CONSTANT ENERGY LIMITED

TIRAWLEY WIND FARM

CO. MAYO

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

MANAGEMENT PLAN 3

SURFACE WATER MANAGEMENT PLAN

September 2025

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DOCUMENT APPROVAL

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Date September 2025	Signature Darren Timlin Padraig O' Dowd	Signature David Kiely

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1 INTRODUCTION

This Surface Water Management Plan (SWMP) describes the management of surface water during construction of Tirawley Wind Farm, Co. Mayo.

The Surface Water Management Plan aims to:

- Describe the baseline environment of the site
- Describe how the system will operate to minimise modification and disruption to the existing site hydrology
- Outline the proposed maintenance regime
- Outline the proposed drainage management post-construction

2 BASELINE ENVIRONMENT

2.1 Site Description

The Planning Permission is being sought by the Developer for the construction of 18 No. Wind Turbines with an anticipated output of 77.40 MW, 1 no. meteorological mast, a Permanent Operations Compound, an Onsite Substation, Battery Energy Storage System (BESS), 19 no. Spoil Deposition Areas and all ancillary works, works along the Turbine Delivery Route (TDR) and the construction of an underground Grid Connection to Tawnaghmore 110 kV substation, Killala Business Park, Co. Mayo. The Proposed Development also includes all associated site preparation and drainage works.

A full description of the Proposed Development is provided in **Chapter 2: Development** Description of this EIAR.

The Wind Farm Site is shown in **Figure 1.1**.

Figure 1.1: Wind Farm Site Layout

2.2 Site Topography

Topography across the Wind Farm Site is variable, ranging from ~20 to 155 m OD (meters above Ordnance Datum). The northern and central areas of the Wind Farm Site are located on elevated ground. The highest elevations are found in the north of the Wind Farm Site, which is situated on the southeastern slopes of Knockboha Hill, which stands at an elevation of ~186 m OD. There are also several other local high points further to the south which range in elevation from ~108 to 137 m OD. The southern section of the Wind Farm Site is located on lower ground with topography sloping gently to the southeast towards Cloonaghmore Estuary and Killala Bay.

2.3 Hydrology and Geology

The geology and hydrology of the Proposed Development are detailed in **EIAR Chapter 8: Soils and Geology** and **EIAR Chapter 9: Hydrology and Hydrogeology**, respectively. Surface water networks draining the Wind Farm Site are mapped and presented in **Figure 2.1**.

On a regional scale, the Wind Farm Site is located in the Blacksod-Broadhaven Bay surface water catchment within Hydrometric Area 33 of the Western River Basin District. The Blacksod-Broadhaven catchment includes the area drained by all streams entering tidal water in Blacksod and Broadhaven Bays and between Corraun Point and Benwee Head, Co. Mayo, draining a total area of 1,302 km² (EPA, 2021). The Wind Farm Site is also mapped in the Glencullin River sub-catchment (Glencullin[NorthMayo]_SC_010) according to WFD mapping. A regional hydrology map is attached as **Figure 2.2**.

More locally the Wind Farm Site is mapped in 3 no. WFD river sub-basins:

- The majority of the Wind Farm Site is located in the Cloonalaghan_010 WFD river sub-basin. This area is drained by the Carn River and several 1st and 2nd order streams all of which discharge into the Cloonalaghan River.
    - The southern section of this WFD river sub-basin is drained by the Cloonavarry Stream and the Carn River. The Cloonavarry Stream flows to the southeast ~130 m south of wind turbine AT02. The Carn River flows the southeast ~430 m northeast of wind turbine AT04. These watercourses confluence to form the Cloonalaghan River which flows to the northeast ~130 m east wind turbine AT01.

- The northern section of this WFD river sub-basin is drained by several mapped tributaries of the Cloonalaghan River. These include:
  - the Ballymurphy Stream which is located ~100 m north of wind turbine AT01;
  - the Lissadrone Stream which is located ~70 m south of wind turbine AT10;
  - the Keeloges Stream which is mapped ~180 m east of wind turbine AT11; and,
  - the Conaghra Stream, located ~130 m north of wind turbine AT12.
- All waters draining this area of the Wind Farm Site eventually end up in the Cloonaghan River which discharges into Lackan Bay.

- The northeast of the Wind Farm Site is located in the Knockboha_010 WFD river sub-basin. This area of the Wind Farm Site is drained by several 1st order streams which flow downslope to the east into Lacken Strand. The watercourses in the vicinity of the Wind Farm Site are locally unnamed but have been assigned names by the EPA. One stream is referred to by the EPA as the Castletown stream. This watercourse is mapped to originate ~250 m northeast of wind turbine AT17.
- The northwest of the Wind Farm Site is located in the Gortmore Stream_010 WFD river sub-basin. This area is drained by a small stream, referred to by the EPA as the Lecarrowntemple Stream. A tributary of this stream referred to by the EPA as the Barhill Stream is mapped ~90 m northeast of wind turbine AT08. The Lecarrowntemple Stream itself flows to the east ~150 m north of wind turbine AT08 before discharging into the Heathfield River to the west. The Heathfield River, referred to as the Gortmore Stream by the EPA, flows to the north before discharging into Bunatrahir Bay.

A local hydrology map is attached as **Figure 2.3** and a site drainage map is included as **Figure 2.1**. Many of the streams draining the Wind Farm Site have been assigned names by the EPA, however only the larger watercourses of the Heathfield, Carn and Cloonalaghan rivers are named on local OSI maps. The names of many of the streams referred to in the preceding text have been assigned by the EPA. Please note that Heathfield River is referred to as the Gortmore Stream by the EPA. A summary of the location of the Proposed Development's infrastructure with respect to WFD catchments, sub-catchments and river sub-basins is presented in **Table 2.1**.

Table 2.1: WFD Catchments, Sub-Catchments and River Sub-Basins of the Wind Farm Site

Catchment	Sub-Catchment	River Sub-Basin	Proposed Development Infrastructure
Blacksod - Broadhaven Bay	Glencullin [NorthMayo]_SC_010	Cloonalaghlan_010	AT01, AT02, AT03, AT04, AT05, AT06, AT09, AT10, AT11, AT12, AT13, AT14, AT15, AT16, spoil deposition areas, substation, 2 no. temporary construction compounds, operations building and met mast. Note that AT18 is located on the boundary between this sub-basin and the Knockboha_010 sub-basin.
		Knockboha_010	AT17 and spoil deposition areas. Note that AT18 is located on the boundary between this sub-basin and the Cloonalaghlan_010 sub-basin.
		Gortmore Stream_010	AT07 and AT08

Within the Wind Farm Site, there are a total of 15 no. crossings over natural watercourses. 8 of these crossings are located along existing public and private roads and there will be no requirement for the construction or upgrade of these crossings. Additionally, works will be required at 7 no. crossings.

No instream works are proposed at the existing watercourse crossing locations. The existing public and private road crossings are as follows:

- An existing public road crosses the Conaghra Stream (EPA Name / EPA Code: 33C54), ~260 m south of wind turbine AT14 and to the east of the Permanent Operations Compound. However, no works are proposed at the existing bridge location (i.e. this section of road is not proposed to be upgraded).

- An existing public road crosses the Glebe stream (EPA Name / EPA Code: 33G09), ~290 m south of wind turbine AT16. This crossing will include the internal Wind Farm grid cable route. There is an existing culvert at this location.
- An existing public road crosses the Lackanhill Stream (EPA Name / EPA Code: 33L02), ~530 m southeast of wind turbine AT16. This crossing will include the internal Wind Farm grid cable route. There is an existing culvert at this location.
- An existing public road to be upgraded crosses the Conaghra Stream (EPA Name / EPA Code: 33C54), ~200 m northeast of wind turbine AT12. This crossing will include the internal Wind Farm grid cable route.
- An existing public road crosses the Heathfield River (EPA Name: Gortmore Stream / EPA Code: 33G04), ~900 m southwest of wind turbine AT08.
- An existing public road to be upgraded crosses the Ballymurphy stream (EPA Name / EPA Code: 33B06), ~730 m west of wind turbine AT01. This crossing will include the internal Wind Farm grid cable route.
- An existing public road to be upgraded crosses the Ballymurphy stream (EPA Name / EPA Code: 33B06), ~600 m south/southeast of wind turbine AT06.
- There is an existing culvert crossing over the Carrickanass Stream (EPA Name / EPA Code: 33C50) ~350 m south of AT01.

The new proposed crossing locations or upgrades to existing watercourse crossings are as follows:

- It is proposed to widen the existing public road ~580 m to the southwest of AT18. This will require an upgrade to the existing culvert over a non EPA mapped watercourse.
- A new proposed Site Access Track over the Glebe Stream (EPA Name / EPA Code: 33G09), ~130 m south of wind turbine AT16 and joining wind turbine AT16 to wind turbine AT15. This crossing will include the internal Wind Farm grid cable route. It is proposed to install a culvert at this location.
- A new proposed Site Access Track over the Lissadrone East Stream (EPA Name / EPA Code: 33L01), ~80 m southeast of wind turbine AT10. This crossing will include the internal Wind Farm grid cable route. It is proposed to instal a culvert at this location.
- A new proposed Site Access Track over the Lissadrone East Stream ~230m to the west/southwest of AT10. It is proposed to instal a new culvert at this location.

- It is proposed to widen the existing public ~1 km west of AT07. This will require a new culvert crossing over the Aghaleague stream (EPA Name: / EPA Code: 33A11) upstream of its confluence with the Heathfield River.
- It is proposed to widen the existing public road ~700 m south of AT06. This will require a new culvert over the Carn Stream (EPA Name / EPA Code: 33C44).
- Internal grid cable connection over the Carn River (EPA Name: Cloonalaghan / EPA Code: 33C01) between AT04 and the onsite substation. It is proposed to cross this watercourse by HDD.

In addition to the natural watercourses, there is a high density of manmade forestry and agricultural drains within some areas of the Wind Farm Site. However, these are not considered to be a significant constraint and can be rerouted around the proposed infrastructure and/or integrated into the proposed drainage design

There are a number of mapped (Geological Survey Ireland, Bedrock 100k[1]) geological formations underlying the Windfarm Site, predominantly mapped Downpatrick Formation, with the Moyny Point Limestone member and Mullaghmore Sandstaone formation also present within the Wind Farm Site Boundary.

- The Downpatrick Formation - A sequence of interbedded rock types comprising: near shore marine mudstones and siltstones; alluvial and deltaic sandstones and siltstones; and fully marine bioclastic limestones interbedded with calcareous shales.
- The Moyny Point Limestone - Charecterised by tabular-bedded limestone and shale.
- The Mullaghmore Sandstone Formation – A series of cyclical units of siltstones and shales which coarsen upwards into the medium to coarse grained sandstone.

Grid Connection

The northern section of the Grid Connection, in the vicinity of the Wind Farm Site, is located in the Blacksod-Broadhaven Bay surface water catchment. Further south, the vast majority of the Grid Connection is located in the Moy and Killala Bay surface water catchment within Hydrometric Area 34. A regional hydrology map is attached as **Figure 2.2**.

[1] Geological Survey of Ireland (GSI) Spatial Resources. Online: https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228. [Accessed: 25/09/2025]

Within the Blacksod-Broadhaven Bay surface water catchment, all surface watercourses along the Grid Connection flow to the southeast towards the Cloonalaghan River. In this catchment, there is 1 no. crossing over an EPA mapped watercourse and 1 no. crossing over a non-EPA mapped watercourse. These crossings occur on the local road which extends northwards from the R314 at Lackan Cross. 1 no. watercourse crossing is an existing bridge crossing over the EPA mapped Cloonalaghan River, with a box culvert crossing over a watercourse which is not recorded on the EPA database.

Further to the south, within the Moy and Killala Bay surface water catchment, there are a total of 8 no. existing watercourse crossings. The western section of the Grid Connection is drained by the Cloonaghmore River and its tributaries. The Grid Connection crosses the Cloonaghmore River (EPA Code: 34C03) along the R314 at Palmerstown Bridge. 2 no. additional crossings occur over smaller watercourses, referred to by the EPA as the Rathbaun stream (EPA Code: 34R33) and the Rathcash Stream (EPA Code: 34R30). Further south, there is an existing bridge crossing over a small stream (EPA Code: 34R25) in the townland of Rathowen East and another crossing over the Magherabrack stream (EPA Code: 34M16).

The eastern section of the Grid Connection is mapped in the Abbeytown sub-catchment. There are a total of 3 no. existing watercourse crossings mapped in the vicinity of Killala Business Park. 2 no. crossings exist over the Moyne Stream, with an additional crossing over the Meelick Stream (EPA Code: 34M20), a small tributary of the Moyne Stream.

All watercourse crossings along the Grid Connection are identified in **Figure 2.4**.

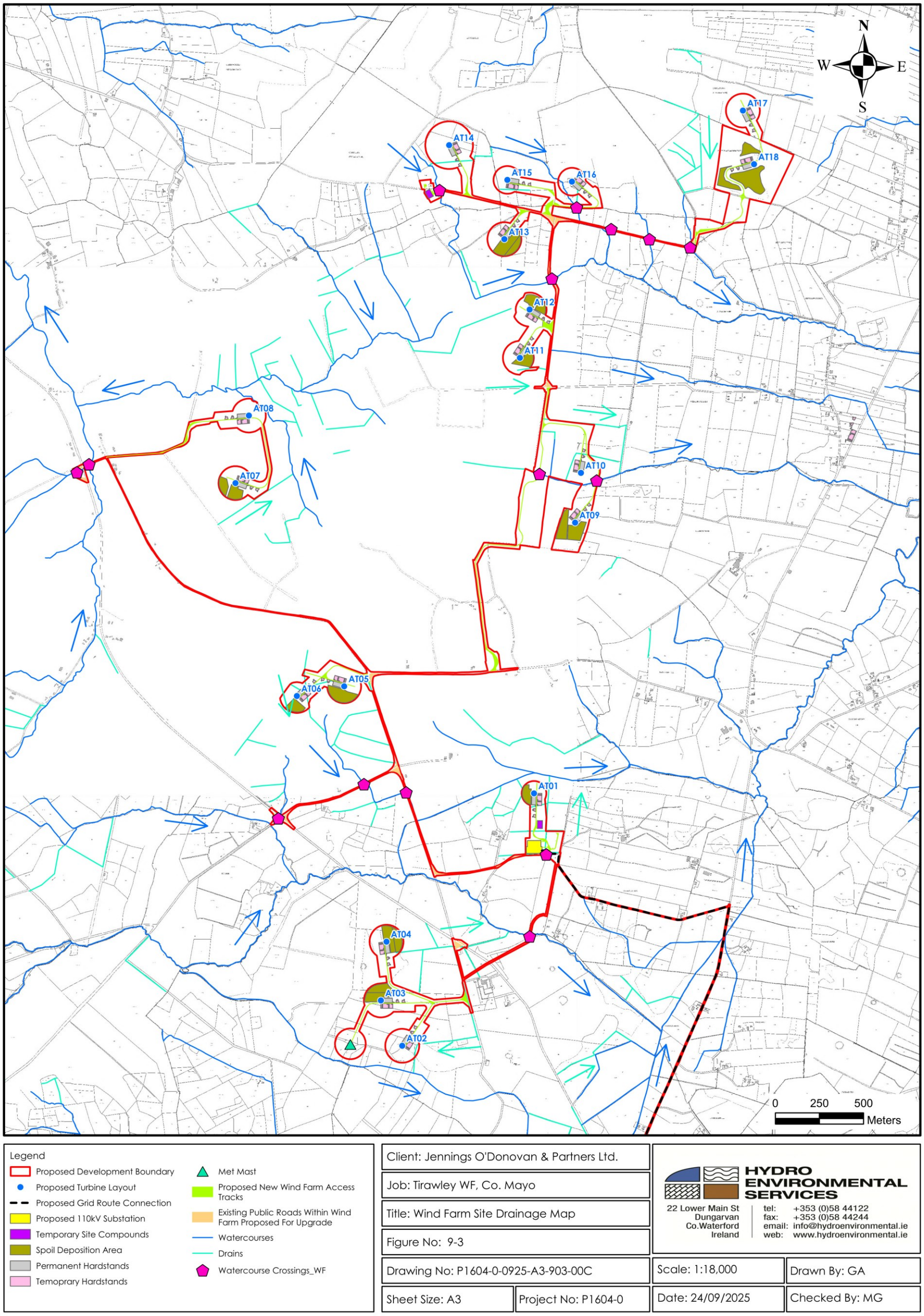


Figure 2.1: Wind Farm Site Drainage Map

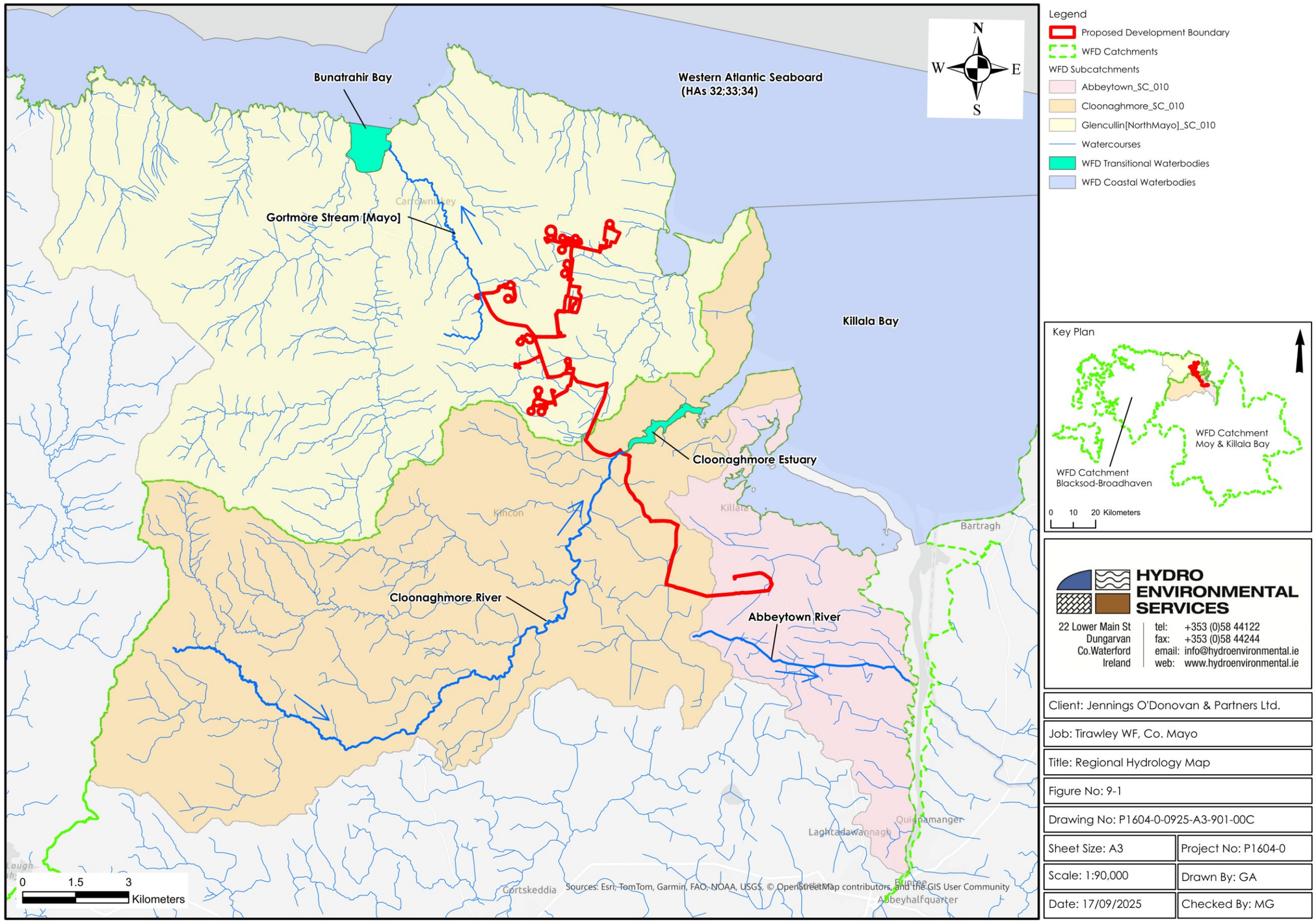


Figure 2.2: Regional Hydrology Map

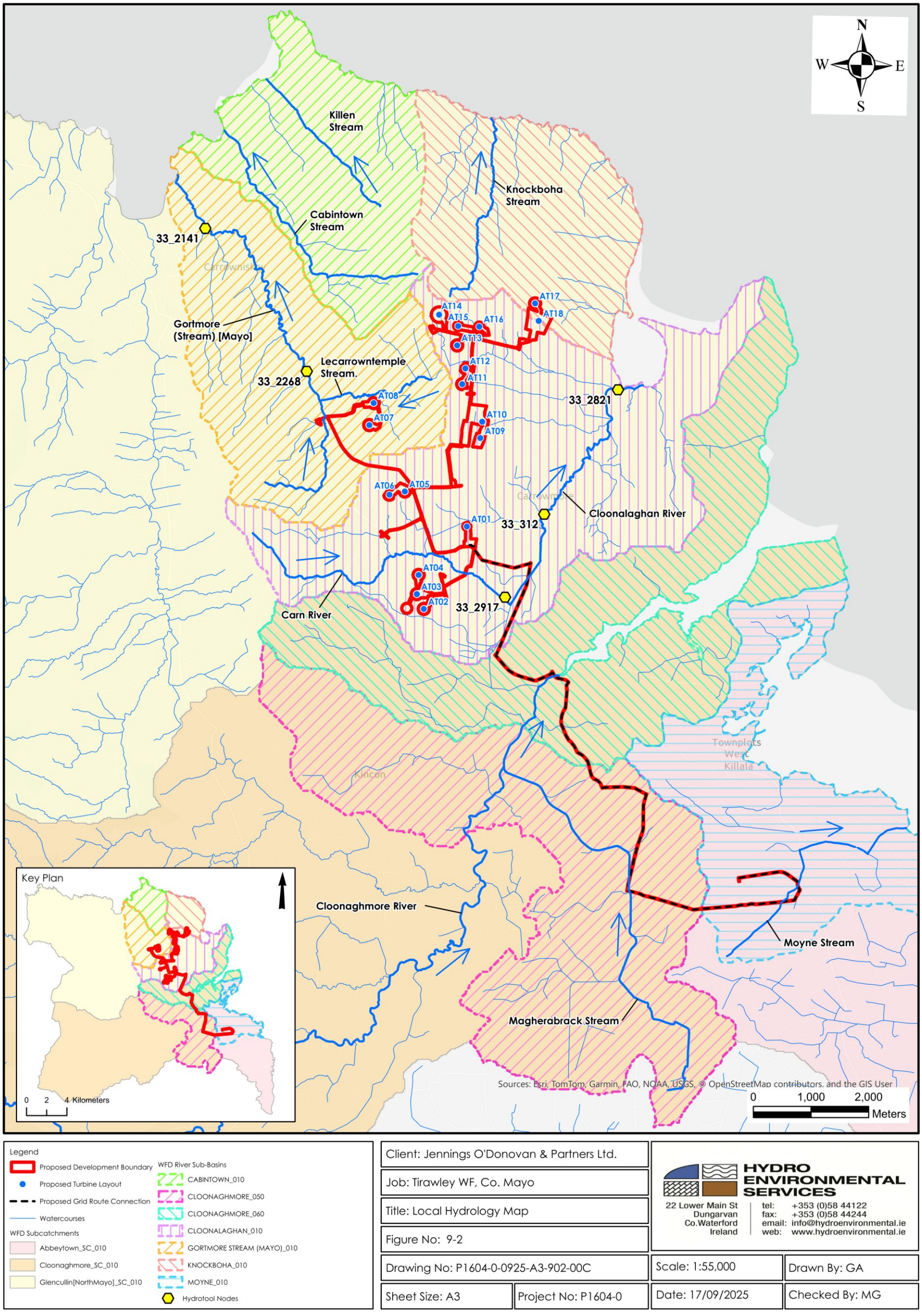


Figure 2.3: Local Hydrology Map

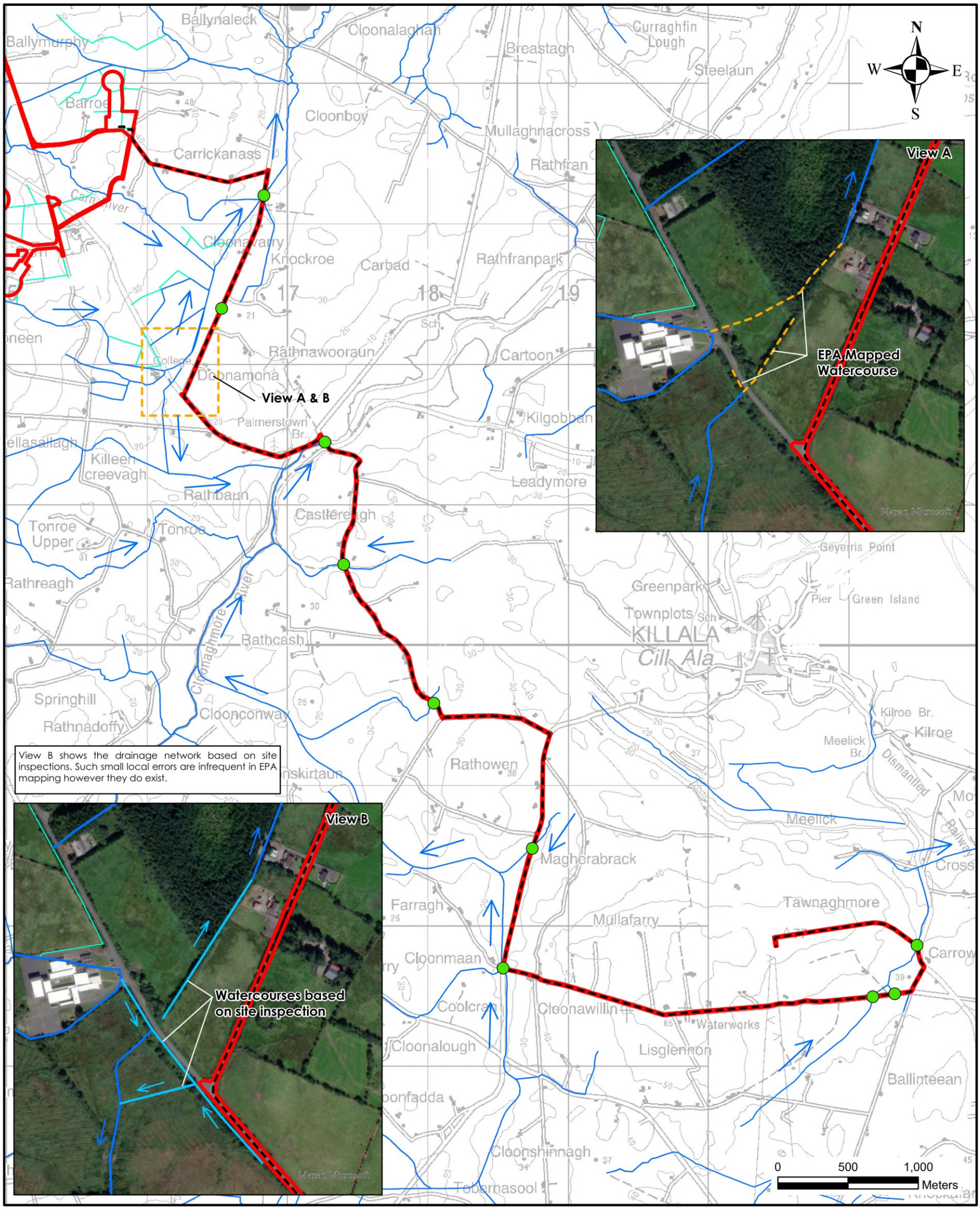


Figure 2.4: Watercourse Crossings along Grid Connection Map

3 ENVIRONMENTAL CONSTRAINTS AND MITIGATION MEASURES

This is a live document and where there is a requirement for variation to the proposed management of surface water during construction the SWMP will be updated to reflect any such changes. The SWMP will be updated by the Environmental Manager (EM) and, where it is relevant to ecology, with input from the Ecological Clerk of Works (ECoW) before any changes are made to the proposed management of surface water during construction of Tirawley Wind Farm.

4 DRAINAGE SYSTEM OVERVIEW

The drainage system has been designed for this Proposed Development. It aims to ensure the Proposed Development does not change the baseline water quality within or downstream of the Wind Farm Site.

The drainage system includes the following:

- A 50m buffer from watercourses except at water crossings.
- A 10m buffer from drains.
- Drainage will be installed in parallel with road construction.
- Check dams will be mainly used for road drainage. All road sections will drain to settlement-attenuation ponds.
- Silt fencing will be utilised during water crossings and around stockpiles.
- Settlement-attenuation ponds will be used at every major excavation.
- Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone.
- Velocity and silt control measures such as check dams, sandbags, oyster bags, straw bales, flow limiters, weirs, baffles, silt fences will be used during the upgrade construction works.
- Temporary silt traps will be placed in the existing drains downstream of construction works, and these will be diverted into proposed interceptor drains, or culverted under/across the works area.

4.1 SuDS Drainage Design

There is increased potential for water pollution, in particular sedimentation to local surface water features due to the excavation and generation of spoil and emplacement of stone materials during the construction stage of the Proposed Development.

The design criteria for the SuDS design are as follows:

- To select and install ecologically sensitive drainage.
- To minimise alterations to the ambient site hydrology and hydrogeology.
- To provide settlement and treatment controls as close to the site footprint as possible and to replicate the existing hydrological environment of the site.
- To minimise sediment loads resulting from the development run-off during the construction phase.
- To preserve greenfield runoff rates and volumes.
- To provide settlement ponds to encourage sedimentation and storm water runoff settlement.
- To reduce stormwater runoff velocities throughout the site to prevent scouring and encourage settlement of sediment locally.
- To manage the problems of erosion and allow for the effective revegetation of bare surfaces.
- To control water within the site and allow for the discharge of runoff from the site within the limits prescribed in the Salmonid Regulations.

The purpose of incorporating a SuDS design is:

- To provide sufficient detail to ensure that water pollution will not occur as a result of construction activities at the site and to minimise the risk of any such occurrence.
- To regulate the rate of surface water run-off downslope to prevent scouring and to encourage settlement of sediment locally.
- To minimise the quantity of sediment laden stormwater and resulting settlement pond sizes by separating “clean” water from the “dirty” development runoff. This can be seen in **Planning Drawing’s No. 6289-PL-100** to **6289-PL-109**.
- To provide appropriate retention times such that no flooding will occur.
- To provide settlement ponds to encourage sedimentation and storm water runoff settlement.

4.2 Design Philosophy

The SuDS design must be managed and monitored (see Section 6) and particularly after Met Éireann Status Yellow, Orange or Red weather warnings for wind, rain or snow and during construction phase environmental auditing. The design rationale is

that of an integrated approach where each element is assessed for its potential contribution to sediment suspension and the appropriate mitigation measures integrated into the layout design. The design principles are as follows:

Minimise → Intercept → Treat → Disperse → Dilute

4.2.1 Minimise

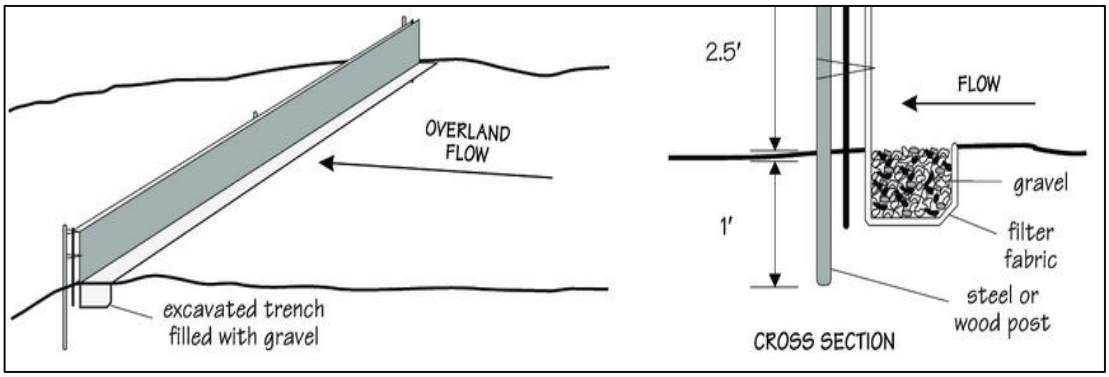


Figure 4.1: Diagram of Silt Fence[2]

The main principle of this SuDS design is to minimise the volume of 'dirty' water requiring treatment through means of informed, integrated and sustainable drainage design. It achieves this by keeping 'clean' water clean by interception and separation, and by collecting the 'dirty' water and treating it by removing the suspended sediments. The resultant outflow is dispersed across vegetation and will become diluted through contact with the clean water runoff in the buffer areas before entering site/ roadside drains.

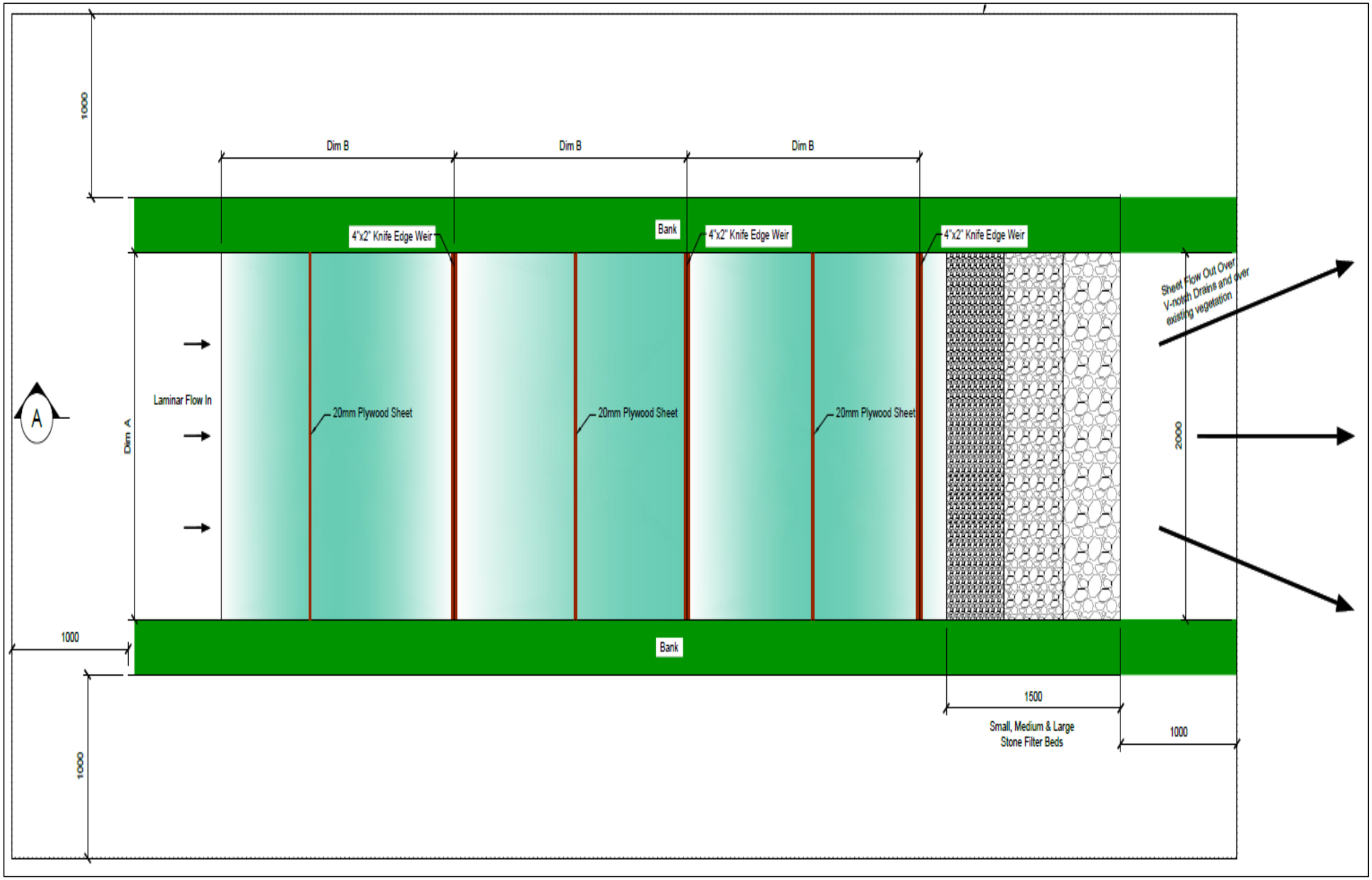


Figure 4.2: Diagram of Settlement Ponds Outlet Where Outflow is Dispersed Across Vegetated Area

4.2.2 Intercept

The key sediment control measure is the separation of construction runoff from the clean water runoff that arises in the undisturbed areas of the site and surrounding lands. This significantly reduces the volume and velocity of dirty water that the sediment and erosion control measures need to deal with. To achieve separation, clean water infiltration collector drains or silt fences are positioned on the upslope and dirty water v-drains positioned along the verge, with site surfaces sloped towards dirty water v-drains. The remainder of this clean water will be regularly piped under the Site Access Tracks and dirty water v-drains to avoid contamination. Piping the clean water regularly under the Site Access Tracks allows the clean water to follow the course it would have taken before construction thus mimicking the existing surface water sheet flow pattern of the site.

Diagrammatic cross section of Interception Infiltration Drain is as shown in **Figure 4.3**.

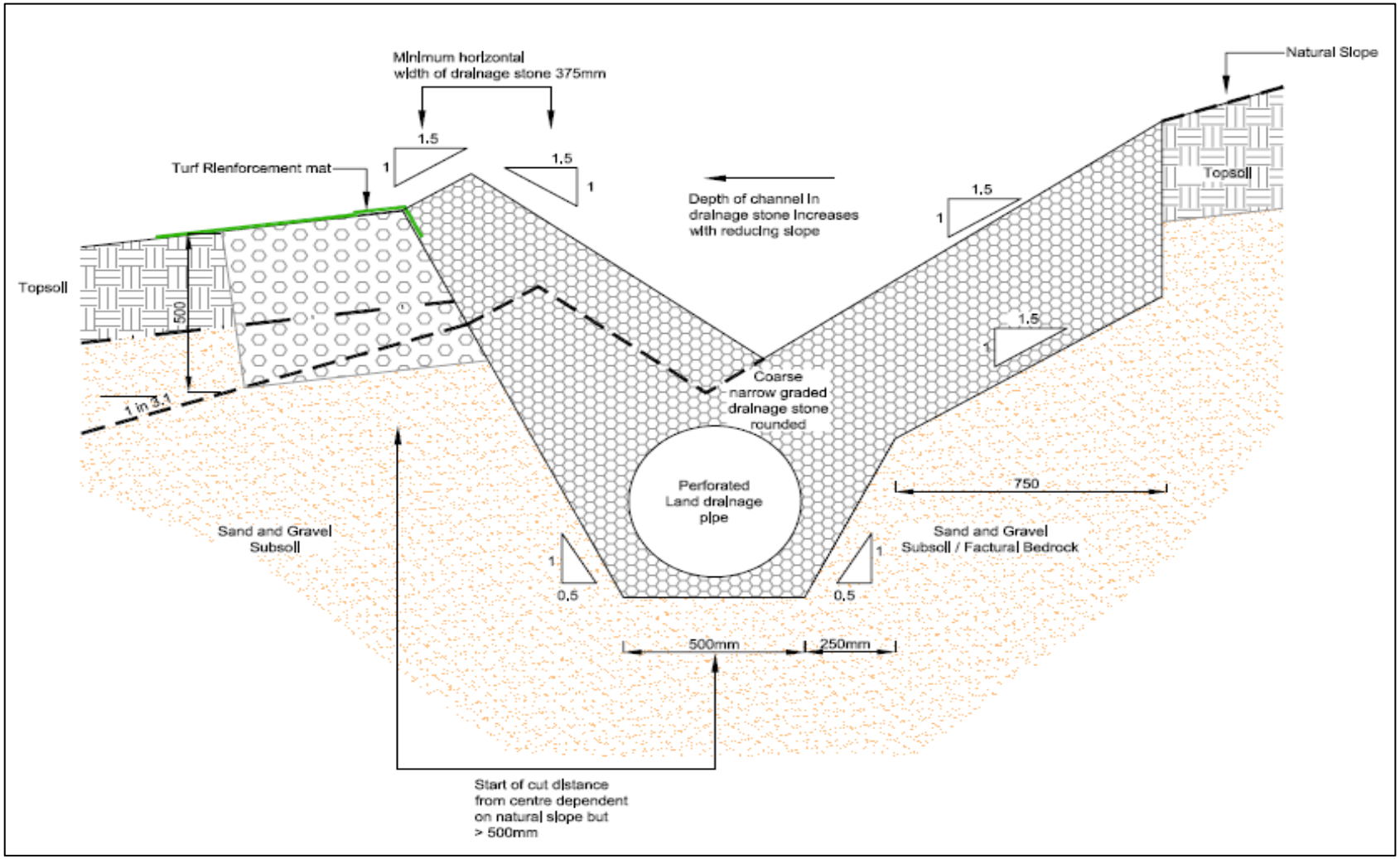


Figure 4.3: Diagrammatic cross section of Interception Infiltration Drains

4.2.3 Treat, Disperse and Dilute

The clean water infiltration interceptor drains are positioned upslope of the development footprint, to prevent any mixing of the clean and 'dirty' water. The infiltration interceptor drains redirect the clean water away from the site infrastructure, as best suits the natural topography of each sector. The clean water outflow is then discharged into either, an existing drainage network or dispersed through an area of vegetation where it can percolate into the ground naturally.

In the drawings, 'dirty water' drains, collect all incident rainwater that falls on the development infrastructure. These then drain into Settlement-Attenuation ponds. The treated effluent from the Settlement-Attenuation ponds is then dispersed across vegetation (through buffered outfalls) to further filter the discharge. Dispersal in this manner has the effect of allowing the smaller particle sizes to be taken up by the vegetation. Please see **Drawing No. 6289-PL-200** and **6289-PL-100** to **6289-PL-109**.

5 DETAILED DESIGN CONSIDERATIONS

5.1 Overview

The following elements in series are proposed:

- Interceptor drains installed up-gradient of works area will divert any clean surface water runoff around and away from works.
- Collector drains will be installed downgradient of the work areas and will collect all runoff and divert towards in-line controls.
- The in-line water treatment controls include interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sand bags, oyster bags, straw bales, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems.
- Treatment systems include temporary sumps and attenuation ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as “Siltbuster”, and/or other similar/equivalent or appropriate systems.

These measures provide a surface water management train that will mitigate any adverse impact on the hydrology of the Wind Farm Site and surrounds during the construction phase of the Proposed Development.

It should be noted that there is an existing network of forestry drains present in some areas will be integrated and enhanced as required and used within the Proposed Developments drainage system. The integration of the existing forestry drainage network and the proposed wind farm network is relatively simple. The key elements are the upgrading and improvements to water treatment elements, such as in-line controls and treatment systems, including silt traps, settlement ponds and buffered outfalls.

The main elements of interaction with existing drains will be as follows:

- Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the proposed Wind Farm Site drainage into the existing reduce the potential for any increased risk of downstream flooding or sediment transport/erosion.

- Temporary silt traps will be place in the existing drains downstream of construction works, and these will be diverted into proposed interceptor drains, or culverted under/across the work areas.
- During the operational phase of Tirawley Wind Farm, runoff from individual turbine hardstanding areas will not be discharged directly into the existing drainage network but discharged locally at each turbine location through field drains, main drains and existing settlement ponds.
- Buffered outfalls which will be numerous over the Wind Farm Site will promote percolation of drainage waters across the bog surface and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the Wind Farm Site.
- Velocity and silt control measures such as check dams, sandbags, oyster bags, straw bales, flow limiters, weirs, baffles, silt fences will be used during the upgrade of construction works.
- Existing culverts will be lengthened where necessary to facilitate access road widening.

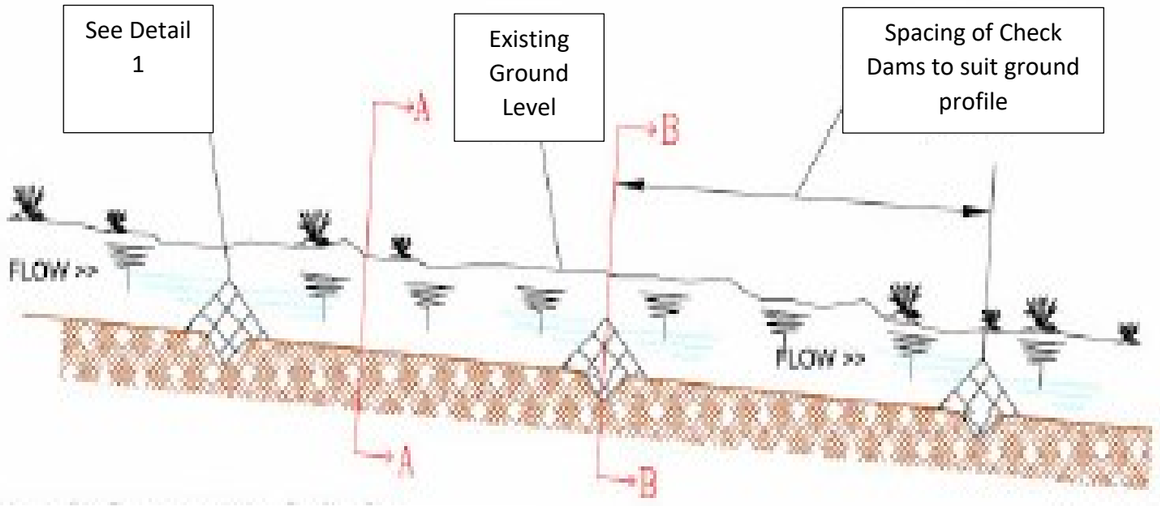
5.2 SuDS Design Principles

The approach to treatment and attenuation of storm water is as follows:

- The dimensions of drainage features will avoid intercepting large volumes of water because this could lead to an overloading of the system and a failure to treat and attenuate storm water. Any changes to the Surface Water Management Plan must be agreed with the Project Hydrologist and the Ecological Clerk of Works.
- Surface water runoff from the proposed Site Access Tracks will be managed with crossfall downslope to mimic the natural drainage patterns of the Wind Farm Site.
- Trackside drains (dirty water) are open gently sloping drainage channels to convey dirty water, trap sediment, enhance filtration and slow down the rate and magnitude of runoff that could enter the local watercourses. The drains will be a maximum of 350 mm – 500 mm in depth and the turf will be taken as a single piece and placed on the downslope side of the drain. Therefore, once construction works are complete the turves can be put back in place with minimal ecological damage.
- Drainage vegetation (vegetation including grasses established within a drainage channel can filter runoff water. Living and decomposing plants and roots and associated microorganisms trap sediments and take up excess nutrients) used will be similar in species to the local area and will be approved by the Ecological Clerk

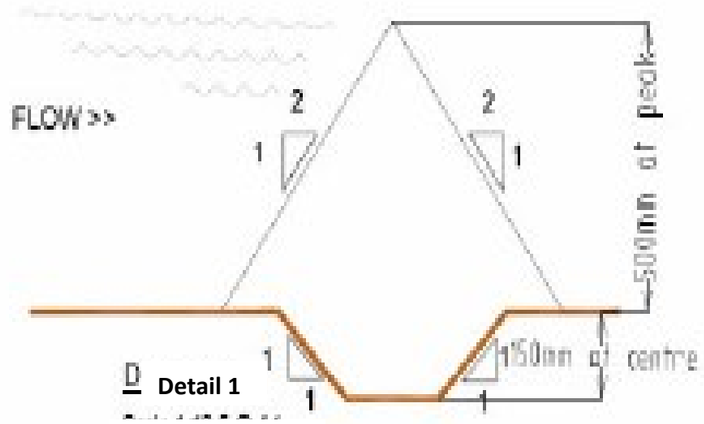
of Works.

- Temporary erosion protection together with silt fences may be required until the vegetation becomes established (coir matting or similar) as shown in **Plate 5.1**.
- Roads will be constructed from aggregate and will not be surfaced with bitumen materials, thus allowing for permeation and helping to reduce runoff volumes. Therefore, a reduced runoff coefficient of 65 % is applicable. For hardstands, an open textured stone will be used as these will only be functional during construction of the specific turbine, a higher permeability is envisaged and the run-off co-efficient is reduced to 50 %.
- An additional 20 % rainfall will be included to allow for a possible increase in rainfall intensity due to climate change.
- Settlement ponds, emplaced downstream of access road sections and at turbine locations, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to existing drains.
- Stormwater runoff within the trackside drainage will be treated through the provision of check dams, within a range depending on local slope of the drain as significant levels of sediment are not expected because of the surface dressing of the roads. All trackside drainage will drain to settlement-attenuation ponds.



Typical Longitudinal Section Through Drainage Ditch or Channel Showing Arrangement of Check Dams

Not to Scale



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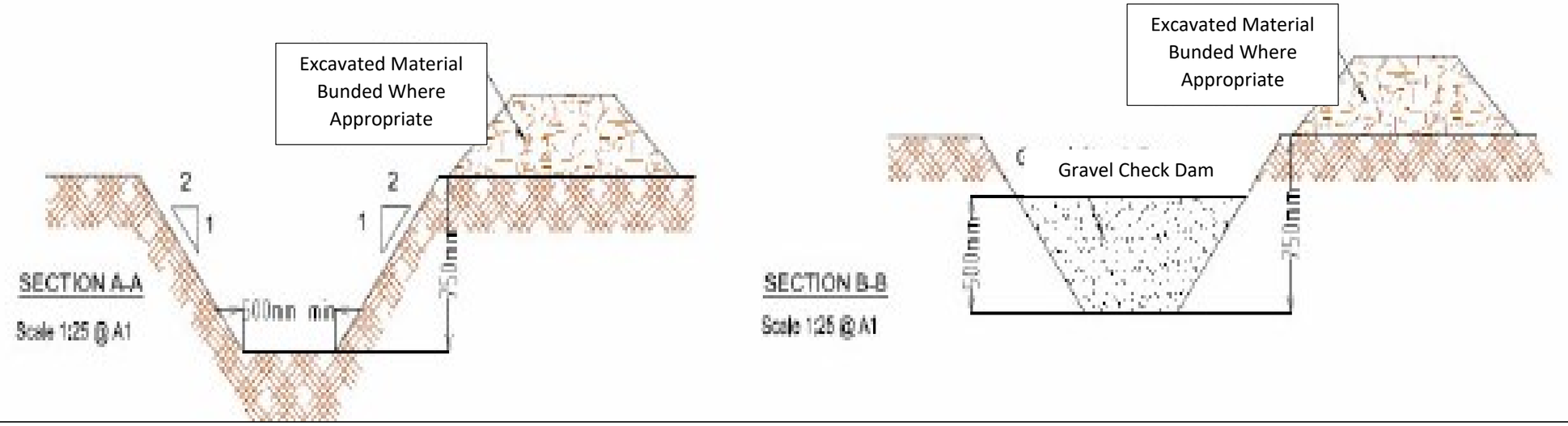


Figure 5.1: Typical Check Dam Arrangement

- The stone used for the construction of the check dams will be washed graded stone with a size range between approximately 4 mm and 40 mm, see **Figure 5.5** and **Plate 5.3**.
- Discharging directly back into the surrounding area will assist in maintaining the hydrological characteristics of the Wind Farm Site. It will prevent wetlands from drying out and without significantly impacting on ecosystems.
- Where vegetation is removed from sloped areas during construction, these areas will be reinstated as early as possible using the same vegetation or similar vegetation as advised by the ECoW.
- Under track drainage will be provided with drainage pipes at existing surface water features. The under-track drainage will provide a means for flows to pass and maintain the natural flow throughout the Wind Farm Site, see **Figure 5.2.**
- A sump may be required for trench dewatering. Water will subsequently be pumped into settlement-attenuation ponds or a siltbuster.
- The level of silt runoff during construction will be monitored which is detailed in (**Management Plan No. 2 Water Quality Management Plan** and **Chapter 9: Hydrology and Hydrogeology**) and if found to be excessive of 25 mg/L in any area, will subsequently be managed by the provision of additional silt attenuation features such as silt fences or silt traps.

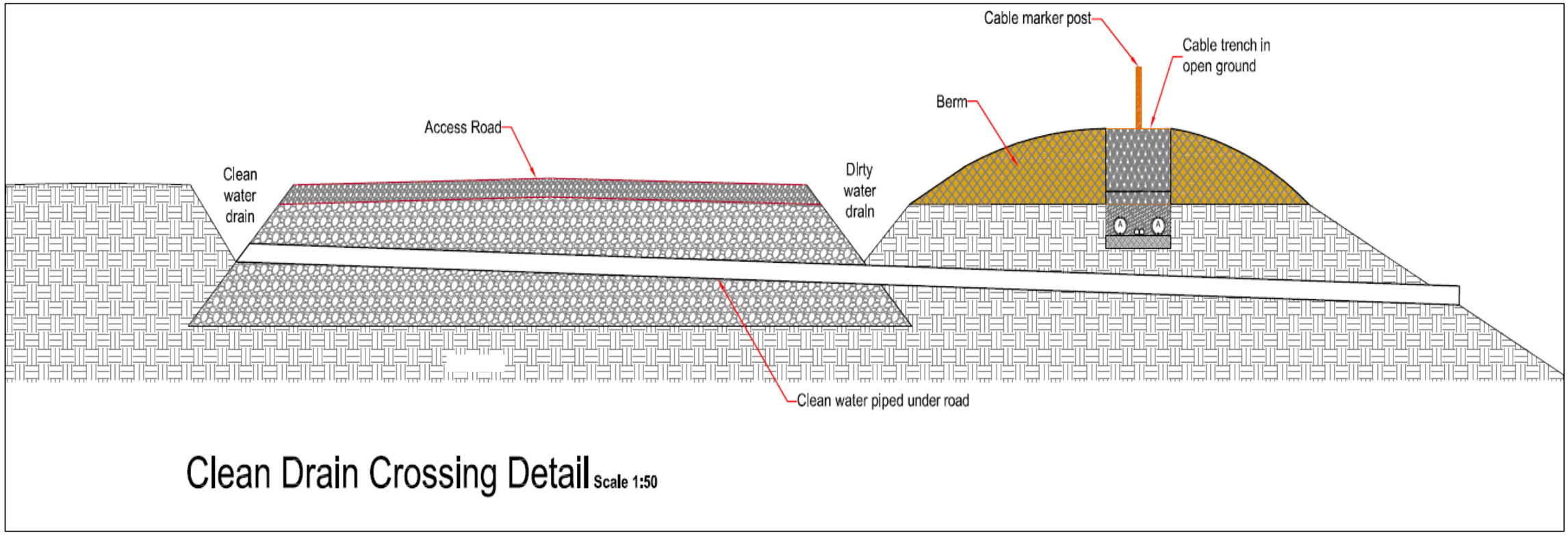


Figure 5.2: Proposed Road and Trench Sections and Drain Crossing Details

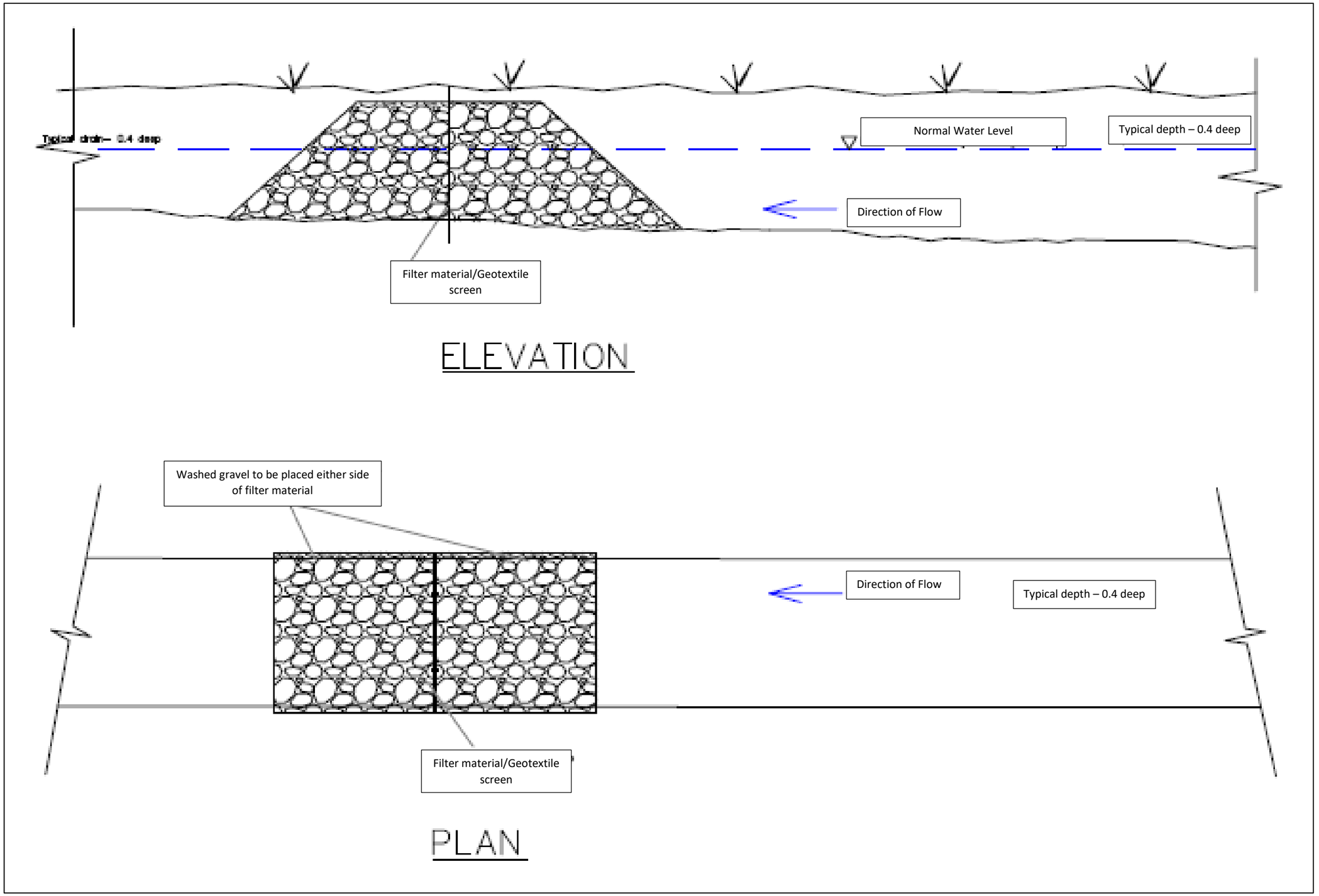


Figure 5.3: Typical Silt Trap

- Daily visual inspections will be carried out on the drainage network including all settlement-attenuations ponds and their discharge.
- Field drains will be piped directly under the track through appropriately sized drainage pipes.
- Appropriate site management measures (see **CEMP, Section 3.4** and **Section 3.5**) will be taken to ensure that runoff from the construction site is not contaminated by fuel or lubricant spillages.
- There will be no discharge of sewage effluent or contaminated drainage into any surface water feature.

Plate 5.1: Photograph of Coir Matting

5.3 Cut-off Ditches / Collector Drains (Clean Water)

These drains will be a maximum of 35 0mm – 500 mm in depth.

5.4 Trackside Drains (Dirty Water)

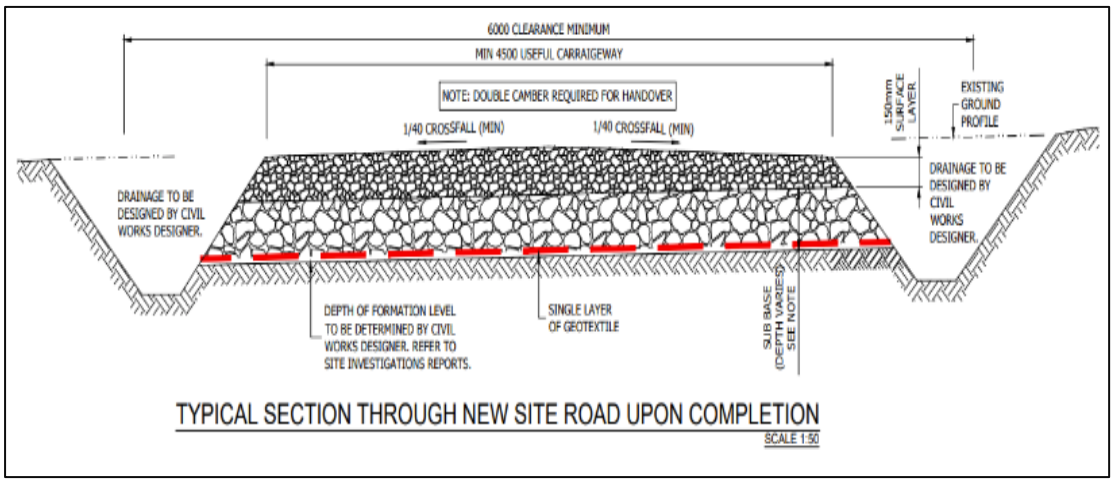


Figure 5.4: New Site Road Drainage

5.5 Silt Fences

Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids. This will act to prevent entry to the existing drainage network of sand and gravel-sized sediment, released from the excavation of mineral sub-soils of glacial and glacio-fluvial origin and entrained in surface water runoff. Inspection and maintenance of these structures during the construction phase are critical to their functioning to stated purpose. They will remain in place throughout the entire construction phase.

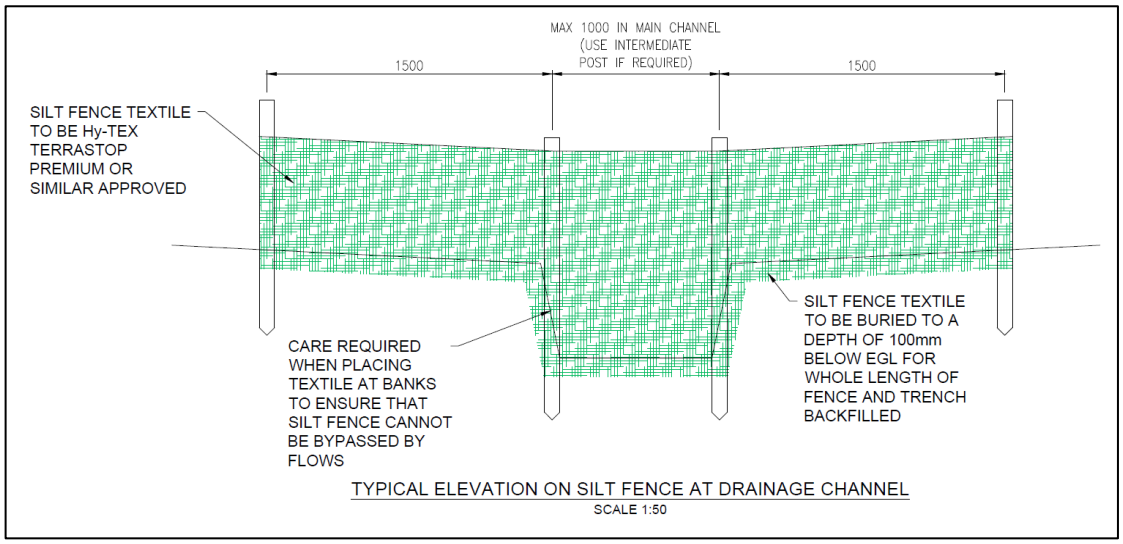


Figure 5.5: Illustration of Silt Fencing

Plate 5.2: Photograph of Silt Fencing

5.6 Filtration Check Dams

Check dams as set out in **Figure 5.6** (flow barriers or dams constructed across the drainage channel) will be installed at regular intervals within the dirty trackside drains in order to reduce erosion and allow for greater flow control. These check dams are required in order to reduce the velocity of water and therefore allow settlement of coarser sediment particles as well as silt at low flow conditions. Reduction in flow velocity will also prevent scouring of the drainage channel itself. Rock filter bunds may be used for check dams however, stone can also be used if properly anchored.

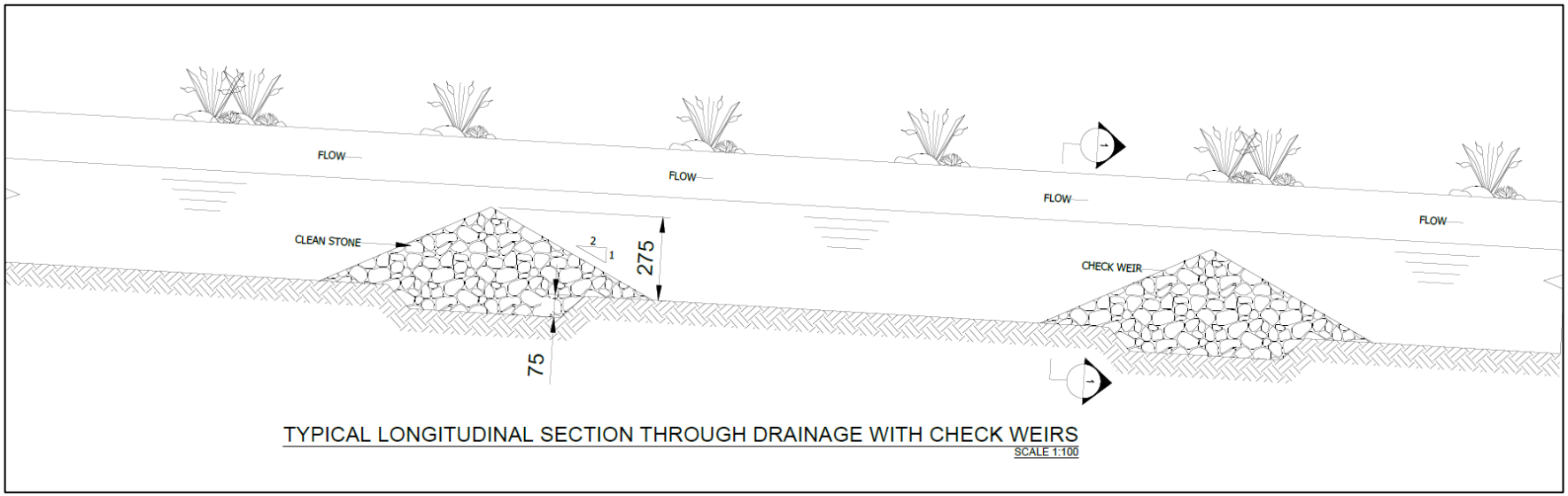


Figure 5.6: Diagram Showing the Function of Check Dams

Plate 5.3: Photograph of Check Dams

Settlement build up will be monitored daily and cleaned during the construction stage when necessary. The number and location of check dams will be dependent on the slope, flow and volume of water, although the following general rules will be applied:

- The maximum spacing between check dams should be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam;
- The centre of the check dam will be at least 0.2 m lower than the outside edges;
- Side slopes will be 1:2 or less;
- A Terram membrane barrier or similar non-woven geotextile membrane is to be placed around the check dam
- Check dams will be keyed at least 0.1 m into the drainage channel bottom in order to
- prevent the dam washing out; and
- Check dams will be maintained and monitored on a regular basis. Sediment will be removed before it reaches one half the original dam height.

Worked example for check dam spacings:

The depth of a check dam is 0.3 m high: 0.3 m x (1 in 100 gradient) = 30m spacing;
For a 0. 3 m high Check Dam: 0.3 m x (1 in 50 gradient) = 15 m spacing.

See **Table 5.1** for recommended spacings, relative to the gradient of drain, for a 0.3 m high check dam.

Table 5.1: Check Dam Spacing

Max Spacing (m)	Gradient
3 m	10 % (1 in 10)
4 m	8 % (1 in 12)
5 m	6 % (1 in 17)
6 m	5 % (1 in 20)
8 m	4 % (1 in 25)
10 m	3 % (1 In 33)
15 m	2 % (1 In 50)
20 m	1.5 % (1 in 67)
30 m	(1 in 100)

5.7 Settlement-Attenuation Ponds

Runoff from the windfarm road surface will be attenuated to mimic natural runoff patterns. To capture runoff generated within the development footprint it is proposed to use constructed trackside drains. Accumulations of runoff will then be transferred to Settlement-Attenuation ponds. See detail drawings (**Planning Drawing No. 6289-PL-202**) which display a diagrammatic cross section through a settlement pond within the drainage regime. Settlement-Attenuation ponds are to be securely fenced to prevent easy access. Three consecutive ponds are to be situated together for further settlement of particles.

Plan view of settlement ponds as shown in **Figure 5.2**.

Plate 5.4a: Completed Settlement Pond System

Plate 5.4b: Completed Settlement Pond System Showing Levels of Settlement

The ponds are utilised to attenuate and to aid the removal of suspended solids from site runoff water. All the pond locations are displayed within the site drainage drawings attached as **Appendix D**. Settlement ponds will be placed at (55) locations along the drainage footprint. The buffered outfalls from the settlement-attenuation ponds will be located in vegetated areas at buffer widths distances as specified in the Forests and Water, UK Forestry Standard Guidelines (**Table 5.2**)[1]. The settlement-attenuation ponds are deigned to settle and attenuate to ensure the suspended solids concentration of the water discharged from the ponds in <25 mg/l and will not impact any sensitive receptors (e.g. freshwater pearl mussel catchments or salmonid rivers) downstream of the construction works.

Where there is an exceedance of 25 mg/l suspended solids the discharge will be diverted to a siltbuster.

Table 5.2: Minimum buffer widths from forest edge to watercourse/body or abstraction point

Buffer width	Situation
10 m	Along permanent watercourses with a channel less than 2 m wide. (Narrower widths of buffer area may be allowable along minor watercourses with a channel less than 1 m wide, especially on steep ground.)
20 m	Along watercourses with a channel more than 2 m wide and along the edge of lakes, reservoirs, large ponds and wetlands.
50 m	Around abstraction points for public or private water supply, such as springs, wells, boreholes and surface water intakes.

The settlement-attenuation ponds will buffer volumes of runoff discharging from the drainage system during periods of high rainfall (1 in 100 yr rainfall event), by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses.

Any changes to the Surface Water Management Plan will be agreed with the ECoW before drainage works commence.

[1] Forestry Commission (2011) Forests and Water. UK Forestry Standard Guidelines. Forestry Commission, Edinburgh. i–iv + 1–80pp

Calculation parameters for the determination of storage requirements have been undertaken and are as follows:

- A 1 in 100 year rainfall return design (Source: Met Éireann - Please refer to **Appendix B**).
- An initial outlet overflow rate (the amount of water leaving the sediment pond per second per hectare) is applied of 17.65 l/s/ha (litres per second) which approximates to Greenfield run-off rates for the site. (Source: HR Wallingford – Please refer to **Appendix C**).
- The Rational Method is subsequently applied to calculate the flow volumes into each settlement pond over these respective periods. The Rational Method is expressed by the formula Q = 0.278 CiA, where Q is the peak rate of runoff in cubic feet per second, C is the run-off co-efficient, A is the drainage area in acres (i) is the average rainfall given in in/hr that occurs over the duration of a storm.
- A runoff coefficient of 0.60 (20 % for Climate Change, 50 % for runoff) is applied to all hardstand areas. These areas are only used using during the construction of turbine bases and delivery of turbine components. Therefore, their porosity will not be impacted during the construction or operation of the proposed development.
- A runoff coefficient of 0.78 (20 % for Climate Change, 65 % for runoff) is conservatively applied to the footprint areas excluding hardstands. As these areas will be used more frequently, they are more likely to become clogged with dirt and their porosity to reduce.

Table 5.3 identifies settlement-attenuation ponds designed to treat and attenuate each development catchment area. The details in **Table 5.3** are based on the calculations included in **Appendix D**.

Table 5.3: Settlement-Attenuation Pond Sizing

Ref	Development Area (m^2)	Residual Volume (m3)	Pond Dimensions			Optimised Length	Overall Volume of Attenuation Pond (m^3)
			Width (m)	Height (m)	Required Length (m)		
SP1	1755	55.9	4.00	2.0	7.0	15	56
SP2	5075	161.6	4.00	2.0	20.2	21	161.6
SP3	5410	141.2	4.00	2.0	17.7	18	141.6
SP4	5705	159.2	4.00	2.0	19.9	20	159.2
SP5	1532	48.8	3.00	1.0	16.3	17	48.9
SP6	11413	363.5	5.00	3.0	24.2	25	363
SP7	3730	159.6	4.00	2.0	19.9	20	159.2
SP8	3210	102.2	3.00	2.0	17.0	18	102
SP9	4880	155.4	3.00	2.0	25.9	26	155.4
SP10	5180	159.1	4.00	2.0	19.9	20	159.2
SP11	6940	221.0	4.00	2.0	27.6	28	220.8
SP12	5700	160.1	5.00	1.0	32.0	32	160
SP13	2330	74.2	3.00	1.0	24.7	25	74.1
SP14	2315	73.7	3.00	1.0	24.6	25	73.8
SP15	5860	294.8	10.00	1.0	29.5	30	295
SP16	2410	109.7	3.00	1.0	36.6	37	109.8
SP17	5115	232.9	4.00	2.0	29.1	30	232.8
SP18	4550	154.9	4.00	2.0	19.4	20	155.2
SP19	5745	160.9	5.00	1.0	32.2	33	161
SP20	5885	187.4	5.00	2.0	18.7	19	187
SP21	1125	35.8	3.00	1.0	11.7	12	35.1
SP22	2440	77.7	3.00	1.0	25.9	26	77.7
SP23	5690	159.1	3.00	1.0	53.0	53	159
SP24	7385	235.2	10.00	1.0	23.5	24	235
SP25	4255	135.5	5.00	1.0	27.1	28	135.5

Ref	Development Area (m^2)	Residual Volume (m3)	Pond Dimensions			Optimised Length	Overall Volume of Attenuation Pond (m^3)
			Width (m)	Height (m)	Required Length (m)		
SP26	5750	170.6	5.00	1.0	34.1	34	170.5
SP27	1665	53.0	3.00	1.0	17.7	18	53.1
SP28	555	17.7	3.00	1.0	5.9	6	17.7
SP29	2220	70.7	3.00	1.0	23.6	24	70.8
SP30	5585	96.7	3.00	1.0	32.2	33	96.6
SP31	1170	37.3	3.00	1.0	12.4	12	37.2
SP32	1185	37.7	3.00	1.0	12.6	12	37.8
SP33	825	26.3	3.00	1.0	8.8	9	26.4
SP34	5790	184.4	3.00	1.0	61.5	62	184.5
SP35	5795	159.2	5.00	1.0	31.8	32	159
SP36	7845	227.7	5.00	2.0	22.8	23	228
SP37	7345	233.9	5.00	2.0	23.4	24	234
SP38	5090	129.9	5.00	1.0	26.0	27	130
SP39	12510	398.5	4.00	2.0	49.8	50	398.4
SP40	6228	127.8	10.00	1.0	12.8	13	128
SP41	2347	74.8	3.00	1.0	24.9	25	74.7
SP42	6270	177.6	2.00	2.0	44.4	45	177.6
SP43	5750	78.0	2.00	1.0	39.0	40	78
SP44	4450	235.8	2.00	2.0	58.9	60	235.6
SP45	8110	99.1	2.00	2.0	24.8	25	99.2
SP46	12090	385.1	4.00	2.0	48.1	49	384.8
SP47	4470	142.4	3.00	2.0	23.7	24	142.2
SP48	5845	152.6	3.00	2.0	25.4	26	152.4
SP49	5515	175.7	3.00	2.0	29.3	30	175.8
SP50	4250	227.7	3.00	2.0	38.0	28	228
SP51	1950	115.6	3.00	2.0	19.3	20	115.8

Ref	Development Area (m^2)	Residual Volume (m3)	Pond Dimensions			Optimised Length	Overall Volume of Attenuation Pond (m^3)
			Width (m)	Height (m)	Required Length (m)		
SP52	6205	192.7	3.00	2.0	32.1	33	192.6
SP53	6130	177.2	3.00	2.0	29.5	30	177
SP40A	5540	143.3	3.00	2.0	23.9	24	143.4
SP40A	4250	113.2	3.00	2.0	18.9	19	113.4

5.8 Cable Trench Drainage

Cable trenches are typically constructed in short sections c. 100 m this minimises for drainage runoff to pick up large volumes of silt or suspended solids. Drainage runoff from cable trench works areas, is managed by storing excavated material on the upgradient side of the trench. Where rainfall causes runoff from the excavated material, the material is captured in the downgradient cable trench. Excess subsoil is removed from the cable trench works area immediately upon excavation. The excavated trench will be dewatered if required, from a sump installed within the low section of the opened trench. Where dewatering is required, silt laden water will be fully and appropriately attenuated, through silt bags, before being appropriately discharged to vegetation or surface water drainage feature.

On steeper slopes, silt fences will be installed temporarily downgradient of the cable trench works area, or on the downhill slope below where excavated material is being temporarily stored to control run-off.

5.9 Forestry Felling Drainage Management

Best practise methods related to water incorporated into the forestry management and water quality protection measures are as follows:

- Forest Service (2000): Forestry and Water Quality Guidelines. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford
- Forest Service, (2000): Code of Best Forest Practice – Ireland. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford
- COFORD (2004): Forest Road Manual – Guidelines for the design, construction and management of forest roads

Control Measures

- Forestry felling works must be overseen by the ECoW. Prior to the forestry works commencing the ECoW will carry out a pre-felling inspection to identify the main drainage ditches.
- Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff.
- Machinery will be chosen which will minimise soils disturbance. Consideration will be given to the use of cable-crane extraction, to reduce soil disturbance;
- Checking and maintenance of roads and culverts will be undertaken by the ECoW through the felling operation;
- No tracking of vehicles through watercourses will occur, as vehicles will use road infrastructure and watercourse crossing points;
- Drains which flow from the areas to be felled will be blocked, and temporary sediment settlement ponds and silt fences will be used;
- Brash mats will be used to support vehicles on soft ground, reducing peat and mineral soils erosion and avoiding the formation of rutted areas, in which surface water ponding will occur;
- Timber will be stacked in dry areas away from surface water buffer zones. Straw bales to be emplaced on the down-gradient side of timber processing areas;
- Surface water samples will be taken downstream during the felling works at locations (**EIAR Figure 9.7**). Daily sampling is recommended given the short duration and temporary nature of the works.

5.10 High Rainfall Events

- An emergency response system has been developed for the construction phase of the project (see **Management Plan 1: Emergency Response Plan)**.
- There will be a 24-hour advance meteorological forecasting (Met Eireann download) linked to a trigger-response system. When a pre-determined rainfall trigger levels is exceeded (e.g., sustained rainfall (any foreseen rainfall event longer than 4 hour duration) and/or any yellow or greater rainfall warning (>25mm/hour) issued by Met Eireann), planned responses will be undertaken.
- These responses will include, inter alia; cessation of construction until the storm event including storm runoff has passed over. All construction works will cease during storm events such as yellow warning rainfall events. Following heavy

rainfall events, and before construction works recommence, the Site will be inspected and corrective measures implemented to ensure safe working conditions e.g. dewatering of standing water in open excavations, etc.

- Exposed soils/peat (exposed temporary stockpiles) will be covered with plastic sheeting during all relatively heavy rainfall events and during periods where works have temporarily ceased before completion at a particular area (e.g., overnight and weekends).
- Settlement ponds, emplaced downstream of access road sections and at turbine locations, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to existing drains.
- Mitigation measures related to surface water quality as outlined in the CEMP will be implemented before excavation works commence.

6 MAINTENANCE AND MONITORING

- Surface water runoff control infrastructure will be checked daily and maintained on a monthly basis or as required.
- Settlement-Attenuation ponds and check dams will be checked daily and maintained (desludged/settle solids removed) on a monthly basis or as required, particularly during the construction phase of the Development. The agitation of solids will be kept to a minimum during these works.
- During the construction phase daily visual inspections will be carried out on all ponds and their discharge. Monthly grab samples will be taken from all ponds and sent to a laboratory to analyse the suspended solids content.
- The monitoring requirements for local surface water bodies upstream and downstream of the Site during the construction phase are outlined in **Management Plan 2- Water Quality Management Plan**.

7 POST CONSTRUCTION DRAINAGE MANAGEMENT

Following the completion of construction, all settlement-attenuation ponds will remain on site.

APPENDIX A

MET ÉIREANN RAINFALL DATA

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 116248, Northing: 336569,

	Interval		Years									
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	120,
5 mins	2.8,	4.1,	4.8,	5.8,	6.5,	7.1,	9.0,	11.1,	12.5,	14.6,	16.4,	17.8,	18.8,
10 mins	3.9,	5.7,	6.7,	8.1,	9.1,	9.9,	12.5,	15.5,	17.5,	20.3,	22.9,	24.9,	26.2,
15 mins	4.6,	6.7,	7.8,	9.5,	10.7,	11.6,	14.7,	18.2,	20.6,	23.9,	26.9,	29.2,	30.8,
30 mins	6.1,	8.7,	10.1,	12.3,	13.7,	14.9,	18.6,	22.9,	25.7,	29.8,	33.4,	36.2,	38.0,
1 hours	8.1,	11.4,	13.2,	15.8,	17.6,	19.0,	23.6,	28.8,	32.2,	37.1,	41.4,	44.7,	46.9,
2 hours	10.7,	14.8,	17.1,	20.4,	22.6,	24.3,	29.9,	36.2,	40.4,	46.2,	51.3,	55.3,	57.9,
3 hours	12.6,	17.3,	19.9,	23.6,	26.1,	28.1,	34.4,	41.4,	46.1,	52.5,	58.2,	62.6,	65.5,
4 hours	14.1,	19.4,	22.1,	26.2,	29.0,	31.1,	37.9,	45.6,	50.6,	57.5,	63.6,	68.3,	71.5,
6 hours	16.6,	22.6,	25.8,	30.4,	33.5,	35.9,	43.6,	52.1,	57.7,	65.4,	72.2,	77.4,	80.8,
9 hours	19.6,	26.4,	30.0,	35.3,	38.8,	41.4,	50.1,	59.6,	65.8,	74.3,	81.8,	87.6,	91.4,
12 hours	22.0,	29.5,	33.4,	39.2,	43.0,	45.9,	55.2,	65.5,	72.2,	81.4,	89.5,	95.6,	99.8,
18 hours	25.9,	34.5,	38.9,	45.4,	49.7,	53.0,	63.5,	75.0,	82.4,	92.6,	101.5,	108.3,	112.8,
24 hours	29.0,	38.5,	43.3,	50.4,	55.1,	58.7,	70.0,	82.4,	90.4,	101.4,	111.0,	118.2,	123.1,
2 days	38.9,	49.9,	55.5,	63.4,	68.6,	72.6,	84.9,	98.2,	106.6,	118.0,	127.9,	135.3,	140.2,
3 days	47.4,	59.8,	65.9,	74.7,	80.3,	84.6,	97.9,	112.0,	120.8,	132.8,	143.0,	150.7,	155.7,
4 days	55.3,	68.9,	75.5,	85.0,	91.0,	95.6,	109.7,	124.5,	133.8,	146.2,	156.8,	164.7,	170.0,
6 days	70.1,	85.6,	93.1,	103.7,	110.5,	115.5,	131.1,	147.2,	157.2,	170.6,	181.9,	190.3,	195.8,
8 days	83.9,	101.2,	109.5,	121.1,	128.4,	133.9,	150.7,	168.0,	178.6,	192.8,	204.7,	213.5,	219.3,
10 days	97.2,	116.0,	125.0,	137.5,	145.4,	151.3,	169.1,	187.4,	198.6,	213.5,	225.9,	235.2,	241.2,
12 days	110.1,	130.4,	140.0,	153.4,	161.7,	167.9,	186.8,	206.0,	217.7,	233.2,	246.2,	255.7,	262.0,
16 days	135.3,	158.2,	168.9,	183.7,	192.9,	199.8,	220.3,	241.2,	253.8,	270.5,	284.3,	294.5,	301.1,
20 days	160.0,	185.1,	196.8,	212.9,	222.9,	230.2,	252.3,	274.6,	288.0,	305.6,	320.2,	330.9,	337.9,
25 days	190.3,	218.0,	230.8,	248.3,	259.1,	267.1,	290.9,	314.6,	329.0,	347.6,	363.0,	374.3,	381.7,

NOTES:
These values are derived from a Depth Duration Frequency (DDF) Model update 2023
For details refer to:
'Mateus C., and Coonan, B. 2023. Estimation of point rainfall frequencies in Ireland. Technical Note No. 68. Met Eireann',
Available for download at:
http://hdl.handle.net/2262/102417

APPENDIX B

HR WALLINGFORD GREENFIELD RUN-OFF RATES

Greenfield runoff rate estimation tool

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

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

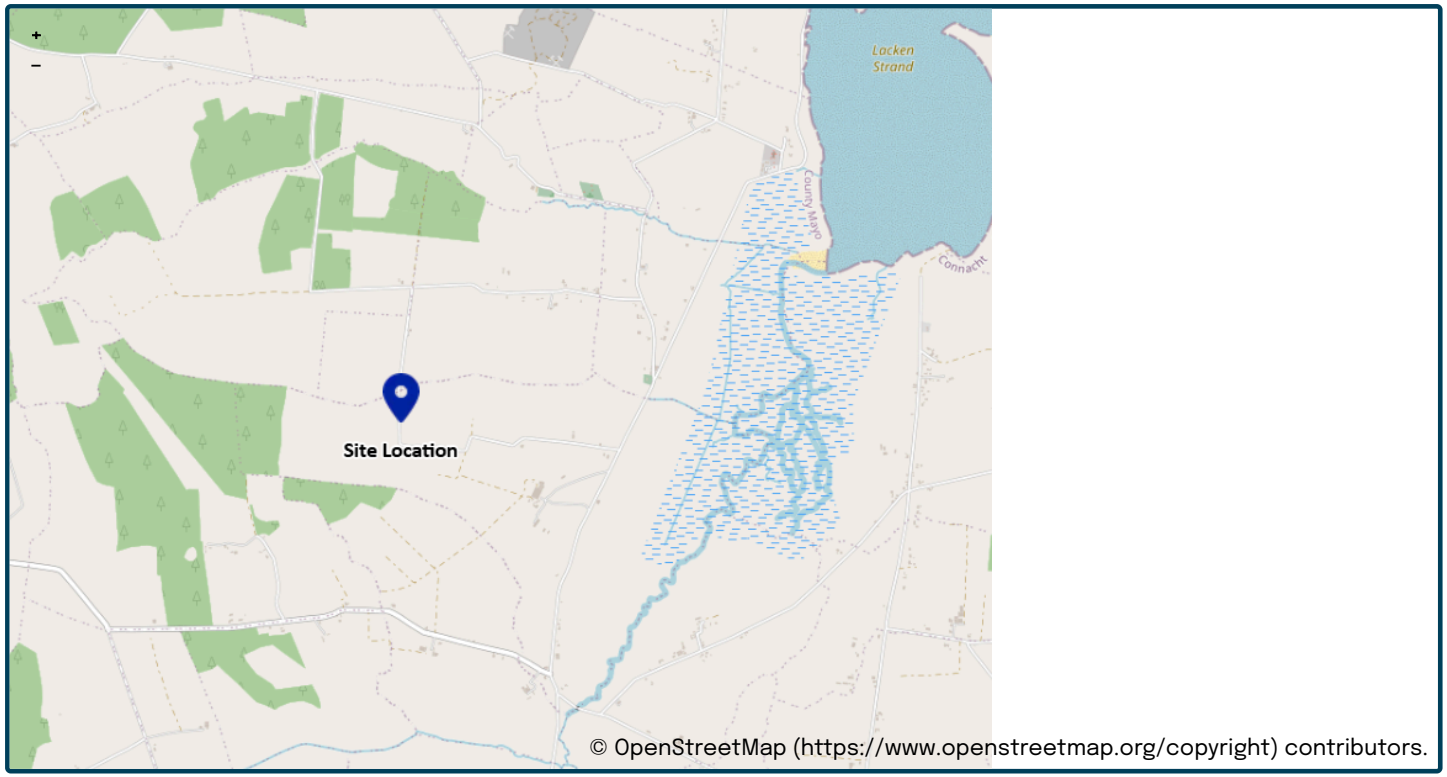
Project details

Date	25/09/2025
Calculated by	Liam Boyle
Reference	6289_Tirawley WF
Model version	2.1.2

Location

Site name: Tirawley Wind Farm

Site location: Tirawley



Site easting (Irish Grid): 116248

Site northing (Irish Grid): 335569

Site easting (Irish Transverse Mercator): 516218

Site northing (Irish Transverse Mercator): 835575

Site details

Total site area (ha): 108 ha

Greenfield runoff

Method

Method	IH124

IH124

	My value		Map value
SAAR (mm)	1288	mm	1266
How should SPR be derived?	WRAP soil type		
WRAP soil type	4		4
SPR	0.47		
QBar (IH124) (l/s)	977.74	l/s	

Growth curve factors

	My value	Map value
Hydrological region	13	13
1 year growth factor	0.85	
2 year growth factor	0.95	
10 year growth factor	1.4	
30 year growth factor	1.65	
100 year growth factor	1.95	
200 year growth factor	2.15	

Results

Method	IH124	
Flow rate 1 year (l/s)	831.1	l/s
Flow rate 2 year (l/s)	928.5	l/s
Flow rate 10 years (l/s)	1368.8	l/s
Flow rate 30 years (l/s)	1613.3	l/s
Flow rate 100 years (l/s)	1906.6	l/s
Flow rate 200 years (l/s)	2102.1	l/s

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

Disclaimer

APPENDIX C

SETTLEMENT POND SIZING CALCULATIONS

6289 Tirawley Wind Farm Co. Mayo
Tirawley Suds Drainage Design

Catchment			**SP1**	Area Excl Hardstand			water discharge rate (l/s/ha)			
Clean water natural flow								17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**	**Q**	**C**	**i (mm/hr)**	**A (km^2)**	**(m^3/s)**	**Volume (m^3)**	**Discharge (m^3/ha)**	**Discharge (m^3)**	**Residual Volume (m^3)**
5min	5	17.2	0.278	0.78	206.4	0.00176	0.079	23.6	5.3	0.9	22.6
10min	10	24	0.278	0.78	144	0.00176	0.055	32.9	10.6	1.9	31.0
15min	15	28.2	0.278	0.78	112.8	0.00176	0.043	38.6	15.9	2.8	35.8
30min	30	34.9	0.278	0.78	69.8	0.00176	0.027	47.8	31.8	5.6	42.2
M200 60min	60	43.1	0.278	0.78	43.1	0.00176	0.016	59.0	63.5	11.2	47.9
M200 2hr	120	53.3	0.278	0.78	26.65	0.00176	0.010	73.0	127.1	22.3	50.7
M200 4hr	240	66	0.278	0.78	16.5	0.00176	0.006	90.4	254.2	44.6	45.8
M200 6hr	300	74.7	0.278	0.78	14.94	0.00176	0.006	122.8	381.2	66.9	55.9
M200 12hr	600	92.3	0.278	0.78	9.23	0.00176	0.004	151.7	762.5	133.8	17.9
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00176	0.002	187.6	1525.0	267.6	-80.1
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00176	0.001	212.4	3049.9	535.3	-322.9

Catchment			SP2	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00508	0.227	68.1	5.3	2.7	65.5
M200 10min	10	24	0.278	0.78	144	0.00508	0.158	95.1	10.6	5.4	89.7
M200 15min	15	28.2	0.278	0.78	112.8	0.00508	0.124	111.7	15.9	8.1	103.7
M200 30min	30	34.9	0.278	0.78	69.8	0.00508	0.077	138.3	31.8	16.1	122.1
M200 60min	60	43.1	0.278	0.78	43.1	0.00508	0.047	170.7	63.5	32.2	138.5
M200 2hr	120	53.3	0.278	0.78	26.65	0.00508	0.029	211.2	127.1	64.5	146.7
M200 4hr	240	66	0.278	0.78	16.5	0.00508	0.018	261.5	254.2	129.0	132.5
M200 6hr	300	74.7	0.278	0.78	14.94	0.00508	0.016	355.1	381.2	193.5	161.6
M200 12hr	600	92.3	0.278	0.78	9.23	0.00508	0.010	438.8	762.5	387.0	51.8
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00508	0.006	542.4	1525.0	773.9	-231.5
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00508	0.004	614.2	3049.9	1547.8	-933.6

Catchment			SP3	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00541	0.242	72.6	5.3	2.9	69.8
M200 10min	10	24	0.278	0.78	144	0.00541	0.169	101.4	10.6	5.7	95.6
M200 15min	15	28.2	0.278	0.78	112.8	0.00541	0.132	119.1	15.9	8.6	110.5
M200 30min	30	34.9	0.278	0.78	69.8	0.00541	0.082	147.4	31.8	17.2	130.2
M200 60min	60	43.1	0.278	0.78	43.1	0.00541	0.051	182.0	63.5	34.4	147.6
M200 2hr	120	53.3	0.278	0.78	26.65	0.00541	0.031	225.1	127.1	68.8	156.3
M200 4hr	240	66	0.278	0.78	16.5	0.00541	0.019	278.7	254.2	137.5	141.2
M200 6hr	300	74.7	0.278	0.78	14.94	0.00541	0.018	378.6	381.2	206.3	172.3
M200 12hr	600	92.3	0.278	0.78	9.23	0.00541	0.011	467.8	762.5	412.5	55.3
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00541	0.007	578.2	1525.0	825.0	-246.8
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00541	0.004	654.8	3049.9	1650.0	-995.2

Catchment			SP4	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00391	0.175	52.5	5.3	2.1	50.4
M200 10min	10	24	0.278	0.78	144	0.00391	0.122	73.3	10.6	4.1	69.1
M200 15min	15	28.2	0.278	0.78	112.8	0.00391	0.096	86.1	15.9	6.2	79.9
M200 30min	30	34.9	0.278	0.78	69.8	0.00391	0.059	106.5	31.8	12.4	94.1
M200 60min	60	43.1	0.278	0.78	43.1	0.00391	0.037	131.6	63.5	24.8	106.7
M200 2hr	120	53.3	0.278	0.78	26.65	0.00391	0.023	162.7	127.1	49.7	113.0
M200 4hr	240	66	0.278	0.78	16.5	0.00391	0.014	201.4	254.2	99.4	102.1
M200 6hr	300	74.7	0.278	0.78	14.94	0.00391	0.013	273.6	381.2	149.1	124.5
M200 12hr	600	92.3	0.278	0.78	9.23	0.00391	0.008	338.1	762.5	298.1	39.9
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00391	0.005	417.9	1525.0	596.3	-178.3
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00391	0.003	473.2	3049.9	1192.5	-719.3

Catchment			SP4	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.5	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.4	15.9	2.9	27.5
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.6	31.8	5.7	31.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.5	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.5	127.1	22.8	34.6
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.1	254.2	45.6	25.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.6	381.2	68.4	28.2
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.4	762.5	136.9	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	147.6	1525.0	273.7	-126.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00180	0.001	167.1	3049.9	547.5	-380.3

Catchment			SP5	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00153	0.069	20.6	5.3	0.8	19.8
M200 10min	10	24	0.278	0.78	144	0.00153	0.048	28.7	10.6	1.6	27.1
M200 15min	15	28.2	0.278	0.78	112.8	0.00153	0.037	33.7	15.9	2.4	31.3
M200 30min	30	34.9	0.278	0.78	69.8	0.00153	0.023	41.7	31.8	4.9	36.9
M200 60min	60	43.1	0.278	0.78	43.1	0.00153	0.014	51.5	63.5	9.7	41.8
M200 2hr	120	53.3	0.278	0.78	26.65	0.00153	0.009	63.7	127.1	19.5	44.3
M200 4hr	240	66	0.278	0.78	16.5	0.00153	0.005	78.9	254.2	38.9	40.0
M200 6hr	300	74.7	0.278	0.78	14.94	0.00153	0.005	107.2	381.2	58.4	48.8
M200 12hr	600	92.3	0.278	0.78	9.23	0.00153	0.003	132.5	762.5	116.8	15.6
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00153	0.002	163.7	1525.0	233.6	-69.9
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00153	0.001	185.4	3049.9	467.2	-281.8

Catchment			SP6	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.01141	0.511	153.2	5.3	6.0	147.2
M200 10min	10	24	0.278	0.78	144	0.01141	0.356	213.8	10.6	12.1	201.7
M200 15min	15	28.2	0.278	0.78	112.8	0.01141	0.279	251.2	15.9	18.1	233.1
M200 30min	30	34.9	0.278	0.78	69.8	0.01141	0.173	310.9	31.8	36.3	274.7
M200 60min	60	43.1	0.278	0.78	43.1	0.01141	0.107	384.0	63.5	72.5	311.5
M200 2hr	120	53.3	0.278	0.78	26.65	0.01141	0.066	474.9	127.1	145.0	329.8
M200 4hr	240	66	0.278	0.78	16.5	0.01141	0.041	588.0	254.2	290.1	297.9
M200 6hr	300	74.7	0.278	0.78	14.94	0.01141	0.037	798.6	381.2	435.1	363.5
M200 12hr	600	92.3	0.278	0.78	9.23	0.01141	0.023	986.8	762.5	870.2	116.6
M200 24hr	1200	114.1	0.278	0.78	5.705	0.01141	0.014	1219.9	1525.0	1740.4	-520.6
M200 48hr	2400	129.2	0.278	0.78	3.23	0.01141	0.008	1381.3	3049.9	3480.9	-2099.6

Catchment			**SP7**	Area Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00194	0.067	20.0	5.3	1.0	19.0
M200 10min	10	24	0.278	0.6	144	0.00194	0.046	27.9	10.6	2.0	25.8
M200 15min	15	28.2	0.278	0.6	112.8	0.00194	0.036	32.8	15.9	3.1	29.7
M200 30min	30	34.9	0.278	0.6	69.8	0.00194	0.023	40.6	31.8	6.1	34.4
M200 60min	60	43.1	0.278	0.6	43.1	0.00194	0.014	50.1	63.5	12.3	37.8
M200 2hr	120	53.3	0.278	0.6	26.65	0.00194	0.009	61.9	127.1	24.6	37.3
M200 4hr	240	66	0.278	0.6	16.5	0.00194	0.005	76.7	254.2	49.2	27.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00194	0.005	104.2	381.2	73.8	30.4
M200 12hr	600	92.3	0.278	0.6	9.23	0.00194	0.003	128.7	762.5	147.5	-18.8
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00194	0.002	159.1	1525.0	295.1	-136.0
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00194	0.001	180.1	3049.9	590.2	-410.0

Catchment			**SP7**	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00180	0.080	24.1	5.3	1.0	23.2
M200 10min	10	24	0.278	0.78	144	0.00180	0.056	33.6	10.6	1.9	31.7
M200 15min	15	28.2	0.278	0.78	112.8	0.00180	0.044	39.5	15.9	2.9	36.7
M200 30min	30	34.9	0.278	0.78	69.8	0.00180	0.027	48.9	31.8	5.7	43.2
M200 60min	60	43.1	0.278	0.78	43.1	0.00180	0.017	60.4	63.5	11.4	49.0
M200 2hr	120	53.3	0.278	0.78	26.65	0.00180	0.010	74.7	127.1	22.8	51.9
M200 4hr	240	66	0.278	0.78	16.5	0.00180	0.006	92.5	254.2	45.6	46.9
M200 6hr	300	74.7	0.278	0.78	14.94	0.00180	0.006	125.6	381.2	68.4	57.2
M200 12hr	600	92.3	0.278	0.78	9.23	0.00180	0.004	155.2	762.5	136.9	18.3
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00180	0.002	191.9	1525.0	273.7	-81.9
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00180	0.001	217.2	3049.9	547.5	-330.2

Catchment			SP8	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00321	0.144	43.1	5.3	1.7	41.4
M200 10min	10	24	0.278	0.78	144	0.00321	0.100	60.1	10.6	3.4	56.7
M200 15min	15	28.2	0.278	0.78	112.8	0.00321	0.079	70.7	15.9	5.1	65.6
M200 30min	30	34.9	0.278	0.78	69.8	0.00321	0.049	87.5	31.8	10.2	77.3
M200 60min	60	43.1	0.278	0.78	43.1	0.00321	0.030	108.0	63.5	20.4	87.6
M200 2hr	120	53.3	0.278	0.78	26.65	0.00321	0.019	133.6	127.1	40.8	92.8
M200 4hr	240	66	0.278	0.78	16.5	0.00321	0.011	165.4	254.2	81.6	83.8
M200 6hr	300	74.7	0.278	0.78	14.94	0.00321	0.010	224.6	381.2	122.4	102.2
M200 12hr	600	92.3	0.278	0.78	9.23	0.00321	0.006	277.5	762.5	244.8	32.8
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00321	0.004	343.1	1525.0	489.5	-146.4
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00321	0.002	388.5	3049.9	979.0	-590.5

Catchment			SP9	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00488	0.218	65.5	5.3	2.6	62.9
M200 10min	10	24	0.278	0.78	144	0.00488	0.152	91.4	10.6	5.2	86.3
M200 15min	15	28.2	0.278	0.78	112.8	0.00488	0.119	107.4	15.9	7.8	99.7
M200 30min	30	34.9	0.278	0.78	69.8	0.00488	0.074	132.9	31.8	15.5	117.4
M200 60min	60	43.1	0.278	0.78	43.1	0.00488	0.046	164.2	63.5	31.0	133.2
M200 2hr	120	53.3	0.278	0.78	26.65	0.00488	0.028	203.0	127.1	62.0	141.0
M200 4hr	240	66	0.278	0.78	16.5	0.00488	0.017	251.4	254.2	124.0	127.4
M200 6hr	300	74.7	0.278	0.78	14.94	0.00488	0.016	341.5	381.2	186.0	155.4
M200 12hr	600	92.3	0.278	0.78	9.23	0.00488	0.010	421.9	762.5	372.1	49.8
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00488	0.006	521.6	1525.0	744.2	-222.6
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00488	0.003	590.6	3049.9	1488.4	-897.7

Catchment			SP10	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00339	0.151	45.4	5.3	1.8	43.7
M200 10min	10	24	0.278	0.78	144	0.00339	0.106	63.4	10.6	3.6	59.8
M200 15min	15	28.2	0.278	0.78	112.8	0.00339	0.083	74.5	15.9	5.4	69.1
M200 30min	30	34.9	0.278	0.78	69.8	0.00339	0.051	92.2	31.8	10.8	81.5
M200 60min	60	43.1	0.278	0.78	43.1	0.00339	0.032	113.9	63.5	21.5	92.4
M200 2hr	120	53.3	0.278	0.78	26.65	0.00339	0.020	140.8	127.1	43.0	97.8
M200 4hr	240	66	0.278	0.78	16.5	0.00339	0.012	174.4	254.2	86.0	88.4
M200 6hr	300	74.7	0.278	0.78	14.94	0.00339	0.011	236.9	381.2	129.0	107.8
M200 12hr	600	92.3	0.278	0.78	9.23	0.00339	0.007	292.7	762.5	258.1	34.6
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00339	0.004	361.8	1525.0	516.2	-154.4
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00339	0.002	409.7	3049.9	1032.4	-622.7

Catchment			SP10	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.5	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.4	15.9	2.9	27.5
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.6	31.8	5.7	31.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.5	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.5	127.1	22.8	34.6
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.1	254.2	45.6	25.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.6	381.2	68.4	28.2
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.4	762.5	136.9	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	147.6	1525.0	273.7	-126.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00180	0.001	167.1	3049.9	547.5	-380.3

Catchment			SP11	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00694	0.311	93.2	5.3	3.7	89.5
M200 10min	10	24	0.278	0.78	144	0.00694	0.217	130.0	10.6	7.3	122.7
M200 15min	15	28.2	0.278	0.78	112.8	0.00694	0.170	152.8	15.9	11.0	141.8
M200 30min	30	34.9	0.278	0.78	69.8	0.00694	0.105	189.1	31.8	22.0	167.0
M200 60min	60	43.1	0.278	0.78	43.1	0.00694	0.065	233.5	63.5	44.1	189.4
M200 2hr	120	53.3	0.278	0.78	26.65	0.00694	0.040	288.8	127.1	88.2	200.6
M200 4hr	240	66	0.278	0.78	16.5	0.00694	0.025	357.6	254.2	176.4	181.2
M200 6hr	300	74.7	0.278	0.78	14.94	0.00694	0.022	485.6	381.2	264.6	221.0
M200 12hr	600	92.3	0.278	0.78	9.23	0.00694	0.014	600.0	762.5	529.2	70.9
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00694	0.009	741.8	1525.0	1058.3	-316.6
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00694	0.005	839.9	3049.9	2116.6	-1276.7

Catchment			SP12	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00174	0.060	18.0	5.3	0.9	17.0
M200 10min	10	24	0.278	0.6	144	0.00174	0.042	25.1	10.6	1.8	23.2
M200 15min	15	28.2	0.278	0.6	112.8	0.00174	0.033	29.5	15.9	2.8	26.7
M200 30min	30	34.9	0.278	0.6	69.8	0.00174	0.020	36.5	31.8	5.5	30.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00174	0.013	45.0	63.5	11.1	34.0
M200 2hr	120	53.3	0.278	0.6	26.65	0.00174	0.008	55.7	127.1	22.1	33.6
M200 4hr	240	66	0.278	0.6	16.5	0.00174	0.005	69.0	254.2	44.2	24.7
M200 6hr	300	74.7	0.278	0.6	14.94	0.00174	0.004	93.7	381.2	66.3	27.3
M200 12hr	600	92.3	0.278	0.6	9.23	0.00174	0.003	115.7	762.5	132.7	-16.9
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00174	0.002	143.1	1525.0	265.3	-122.3
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00174	0.001	162.0	3049.9	530.7	-368.7

Catchment			SP12	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00396	0.177	53.2	5.3	2.1	51.1
M200 10min	10	24	0.278	0.78	144	0.00396	0.124	74.2	10.6	4.2	70.0
M200 15min	15	28.2	0.278	0.78	112.8	0.00396	0.097	87.2	15.9	6.3	80.9
M200 30min	30	34.9	0.278	0.78	69.8	0.00396	0.060	107.9	31.8	12.6	95.3
M200 60min	60	43.1	0.278	0.78	43.1	0.00396	0.037	133.2	63.5	25.2	108.1
M200 2hr	120	53.3	0.278	0.78	26.65	0.00396	0.023	164.8	127.1	50.3	114.4
M200 4hr	240	66	0.278	0.78	16.5	0.00396	0.014	204.0	254.2	100.6	103.4
M200 6hr	300	74.7	0.278	0.78	14.94	0.00396	0.013	277.1	381.2	151.0	126.1
M200 12hr	600	92.3	0.278	0.78	9.23	0.00396	0.008	342.4	762.5	301.9	40.4
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00396	0.005	423.3	1525.0	603.9	-180.6
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00396	0.003	479.3	3049.9	1207.8	-728.5

Catchment			SP13	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00233	0.104	31.3	5.3	1.2	30.1
M200 10min	10	24	0.278	0.78	144	0.00233	0.073	43.7	10.6	2.5	41.2
M200 15min	15	28.2	0.278	0.78	112.8	0.00233	0.057	51.3	15.9	3.7	47.6
M200 30min	30	34.9	0.278	0.78	69.8	0.00233	0.035	63.5	31.8	7.4	56.1
M200 60min	60	43.1	0.278	0.78	43.1	0.00233	0.022	78.4	63.5	14.8	63.6
M200 2hr	120	53.3	0.278	0.78	26.65	0.00233	0.013	96.9	127.1	29.6	67.3
M200 4hr	240	66	0.278	0.78	16.5	0.00233	0.008	120.0	254.2	59.2	60.8
M200 6hr	300	74.7	0.278	0.78	14.94	0.00233	0.008	163.0	381.2	88.8	74.2
M200 12hr	600	92.3	0.278	0.78	9.23	0.00233	0.005	201.5	762.5	177.7	23.8
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00233	0.003	249.0	1525.0	355.3	-106.3
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00233	0.002	282.0	3049.9	710.6	-428.6

Catchment			SP14	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	FALSE	0.000	0.0	5.3	0.0	0.0
M200 10min	10	24	0.278	0.78	144	0.00232	0.072	43.4	10.6	2.5	40.9
M200 15min	15	28.2	0.278	0.78	112.8	0.00232	0.057	51.0	15.9	3.7	47.3
M200 30min	30	34.9	0.278	0.78	69.8	0.00232	0.035	63.1	31.8	7.4	55.7
M200 60min	60	43.1	0.278	0.78	43.1	0.00232	0.022	77.9	63.5	14.7	63.2
M200 2hr	120	53.3	0.278	0.78	26.65	0.00232	0.013	96.3	127.1	29.4	66.9
M200 4hr	240	66	0.278	0.78	16.5	0.00232	0.008	119.3	254.2	58.8	60.4
M200 6hr	300	74.7	0.278	0.78	14.94	0.00232	0.007	162.0	381.2	88.3	73.7
M200 12hr	600	92.3	0.278	0.78	9.23	0.00232	0.005	200.2	762.5	176.5	23.6
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00232	0.003	247.4	1525.0	353.0	-105.6
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00232	0.002	280.2	3049.9	706.1	-425.9

Catchment			SP15	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.5	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.4	15.9	2.9	27.5
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.6	31.8	5.7	31.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.5	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.5	127.1	22.8	34.6
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.1	254.2	45.6	25.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.6	381.2	68.4	28.2
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.4	762.5	136.9	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	147.6	1525.0	273.7	-126.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00180	0.001	167.1	3049.9	547.5	-380.3

Catchment			SP15	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	20.8	0.278	0.78	249.6	0.00407	0.220	66.0	5.3	2.2	63.9
M200 10min	10	29	0.278	0.78	174	0.00407	0.153	92.0	10.6	4.3	87.7
M200 15min	15	34.1	0.278	0.78	136.4	0.00407	0.120	108.2	15.9	6.5	101.8
M200 30min	30	42.1	0.278	0.78	84.2	0.00407	0.074	133.6	31.8	12.9	120.7
M200 60min	60	51.9	0.278	0.78	51.9	0.00407	0.046	164.7	63.5	25.8	138.9
M200 2hr	120	64	0.278	0.78	32	0.00407	0.028	203.1	127.1	51.7	151.4
M200 4hr	240	79	0.278	0.78	19.75	0.00407	0.017	250.7	254.2	103.3	147.4
M200 6hr	300	89.3	0.278	0.78	17.86	0.00407	0.016	340.0	381.2	155.0	185.1
M200 12hr	600	110.2	0.278	0.78	11.02	0.00407	0.010	419.6	762.5	309.9	109.7
M200 24hr	1200	135.9	0.278	0.78	6.795	0.00407	0.006	517.5	1525.0	619.9	-102.4
M200 48hr	2400	148.4	0.278	0.78	3.71	0.00407	0.003	565.1	3049.9	1239.8	-674.7

Catchment			SP16	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	20.8	0.278	0.78	249.6	0.00241	0.130	39.1	5.3	1.3	37.9
M200 10min	10	29	0.278	0.78	174	0.00241	0.091	54.6	10.6	2.6	52.0
M200 15min	15	34.1	0.278	0.78	136.4	0.00241	0.071	64.2	15.9	3.8	60.3
M200 30min	30	42.1	0.278	0.78	84.2	0.00241	0.044	79.2	31.8	7.7	71.5
M200 60min	60	51.9	0.278	0.78	51.9	0.00241	0.027	97.6	63.5	15.3	82.3
M200 2hr	120	64	0.278	0.78	32	0.00241	0.017	120.4	127.1	30.6	89.8
M200 4hr	240	79	0.278	0.78	19.75	0.00241	0.010	148.6	254.2	61.3	87.4
M200 6hr	300	89.3	0.278	0.78	17.86	0.00241	0.009	201.6	381.2	91.9	109.7
M200 12hr	600	110.2	0.278	0.78	11.02	0.00241	0.006	248.8	762.5	183.8	65.0
M200 24hr	1200	135.9	0.278	0.78	6.795	0.00241	0.004	306.8	1525.0	367.5	-60.7
M200 48hr	2400	148.4	0.278	0.78	3.71	0.00241	0.002	335.0	3049.9	735.0	-400.0

Catchment			SP17	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	20.8	0.278	0.78	249.6	0.00512	0.277	83.1	5.3	2.7	80.3
M200 10min	10	29	0.278	0.78	174	0.00512	0.193	115.8	10.6	5.4	110.4
M200 15min	15	34.1	0.278	0.78	136.4	0.00512	0.151	136.2	15.9	8.1	128.0
M200 30min	30	42.1	0.278	0.78	84.2	0.00512	0.093	168.1	31.8	16.3	151.9
M200 60min	60	51.9	0.278	0.78	51.9	0.00512	0.058	207.2	63.5	32.5	174.7
M200 2hr	120	64	0.278	0.78	32	0.00512	0.035	255.5	127.1	65.0	190.5
M200 4hr	240	79	0.278	0.78	19.75	0.00512	0.022	315.4	254.2	130.0	185.4
M200 6hr	300	89.3	0.278	0.78	17.86	0.00512	0.020	427.9	381.2	195.0	232.9
M200 12hr	600	110.2	0.278	0.78	11.02	0.00512	0.012	528.0	762.5	390.0	138.0
M200 24hr	1200	135.9	0.278	0.78	6.795	0.00512	0.008	651.2	1525.0	780.0	-128.9
M200 48hr	2400	148.4	0.278	0.78	3.71	0.00512	0.004	711.1	3049.9	1560.0	-849.0

Catchment			SP18	Hardstand				water discharge rate (l/s)			
Clean water natural flow									22.97		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	20.8	0.278	0.78	249.6	0.00455	0.246	73.9	6.9	3.1	70.7
M200 10min	10	29	0.278	0.78	174	0.00455	0.172	103.0	13.8	6.3	96.7
M200 15min	15	34.1	0.278	0.78	136.4	0.00455	0.135	121.1	20.7	9.4	111.7
M200 30min	30	42.1	0.278	0.78	84.2	0.00455	0.083	149.5	41.3	18.8	130.7
M200 60min	60	51.9	0.278	0.78	51.9	0.00455	0.051	184.3	82.7	37.6	146.7
M200 2hr	120	64	0.278	0.78	32	0.00455	0.032	227.3	165.4	75.2	152.1
M200 4hr	240	79	0.278	0.78	19.75	0.00455	0.019	280.6	330.8	150.5	130.1
M200 6hr	300	89.3	0.278	0.78	17.86	0.00455	0.018	380.6	496.2	225.7	154.9
M200 12hr	600	110.2	0.278	0.78	11.02	0.00455	0.011	469.7	992.3	451.5	18.2
M200 24hr	1200	135.9	0.278	0.78	6.795	0.00455	0.007	579.2	1984.6	903.0	-323.8
M200 48hr	2400	148.4	0.278	0.78	3.71	0.00455	0.004	632.5	3969.2	1806.0	-1173.5

Catchment			SP19	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00395	0.177	53.0	5.3	2.1	50.9
M200 10min	10	24	0.278	0.78	144	0.00395	0.123	74.0	10.6	4.2	69.8
M200 15min	15	28.2	0.278	0.78	112.8	0.00395	0.097	87.0	15.9	6.3	80.7
M200 30min	30	34.9	0.278	0.78	69.8	0.00395	0.060	107.6	31.8	12.5	95.1
M200 60min	60	43.1	0.278	0.78	43.1	0.00395	0.037	132.9	63.5	25.1	107.8
M200 2hr	120	53.3	0.278	0.78	26.65	0.00395	0.023	164.3	127.1	50.2	114.2
M200 4hr	240	66	0.278	0.78	16.5	0.00395	0.014	203.5	254.2	100.4	103.1
M200 6hr	300	74.7	0.278	0.78	14.94	0.00395	0.013	276.4	381.2	150.6	125.8
M200 12hr	600	92.3	0.278	0.78	9.23	0.00395	0.008	341.5	762.5	301.2	40.3
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00395	0.005	422.2	1525.0	602.4	-180.2
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00395	0.003	478.1	3049.9	1204.7	-726.7

Catchment			SP19	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.5	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.4	15.9	2.9	27.5
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.6	31.8	5.7	31.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.5	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.5	127.1	22.8	34.6
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.1	254.2	45.6	25.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.6	381.2	68.4	28.2
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.4	762.5	136.9	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	147.6	1525.0	273.7	-126.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00180	0.001	167.1	3049.9	547.5	-380.3

Catchment			SP20	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00589	0.263	79.0	5.3	3.1	75.9
M200 10min	10	24	0.278	0.78	144	0.00589	0.184	110.3	10.6	6.2	104.0
M200 15min	15	28.2	0.278	0.78	112.8	0.00589	0.144	129.6	15.9	9.3	120.2
M200 30min	30	34.9	0.278	0.78	69.8	0.00589	0.089	160.3	31.8	18.7	141.6
M200 60min	60	43.1	0.278	0.78	43.1	0.00589	0.055	198.0	63.5	37.4	160.6
M200 2hr	120	53.3	0.278	0.78	26.65	0.00589	0.034	244.9	127.1	74.8	170.1
M200 4hr	240	66	0.278	0.78	16.5	0.00589	0.021	303.2	254.2	149.6	153.6
M200 6hr	300	74.7	0.278	0.78	14.94	0.00589	0.019	411.8	381.2	224.4	187.4
M200 12hr	600	92.3	0.278	0.78	9.23	0.00589	0.012	508.8	762.5	448.7	60.1
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00589	0.007	629.0	1525.0	897.4	-268.4
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00589	0.004	712.2	3049.9	1794.9	-1082.6

Catchment			SP21	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00113	0.050	15.1	5.3	0.6	14.5
M200 10min	10	24	0.278	0.78	144	0.00113	0.035	21.1	10.6	1.2	19.9
M200 15min	15	28.2	0.278	0.78	112.8	0.00113	0.028	24.8	15.9	1.8	23.0
M200 30min	30	34.9	0.278	0.78	69.8	0.00113	0.017	30.6	31.8	3.6	27.1
M200 60min	60	43.1	0.278	0.78	43.1	0.00113	0.011	37.9	63.5	7.1	30.7
M200 2hr	120	53.3	0.278	0.78	26.65	0.00113	0.007	46.8	127.1	14.3	32.5
M200 4hr	240	66	0.278	0.78	16.5	0.00113	0.004	58.0	254.2	28.6	29.4
M200 6hr	300	74.7	0.278	0.78	14.94	0.00113	0.004	78.7	381.2	42.9	35.8
M200 12hr	600	92.3	0.278	0.78	9.23	0.00113	0.002	97.3	762.5	85.8	11.5
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00113	0.001	120.2	1525.0	171.6	-51.3
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00113	0.001	136.2	3049.9	343.1	-207.0

Catchment			SP22	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00244	0.109	32.8	5.3	1.3	31.5
M200 10min	10	24	0.278	0.78	144	0.00244	0.076	45.7	10.6	2.6	43.1
M200 15min	15	28.2	0.278	0.78	112.8	0.00244	0.060	53.7	15.9	3.9	49.8
M200 30min	30	34.9	0.278	0.78	69.8	0.00244	0.037	66.5	31.8	7.8	58.7
M200 60min	60	43.1	0.278	0.78	43.1	0.00244	0.023	82.1	63.5	15.5	66.6
M200 2hr	120	53.3	0.278	0.78	26.65	0.00244	0.014	101.5	127.1	31.0	70.5
M200 4hr	240	66	0.278	0.78	16.5	0.00244	0.009	125.7	254.2	62.0	63.7
M200 6hr	300	74.7	0.278	0.78	14.94	0.00244	0.008	170.7	381.2	93.0	77.7
M200 12hr	600	92.3	0.278	0.78	9.23	0.00244	0.005	211.0	762.5	186.0	24.9
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00244	0.003	260.8	1525.0	372.1	-111.3
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00244	0.002	295.3	3049.9	744.2	-448.9

Catchment			SP23	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.5	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.4	15.9	2.9	27.5
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.6	31.8	5.7	31.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.5	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.5	127.1	22.8	34.6
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.1	254.2	45.6	25.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.6	381.2	68.4	28.2
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.4	762.5	136.9	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	147.6	1525.0	273.7	-126.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00180	0.001	167.1	3049.9	547.5	-380.3

Catchment			SP23	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00390	0.174	52.3	5.3	2.1	50.2
M200 10min	10	24	0.278	0.78	144	0.00390	0.122	73.0	10.6	4.1	68.8
M200 15min	15	28.2	0.278	0.78	112.8	0.00390	0.095	85.7	15.9	6.2	79.6
M200 30min	30	34.9	0.278	0.78	69.8	0.00390	0.059	106.1	31.8	12.4	93.7
M200 60min	60	43.1	0.278	0.78	43.1	0.00390	0.036	131.0	63.5	24.7	106.3
M200 2hr	120	53.3	0.278	0.78	26.65	0.00390	0.023	162.1	127.1	49.5	112.6
M200 4hr	240	66	0.278	0.78	16.5	0.00390	0.014	200.7	254.2	99.0	101.7
M200 6hr	300	74.7	0.278	0.78	14.94	0.00390	0.013	272.6	381.2	148.5	124.1
M200 12hr	600	92.3	0.278	0.78	9.23	0.00390	0.008	336.8	762.5	297.0	39.8
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00390	0.005	416.3	1525.0	594.0	-177.7
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00390	0.003	471.4	3049.9	1187.9	-716.5

Catchment			SP24	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00739	0.331	99.2	5.3	3.9	95.2
M200 10min	10	24	0.278	0.78	144	0.00739	0.231	138.4	10.6	7.8	130.5
M200 15min	15	28.2	0.278	0.78	112.8	0.00739	0.181	162.6	15.9	11.7	150.8
M200 30min	30	34.9	0.278	0.78	69.8	0.00739	0.112	201.2	31.8	23.5	177.7
M200 60min	60	43.1	0.278	0.78	43.1	0.00739	0.069	248.5	63.5	46.9	201.5
M200 2hr	120	53.3	0.278	0.78	26.65	0.00739	0.043	307.3	127.1	93.8	213.4
M200 4hr	240	66	0.278	0.78	16.5	0.00739	0.026	380.5	254.2	187.7	192.8
M200 6hr	300	74.7	0.278	0.78	14.94	0.00739	0.024	516.8	381.2	281.5	235.2
M200 12hr	600	92.3	0.278	0.78	9.23	0.00739	0.015	638.5	762.5	563.1	75.4
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00739	0.009	789.3	1525.0	1126.2	-336.9
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00739	0.005	893.8	3049.9	2252.4	-1358.6

Catchment			SP25	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00426	0.190	57.1	5.3	2.3	54.9
M200 10min	10	24	0.278	0.78	144	0.00426	0.133	79.7	10.6	4.5	75.2
M200 15min	15	28.2	0.278	0.78	112.8	0.00426	0.104	93.7	15.9	6.8	86.9
M200 30min	30	34.9	0.278	0.78	69.8	0.00426	0.064	115.9	31.8	13.5	102.4
M200 60min	60	43.1	0.278	0.78	43.1	0.00426	0.040	143.2	63.5	27.0	116.1
M200 2hr	120	53.3	0.278	0.78	26.65	0.00426	0.025	177.0	127.1	54.1	123.0
M200 4hr	240	66	0.278	0.78	16.5	0.00426	0.015	219.2	254.2	108.1	111.1
M200 6hr	300	74.7	0.278	0.78	14.94	0.00426	0.014	297.7	381.2	162.2	135.5
M200 12hr	600	92.3	0.278	0.78	9.23	0.00426	0.009	367.9	762.5	324.4	43.5
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00426	0.005	454.8	1525.0	648.9	-194.1
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00426	0.003	515.0	3049.9	1297.7	-782.8

Catchment			SP26	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.5	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.4	15.9	2.9	27.5
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.6	31.8	5.7	31.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.5	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.5	127.1	22.8	34.6
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.1	254.2	45.6	25.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.6	381.2	68.4	28.2
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.4	762.5	136.9	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	147.6	1525.0	273.7	-126.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00180	0.001	167.1	3049.9	547.5	-380.3

Catchment			SP26	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00194	0.087	26.0	5.3	1.0	25.0
M200 10min	10	24	0.278	0.78	144	0.00194	0.060	36.3	10.6	2.0	34.2
M200 15min	15	28.2	0.278	0.78	112.8	0.00194	0.047	42.6	15.9	3.1	39.5
M200 30min	30	34.9	0.278	0.78	69.8	0.00194	0.029	52.7	31.8	6.1	46.6
M200 60min	60	43.1	0.278	0.78	43.1	0.00194	0.018	65.1	63.5	12.3	52.8
M200 2hr	120	53.3	0.278	0.78	26.65	0.00194	0.011	80.5	127.1	24.6	55.9
M200 4hr	240	66	0.278	0.78	16.5	0.00194	0.007	99.7	254.2	49.2	50.5
M200 6hr	300	74.7	0.278	0.78	14.94	0.00194	0.006	135.4	381.2	73.8	61.6
M200 12hr	600	92.3	0.278	0.78	9.23	0.00194	0.004	167.3	762.5	147.5	19.8
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00194	0.002	206.8	1525.0	295.1	-88.3
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00194	0.001	234.2	3049.9	590.2	-356.0

Catchment			SP27	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00167	0.075	22.4	5.3	0.9	21.5
M200 10min	10	24	0.278	0.78	144	0.00167	0.052	31.2	10.6	1.8	29.4
M200 15min	15	28.2	0.278	0.78	112.8	0.00167	0.041	36.7	15.9	2.6	34.0
M200 30min	30	34.9	0.278	0.78	69.8	0.00167	0.025	45.4	31.8	5.3	40.1
M200 60min	60	43.1	0.278	0.78	43.1	0.00167	0.016	56.0	63.5	10.6	45.4
M200 2hr	120	53.3	0.278	0.78	26.65	0.00167	0.010	69.3	127.1	21.2	48.1
M200 4hr	240	66	0.278	0.78	16.5	0.00167	0.006	85.8	254.2	42.3	43.5
M200 6hr	300	74.7	0.278	0.78	14.94	0.00167	0.005	116.5	381.2	63.5	53.0
M200 12hr	600	92.3	0.278	0.78	9.23	0.00167	0.003	144.0	762.5	127.0	17.0
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00167	0.002	178.0	1525.0	253.9	-75.9
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00167	0.001	201.5	3049.9	507.8	-306.3

Catchment			SP28	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00056	0.025	7.5	5.3	0.3	7.2
M200 10min	10	24	0.278	0.78	144	0.00056	0.017	10.4	10.6	0.6	9.8
M200 15min	15	28.2	0.278	0.78	112.8	0.00056	0.014	12.2	15.9	0.9	11.3
M200 30min	30	34.9	0.278	0.78	69.8	0.00056	0.008	15.1	31.8	1.8	13.4
M200 60min	60	43.1	0.278	0.78	43.1	0.00056	0.005	18.7	63.5	3.5	15.1
M200 2hr	120	53.3	0.278	0.78	26.65	0.00056	0.003	23.1	127.1	7.1	16.0
M200 4hr	240	66	0.278	0.78	16.5	0.00056	0.002	28.6	254.2	14.1	14.5
M200 6hr	300	74.7	0.278	0.78	14.94	0.00056	0.002	38.8	381.2	21.2	17.7
M200 12hr	600	92.3	0.278	0.78	9.23	0.00056	0.001	48.0	762.5	42.3	5.7
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00056	0.001	59.3	1525.0	84.6	-25.3
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00056	0.000	67.2	3049.9	169.3	-102.1

Catchment			SP29	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00222	0.099	29.8	5.3	1.2	28.6
M200 10min	10	24	0.278	0.78	144	0.00222	0.069	41.6	10.6	2.4	39.2
M200 15min	15	28.2	0.278	0.78	112.8	0.00222	0.054	48.9	15.9	3.5	45.3
M200 30min	30	34.9	0.278	0.78	69.8	0.00222	0.034	60.5	31.8	7.1	53.4
M200 60min	60	43.1	0.278	0.78	43.1	0.00222	0.021	74.7	63.5	14.1	60.6
M200 2hr	120	53.3	0.278	0.78	26.65	0.00222	0.013	92.4	127.1	28.2	64.2
M200 4hr	240	66	0.278	0.78	16.5	0.00222	0.008	114.4	254.2	56.4	58.0
M200 6hr	300	74.7	0.278	0.78	14.94	0.00222	0.007	155.3	381.2	84.6	70.7
M200 12hr	600	92.3	0.278	0.78	9.23	0.00222	0.004	191.9	762.5	169.3	22.7
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00222	0.003	237.3	1525.0	338.5	-101.3
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00222	0.002	268.7	3049.9	677.1	-408.4

Catchment			SP30	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00379	0.170	50.9	5.3	2.0	48.9
M200 10min	10	24	0.278	0.78	144	0.00194	0.060	36.3	10.6	2.0	34.2
M200 15min	15	28.2	0.278	0.78	112.8	0.00194	0.047	42.6	15.9	3.1	39.5
M200 30min	30	34.9	0.278	0.78	69.8	0.00194	0.029	52.7	31.8	6.1	46.6
M200 60min	60	43.1	0.278	0.78	43.1	0.00194	0.018	65.1	63.5	12.3	52.8
M200 2hr	120	53.3	0.278	0.78	26.65	0.00194	0.011	80.5	127.1	24.6	55.9
M200 4hr	240	66	0.278	0.78	16.5	0.00194	0.007	99.7	254.2	49.2	50.5
M200 6hr	300	74.7	0.278	0.78	14.94	0.00194	0.006	135.4	381.2	73.8	61.6
M200 12hr	600	92.3	0.278	0.78	9.23	0.00194	0.004	167.3	762.5	147.5	19.8
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00194	0.002	206.8	1525.0	295.1	-88.3
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00194	0.001	234.2	3049.9	590.2	-356.0

Catchment			SP30	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.5	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.4	15.9	2.9	27.5
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.6	31.8	5.7	31.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.5	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.5	127.1	22.8	34.6
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.1	254.2	45.6	25.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.6	381.2	68.4	28.2
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.4	762.5	136.9	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	147.6	1525.0	273.7	-126.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00000	0.000	0.0	3049.9	0.0	0.0

Catchment			SP31	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00117	0.052	15.7	5.3	0.6	15.1
M200 10min	10	24	0.278	0.78	144	0.00117	0.037	21.9	10.6	1.2	20.7
M200 15min	15	28.2	0.278	0.78	112.8	0.00117	0.029	25.8	15.9	1.9	23.9
M200 30min	30	34.9	0.278	0.78	69.8	0.00117	0.018	31.9	31.8	3.7	28.2
M200 60min	60	43.1	0.278	0.78	43.1	0.00117	0.011	39.4	63.5	7.4	31.9
M200 2hr	120	53.3	0.278	0.78	26.65	0.00117	0.007	48.7	127.1	14.9	33.8
M200 4hr	240	66	0.278	0.78	16.5	0.00117	0.004	60.3	254.2	29.7	30.5
M200 6hr	300	74.7	0.278	0.78	14.94	0.00117	0.004	81.9	381.2	44.6	37.3
M200 12hr	600	92.3	0.278	0.78	9.23	0.00117	0.002	101.2	762.5	89.2	12.0
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00117	0.001	125.1	1525.0	178.4	-53.4
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00117	0.001	141.6	3049.9	356.8	-215.2

Catchment			SP32	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00119	0.053	15.9	5.3	0.6	15.3
M200 10min	10	24	0.278	0.78	144	0.00119	0.037	22.2	10.6	1.3	20.9
M200 15min	15	28.2	0.278	0.78	112.8	0.00119	0.029	26.1	15.9	1.9	24.2
M200 30min	30	34.9	0.278	0.78	69.8	0.00119	0.018	32.3	31.8	3.8	28.5
M200 60min	60	43.1	0.278	0.78	43.1	0.00119	0.011	39.9	63.5	7.5	32.3
M200 2hr	120	53.3	0.278	0.78	26.65	0.00119	0.007	49.3	127.1	15.1	34.2
M200 4hr	240	66	0.278	0.78	16.5	0.00119	0.004	61.1	254.2	30.1	30.9
M200 6hr	300	74.7	0.278	0.78	14.94	0.00119	0.004	82.9	381.2	45.2	37.7
M200 12hr	600	92.3	0.278	0.78	9.23	0.00119	0.002	102.5	762.5	90.4	12.1
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00119	0.001	126.7	1525.0	180.7	-54.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00119	0.001	110.3	3049.9	361.4	-251.1

Catchment			SP33	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00083	0.037	11.1	5.3	0.4	10.6
M200 10min	10	24	0.278	0.78	144	0.00083	0.026	15.5	10.6	0.9	14.6
M200 15min	15	28.2	0.278	0.78	112.8	0.00083	0.020	18.2	15.9	1.3	16.9
M200 30min	30	34.9	0.278	0.78	69.8	0.00083	0.012	22.5	31.8	2.6	19.9
M200 60min	60	43.1	0.278	0.78	43.1	0.00083	0.008	27.8	63.5	5.2	22.5
M200 2hr	120	53.3	0.278	0.78	26.65	0.00083	0.005	34.3	127.1	10.5	23.8
M200 4hr	240	66	0.278	0.78	16.5	0.00083	0.003	42.5	254.2	21.0	21.5
M200 6hr	300	74.7	0.278	0.78	14.94	0.00083	0.003	57.7	381.2	31.5	26.3
M200 12hr	600	92.3	0.278	0.78	9.23	0.00083	0.002	71.3	762.5	62.9	8.4
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00083	0.001	88.2	1525.0	125.8	-37.6
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00083	0.001	99.8	3049.9	251.6	-151.8

Catchment			SP34	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00579	0.259	77.7	5.3	3.1	74.7
M200 10min	10	24	0.278	0.78	144	0.00579	0.181	108.5	10.6	6.1	102.3
M200 15min	15	28.2	0.278	0.78	112.8	0.00579	0.142	127.5	15.9	9.2	118.3
M200 30min	30	34.9	0.278	0.78	69.8	0.00579	0.088	157.7	31.8	18.4	139.3
M200 60min	60	43.1	0.278	0.78	43.1	0.00579	0.054	194.8	63.5	36.8	158.0
M200 2hr	120	53.3	0.278	0.78	26.65	0.00579	0.033	240.9	127.1	73.6	167.3
M200 4hr	240	66	0.278	0.78	16.5	0.00579	0.021	298.3	254.2	147.2	151.1
M200 6hr	300	74.7	0.278	0.78	14.94	0.00579	0.019	405.2	381.2	220.7	184.4
M200 12hr	600	92.3	0.278	0.78	9.23	0.00579	0.012	500.6	762.5	441.5	59.1
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00579	0.007	618.9	1525.0	883.0	-264.1
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00579	0.004	700.8	3049.9	1765.9	-1065.2

Catchment			SP35	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00391	0.175	52.5	5.3	2.1	50.4
M200 10min	10	24	0.278	0.78	144	0.00391	0.122	73.3	10.6	4.1	69.1
M200 15min	15	28.2	0.278	0.78	112.8	0.00391	0.096	86.1	15.9	6.2	79.9
M200 30min	30	34.9	0.278	0.78	69.8	0.00391	0.059	106.5	31.8	12.4	94.1
M200 60min	60	43.1	0.278	0.78	43.1	0.00391	0.037	131.6	63.5	24.8	106.7
M200 2hr	120	53.3	0.278	0.78	26.65	0.00391	0.023	162.7	127.1	49.7	113.0
M200 4hr	240	66	0.278	0.78	16.5	0.00391	0.014	201.4	254.2	99.4	102.1
M200 6hr	300	74.7	0.278	0.78	14.94	0.00391	0.013	273.6	381.2	149.1	124.5
M200 12hr	600	92.3	0.278	0.78	9.23	0.00391	0.008	338.1	762.5	298.1	39.9
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00391	0.005	417.9	1525.0	596.3	-178.3
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00391	0.003	473.2	3049.9	1192.5	-719.3

Catchment			SP35	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.5	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.4	15.9	2.9	27.5
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.6	31.8	5.7	31.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.5	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.5	127.1	22.8	34.6
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.1	254.2	45.6	25.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.6	381.2	68.4	28.2
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.4	762.5	136.9	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	147.6	1525.0	273.7	-126.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00180	0.001	167.1	3049.9	547.5	-380.3

Catchment			SP36	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00605	0.271	81.2	5.3	3.2	78.0
M200 10min	10	24	0.278	0.78	144	0.00605	0.189	113.3	10.6	6.4	106.9
M200 15min	15	28.2	0.278	0.78	112.8	0.00605	0.148	133.2	15.9	9.6	123.6
M200 30min	30	34.9	0.278	0.78	69.8	0.00605	0.092	164.8	31.8	19.2	145.6
M200 60min	60	43.1	0.278	0.78	43.1	0.00605	0.057	203.6	63.5	38.4	165.1
M200 2hr	120	53.3	0.278	0.78	26.65	0.00605	0.035	251.7	127.1	76.9	174.8
M200 4hr	240	66	0.278	0.78	16.5	0.00605	0.022	311.7	254.2	153.8	157.9
M200 6hr	300	74.7	0.278	0.78	14.94	0.00605	0.020	423.3	381.2	230.7	192.7
M200 12hr	600	92.3	0.278	0.78	9.23	0.00605	0.012	523.1	762.5	461.3	61.8
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00605	0.007	646.6	1525.0	922.6	-276.0
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00605	0.004	732.2	3049.9	1845.2	-1113.0

Catchment			SP36	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.5	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.4	15.9	2.9	27.5
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.6	31.8	5.7	31.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.5	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.5	127.1	22.8	34.6
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.1	254.2	45.6	25.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.6	381.2	68.4	28.2
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.4	762.5	136.9	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	147.6	1525.0	273.7	-126.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00180	0.001	167.1	3049.9	547.5	-380.3

Catchment			SP37	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00735	0.329	98.6	5.3	3.9	94.7
M200 10min	10	24	0.278	0.78	144	0.00735	0.229	137.6	10.6	7.8	129.8
M200 15min	15	28.2	0.278	0.78	112.8	0.00735	0.180	161.7	15.9	11.7	150.0
M200 30min	30	34.9	0.278	0.78	69.8	0.00735	0.111	200.1	31.8	23.3	176.8
M200 60min	60	43.1	0.278	0.78	43.1	0.00735	0.069	247.1	63.5	46.7	200.5
M200 2hr	120	53.3	0.278	0.78	26.65	0.00735	0.042	305.6	127.1	93.3	212.3
M200 4hr	240	66	0.278	0.78	16.5	0.00735	0.026	378.4	254.2	186.7	191.7
M200 6hr	300	74.7	0.278	0.78	14.94	0.00735	0.024	514.0	381.2	280.0	233.9
M200 12hr	600	92.3	0.278	0.78	9.23	0.00735	0.015	635.1	762.5	560.0	75.0
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00735	0.009	785.1	1525.0	1120.1	-335.0
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00735	0.005	889.0	3049.9	2240.2	-1351.2

Catchment			SP38	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.5	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.4	15.9	2.9	27.5
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.6	31.8	5.7	31.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.5	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.5	127.1	22.8	34.6
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.1	254.2	45.6	25.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.6	381.2	68.4	28.2
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.4	762.5	136.9	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	147.6	1525.0	273.7	-126.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00180	0.001	167.1	3049.9	547.5	-380.3

Catchment			SP38	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00330	0.147	44.2	5.3	1.7	42.5
M200 10min	10	24	0.278	0.78	144	0.00330	0.103	61.7	10.6	3.5	58.2
M200 15min	15	28.2	0.278	0.78	112.8	0.00330	0.081	72.5	15.9	5.2	67.3
M200 30min	30	34.9	0.278	0.78	69.8	0.00330	0.050	89.8	31.8	10.5	79.3
M200 60min	60	43.1	0.278	0.78	43.1	0.00330	0.031	110.9	63.5	20.9	89.9
M200 2hr	120	53.3	0.278	0.78	26.65	0.00330	0.019	137.1	127.1	41.9	95.2
M200 4hr	240	66	0.278	0.78	16.5	0.00330	0.012	169.8	254.2	83.7	86.0
M200 6hr	300	74.7	0.278	0.78	14.94	0.00330	0.011	230.6	381.2	125.6	104.9
M200 12hr	600	92.3	0.278	0.78	9.23	0.00330	0.007	284.9	762.5	251.2	33.7
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00330	0.004	352.2	1525.0	502.5	-150.3
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00330	0.002	398.8	3049.9	1004.9	-606.2

Catchment			SP39	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.01251	0.560	168.0	5.3	6.6	161.3
M200 10min	10	24	0.278	0.78	144	0.01251	0.391	234.4	10.6	13.2	221.1
M200 15min	15	28.2	0.278	0.78	112.8	0.01251	0.306	275.4	15.9	19.9	255.5
M200 30min	30	34.9	0.278	0.78	69.8	0.01251	0.189	340.8	31.8	39.7	301.1
M200 60min	60	43.1	0.278	0.78	43.1	0.01251	0.117	420.9	63.5	79.5	341.4
M200 2hr	120	53.3	0.278	0.78	26.65	0.01251	0.072	520.5	127.1	159.0	361.5
M200 4hr	240	66	0.278	0.78	16.5	0.01251	0.045	644.5	254.2	318.0	326.6
M200 6hr	300	74.7	0.278	0.78	14.94	0.01251	0.041	875.4	381.2	476.9	398.5
M200 12hr	600	92.3	0.278	0.78	9.23	0.01251	0.025	1081.6	762.5	953.9	127.8
M200 24hr	1200	114.1	0.278	0.78	5.705	0.01251	0.015	1337.1	1525.0	1907.7	-570.6
M200 48hr	2400	129.2	0.278	0.78	3.23	0.01251	0.009	1514.1	3049.9	3815.4	-2301.4

Catchment			SP40	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00443	0.198	59.5	5.3	2.3	57.2
M200 10min	10	24	0.278	0.78	144	0.00443	0.138	83.1	10.6	4.7	78.4
M200 15min	15	28.2	0.278	0.78	112.8	0.00443	0.108	97.6	15.9	7.0	90.5
M200 30min	30	34.9	0.278	0.78	69.8	0.00443	0.067	120.8	31.8	14.1	106.7
M200 60min	60	43.1	0.278	0.78	43.1	0.00443	0.041	149.1	63.5	28.2	121.0
M200 2hr	120	53.3	0.278	0.78	26.65	0.00443	0.026	184.4	127.1	56.3	128.1
M200 4hr	240	66	0.278	0.78	16.5	0.00443	0.016	228.4	254.2	112.7	115.7
M200 6hr	300	74.7	0.278	0.78	14.94	0.00443	0.014	310.2	381.2	169.0	141.2
M200 12hr	600	92.3	0.278	0.78	9.23	0.00443	0.009	383.3	762.5	338.0	45.3
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00443	0.005	473.8	1525.0	676.0	-202.2
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00443	0.003	536.5	3049.9	1352.0	-815.5

Catchment			SP40	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.5	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.4	15.9	2.9	27.5
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.6	31.8	5.7	31.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.5	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.5	127.1	22.8	34.6
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.1	254.2	45.6	25.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.6	381.2	68.4	28.2
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.4	762.5	136.9	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	147.6	1525.0	273.7	-126.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00180	0.001	167.1	3049.9	547.5	-380.3

Catchment			SP41	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00235	0.105	31.5	5.3	1.2	30.3
M200 10min	10	24	0.278	0.78	144	0.00235	0.073	44.0	10.6	2.5	41.5
M200 15min	15	28.2	0.278	0.78	112.8	0.00235	0.057	51.7	15.9	3.7	47.9
M200 30min	30	34.9	0.278	0.78	69.8	0.00235	0.036	63.9	31.8	7.5	56.5
M200 60min	60	43.1	0.278	0.78	43.1	0.00235	0.022	79.0	63.5	14.9	64.1
M200 2hr	120	53.3	0.278	0.78	26.65	0.00235	0.014	97.7	127.1	29.8	67.8
M200 4hr	240	66	0.278	0.78	16.5	0.00235	0.008	120.9	254.2	59.7	61.3
M200 6hr	300	74.7	0.278	0.78	14.94	0.00235	0.008	164.2	381.2	89.5	74.8
M200 12hr	600	92.3	0.278	0.78	9.23	0.00235	0.005	202.9	762.5	179.0	24.0
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00235	0.003	250.9	1525.0	357.9	-107.1
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00235	0.002	284.1	3049.9	715.8	-431.8

Catchment			SP42	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.5	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.4	15.9	2.9	27.5
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.6	31.8	5.7	31.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.5	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.5	127.1	22.8	34.6
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.1	254.2	45.6	25.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.6	381.2	68.4	28.2
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.4	762.5	136.9	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	147.6	1525.0	273.7	-126.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00180	0.001	167.1	3049.9	547.5	-380.3

Catchment			SP42	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00448	0.200	60.1	5.3	2.4	57.7
M200 10min	10	24	0.278	0.78	144	0.00448	0.140	83.8	10.6	4.7	79.1
M200 15min	15	28.2	0.278	0.78	112.8	0.00448	0.109	98.5	15.9	7.1	91.4
M200 30min	30	34.9	0.278	0.78	69.8	0.00448	0.068	121.9	31.8	14.2	107.7
M200 60min	60	43.1	0.278	0.78	43.1	0.00448	0.042	150.6	63.5	28.4	122.1
M200 2hr	120	53.3	0.278	0.78	26.65	0.00448	0.026	186.2	127.1	56.9	129.3
M200 4hr	240	66	0.278	0.78	16.5	0.00448	0.016	230.6	254.2	113.7	116.8
M200 6hr	300	74.7	0.278	0.78	14.94	0.00448	0.014	313.1	381.2	170.6	142.5
M200 12hr	600	92.3	0.278	0.78	9.23	0.00448	0.009	386.9	762.5	341.2	45.7
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00448	0.006	478.3	1525.0	682.4	-204.1
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00448	0.003	541.6	3049.9	1364.8	-823.2

Catchment			SP43	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.5	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.4	15.9	2.9	27.5
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.6	31.8	5.7	31.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.5	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.5	127.1	22.8	34.6
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.1	254.2	45.6	25.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.6	381.2	68.4	28.2
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.4	762.5	136.9	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	147.6	1525.0	273.7	-126.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00180	0.001	167.1	3049.9	547.5	-380.3

Catchment			SP43	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00329	0.147	44.2	5.3	1.7	42.4
M200 10min	10	24	0.278	0.78	144	0.00329	0.103	61.6	10.6	3.5	58.2
M200 15min	15	28.2	0.278	0.78	112.8	0.00329	0.080	72.4	15.9	5.2	67.2
M200 30min	30	34.9	0.278	0.78	69.8	0.00329	0.050	89.6	31.8	10.5	79.2
M200 60min	60	43.1	0.278	0.78	43.1	0.00329	0.031	110.7	63.5	20.9	89.8
M200 2hr	120	53.3	0.278	0.78	26.65	0.00329	0.019	136.9	127.1	41.8	95.1
M200 4hr	240	66	0.278	0.78	16.5	0.00329	0.012	169.5	254.2	83.6	85.9
M200 6hr	300	74.7	0.278	0.78	14.94	0.00329	0.011	230.2	381.2	125.4	104.8
M200 12hr	600	92.3	0.278	0.78	9.23	0.00329	0.007	284.5	762.5	250.9	33.6
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00329	0.004	351.6	1525.0	501.7	-150.1
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00329	0.002	398.2	3049.9	1003.4	-605.2

Catchment			SP44	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.5	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.4	15.9	2.9	27.5
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.6	31.8	5.7	31.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.5	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.5	127.1	22.8	34.6
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.1	254.2	45.6	25.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.6	381.2	68.4	28.2
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.4	762.5	136.9	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	147.6	1525.0	273.7	-126.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00180	0.001	167.1	3049.9	547.5	-380.3

Catchment			SP44	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00266	0.119	35.6	5.3	1.4	34.2
M200 10min	10	24	0.278	0.78	144	0.00266	0.083	49.7	10.6	2.8	46.9
M200 15min	15	28.2	0.278	0.78	112.8	0.00266	0.065	58.4	15.9	4.2	54.2
M200 30min	30	34.9	0.278	0.78	69.8	0.00266	0.040	72.3	31.8	8.4	63.9
M200 60min	60	43.1	0.278	0.78	43.1	0.00266	0.025	89.3	63.5	16.9	72.5
M200 2hr	120	53.3	0.278	0.78	26.65	0.00266	0.015	110.5	127.1	33.7	76.7
M200 4hr	240	66	0.278	0.78	16.5	0.00266	0.009	136.8	254.2	67.5	69.3
M200 6hr	300	74.7	0.278	0.78	14.94	0.00266	0.009	185.8	381.2	101.2	84.6
M200 12hr	600	92.3	0.278	0.78	9.23	0.00266	0.005	229.6	762.5	202.4	27.1
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00266	0.003	283.8	1525.0	404.9	-121.1
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00266	0.002	321.3	3049.9	809.8	-488.4

Catchment			SP45	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.5	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.4	15.9	2.9	27.5
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.6	31.8	5.7	31.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.5	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.5	127.1	22.8	34.6
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.1	254.2	45.6	25.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.6	381.2	68.4	28.2
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.4	762.5	136.9	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	147.6	1525.0	273.7	-126.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00180	0.001	167.1	3049.9	547.5	-380.3

Catchment			SP45	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00632	0.283	84.8	5.3	3.3	81.4
M200 10min	10	24	0.278	0.78	144	0.00632	0.197	118.3	10.6	6.7	111.6
M200 15min	15	28.2	0.278	0.78	112.8	0.00632	0.154	139.0	15.9	10.0	129.0
M200 30min	30	34.9	0.278	0.78	69.8	0.00632	0.096	172.0	31.8	20.1	152.0
M200 60min	60	43.1	0.278	0.78	43.1	0.00632	0.059	212.5	63.5	40.1	172.3
M200 2hr	120	53.3	0.278	0.78	26.65	0.00632	0.036	262.7	127.1	80.3	182.5
M200 4hr	240	66	0.278	0.78	16.5	0.00632	0.023	325.4	254.2	160.5	164.9
M200 6hr	300	74.7	0.278	0.78	14.94	0.00632	0.020	441.9	381.2	240.8	201.1
M200 12hr	600	92.3	0.278	0.78	9.23	0.00632	0.013	546.0	762.5	481.5	64.5
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00632	0.008	675.0	1525.0	963.0	-288.0
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00632	0.004	764.3	3049.9	1926.0	-1161.7

Catchment			SP46	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.01209	0.541	162.3	5.3	6.4	155.9
M200 10min	10	24	0.278	0.78	144	0.01209	0.378	226.5	10.6	12.8	213.7
M200 15min	15	28.2	0.278	0.78	112.8	0.01209	0.296	266.1	15.9	19.2	246.9
M200 30min	30	34.9	0.278	0.78	69.8	0.01209	0.183	329.4	31.8	38.4	291.0
M200 60min	60	43.1	0.278	0.78	43.1	0.01209	0.113	406.8	63.5	76.8	329.9
M200 2hr	120	53.3	0.278	0.78	26.65	0.01209	0.070	503.0	127.1	153.6	349.4
M200 4hr	240	66	0.278	0.78	16.5	0.01209	0.043	622.9	254.2	307.3	315.6
M200 6hr	300	74.7	0.278	0.78	14.94	0.01209	0.039	846.0	381.2	460.9	385.1
M200 12hr	600	92.3	0.278	0.78	9.23	0.01209	0.024	1045.3	762.5	921.8	123.5
M200 24hr	1200	114.1	0.278	0.78	5.705	0.01209	0.015	1292.2	1525.0	1843.7	-551.5
M200 48hr	2400	129.2	0.278	0.78	3.23	0.01209	0.008	1463.2	3049.9	3687.4	-2224.1

Catchment			SP47	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00447	0.200	60.0	5.3	2.4	57.7
M200 10min	10	24	0.278	0.78	144	0.00447	0.140	83.7	10.6	4.7	79.0
M200 15min	15	28.2	0.278	0.78	112.8	0.00447	0.109	98.4	15.9	7.1	91.3
M200 30min	30	34.9	0.278	0.78	69.8	0.00447	0.068	121.8	31.8	14.2	107.6
M200 60min	60	43.1	0.278	0.78	43.1	0.00447	0.042	150.4	63.5	28.4	122.0
M200 2hr	120	53.3	0.278	0.78	26.65	0.00447	0.026	186.0	127.1	56.8	129.2
M200 4hr	240	66	0.278	0.78	16.5	0.00447	0.016	230.3	254.2	113.6	116.7
M200 6hr	300	74.7	0.278	0.78	14.94	0.00447	0.014	312.8	381.2	170.4	142.4
M200 12hr	600	92.3	0.278	0.78	9.23	0.00447	0.009	386.5	762.5	340.8	45.7
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00447	0.006	477.8	1525.0	681.7	-203.9
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00447	0.003	541.0	3049.9	1363.3	-822.3

Catchment			SP48	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00585	0.262	78.5	5.3	3.1	75.4
M200 10min	10	24	0.278	0.78	144	0.00585	0.183	109.5	10.6	6.2	103.3
M200 15min	15	28.2	0.278	0.78	112.8	0.00585	0.143	128.7	15.9	9.3	119.4
M200 30min	30	34.9	0.278	0.78	69.8	0.00585	0.088	159.2	31.8	18.6	140.7
M200 60min	60	43.1	0.278	0.78	43.1	0.00585	0.055	196.7	63.5	37.1	159.5
M200 2hr	120	53.3	0.278	0.78	26.65	0.00585	0.034	243.2	127.1	74.3	168.9
M200 4hr	240	66	0.278	0.78	16.5	0.00585	0.021	301.1	254.2	148.6	152.6
M200 6hr	300	74.7	0.278	0.78	14.94	0.00585	0.019	409.0	381.2	222.8	186.2
M200 12hr	600	92.3	0.278	0.78	9.23	0.00585	0.012	505.4	762.5	445.7	59.7
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00585	0.007	624.7	1525.0	891.3	-266.6
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00585	0.004	707.4	3049.9	1782.7	-1075.3

Catchment			SP49	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00552	0.247	74.0	5.3	2.9	71.1
M200 10min	10	24	0.278	0.78	144	0.00552	0.172	103.3	10.6	5.8	97.5
M200 15min	15	28.2	0.278	0.78	112.8	0.00552	0.135	121.4	15.9	8.8	112.6
M200 30min	30	34.9	0.278	0.78	69.8	0.00552	0.083	150.2	31.8	17.5	132.7
M200 60min	60	43.1	0.278	0.78	43.1	0.00552	0.052	185.6	63.5	35.0	150.5
M200 2hr	120	53.3	0.278	0.78	26.65	0.00552	0.032	229.5	127.1	70.1	159.4
M200 4hr	240	66	0.278	0.78	16.5	0.00552	0.020	284.1	254.2	140.2	144.0
M200 6hr	300	74.7	0.278	0.78	14.94	0.00552	0.018	385.9	381.2	210.3	175.7
M200 12hr	600	92.3	0.278	0.78	9.23	0.00552	0.011	476.8	762.5	420.5	56.3
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00552	0.007	589.5	1525.0	841.0	-251.6
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00552	0.004	667.5	3049.9	1682.0	-1014.6

Catchment			SP50	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.5	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.4	15.9	2.9	27.5
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.6	31.8	5.7	31.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.5	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.5	127.1	22.8	34.6
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.1	254.2	45.6	25.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.6	381.2	68.4	28.2
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.4	762.5	136.9	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	147.6	1525.0	273.7	-126.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00180	0.001	167.1	3049.9	547.5	-380.3

Catchment			SP50	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00605	0.271	81.2	5.3	3.2	78.0
M200 10min	10	24	0.278	0.78	144	0.00605	0.189	113.3	10.6	6.4	106.9
M200 15min	15	28.2	0.278	0.78	112.8	0.00605	0.148	133.2	15.9	9.6	123.6
M200 30min	30	34.9	0.278	0.78	69.8	0.00605	0.092	164.8	31.8	19.2	145.6
M200 60min	60	43.1	0.278	0.78	43.1	0.00605	0.057	203.6	63.5	38.4	165.1
M200 2hr	120	53.3	0.278	0.78	26.65	0.00605	0.035	251.7	127.1	76.9	174.8
M200 4hr	240	66	0.278	0.78	16.5	0.00605	0.022	311.7	254.2	153.8	157.9
M200 6hr	300	74.7	0.278	0.78	14.94	0.00605	0.020	423.3	381.2	230.7	192.7
M200 12hr	600	92.3	0.278	0.78	9.23	0.00605	0.012	523.1	762.5	461.3	61.8
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00605	0.007	646.6	1525.0	922.6	-276.0
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00605	0.004	732.2	3049.9	1845.2	-1113.0

Catchment			SP51	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00400	0.179	53.7	5.3	2.1	51.6
M200 10min	10	24	0.278	0.78	144	0.00400	0.125	74.9	10.6	4.2	70.7
M200 15min	15	28.2	0.278	0.78	112.8	0.00400	0.098	88.1	15.9	6.4	81.7
M200 30min	30	34.9	0.278	0.78	69.8	0.00400	0.061	109.0	31.8	12.7	96.3
M200 60min	60	43.1	0.278	0.78	43.1	0.00400	0.037	134.6	63.5	25.4	109.2
M200 2hr	120	53.3	0.278	0.78	26.65	0.00400	0.023	166.4	127.1	50.8	115.6
M200 4hr	240	66	0.278	0.78	16.5	0.00400	0.014	206.1	254.2	101.7	104.4
M200 6hr	300	74.7	0.278	0.78	14.94	0.00400	0.013	279.9	381.2	152.5	127.4
M200 12hr	600	92.3	0.278	0.78	9.23	0.00400	0.008	345.8	762.5	305.0	40.9
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00400	0.005	427.5	1525.0	610.0	-182.5
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00400	0.003	484.1	3049.9	1220.0	-735.9

Catchment			SP52	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00605	0.271	81.2	5.3	3.2	78.0
M200 10min	10	24	0.278	0.78	144	0.00605	0.189	113.3	10.6	6.4	106.9
M200 15min	15	28.2	0.278	0.78	112.8	0.00605	0.148	133.2	15.9	9.6	123.6
M200 30min	30	34.9	0.278	0.78	69.8	0.00605	0.092	164.8	31.8	19.2	145.6
M200 60min	60	43.1	0.278	0.78	43.1	0.00605	0.057	203.6	63.5	38.4	165.1
M200 2hr	120	53.3	0.278	0.78	26.65	0.00605	0.035	251.7	127.1	76.9	174.8
M200 4hr	240	66	0.278	0.78	16.5	0.00605	0.022	311.7	254.2	153.8	157.9
M200 6hr	300	74.7	0.278	0.78	14.94	0.00605	0.020	423.3	381.2	230.7	192.7
M200 12hr	600	92.3	0.278	0.78	9.23	0.00605	0.012	523.1	762.5	461.3	61.8
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00605	0.007	646.6	1525.0	922.6	-276.0
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00605	0.004	732.2	3049.9	1845.2	-1113.0

Catchment			SP53	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00613	0.274	82.3	5.3	3.2	79.1
M200 10min	10	24	0.278	0.78	144	0.00613	0.191	114.8	10.6	6.5	108.4
M200 15min	15	28.2	0.278	0.78	112.8	0.00613	0.150	134.9	15.9	9.7	125.2
M200 30min	30	34.9	0.278	0.78	69.8	0.00613	0.093	167.0	31.8	19.5	147.5
M200 60min	60	43.1	0.278	0.78	43.1	0.00613	0.057	206.2	63.5	39.0	167.3
M200 2hr	120	53.3	0.278	0.78	26.65	0.00613	0.035	255.1	127.1	77.9	177.2
M200 4hr	240	66	0.278	0.78	16.5	0.00613	0.022	315.8	254.2	155.8	160.0
M200 6hr	300	74.7	0.278	0.78	14.94	0.00613	0.020	428.9	381.2	233.7	195.2
M200 12hr	600	92.3	0.278	0.78	9.23	0.00613	0.012	530.0	762.5	467.4	62.6
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00613	0.008	655.2	1525.0	934.8	-279.6
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00613	0.004	741.9	3049.9	1869.6	-1127.7

Catchment			SP4A	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**I (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.5	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.4	15.9	2.9	27.5
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.6	31.8	5.7	31.9
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.5	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.5	127.1	22.8	34.6
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.1	254.2	45.6	25.5
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.6	381.2	68.4	28.2
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.4	762.5	136.9	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	147.6	1525.0	273.7	-126.1
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00180	0.001	167.1	3049.9	547.5	-380.3

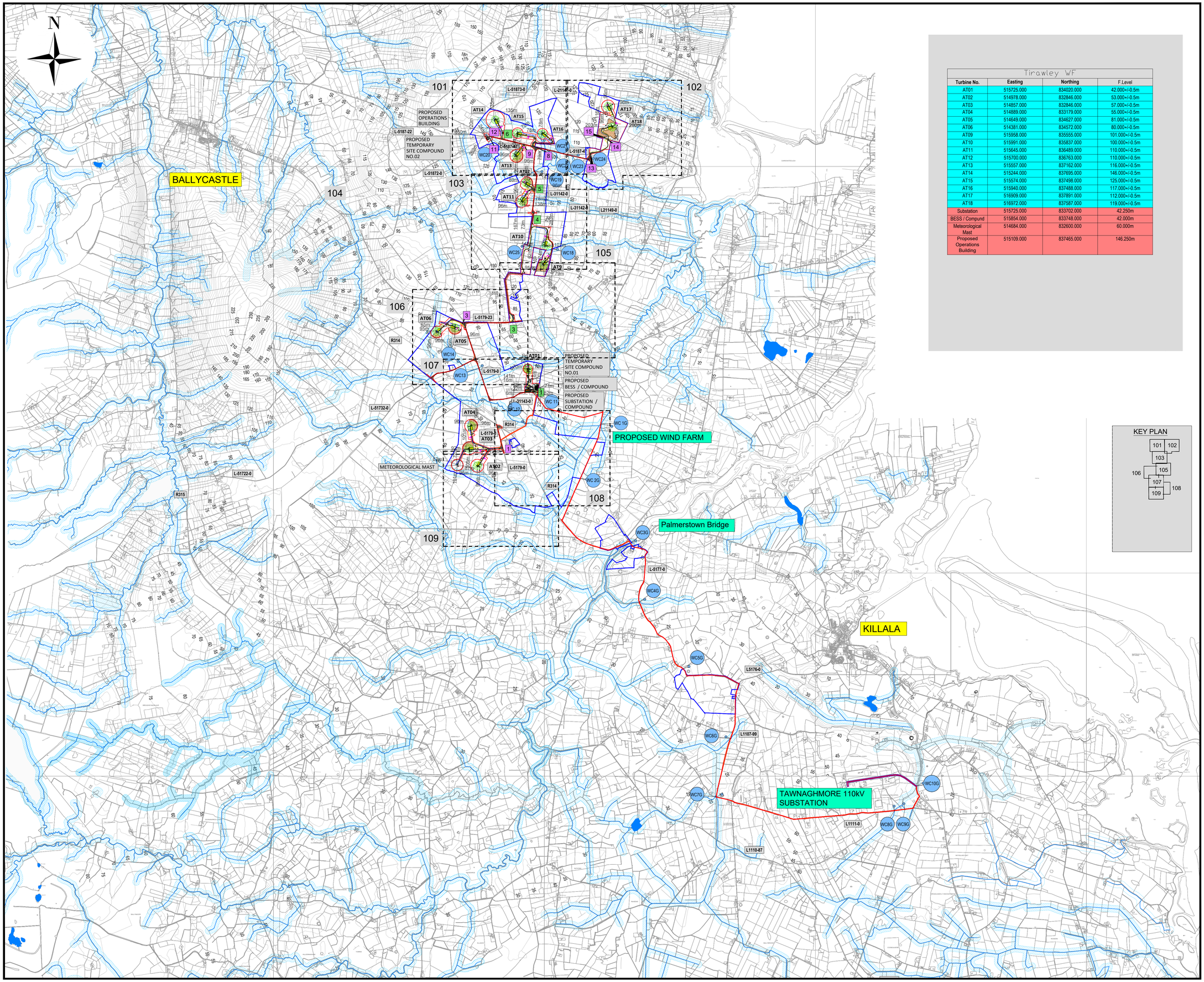
Catchment			SP4A	Area Excl Hardstand Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00375	0.168	50.3	5.3	2.0	48.3
M200 10min	10	24	0.278	0.78	144	0.00375	0.117	70.2	10.6	4.0	66.2
M200 15min	15	28.2	0.278	0.78	112.8	0.00375	0.092	82.4	15.9	5.9	76.5
M200 30min	30	34.9	0.278	0.78	69.8	0.00375	0.057	102.0	31.8	11.9	90.1
M200 60min	60	43.1	0.278	0.78	43.1	0.00375	0.035	126.0	63.5	23.8	102.2
M200 2hr	120	53.3	0.278	0.78	26.65	0.00375	0.022	155.8	127.1	47.6	108.2
M200 4hr	240	66	0.278	0.78	16.5	0.00375	0.013	192.9	254.2	95.2	97.8
M200 6hr	300	74.7	0.278	0.78	14.94	0.00375	0.012	262.1	381.2	142.8	119.3
M200 12hr	600	92.3	0.278	0.78	9.23	0.00375	0.007	323.8	762.5	285.5	38.3
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00375	0.005	400.3	1525.0	571.1	-170.8
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00375	0.003	453.2	3049.9	1142.2	-688.9

Catchment			SP40A	Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.6	206.4	0.00180	0.062	18.6	5.3	1.0	17.6
M200 10min	10	24	0.278	0.6	144	0.00180	0.043	25.9	10.6	1.9	24.0
M200 15min	15	28.2	0.278	0.6	112.8	0.00180	0.034	30.5	15.9	2.9	27.6
M200 30min	30	34.9	0.278	0.6	69.8	0.00180	0.021	37.7	31.8	5.7	32.0
M200 60min	60	43.1	0.278	0.6	43.1	0.00180	0.013	46.6	63.5	11.4	35.1
M200 2hr	120	53.3	0.278	0.6	26.65	0.00180	0.008	57.6	127.1	22.9	34.7
M200 4hr	240	66	0.278	0.6	16.5	0.00180	0.005	71.3	254.2	45.7	25.6
M200 6hr	300	74.7	0.278	0.6	14.94	0.00180	0.004	96.9	381.2	68.6	28.3
M200 12hr	600	92.3	0.278	0.6	9.23	0.00180	0.003	119.7	762.5	137.2	-17.5
M200 24hr	1200	114.1	0.278	0.6	5.705	0.00180	0.002	148.0	1525.0	274.5	-126.5
M200 48hr	2400	129.2	0.278	0.6	3.23	0.00180	0.001	167.6	3049.9	549.0	-381.4

Catchment			SP40A	Area Excl Hardstand				water discharge rate (l/s)			
Clean water natural flow									17.65		l/s/ha
1 in 200 year return	**minutes**	**Rainfall (mm)**		**C**	**i (mm/hr)**	**A (km²)**	**(m³/s)**	**Volume (m³)**	**Discharge (m³/ha)**	**Discharge (m³)**	**Residual Volume (m³)**
M200 5min	5	17.2	0.278	0.78	206.4	0.00245	0.110	32.9	5.3	1.3	31.6
M200 10min	10	24	0.278	0.78	144	0.00245	0.077	45.9	10.6	2.6	43.3
M200 15min	15	28.2	0.278	0.78	112.8	0.00245	0.060	53.9	15.9	3.9	50.0
M200 30min	30	34.9	0.278	0.78	69.8	0.00245	0.037	66.7	31.8	7.8	59.0
M200 60min	60	43.1	0.278	0.78	43.1	0.00245	0.023	82.4	63.5	15.6	66.9
M200 2hr	120	53.3	0.278	0.78	26.65	0.00245	0.014	101.9	127.1	31.1	70.8
M200 4hr	240	66	0.278	0.78	16.5	0.00245	0.009	126.2	254.2	62.3	64.0
M200 6hr	300	74.7	0.278	0.78	14.94	0.00245	0.008	171.4	381.2	93.4	78.0
M200 12hr	600	92.3	0.278	0.78	9.23	0.00245	0.005	211.8	762.5	186.8	25.0
M200 24hr	1200	114.1	0.278	0.78	5.705	0.00245	0.003	261.9	1525.0	373.6	-111.8
M200 48hr	2400	129.2	0.278	0.78	3.23	0.00245	0.002	296.5	3049.9	747.2	-450.7

APPENDIX D

DRAINAGE DRAWINGS



Tirawley WF			
Turbine No.	Easting	Northing	F.Level
AT01	515725.000	834020.000	42.000+/-0.5m
AT02	514978.000	832846.000	53.000+/-0.5m
AT03	514857.000	832846.000	57.000+/-0.5m
AT04	514889.000	833179.000	55.000+/-0.5m
AT05	514649.000	834627.000	81.000+/-0.5m
AT06	514381.000	834572.000	80.000+/-0.5m
AT09	515958.000	835555.000	101.000+/-0.5m
AT10	515991.000	835837.000	100.000+/-0.5m
AT11	515645.000	836489.000	110.000+/-0.5m
AT12	515700.000	836763.000	110.000+/-0.5m
AT13	515557.000	837162.000	116.000+/-0.5m
AT14	515244.000	837695.000	146.000+/-0.5m
AT15	515574.000	837498.000	125.000+/-0.5m
AT16	515940.000	837488.000	117.000+/-0.5m
AT17	516909.000	837891.000	112.000+/-0.5m
AT18	516972.000	837587.000	119.000+/-0.5m
Substation	515725.000	833702.000	42.250m
BESS / Compund	515854.000	833748.000	42.000m
Meteorological Mast	514684.000	832600.000	60.000m
Proposed Operations Building	515109.000	837465.000	146.250m

NOTES
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4. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.

THIS DRAWING IS NOT TO BE USED AS A CONSTRUCTION DRAWING.

LEGEND

- DEVELOPMENT AREA
- LAND UNDER CONTROL OF APPLICANT
- PROPOSED WIND FARM ACCESS TRACK
- EXISTING ROADS -PUBLIC TO BE UPGRADED
- PROPOSED WIND TURBINE LOCATION
- PROPOSED TURBINE HARDSTAND
- WATERCOURSE CROSSING
- SPOIL MANAGEMENT AREA
- C1 — PROPOSED NEW WIND FARM INTERNAL POWER AND COMUNICATION CABLING
- C2 — PROPOSED NEW BATTERY STORAGE FACILITY INTERNAL POWER AND COMUNICATION CABLING
- 5 — 5m CONTOUR
- CHAINAGE
- PROPOSED STOCK PROOF FENCE
- PROPOSED 50M STREAM BUFFER ZONE
- PROPOSED ATTENUATION PONDS (SP) AND BUFFERED OUTFALL SHOWN THUS
- PROPOSED CLEAN WATER DRAIN SHOWN THUS
- PROPOSED DIRTY WATER DRAIN SHOWN THUS
- ARCHEOLOGICAL SITES SHOWN THUS
- EXISTING SITE ENTRANCES
- PROPOSED SITE ENTRANCES
- L0000-00 / R314 — PUBLIC ROAD NUMBERS

KEY PLAN

VECTOR SHEETS:
942,943,944,945,998,999,1000,1001
1057,1058,1059,1121,1184,1248,1317

Tailte Éireann

rev	date	modifications	D	C	A

Client
CONSTANT ENERGY LTD

Project
TIRAWLEY WIND FARM
CO.MAYO

Stage
PLANNING

Title
SITE LAYOUT PLAN
KEY PLAN

Scales
1:50,000 @ A3

Surveyed	Drawn	Checked	Approved	Date
JOD	JB	MG / DT	DK	07/2025

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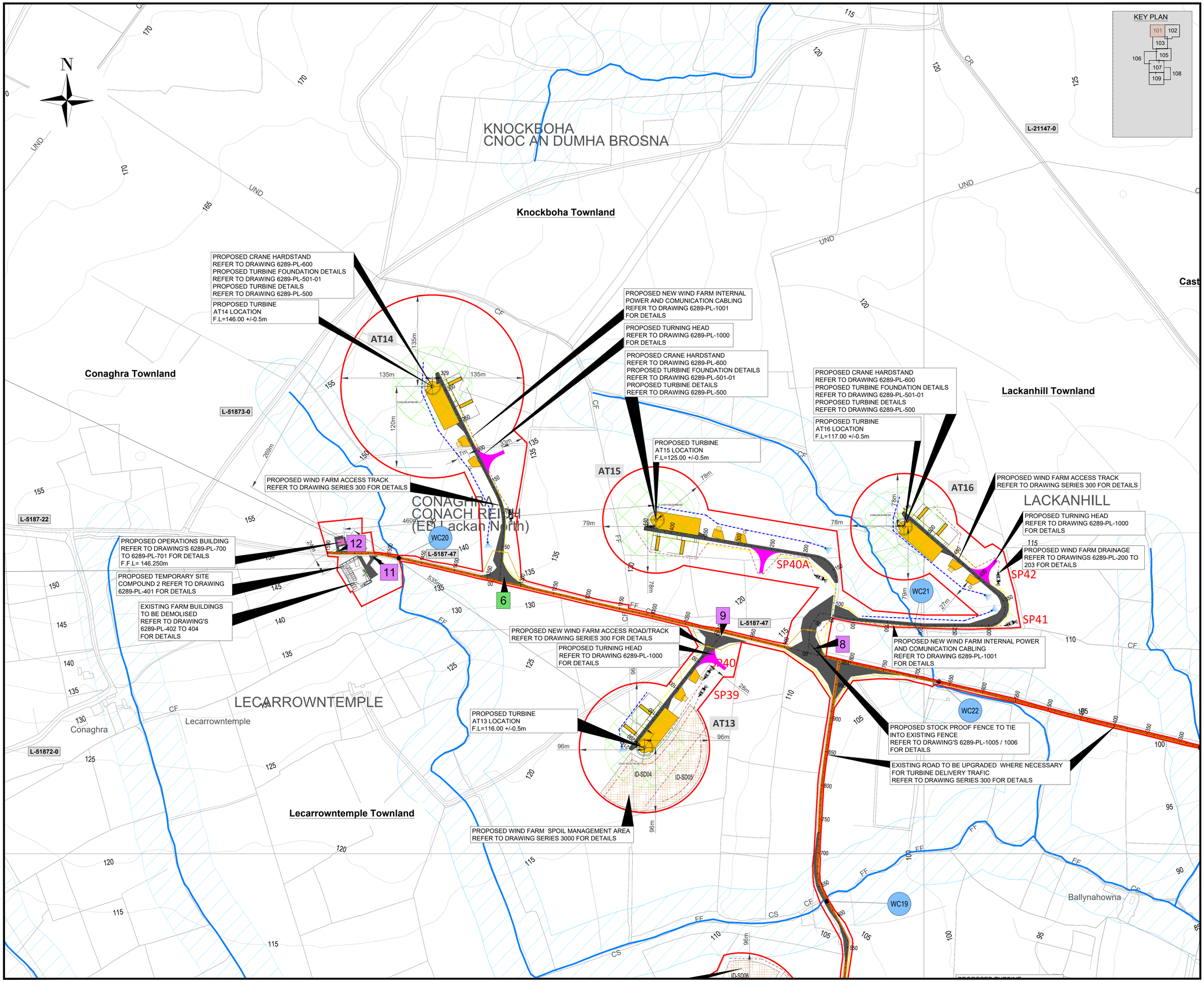
Job Ref.	Drawing No.	Revision
6289	PL-100	0



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LEGEND

- DEVELOPMENT AREA
- PROPOSED WIND FARM ACCESS TRACK
- EXISTING ROADS -PUBLIC TO BE UPGRADED
- PROPOSED WIND TURBINE LOCATION
- PROPOSED TURBINE HARDSTAND
- WATERCOURSE CROSSING
- SPOIL MANAGEMENT AREA
- PROPOSED NEW WIND FARM INTERNAL POWER AND COMUNICATION CABLING
- PROPOSED NEW BATTERY STORAGE FACILITY INTERNAL POWER AND COMUNICATION CABLING
- 5m CONTOUR
- CHAINAGE
- PROPOSED STOCK PROOF FENCE
- PROPOSED 50M STREAM BUFFER ZONE
- PROPOSED ATTENUATION PONDS (SP) AND BUFFERED OUTFALL SHOWN THUS
- PROPOSED CLEAN WATER DRAIN SHOWN THUS
- PROPOSED DIRTY WATER DRAIN SHOWN THUS
- ARCHEOLOGICAL SITES SHOWN THUS
- EXISTING SITE ENTRANCES
- PROPOSED SITE ENTRANCES
- L0000-00 R314 PUBLIC ROAD NUMBERS

VECTOR SHEETS:
0943,0944,0999,1000

rev	date	modifications	D	C	A

Client
CONSTANT ENERGY LTD

Project
TIRAWLEY WIND FARM
CO.MAYO

Stage
PLANNING

Title
SITE LAYOUT PLAN
SHEET 1
(WIND FARM)

Scales
1:2,500 @ A1

Surveyed	Drawn	Checked	Approved	Date
JOD	JB	MG / DT	DK	07/2025

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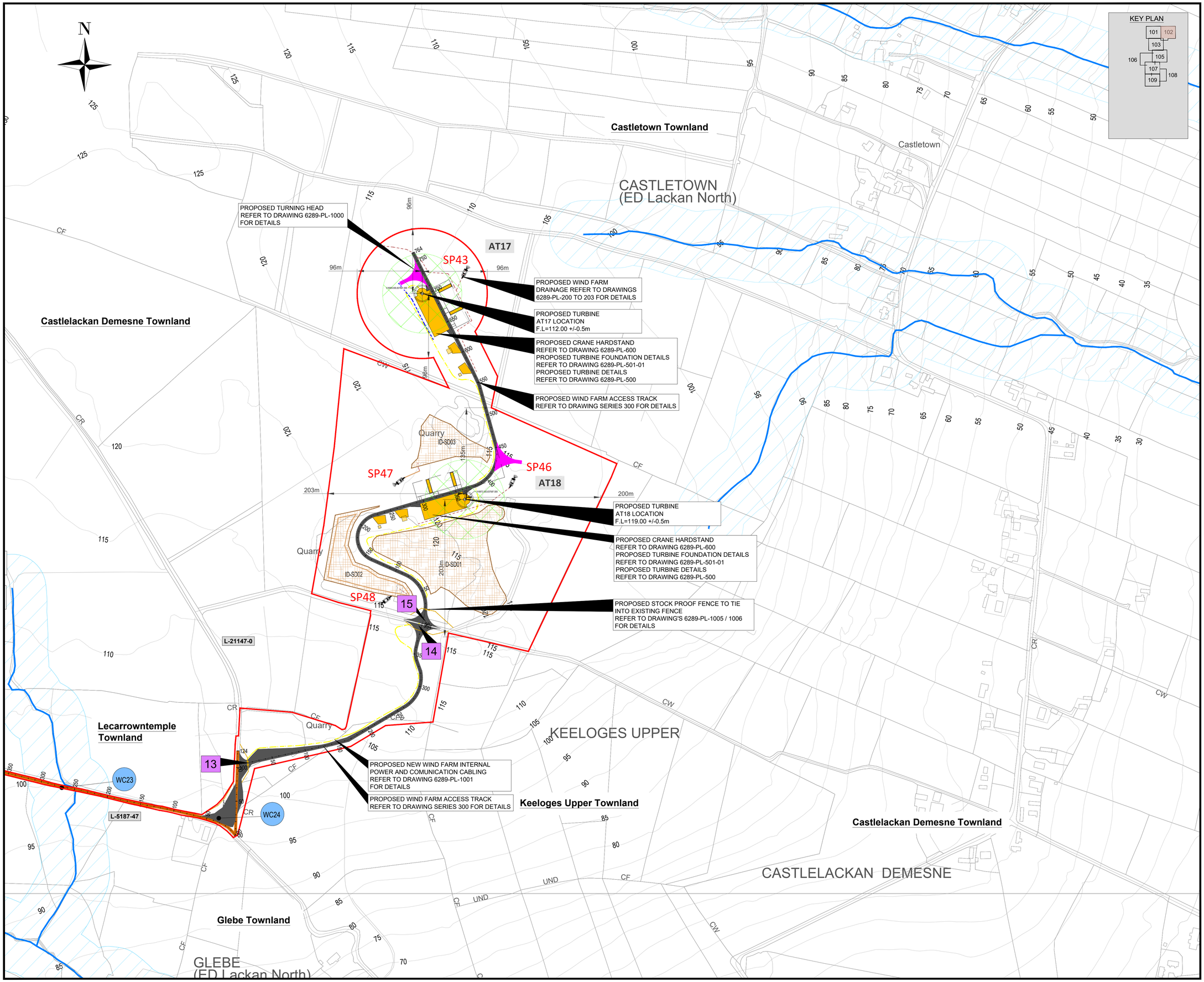
Job Ref.	Drawing No.	Revision
6289	PL-101	0



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LEGEND

- DEVELOPMENT AREA
- PROPOSED WIND FARM ACCESS TRACK
- EXISTING ROADS -PUBLIC TO BE UPGRADED
- PROPOSED WIND TURBINE LOCATION
- PROPOSED TURBINE HARDSTAND
- WATERCOURSE CROSSING
- SPOIL MANAGEMENT AREA
- PROPOSED NEW WIND FARM INTERNAL POWER AND COMUNICATION CABLING
- PROPOSED NEW BATTERY STORAGE FACILITY INTERNAL POWER AND COMUNICATION CABLING
- 5m CONTOUR
- CHAINAGE
- PROPOSED STOCK PROOF FENCE
- PROPOSED 50M STREAM BUFFER ZONE
- PROPOSED ATTENUATION PONDS (SP) AND BUFFERED OUTFALL SHOWN THUS
- PROPOSED CLEAN WATER DRAIN SHOWN THUS
- PROPOSED DIRTY WATER DRAIN SHOWN THUS
- ARCHEOLOGICAL SITES SHOWN THUS
- EXISTING SITE ENTRANCES
- PROPOSED SITE ENTRANCES
- L0000-00 R314 PUBLIC ROAD NUMBERS

VECTOR SHEETS:
0944,1000

rev	date	modifications	D	C	A

Client
CONSTANT ENERGY LTD

Project
TIRAWLEY WIND FARM
CO.MAYO

Stage
PLANNING

Title
SITE LAYOUT PLAN
SHEET 2
(WIND FARM)

Scales
1:2,500 @ A1

Surveyed	Drawn	Checked	Approved	Date
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Job Ref.	Drawing No.	Revision
6289	PL-102	0

PROPOSED WIND FARM SPOIL MANAGEMENT AREA
REFER TO DRAWING SERIES 3000 FOR DETAILS

PROPOSED TURNING HEAD
REFER TO DRAWING 6289-PL-1000
FOR DETAILS

PROPOSED WIND FARM ACCESS TRACK
REFER TO DRAWING SERIES 300 FOR DETAILS

PROPOSED WIND FARM DRAINAGE
REFER TO DRAWINGS 6289-PL-200 TO
203 FOR DETAILS

PROPOSED TURNING HEAD
REFER TO DRAWING 6289-PL-1000
FOR DETAILS

PROPOSED WIND FARM SPOIL MANAGEMENT AREA
REFER TO DRAWING SERIES 3000 FOR DETAILS

PROPOSED WIND FARM ACCESS TRACK
REFER TO DRAWING SERIES 300 FOR DETAILS

PROPOSED TURBINE
AT12 LOCATION
F.L=110.00 +/-0.5m

PROPOSED CRANE HARDSTAND
REFER TO DRAWING 6289-PL-600
PROPOSED TURBINE FOUNDATION DETAILS
REFER TO DRAWING 6289-PL-501-01
PROPOSED TURBINE DETAILS
REFER TO DRAWING 6289-PL-500

EXISTING ROAD TO BE UPGRADED WHERE NECESSARY
FOR TURBINE DELIVERY TRAFIC
REFER TO DRAWING SERIES 300 FOR DETAILS

PROPOSED STOCK PROOF FENCE TO TIE
INTO EXISTING FENCE
REFER TO DRAWING'S 6289-PL-1005 / 1006
FOR DETAILS

PROPOSED CRANE HARDSTAND
REFER TO DRAWING 6289-PL-600
PROPOSED TURBINE FOUNDATION DETAILS
REFER TO DRAWING 6289-PL-501-01
PROPOSED TURBINE DETAILS
REFER TO DRAWING 6289-PL-500

PROPOSED TURBINE
AT11 LOCATION
F.L=110.00 +/-0.5m

PROPOSED NEW WIND FARM INTERNAL
POWER AND COMUNICATION CABLING
REFER TO DRAWING 6289-PL-1001
FOR DETAILS

PROPOSED WIND FARM ACCESS TRACK
REFER TO DRAWING SERIES 300 FOR DETAILS

PROPOSED NEW WIND FARM INTERNAL POWER
AND COMUNICATION CABLING
REFER TO DRAWING 6289-PL-1001
FOR DETAILS

PROPOSED WIND FARM
DRAINAGE REFER TO DRAWINGS
6289-PL-200 TO 203 FOR DETAILS

PROPOSED CRANE HARDSTAND
REFER TO DRAWING 6289-PL-600
PROPOSED TURBINE FOUNDATION DETAILS
REFER TO DRAWING 6289-PL-501-01
PROPOSED TURBINE DETAILS
REFER TO DRAWING 6289-PL-500

PROPOSED TURBINE
AT10 LOCATION
F.L=100.00 +/-0.5m

PROPOSED NEW WIND FARM ACCESS ROAD/TRACK
REFER TO DRAWING SERIES 300 FOR DETAILS

PROPOSED WIND FARM
DRAINAGE REFER TO DRAWINGS
6289-PL-200 TO 203 FOR DETAILS

PROPOSED TURNING HEAD
REFER TO DRAWING 6289-PL-1000
FOR DETAILS

PROPOSED TURBINE
AT9 LOCATION
F.L=101.00 +/-0.5m

PROPOSED CRANE HARDSTAND
REFER TO DRAWING 6289-PL-600
PROPOSED TURBINE FOUNDATION DETAILS
REFER TO DRAWING 6289-PL-501-01
PROPOSED TURBINE DETAILS
REFER TO DRAWING 6289-PL-500

LISSADRONE WEST

LISSADRONE EAST

Lissadrone West Townland

Lissadrone East Townland

Barnhill Upper Townland

Carrowmore Townland

AT12 AT11 AT10 AT9

SP23 SP24 SP25 SP26 SP27 SP28 SP29 SP30 SP31 SP32 SP33 SP34 SP35 SP36 SP37

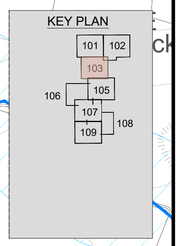
L-31142-0

WC25 WC18

ID-SD06 ID-SD07 ID-SD08 ID-SD09 ID-SD10

143m 89m 96m 78m 167m 73m 148m 107m 74m 95m 79m 169m 283m

KEY PLAN



NOTES
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LEGEND

- DEVELOPMENT AREA
- PROPOSED WIND FARM ACCESS TRACK
- EXISTING ROADS -PUBLIC TO BE UPGRADED
- PROPOSED WIND TURBINE LOCATION
- PROPOSED TURBINE HARDSTAND
- WATERCOURSE CROSSING
- SPOIL MANAGEMENT AREA
- PROPOSED NEW WIND FARM INTERNAL POWER AND COMUNICATION CABLING
- PROPOSED NEW BATTERY STORAGE FACILITY INTERNAL POWER AND COMUNICATION CABLING
- 5m CONTOUR
- CHAINAGE
- PROPOSED STOCK PROOF FENCE
- PROPOSED 50M STREAM BUFFER ZONE
- PROPOSED ATTENUATION PONDS (SP) AND BUFFERED OUTFALL SHOWN THUS
- PROPOSED CLEAN WATER DRAIN SHOWN THUS
- PROPOSED DIRTY WATER DRAIN SHOWN THUS
- ARCHEOLOGICAL SITES SHOWN THUS
- EXISTING SITE ENTRANCES
- PROPOSED SITE ENTRANCES
- L0000-00 R314 PUBLIC ROAD NUMBERS

VECTOR SHEETS:
0999,1000

rev	date	modifications	D	C	A

Client
CONSTANT ENERGY LTD

Project
TIRAWLEY WIND FARM
CO.MAYO

Stage
PLANNING

Title
SITE LAYOUT PLAN
SHEET 3
(WIND FARM)

Scales
1:2,500 @ A1

Surveyed	Drawn	Checked	Approved	Date
JOD	JB	MG / DT	DK	07/2025

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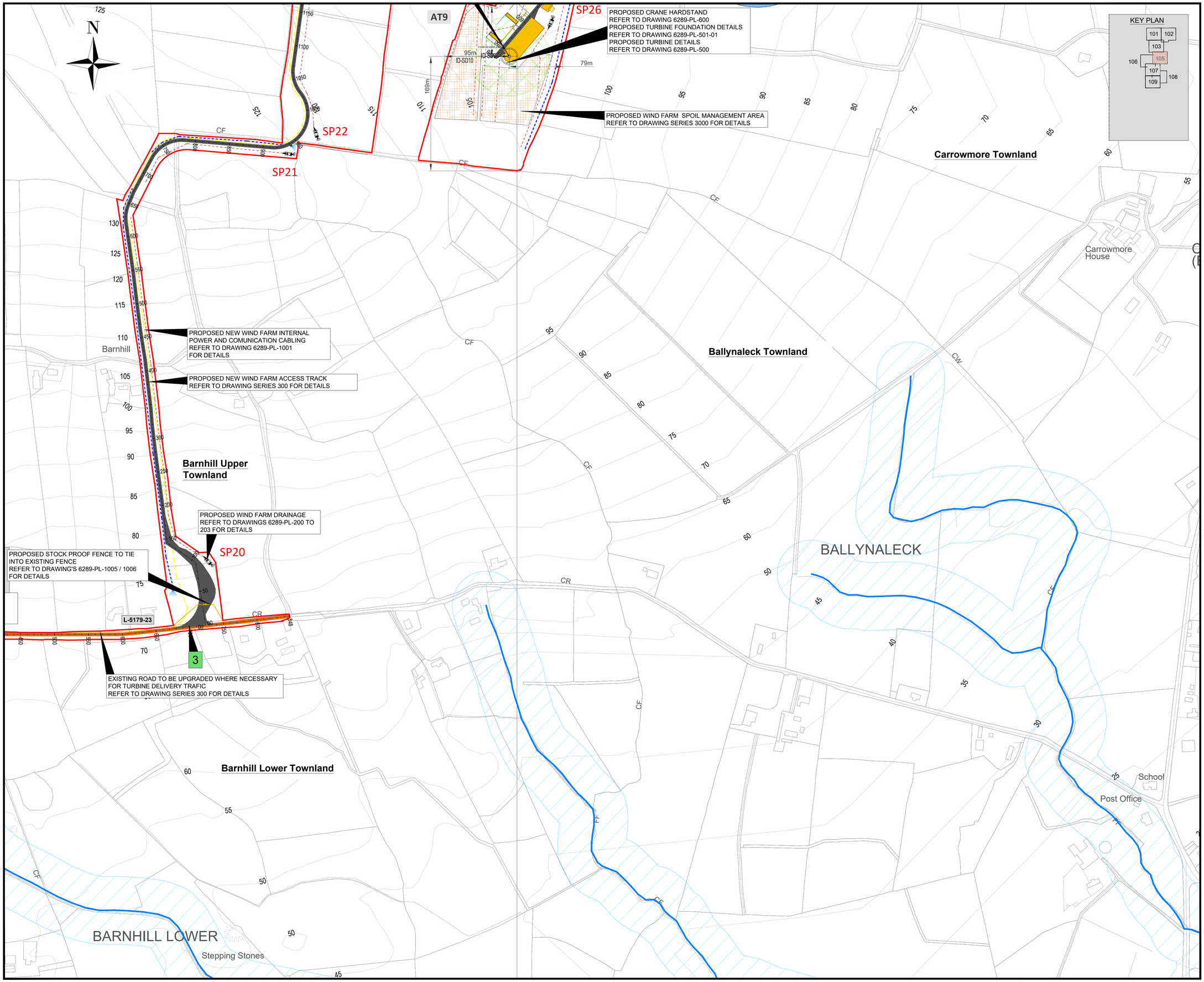
Job Ref.	Drawing No.	Revision
6289	PL-103	0



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THIS DRAWING IS NOT TO BE USED AS A CONSTRUCTION DRAWING.

KEY PLAN

LEGEND

- DEVELOPMENT AREA
- PROPOSED WIND FARM ACCESS TRACK
- EXISTING ROADS -PUBLIC TO BE UPGRADED
- PROPOSED WIND TURBINE LOCATION
- PROPOSED TURBINE HARDSTAND
- WATERCOURSE CROSSING
- SPOIL MANAGEMENT AREA
- PROPOSED NEW WIND FARM INTERNAL POWER AND COMUNICATION CABLING
- PROPOSED NEW BATTERY STORAGE FACILITY INTERNAL POWER AND COMUNICATION CABLING
- 5m CONTOUR
- CHAINAGE
- PROPOSED STOCK PROOF FENCE
- PROPOSED 50M STREAM BUFFER ZONE
- PROPOSED ATTENUATION PONDS (SP) AND BUFFERED OUTFALL SHOWN THUS
- PROPOSED CLEAN WATER DRAIN SHOWN THUS
- PROPOSED DIRTY WATER DRAIN SHOWN THUS
- ARCHEOLOGICAL SITES SHOWN THUS
- EXISTING SITE ENTRANCES
- PROPOSED SITE ENTRANCES
- L0000-00 R314 PUBLIC ROAD NUMBERS

VECTOR SHEETS:
0999,1000

rev	date	modifications	D	C	A

Client
CONSTANT ENERGY LTD

Project
TIRAWLEY WIND FARM
CO.MAYO

Stage
PLANNING

Title
SITE LAYOUT PLAN
SHEET 5
(WIND FARM)

Scales
1:2,500 @ A1

Surveyed	Drawn	Checked	Approved	Date
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Job Ref.	Drawing No.	Revision
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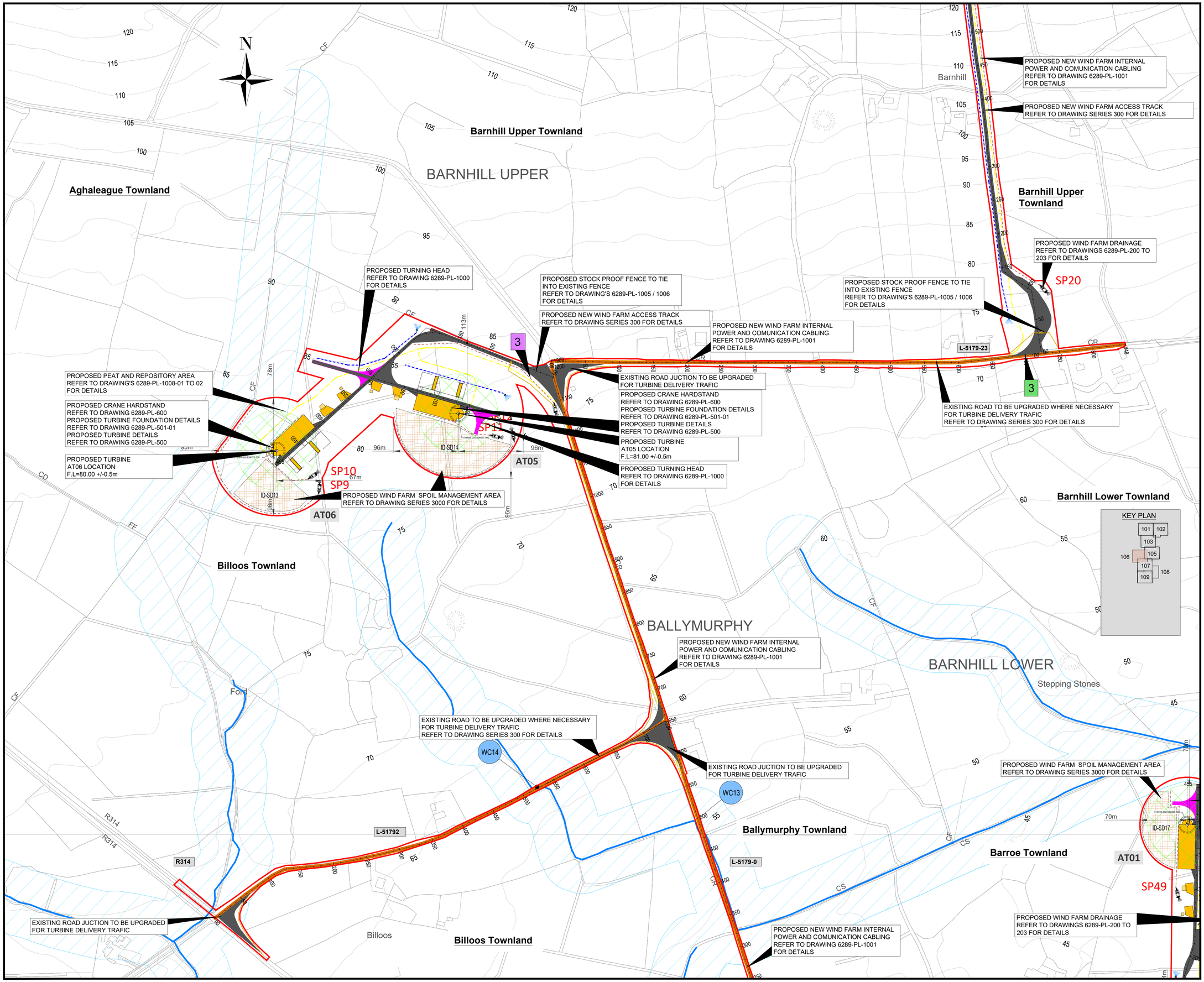

NOTES

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3. ALL LEVELS REFER TO ORDNANCE DATUM (MALIN HEAD).
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THIS DRAWING IS NOT TO BE USED AS A CONSTRUCTION DRAWING.

LEGEND

- DEVELOPMENT AREA
- PROPOSED WIND FARM ACCESS TRACK
- EXISTING ROADS -PUBLIC TO BE UPGRADED
- PROPOSED WIND TURBINE LOCATION
- PROPOSED TURBINE HARDSTAND
- WATERCOURSE CROSSING
- SPOIL MANAGEMENT AREA
- PROPOSED NEW WIND FARM INTERNAL POWER AND COMUNICATION CABLING
- PROPOSED NEW BATTERY STORAGE FACILITY INTERNAL POWER AND COMUNICATION CABLING
- 5m CONTOUR
- CHAINAGE
- PROPOSED STOCK PROOF FENCE
- PROPOSED 50M STREAM BUFFER ZONE
- PROPOSED ATTENUATION PONDS (SP) AND BUFFERED OUTFALL SHOWN THUS
- PROPOSED CLEAN WATER DRAIN SHOWN THUS
- PROPOSED DIRTY WATER DRAIN SHOWN THUS
- ARCHEOLOGICAL SITES SHOWN THUS
- EXISTING SITE ENTRANCES
- PROPOSED SITE ENTRANCES
- L0000-00 R314 PUBLIC ROAD NUMBERS

VECTOR SHEETS:
0999,1000,1058,1059

rev	date	modifications	D	C	A

Client
CONSTANT ENERGY LTD

Project
TIRAWLEY WIND FARM
CO.MAYO

Stage
PLANNING

Title
SITE LAYOUT PLAN
SHEET 6
(WIND FARM)

Scales
1:2,500 @ A1

Surveyed	Drawn	Checked	Approved	Date
JOD	JB	MG / DT	DK	07/2025

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Job Ref.	Drawing No.	Revision
6289	PL-106	0

EXISTING ROAD TO BE UPGRADED WHERE NECESSARY
FOR TURBINE DELIVERY TRAFIC
REFER TO DRAWING SERIES 300 FOR DETAILS

EXISTING ROAD JUCTION TO BE UPGRADED
FOR TURBINE DELIVERY TRAFIC

PROPOSED WIND FARM SPOIL MANAGEMENT AREA
REFER TO DRAWING SERIES 3000 FOR DETAILS

PROPOSED TURNING HEAD
REFER TO DRAWING 6289-PL-1000
FOR DETAILS

PROPOSED CRANE HARDSTAND
REFER TO DRAWING 6289-PL-600
PROPOSED TURBINE FOUNDATION DETAILS
REFER TO DRAWING 6289-PL-501-01
PROPOSED TURBINE DETAILS
REFER TO DRAWING 6289-PL-500

PROPOSED TURBINE
AT01 LOCATION
F.L=42.00 +/-0.5m

PROPOSED WIND FARM DRAINAGE
REFER TO DRAWINGS 6289-PL-200 TO
203 FOR DETAILS

PROPOSED NEW WIND FARM INTERNAL
POWER AND COMUNICATION CABLING
REFER TO DRAWING 6289-PL-1001
FOR DETAILS

PROPOSED TEMPORARY
CONTRACTORS COMPOUND NO.01
REFER TO DRAWING 6289-PL-400
FOR DETAILS

PROPOSED BESS / COMPOUND
REFER TO DRAWING SERIES 2000 FOR DETAILS
F.L=42.00M

PROPOSED SUBSTATION / COMPOUND
REFER TO DRAWING'S 6289-PL-801 TO 804
FOR DETAILS
F.L=41.00m

PROPOSED NEW WIND FARM INTERNAL
POWER AND COMUNICATION CABLING
REFER TO DRAWING 6289-PL-1001
FOR DETAILS

EXISTING ROAD JUCTION TO BE UPGRADED
FOR TURBINE DELIVERY TRAFIC

PROPOSED TURBINE
AT04 LOCATION
F.L=55.00 +/-0.5m

PROPOSED CRANE HARDSTAND
REFER TO DRAWING 6289-PL-600
PROPOSED TURBINE FOUNDATION DETAILS
REFER TO DRAWING 6289-PL-501-01
PROPOSED TURBINE DETAILS
REFER TO DRAWING 6289-PL-500

PROPOSED WIND FARM SPOIL MANAGEMENT AREA
REFER TO DRAWING SERIES 3000 FOR DETAILS

PROPOSED WIND FARM DRAINAGE REFER TO
DRAWINGS 6289-PL-200 TO 203 FOR DETAILS

PROPOSED NEW WIND FARM ACCESS TRACK
REFER TO DRAWING SERIES 300 FOR DETAILS

PROPOSED TURBINE
AT03 LOCATION
F.L=57.00 +/-0.5m

PROPOSED CRANE HARDSTAND
REFER TO DRAWING 6289-PL-600
PROPOSED TURBINE FOUNDATION DETAILS
REFER TO DRAWING 6289-PL-501-01
PROPOSED TURBINE DETAILS
REFER TO DRAWING 6289-PL-500

PROPOSED TURNING HEAD
REFER TO DRAWING 6289-PL-1000
FOR DETAILS

PROPOSED STOCK PROOF FENCE TO TIE
INTO EXISTING FENCE
REFER TO DRAWING'S 6289-PL-1005 / 1006
FOR DETAILS

PROPOSED PEAT AND REPOSITORY AREA
REFER TO DRAWING'S 6289-PL-1008-01 TO 02
FOR DETAILS

Ballymurphy Townland
Billoos Townland
Barroe Townland
Carn Townland
Carrickanass Townland
BARROE
An Barr Rua
Carn River
L-51792
L-5179-0
L-31143-0
R314
AT01
AT03
AT04
SP49
SP50
SP51
SP52
SP5
SP6
SP7
SP2
SP3
SP4
SP8
WC11
WC12
WC13
WC14
ID-SD15
ID-SD16
ID-SD17
ID-SD18
ID-SD19

KEY PLAN
101 102 103 105 106 107 108 109

NOTES
1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. DRAWING TO BE USED FOR PLANNING PURPOSES ONLY.
3. ALL LEVELS REFER TO ORDNANCE DATUM (MALIN HEAD).
4. ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.

THIS DRAWING IS NOT TO BE USED AS A CONSTRUCTION DRAWING.

LEGEND
- DEVELOPMENT AREA
- PROPOSED WIND FARM ACCESS TRACK
- EXISTING ROADS -PUBLIC TO BE UPGRADED
- PROPOSED WIND TURBINE LOCATION
- PROPOSED TURBINE HARDSTAND
- WATERCOURSE CROSSING
- SPOIL MANAGEMENT AREA
- PROPOSED NEW WIND FARM INTERNAL POWER AND COMUNICATION CABLING
- PROPOSED NEW BATTERY STORAGE FACILITY INTERNAL POWER AND COMUNICATION CABLING
- 5m CONTOUR
- CHAINAGE
- PROPOSED STOCK PROOF FENCE
- PROPOSED 50M STREAM BUFFER ZONE
- PROPOSED ATTENUATION PONDS (SP) AND BUFFERED OUTFALL SHOWN THUS
- PROPOSED CLEAN WATER DRAIN SHOWN THUS
- PROPOSED DIRTY WATER DRAIN SHOWN THUS
- ARCHEOLOGICAL SITES SHOWN THUS
- EXISTING SITE ENTRANCES
- PROPOSED SITE ENTRANCES
- L0000-00 R314 PUBLIC ROAD NUMBERS

VECTOR SHEETS:
999,1000,1058,1059

rev	date	modifications	D	C	A

Client
CONSTANT ENERGY LTD

Project
TIRAWLEY WIND FARM
CO.MAYO

Stage
PLANNING

Title
SITE LAYOUT PLAN
SHEET 7
(WIND FARM)

Scales
1:2,500 @ A1

Surveyed	Drawn	Checked	Approved	Date
JOD	JB	MG / DT	DK	07/2025

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Job Ref.	Drawing No.	Revision
6289	PL-107	0

N

EXISTING ROAD JUCTION TO BE UPGRADED FOR TURBINE DELIVERY TRAFIC

WC12

WC2G

R314

L-5179-0

SP8

1

Carn Townland

Cloonavarry Townland

CLOONAVARRY

Tooracappul Townland

TOORACAPPUL

Doonamona Townland

KNOCKR

Carn River

Cave

Infants Burial Ground

NOTE
FOR CONTINUATION OF SITE LAYOUT
DRAWINGS FOR GRID CONNECTION ROUTE
REFER TO DWG'S SERIES
6289-PL-GR-1100 TO 1117

KEY PLAN

101 102 103 105 106 107 108 109

NOTES
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LEGEND

- DEVELOPMENT AREA
- PROPOSED WIND FARM ACCESS TRACK
- EXISTING ROADS -PUBLIC TO BE UPGRADED
- PROPOSED WIND TURBINE LOCATION
- PROPOSED TURBINE HARDSTAND
- WATERCOURSE CROSSING
- SPOIL MANAGEMENT AREA
- PROPOSED NEW WIND FARM INTERNAL POWER AND COMUNICATION CABLING
- PROPOSED NEW BATTERY STORAGE FACILITY INTERNAL POWER AND COMUNICATION CABLING
- 5m CONTOUR
- CHAINAGE
- PROPOSED STOCK PROOF FENCE
- PROPOSED 50M STREAM BUFFER ZONE
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- PROPOSED CLEAN WATER DRAIN SHOWN THUS
- PROPOSED DIRTY WATER DRAIN SHOWN THUS
- ARCHEOLOGICAL SITES SHOWN THUS
- EXISTING SITE ENTRANCES
- PROPOSED SITE ENTRANCES
- L0000-00 R314 PUBLIC ROAD NUMBERS

VECTOR SHEETS:
1058,1059

rev	date	modifications	D	C	A

Client
CONSTANT ENERGY LTD

Project
TIRAWLEY WIND FARM
CO.MAYO

Stage
PLANNING

Title
SITE LAYOUT PLAN
SHEET 8
(WIND FARM)

Scales
1:2,500 @ A1

Surveyed	Drawn	Checked	Approved	Date
JOD	JB	MG / DT	DK	07/2025

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Job Ref.	Drawing No.	Revision
6289	PL-108	0

FOR DETAILS

PROPOSED NEW WIND FARM INTERNAL
POWER AND COMUNICATION CABLING
REFER TO DRAWING 6289-PL-1001
FOR DETAILS

PROPOSED METEOROLOGICAL MAST
REFER TO DRAWING 6289-PL-900
FOR DETAILS

PROPOSED METEOROLOGICAL MAST
F.L=60.00m

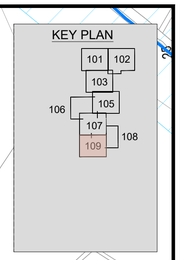
PROPOSED TURBINE
AT02 LOCATION
F.L=53.00 +/-0.5m

PROPOSED CRANE HARDSTAND
REFER TO DRAWING 6289-PL-600
PROPOSED TURBINE FOUNDATION DETAILS
REFER TO DRAWING 6289-PL-501-01
PROPOSED TURBINE DETAILS
REFER TO DRAWING 6289-PL-500

NOTE
FOR CONTINUATION OF SITE LA
DRAWINGS FOR GRID CONNECT
REFER TO DWG'S SERIES
6289-PL-GR-1100 TO 1117

Cave
Infants Burial Ground
Carn Townland
Moneen Townland
MONEEN
An Móinín
Rathbaun -
Templemurry
Parish Townland
Bellasallagh Townland
BELLASALLAGH
Béal Atha Saileach
L-5179-0
R314

KEY PLAN



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LEGEND

- DEVELOPMENT AREA
- PROPOSED WIND FARM ACCESS TRACK
- EXISTING ROADS -PUBLIC TO BE UPGRADED
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- ARCHEOLOGICAL SITES SHOWN THUS
- EXISTING SITE ENTRANCES
- PROPOSED SITE ENTRANCES
- L0000-00 R314 PUBLIC ROAD NUMBERS

VECTOR SHEETS:
1058

rev	date	modifications	D	C	A

Client
CONSTANT ENERGY LTD

Project
TIRAWLEY WIND FARM
CO.MAYO

Stage
PLANNING

Title
SITE LAYOUT PLAN
SHEET 9
(WIND FARM)

Scales
1:2,500 @ A1

Surveyed	Drawn	Checked	Approved	Date
JOD	JB	MG / DT	DK	07/2025

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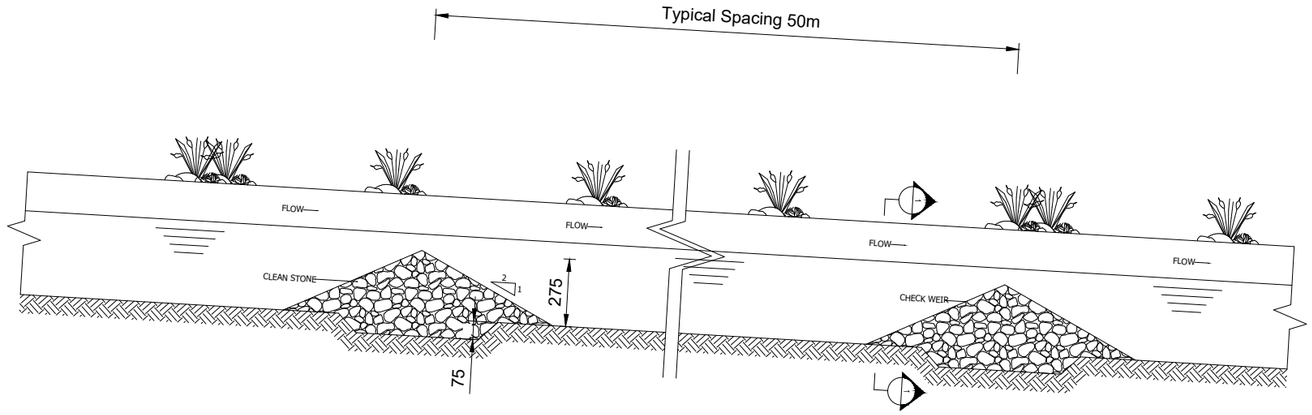
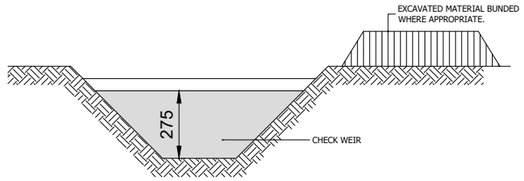
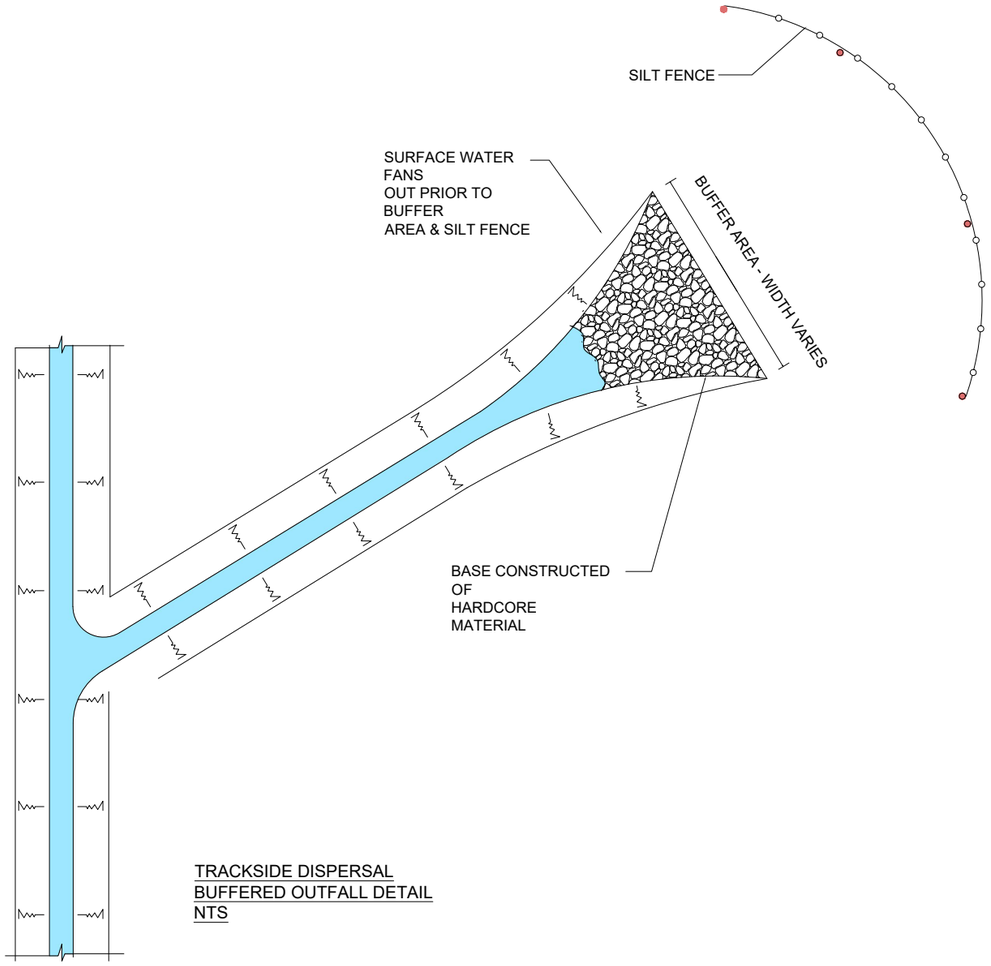
Job Ref.	Drawing No.	Revision
6289	PL-109	0



LONGITUDINAL SECTION THROUGH DRAINAGE WITH CHECK WEIRS
SCALE 1:25



SECTION 1-1
SCALE 1:25



TRACKSIDE DISPERSAL
BUFFERED OUTFALL DETAIL
NTS

NOTES:

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THIS DRAWING IS NOT TO BE USED AS A CONSTRUCTION DRAWING.

DRAINAGE NOTES

1. GENERAL:
DRAINAGE BUFFER ZONE WIDTHS SHALL BE A MINIMUM OF 65m.

2. CONSTRUCTION AND MAINTENANCE
- ROADSIDE DRAIN SHOULD NOT INTERCEPT LARGE VOLUMES OF WATER FROM THE GROUND ABOVE.
- ROADSIDE DRAINS LIKELY TO CARRY HIGH SEDIMENT LOADS AND MUST DISCHARGE INTO A BUFFER OF ADEQUATE WIDTH.
- DRAINS ON THE UPPER SIDE OF THE ROAD MAY NEED CULVERTS TO THE LOWER SIDE.
- REGULAR INSPECTIONS, CLEANING AND REPAIRS WHERE NECESSARY.

3. DRAINS:
- DRAINS SHALL BE DESIGNED AND CONSTRUCTED TO MITIGATE CHANNEL EROSION, E.G. BY INSTALLATION OF PERFORATED PIPE WITH DRAINAGE STONE SURROUND.
DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SYSTEM OF STILLING PONDS AND BUFFERED OUTFALLS.
- DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL BE CONVEYED THROUGH A BUFFERED OUTFALL WITHIN AN UNDISTURBED STABILISED AREA AT NON-EROSIVE VELOCITIES.
- ALL OBSTRUCTIONS WITHIN A DRAINAGE CHANNEL SHALL BE REMOVED AND DISPOSED OF, SO AS NOT TO INTERFERE WITH THE PROPER FUNCTION OF THE DRAINAGE SYSTEM.
- CHECK DAMS SHALL BE CONSTRUCTED USING WELL GRADED 150mm DOWN ANGULAR GRAVEL PLACED OVER A GEO-TEXTILE LAYER. SEE DETAIL 1.
- THE SPACING OF CHECK DAMS SHALL BE SUCH THAT THE PEAK OF THE DOWNSTREAM DAM IS NO LOWER THAN THE FOOT OF THE UPSTREAM DAM.
- THE USE OF STRAW BALES WITHIN THE DRAINAGE SYSTEM SHOULD BE CONSIDERED ON A TEMPORARY BASIS DURING CONSTRUCTION AND MAINTENANCE WORK.
- STRAW BALES SHOULD, HOWEVER, ONLY BE USED TO INTERCEPT SEDIMENT-LADEN RUNOFF FROM ALL DRAINAGE AREAS OF DISTURBED SOIL.
- BALES SHOULD BE ANCHORED IN PLACE BY THE USE OF TIMBER STAKES OR RE-BARS DRIVEN THROUGH THE BALE. WHERE BALES ARE TO BE PLACED IN POSITION ADJACENT TO OTHER BALES (EG WITHIN A STILLING POND), THE FIRST STAKE IN EACH BALE SHOULD BE DRIVEN TOWARDS THE PREVIOUSLY LAID BALE AT AN ANGLE. THIS HAS THE EFFECT OF FORCING THE TWO BALES TOGETHER.
- BALES SHALL BE REPLACED AS REQUIRED
- BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS.

4. OUTFALLS:
- ALL DRAINAGE CHANNELS SHALL FAN/TAPER OUT BEFORE ENTERING THE BUFFER ZONE. PRIOR TO ENTERING THE TAPERED ZONE, THE BASE OF THE DRAINAGE CHANNELS TO BE CONSTRUCTED OF A HARDCORE MATERIAL TO AID THE SETTLEMENT OF SUSPENDED SOLIDS.
- NON-DEVELOPMENT RUN-OFF SHALL BE RETURNED TO A SURFACE FLOW CONDITION E.G. BY USE OF LEVEL SPREADERS.

rev.	modifications	D	C	A

P:\Jod-jobs\6289 Tirawley WF\700 Drawings\703 Planning\200 - Drainage\6289-PL-200-201.dwg

Client
CONSTANT ENERGY LTD

Project
TIRAWLEY WIND FARM
CO. MAYO

Stage
PLANNING

Title
DRAINAGE DETAILS
SHEET 1 OF 4

Scales
AS NOTED @ A3

Surveyed	Prepared	Checked	Approved	Date
JOD	JB	MG / DT	DK	07/2025

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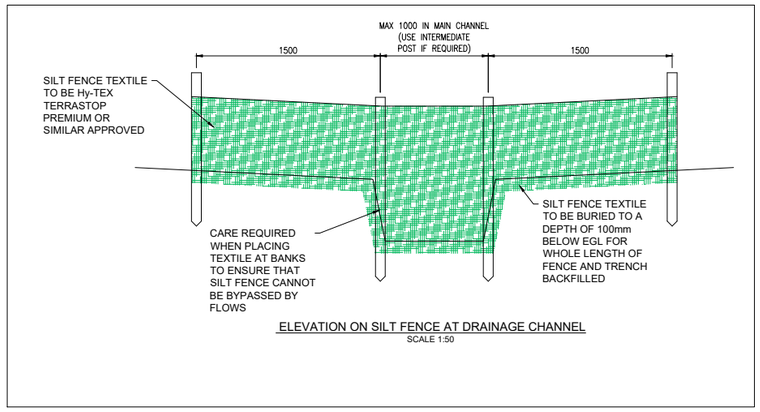
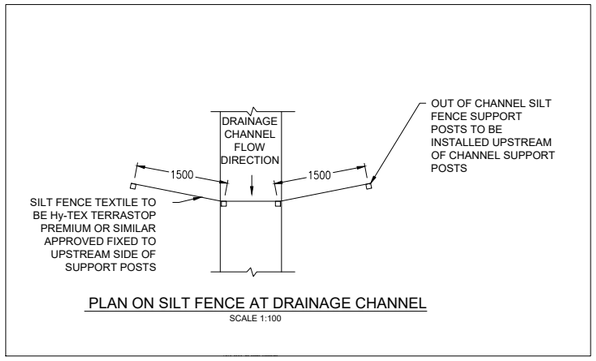
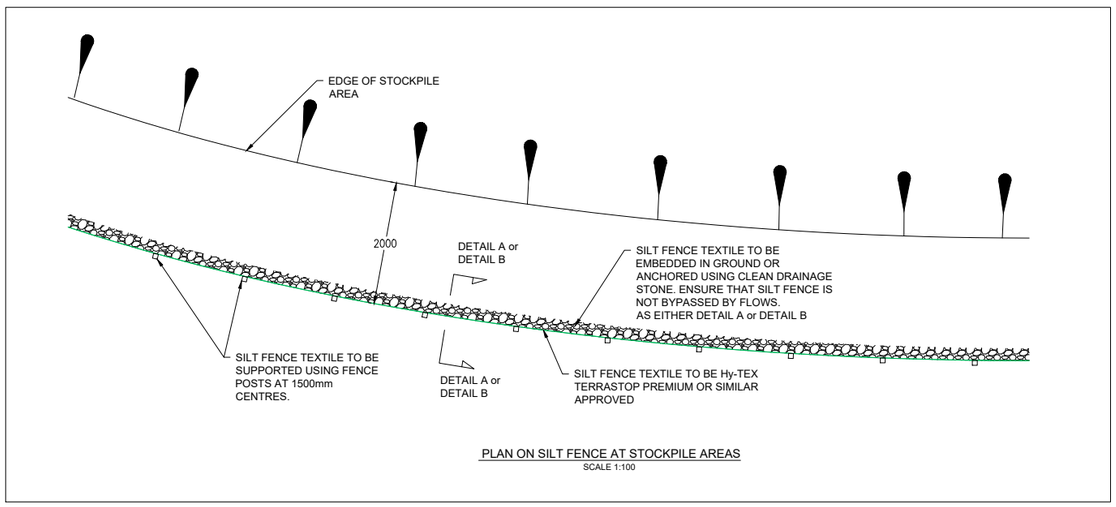
Job No.	Drawing no.	Revision
6289	PL-200	0



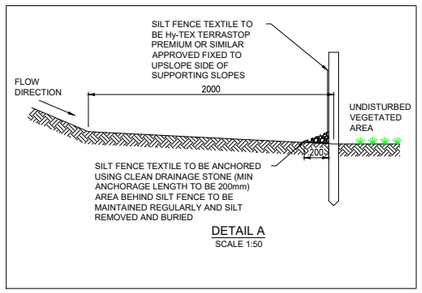
ELEVATION ON SILT FENCE AT DRAINAGE CHANNEL
SCALE 1:50



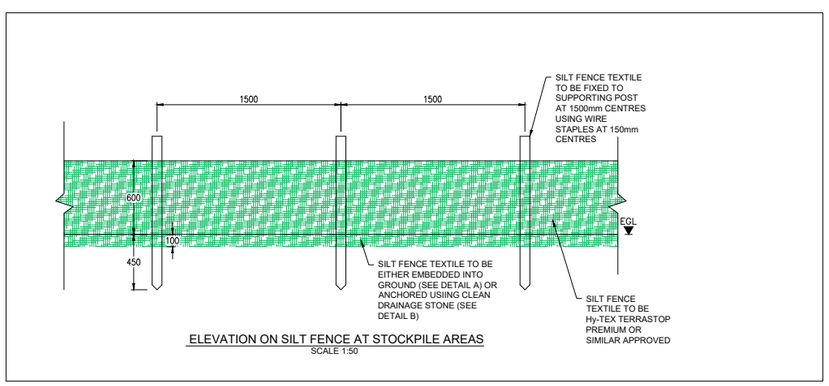
PLAN ON SILT FENCE AT DRAINAGE CHANNEL
SCALE 1:100



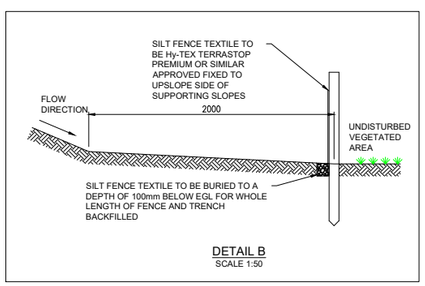
PLAN ON SILT FENCE AT STOCKPILE AREAS
SCALE 1:100



DETAIL A
SCALE 1:50



ELEVATION ON SILT FENCE AT STOCKPILE AREAS
SCALE 1:50



DETAIL B
SCALE 1:50

NOTES:

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2. CONSTRUCTION AND MAINTENANCE
- ROADSIDE DRAIN SHOULD NOT INTERCEPT LARGE VOLUMES OF WATER FROM THE GROUND ABOVE.
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3. DRAINS:
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- ALL OBSTRUCTIONS WITHIN A DRAINAGE CHANNEL SHALL BE REMOVED AND DISPOSED OF, SO AS NOT TO INTERFERE WITH THE PROPER FUNCTION OF THE DRAINAGE SYSTEM.
- CHECK DAMS SHALL BE CONSTRUCTED USING WELL GRADED 150mm DOWN ANGULAR GRAVEL PLACED OVER A GEO-TEXTILE LAYER. SEE DETAIL 1.
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- NON-DEVELOPMENT RUN-OFF SHALL BE RETURNED TO A SURFACE FLOW CONDITION E.G. BY USE OF LEVEL SPREADERS.

rev.	modifications	D	C	A

P:\Jod-jobs\6289 Tirawley WF\700 Drawings\703 Planning\200 - Drainage\6289-PL-200-201.dwg

Client
CONSTANT ENERGY LTD

Project
TIRAWLEY WIND FARM
CO. MAYO

Stage
PLANNING

Title
DRAINAGE DETAILS
SHEET 2 OF 4

Scales
AS NOTED @ A3

Surveyed	Prepared	Checked	Approved	Date
JOD	JB	MG / DT	DK	07/2025

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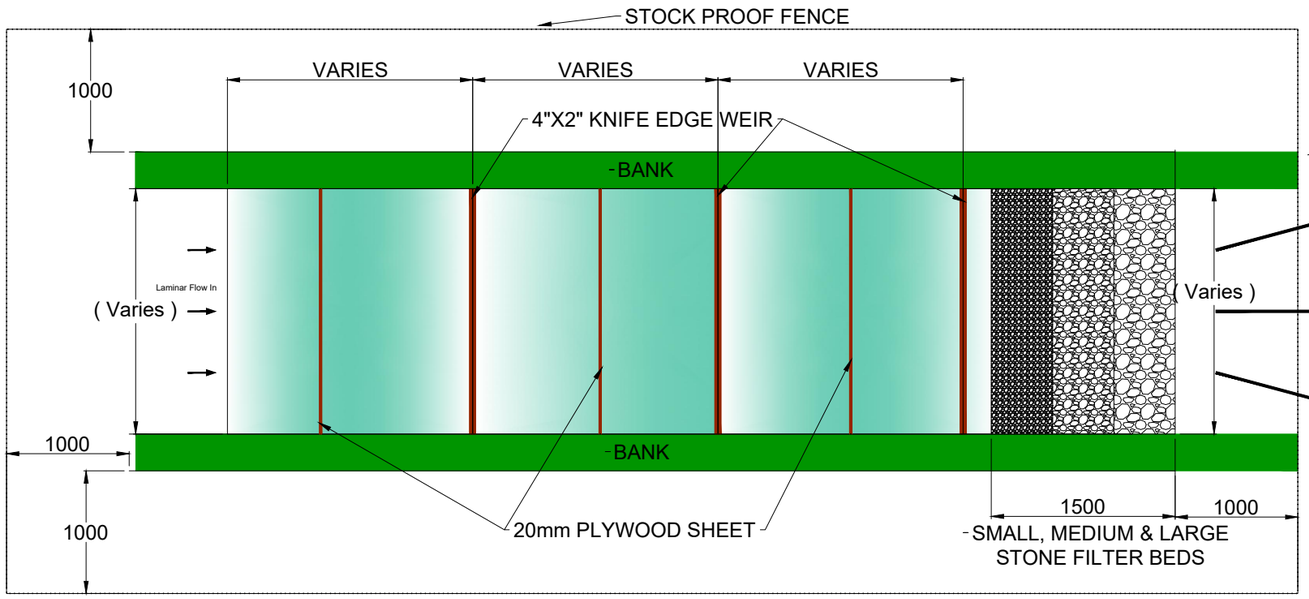
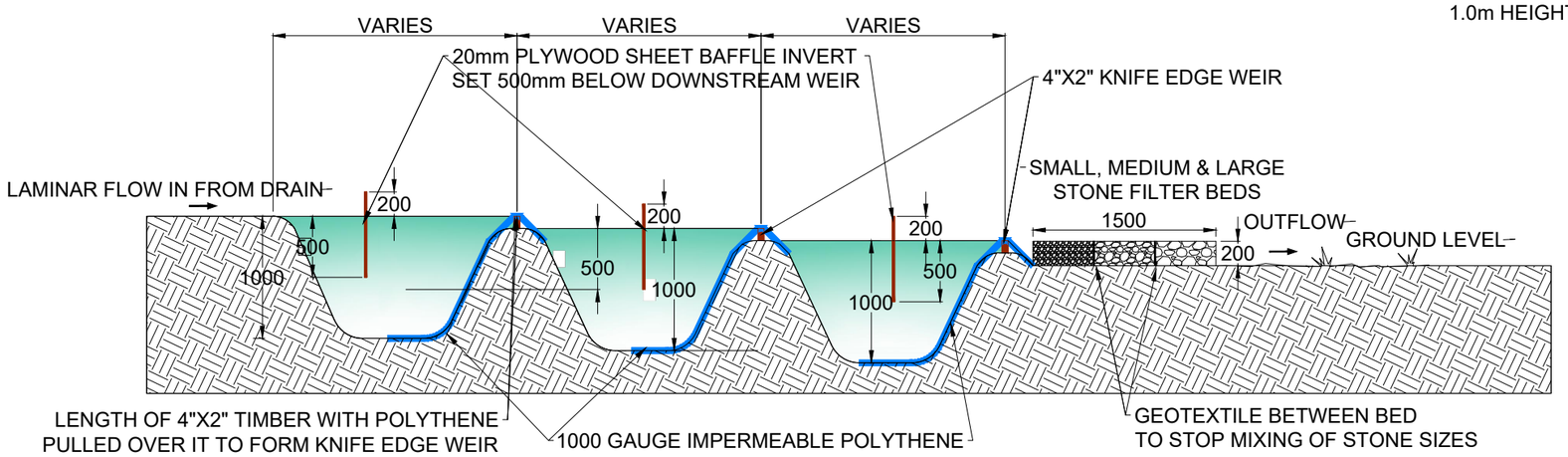
Job No.	Drawing no.	Revision
6289	PL-201	0



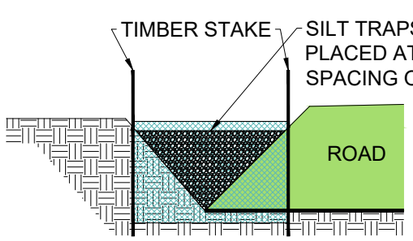
PLAN VIEW OF SETTLEMENT PONDS (WITH DISCHARGE TO DRAINS WHERE APPLICABLE)SCALE
SCALE 1:50

HY-TEX TERRASTOP PREMIUM
SILT FENCE OR SIMILAR APPROVED.
HELD IN PLACE WITH 75mmSQ BY
1.0m HEIGHT TIMBER POSTS @ 1.5m C/C

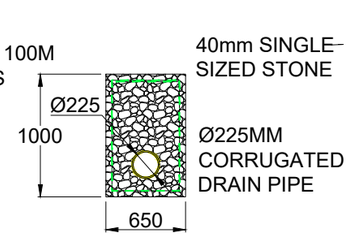


SECTION A-A
SCALE 1:50

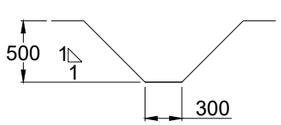
SILT TRAPS TO BE PLACED AT
APPROX 100m SPACING ON DRAINS



SEDIMENT FENCE DETAIL
SCALE 1:50



PERMANENT PERIPHERAL
LAND DRAIN
SCALE 1:50



TEMPORARY "V"
DITCH DRAIN PROFILE
SCALE 1:50

COMPLETED SETTLEMENT POND SYSTEM
N.T.SCALE

NOTES:
1 FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2 ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
3 ENGINEER TO BE INFORMED OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
4 THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS.

THIS DRAWING IS NOT TO BE USED AS A CONSTRUCTION DRAWING.

rev.	modifications	D	C	A

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Client
CONSTANT ENERGY LTD

Project
TIRAWLEY WIND FARM
CO. MAYO

Stage
PLANNING

Title
DRAINAGE DETAILS
SHEET 3 OF 4

Scales
AS NOTED @ A3

Surveyed	Prepared	Checked	Approved	Date
JOD	JB	MG / DT	DK	07/2025

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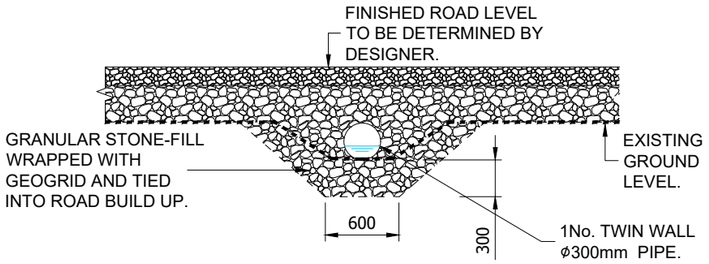
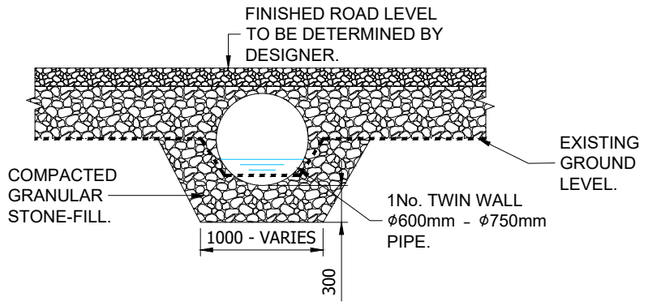
Job No.	Drawing no.	Revision
6289	PL-202	0



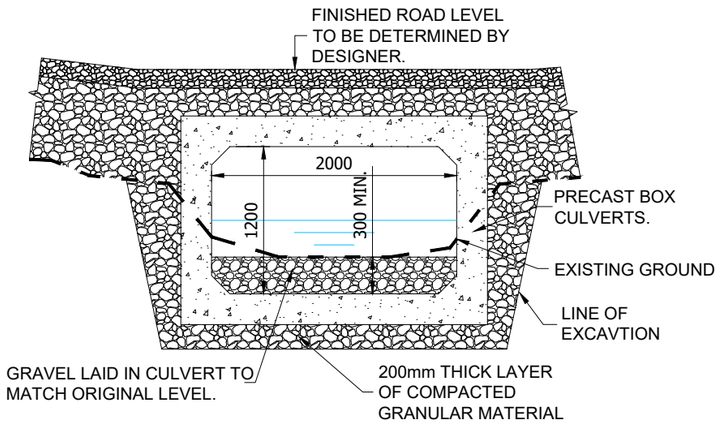
TYPE 1 CULVERT

SCALE 1:50



TYPE 2 CULVERT

SCALE 1:50



TYPE 3 CULVERT

SCALE 1:50

NOTE:

CULVERTS ARE TO BE OF ADEQUATE SIZE TO CARRY PEAK FLOWS CORRESPONDING TO A 1 IN 100 YEAR STORM EVENT, WITH A MINIMUM DIAMETER OF 900mm. THEY SHOULD BE INSTALLED TO CONFORM WHEREVER POSSIBLE TO THE NATURAL SLOPE AND ALIGNMENT OF THE STREAM OR DRAINAGE LINE. CULVERTS GREATER THAN 1m DIAMETER SHOULD BE BURIED TO A MINIMUM DEPTH OF 300mm BELOW THE STREAMBED AND THE ORIGINAL BED MATERIAL PLACED IN THE BOTTOM OF THE CULVERT.

1. FORMATION LEVEL TO BE DETERMINED BY THE CIVIL WORKS DESIGNER. REFER TO SITE INVESTIGATIONS REPORT.

2. SUB BASE MATERIAL TO CONFORM TO THE FOLLOWING:

   IMPORTED MATERIAL
   TO CONFORM TO TYPE 6F1 IN ACCORDANCE WITH TABLE 6/2 OF THE NRA SPECIFICATION FOR ROAD WORKS.

   SITE WON MATERIAL
   ROCK WON IN EXCAVATION OF TURBINES MUST BE CRUSHED AND GRADED ON SITE. THE MAXIMUM SIZE OF AGGREGATE TO BE 125mm. THE AGGREGATE GRADING TO BE AGREED WITH THE ENGINEER.

3. SURFACE LAYER TO BE CLAUSE 804. THIS LAYER MAY BE APPLIED IMMEDIATELY BEFORE TURBINE DELIVERY.

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rev.	modifications	D	C	A

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