

Sustainable Drainage Management Plan

Mynydd Maen Wind Farm

Ref 04412-5887892

Revision History

Issue	Date	Name	Latest changes
01	31 August 2023	Evan Evans	First Created

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1 Introduction & Scope

1.1 Introduction

The principal objective of this document is to provide details of the proposed sustainable drainage management arrangements for Mynydd Maen Wind Farm hereinafter referred to as ‘the proposed wind farm’.

This document provides details of the proposed sustainable drainage systems (SuDS) for the proposed wind farm. This report provides details of the drainage management measures that would be implemented throughout the construction phase and operational life of the proposed wind farm.

This document is a live document and would be updated with further detailed design information prior to the wind farm construction works commencing.

1.2 Description of the site

The proposed wind farm is being developed by Renewable Energy Systems Ltd (RES) and is located on privately owned agricultural lands which sits between the Welsh towns of Cwmbran (approx. 350 m to the east), Pontypool (approx. 450 m to the north), and Newbridge (approx. 1 km to the west), partly in Caerphilly County Borough (CCB) and partly in Torfaen County Borough (TCB).

The proposed wind farm is centred at E325790 N198000. The site is defined by the Site Location Plan drawing 04412-RES-MAP-DR-XX-001, included in Annex 1.

The proposed wind farm includes the installation of thirteen wind turbines and associated infrastructure, including the construction of foundations, access tracks and electrical infrastructure and the grid connection. The layout of the wind farm is shown on Infrastructure Layout drawing 04412-RES-LAY-DR-PT-001, included in Annex 2.

1.3 Existing hydrology

The main site contains the headwaters of several small watercourses which drain down towards the Ebbw River, River Usk, Afon Llwyd, Blaen Bran Reservoir and Cwm Lickey Pond.

Turbines T5, T10, T11 and T12 are located in the catchment of the Nant Gwyddon which flows into the Ebbw River.

Turbine T13 is located in the catchment of the Nant Carn which flows into the Ebbw River.

Turbines T1, T3, T4, T6 and T7 and three potential borrow pits are located in the catchment of a number of unnamed drains and watercourse that flow north from the site before heading west and discharging to the Ebbw River.

Turbine T9 is located in the catchment of the Blaen Bran Reservoir which has an outfall to the Afon Llwyd, which is a tributary to the River Usk.

Turbine T2 and T8 are located in the catchment of the Cwm Lickey watercourse and pond.

1.4 Ground conditions

1.4.1 Bedrock geology

A desktop review of the geological data provided by the British Geological Survey (BGS) maps indicates that bedrock lies near the surface. The bedrock includes Hughes Member Sandstone over Rhondda Member Sandstone in turn over Deri Formation (Mudstone) and South Wales Coal Measures Formation.

Coal authority mapping shows the entire site to sit in an area where coal mining has been reported. Furthermore, the mapping shows numerous bands of high risk areas for development.

A Geotechnical Investigation was undertaken to establish the ground conditions and assess the identified risk from shallow coal workings at four turbine locations (T3, T7, T8 and T11).

At all trial pit and borehole locations the same sequence of lithologies were recorded which varied slightly in thickness. The exploratory holes encountered a layer of peat over varying amounts of clay, sands and gravels, with sandstone bedrock at relatively shallow depths.

The boreholes recorded intact sandstone bedrock throughout and there was no evidence of any underground coal mining to the full depths of drilling.

1.4.2 Peat

Although BGS maps indicate a lack of superficial deposits, peat is present within the site bounds.

2 References, Guidance and Legislative Requirements

2.1 References

This document should be read in conjunction with the following documents:

- Mynydd Maen Wind Farm Environmental Statement - Chapter 9: Hydrology, Hydrogeology, Geology & Peat
- Mynydd Maen Wind Farm Environmental Statement - Chapter 6: Ecology

2.2 Relevant guidance and legislative requirements

All drainage relating to the proposed wind farm would be constructed using best practice and in conformance with the requirements of the relevant regulatory authorities. The key legislation and guidance that will be adhered to, are as follows:

- The EU Water Framework Directive (2000/60/EC).
- Welsh Planning Policy.
- NRW Guidance for Pollution Prevention (GPPs and PPGs).
- Statutory Standards for Sustainable Drainage Systems - designing, constructing, operating and maintaining surface water drainage systems, Welsh Government, 2018.
- Sustainable Drainage (SuDS) Statutory Guidance, Welsh Government, 2019.
- Caerphilly County Borough Council (CCBC) Land Drainage Byelaws 2018.
- Welsh Assembly Government Planning Policy Wales Technical Advice Note (TAN) 15, Development and Flood Risk.
- Assessing the impact of wind farm developments on peatlands in Wales, Countryside Council for Wales.
- CIRIA Guide C532 - Control of Water Pollution from Linear Construction Projects.
- CIRIA Guide C609 - Sustainable Drainage Systems. Hydraulic, Structural and Water Quality Advice.
- CIRIA Guide C648 - Control of Water Pollution from Linear Construction Projects. Technical Guidance.
- CIRIA Guide C649 - Control of Water Pollution from Linear Construction Projects: Site Guide.
- CIRIA Guide C698 - Site Handbook for the Construction of SuDS.
- CIRIA Guide C753 - The SuDS Manual.
- CIRIA Guide C768 - Guidance on the Construction of SuDS.

As of January 2019 the Welsh Government brought Schedule 3 of the Flood and Water Management Act 2010 into effect in Wales. Statutory National Standards (SuDS Standards) on the design, construction, operation and maintenance of SuDS were published by the Welsh Ministers in 2018.

A SuDS approving body (SAB) has been established in the local authority to approve SuDS for Developments of National Significance (DNS). Approval for the Development's SuDS design would be sought from the SAB prior to construction commencing.

3 Potential Sources of Pollution

The following potential sources of pollution have been identified for the project:

- Suspended solids / fines laden run-off from site won / imported stone for track / hardstanding construction.
- Suspended solids / fines laden run-off from exposed excavations.
- Suspended solids / fines laden run-off from excavations in watercourses.
- Fuel / chemical spills.
- Concrete from spills / washouts.
- Foul drainage discharges from temporary and permanent welfare facilities.

The subsequent chapters outline how the risk of pollution from the identified pollution sources would be mitigated.

4 Potential Pollution Receptors

4.1 Watercourses

The significant watercourses referred to in Section 1.3 have been classified with ‘moderate’ ecological status under the NRW / EA River Basin Management Plan (RBMP) classification.

4.2 Groundwater

The site is not located in a groundwater source protection zone.

Groundwater was not encountered at four borehole locations (T3, T7, T8 and T11) to a depth of 20 m. Bedrock was found to be shallow in all four boreholes.

Due to the low productivity of the underlying bedrock it has been assumed that the majority of the subsurface flow of water will be within the surface weathered zone of the bedrock and within the peat.

4.3 Water Supplies

There are a number of private water supplies (PWS) in the vicinity of the site. The NRW Public register for Water Resources Licences provides details of applicants with abstraction licenses. Caerphilly County Borough Council (CCBC) and Torfaen County Borough Council (TCBC) hold records of private water supplies within their county borders.

The PWS within CCB and TCB, and the NRW registered licenced abstractions are included in Table 4.1 below. The locations of the PWS and NRW registered licenced abstractions are shown on drawing 04412-RES-DRN-DR-CE-001 included in Annex 3.

Table 4.1: Private Water Supplies within CCB and TCB

Private Water Supplies (PWS)			
Council	Location	NGR	Notes
Caerphilly County Borough Council (CCBC)	Pen y Caeau Farm, Abercarn Mountain Road	323236, 198284	None.
	Blaengawney Farm, Hafodyrynys	322976, 197862	None.
	Cilonydd Farm, Pantside	322893, 197164	None.
	Glan Shon, Newbridge	322467, 195970	None.
	Rhyswg Fawr, Farm House	322662, 194602	None.
	Rhyswg Ganol Farm, Rhyswg Mountain Road	323807, 194827	None.
	Crumlin Road	326204, 200138	Three properties at this location.

Private Water Supplies (PWS)			
Council	Location	NGR	Notes
Torfaen County Borough Council (TCBC)	Blaendare Farm Lane	327110, 199434	None.
	Belle Vue Lane	326837, 196495	None.
	Belle Vue Lane	326714, 196193	None.
	Unnamed track	326556, 195401	None.
	Ty Canol	326188, 194846	None.
	Pant-yr-yrfa	325343, 19338	None.
	Blaen-y-cwm	325831, 193306	Two properties at this location.

Table XX Abstraction Locations

Abstraction Locations					
Holder	License no.	Source	Type	NGR	Notes
Dwr Cymru	20/56/12/0051	Surface	Public Water Supply	327686, 199313	Springs and streams feeding Penyrheol Reservoir
	20/56/12/0051	Surface	Public Water Supply	327686, 199313	Intake chamber at Penyrheol Reservoir
	20/56/12/0051	Surface	Public Water Supply	327804, 199169	Intake chamber at Penyrheol Reservoir
	20/56/12/0051	Surface	Public Water Supply	326909, 198529	Nant Lleucu to Penyrheol Reservoir
	20/56/11/0007	Surface	Public Water Supply	325136, 193514	Spring to Pant-Yr-Eos Reservoir

4.4 Designated Sites

The River Usk is designated as a Special Area of Conservation (SAC).

5 Drainage Management Proposals

5.1 General

The overarching aim of the SuDS design is to minimise, where possible, any change to the hydrology and groundwater conditions within the site. The SuDS will utilise a series of surface water management techniques that will mitigate any adverse impact on the hydrology of the site.

The following drawings provide details of the SuDS that would be implemented at the proposed wind farm (included in Annex 4):

- 04412-RES-DRN-DR-CE-002 Typical Settlement Pond Details.
- 04412-RES-DRN-DR-CE-003 Typical Silt Fence Details.
- 04412-RES-DRN-DR-CE-004 Typical Drainage Details.

5.2 Prevention

Potential causes of pollution will be managed at their source. The following working methods would be adopted to avoid mobilisation of pollutants:

- Areas stripped of vegetation will be kept to a minimum. Stripped vegetation will be reinstated on slopes as soon as possible after removal.
- Where necessary, biodegradable matting will be utilised on cut slopes to prevent washing of fines into the drainage network.
- Good quality stone will be used in track and hardstanding construction. Construction material will be specified in accordance with the Specification for Highway Works (SHW). SHW compliant material does not permit the use of large quantities of fine material, and therefore all material used for track and hardstand construction will not be heavily laden with silt / fines. Regular inspections and testing of material will ensure the construction material is compliant with the SHW.

5.3 Buffer zones

Turbine centres are located a minimum of 50 m from significant watercourses. A significant watercourse is defined as a watercourse that appears on 1:50,000 scale OS mapping.

A 10 m buffer zone would be employed for all main watercourses in accordance with GPP5: Works or maintenance in or near water (2018). No dewatering or outflows would be permitted within the 10 m buffer zones.

Washing out of concrete mixer lorries will be strictly controlled and limited to a designated wash area a minimum of 50 m away from any watercourse. Where a potential risk is identified of an accidental concrete spillage into a watercourse, cut off ditches and diversion dams would be installed to channel potential spillages and run-off water to a suitable collection area. Residual solidified concrete within the containment

area would be broken up and disposed of off-site in accordance with the pertinent regulations, prior to reinstatement of the area.

Any dewatering from excavations would be via surface silt traps, check dams, and temporary settlement ponds to reduce potential silt entering receiving watercourses.

Contaminated water would not be pumped or allowed to flow into the water environment without treatment. Collected effluent would be pumped out and disposed of off-site.

5.4 Water quality and treatment

A treatment train would be implemented for the treatment of run-off from the site during the construction phase prior to flows entering receiving watercourses.

All temporary and permanent surface water drainage from the site would have a minimum three stages of treatment. A single stage of treatment is considered as any of the following:

- Conveyance through a swale.
- Filtration of water through filter media (e.g. check dam).
- Detention in settlement ponds / behind dam in overland breakout.
- Filtration / settlement across vegetated ground.

Clean water (groundwater, natural overland flows, watercourses, etc.) and dirty water (from tracks, hardstands and cut slopes) would be as far as practicably possible kept separate. Reducing the volume of water entering the treatment system would significantly improve the performance of the treatment system. Where appropriate, a cut off ditch would be installed to ensure that surface water run-off can be directed around areas of work and consequently reduce volumes of silt laden construction run-off.

Overland breakouts or settlement ponds would be utilised to avoid discharging flows directly from swales into watercourses. Settlement ponds would also be used to collect and treat run-off from temporary hardstandings / compounds.

5.5 Dust suppression and control

Good practice measures would be adopted during construction to control the generation and dispersion of dust such that significant impacts on neighbouring habitats would not occur. The hierarchy for mitigation would be prevention, suppression then containment.

The following mitigation measures would be implemented to restrict and control the movement of dust within the site:

- Excavation and earthworks areas would be stripped as required in order to minimise exposed areas.
- During excavation works, drop heights from buckets would be minimised to control the fall of materials reducing dust escape.

- Temporary cover may be provided for earthworks if necessary, and completed earthworks, stockpiles and other exposed areas will be covered with topsoil and re-vegetated as soon as it is practical in order to stabilise surfaces. Temporary sheeting may be used where necessary.
- During stockpiling of loose materials, stockpiles shall exist for the shortest possible time.
- Material stockpiles would be low mounds without steep sides or sharp changes in shape.
- Material stockpiles would be located away from sensitive receptor and watercourses.
- Material stockpiles would be sited to account for the predominant wind direction and the location of sensitive receptors.
- Water bowsers would be available on-site and utilised for dust suppression during roadworks/ vehicle movements when and where required.
- Where dust is mobilised it would pass through and will be contained within the water quality and treatment system serving the tracks and hardstands.
- Regular visual inspections would be undertaken to assess need for use of water bowsers.
- Regular visual inspections would be undertaken to assess the condition of the junction of the site track.

Water needed for dust suppression on the site infrastructure and haul roads during periods of dry weather and the compound vehicle wash would be clean water. Clean water may be obtained from re-circulated clean or treated drainage waters.

Where required, water may be extracted from local watercourses or groundwater. In these instances, the Principal Contractor would consult with NRW beforehand to agree abstraction locations and rates.

6 Controlling Run-Off

6.1 Flow control measures

Run-off would be attenuated in swales and settlement ponds. Attenuated flows would be discharged over existing vegetation prior to discharging into receiving watercourses, as per the existing drainage regime for the site.

Rate and volume of run-off would be attenuated using settlement ponds receiving flows from newly constructed hardstand areas. Attenuation features would also reduce flow velocities and allow settlement of fines prior to discharge. Attenuation features would also reduce flow velocities and allow settlement of fines prior to discharge. Flow rates would also be reduced through the integration of swales and check dams.

Track and hardstand areas would be constructed from unbound aggregate and are therefore not fully impermeable, thus helping to reduce run-off rates.

Piped under-track drainage, where required, would be provided with associated sumps and check dams. The under-track drainage would provide a means for flows to pass from a swale on the uphill side of the track to the downhill side of the track.

In cases where the tracks run significantly downhill, transverse drains (grips) would be constructed in the surface of the tracks to divert any run-off flowing down the track into the swale.

Excavated tracks would incorporate swales with check dams to overland breakouts over vegetation.

6.2 Preserving site hydrology

Existing overland flow routes and channels would be maintained. Piped drainage would be provided under the tracks at all locations where existing natural flow paths pass through the proposed track alignment.

The installation of the electrical cables would be within small trenches. Where trenches are dug on steep slopes they would be dug in sections or plugs of soil may be left in place at intervals to prevent them acting as preferential drainage pathways. As indicated above, best practice cable installation means that the trenches would not remain open for long periods of time and would be restored by replacing the subsoil and topsoil removed earlier.

7 Proposed SuDS Features

The table below sets out a summary of the key SuDS features that would be considered to manage and treat surface water run-off. There would be a degree of flexibility in terms of the drainage solution employed if certain arrangements are found to provide inadequate treatment or in certain areas where other factors limit the range of feasible options.

Table 7.1 SuDS Feature Summary

Drainage Components	Description
Recharge Trenches	Capture and prevent existing surface water run-off from reaching the work area. These would be installed upslope of the works areas where necessary. Collected greenfield run-off would be discharged into an area of vegetation for dispersion or infiltration. Silt fencing, gabion stone or some other form of silt trap may be required at the discharge point to alleviate flows and aid in flow dispersion to avoid scour. The gradient of any recharge trench would be kept to a minimum to prevent erosion.
Swales	Open drainage channels downstream of the construction activities designed to capture potentially contaminated run-off from the work area, provide treatment through silt traps and check dams, and divert flows to a secondary treatment component (e.g. settlement pond).
Settlement Ponds	Ponds designed to attenuate collected run-off and allow sediment to settle out within the water column. Sized to suit site conditions, particle size, anticipated through-flow and available space.
Check Dams	Installed within drainage swales (or cable trench) for additional filtration, flow attenuation and treatment, preventing erosion and trapping small amounts of silt by allowing it time to settle out. Ideally constructed from gravel or cobble sized rock aggregate, although turves or sand bags can also temporarily be used. Numerous check dams should be installed along the length of a swale at spacing between 4 m to 30 m, determined by the gradient of the track.
Sumps	A sump is a deeper basin generally adopted where space is constrained to create a settlement pond. These features contain collected surface water run-off or dewatered groundwater, and generally require pumping to a secondary sediment control structure. These require emptying of silt on a regular basis and after each episode of heavy rainfall.
Silt Fencing	Captures and slows the flow of sediment-laden surface water, allowing relatively clean water to seep through and filter out any particles. Fences need to be supported on stakes and the bottom edge trenched into the soil to prevent water from undermining it. Can be installed in a curved formation to intercept flow of water and to provide an area for it to pool behind, or in a straight line alongside watercourse or drainage swale as a last line of defence. They should not be installed within drainage swales or watercourse

	<p>as the flows would overtop the feature and no treatment will be provided. In addition, during high flows the material may be washed downstream.</p> <p>Silt fencing may also be installed either side of tracks to create splashbacks where they pass over or near to a watercourse. They act as a physical barrier to any splashes of mud from the track, and if dug into the ground, a barrier to any run-off from the track.</p>
Sedimats	<p>Matting material which can be used to capture mobilised sediment in flowing water and trap it for later removal. These are laid flat in the path of flowing water during in-stream works, and are secured with stakes or stones if needed. Sedimats can be used within watercourses or combined with other silt mitigation techniques e.g. at the end of a series of check dams or the outfall of a settlement pond.</p>

8 Watercourse Crossings

The track layout intercepts one significant watercourse shown on 1:50,000 scale OS mapping. The proposed watercourse crossing point is close to the site entrance and is located at an existing watercourse crossing. Prior to construction an application for an Ordinary Watercourse Consent would be submitted.

9 Foul Drainage/ Treated Discharges

There are no public sewers in proximity to the site.

Disposal of sewerage from temporary and permanent facilities on the site would be designed by the Contractor and shall be in accordance with the methods outlined in GPP4: Treatment and disposal of wastewater where there is no connection to the public foul sewer, Version 1.2 June 2021, and treatment systems will be sized in accordance with British Water Code of Practice - Flows & Loads.

9.1 Permanent treatment systems

Permanent welfare facilities would be located within the control building and substation compound, in the form of one toilet and two sinks.

The preferred option for treatment is via a septic tank with effluent to discharge to a soakaway.

Infiltration tests would be carried out to confirm the infiltration properties of the existing ground in the vicinity of the compound.

Prior to the installation of the sewage treatment system, any necessary agreements or licensing from the relevant third party would be gained.

9.2 Temporary treatment systems

At the temporary construction compound, welfare facilities would comprise of toilets and sinks. Temporary foul drainage would be installed to discharge flows into a temporary sealed cess pit. Off-site disposal from temporary cess pits would be by a licensed waste haulier / contractor.

The temporary drainage facilities would be removed on completion of construction.

10 Monitoring

10.1 Inspections and maintenance

All drainage management measures being implemented would be checked regularly and action taken to ensure functionality. Any sign of silt laden water entering a watercourse would be reported immediately to the Site Manager, the source of the silt identified, and further remedial measures undertaken.

On a daily basis the Principal Contractor would visually monitor the watercourses and drains that may be impacted due to their works. Details of the inspections would be recorded, and these records would be made available to NRW should they be requested.

The Principal Contractor would undertake an inspection of the site to check items such as bunding integrity, oil interceptor, signs of pollution, fuel storage facilities, etc.

Plant/vehicle check sheets shall be completed by the Principal Contractor and would include checks for leaks/drips and the presence of an adequate spill kit.

An independent Ecological Clerk of Works (ECoW) shall also carry out regular inspections on the surface water management measures and compliance with this SDMP.

10.2 Emergency pollution procedures

The emergency pollution procedure is included in Annex 5. The emergency procedure would form part of the site management procedures adopted by the site team managing the construction works.

The procedure would remain in place throughout the operational phase of the proposed wind farm.

In the unlikely event of an environmental pollution incident, there would be an emergency response procedure to address any accidental pollution incident. For example, a procedure requiring the use of spill kits to contain the material and procedures to ensure that NRW is notified on their Pollution Hotline number (0300 065300) within 30 minutes of an incident (unless unsafe to do so), would be applied.

ANNEXES

Annex 1 Site Location Plan



MYNYDD MAEN WIND FARM

FIGURE 1.1 SITE LOCATION PLAN

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2023 LICENCE NUMBER 0100031673.

KEY:
— PLANNING APPLICATION BOUNDARY



SITE LOCATION - NOT TO SCALE

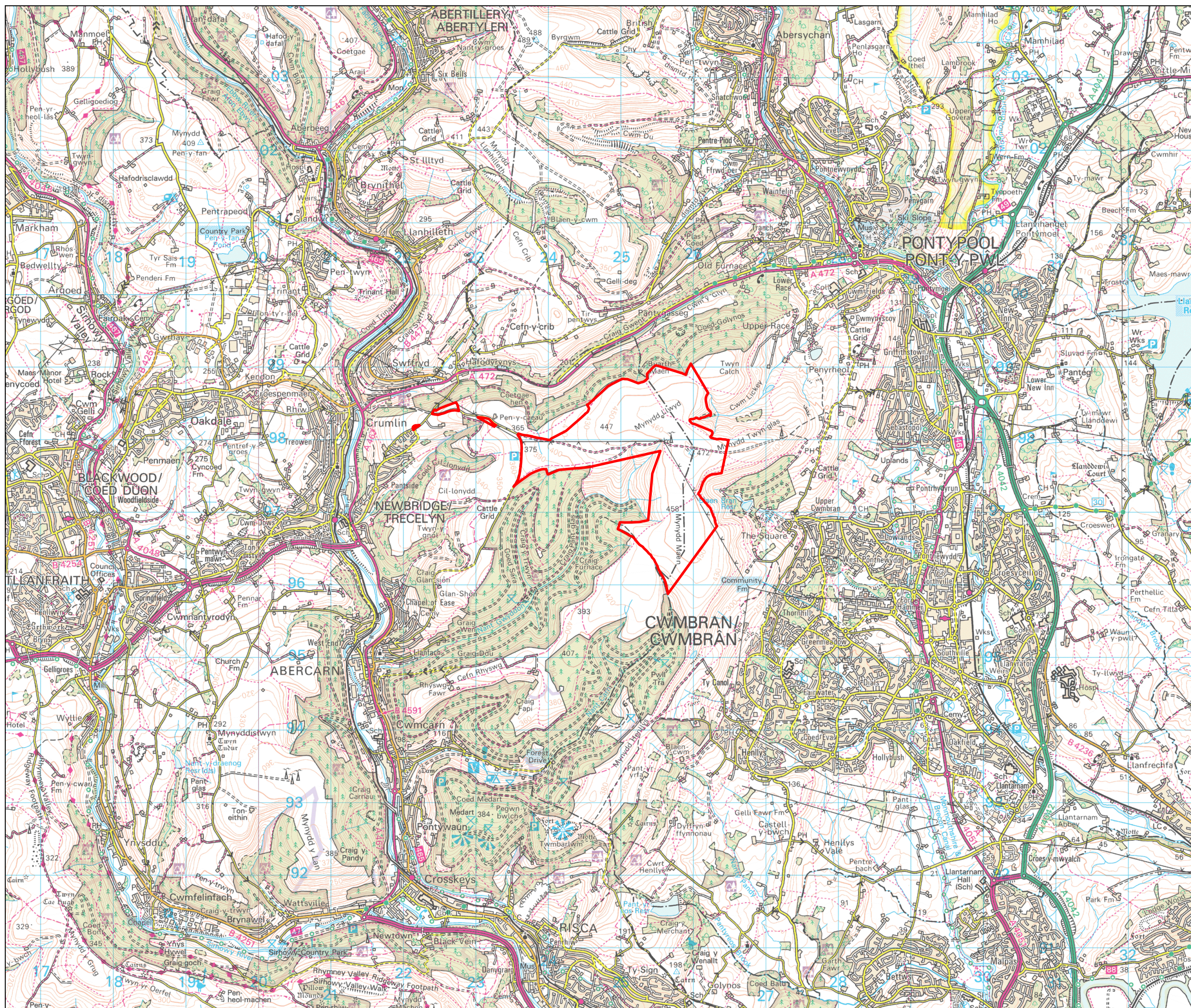


LAYOUT DWG	N/A	T-LAYOUT NO.	N/A
DRAWING NUMBER	04412-RES-MAP-DR-XX-001	REV	5

SCALE - 1:50,000 @ A3

**ENVIRONMENTAL STATEMENT
2023**

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Annex 2 Infrastructure Layout Drawing














MYNYDD MAEN WIND FARM

FIGURE 3.1 INFRASTRUCTURE LAYOUT

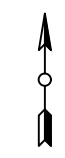
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KEY:

-  PLANNING APPLICATION BOUNDARY
(CENTRE OF LINE DENOTES BOUNDARY)
-  TURBINE
-  TRACK (NEW)
-  TRACK (UPGRADED)
-  TRACK (TEMPORARY)
-  WATERCOURSE CROSSING
-  TURNING HEAD
-  HARDSTANDING
-  SUBSTATION
-  TEMPORARY CONSTRUCTION
COMPOUND
-  BORROW PIT SEARCH AREA

NOTES:

1. PLANNING APPLICATION BOUNDARY TAKEN
FROM 04412-RES-PRO-DR-LE-002.



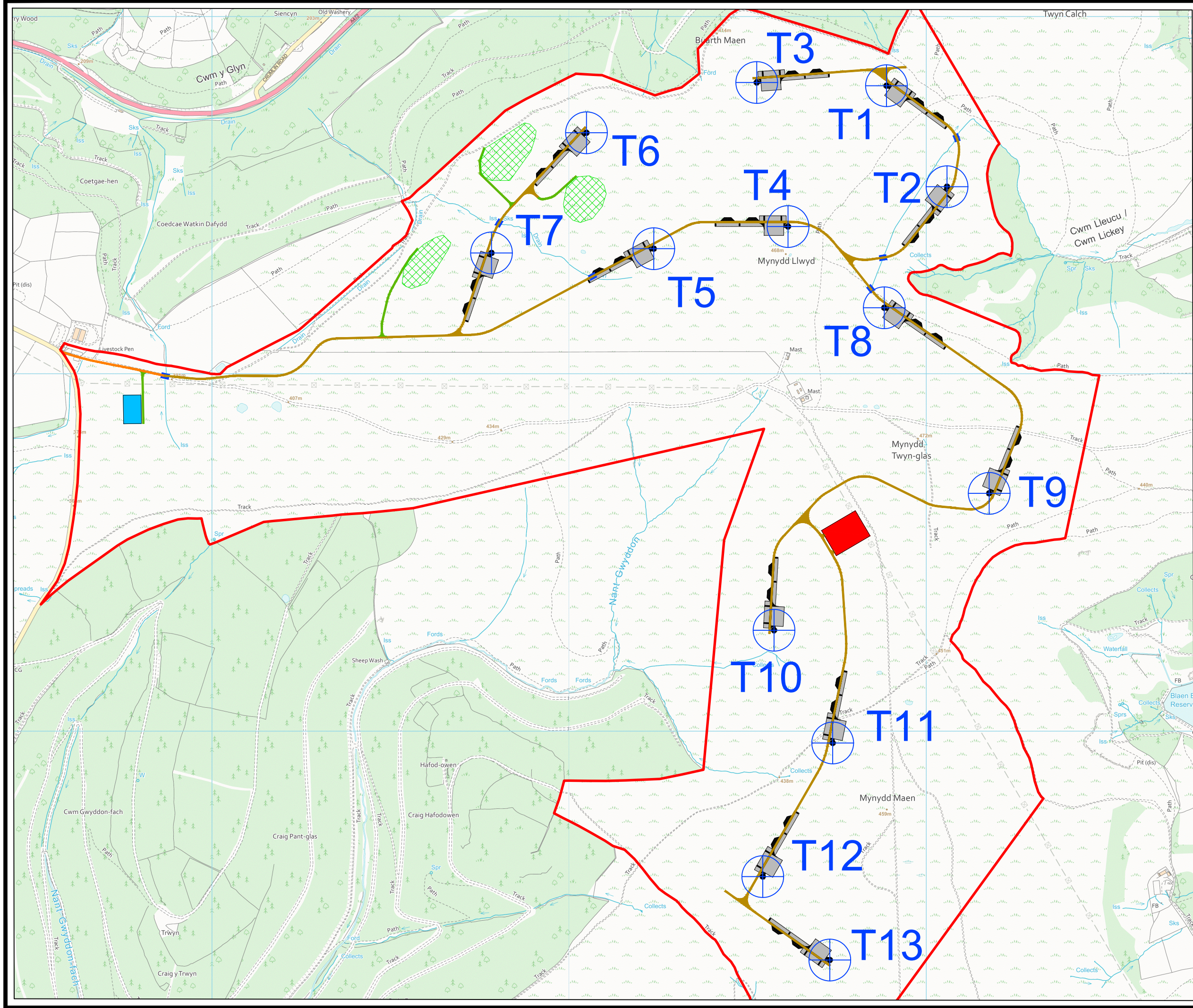
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SCALE - 1:10,000

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Annex 3 Drainage Catchment Areas

MYNYDD MAEN WIND FARM

FIGURE 9.1

DRAINAGE CATCHMENT AREAS AND RECEPTORS

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KEY:

- PLANNING APPLICATION BOUNDARY (CENTRE OF LINE DENOTES BOUNDARY)
- TURBINE
- TRACK (NEW)
- TRACK (UPGRADED)
- TRACK (TEMPORARY)
- TURNING HEAD
- HARDSTANDING
- SUBSTATION
- TEMPORARY CONSTRUCTION COMPOUND
- BORROW PIT SEARCH AREAS
- WATERCOURSE WITH 50m BUFFER (FROM 1:50,000 SCALE MAPPING)
- CATCHMENT AREA
- REGISTERED PUBLIC LICENCED ABSTRACTIONS
- PRIVATE WATER SUPPLIES
- WATERCOURSE CROSSING
- SPRINGS (SPR)



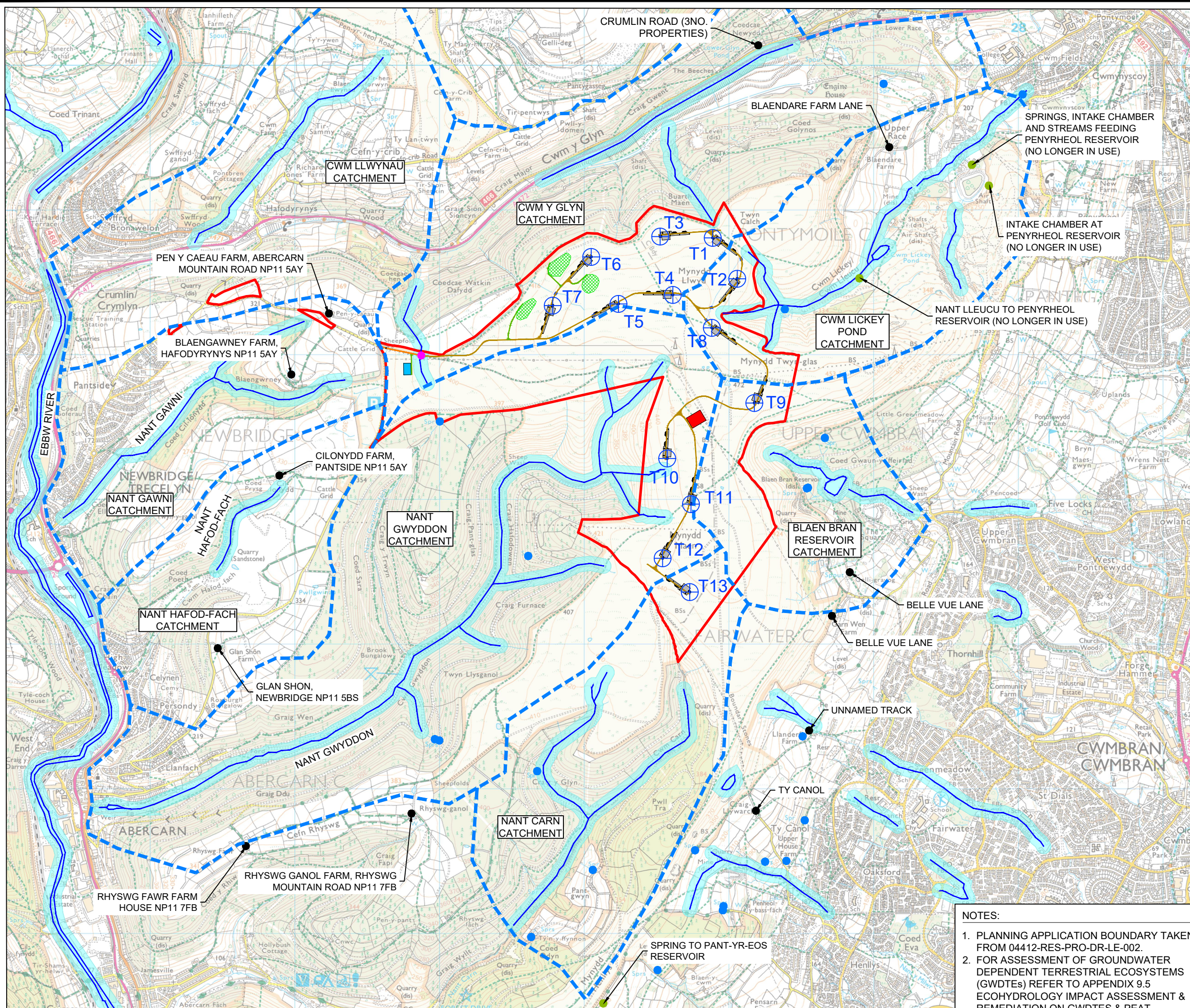
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DRAWING NUMBER **04412-RES-DRN-DR-PT-001** REV **2**

SCALE - 1:25,000 @ A3

ENVIRONMENTAL STATEMENT 2023

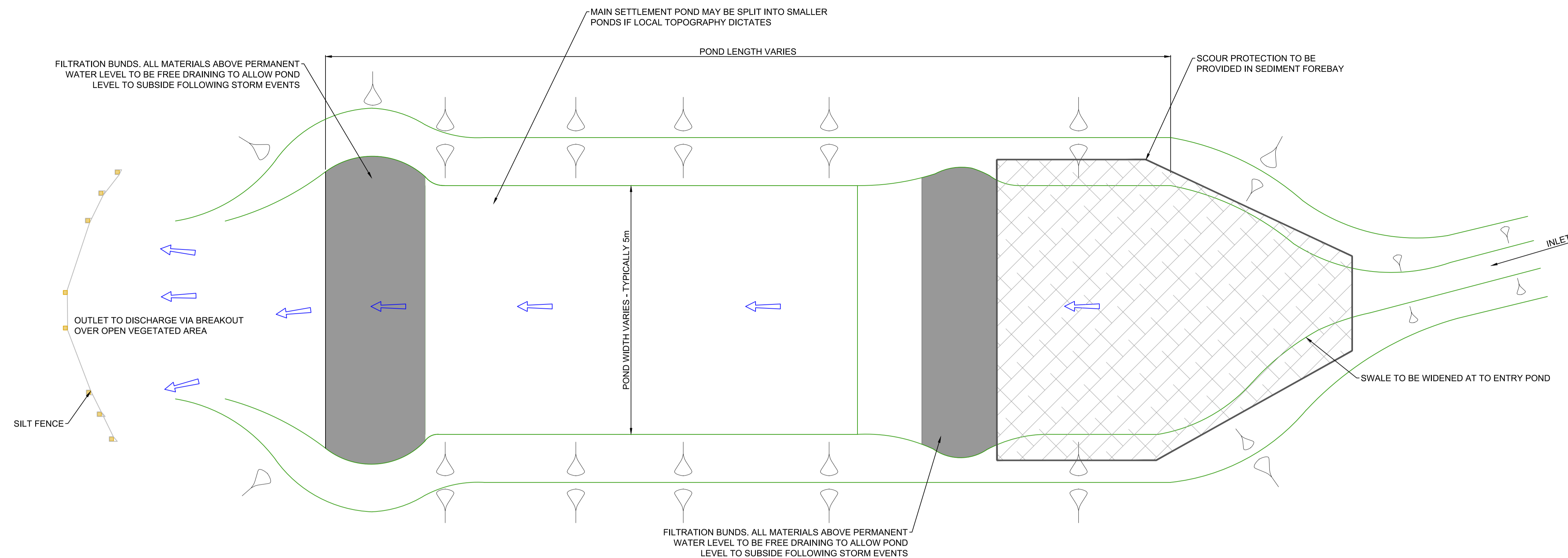
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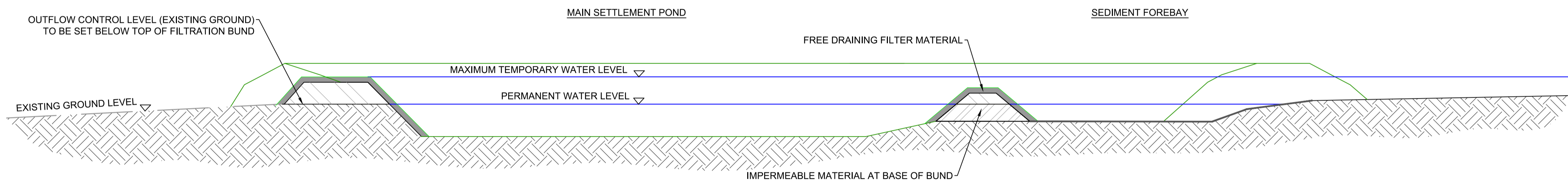
NOTES:

1. PLANNING APPLICATION BOUNDARY TAKEN FROM 04412-RES-PRO-DR-LE-002.
2. FOR ASSESSMENT OF GROUNDWATER DEPENDENT TERRESTRIAL ECOSYSTEMS (GWDTEs) REFER TO APPENDIX 9.5 ECOHYDROLOGY IMPACT ASSESSMENT & REMEDIATION ON GWDTEs & PEAT.

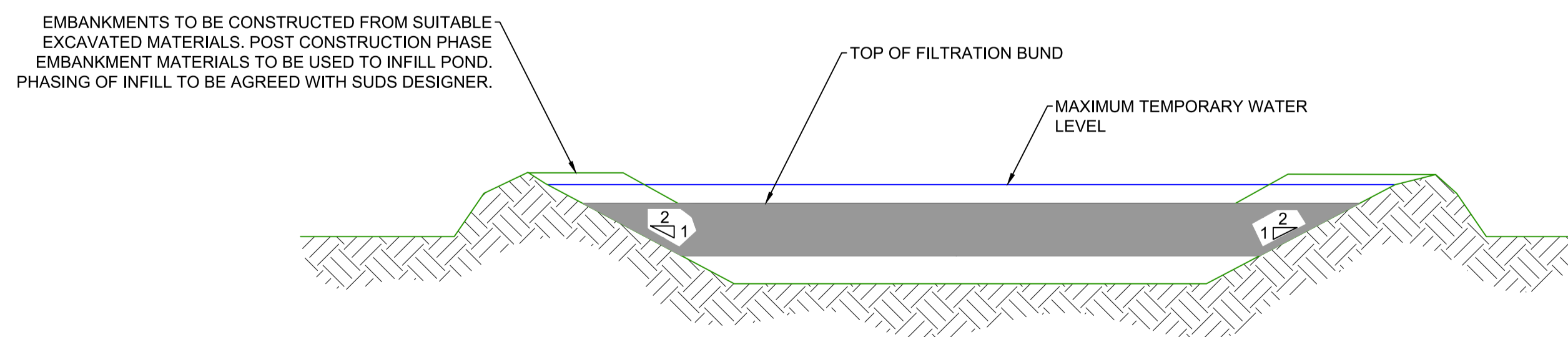
Annex 4 SuDS Details



TYPICAL SETTLEMENT POND DETAIL - PLAN
SCALE - 1:50




TYPICAL SETTLEMENT POND DETAIL - LONG SECTION
SCALE - 1:50

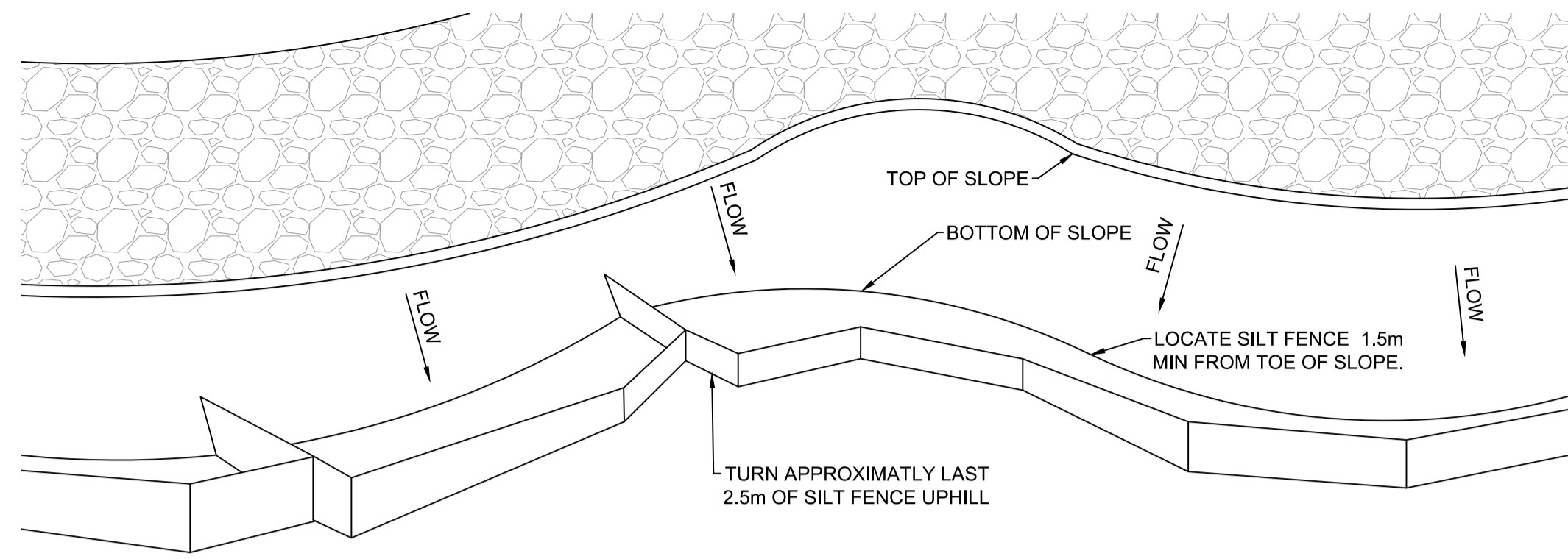


TYPICAL SETTLEMENT POND DETAIL - CROSS SECTION
SCALE - 1:50

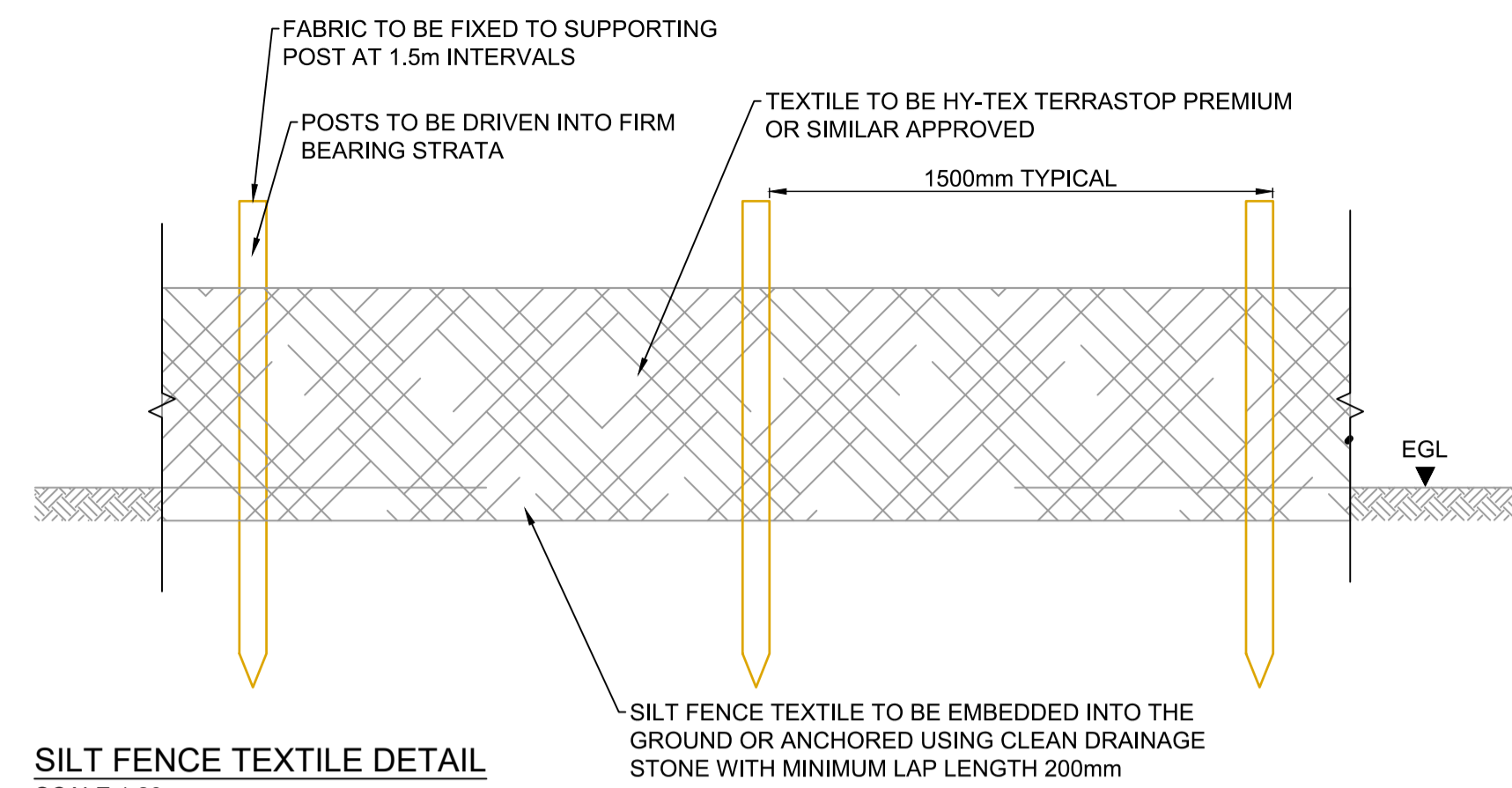
- NOTES:**
- SUDS SYSTEM TO BE CONSTRUCTED PRIOR TO, OR AT THE SAME TIME AS THE ACCESS ROAD & HARDSTANDINGS. INTERIM MEASURES SUCH AS THE PLACEMENT OF SILT FENCES TO BE USED AROUND WATERCOURSES AND RETAINED IN PLACE UNTIL SUDS ARE ESTABLISHED AND PROVIDING SUFFICIENT SILT REMOVAL.
 - SETTLEMENT PONDS TO BE CONSTRUCTED IN A MANNER WHEREBY THEY MAY BE EASILY INFILLED AT A LATER DATE (POST COMPLETION OF THE ACCESS ROAD CONSTRUCTION). ONLY SUITABLE MATERIALS EXCAVATED FROM THE POND TO BE USED TO FORM PART OF THE EMBANKMENT AROUND THE POND.
 - THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE TEMPORARILY MANAGED BY PLACING SILT FENCES AT THE PROBLEM AREAS.
 - SILT LEVELS AT CHECK DAMS AND POND FOREBAYS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAM TO BE REMOVED AND DISPOSED OF APPROPRIATELY.

1	BM	BY	MC	2023-08-29	FIRST ISSUE
ISSUE	DRAWN	CHKD	APPD	DATE	REVISION NOTES
PURPOSE					COORDINATES
PRELIMINARY					N/A
SCALE				DATUM	N/A
AS SHOWN @ A1					
LAYOUT DWG					T.LAYOUT NO.
N/A					N/A

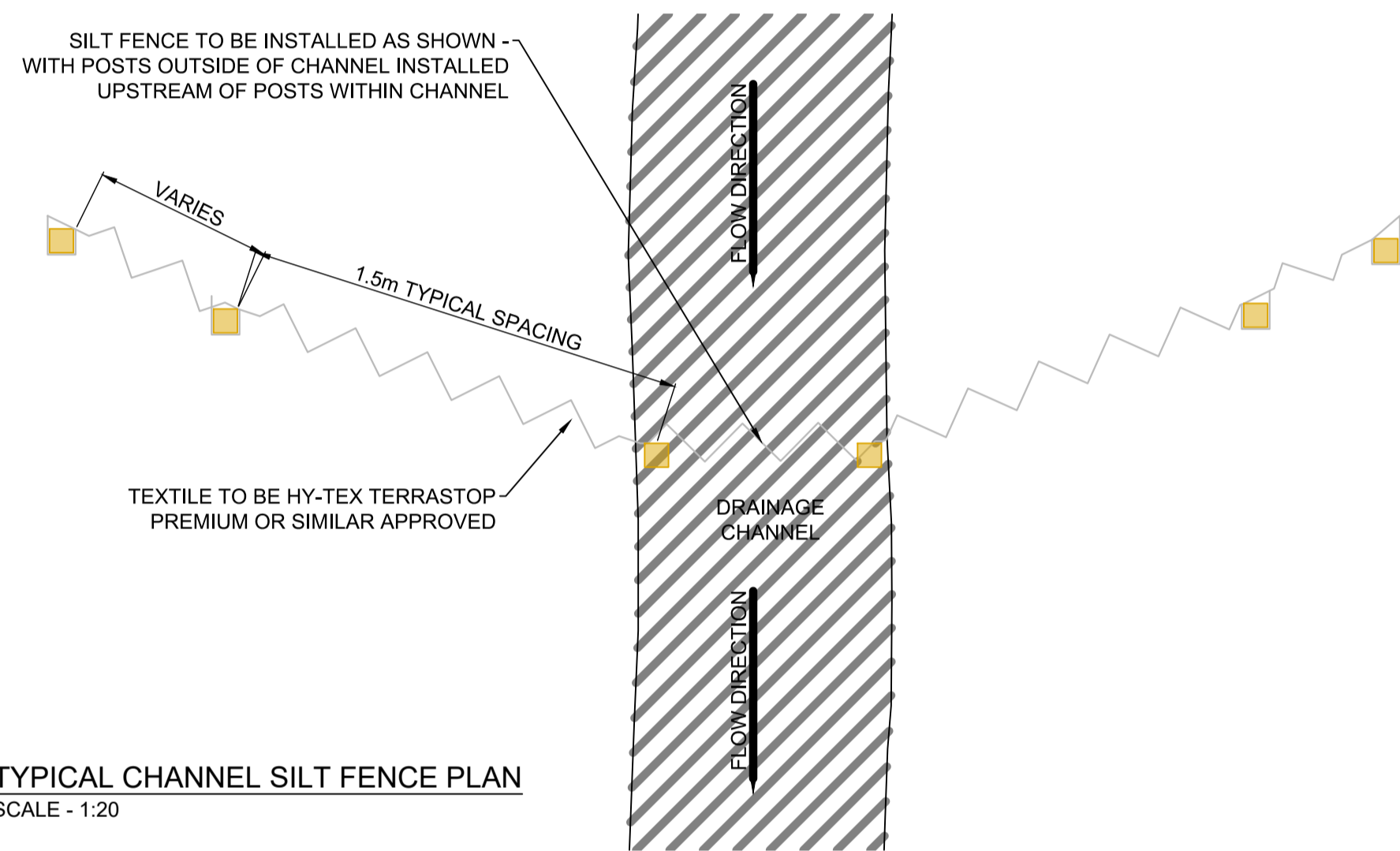
PROJECT TITLE
 MYNYDD MAEN WIND FARM
DRAWING TITLE
 TYPICAL SETTLEMENT POND DETAILS
RES DRAWING NUMBER
 04412-RES-DRN-DR-CE-002
REV
 1
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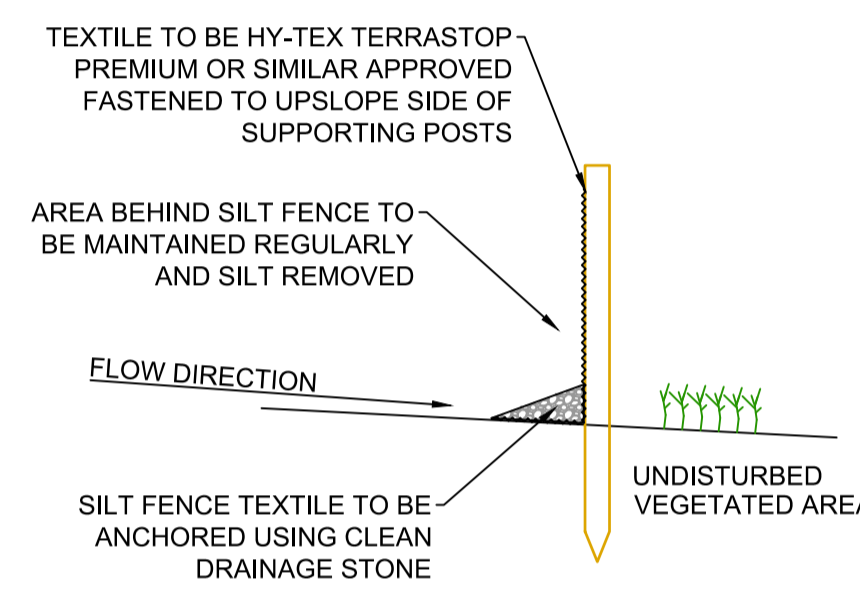
TYPICAL SILT FENCE BOTTOM OF SLOPE
SCALE - NTS



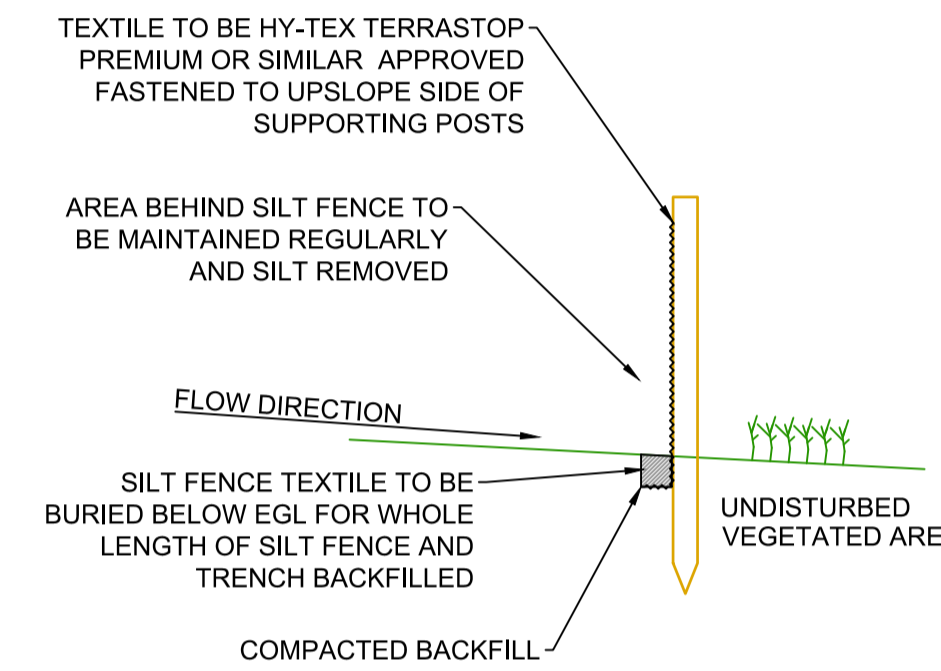
SILT FENCE TEXTILE DETAIL
SCALE 1:20



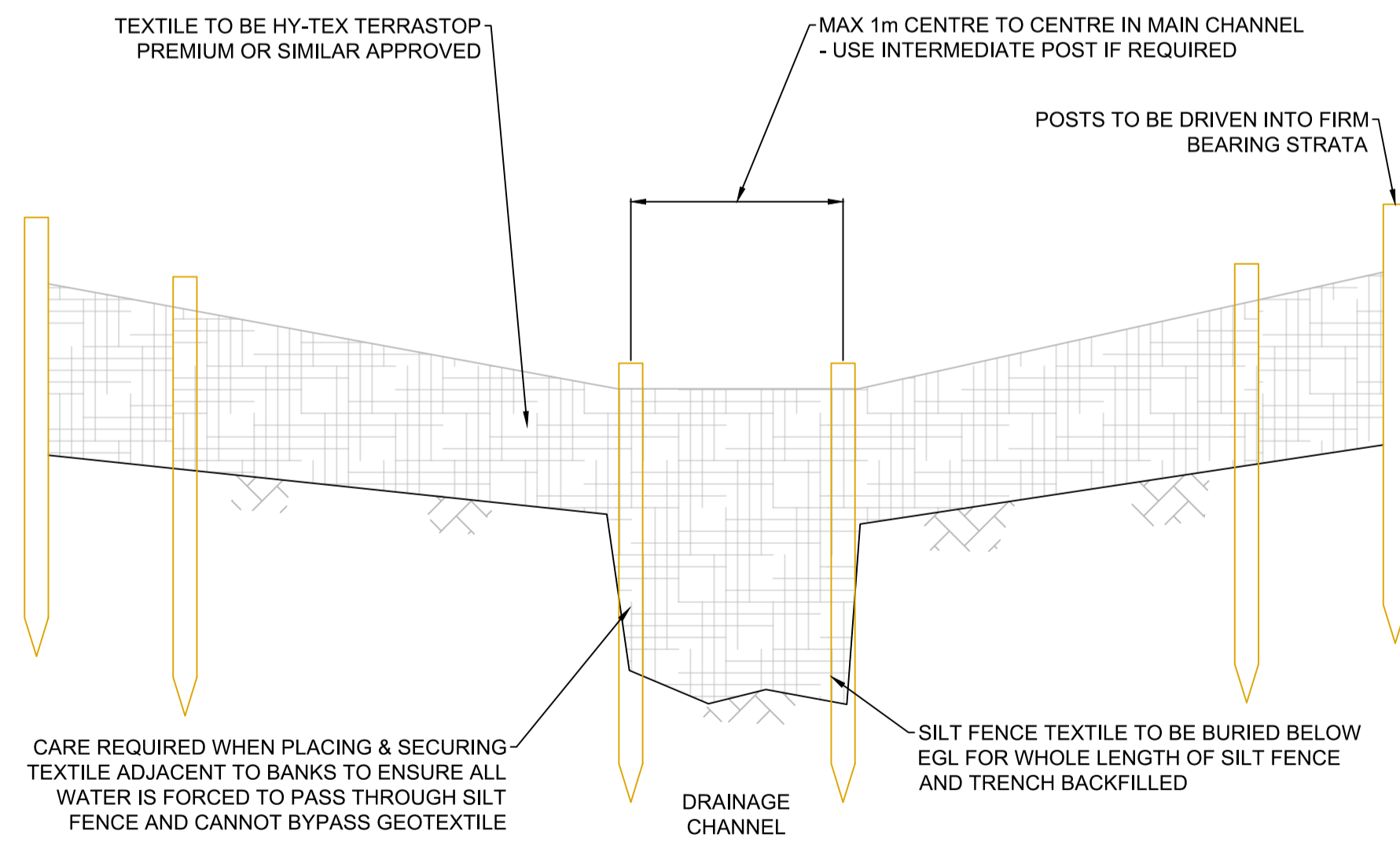
TYPICAL CHANNEL SILT FENCE PLAN
SCALE - 1:20



ANCHORED TYPE OPTION
SCALE 1:25



BURIED TYPE OPTION
SCALE 1:25

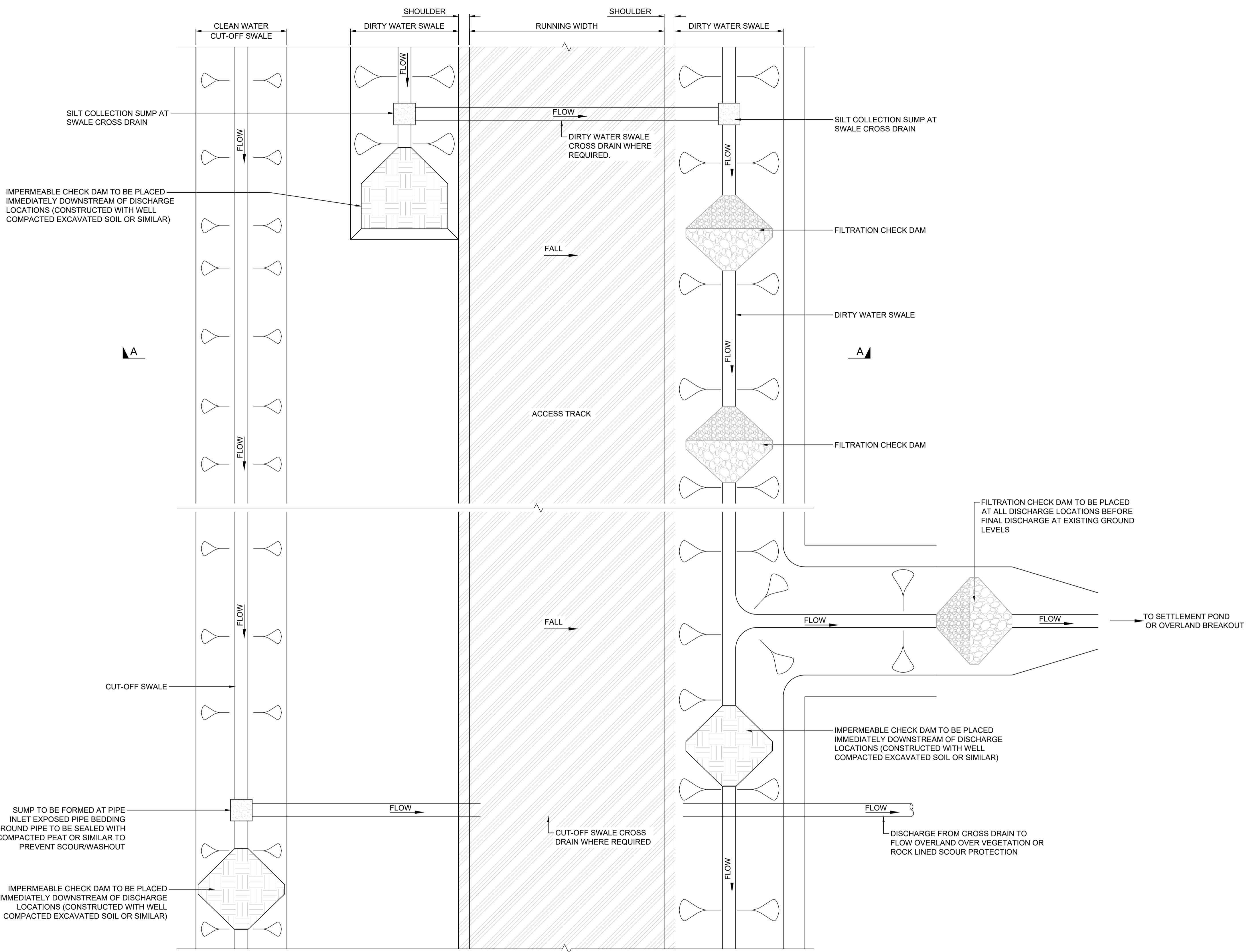


TYPICAL CHANNEL SILT FENCE ELEVATION
SCALE - 1:20

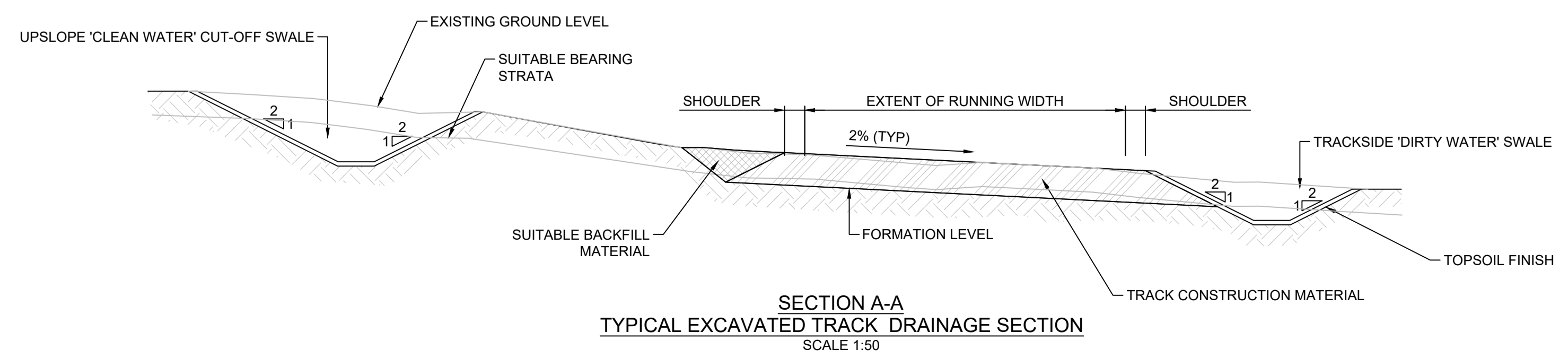
- NOTES:**
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 - THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE TEMPORARILY MANAGED BY PLACING SILT FENCES AT THE PROBLEM AREAS.

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PROJECT TITLE	
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DRAWING TITLE	
TYPICAL SILT FENCE DETAILS	
RES DRAWING NUMBER	REV
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TYPICAL EXCAVATED TRACK SURFACE WATER DRAINAGE PLAN
SCALE 1:50

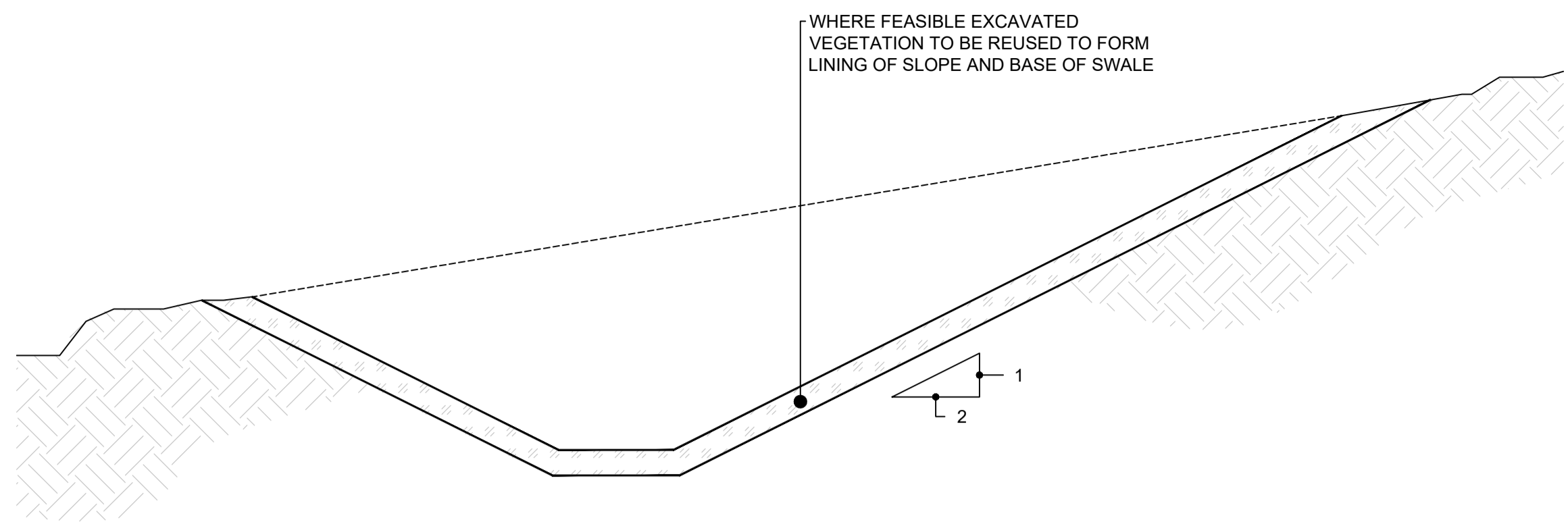


SECTION A-A
TYPICAL EXCAVATED TRACK DRAINAGE SECTION
SCALE 1:50

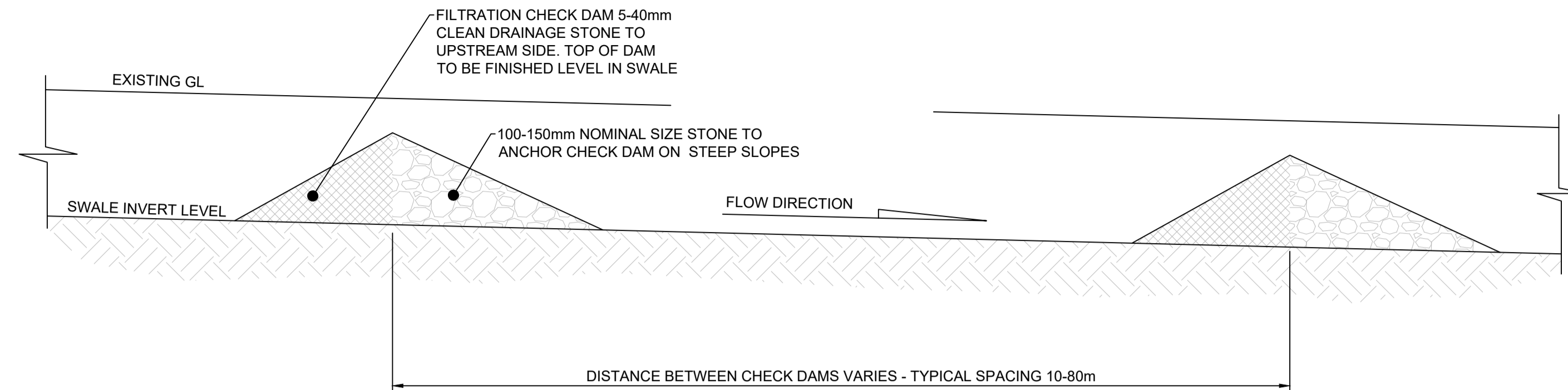
- NOTES:
1. SUDS SYSTEM TO BE CONSTRUCTED PRIOR TO, OR AT THE SAME TIME AS THE ACCESS TRACK & HARDSTANDS. INTERIM MEASURES SUCH AS THE PLACEMENT OF SILT FENCES TO BE USED AROUND WATERCOURSES AND RETAINED IN PLACE UNTIL SUDS ARE ESTABLISHED AND PROVIDING SUFFICIENT SILT REMOVAL.
 2. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE TEMPORARILY MANAGED BY PLACING SILT FENCES AT THE PROBLEM AREAS.
 3. WHERE RESEEDING IS REQUIRED, NATIVE SPECIES SEED MIX SHALL BE USED BASED UPON THE SURROUNDING HABITAT. THE PLANTING SHALL BE CAPABLE OF RESISTING DROUGHT CONDITIONS.
 4. AREAS STRIPPED OF VEGETATION SHOULD BE KEPT TO A MINIMUM.
 5. CLEAN STONE FLOW CONTROL CHECK DAMS TO BE WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 5/40mm CLEAN STONE. ON SLOPING SECTIONS OF THE ACCESS TRACK, 5/40mm CHECK DAMS TO BE PROTECTED FROM WASHING AWAY THROUGH THE PLACEMENT OF 100/150mm STONE ON THE DOWNHILL FACE OF THE CHECK DAM.
 6. SILT LEVELS AT CHECK DAMS AND POND FOREBAYS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAM TO BE REMOVED AND DISPOSED OF APPROPRIATELY.
 7. WHERE ACCESS TRACKS ARE OF FLOATED CONSTRUCTION (OVER PEAT), TRACKSIDE DIRTY WATER SWALES WILL NOT BE PROVIDED.
 8. THE REQUIREMENT FOR DIRTY WATER SWALES BOTH SIDES OF TRACK, AND CUT-OFF SWALES WILL VARY TO SUIT THE PROPOSED ACCESS TRACK ALIGNMENT AND EXISTING TOPOGRAPHY.
 9. WHERE EROSION IS IDENTIFIED IN THE CUT-OFF SWALES, CHECK DAMS SHOULD BE INSTALLED SIMILAR TO THE TRACKSIDE SWALES WHERE NECESSARY.

SHEET 1 OF 2

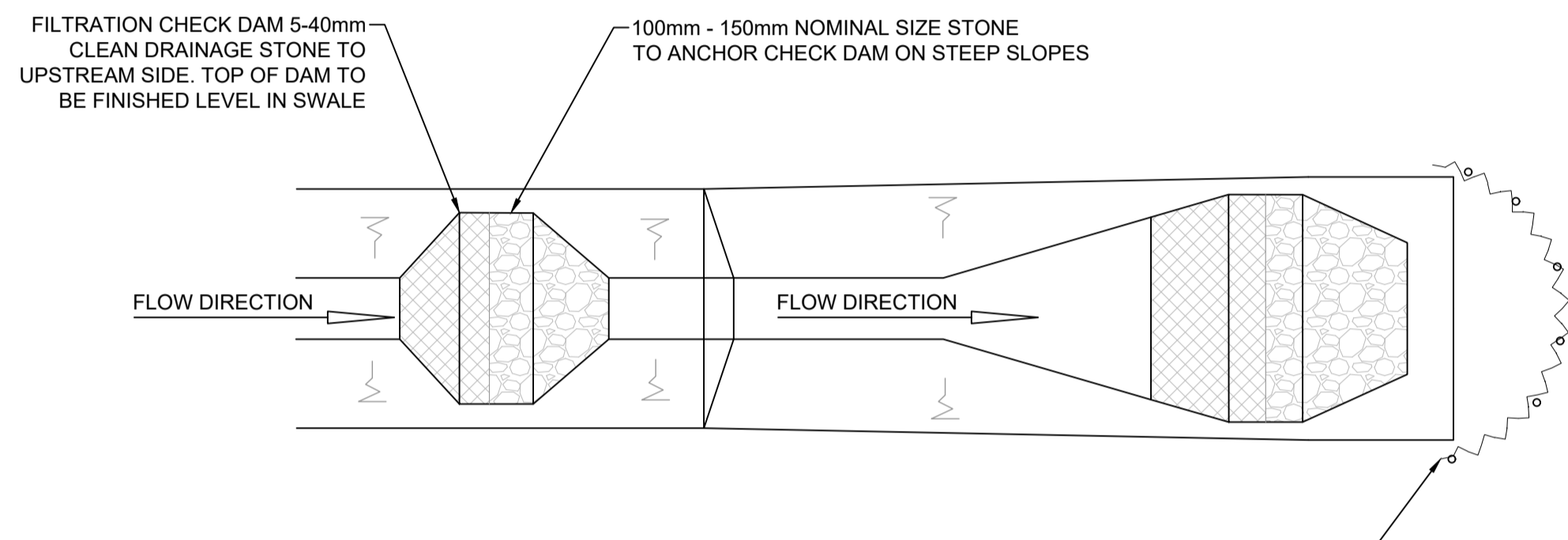
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1	2023-08-29	BY APPD	CHKD	APPD	MC	DATE	FIRST ISSUE
PURPOSE							COORDINATES
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TYPICAL DRAINAGE DETAILS							
RES DRAWING NUMBER							REV
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TYPICAL SWALE - CROSS SECTION
SCALE - 1:20

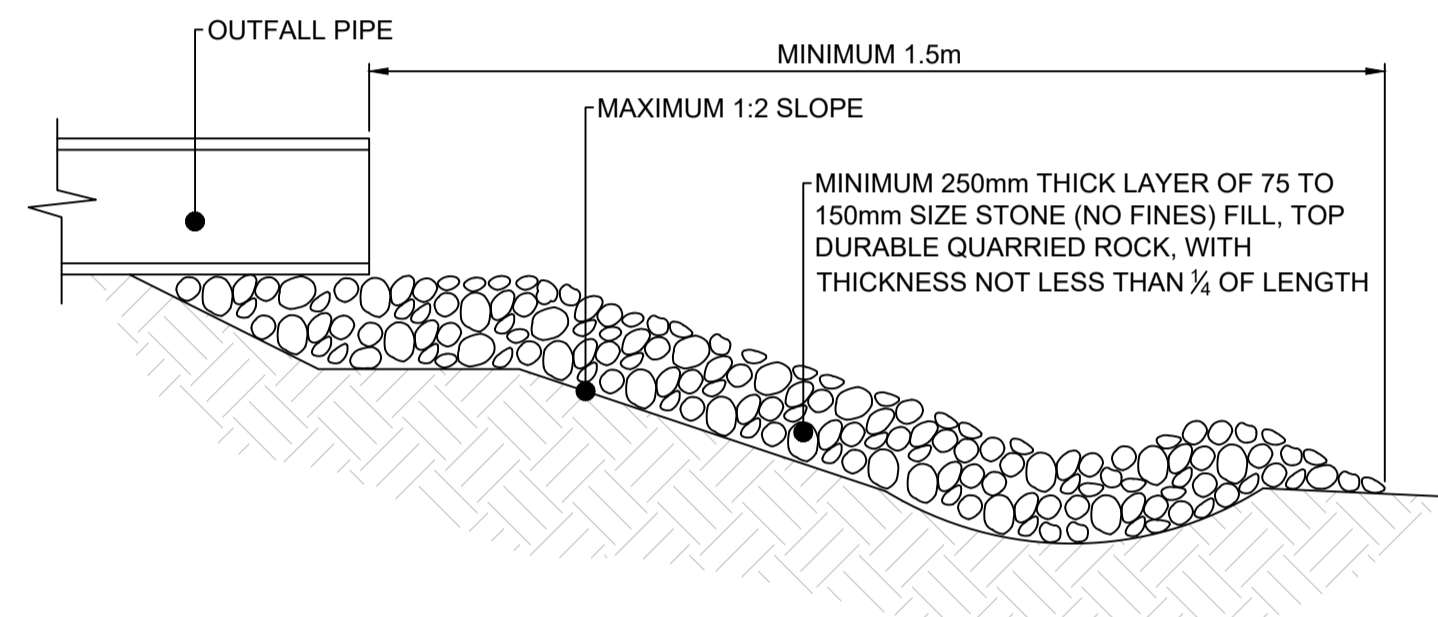


TYPICAL TRACKSIDE SWALE - LONG SECTION
SCALE - 1:20

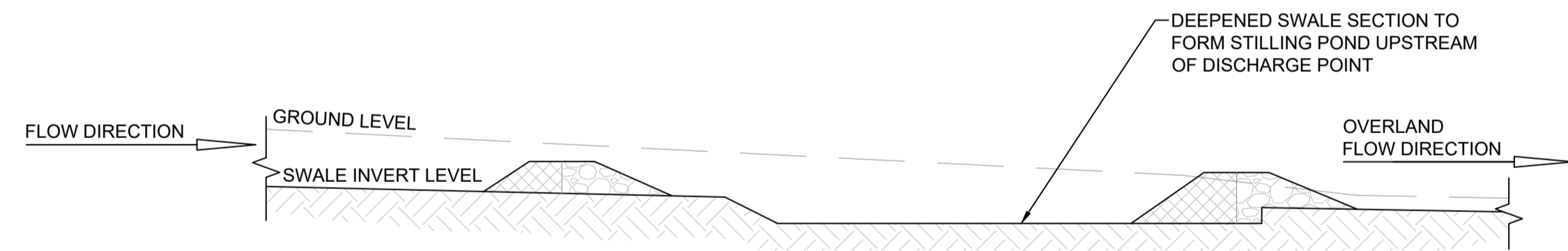


TYPICAL OVERLAND BREAKOUT - PLAN
SCALE - 1:50

TEMPORARY SILT FENCE TO BE INSTALLED AS ADDITIONAL MEASURE DURING CONSTRUCTION PHASE AS REQUIRED WHERE RISK OF POLLUTION IS OBSERVED AT OUTLET



TYPICAL ROCK LINED SCOUR PROTECTION - LONG SECTION
SCALE - 1:20



TYPICAL OVERLAND BREAKOUT - LONG SECTION
SCALE - 1:50

NOTES:

- SUDS SYSTEM TO BE CONSTRUCTED PRIOR TO, OR AT THE SAME TIME AS THE ACCESS TRACK & HARDSTANDS. INTERIM MEASURES SUCH AS THE PLACEMENT OF SILT FENCES TO BE USED AROUND WATERCOURSES AND RETAINED IN PLACE UNTIL SUDS ARE ESTABLISHED AND PROVIDING SUFFICIENT SILT REMOVAL.
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- AREAS STRIPPED OF VEGETATION SHOULD BE KEPT TO A MINIMUM.
- CLEAN STONE FLOW CONTROL CHECK DAMS TO BE WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 5/40mm CLEAN STONE. ON SLOPING SECTIONS OF THE ACCESS TRACK, 5/40mm CHECK DAMS TO BE PROTECTED FROM WASHING AWAY THROUGH THE PLACEMENT OF 100/150mm STONE ON THE DOWNHILL FACE OF THE CHECK DAM.
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- WHERE ACCESS TRACKS ARE OF FLOATED CONSTRUCTION (OVER PEAT), TRACKSIDE DIRTY WATER SWALES WILL NOT BE PROVIDED.
- THE REQUIREMENT FOR DIRTY WATER SWALES BOTH SIDES OF TRACK, AND CUT-OFF SWALES WILL VARY TO SUIT THE PROPOSED ACCESS TRACK ALIGNMENT AND EXISTING TOPOGRAPHY.
- WHERE EROSION IS IDENTIFIED IN THE CUT-OFF SWALES, CHECK DAMS SHOULD BE INSTALLED SIMILAR TO THE TRACKSIDE SWALES WHERE NECESSARY.

SHEET 2 OF 2

ISSUE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
BY	BM	BY	MC	2023-08-29	FIRST ISSUE																
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DRAWING TITLE	TYPICAL DRAINAGE DETAILS																				
RES DRAWING NUMBER	04412-RES-DRN-DR-CE-004																		REV	1	

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Annex 5 Emergency Pollution Procedure



Emergency Procedure in the Event of a Contaminant Spillage

Report No: 01276R00001

Revision History

Issue	Date	Nature And Location Of Change
01 - 08	28/02/03 – 17/05/11	For Revision histories 01 – 08 refer to Issue 09
09	2/8/14	Reviewed and updated to reflect current RES process and changes to the IMS
10	25/8/16	Updated to amalgamate where possible

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1.0 OBJECTIVES

This procedure details the emergency procedure to be followed and actions to be taken in the event of a hazardous waste spillage such as oil, fuel and chemicals, occurring on a RES managed premises or site / project in order that the environmental impacts that may be associated with a hazardous waste spillage may be mitigated.

2.0 SCOPE

This procedure covers all UK geographic locations; sites, project or offices for which RES are responsible for or manage.

3.0 PROCEDURE

3.1 Project, Site or Office Locations

		Responsibility
i)	<p>The Contractor shall provide MSDS and COSHH assessments for all substances controlled under COSHH that are to be used or stored on the site.</p> <p>Records of the supplied MSDS & CoSHH Assessments shall be maintained.</p> <p>Note: Substances with hazardous properties such as cement, concrete and curing agents are all controlled by the COSHH.</p>	C
ii)	<p>Appropriately sized spill kits shall be provided for the controlled substances that will be used or stored on the site; the contractor shall train personnel in the use of these spill kits and maintain training records.</p>	C RRM
iii)	<p>The Contractor shall provide oil spill training and awareness to their staff</p> <p>RES have subscribed to an emergency environmental call-off support service from Veolia to be used the event of a major spill, details included in Project Directory or can be provided by the HSQEM.</p>	C, HSQEM
iv)	<p>In the event of a liquid spill occurring the Contractor shall cease work in the vicinity immediately.</p> <p>If spillage is flammable, extinguish all ignition sources.</p> <p>Identify source of pollution and rectify the problem.</p> <p>The Contractor's trained personnel shall immediately deploy the spill kit in accordance with the manufacturer's instructions.</p> <p>Contractor's personnel shall don appropriate PPE and clean up the spill.</p> <p>All used spill kit materials should be disposed of in the proper manner.</p>	C

v)	<p>In the event of a concrete spillage into water channel or surface water, as the waste is highly alkaline it is regarded as Hazardous Waste. Every effort should be made to contain the movement of the liquid cement in the watercourse or drainage channel.</p> <p>Similarly in the event of a Peat / Spoil Movement / Slip into a water course; remove any peat or clay material which has entered the watercourse and transport to a location where it will no longer be a source of pollution.</p> <p>Notify the following agencies; Environmental Agency (region specific; EA, SEPA or NIEA etc), local Fisheries.</p>	RRM, C
vi)	<p>Place geotextile silt fences/stone barrages at downstream points in the river as required.</p> <p>Constant monitoring should be maintained not only of the water quality (clarity) downstream of the check dams, but also of the excavated peat or clay material.</p> <p>Consideration should also be given to the subsequent movement of the spoil / peat and any preventative / containment measures required.</p>	RRM
vii)	<p>The Contractor shall inform the RRM of the incident as soon as possible and certainly no more than 1 hour after the spill.</p>	C
viii)	<p>The Contractor is responsible for replacing the used spill kits as soon as possible and no later than 24 hours after use.</p>	C
ix)	<p>The Contractor is responsible for ensuring that used spill kits and any other oil / fuel soaked / contaminated material e.g. rags, used during the incident are disposed of in accordance with the Environmental Waste Management Regulations in operation. These materials shall be bagged up, and disposed of at a licensed hazardous waste disposal site e.g. taken away by a licensed oil / fuel disposal / broker company.</p>	C
x)	<p>The Contractor shall submit copies of the receipt or waste oil certificate to the RRM within 48 hours.</p>	C

4.0 REFERENCE DOCUMENTS

- i) IMS 20 – Emergency Incident Preparedness and Response [HSQE00-001043](#)

5.0 DEFINITIONS

Abbreviation or term	Explanation of abbreviation or term
i) C	Contractor: Any company or person employed by RES to carry out any work on a site / project or office location
ii) COSHH	Control of Substance Hazardous to Health Regulations 2011
iii) H&S Plan	Health and Safety File maintained by the Site Manager
iv) HSQE	Health, Safety, Quality & Environment
v) HSQEM	HSQE Manager (Head of HSQE)
vi) MSDS	Material Safety Data Sheet supplied by manufacturer
viii) RRM	Responsible RES Manager (Construction Site – Construction Site Manager, Generation Site – Site / Asset Manager, Office Locations – Office Manager)