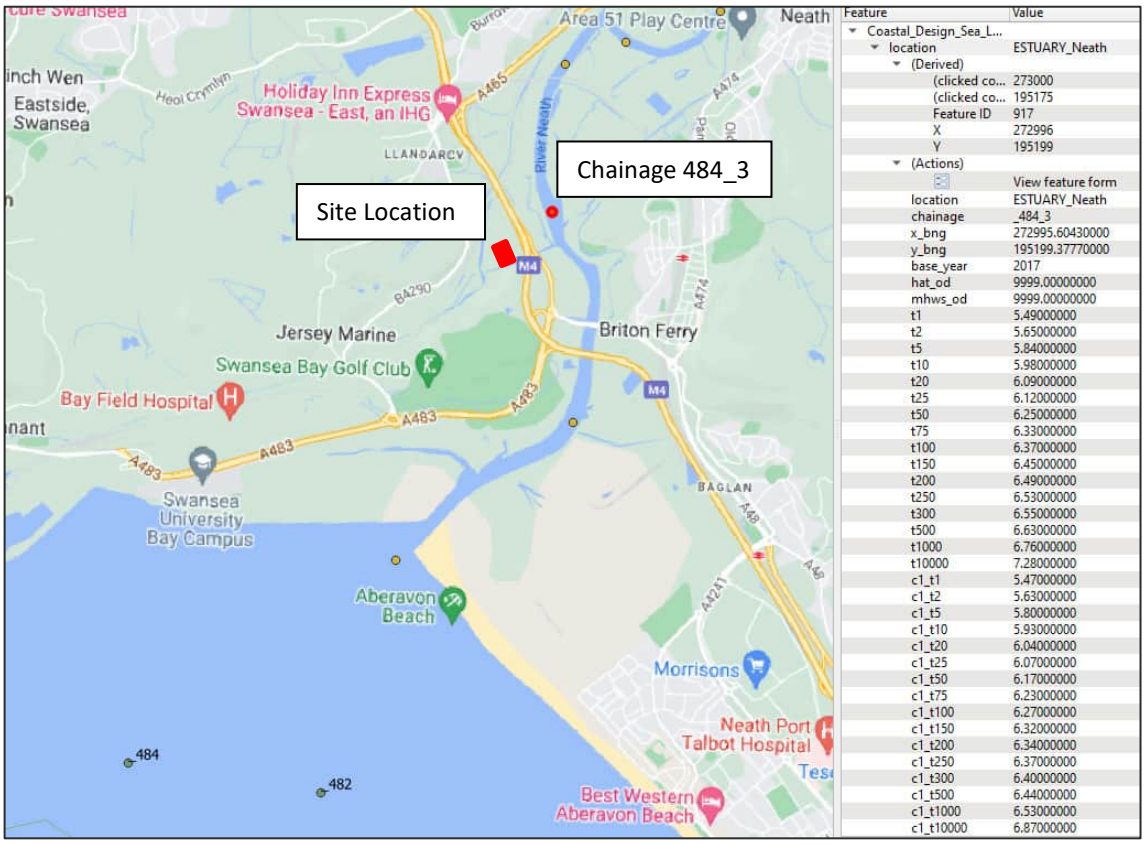


Table 4-2: Present Day Tidal Flood Levels

Annual Exceedance Probability	Tidal Level (m Above Ordnance Datum (AOD))
5% (1 in 20)	6.09
4% (1 in 25)	6.12

4.3.1 Welsh Government Climate Change Allowances

Climate change allowances are provided by the *Flood Consequences Assessments: Climate change allowances*[4] published by the Welsh Government. Table 3 of this guidance, *Estimated mean sea level rise (in metres) for relevant local authority areas by 2100 and 2120* provides the sea level rise allowances for each local authority area in Wales based on RCP8.5 70th and 95th percentiles.

The Site lies within Neath Port Talbot Local Authority Area and the sea level rise allowances as summarised in Table 4-3.

[4] https://www.gov.wales/sites/default/files/publications/2021-09/climate-change-allowances-and-flood-consequence-assessments_0.pdf

Table 4-3: Neath Port Talbot sea level rise allowances

Local Authority Area	Percentile	Mean sea level rise (m) by 2100	Mean sea level rise (m) by 2120
Neath Port Talbot	70th percentile (higher central allowance)	0.84	1.00
	95th percentile (upper end allowance)	1.11	1.32

Table 4-4 shows the application of these allowances to the 'present day' extreme sea level summarised in Table 4-2.

Table 4-4: Welsh Government extreme sea levels

AEP (%)	Extreme Sea Level (m AOD)			
	70th percentile		95th percentile	
	2100	2120	2100	2120
25	6.96	7.12	7.23	7.44

The lifetime of the proposed development is 75 years and with reference to the climate change guidance '*development proposals should be assessed against the relevant regional 70th percentile to inform design levels. An assessment should also be made against the 95th percentile to inform mitigation measures, access and egress routes and emergency evacuation plans*'.

It is therefore considered appropriate to adopt the 70th percentile 2100 extreme level of **6.96mAOD** for the tide locking analysis.

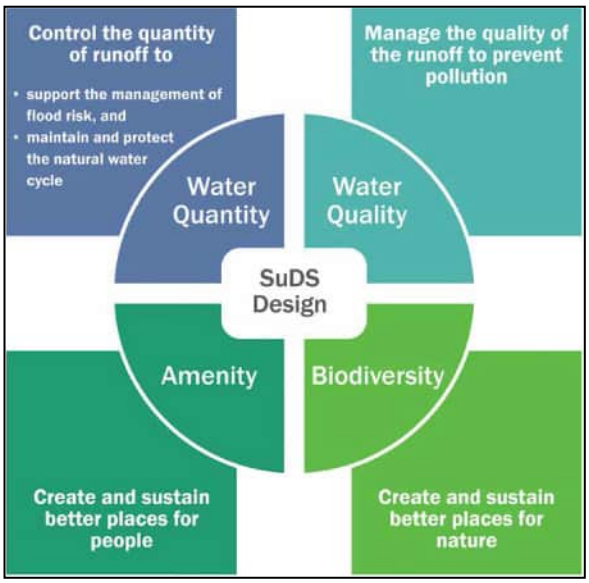
5.0 Surface Water Management Strategy

5.1 Sustainable (urban) Drainage Systems

Current best practice guidance relating to sustainable surface water management is outlined in the SuDS Manual (C753)[5] which provides details on the use of SuDS for managing surface water runoff.

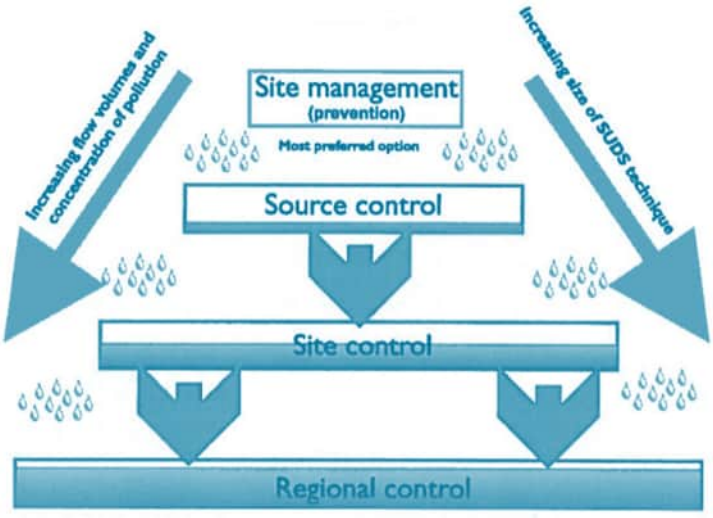
There are four main categories of SuDS which are referred to as the 'four pillars of SuDS design' and are depicted Figure 5-1.

Figure 5-1: Four Pillars of SuDS (after the SuDS Manual)



The SuDS Manual identifies a hierarchy of SuDS for managing runoff, which is commonly referred to as a 'management train' and is depicted in Figure 5-2.

Figure 5-2: SuDS Management Train



[5] CIRIA, 2015. *The SuDs Manual (C753)*

- **Prevention** – the use of good site design and housekeeping measures on individual sites to prevent runoff and pollution (e.g. minimise areas of hard standing).
- **Source Control** – control of runoff at or very near its source (such as the use of rainwater harvesting, permeable pavement and green roofs).
- **Site Control** – management of water from several sub-catchments (including routing water from roofs and car parks to one / several soakaways, below ground storage units or attenuation ponds for the whole site).
- **Regional Control** – management of runoff from several sites, typically in a retention pond or wetland.

It is generally accepted that the implementation of SuDS, as opposed to conventional drainage systems, provides several benefits by:

- reducing peak flows to watercourses or sewers and potentially reducing the risk of flooding downstream;
- reducing the volumes and frequency of water flowing directly to watercourses or sewers from developed sites;
- improving water quality over conventional surface water sewers by removing pollutants from diffuse pollutant sources;
- reducing potable water demand through rainwater harvesting;
- improving amenity through the provision of public open spaces and providing biodiversity and wildlife habitat enhancements; and
- replicating natural drainage patterns, including the recharge of groundwater so that base flows are maintained.

5.2 Sustainable Drainage Systems Standards for Wales

The Welsh Government has published the *Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems*[6] to support the implementation Flood and Water Management Act 2010 (Schedule 3) which came into effect in Wales on 7 January 2019.

In addition to referencing C753 as good practice guidance, the statutory standards provide an overarching set of principles in that SuDS schemes should aim to:

- manage water on or close to the surface and as close to the source of the runoff as possible;
- treat rainfall as a valuable natural resource;
- ensure pollution is prevented at source, rather than relying on the drainage system to treat or intercept it;
- manage rainfall to help protect people from increased flood risk, and the environment from morphological and associated ecological damage resulting from changes in flow rates, patterns and sediment movement caused by the development;
- take account of likely future pressures on flood risk, the environment and water resources such as climate change and urban creep;

[6] Welsh Government, 2018. *Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems*

- use the SuDS Management Train, using drainage components in series across a site to achieve a robust surface water management system (rather than using a single “end of pipe” feature, such as a pond, to serve the whole development);
- maximise the delivery of benefits for amenity and biodiversity;
- seek to make the best use of available land through multifunctional usage of public spaces and the public realm;
- perform safely, reliably and effectively over the design life of the development taking into account the need for reasonable levels of maintenance;
- avoid the need for pumping where possible; and
- be affordable, taking into account both construction and long-term maintenance costs and the additional environmental and social benefits afforded by the system.
- applications should be accompanied by proposals for a maintenance plan and the means of funding for the scheme for its design life

Six standards against which the SAB approval process will be determined are also provided:

- S1. Surface water runoff destination
- S2. Surface water runoff hydraulic control
- S3. Water Quality
- S4. Amenity
- S5. Biodiversity
- S6. Design of drainage for construction, operation and maintenance

A review of the proposed design against the six standards is presented in Sections 5.4 to 5.9 and concludes with a review of the drainage design against the Overarching Principles in Section 5.10.

5.3 Drainage Design

The drainage design for the proposed development is shown by Drawings 003 and 004.

5.3.1 Operational Area

The essentially flat site is to be reprofiled to provide a positively-drained surface.

The principal risk with respect to the quality of surface water runoff is considered to be from elevated concentrations of suspended solids, derived particularly from the delivery and movement of feed aggregates for the Asphalt Plant. Although the risk of elevated concentrations of suspended solids in the surface water runoff is mitigated by the covered aggregate storage bays.

For this reason, maintainability of the drainage system is an important aspect in its design and therefore the drainage of the operational area is to be by channel drains and two sections of swale separated by a Class 1 oil interceptor. In addition, catchpits are located at the end of the principle channel drain runs prior to discharge to the first section of swale.

The second section of swale is to be constructed along the southern boundary of the site with a final discharge to the Red Jacket Pil.

Preliminary discussions have been held with Natural Resources Wales (NRW) with respect to the permitting of the discharge to the Red Jacket Pil. NRW has confirmed that in addition to the proposed SuDS measures, the Class 1 oil interceptor is required.

A copy of the email correspondence with NRW is enclosed at Appendix 06.

5.3.2 Car Park

Whilst not included in the planning application, the SAB raised an issue with the runoff from the existing car park to the rear of the workshop building. It has not been possible to verify how this area is drained and therefore runoff from the car park has been catered for in the drainage design.

The car park will therefore be locally regraded and resurfaced as required to drain to a filter strip / shallow swale along the southern edge as shown by Drawing 004. It will then drain via the Class 1 oil interceptor and the swale to the Red Jacket Pill.

5.4 S1. Surface water runoff destination

The hierarchy of preferred disposal options for surface water runoff from development sites in decreasing order of sustainability required by the Standard is as follows:

Priority Level 1: Surface water runoff is collected for use;

Priority Level 2: Surface water runoff is infiltrated to ground;

Priority Level 3: Surface water runoff is discharged to a surface water body

Priority Level 4: Surface water runoff is discharged to a surface water sewer, highway drain, or another drainage system

Priority Level 5: Surface water runoff is discharged to a combined sewer

Table 5-1 summarises the suitability of disposal methods in the context of the Site and the proposed development.

Table 5-1: Suitability of Surface Water Disposal Methods

Surface Water Disposal Method	Suitability Description	Method Suitable? (Y / N)
Priority Level 1	Runoff from the roof of the proposed covered aggregate bays will be collected and used as a source of washdown water. Excess runoff will discharge to the swale. In addition, runoff can be drawn from the proposed siltation lagoon for reuse.	Y
Priority Level 2	Whilst the Geotechnical and Geoenvironmental Investigation indicates that soakaways may be an option for the disposal of surface water runoff, the potentially elevated groundwater levels are likely to reduce their effectiveness. Nevertheless, an unlined swale is to be incorporated within the drainage system that will permit infiltration, however, a discharge to the Red Jacket Pil will be the primary means of surface water disposal.	N

Surface Water Disposal Method	Suitability Description	Method Suitable? (Y / N)
Priority Level 3	The primary means for surface water disposal will be to the Red Jacket Pil.	Y
Priority Level 4	There are no surface water sewers in the vicinity of the Site to which a connection could be made.	N
Priority Level 5	There are no combined sewers in the vicinity of the Site to which a connection could be made.	N

5.5 S2. Surface water runoff hydraulic control

5.5.1 Impermeable Drained Areas

The area of hardstanding to serve the operational areas of the Asphalt Plant and the roof of the Aggregate Store extends to **0.64ha** as shown by Drawings 003 and 004.

The drained area of the car park to the rear of the existing workshop is **765m²**.

5.5.2 Allowable Discharge

With reference to The SuDS Manual:

> *'runoff should where possible be restricted to the greenfield 1 in 1 year [100% AEP] runoff rate during all events up to and including the 1 in 100 year [1% AEP] rainfall event with climate change.'*

This is also reflected in Standard S2.

However, Paragraph G2.1 of Standard S2 states:

> *This Standard applies to discharges to surface water bodies, surface water sewers or combined sewerage systems. However where the surface water body is unaffected by either the discharge rate or volume of runoff (e.g. an estuary, the sea or a water body identified in the Local Flood Risk Management Strategy (LFRMS) as not needing hydraulic control of runoff to it), the hydraulic management control requirements are limited to the drainage service provisions for the site and adjacent areas that could be affected by the performance of the drainage system.*

This indicates that no attenuation of the discharge to the tidally-dominated Red Jacket Pil will be required and this was accepted by the SAB in their response to the previous pre-application submission prepared by JBA.

5.5.3 Control of Runoff Volume

Section 3.3.1 of The SuDS Manual sets out volume control criteria for:

- Frequent rainfall events.
- Extreme rainfall events.

Frequent rainfall events

The SuDS Manual requires:

'the prevention of runoff from the [Site] for the majority of small (frequent) rainfall events (or for the initial depth of rainfall for larger events)'. This is known as Interception and 'Inception of about 5mm is normally achievable.'

With reference to Section 24.8 of The SuDS Manual:

'*Inception can be delivered using one or a combination of process:*

- *Rainwater harvesting*
- *Infiltration*
- *Evapotranspiration using temporary shallow ponding or storage within the soil or upper aggregate layers.*'

As the SAB has agreed that attenuation of runoff from the Site to the Red Jacket Pil is not required, this condition does not have to be explicitly met. However, a degree of infiltration from the swale can be anticipated and this, along with retention of runoff can be enhanced by setting the invert of the swale below the outgoing pipe to the Red Jacket Pil.

Extreme rainfall events

For extreme rainfall events, the drainage system should be designed such that '*the volume of runoff from the Site (or development) area [does] not exceed the volume of runoff from the equivalent area in its natural undeveloped or "greenfield" state*'.

Again, as the SAB has agreed that attenuation of runoff from the Site to the Red Jacket Pil is not required, this condition does not have to be explicitly met. Nevertheless, the swale is likely to allow a proportion of an extreme rainfall event to infiltrate to ground.

5.5.4 Hydraulic analysis and tide locking

The JBA FCA identified that the Site is at risk of flooding from extreme tidal events, albeit the risk is considered low.

Nevertheless, there is a risk that outfall to the Red Jacket Pil will become tide-locked on occasion. It is noted that agreement was reached with the SAB on the appropriate tide locking scenario and this has been adopted for the detailed design:

'The influence of tide locking on the outfall has been modelled for a life expectancy of the development of 75 years (2096) with no site flooding indicated for 1:100. A non-return valve is proposed for the outfall. Further information will be available in detailed design (for full app), but the principles seem ok for this pre app. Further construction details are required as part of the SAB approval. Climate change proposed is 20% we recommend 30% CC'.

The sustainable drainage system has been modelled using the industry standard MicroDrainage design and analysis package. The swales and settlement lagoon have been explicitly represented in the model and the design tested for tide locked conditions, i.e. a 1% AEP storm event allowing for a 30% increase in rainfall due to the impact of climate change with a 25% AEP 2100 tidal flood event. The tide locking profile has been derived from a spring tide profile for Baglan Bay and the 25% AEP 2100 peak tidal flood level.

Details of the analysis are enclosed at Appendix 07 and confirms that no flooding occurs for the critical 720 minute 1% AEP summer storm event allowing for the impact of climate change.

5.5.5 Design Exceedance Arrangement

The drainage strategy has also considered residual flood events i.e. those that are in excess of the design event.

If a storm event overwhelms the channel drainage system, some ponding of water could be expected on the areas of hardstanding, however, the proposed plant and vehicles serving it are likely to be resilient to the effects of a limited depth of flooding.

Excess flows will drain towards the Red Jacket Pil following the existing topography as shown by Drawings 003 and 004.

The proposed development will not create any locally low-lying area that could flood to any significant depth during an extreme event.

5.6 S3. Water Quality

To confirm the efficiency of the proposed water treatment process, the SAB requested that it is reviewed against the C753 '*simple index*' approach.

The risks associated with a number of typically drained surfaces (land uses) are assessed in Section 26 of the SuDS Manual and expressed in Table 26.2 as a potential *'Pollution hazard level'*. A review of proposed land use has been completed in reference to Table 26.2 of SuDS Manual to determine the appropriate *Pollution Hazard Levels*. Analysis has been completed for both the operational area and the car park

Operational area

The *Pollution hazard levels* appropriate to the operational area are summarised in Table 5-2.

Table 5-2: Pollution Hazard Level for Operational Area

Proposed Land Use	Pollution Hazard Level	Pollution Hazard Indices		
		Total Suspended Solids (TSS)	Metals	Hydro-Carbons
Sites with heavy pollution	High	0.8	0.8	0.9

Table 26.3 of the SuDS Manual provides indicative '*Mitigation indices*' for a range of SuDS components where runoff is to be discharged to surface waters and are summarised in Table 5-3.

.

Table 5-3: Indicative SuDS Mitigation Indices for Discharges to Surface Waters

SuDS Component	SuDS Mitigation Indices		
	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
Swale	0.5	0.6	0.6
Swale[1]	0.25	0.3	0.3
Total[1]	**0.75**	**0.9**	**0.9**

Notes:

[1] Total SuDS mitigation index = mitigation index$_1$ + 0.5 (mitigation index$_2$) + 0.5 (mitigation index$_3$)
Where: mitigation index$_n$ = mitigation index for component n

The two sections of Swale fall slightly short of providing a sufficient combined *SuDS Mitigation Index* for the suspended solids *Pollution Hazard Index*. However, as the SuDS elements are supplemented by the catchpits and the silt removal provided by the oil interceptor, the water quality requirements are considered to have been met.

Car park

The *Pollution hazard levels* appropriate to the car park are summarised in Table 5-4.

Table 5-4: Pollution Hazard Level for Car Park

Proposed Land Use	Pollution Hazard Level	Pollution Hazard Indices		
		Total Suspended Solids (TSS)	Metals	Hydro-Carbons
Non-residential car parking with infrequent change	Low	0.5	0.4	0.4

Table 26.3 of the SuDS Manual provides indicative '*Mitigation indices*' for a range of SuDS components where runoff is to be discharged to surface waters and are summarised in Table 5-5.

Table 5-5: Indicative SuDS Mitigation Indices for Discharges to Surface Waters

SuDS Component	SuDS Mitigation Indices		
	Total Suspended Solids (TSS)	Metals	Hydro-Carbons
Filter strip	0.4	0.4	0.5
Swale[1]	0.25	0.3	0.3
Total[1]	**0.65**	**0.7**	**0.8**

Notes:

[1] Total SuDS mitigation index = mitigation index$_1$ + 0.5 (mitigation index$_2$) + 0.5 (mitigation index$_3$)
Where: mitigation index$_n$ = mitigation index for component n

As the *SuDS mitigation indices* are greater that the *Pollution Hazard Indices* the water quality requirements are deemed to have been met.

In addition, a Class 1 oil interceptor is to be installed downstream of the car park. No allowance of the additional treatment this will provide has be considered in the *simple index* approach described above.

5.7 S4. Amenity

It is proposed to provide an amenity area for operatives of the plant adjacent to the swale as shown by Drawing 004. Details of the amenity area planting are shown by the drawing enclosed at Appendix 08.

5.8 S5. Biodiversity

A Preliminary Ecological Report was prepared to support the planning application by Bay Ecology.

The report concluded that:

> *'In terms of the ecological importance of the site the hard standing was of negligible ecological value and represented the most suitable area of the site to support the asphalt plant development. The offsite southern boundary tidal canal was considered to be utilised by a variety of foraging and commuting mammals (e.g. Otter & bats), birds and potentially reptiles and should remain undisturbed as a dark wildlife corridor with no incidental site lighting'*

Bay Ecology also prepared a Biodiversity Enhancement Plan based on the JBA preliminary drainage strategy. This focused on the opportunities provided by the proposed swales and filter strips to enhance biodiversity.

The revised strategy that is the focus of this assessment retains the swales as a means of secondary water treatment, however, the filter strips have been replace by a formal drainage system that is considered more appropriate to the proposed use of the Site.

Nevertheless, the advice with respect to the swales will be followed to enhance the biodiversity of the southern boundary:

'The swale will be lined with low nutrient soil to encourage a diverse botanical range. The features will be seeded with a wet meadow seed mix which will be supplemented with reed, rush and sedge plug planting to provide a variety of sward height and to further clean and treat surface water.

It is recommended that the sown grassland within the features is mown once a year to encourage wildflower development at the end of the growing season in September and the cuttings removed from the site; whilst the features are inspected twice a year for signs of erosion damage, silt deposits, excessive waterlogging and poor vegetation growth.'

A copy of the Biodiversity Enhancement Plan is enclosed at Appendix 09 and the plan enclosed at Appendix 08 provides details of the proposed planting of the swales and filter strips

5.9 S6. Design of drainage for construction, operation and maintenance

The following plans demonstrate compliance with Standard S6:

- An Environmental Method Statement and Site Environmental Plan and Environmental Risk Assessment are provided at Appendix 10;
- A Construction Phase Health & Safety Plan is provided at Appendix 11; and
- A Drainage Maintenance Plan is provided at Appendix 12.

5.10 Adherence to Principles

Table 5-6 provides a summary of how the proposed drainage scheme will meet the overarching Principles.

Table 5-6: Adherence to Principles

Principle	Response
Manage water on or close to the surface and as close to the source of the runoff as possible;	The operational area will drain to a swale along its western edge via catchpits.
Treat rainfall as a valuable natural resource;	Runoff from the roof of the proposed covered aggregate bays will be collected and used as a source of washdown water. Excess runoff will discharge to the swale.
Ensure pollution is prevented at source, rather than relying on the drainage system to treat or intercept it;	The swales will treat the runoff as close as is practical to source prior to discharge to the Red Jacket Pil via a Class 1 oil interceptor and secondary swale. The oil interceptor is likely to be a requirement of the permit to discharge to the Red Jacket Pil.
Manage rainfall to help protect people from increased flood risk, and the environment from morphological and associated ecological damage resulting from changes in flow rates, patterns and sediment movement caused by the development;	No attenuation of runoff is required as the discharge is to the tidally-dominated Red Jacket Pil.
Take account of likely future pressures on flood risk, the environment and water resources such as climate change and urban creep;	The impact of climate change on peak rainfall intensity has been explicitly considered in the design of the drainage system. There are no opportunities to increase the operational area of the Asphalt Plant and therefore urban creep has been discounted.
Use the SuDS Management Train, using drainage components in series across a site to achieve a robust surface water management system (rather than using a single “end of pipe” feature, such as a pond, to serve the whole development);	Catchpits and swale will reduce the concentration of suspended solids in the runoff from the operational area with secondary treatment provided by a Class 1 oil interceptor and secondary swale.
Maximise the delivery of benefits for amenity and biodiversity;	As part of the development an amenity space will be provided for operatives and the secondary swale provides an opportunity to enhance biodiversity.
Seek to make the best use of available land through multifunctional usage of public spaces and the public realm;	The Asphalt Plant is an industrial site with no public access.
Perform safely, reliably and effectively over the design life of the development taking into account the need for reasonable levels of maintenance;	The design has explicitly considered the maintenance of the drainage scheme by minimising below ground drainage and provision of catchpits to retain the larger factions of suspended solids.

Principle	Response
Avoid the need for pumping where possible; and	No pumping is required. Through the reprofiling of the operational area, a gravity discharge to the Red Jacket Pil can be made.
Be affordable, taking into account both construction and long term maintenance costs and the additional environmental and social benefits afforded by the system.	The operator considers that the proposed drainage scheme is affordable taking into account both construction and long-term maintenance costs and the additional environmental and social benefits afforded by the system.
In addition, applications should be accompanied by proposals for a maintenance plan and the means of funding for the scheme for its design life	A Drainage Maintenance Plan is provided at Appendix 12.

6.0 CONCLUSIONS

SLR Consulting Ltd (SLR) has been retained by GDH to complete a Drainage Impact Assessment to support an application for Sustainable Drainage Approving Body (SAB) Approval – Wales for the proposed development of an Asphalt Plant and associated infrastructure at the former E M Edwards Works, Llandarcy, Skewen, Neath.

The surface water management strategy presented in this report demonstrates compliance with the six standards and the overarching principles set out in the *Statutory standards for sustainable drainage systems* that supports the Flood and Water Management Act 2010 (Schedule 3).

DRAWINGS

APPENDIX 01

SAB response to June 2021 Pre-app

APPENDIX 02

SAB response to July 2022 Pre-app

APPENDIX 03

Topographic Survey

APPENDIX 04

Site development plan

APPENDIX 05

Flood Consequences Assessment

APPENDIX 06

Correspondence with NRW

APPENDIX 07

Drainage analysis

APPENDIX 08

Landscape and Amenity Plan

APPENDIX 09

Biodiversity Enhancement Plan

APPENDIX 10

Environmental Method Statement and Site Environmental Plan

and

Environmental Risk Assessment Plan

APPENDIX 11

Construction Phase Health & Safety Plan

APPENDIX 12

Drainage Maintenance Plan

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Drawing 01- Drainage General Arrangment (1 of 2)

NOTES

1) TOPOGRAPHIC LEVELS TAKEN FROM LLANDARCY 3D.DWG, G D HARRIES AND SONS LTD, LLANADARCY, TOPOGRAPHICAL SURVEY, GDHLLAN/TT/0002
2) PROPOSED LEVELS TAKEN FROM 407.V64136.00001.18.102.0 Proposed Site TC 15.03.23-A2 PRODUCED BY GERALD D HARRIES AND SONS LTD
3) THE SPECIFICATION IN ALL RESPECTS SHALL BE IN ACCORDANCE WITH THE CURRENT NPTCBC SPECIFICATION AND CONSTRUCTION PUBLICATION IN FORCE IN THE COUNTY AT THE TIME OF CONSTRUCTION.
4) ALL SUDS COMPONENTS SHOULD BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH CIRIA REPORT C756 THE SUDS MANUAL AND CIRIA REPORT C768 GUIDANCE ON THE CONSTRUCTION OF SUDS
5) FOR DETAILS OF THE PLANTING TO THE SWALES, FILTER STRIP AND AMENITY AREA REFER TO DRAWING No.2214FESLS001 ISSUE O1
6) REFER TO DRAWINGS 005, 006 AND 007 FOR DETAILS OF DRAINAGE FEATURES

LEGEND

- +7.60 — PROPOSED LEVELS
- SITE BOUNDARY
- APPLICATION BOUNDARY
- EXCESS FLOW PATH
- ASPHALT SURFACING (SEE DETAIL P)
- CONCRETE SURFACING (SEE DETAIL Q)

Revision	By	Chk'd By	Date	Comments
2	AB	ILW	08/23	ASPHALT PLANT AMENDED SURFACING ADDED
1	AB	ILW	05/23	SCHEME REVISED TO FIT WITHIN PLANNING BOUNDARY
0	TS	IW	22/07	

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Site: ASPHALT PLANT AT LLANDARCY

Project: SURFACE WATER MANAGEMENT

Drawing Title: **DRAINAGE GENERAL ARRANGEMENT (SHEET 1 OF 2)**

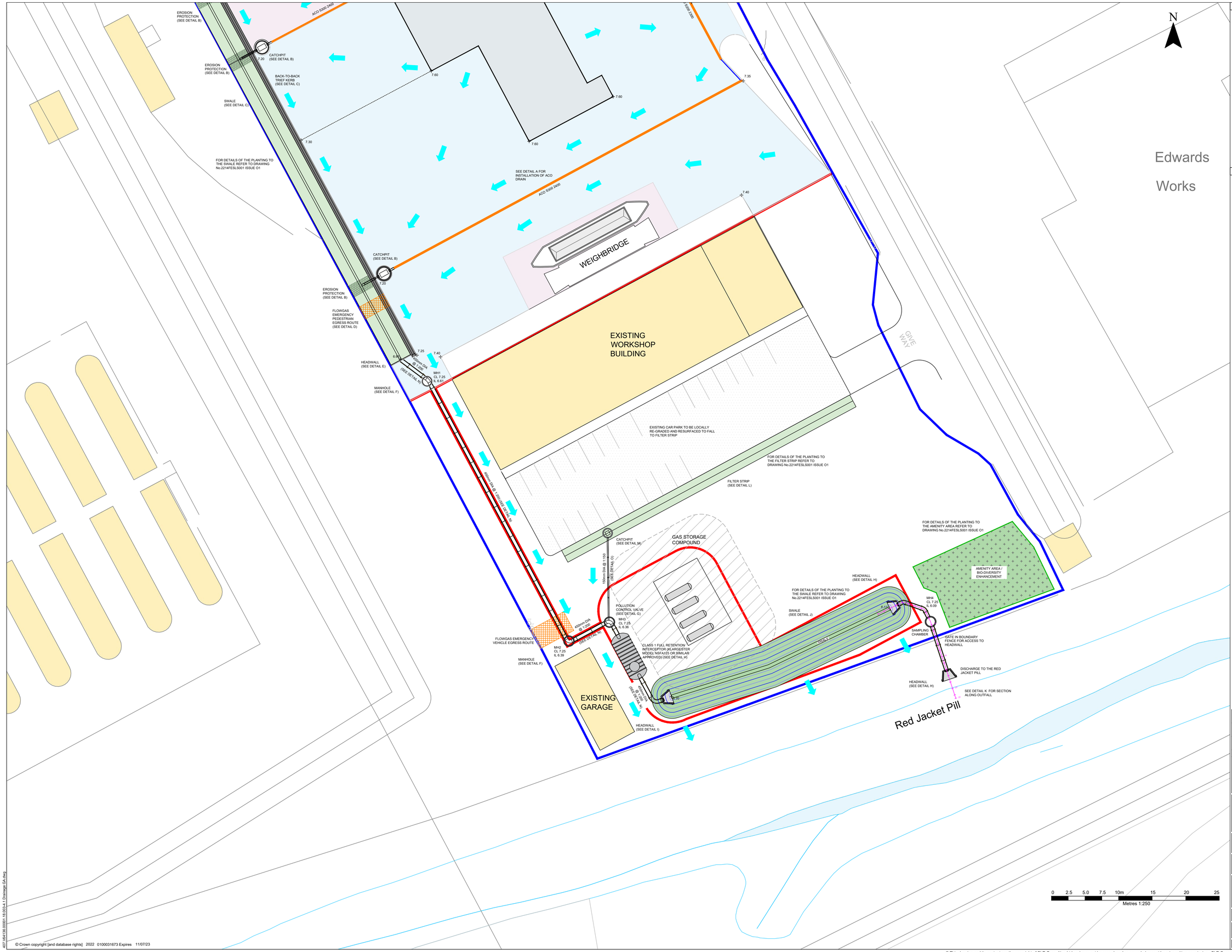
Scale: 1:250 @ A1

Date: 11.07.22

Drawing Number: **003**

Revision: **2**

Drawing 02- Drainage General Arrangment (2 of 2)



NOTES

1) TOPOGRAPHIC LEVELS TAKEN FROM LLANDARCY 3D.DWG, G D HARRIES AND SONS LTD, LLANADARCY, TOPOGRAPHICAL SURVEY, GDHLLANTT0002
2) PROPOSED LEVELS TAKEN FROM 407.V64136.00001.18.102.0 Proposed Site TC 15.03.23-A2 PRODUCED BY GERALD D HARRIES AND SONS LTD
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5) FOR DETAILS OF THE PLANTING TO THE SWALES, FILTER STRIP AND AMENITY AREA REFER TO DRAWING No.2214FESLS001 ISSUE O1
6) REFER TO DRAWINGS 005, 006 AND 007 FOR DETAILS OF DRAINAGE FEATURES

LEGEND

- +7.60 — PROPOSED LEVELS
- SITE BOUNDARY
- PLANNING BOUNDARY
- EXCESS FLOW PATH
- ASPHALT SURFACING (SEE DETAIL P)
- CONCRETE SURFACING (SEE DETAIL Q)

Revision	By	Chk'd By	Date	Comments
2	AB	ILW	08/23	ASPHALT PLANT AMENDED SURFACING ADDED
1	AB	ILW	05/23	SCHEME REVISED TO FIT WITHIN PLANNING BOUNDARY
0	TS	IW	22/07	

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Project: SURFACE WATER MANAGEMENT

Drawing Title: **DRAINAGE GENERAL ARRANGEMENT (SHEET 2 OF 2)**

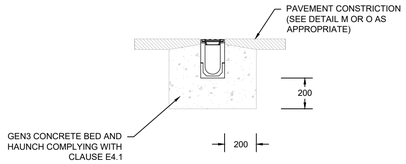
Scale: 1:250 @ A1

Date: 11.07.22

Drawing Number: **004**

Revision: **2**

Drawing 03- Drainage Details



DETAIL A - ACO DRAIN INSTALLATION

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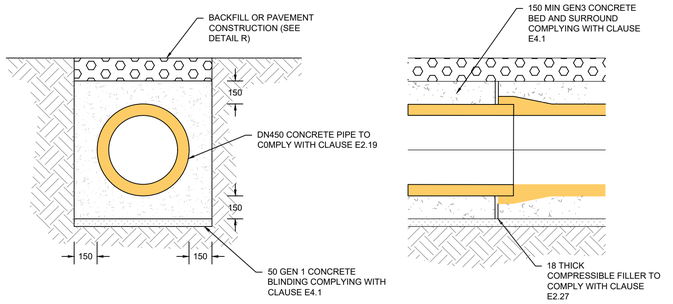
Metres 1:20



DETAIL N : 450mm DIA PIPE BEDDING DETAIL

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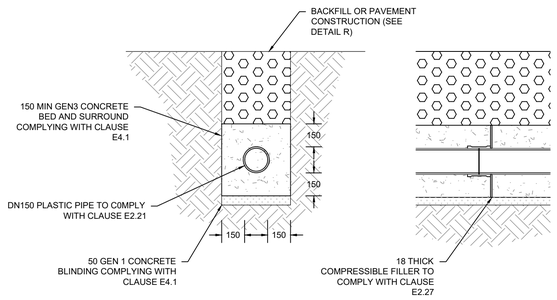

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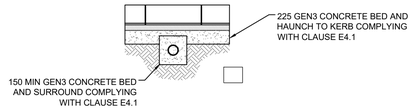

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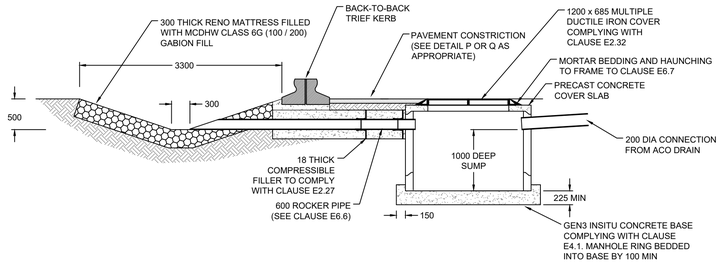

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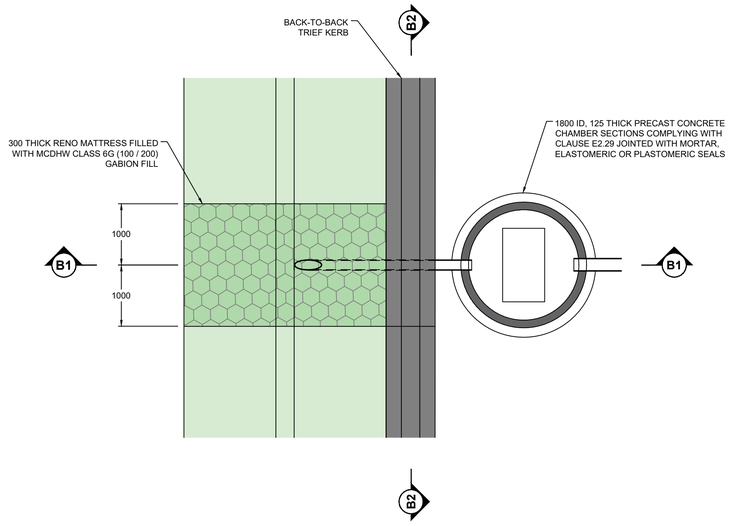

PLAN

DETAIL B: CATCHPIT AND EROSION PROTECTION

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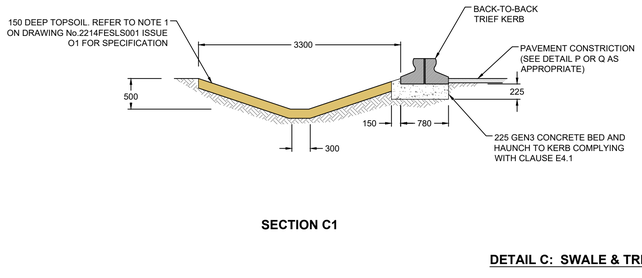
Metres 1:50



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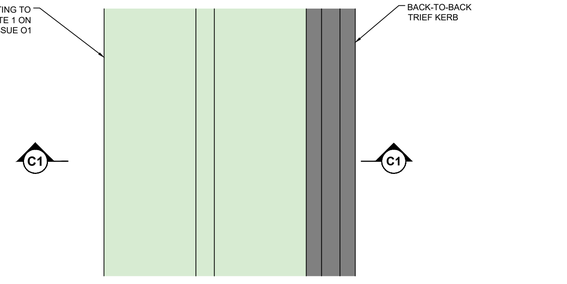

DETAIL C: SWALE & TRIEF KERB

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PLA

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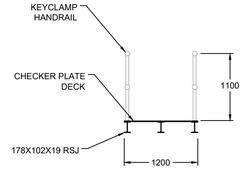
Metres 1:50



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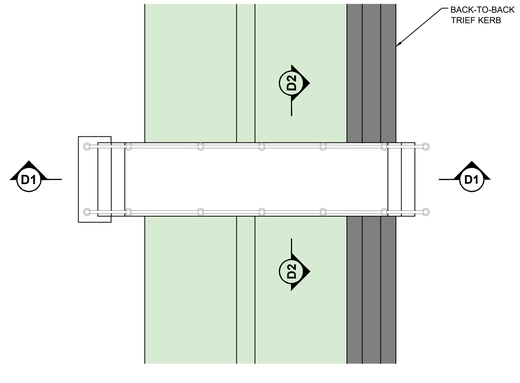

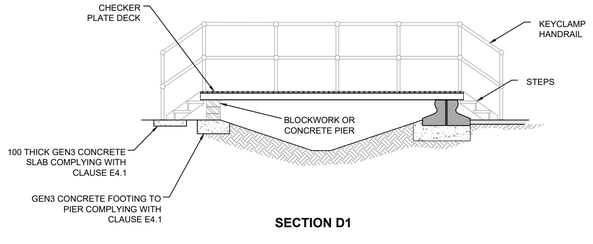

SECTION D1

DETAIL D: FLOGAS EMERGENCY PEDESTRIAN EGRESS ROUTE

SCALE 1:50

NOTE: TYPICAL DETAILS ONLY, BRIDGE FABRICATION AND
FOUNDATION DETAILS TO BE CONFIRMED BY BRIDGE SUPPLIER

PLAN

0 1 2m 3 4 5

Metres 1:50

NOTES

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LEGEND

Revision	By	Chk'd By	Date	Comments
1	AB	ILW	08/23	ADDITIONAL DETAIL ADDED. SURFACING ADDED
0	AB	IW	23/05	

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Site: ASPHALT PLANT AT LLANDARCY

Project: SURFACE WATER MANAGEMENT

Drawing Title: **DRAINAGE DETAILS SHEET 1 OF 3**

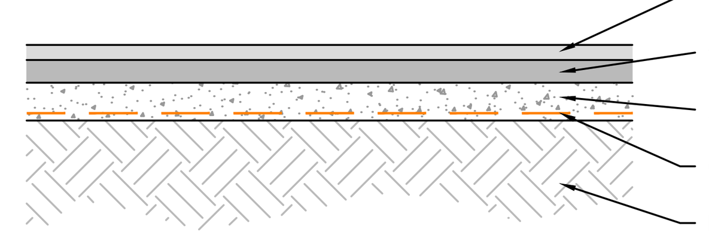
Scale: 1:50 (or as shown) @ A1

Date: 31 May 2023

Drawing Number: **005**

Revision: **1**

407.V64.06.00001.18.005.1 General Details.dwg



DETAIL P : TYPICAL ASPHALT YARD CONSTRUCTION

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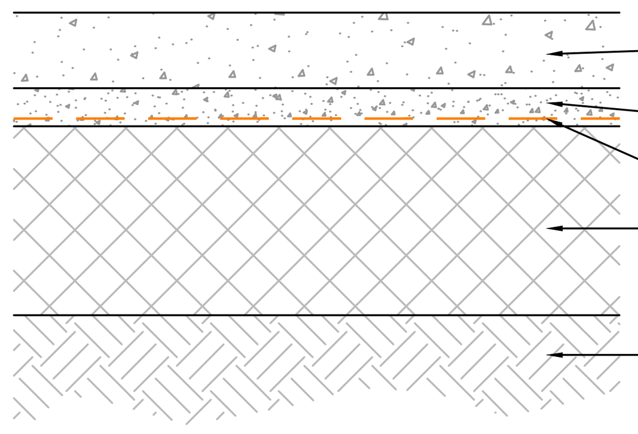
Metres 1:20



DETAIL Q: TYPICAL CONCRETE YARD CONSTRUCTION

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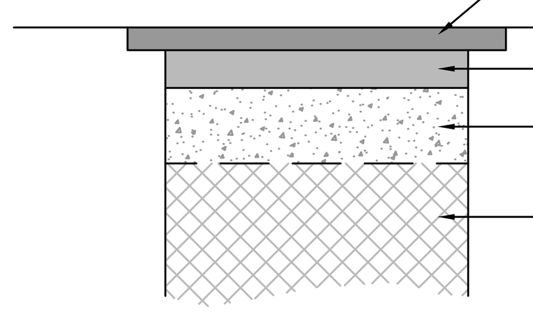
Metres 1:20



DETAIL R: TYPICAL TRENCH REINSTATEMENT

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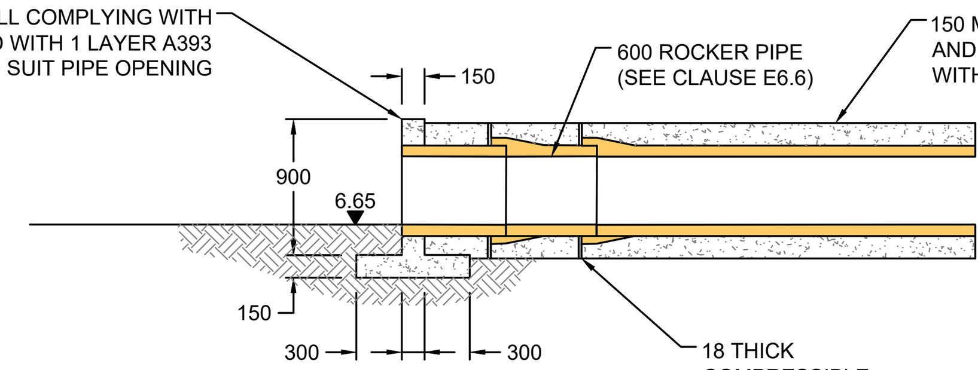
Metres 1:20



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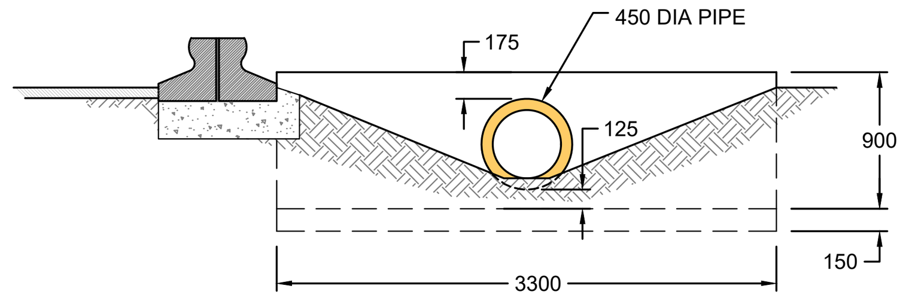
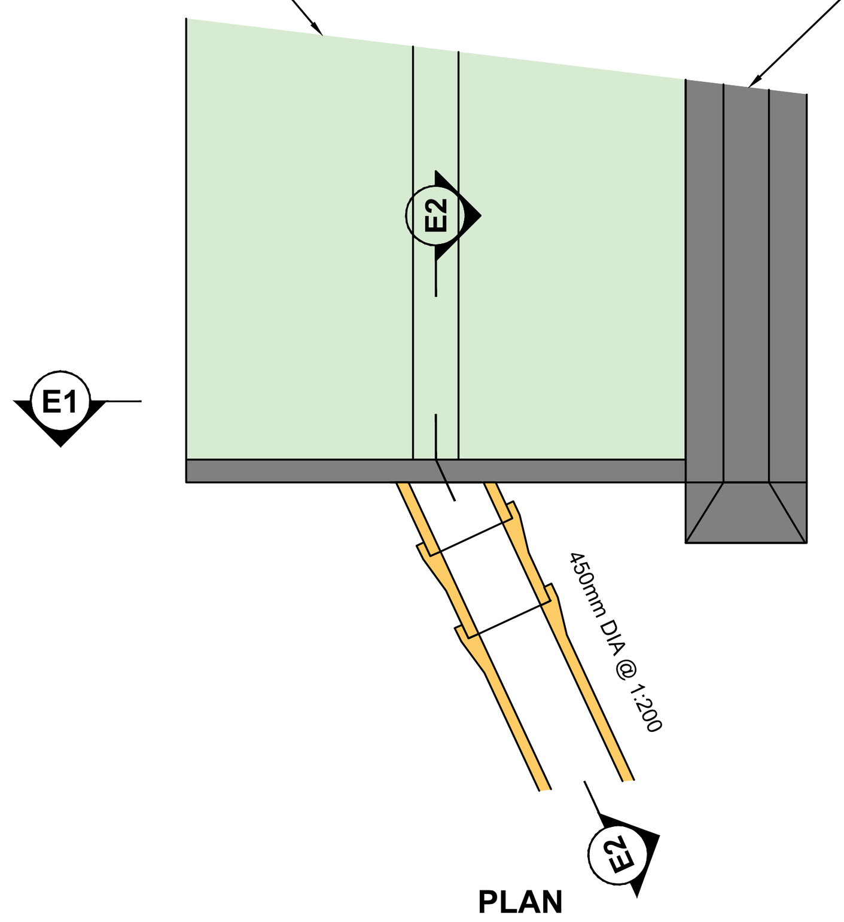


ELEVATION E1



PLAN

DETAIL E: HEADWALL

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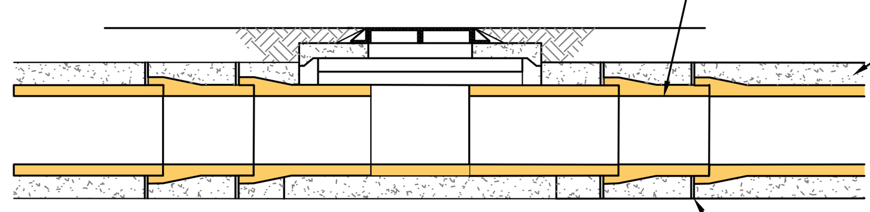
Metres 1:50



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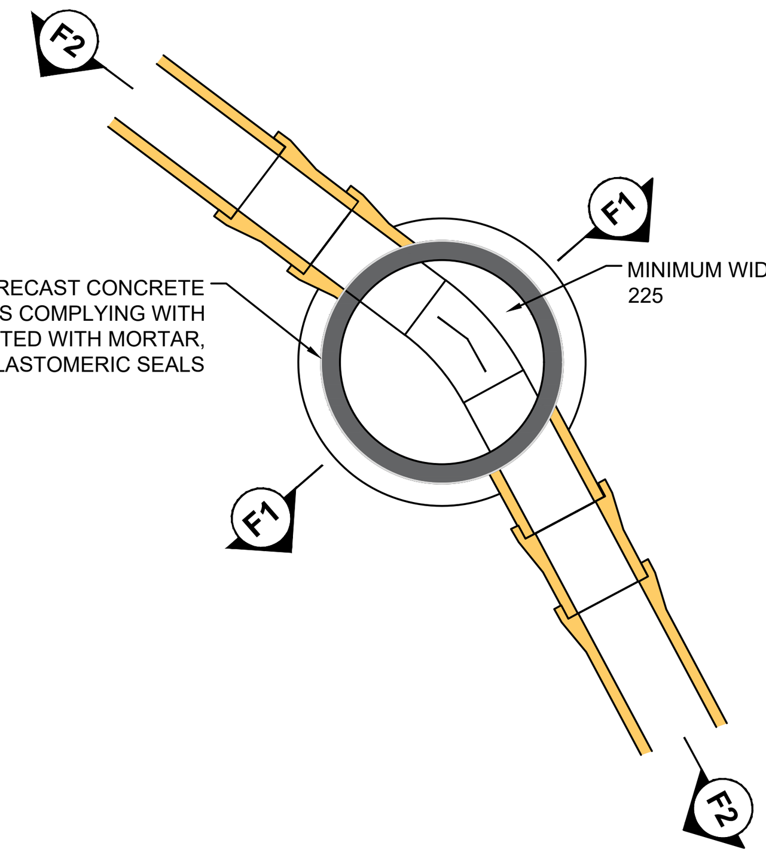
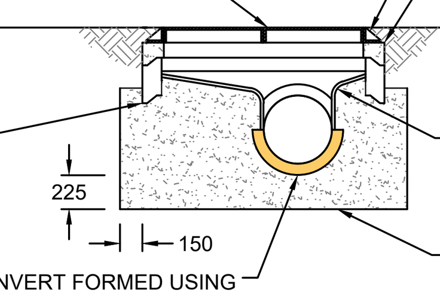




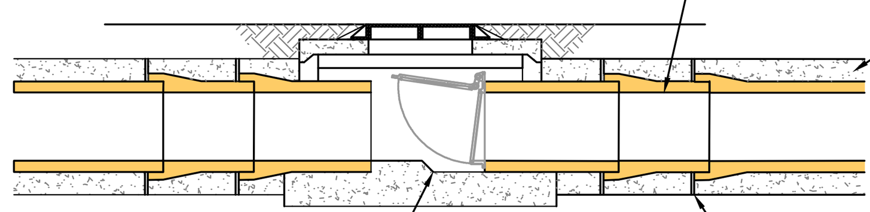
ELEVATION F1

DETAIL F: MANHOLE DETAIL

SCALE 1:50

0 1 2m 3 4 5

Metres 1:50



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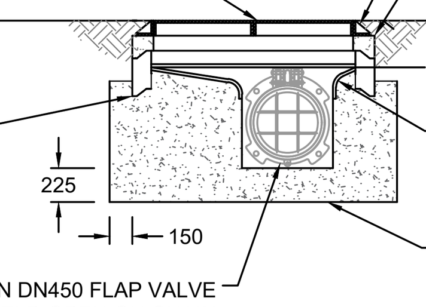
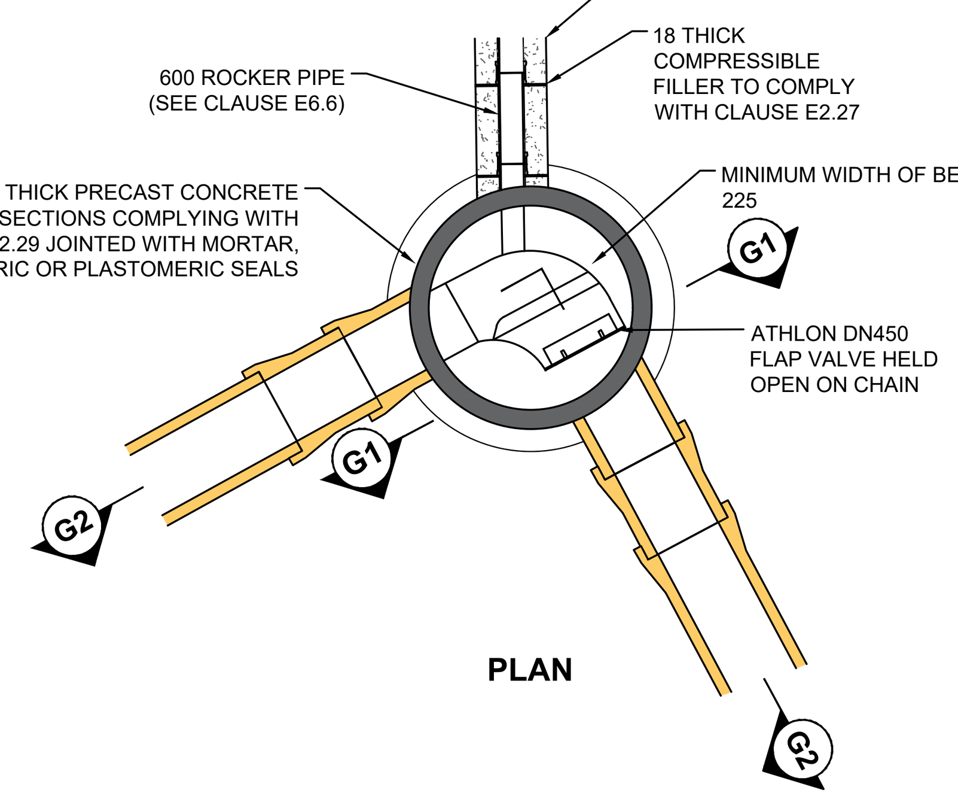


ELEVATION G1



PLAN

DETAIL G: POLLUTION CONTROL MANHOLE

SCALE 1:50

0 1 2m 3 4 5

Metres 1:50

NOTES

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LEGEND

Revision	By	Chk'd By	Date	Comments
0	AB	IW	17/08	

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BEIGNON CLOSE
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Site: ASPHALT PLANT AT LLANDARCY

Project: SURFACE WATER MANAGEMENT

Drawing Title: **DRAINAGE DETAILS SHEET 2 OF 3**

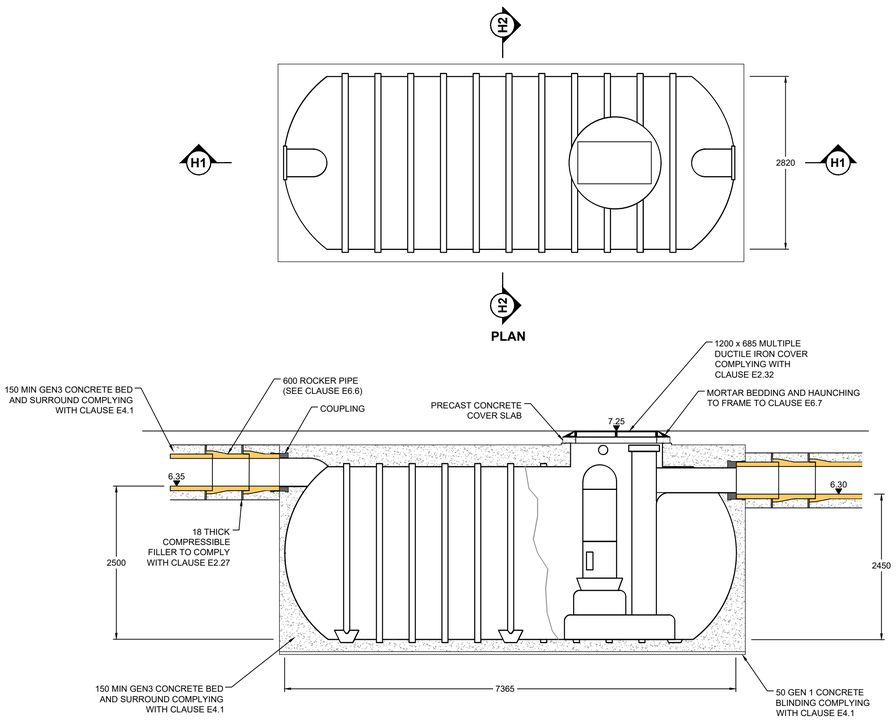
Scale: 1:50 (or as shown) @ A1

Date: 17 Aug 2023

Drawing Number: 006

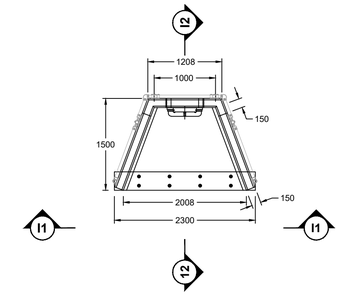
Revision: 0

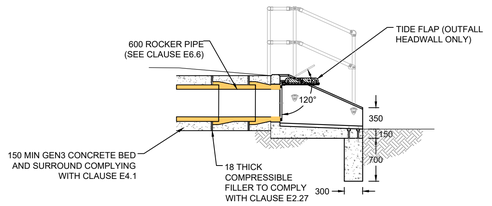
407.V64136.00001.18.005.1 General Details.dwg

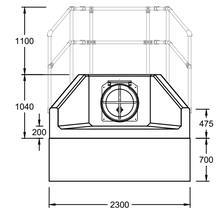


DETAIL H: CLASS 1 FULL RETENTION INTERCEPTOR (KLARGESTER MODEL NSFA125 OR SIMILAR APPROVED)
SCALE 1:50

0 1 2m 3 4 5
Metres 1:50

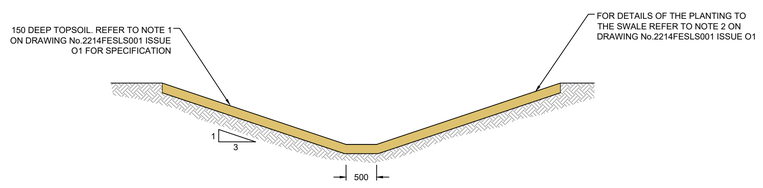






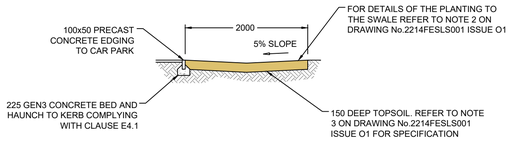
DETAIL I: ATHLON SFA10 B PRECAST CONCRETE HEADWALL
SCALE 1:50

0 1 2m 3 4 5
Metres 1:50



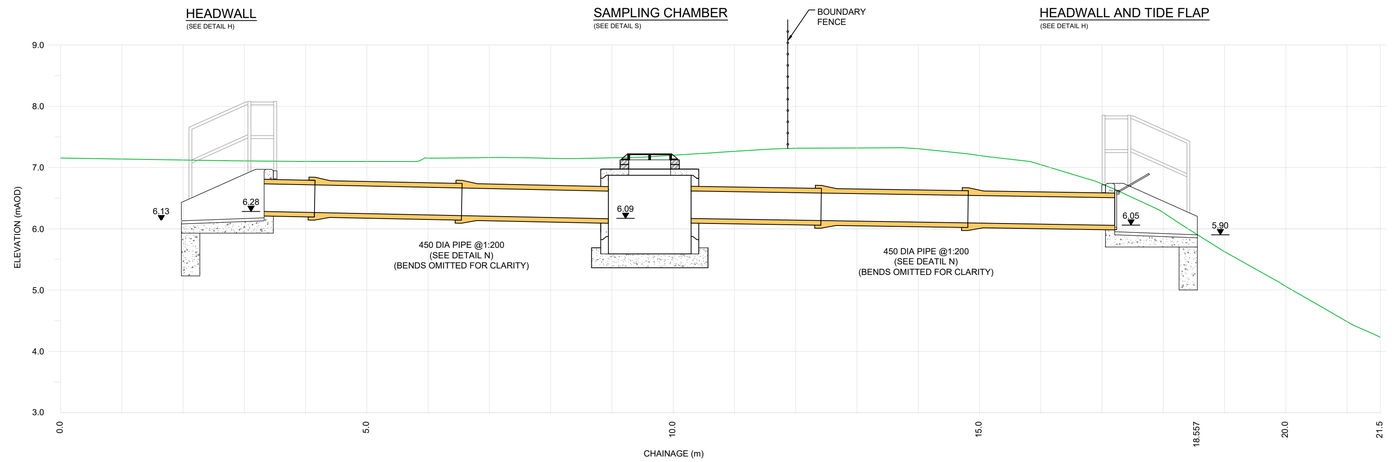
DETIAL J: SWALE
SCALE 1:50

0 1 2m 3 4 5
Metres 1:50



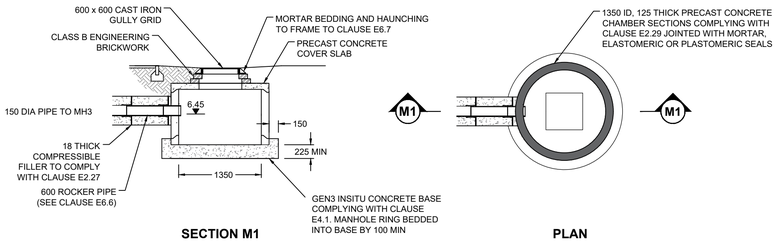
DETIAL L: FILTER STRIP
SCALE 1:50

0 1 2m 3 4 5
Metres 1:50



DETIAL K: OUTFALL TO RED JACKET PIL
SCALE 1:50

0 1 2m 3 4 5
Metres 1:50



DETAIL M: CATCHPIT
SCALE 1:50

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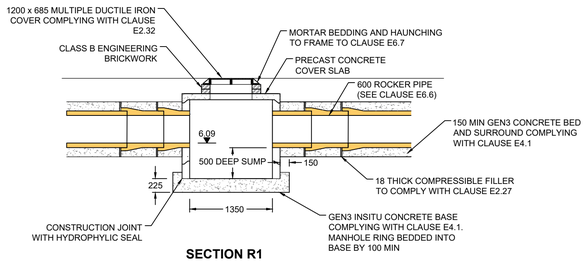
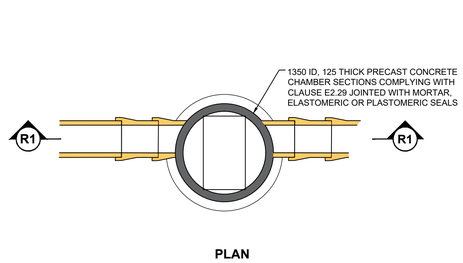
Metres 1:50





DETAIL S: SAMPLING CHAMBER
SCALE 1:50

0 1 2m 3 4 5
Metres 1:50

NOTES

1) THE SPECIFICATION IN ALL RESPECTS SHALL BE IN ACCORDANCE WITH THE CURRENT NPTCBC SPECIFICATION AND CONSTRUCTION PUBLICATION IN FORCE IN THE COUNTY AT THE TIME OF CONSTRUCTION.
2) ALL SUDS COMPONENTS SHOULD BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH CIRIA REPORT C756 THE SUDS MANUAL AND CIRIA REPORT C768 GUIDANCE ON THE CONSTRUCTION OF SUDS
3) CLAUSE REFERENCES ARE TO DESIGN AND CONSTRUCTION GUIDANCE FOR FOUL AND SURFACE WATER SEWERS OFFERED FOR ADOPTION UNDER THE CODE FOR ADOPTION AGREEMENTS FOR WATER AND SEWERAGE COMPANIES OPERATING WHOLLY OR MAINLY IN ENGLAND

LEGEND

Revision	By	Chk'd By	Date	Comments
0	AB	IW	17/08	

GERALD D HARRIES AND SONS LTD

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Project: SURFACE WATER MANAGEMENT

Drawing Title: **DRAINAGE DETAILS SHEET 3 OF 3**

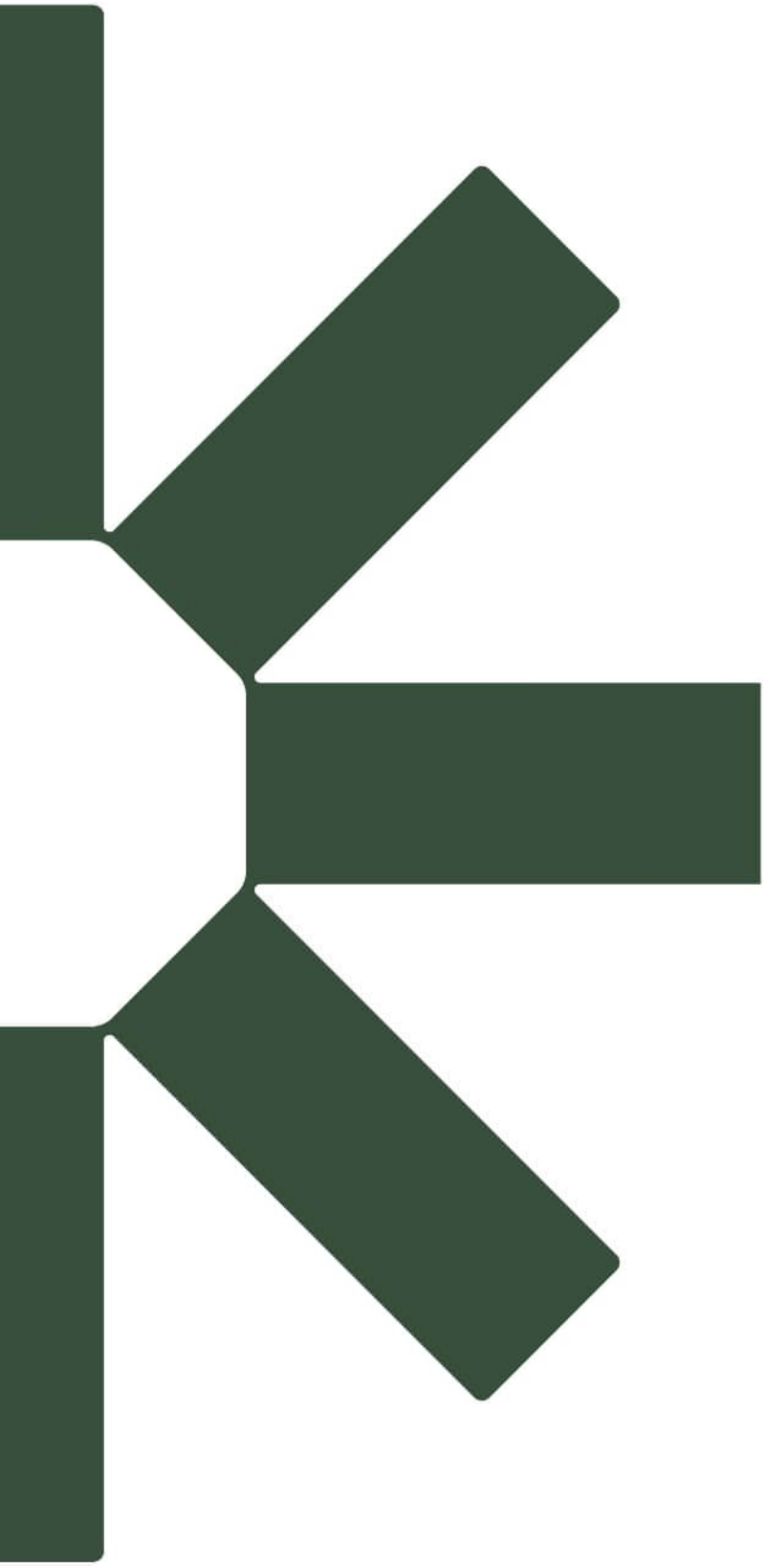
Scale: 1:50 (or as shown) @ A1

Date: 17 Aug 2023

Drawing Number: **007**

Revision: **0**

407.W4136.00001.R.005.1 General Details .dwg



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