

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 1.1 - Western Springs	Revision: B
Location:	Western Springs	Date: 25/07/12
Prepared by	Anna Tyrrell, revised Aidan Cooper	
Checked by	Dietmar Londer	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the WS1 – Western Springs construction site.

The plan outlines Erosion Sediment Control Plan (ESCP) required for the site establishment phase and the Stormwater Management Plan (SMP) for the Construction phase. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site establishment phase of the proposed Central Interceptor works at this site. The ESCP was developed using available LIDAR data and Council Services information from GIS.

It is assumed the site establishment phase will conservatively last 6 months.

Sediment controls in the works area will include stabilised clean water diversions, silt fences and 2x decanting earth bunds (DEBs).

The total designation area (0.78ha) will be directed to two DEBs which will start treating the catchment immediately.

- DEB A will receive 0.39 ha and will have a volume of 117m³.
- DEB B will receive 0.39 ha and will have a volume of 117m³.

2.2 Erosion and Sediment Control Construction Methodology

DEB A will be constructed in the north west corner of the site and DEB B will be constructed in the south east corner in accordance with ARC's TP90. Both outlets will discharge to the existing public stormwater network. Stabilised emergency spillways will be constructed to safely convey storm exceedance events from the site to the surrounding grass fields surrounding the site.

Diversion bunds will direct the catchment's sediment laden flow to the DEBs as indicated. Lined clean water diversion bunds will direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the respective treatment device.

The site access will be stabilised with road metal and a vehicle wheel wash constructed to drain to a sediment treatment device.

2.3 Erosion and Sediment Control Measures

- 1) Install 2x DEBs, stabilised spillways and outlets. Construct sediment diversion drains to direct catchment to treatment devices.
- 2) Construct clean water diversion drains to divert clean water from construction site.
- 3) Construct stabilised vehicle access and wheel wash. Direct wheel wash drain to treatment device.
- 4) Progressively stabilise site in accordance with TP90.
- 5) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

It is required to consider each of the Central Interceptor construction sites individually to determine if stormwater treatment and attenuation is required during the construction phase of the central interceptor.

Sites that have an impermeable area of greater than 1000m² require their pre development stormwater condition to be maintained as outlined in TP10.

Due to the construction duration at this site it has been assumed, at this stage, that these areas will be stabilised with concrete or asphalt and that TP10 requirements are required. Alternatively the Contractor may propose, subject to final approval, the use of metallised surfaces with TP90 treatment requirements

This stormwater management plan will summaries TP108 quantities for the water quality volume (WQV) and 34.5mm (EDV) event. The stormwater volumes and quantities, as determined by TP10 calculations, will be summarised for each of the sites.

3.2 Site Activity

The Construction Phase for the WS1 – Western Springs construction site will conservatively last 60 months (5 years). Construction activities on the site include the construction of 2 shafts and 2 chambers for the tunnel construction to the treatment shafts site, and the construction of an air treatment facility. During construction the majority of traffic will consist of heavy trucks to remove construction spoil from site and deliver construction materials. Pollutants within the works area will be contributed by construction traffic and some sediment from the construction activity.

During the construction phase the site will include extensive construction materials stock pile areas, utility buildings, and construction staff parking areas.

3.3 Stormwater Management Controls

The impermeable area will consist of access roads, car parks, and construction hard stand area, site and utility buildings. Due to the heavy traffic accessing the site permeable paving is not considered a practical option to minimise the impervious surface area. The total construction area is >1000m² and requires treatment as set out in TP10.

To provide surface water treatment during the construction phase it is proposed to utilise the proposed permanent stormwater treatment and attenuation devices where possible.

Construction phase stormwater TP10 treatment volumes have been summarised.

	Peak Flow			Runoff Volume	
	2 year ARI (l/s)	10 year ARI (l/s)	100 year ARI (l/s)	EDV(m3)	WQV(m3)
Construction phase	77	154		196	141

The site's permanent impermeable area, of 2508m², will be treated 2x proprietary devices.

To provide surface water treatment during the temporary construction phase it is proposed to utilise the 2x permanent proposed proprietary treatment devices.

It is proposed to utilise rain tanks to attenuate the utility sheds and office's clean roof water and discharge directly to the public stormwater network. It has been assumed the receiving network has capacity for these additional flows.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

In the event of a design exceedance event overland flow paths will be directed safely from the construction site to the surrounding park area.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 1.2 – Western Springs (CC2A1) Connection	Revision: B 25/07/12
Location:	Western Springs	
Prepared by:	Anna Tyrrell, revised Tomas Ussher	
Checked by:	Aidan Cooper	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the WS1 – Western Springs CC2A1 Construction site.

The plan describes the surface water treatment and attenuation required for the site establishment phase and the central interceptor's construction phase. Both phases of work have assumed 100% of the designation is being utilised for the required works.

The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site establishment phase of the proposed Central Interceptor works at this site. The ESCP was developed using available Lidar data and Council Services information from GIS.

It is assumed the site establishment phase will conservatively last 1 month.

Sediment controls in the works area will include stabilised clean water diversions and a silt fence.

The works area is 70m² with works consisting of the installation of a drop shaft and control chamber. It is proposed to install a silt fence which will start treating the catchment immediately.

2.2 Erosion and Sediment Control Construction Methodology

Construct silt fence in the south eastern part of the site in accordance with ARC's TP90.

Lined clean water diversion bunds will direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the respective treatment device.

2.3 Erosion and Sediment Control Measures

- 1) Install silt fence.

- 2) Construct clean water diversion drains to divert clean water from construction site.
- 3) Progressively stabilise site in accordance with TP90.
- 4) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SWMP) proposes the site to be stabilised with grass, road metal hard stand or similar control as defined by TP90. It is required to consider stormwater quality and attenuation during the central interceptor's construction.

3.2 Site Activity

It is assumed the Construction Phase for the WS1 – Western Springs CC2A1 Connection construction site will conservatively last 8 months.

During the construction phase the traffic at this construction site will consist of heavy trucks to cart construction spoil away and deliver construction materials. The majority of the pollutants within the works area will be contributed by construction traffic and some sediment from the construction activity.

3.3 Stormwater Management Controls

The site's total area is 70m² of which it is assumed 100% will be utilised during the construction phase of the works. The site's construction hardstand area and access road will be stabilised with road metal and maintained to comply with TP90. The site's utility buildings are considered clean surfaces and will be directed across a grass filter strip into the adjoining reserve. Any area not being utilised specifically for construction activities will be stabilised with grass seed and straw mulch (or similar TP90 erosion control) and directed across a grass filter strip into the adjoining reserve.

Lined (stabilised) clean water diversion bunds will continue to direct overland flows from outside of the work area around the construction site.

The Vehicle wash bay will be maintained and drain across a grass filter strip into the adjoining reserve.

In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Construction surface water will continue to flow across a grass filter strip into the adjoining reserve.

The construction phase SWMP has assumed the site will be stabilised with road metal, grass or similar TP90 Erosion Control method. In the event this changes the SWMP will be revised for Council approval.

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 2.1 Mt Albert War Memorial Reserve	Revision: B
Location:	Mt Albert	25/07/12
Prepared by:	Aidan Cooper	
Checked by:	Andy Gough	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the AS1 – Mt Albert War Memorial Reserve construction site.

The plan outlines Erosion Sediment Control Plan (ESCP) required for the site establishment phase and the Stormwater Management Plan (SMP) for the Construction phase. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site's establishment phase for the Central Interceptor works at this site. The ESCP was developed referencing TP90, available LIDAR data and Council Services information available from GIS.

It is assumed the site establishment phase will conservatively last 2 months.

Sediment controls in the works area will include stabilised clean water diversions, sediment diversion drains and a Decanting Earth Bund (DEB).

The total works area is 0.44ha and will be directed to the DEB which will start treating the catchment immediately. The DEB will have a volume of 131m³ (3%) and will be connected to the existing stormwater drain which runs beside the site; the DEB's spillway will be directed safely to the neighbouring reserve. The DEB is not flocculated.

2.2 Erosion and Sediment Control Construction Methodology

The DEB will be constructed in the north eastern part of the site in accordance with ARC's TP90. The DEB outlet will discharge to the existing 1500mm dia stormwater pipe. A stabilised emergency spillway will be constructed to safely convey storm exceedance events from the site to the neighbouring reserve.

Diversion bunds will direct the catchment's sediment laden flow to the DEB as indicated. Lined (stabilised) clean water diversion bunds will direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the treatment device.

The site access will be stabilised with road metal and a vehicle wheel wash constructed to drain to the DEB.

2.3 Erosion and Sediment Control Measures

- 1) Install DEB, stabilised spillways and outlets.
- 2) Construct sediment diversion drains to direct catchment to treatment devices.
- 3) Construct clean water diversion drains to divert clean water from construction site.
- 4) Construct stabilised vehicle access and wheel wash. Direct wheel wash drain to treatment device.
- 5) Progressively stabilise site in accordance with TP90.
- 6) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SMP) proposes the site to be stabilised with grass, road metal hard stand or similar control as defined by TP90. It is required to consider stormwater quality and attenuation during the central interceptor's construction. It is proposed to continue operation of the established TP90 environmental controls during the construction phase to provide treatment to the construction area and attenuation of the surface area.

3.2 Site Activity

It is conservatively assumed the Construction Phase for the AS1 – Mt Albert War Memorial Reserve construction site will last 18 months.

Construction activities on the site may include the construction of a jacking shaft, the tunnel construction to the next shaft site, construction of the permanent access structure and reinstatement of the site.

During construction heavy vehicles will remove construction spoil away and deliver construction materials. Pollutants within the works area will be contributed by construction traffic, and central interceptor construction activity.

It is anticipated the site will include utility buildings and construction staff parking during the construction phase.

3.3 Surface Water Management Controls

The site's designation area is 4383m² of which it is assumed 100% will be utilised during the construction phase of the works. The site's construction hardstand area, access road and parking areas will be stabilised with road metal and maintained to comply with TP90. The site's utility buildings are considered clean surfaces and will be directed to the existing DEB. Any area not being utilised specifically for construction activities will be stabilised with grass seed and straw mulch (or similar TP90 erosion control) and directed to the DEB. The DEB

will attenuate surface water and continue to discharge to the existing 1500mm dia stormwater pipe.

Diversion bunds will continue to direct the catchment's surface water flow to the DEB as indicated. Lined (stabilised) clean water diversion bunds will continue to direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the treatment device.

The Vehicle wash bay will be maintained and drain to the DEB.

In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Surface water will flow from the DEB's stabilised spillway to the neighbouring reserve.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

Central Interceptor

Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 3.1 – Lyon Avenue	Revision: B
Location:	Lyon Avenue	Date: 25/07/12
Prepared by:	Anna Tyrrell, revised Vivian Li	
Checked by:	Aidan Cooper	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the AS2 – Lyon Avenue construction site.

The plan outlines Erosion Sediment Control Plan (ESCP) required for the site establishment phase and the Stormwater Management Plan (SMP) for the Construction phase. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site establishment phase of the proposed Central Interceptor works at this site. The ESCP was developed using available LIDAR data and Council Services information from GIS.

It is assumed the site establishment phase will conservatively last 2 months.

Sediment controls in the works area will include stabilised clean water diversions, sediment diversion drains, a silt fence and a Sediment Retention Pond (SRP).

The works area (0.40ha) will be directed to a silt fence and a SRP which will start treating the catchment immediately.

- The silt fence will receive 0.07 ha and will be 50m long. The silt fence will provide 65% treatment efficiency.
- The SRP will receive 0.34 ha and will have a volume of 120m³. It is proposed to flocculate the treatment pond, providing 95% treatment efficiency. The SRP outlet will discharge to the stream.

2.2 Erosion and Sediment Control Construction Methodology

The silt fence will be constructed with returns in the north western part of the site in accordance with ARC's TP90.

The SRP will be constructed in the western part of the site in accordance with ARC's TP90. The outlet will discharge to the existing open stormwater channel. An emergency spillway will be constructed to safely convey storm exceedance events from the site to the nearby concrete lined stormwater channel.

Diversion bunds will direct the catchment's sediment-laden flow to the SRP as indicated. Lined clean water diversion bunds will direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the respective treatment device.

The site access will be stabilised with road metal and a vehicle wheel wash constructed to drain to a sediment treatment device.

2.3 Erosion and Sediment Control Measures

- 1) Install silt fence, SRP, stabilised spillways and outlets.
- 2) Construct sediment diversion drains to direct catchment to treatment devices.
- 3) Construct clean water diversion drains to divert clean water from construction site.
- 4) Construct stabilised vehicle access and wheel wash. Direct wheel wash drain to treatment device.
- 5) Progressively stabilise site in accordance with TP90.
- 6) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SMP) proposes the site to be stabilised with grass, road metal hard stand or similar control as defined by TP90. It is required to consider stormwater quality and attenuation during the central interceptor's construction. It is proposed to continue operation of the established TP90 environmental controls during the construction phase to provide treatment to the construction area and attenuation of the surface area.

3.2 Site Activity

It is assumed the Construction Phase for the AS2 – Lyon Avenue construction site will conservatively last 12 to 18 months.

Construction activities on the site include the construction of a jacking shaft, the tunnel construction to the next shaft site, construction of the permanent access structure and reinstatement of the site.

During the construction phase the traffic at this construction site will consist of heavy trucks to cart construction spoil away and deliver construction materials. The majority of the pollutants within the works area will be contributed by construction traffic and sediment from the construction activity. A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects on the proposed SMP controls.

It is anticipated the site will include utility buildings and construction staff parking during the construction phase.

3.3 Stormwater Management Controls

The site's total area is 4012m² of which it is assumed 100% will be utilised during the construction phase of the works. The site's construction hardstand area, access road and parking areas will be stabilised with road metal and maintained to comply with TP90. The site's utility buildings are considered clean surfaces and will be directed to the existing SRP. The SRP will not be flocculated during construction. Any area not being utilised specifically for construction activities will be stabilised with grass seed and straw mulch (or similar TP90 erosion control) and directed to the SRP.

The area treated using a silt fence during the Site Establishment phase will be stabilised and runoff will be diverted across a grass filter strip into the adjoining concrete lined stormwater channel.

Diversion bunds will continue to direct the catchment's sediment laden flow to the SRP as indicated. Lined (stabilised) clean water diversion bunds will continue to direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the treatment device.

The Vehicle wash bay will be maintained and drain to the DEB.

In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Surface water will flow from the DEB's stabilised spillway to the neighbouring reserve.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 4.1 – Haverstock Road	Revision: B
Location:	Mt Albert	25/07/12
Prepared by:	Aidan Cooper, revised Tomas Ussher	
Checked by:	Dietmar Londer	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the AS3 – Haverstock Road construction site.

The plan outlines Erosion Sediment Control Plan (ESCP) required for the site establishment phase and the Stormwater Management Plan (SMP) for the Construction phase. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site's establishment phase for the Central Interceptor works at this site. The ESCP was developed referencing TP90, available LIDAR data and Council Services information available from GIS.

It is assumed the site establishment phase will conservatively last 2 months.

Sediment controls in the works area will include stabilised clean water diversions and a silt fence.

The works area (0.1ha) will be directed to a silt fence which will start treating the catchment immediately.

2.2 Construction Sequence / Methodology

A silt fence will be constructed along the northern boundary of the site in accordance with ARC's TP90.

An existing open drain will continue to channel flows from outside of the work area around the construction site. A temporary culvert will be installed to direct this open drain below the northern vehicle access point and connect to the existing 1600mm diameter stormwater drain. The site will be contoured to direct construction surface flows to the silt fence.

If the southern vehicle entrance is required, a temporary culvert will be installed to direct the existing private open drain below the site access.

The site access will be stabilised with road metal and a vehicle wheel wash.

2.3 Erosion and Sediment Control Measures

- 1) Install silt fence.
- 2) Construct clean water diversion drains and culverts to divert clean water from construction site.
- 3) Construct stabilised vehicle access and wheel wash.
- 4) Progressively stabilise site in accordance with TP90.
- 5) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SMP) proposes the site to be stabilised with grass, road metal hard stand or similar control as defined by TP90.

3.2 Site Activity

It is conservatively assumed the Construction Phase for the AS3 – Haverstock Road construction site will last 18 months.

Construction activities on the site may include the construction of two access shafts, one chamber, construction of the permanent all weather access, and reinstatement of the site.

During construction heavy vehicles will remove construction spoil away and deliver construction materials. Pollutants within the works area will be contributed by construction traffic, and central interceptor construction activity.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects on the proposed SMP controls.

It is anticipated the site will include utility buildings and construction staff parking during the construction phase.

3.3 Surface Water Management Controls

The site's designation area is 4190m² of which it is assumed 100% will be utilised during the construction phase of the works. The site's construction hardstand area, access road and parking areas will be stabilised with road metal and maintained to comply with TP90. Stabilised surface areas will be directed towards the proposed permanent grassed swale which will provide surface treatment and some attenuation before discharging to the existing open channel. The permanent grass swale runs parallel to the existing open channel

The site's utility buildings are considered clean surfaces and will discharge directly to the existing open stormwater channel.

The Vehicle wash bay will drain to the grass swale.

In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Surface water will flow from the DEB's stabilised spillway to the neighbouring reserve.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 5.1 – Walmsley	Revision: B
Date:	Park 31/05/12	25/07/12
Location:	Walmsley Park	
Prepared by:	Anna Tyrrell, revised Vivian Li	
Checked by:	Aidan Cooper	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the AS4 – Walmsley Park construction site.

The plan outlines Erosion Sediment Control Plan (ESCP) required for the site establishment phase and the Stormwater Management Plan (SMP) for the Construction phase. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site establishment phase of the proposed Central Interceptor works at this site. The ESCP was developed using available LIDAR data and Council Services information from GIS.

It is assumed the site establishment phase will conservatively last 2 months.

Sediment controls in the works area will include stabilised clean water diversions, sediment diversion drains, a decanting earth bund (DEB) and 2x silt fences with bunding on the accessway.

The works area (0.25 ha) will be directed to two silt fences which will start treating the catchment immediately.

- The DEB (to the west of the stream) will receive 0.21 ha and will be 70m³. It will provide 75% treatment efficiency. The DEB will discharge to the stream.
- Silt fence 1 (to the east of the stream) will receive 0.04 ha and will be 30m long. It will provide 65% treatment efficiency.
- Silt fence 2 (to the west of the stream) will provide additional protection to the stream but does not have a dedicated catchment.

2.2 Erosion and Sediment Control Construction Methodology

The DEB will be constructed in the western part of the site in accordance with ARC's TP90. Bunding will be constructed on the accessway itself to direct sediment-laden water to the DEB.

Silt fence 1 will be constructed in the eastern part of the site in accordance with ARC's TP90. Returns will be constructed next to the accessway, and bunding will be constructed on the accessway itself to prevent sediment-laden discharge from bypassing the silt fence.

Silt fence 2 will be constructed in the western part of the site in accordance with ARC's TP90. Returns will be constructed next to the accessway, and bunding will be constructed on the accessway itself to prevent sediment-laden discharge from bypassing the silt fence.

Lined clean water diversion bunds will direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the respective treatment devices.

The site access will be stabilised with road metal and a vehicle wheel wash constructed to drain to a sediment treatment device.

2.3 Erosion and Sediment Control Measures

- 1) Install silt fence with bunding across accessway.
- 2) Install DEB and sediment diversion bunds.
- 3) Construct clean water diversion drains to divert clean water from construction site.
- 4) Construct stabilised vehicle access and wheel wash. Direct wheel wash drain to treatment device.
- 5) Progressively stabilise site in accordance with TP90.
- 6) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SMP) proposes the site to be stabilised with grass, road metal hard stand or similar control as defined by TP90. It is required to consider stormwater quality and attenuation during the central interceptor's construction. It is proposed to continue operation of the established TP90 environmental controls during the construction phase to provide treatment to the construction area and attenuation of the surface area.

3.2 Site Activity

It is assumed the Construction Phase for the AS4 – Walmsley Park construction site will conservatively last 18 months.

Construction activities on the site include the construction of a jacking shaft, the tunnel construction to the next shaft site, construction of the permanent access structure and reinstatement of the site.

During the construction phase the traffic at this construction site will consist of heavy trucks to cart construction spoil away and deliver construction materials. The majority of the pollutants within the works area will be contributed by construction traffic and some sediment

from the construction activity. A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects on the proposed SMP controls.

It is anticipated the site will include utility buildings and construction staff parking during the construction phase.

3.3 Stormwater Management Controls

The site's total area is 2550m² of which it is assumed 100% will be utilised during the construction phase of the works. The site's construction hardstand area, access road and parking areas will be stabilised with road metal and maintained to comply with TP90. The site's utility buildings are considered clean surfaces and will be directed to the existing DEB. Any area not being utilised specifically for construction activities will be stabilised with grass seed and straw mulch (or similar TP90 erosion control) and directed to the DEB.

Diversion bunds will continue to direct the catchment's sediment laden flow to the DEB as indicated. Lined (stabilised) clean water diversion bunds will continue to direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the treatment device.

The area treated using a silt fence during the Site Establishment phase will be stabilised and runoff will be diverted across a grass filter strip into the adjoining reserve or stream.

The Vehicle wash bay will be maintained and drain to the DEB.

In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Surface water will flow from the DEB's stabilised spillway to the neighbouring reserve.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 6.1 – May Road	Revision: B
Location:	Mangere	25/07/12
Prepared by:	Aidan Cooper	
Checked by:	Dietmar Londer	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the WS2 - May Road construction site.

The plan describes the surface water treatment and attenuation required for the site establishment phase and the central interceptor's construction phase. Both phases of work have assumed 100% of the designation is being utilised for the required works. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site's establishment phase for the Central Interceptor works at this site. The ESCP was developed referencing TP90, available LIDAR data and Council Services information available from GIS.

It is assumed the site establishment phase will conservatively last 6 months

Sediment controls in the works area will include stabilised clean water diversions, sediment diversion drains and 2x Sediment Retention Ponds (SRPs).

The total works area (1.48 ha) will be directed to two SRPs which will start treating the catchment immediately.

- SRP A will receive 0.66 ha and will have a volume of 200m³. It is proposed to flocculate the treatment pond providing 95% treatment efficiency.
- SRP B will receive 0.82 ha and will have a volume of 246m³. It is proposed to flocculate the treatment pond providing 95% treatment efficiency.

2.2 Construction Sequence / Methodology

SRP A will be constructed in the northern corner of the site in accordance with ARC's TP90. The outlet will discharge to the open drain. A stabilised emergency spillway will be constructed to safely convey storm exceedance events from the site to the open drain.

SRP B will be constructed near the vehicle entrance in accordance with ARC's TP90. The outlet will discharge to the nearby open drain. A stabilised emergency spillway will be constructed to safely convey storm exceedance events from the site to the open drain.

Diversion bunds will direct the catchment's sediment laden flow to the SRPs as indicated. Lined clean water diversion bunds and existing open drains will direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the respective treatment device.

The site access will be stabilised with road metal and a vehicle wheel wash constructed to drain to a sediment treatment device.

2.3 Erosion and Sediment Control Measures

- 1) Install 2x SRPs, stabilised spillways and outlets.
- 2) Construct sediment diversion drains to direct catchment to treatment devices.
- 3) Construct clean water diversion drains to divert clean water from construction site.
- 4) Construct stabilised vehicle access and wheel wash. Direct wheel wash drain to treatment device.
- 5) Progressively stabilise site in accordance with TP90.
- 6) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

It is required to consider each of the Central Interceptor construction sites individually to determine if stormwater treatment and attenuation is required during the construction phase of the central interceptor.

Sites that have an impermeable area of greater than 1000m² require their pre development stormwater condition to be maintained as outlined in TP10.

Due to the construction duration at this site it has been assumed, at this stage, that these areas will be stabilised with concrete or asphalt and that TP10 requirements are required. Alternatively the Contractor may propose, subject to final approval, the use of metallised surfaces with TP90 treatment requirements

This stormwater management plan will summaries TP108 quantities for the water quality volume (WQV) and 34.5mm (EDV) event. The stormwater volumes and quantities, as determined by TP10 calculations, will be summarised for each of the sites

3.2 Site Activity

The Construction Phase for the WS2 – May Road construction site will conservatively last 60 months (5 years). Construction activities on the site include the construction of three drop shafts, tunnel construction to the next shaft site, a stormwater detention area, and a air treatment facility. During construction the majority of traffic will consist of heavy trucks to cart construction spoil away and deliver construction materials. Pollutants within the works area will be contributed by construction traffic and sediment from the construction activity.

During the construction phase the site will include extensive construction materials stock pile areas, utility buildings, and construction staff parking areas.

3.3 Stormwater Management Controls

The site's total area is 1.48ha. It has been assumed that 1.48ha will be impermeable during the construction phase of the works.

The impermeable area will consist of access roads, carparks, construction hard stand area, site and utility buildings. Due to the construction duration at this site it has been assumed these areas will be stabilised with concrete or asphalt. Due to the heavy traffic accessing the site permeable paving is not considered a practical option to minimise the impervious surface area. The total construction area is >1000m² and requires the surface water to be treated.

To provide treatment and attenuation to the site's surface water it is proposed to continue using the two TP90 sediment retention ponds while construction activities are being undertaken on site. Upon construction completion a stormwater detention area is proposed.

Construction phase stormwater TP10 treatment volumes have been summarised.

	Peak Flow			Runoff Volume	
	2 year ARI (l/s)	10 year ARI (l/s)	100 year ARI (l/s)	EDV(m3)	WQV(m3)
Construction phase	146	292		371	268

It is proposed to direct hardstand surface water to grassed swales to treat and convey surface water to the existing TP90 sediment ponds. The grass swales will be in a similar location to the noted temporary sediment laden diversion drains.

The total TP90 treatment volume is 446m³ of which 312m³ is live storage. It is proposed to direct all surface water from the site to the two existing sediment retention ponds where it will be attenuated to TP90 standards (3l/s/ha).

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

In the event of a design exceedance storm event overland flow paths will direct surface water safely from the site to the surface drain.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 7.1 – Keith Hay Park	Revision B
Location:	Keith Hay Park	Date: 25/07/2012
Prepared by:	Lance Collier, Revised Tomas Ussher	
Checked by:	Aidan Cooper	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the AS5 – Keith Hay Park construction site.

The plan outlines Erosion Sediment Control Plan (ESCP) required for the site establishment phase and the Stormwater Management Plan (SMP) for the Construction phase. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site establishment phase of the proposed Central Interceptor works at this site. The ESCP was developed using available LIDAR data and Council Services information from GIS.

It is assumed the site establishment phase will conservatively last 2 months.

Sediment controls in the works area will include stabilised clean water diversions, sediment diversion drains, a silt fence and a Decanting Earth Bund (DEB).

The works area (0.43ha) will be directed to a silt fence and a DEB which will start treating the catchment immediately.

- The DEB will receive 0.37 ha and will have a volume of 111m³. It is proposed not to flocculate the DEB providing 75% treatment efficiency.
- Silt fence A will receive 0.06 ha and will provide 65% treatment efficiency.

2.2 Erosion and Sediment Control Construction Methodology

The DEB will be constructed in the northern part of the site in accordance with ARC's TP90. The outlet will discharge to the open channel. An emergency spillway will be constructed to safely convey storm exceedance events from the site.

Silt fence A will be constructed in the north western part of the site in accordance with ARC's TP90.

Diversion bunds will direct the catchment's sediment laden flow to the DEB as indicated. Lined clean water diversion bunds will direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the respective treatment device.

The site access will be stabilised with road metal.

2.3 Erosion and Sediment Control Measures

- 1) Install DEB, stabilised spillways and outlets.
- 2) Construct sediment diversion drains to direct catchment to treatment devices.
- 3) Construct clean water diversion drains to divert clean water from construction site.
- 4) Construct stabilised vehicle access and wheel wash. Direct wheel wash drain to treatment device.
- 5) Progressively stabilise site in accordance with TP90.
- 6) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SMP) proposes the site to be stabilised with grass, road metal hard stand or similar erosion control as defined by TP90. It is required to consider stormwater quality and attenuation during the central interceptor's construction. It is proposed to continue operation of the established TP90 environmental controls during the construction phase to provide treatment to the construction area and attenuation of the surface area.

3.2 Site Activity

It is assumed the Construction Phase for the AS5 – Keith Hay Park construction site will conservatively last 18 months.

Construction activities on the site include the construction of a jacking shaft, the tunnel construction to the next shaft site, construction of the permanent access structure and reinstatement of the site.

During the construction phase the traffic at this construction site will consist of heavy trucks to cart construction spoil away and deliver construction materials. The majority of the pollutants within the works area will be contributed by construction traffic and sediment from the construction activity. A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects on the proposed SMP controls.

It is anticipated the site will include utility buildings and construction staff parking during the construction phase.

3.3 Stormwater Management Controls

The site's total area is 4253m² of which it is assumed 100% will be utilised during the construction phase of the works. The site's construction hardstand area, access road and

parking areas will be stabilised with road metal and maintained to comply with TP90. The site's utility buildings are considered clean surfaces and will be directed to the existing DEB. Any area not being utilised specifically for construction activities will be stabilised with grass seed and straw mulch (or similar TP90 erosion control) and directed to the DEB.

The area treated using a silt fence during the Site Establishment phase will be stabilised and runoff will be diverted across a grass filter strip into the adjoining concrete lined stormwater channel.

Diversion bunds will continue to direct the catchment's sediment laden flow to the DEB as indicated. Lined (stabilised) clean water diversion bunds will continue to direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the treatment device.

The Vehicle wash bay will be maintained and drain to the DEB.

In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Surface water will flow from the DEB's stabilised spillway to the neighbouring reserve.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 8.1– PS23 (AS6)	Revision B
Location:	AS6	Date: 25/07/2012
Prepared by:	Aidan Cooper, revised Tomas Ussher	
Checked by:	Aidan Cooper	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the AS6 – PS23 construction site.

The plan outlines Erosion Sediment Control Plan (ESCP) required for the site establishment phase and the Stormwater Management Plan (SMP) for the Construction phase. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site establishment phase of the proposed Central Interceptor works at this site. The ESCP was developed using available LIDAR data and Council Services information from GIS.

It is assumed the site establishment phase will conservatively last 2 months.

Sediment controls in the works area will include the use of clean fill as the fill material, controlled fill of the site and if required a sediment sump. It is proposed to use the fill material as sediment treatment for the 0.19ha works area by ensuring the edges of the fill are above the mean high tide mark and are graded to drain away from the fill edges.

2.2 Erosion and Sediment Control Construction Methodology

A clean water diversion bund will be formed across the existing driveway to direct flows from driveway to kerbs and beside the works area.

In order to form the construction platform, clean aggregate fill material will be pushed out from the existing edge compacted and graded to drain inwards, away from fill edge. It is anticipated that any sediment within the construction area will be treated by the fill material. Designate vehicle washing area.

If required, a 2m³ sediment sump will be constructed within the fill to filter and contain any sediment laden runoff and provide treatment prior to pumping to the Manukau harbour as required.

2.3 Erosion and Sediment Control Measures

- 1) Install sediment sump and diversion bunds.
- 2) Construct sediment diversion drains to direct catchment to treatment devices.
- 3) Construct clean water diversion drains to divert clean water from construction site.
- 4) Construct wheel wash. Direct wheel wash drain to treatment device.
- 5) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SWMP) proposes the site to be stabilised with grass, road metal hard stand or similar control as defined by TP90. It is required to consider stormwater quality and attenuation during the central interceptor's construction. It is proposed to continue operation of the established TP90 environmental controls during the construction phase to provide treatment to the construction area and attenuation of the surface area.

3.2 Site Activity

It is assumed the Construction Phase for the AS6 – PS23 construction site will conservatively last 18 months.

Construction activities on the site include the construction of two jacking shafts, the tunnel construction to the next shaft site, construction of the permanent access structure, the treatment device and reinstatement of the site.

During the construction phase the traffic at this construction site will consist of heavy trucks to cart construction spoil away and deliver construction materials. The majority of the pollutants within the works area will be contributed by construction traffic and sediment from the construction activity.

It is anticipated the site will include utility buildings and construction staff parking during the construction phase.

3.3 Stormwater Management Controls

The site's total area is 1941m² of which it is assumed 100% will be utilised during the construction phase of the works. The site's construction hardstand area, access road and parking areas will be maintained to comply with TP90. The site's utility buildings are considered clean surfaces and will be directed into the existing sediment sump pit if required. Any area not being utilised specifically for construction activities will be stabilised with grass seed and straw mulch (or similar TP90 erosion control) and directed to the sediment sump pit, if required.

Lined (stabilised) clean water diversion bunds will continue to direct overland flows from outside of the work area around the construction site.

The Vehicle wash bay will be maintained and drain to the sediment sump.

In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Surface water will flow from the fill area to the coastal marine environment.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

Permanent stormwater TP10 treatment volumes have been summarised.

	Peak Flow			Runoff Volume	
	2 year ARI (l/s)	10 year ARI (l/s)	100 year ARI (l/s)	EDV(m3)	WQV(m3)
Operation phase	19	38		34	23

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 9A1 - Kiwi Esplanade Utilities	Revision B
Location:	Mangere	Date: 25/07/2012
Prepared by:	Aidan Cooper, revised Tomas Ussher	
Checked by:	Aidan Cooper	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the AS7 - Kiwi Esplanade Utilities construction site.

The plan outlines Erosion Sediment Control Plan (ESCP) required for the site establishment phase and the Stormwater Management Plan (SMP) for the Construction phase. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site establishment phase of the proposed Central Interceptor works at this site. The ESCP was developed using available LIDAR data and Council Services information from GIS.

It is assumed the site establishment phase will conservatively last 2 months.

Sediment controls in the works area will include stabilised clean water diversions, sediment diversion drains and a decanting earth bund (DEB).

The works area (0.3ha) will be directed to a single DEB which will start treating the catchment immediately. The DEB will receive 0.3ha and will have a volume of 90m³ (3%).

2.2 Erosion and Sediment Control Construction Methodology

DEB1 will be constructed in the northern part of the construction site and will be in accordance with ARC's TP90. The outlet will discharge to the Manukau harbour.

The site will be graded to direct the site's catchment inwards to the DEB. The existing kerb line along the eastern boundary of the site will be maintained to divert clean flows from the reserve access road away from the construction site. Sediment diversion drains will direct the catchment's sediment laden flow to the DEB as indicated. Lined clean water diversion bunds will direct overland flows from outside of the work area around the construction site.

The site access will be stabilised with road metal and a vehicle wheel wash constructed to drain to the DEB. The vehicle wheel wash area will additionally act as the DEB's emergency spillway which will be constructed to safely convey storm exceedance events from the site to the Kiwi Esplanade Reserve

2.3 Erosion and Sediment Control Measures

- 1) Install DEB, stabilised spillways and outlets.
- 2) Construct sediment diversion drains to direct catchment to treatment devices.
- 3) Construct clean water diversion drains to divert clean water from construction site.
- 4) Construct stabilised vehicle access and wheel wash. Direct wheel wash drain to treatment device.
- 5) Progressively stabilise site in accordance with TP90.
- 6) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SMP) proposes the site to be stabilised with grass, road metal hard stand or similar control as defined by TP90. It is required to consider stormwater quality and attenuation during the central interceptor's construction. It is proposed to continue operation of the established TP90 environmental controls during the construction phase to provide treatment to the construction area and attenuation of the surface area.

3.2 Site Activity

It is assumed the Construction Phase for the AS7 - Kiwi Esplanade Utilities construction site will conservatively last 18 months. Construction activities on the site include the construction of shafts to continue construction of the Central Interceptor. During the construction phase the traffic at this construction site will consist of heavy trucks to cart construction spoil away and deliver construction materials and excavation machinery. The majority of the pollutants within the works area will be contributed by construction traffic and some sediment from the construction activity.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects on the proposed SMP controls.

3.3 Stormwater Management Controls

The site's total area is 3022m² of which it is assumed 100% will be utilised during the construction phase of the works.

The site's construction hardstand area, access road and parking areas will be stabilised with road metal and maintained to comply with TP90. The site's utility buildings are considered clean surfaces and will be directed to the existing DEB. Any area not being utilised specifically for construction activities will be stabilised with grass seed and straw mulch (or similar TP90 erosion control) and directed to the DEB. The DEB will attenuate surface water and continue to discharge to the Coastal Marine Area (CMA).

Diversion bunds will continue to direct the catchment's sediment laden flow to the DEB as indicated. Lined (stabilised) clean water diversion bunds will continue to direct overland

flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the treatment device.

The Vehicle wash bay will be maintained and drain to the DEB.

In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Surface water will flow from the DEB's stabilised spillway to the neighbouring reserve.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

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Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 9B1 – Ambury Park	Revision B
Location:	Mangere	Date: 25/07/2012
Prepared by:	Lance Collier, revised Tomas Ussher	
Checked by:	Aidan Cooper	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the AS7 – Ambury Park construction site.

The plan outlines Erosion Sediment Control Plan (ESCP) required for the site establishment phase and the Stormwater Management Plan (SMP) for the Construction phase. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site establishment phase of the proposed Central Interceptor works at this site. The ESCP was developed using available LIDAR data and Council Services information from GIS.

It is assumed the site establishment phase will conservatively last 2 months.

Sediment controls in the works area will include stabilised clean water diversions and a silt fence with returns.

The works area (0.18ha) will be directed to a silt fence which will start treating the catchment immediately.

2.2 Erosion and Sediment Control Construction Methodology

The silt fence will be constructed along the eastern edge of the construction site and will in accordance with ARC's TP90.

The site will be graded to direct the site's catchment evenly to the silt fence. Lined clean water diversion bunds will direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the respective treatment device.

The site access will be stabilised with road metal and a vehicle wheel wash constructed to drain to the silt fence.

2.3 Erosion and Sediment Control Measures

- 1) Install DEB, stabilised spillways and outlets.
- 2) Construct sediment diversion drains to direct catchment to treatment devices.
- 3) Construct clean water diversion drains to divert clean water from construction site.
- 4) Construct stabilised vehicle access and wheel wash. Direct wheel wash drain to treatment device.
- 5) Progressively stabilise site in accordance with TP90.
- 6) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SMP) proposes the site to be stabilised with grass, road metal hard stand or similar erosion control as defined by TP90. It is required to consider stormwater quality and attenuation during the central interceptor's construction.

3.2 Site Activity

It is assumed the Construction Phase for the AS7 – Ambury Park construction site will conservatively last 18 months. Construction activities on the site include the construction of a drop shaft and access shaft to continue construction of the Central Interceptor. During the construction phase the traffic at this construction site will consist of heavy trucks to cart construction spoil away and deliver construction materials. The majority of the pollutants within the works area will be contributed by construction traffic and some sediment from the construction activity.

3.3 Stormwater Management Controls

The site's total area is 1747m² of which it is assumed 100% will be utilised during the construction phase of the works. The site's construction hardstand area, access road and parking areas will be stabilised with road metal and maintained to comply with TP90 and directed to drain through a grass filter strip to the adjoining reserve. The site's utility buildings are considered clean surfaces and will be directed across a grass filter strip into the adjoining reserve. Any area not being utilised specifically for construction activities will be stabilised with grass seed and straw mulch (or similar TP90 erosion control) and directed across a grass filter strip into the adjoining reserve.

Lined (stabilised) clean water diversion bunds will continue to direct overland flows from outside of the work area around the construction site.

The Vehicle wash bay will be maintained and drain to the DEB.

In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Surface water will flow from the DEB's stabilised spillway to the neighbouring reserve.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 10.1 - Mangere Pump Station	Revision: B
Location:	Mangere	Date: 25/07/12
Prepared by:	Aidan Cooper,	
Checked by:	Andy Gough	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the WS3 - Mangere Pump Station construction site.

The plan describes the surface water treatment and attenuation required for the site establishment phase and the central interceptor's construction phase. Both phases of work have assumed 100% of the designation is being utilised for the required works. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site's establishment phase for the Central Interceptor works at this site. The ESCP was developed referencing TP90, available LIDAR data and Council Services information available from GIS.

It is assumed the site establishment phase will conservatively last 6 months

Sediment controls in the works area will include stabilised clean water diversions, sediment diversion drains and 2x Sediment Retention Ponds (SRPs). A Portion of the site (0.4ha) is to be stabilised by approved TP90 erosion control practises. The sediment retention ponds spillway will be directed safely to the Manukau Harbour.

The works area (2.6ha) will be directed to two SRPs which will start treating the catchment immediately.

- SRP1 will receive 1 ha and will have a volume of 300m³. It is proposed to flocculate the treatment pond during site establishment.
- SRP2 will receive 1.2 ha and will have a volume of 360m³. It is proposed to flocculate the treatment pond during site establishment.
- 0.4ha will be stabilised by TP90 approved erosion control practises.

2.2 Construction Sequence / Methodology

SRP1 will be constructed in the western part of the site in accordance with ARC's TP90. The outlet will discharge to the Manukau harbour. An emergency spillway will be constructed to safely convey storm exceedance events from the site to the Manukau harbour.

SRP2 will be constructed in the eastern part of the site in accordance with ARC's TP90. The outlet will discharge to the estuary noted on the plan. An emergency spillway will be constructed to safely convey storm exceedance events from the site to the estuary.

Diversion bunds will direct the catchment's sediment laden flow to the SRPs as indicated. Lined clean water diversion bunds will direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the respective treatment device.

The area noted for future use (0.4ha) will be maintained by TP90 approved erosion controls.

The site access will be stabilised with road metal and a vehicle wheel wash constructed to drain to a sediment treatment device.

2.3 Erosion and Sediment Control Measures

- 1) Install 2x SRPs, stabilised spillways and outlets. Size and install flocculation units in accordance with TP227.
- 2) Construct sediment diversion drains to direct catchment to treatment devices.
- 3) Construct clean water diversion drains to divert clean water from construction site.
- 4) Construct stabilised vehicle access and wheel wash. Direct wheel wash drain to treatment device.
- 5) Maintain future use area to TP90 erosion control standard.
- 6) Progressively stabilise site in accordance with TP90
- 7) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

It is required to consider each of the Central Interceptor construction sites individually to determine if stormwater treatment and attenuation is required during the construction phase of the central interceptor.

Sites that have an impermeable area of greater than 1000m² require their pre development stormwater condition to be maintained as outlined in TP10.

Due to the construction duration at this site it has been assumed, at this stage, that these areas will be stabilised with concrete or asphalt and that TP10 requirements are required. Alternatively the Contractor may propose, subject to final approval, the use of metallised surfaces with TP90 treatment requirements

This stormwater management plan will summaries TP108 quantities for the water quality volume (WQV) and 34.5mm (EDV) event. The stormwater volumes and quantities, as determined by TP10 calculations, will be summarised for each of the sites.

3.2 Site Activity

The Construction Phase for the WS3 - Mangere Pump Station construction site will conservatively last 72 months (6 years). Construction activities on the site include the construction of receiving shaft/pump station. During construction the majority of traffic will consist of heavy trucks to cart construction spoil away and deliver construction materials. Pollutants within the works area will be contributed by construction traffic and some sediment from the construction activity.

During the construction phase the site will include extensive construction materials stock pile areas, utility buildings, and construction staff parking areas.

Due to the extents of the area required for construction the two TP90 sediment retention ponds (SRP) will be decommissioned as the site is progressively stabilised.

3.3 Stormwater Management Controls

The site's total area is 2.6ha. It has been assumed that 2.2ha will be impermeable during the construction phase of the works, with 0.4ha being maintained as existing grass area.

The impermeable area will consist of access roads, carparks, construction hard stand area, site and utility buildings. Due to the construction duration at this site it has been assumed these areas will be stabilised with concrete or asphalt. Due to the heavy traffic accessing the site permeable paving is not considered a practical option to minimise the impervious surface area during construction. The total construction area is >1000m² and requires treatment as set out in TP10.

To provide surface water treatment during the construction phase it is proposed to utilise the proposed permanent stormwater treatment and attenuation devices where possible.

Construction phase stormwater TP10 treatment volumes have been summarised.

	Peak Flow			Runoff Volume	
	2 year ARI (l/s)	10 year ARI (l/s)	100 year ARI (l/s)	EDV(m3)	WQV(m3)
Construction phase	256	513		522	361

To minimise surface water runoff during construction it is proposed to direct clean surface water from utility building roof areas directly to the Manukau Harbour (CMA).

It is proposed to direct hardstand surface water to grassed swales to treat and convey surface water. The permanent grass swales will be in a similar location to the temporary sediment laden diversion drains in the centre of the designation. The site will discharge to the Manukau Harbour (Coastal Marine Area) and will not require attenuation.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

In the event of a design exceedance event overland flow paths will be directed safely from the construction site to the surrounding park area.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 11.1 – Motions Road	Revision B
Location:	Motions Road	Date: 25/07/2012
Prepared by:	Aidan Cooper, revised Tomas Ussher	
Checked by:	Aidan Cooper	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the L1S1 – Motions Road construction site.

The plan outlines Erosion Sediment Control Plan (ESCP) required for the site establishment phase and the Stormwater Management Plan (SMP) for the Construction phase. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site establishment phase of the proposed Central Interceptor works at this site. The ESCP was developed using available LIDAR data and Council Services information from GIS.

It is assumed the site establishment phase will conservatively last 2 months.

Sediment controls in the works area will include stabilised clean water diversions, sediment diversion drains, stabilised vehicle access, decanting earth bund (DEB) and 2x Silt Fences.

The total works area (0.21ha) will be directed to a DEB and 2 silt fences which will start treating the catchment immediately.

- DEB will receive 0.18ha and will have a volume of 54m³.
- Silt Fence 1 will receive a total of 180m²
- Silt Fence 2 will receive a total of 70m².

2.2 Erosion and Sediment Control Construction Methodology

The proposed DEB will be constructed in the southern part of the site in accordance with ARC's TP90. The DEB outlet will discharge to the Motions creek and a stabilised emergency spillway will be constructed to safely convey storm exceedance events from the site to Motions creek.

The 2x silt fences will provide sediment treatment to the 2x proposed outfall construction areas.

Diversion bunds will direct the catchment's sediment laden flow to the DEB as indicated. Lined clean water diversion bunds will direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the respective treatment device.

The site access will be stabilised with road metal and a vehicle wheel wash constructed to drain to the DEB sediment treatment device.

2.3 Erosion and Sediment Control Measures

- 1) Construct DEB, stabilised spillways and outlets.
- 2) Construct sediment diversion drains to direct catchment to treatment devices.
- 3) Construct cleanwater diversion drains to divert clean water from construction site.
- 4) Construct stabilised vehicle access and wheel wash. Direct wheel wash drain to treatment device.
- 5) Construct Silt Fences to provide treatment to outlying work areas.
- 6) Progressively stabilise site in accordance with TP90.
- 7) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SMP) proposes the site to be stabilised with grass, road metal hard stand or similar erosion control as defined by TP90. It is required to consider stormwater quality and attenuation during the central interceptor's construction. It is proposed to continue operation of the established TP90 environmental controls during the construction phase to provide treatment to the construction area and attenuation of the surface area.

3.2 Site Activity

It is assumed the Construction Phase for the L1S1 – Motions Road construction site will conservatively last 18 months.

Construction activities on the site may include the construction of a jacking shaft, the tunnel construction to the next shaft site, construction of the permanent access structure and reinstatement of the site.

During the construction phase the traffic at this construction site will consist of heavy trucks to cart construction spoil away and deliver construction materials. The majority of the pollutants within the works area will be contributed by construction traffic and some sediment from the construction activity.

It is anticipated the site will include utility buildings and construction staff parking during the construction phase.

3.3 Stormwater Management Controls

The site's total area is 2082m² of which it is assumed 100% will be utilised during the construction phase of the works. The site's construction hardstand area, access road and parking areas will be stabilised with road metal and maintained to comply with TP90. The site's utility buildings are considered clean surfaces and will be directed to the existing DEB. Any area not being utilised specifically for construction activities will be stabilised with grass seed and straw mulch (or similar TP90 erosion control) and directed to the DEB.

The area treated using a silt fence during the Site Establishment phase will be stabilised and runoff will be diverted across a grass filter strip to Motions Creek.

Diversion bunds will continue to direct the catchment's sediment laden flow to the DEB as indicated. Lined (stabilised) clean water diversion bunds will continue to direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the treatment device.

The Vehicle wash bay will be maintained and drain to the DEB.

In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Surface water will flow from the DEB's stabilised spillway to the neighbouring reserve.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

Central Interceptor

Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 12.1 – Western Springs Depot	Revision B
Location:	Western Springs	Date: 31/05/12
Prepared by:	Anna Tyrrell, revised Tomas Ussher	
Checked by:	Aidan Cooper	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the L1S2 – Western Springs Depot construction site.

The plan describes the surface water treatment and attenuation required for the site establishment phase and the central interceptor's construction phase. Both phases of work have assumed 100% of the designation is being utilised for the required works.

The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site establishment phase of the proposed Central Interceptor works at this site. The ESCP was developed using available LIDAR data and Council Services information from GIS.

It is assumed the site establishment phase will conservatively last 1 month.

Sediment controls in the works area will include stabilised clean water diversions and a silt fence.

The works area (0.07ha) will be directed to a silt fence which will start treating the catchment immediately.

2.2 Erosion and Sediment Control Construction Methodology

The silt fence will be constructed in the south eastern part of the site in accordance with ARC's TP90.

Lined clean water diversion bunds will direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the respective treatment device.

The site access will be stabilised with road metal or the existing concrete left in situ

2.3 Erosion and Sediment Control Measures

- 1) Install silt fence, SRP, stabilised spillways and outlets.
- 2) Construct sediment diversion drains to direct catchment to treatment devices.
- 3) Construct clean water diversion drains to divert clean water from construction site.

- 4) Construct stabilised vehicle access and wheel wash. Direct wheel wash drain to treatment device.
- 5) Progressively stabilise site in accordance with TP90.
- 6) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SWMP) proposes the site to be stabilised with grass, road metal hard stand or similar control as defined by TP90. It is required to consider stormwater quality and attenuation during the central interceptor's construction.

3.2 Site Activity

It is assumed the Construction Phase for the L1S2 – Western Springs Depot construction site will conservatively last 8 months.

Construction activities on the site include the construction of the permanent access structure and reinstatement of the site.

During the construction phase the traffic at this construction site will consist of excavation machinery, heavy trucks to cart construction spoil away and deliver construction materials. The majority of the pollutants within the works area will be contributed by construction traffic and some sediment from the construction activity.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects on the proposed SWMP controls.

It is anticipated the site will include utility buildings and construction staff parking during the construction phase.

3.3 Stormwater Management Controls

The site's total area is 755m² of which it is assumed 100% will be utilised during the construction phase of the works. The site's construction hardstand area, access road and parking areas will be stabilised with road metal and maintained to comply with TP90. The site's utility buildings are considered clean surfaces and will be directed across a grass filter strip into the adjoining reserve. Any area not being utilised specifically for construction activities will be stabilised with grass seed and straw mulch (or similar TP90 erosion control) and directed across a grass filter strip into the adjoining reserve.

Lined (stabilised) clean water diversion bunds will continue to direct overland flows from outside of the work area around the construction site.

The Vehicle wash bay will be maintained and drain across a grass filter strip into the adjoining reserve.

In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Construction surface water will continue to flow across a grass filter strip into the adjoining reserve.

The construction phase SWMP has assumed the site will be stabilised with road metal, grass or similar TP90 Erosion Control method. In the event this changes the SWMP will be revised for Council approval.

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 13.1 – Rawalpindi Reserve	Revision B
Location:	Rawalpindi Reserve	Date: 25/07/2012
Prepared by:	Aidan Cooper, revised Tomas Ussher	
Checked by:	Aidan Cooper	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the L2S1 – Rawalpindi Reserve construction site.

The plan outlines Erosion Sediment Control Plan (ESCP) required for the site establishment phase and the Stormwater Management Plan (SMP) for the Construction phase. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site establishment phase of the proposed Central Interceptor works at this site. The ESCP was developed using available LIDAR data and Council Services information from GIS.

It is assumed the site establishment phase will conservatively last 2 months.

Sediment controls in the works area will include stabilised clean water diversions, sediment diversion drains and a decanting earth bund (DEB).

The works area (0.48 ha) will be directed to a DEB which will start treating the catchment immediately. The DEB will have a volume of 145m³.

2.2 Erosion and Sediment Control Construction Methodology

The DEB will be constructed in the north eastern corner of the site in accordance with ARC's TP90. The outlet will discharge to the nearby stream. An emergency spillway will be constructed to safely convey storm exceedance events from the site to the stream.

Diversion bunds will direct the catchment's sediment laden flow to the DEB as indicated. Lined clean water diversion bunds will direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the respective treatment device via sediment diversion drains.

The site access will be stabilised with road metal and a vehicle wheel wash constructed to drain to a sediment treatment device.

2.3 Erosion and Sediment Control Measures

- 1) Install DEB, stabilised spillways and outlets.
- 2) Construct sediment diversion drains to direct catchment to treatment device.
- 3) Construct clean water diversion drains to divert clean water from construction site.
- 4) Construct stabilised vehicle access and wheel wash. Direct wheel wash drain to treatment device.
- 5) Progressively stabilise site in accordance with TP90.
- 6) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SMP) proposes the site to be stabilised with grass, road metal hard stand or similar control as defined by TP90. It is required to consider stormwater quality and attenuation during the central interceptor's construction. It is proposed to continue operation of the established TP90 environmental controls during the construction phase to provide treatment and attenuation to the construction surface area.

3.2 Site Activity

It is conservatively assumed the Construction Phase for the L2S1 – Rawalpindi Reserve construction site will last 18 months.

Construction activities on the site may include the construction of a jacking shaft, the tunnel construction to the next shaft site, construction of the permanent access structure and reinstatement of the site.

During construction heavy vehicles will remove construction spoil away and deliver construction materials. Pollutants within the works area will be contributed by construction traffic, and central interceptor construction activity.

It is anticipated the site will include utility buildings and construction staff parking during the construction phase.

3.3 Stormwater Management Controls

The site's total area is 4828m² of which it is assumed 100% will be utilised during the construction phase of the works. The site's construction hardstand area, access road and parking areas will be stabilised with road metal and maintained to comply with TP90. The site's utility buildings are considered clean surfaces and will be directed to the existing DEB. Any area not being utilised specifically for construction activities will be stabilised with grass seed and straw mulch (or similar TP90 erosion control) and directed to the DEB. The DEB will attenuate surface water and continue to discharge to the adjoining reserve.

Diversion bunds will continue to direct the catchment's sediment laden flow to the DEB as indicated. Lined (stabilised) clean water diversion bunds will continue to direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the treatment device.

The Vehicle wash bay will be maintained and drain to the DEB.

In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Surface water will flow from the DEB's stabilised spillway to the neighbouring reserve.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 14.1 – Norgrove Avenue	Revision B
Location:	Mt Albert	Date: 25/07/12
Prepared by:	Lance Collier, revised Tomas Ussher	
Checked by:	Aidan Cooper	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the L2S2 – Norgrove Avenue construction site.

The plan outlines Erosion Sediment Control Plan (ESCP) required for the site establishment phase and the Stormwater Management Plan (SMP) for the Construction phase. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site establishment phase of the proposed Central Interceptor works at this site. The ESCP was developed using available LIDAR data and Council Services information from GIS.

It is assumed the site establishment phase will conservatively last 1 months.

Sediment controls in the works area will include stabilised clean water diversions, sediment diversion drains, a silt fence and 2x Decanting Earth Bunds (DEBs).

The works area (0.28ha) will be directed to two DEBs and a silt fence which will start treating the catchment immediately.

- DEB A will receive 0.07 ha and will have a volume of 22m³.
- DEB B will receive 0.16 ha and will have a volume of 49m³.
- The silt fence will receive 0.05 ha.

2.2 Erosion and Sediment Control Construction Methodology

DEB A will be constructed in the eastern part of the site and DEB B will be constructed in the north western part of the site, in accordance with ARC's TP90. The outlets for both DEBs will discharge to the nearby stream. A stabilised emergency spillway will be constructed for each DEB to safely convey storm exceedance events from the site to the stream.

Diversion bunds will direct the catchment's sediment laden flow to the DEBs as indicated. Lined clean water diversion bunds will direct overland flows from outside of the work area

around the construction site. The site will be contoured to direct surface flows to the respective treatment device.

2.3 Erosion and Sediment Control Measures

- 1) Install silt fence, SRP, stabilised spillways and outlets.
- 2) Construct sediment diversion drains to direct catchment to treatment devices.
- 3) Construct clean water diversion drains to divert clean water from construction site.
- 4) Construct stabilised vehicle access and wheel wash. Direct wheel wash drain to treatment device.
- 5) Progressively stabilise site in accordance with TP90.
- 6) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SMP) proposes the site to be stabilised with grass, road metal hard stand or similar erosion control as defined by TP90. It is required to consider stormwater quality and attenuation during the central interceptor's construction. It is proposed to continue operation of the established TP90 environmental controls during the construction phase to provide treatment to the construction area and attenuation of the surface area.

3.2 Site Activity

It is assumed the Construction Phase for the L2S2 – Norgrove Avenue construction site will conservatively last 8 months.

Construction activities on the site include the construction of a jacking shaft, the tunnel construction to the next shaft site, construction of the permanent access structure and reinstatement of the site.

During the construction phase the traffic at this construction site will consist of heavy trucks to cart construction spoil away and deliver construction materials. The majority of the pollutants within the works area will be contributed by construction traffic and sediment from the construction activity.

It is anticipated the site will include utility buildings and construction staff parking during the construction phase.

3.3 Stormwater Management Controls

The site's total area is 2861m² of which it is assumed 100% will be utilised during the construction phase of the works. The site's construction hardstand area, access road and parking areas will be stabilised with road metal and maintained to comply with TP90. The site's utility buildings are considered clean surfaces and will be directed to the existing DEB. Any area not being utilised specifically for construction activities will be stabilised with grass seed and straw mulch (or similar TP90 erosion control) and directed to the DEB.

The area treated using a silt fence during the Site Establishment phase will be stabilised and runoff will be diverted across a grass filter strip into the adjoining reserve or stream.

Diversion bunds will continue to direct the catchment's sediment laden flow to the DEB as indicated. Lined (stabilised) clean water diversion bunds will continue to direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the treatment device.

The Vehicle wash bay will be maintained and drain to the DEB.

In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Surface water will flow from the DEB's stabilised spillway to the neighbouring reserve.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 15.1 - PS25 (L3S1)	Revision: B
Location:	PS25	25/07/12
Prepared by:	Aidan Cooper, revised Aidan Cooper	
Checked by:	Dietmar Londer	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the L3S1 - PS25 construction site.

The plan outlines Erosion Sediment Control Plan (ESCP) required for the site establishment phase and the Stormwater Management Plan (SMP) for the Construction phase. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

1.1 Introduction

This plan provides an Erosion Sediment Control Plan (ESCP) to accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor. The ESCP provides details of the proposed sediment treatment control devices for the site establishment phase of the proposed Central Interceptor works at this site. The ESCP was developed using available Lidar data and Council Services information from GIS.

It is assumed the site establishment phase will conservatively last 2 months.

Sediment controls in the works area will include stabilised clean water diversions, sediment diversion drains and 1x Sediment Retention Pond (SRP).

The total works area is 0.58ha and will be directed to the SRP which will start treating the catchment immediately.

- SRP A will receive 0.58 ha and will have a volume of 174m³.

1.2 Construction Sequence / Methodology

SRP A will be constructed on the north bank of the stream in accordance with ARC's TP90 and discharge to the stream. A stabilised emergency spillway will be constructed to safely convey storm exceedance events from the site to the stream.

Diversion bunds will direct the catchment's sediment laden flow to the SRP as indicated. Lined clean water diversion bunds will direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the treatment device. Contour drains will be used on steep sections to convey water across sloping land on a minimal gradient. The vehicle wash bay will be directed to the SRP.

The site access will be stabilised with road metal.

1.3 Erosion and Sediment Control Measures

- 1) Install 1x SRP, stabilised spillways and outlet. Size and install flocculation unit in accordance with TP227.
- 2) Construct vehicle wheel wash.
- 3) Construct sediment diversion drains to direct catchment to treatment devices, with check dams on steep portions.
- 4) Construct clean water diversion drains to divert clean water from construction site.
- 5) Construct stabilised vehicle access.
- 6) Progressively stabilise site in accordance with TP90.
- 7) Maintain sediment controls in accordance with TP90.

2 Construction Phase

2.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SMP) proposes the site to be stabilised with grass, road metal hard stand or similar erosion control as defined by TP90.

2.2 Site Activity

It is conservatively assumed the Construction Phase for the L3S1 - PS25 construction site will last 18 months.

Construction activities on the site may include the construction of a shaft, two chambers, construction of the permanent all weather access, Air treatment facility and reinstatement of the site.

During construction heavy vehicles will remove construction spoil away and deliver construction materials. Pollutants within the works area will be contributed by construction traffic, and central interceptor construction activity.

It is anticipated the site will include utility buildings and construction staff parking during the construction phase.

2.3 Surface Water Management Controls

The site's designation area is 5814m² of which it is assumed 100% will be utilised during the construction phase of the works. The site's construction hardstand area, access road and parking areas will be stabilised with road metal and maintained to comply with TP90. Stabilised surface requirements areas will be directed towards the existing SRP which will provide surface treatment and some attenuation before discharging to the existing stream.

The site's utility buildings are considered clean surfaces and will discharge directly to the stream.

The Vehicle wash bay will drain to the SRP.

In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Surface water will flow from the DEB's stabilised spillway to the neighbouring reserve.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 16.1 – Miranda Reserve	Revision B
Location:	Miranda Reserve	Date: 25/07/2012
Prepared by:	Anna Tyrrell, revised Tomas Ussher	
Checked by:	Aidan Cooper	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the L3S2 – Miranda Reserve construction site.

The plan outlines Erosion Sediment Control Plan (ESCP) required for the site establishment phase and the Stormwater Management Plan (SMP) for the Construction phase. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site's establishment phase for the Central Interceptor works at this site. The ESCP was developed referencing TP90, available LIDAR data and Council Services information available from GIS.

It is assumed the site establishment phase will conservatively last 1 month.

Sediment controls in the works area will include stabilised clean water diversions, sediment diversion drains and a Decanting Earth Bund (DEB).

The works area (0.097 ha) will be directed to a DEB which will start treating the catchment immediately. The DEB will have a volume of 29m³.

2.2 Erosion and Sediment Control Construction Methodology

The DEB will be constructed in the south western corner of the site in accordance with ARC's TP90. The outlet will discharge to the nearby stream. A stabilised emergency spillway will be constructed to safely convey storm exceedance events from the site to the stream.

Diversion bunds will direct the catchment's sediment laden flow to the DEB as indicated. Lined clean water diversion bunds will direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the respective treatment device.

The site access will be stabilised with road metal and a vehicle wheel wash constructed to drain to the DEB.

2.3 Erosion and Sediment Control Measures

- 1) Install DEB, stabilised spillways and outlets.
- 2) Construct sediment diversion drains to direct catchment to treatment devices.
- 3) Construct clean water diversion drains to divert clean water from construction site.
- 4) Construct stabilised vehicle access and wheel wash. Direct wheel wash drain to treatment device.
- 5) Progressively stabilise site in accordance with TP90.
- 6) Maintain sediment controls in accordance with TP90.

3 Construction Phase Surface

3.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SMP) proposes the site to be stabilised with grass, road metal hard stand or similar control as defined by TP90. It is required to consider stormwater quality and attenuation during the central interceptor's construction. It is proposed to continue operation of the established TP90 environmental controls during the construction phase to provide treatment to the construction area and attenuation of the surface area.

3.2 Site Activity

It is conservatively assumed the Construction Phase for the L3S2 – Miranda Reserve construction site will last 8 months.

Construction activities on the site may include the construction of a jacking shaft, the tunnel construction to the next shaft site, construction of the permanent access structure and reinstatement of the site.

During construction heavy vehicles will remove construction spoil away and deliver construction materials. Pollutants within the works area will be contributed by construction traffic, and central interceptor construction activity.

It is anticipated the site will include utility buildings and construction staff parking during the construction phase.

3.3 Surface Water Management Controls

The site's designation area is 968m² of which it is assumed 100% will be utilised during the construction phase of the works. The site's construction hardstand area, access road and parking areas will be stabilised with road metal and maintained to comply with TP90. The site's utility buildings are considered clean surfaces and will be directed to the existing DEB. Any area not being utilised specifically for construction activities will be stabilised with grass seed and straw mulch (or similar TP90 erosion control) and directed to the DEB. The DEB will attenuate surface water and continue to discharge to the adjoining stream.

Diversion bunds will continue to direct the catchment's sediment laden flow to the DEB as indicated. Lined (stabilised) clean water diversion bunds will continue to direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the treatment device.

The Vehicle wash bay will be maintained and drain to the DEB.

In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Surface water will flow from the DEB's stabilised spillway to the neighbouring reserve.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 17.1 – Whitney Street	Revision B
Location:	Whitney Street	Date: 25/07/2012
Prepared by:	Aidan Cooper, revised Tomas Ussher	
Checked by:	Aidan Cooper	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the L3S3 – Whitney Street construction site.

The plan outlines Erosion Sediment Control Plan (ESCP) required for the site establishment phase and the Stormwater Management Plan (SMP) for the Construction phase. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site's establishment phase for the Central Interceptor works at this site. The ESCP was developed referencing TP90, available LIDAR data and Council Services information available from GIS.

It is assumed the construction of the indicated works will conservatively last 1 months.

Sediment controls in the works area will include asphalt clean water diversion bunds to direct clean water from Whitney Street around the works area. Depending on excavation depths silt fences may be required around stormwater cesspits.

The total works area is 0.0465ha and is located within the Whitney Street road corridor. The site will likely be divided into 2 separate works areas of 175m² and 190m². The top area will be stabilised with GAP aggregate and geotextile. If required each work area will be treated by silt fences.

2.2 Erosion and Sediment Control Construction Methodology

Install asphalt clean water diversion to direct overland flows from outside of the work area around the construction site.

Install road aggregate stabilised work area.

Install silt fences with returns to ensure work area sediment laden run off is attenuated within works area.

The site access will be via Whitney Street. Ensure Whitney Street is maintained and kept free of excavation materials.

2.3 Erosion and Sediment Control Measures

- 1) Install DEB, stabilised spillways and outlets.
- 2) Construct sediment diversion drains to direct catchment to treatment devices.
- 3) Construct clean water diversion drains to divert clean water from construction site.
- 4) Construct stabilised vehicle access and wheel wash. Direct wheel wash drain to treatment device.
- 5) Progressively stabilise site in accordance with TP90.
- 6) Maintain sediment controls in accordance with TP90.

3 Construction Phase Surface

3.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SMP) proposes the site to be stabilised with grass, road metal hard stand or similar control as defined by TP90. It is required to consider stormwater quality and attenuation during the central interceptor's construction. It is proposed to continue operation of the established TP90 environmental controls during the construction phase to provide treatment to the construction area and attenuation of the surface area.

3.2 Site Activity

It is conservatively assumed the Construction Phase for the L3S3 – Whitney Street construction site will last 8 months.

Construction activities on the site may include the construction of a drop shaft to continue construction of the Central Interceptor, excavation of spoil and storage of materials.

During construction heavy vehicles will remove construction spoil away and deliver construction materials. Pollutants within the works area will be contributed by construction traffic, and central interceptor construction activity. A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects on the proposed SMP controls.

It is anticipated the site will include construction staff parking during the construction phase.

3.3 Surface Water Management Controls

The site's designation area is 465m² of which it is assumed 100% will be utilised during the construction phase of the works. The site's construction hardstand area, access road and parking areas will be stabilised with aggregate on geotextile and maintained to comply with TP90.

In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Surface water will flow from the DEB's stabilised spillway to the neighbouring reserve.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 18.1 – Dundale Avenue	Revision B
Location:	Dundale Avenue	Date: 25/07/12
Prepared by:	Anna Tyrrell, revised Tomas Ussher	
Checked by:	Aidan Cooper	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the L3S4 – Dundale Avenue construction site.

The plan outlines Erosion Sediment Control Plan (ESCP) required for the site establishment phase and the Stormwater Management Plan (SMP) for the Construction phase. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site establishment phase of the proposed Central Interceptor works at this site. The ESCP was developed using available LIDAR data and Council Services information from GIS.

It is assumed the site establishment phase will conservatively last 1 month.

Sediment controls in the works area will include stabilised clean water diversions and a silt fence.

The works area (0.11 ha) will be directed to a silt fence which will start treating the catchment immediately.

2.2 Erosion and Sediment Control Construction Methodology

The silt fence will be constructed along the northern boundary of the site in accordance with ARC's TP90.

Lined clean water diversion bunds will direct overland flows from outside of the work area around the construction site. The existing kerb will act as a clean water diversion along the southern boundary. The site will be contoured to direct surface flows to the respective treatment device.

The site access will be stabilised with road metal and a vehicle wheel wash.

2.3 Erosion and Sediment Control Measures

- 1) Install silt fence, SRP, stabilised spillways and outlets.
- 2) Construct clean water diversion drains to divert clean water from construction site.
- 3) Construct stabilised vehicle access and wheel wash. Direct wheel wash drain to treatment device.
- 4) Progressively stabilise site in accordance with TP90.
- 5) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SMP) proposes the site to be stabilised with grass, road metal hard stand or similar control as defined by TP90. It is required to consider stormwater quality and attenuation during the central interceptor's construction.

3.2 Site Activity

It is assumed the Construction Phase for the L3S4 – Dundale Avenue construction site will conservatively last 8 months.

Construction activities on the site include the construction permanent access structure and reinstatement of the site.

During the construction phase the traffic at this construction site will consist of heavy trucks to cart construction spoil away and deliver construction materials. The majority of the pollutants within the works area will be contributed by construction traffic and sediment from the construction activity..

It is anticipated the site will include utility buildings and construction staff parking during the construction phase.

3.3 Stormwater Management Controls

The site's total area is 1118m² of which it is assumed 100% will be utilised during the construction phase of the works. The site's construction hardstand area, access road and parking areas will be stabilised with road metal and maintained to comply with TP90. The site's utility buildings are considered clean surfaces and will be directed across a grass filter strip into the adjoining reserve. Any area not being utilised specifically for construction activities will be stabilised with grass seed and straw mulch (or similar TP90 erosion control) and directed across a grass filter strip into the adjoining reserve.

Lined (stabilised) clean water diversion bunds will continue to direct overland flows from outside of the work area around the construction site.

The Vehicle wash bay will be maintained and drain across a grass filter strip into the adjoining reserve.

In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Surface water will flow from the DEB's stabilised spillway to the neighbouring reserve.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.

Central Interceptor Erosion & Sediment and Stormwater Control Plan

Plan No:	MAIN ESCP 19.1 – Haycock Avenue	Revision B
Location:	Haycock Avenue	Date: 25/07/12
Prepared by:	Lance Collier, revised Tomas Ussher	
Checked by:	Aidan Cooper	

1 Summary

This Erosion & Sediment and Stormwater Control Plan covers the site establishment phase and construction phase of the Central Interceptor at the L3S5 – Haycock Avenue construction site.

The plan outlines Erosion Sediment Control Plan (ESCP) required for the site establishment phase and the Stormwater Management Plan (SMP) for the Construction phase. The document will accompany the Assessment of Environmental Effects being developed for the Central Interceptor and Associated Works by Tonkin & Taylor.

The ESCP for site establishment and the SMP for the construction phase will be developed and finalised by the Contractor to meet council requirements and to suit their methodology following the award of the Construction Contract. The Contractors ESCP and SMP will require the approval of the Engineer and council prior to commencing work on site.

2 Site Establishment

2.1 Introduction

The Erosion Sediment Control Plan (ESCP) provides details of the proposed sediment treatment control devices for the site establishment phase of the proposed Central Interceptor works at this site. The ESCP was developed using available LIDAR data and Council Services information from GIS.

It is assumed the site establishment phase will conservatively last 1 month.

Sediment controls in the works area will include stabilised clean water diversions, sediment diversion drains and a Decanting Earth Bund (DEB).

The total works area (0.13 ha) will be directed to a DEB which will start treating the catchment immediately. The DEB will receive all 0.13 ha and will have a volume of 40m³.

2.2 Erosion and Sediment Control Construction Methodology

The proposed DEB will be constructed in the south western corner of the site in accordance with ARC's TP90. The DEB outlet will discharge to the nearby open channel via level spreader. A stabilised emergency spillway will be constructed to safely convey storm exceedance events from the site to the open channel.

Diversion bunds will direct the catchment's sediment laden flow to the DEB as indicated. The site will be contoured to direct surface flows to the treatment device. The site access will be stabilised with road metal.

2.3 Erosion and Sediment Control Measures

- 1) Install, DEB, stabilised spillways and outlets.
- 2) Construct sediment diversion drains to direct catchment to treatment devices.
- 3) Construct clean water diversion drains to divert clean water from construction site.
- 4) Construct stabilised vehicle access and wheel wash. Direct wheel wash drain to treatment device.
- 5) Progressively stabilise site in accordance with TP90.
- 6) Maintain sediment controls in accordance with TP90.

3 Construction Phase

3.1 Introduction

During the Central Interceptor's construction phase the Stormwater Management Plan (SMP) proposes the site to be stabilised with grass, road metal hard stand or similar control as defined by TP90. It is required to consider stormwater quality and attenuation during the central interceptor's construction. It is proposed to continue operation of the established TP90 environmental controls during the construction phase to provide treatment to the construction area and attenuation of the surface area.

3.2 Site Activity

It is assumed the Construction Phase for the L3S5 – Haycock Avenue construction site will conservatively last 8 months.

Construction activities on the site include the construction of a jacking shaft, the tunnel construction to the next shaft site, construction of the permanent access structure and reinstatement of the site.

During the construction phase the traffic at this construction site will consist of heavy trucks to cart construction spoil away and deliver construction materials. The majority of the pollutants within the works area will be contributed by construction traffic and sediment from the construction activity. A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects on the proposed SMP controls.

It is anticipated the site will include utility buildings and construction staff parking during the construction phase.

3.3 Stormwater Management Controls

The site's total area is 1340m² of which it is assumed 100% will be utilised during the construction phase of the works. The site's construction hardstand area, access road and parking areas will be stabilised with road metal and maintained to comply with TP90. The site's utility buildings are considered clean surfaces and will be directed to the existing DEB. Any area not being utilised specifically for construction activities will be stabilised with grass seed and straw mulch (or similar TP90 erosion control) and directed to the DEB.

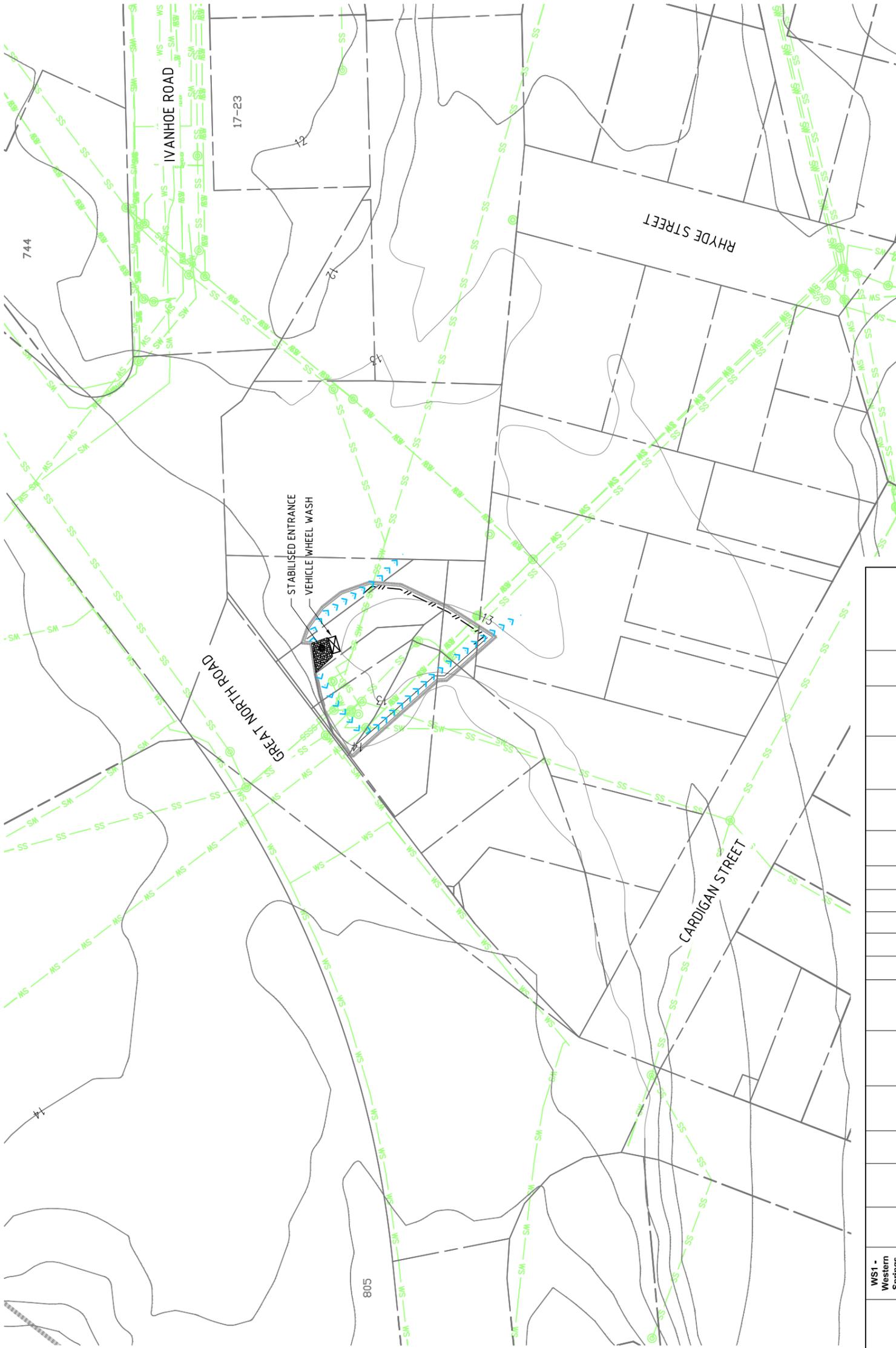
Diversion bunds will continue to direct the catchment's sediment laden flow to the DEB as indicated. Lined (stabilised) clean water diversion bunds will continue to direct overland flows from outside of the work area around the construction site. The site will be contoured to direct surface flows to the treatment device.

The Vehicle wash bay will be maintained and drain to the DEB.

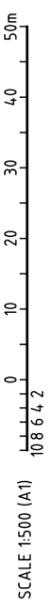
In the event of a design exceedance event overland flow paths will be directed safely around the construction site. Surface water will flow from the DEB's stabilised spillway to the neighbouring reserve.

A spill response plan will be developed to mediate the potential risk of refuelling on site and the effects of fuel on the proposed SMP controls.

Detailed design of the temporary construction stormwater management devices will be provided to Council for approval pre construction.



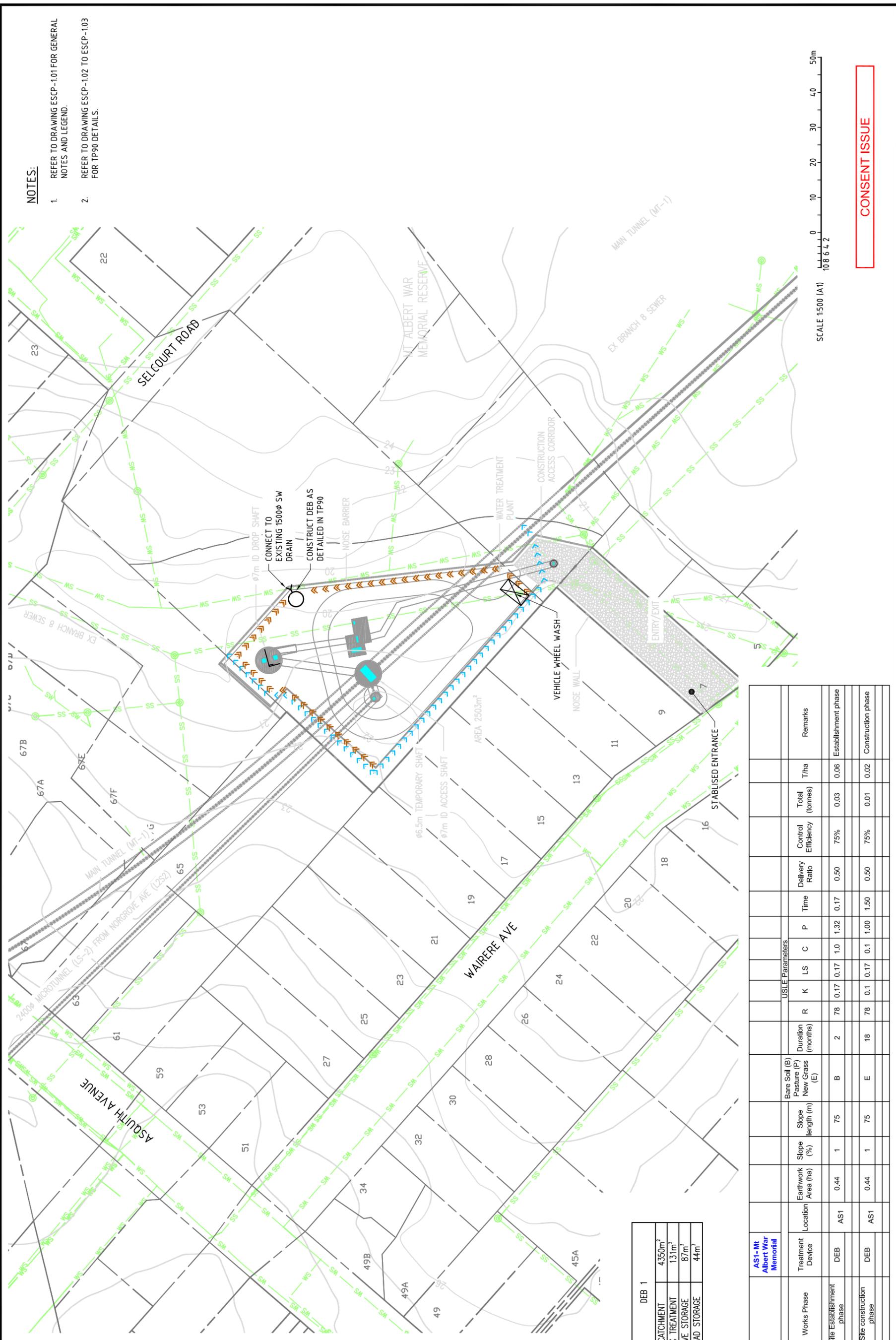
- NOTES:**
1. REFER TO DRAWING ESCP-1.01 FOR GENERAL NOTES AND LEGEND.
 2. REFER TO DRAWING ESCP-1.02 TO ESCP-1.03 FOR TP90 DETAILS.



CONSENT ISSUE

Works Phase	Treatment Device	Location	Earthwork Area (ha)	Slope (%)	Slope length (m)	Bare Soil (B) Pasture (P) New Grass (E)	Duration (months)	USLE Parameters			Time	Delivery Ratio	Control Efficiency	Total (tonnes)	T/ha	Remarks	
								R	K	C							
Site Establishment phase	Sill Fence	WS1	0.01	2	40	B	1	78	0.17	0.22	1.0	1.32	0.50	65%	0.00	0.06	Establishment phase
Site Construction phase	GFS	WS1	0.01	2	40	E	8	78	0.1	0.22	0.1	1.00	0.50	65%	0.00	0.02	Construction phase

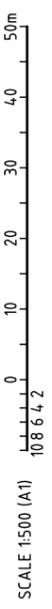
<p style="font-size: 8px; margin-top: 5px;">COPYRIGHT - This drawing, the design and concept, remain the exclusive property of WaterCare Services Limited and may not be used without approval. Copyright reserved.</p>		CENTRAL INTERCEPTOR GENERAL WESTERN SPRINGS CC2A1 CONNECTION - EROSION SEDIMENT CONTROL PLAN	CAD FILE MAIN-ESCP-1.2 ORIGINAL SCALE A1 DATE 7-Jun-12 CONTRACT No. 0538	DRAWING No. MAIN-ESCP-1.2 ISSUE C
DESIGNED AT DES. CHECKED AC DRAWN LC DWG. CHECKED CTC	OPERATIONS	ASSET MANAGER	DATE	BY
18/7/12 UPDATED USLE TABLE - SITE ESTABLISHMENT DURATION 26/6/12 ISSUED FOR CONSENT 7/6/12 ISSUED FOR CONSENT	AGT	APP'D P.DIR	DATE	BY
AMENDMENT				



- NOTES:**
- REFER TO DRAWING ESCP-1.01 FOR GENERAL NOTES AND LEGEND.
 - REFER TO DRAWING ESCP-1.02 TO ESCP-1.03 FOR TP90 DETAILS.

DEB 1	
CATCHMENT	4350m ²
3% TREATMENT	131m ³
LIVE STORAGE	87m ³
DEAD STORAGE	44m ³

Works Phase	Treatment Device	Location	Earthwork Area (ha)	Slope (%)	Slope length (m)	Bare Soil (B)	Pasture (P)	New Grass (E)	USLE Parameters				Duration (months)	R	K	LS	C	P	Time	Delivery Ratio	Control Efficiency	Total (tonnes)	T/ha	Remarks
									R	K	LS	C												
Site Establishment phase	DEB	AS1	0.44	1	75	B			2	78	0.17	0.17	1.0	1.32	0.17	0.50	0.50	0.17	0.50	75%	0.03	0.06	Establishment phase	
Site construction phase	DEB	AS1	0.44	1	75	E			18	78	0.1	0.17	0.1	1.00	1.50	0.50	0.50	1.50	0.50	75%	0.01	0.02	Construction phase	

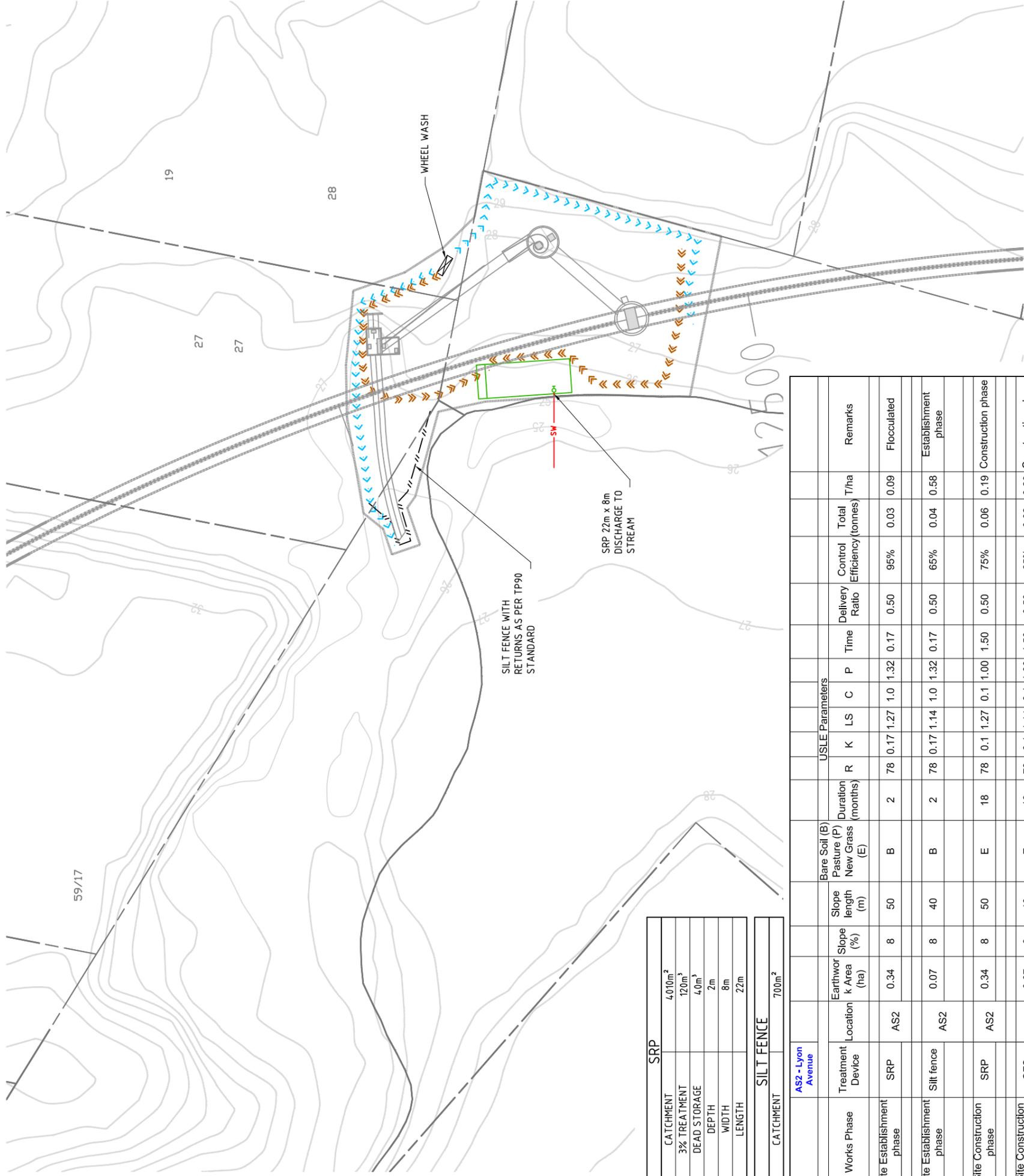


CONSENT ISSUE

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CENTRAL INTERCEPTOR GENERAL MT ALBERT WAR MEMORIAL RESERVE (AS1) - EROSION SEDIMENT CONTROL PLAN			
CAD FILE MAIN-ESCP-2.1	DATE 7-Jun-12	CONTRACT No.	ISSUE
ORIGINAL SCALE A1	1:500	0538	C
DRAWING No.		MAIN-ESCP-2.1	



59/17



NOTES:

1. REFER TO DRAWING ESCP-1.01 FOR GENERAL NOTES AND LEGEND.
2. REFER TO DRAWING ESCP-1.02 TO ESCP-1.03 FOR TP90 DETAILS.

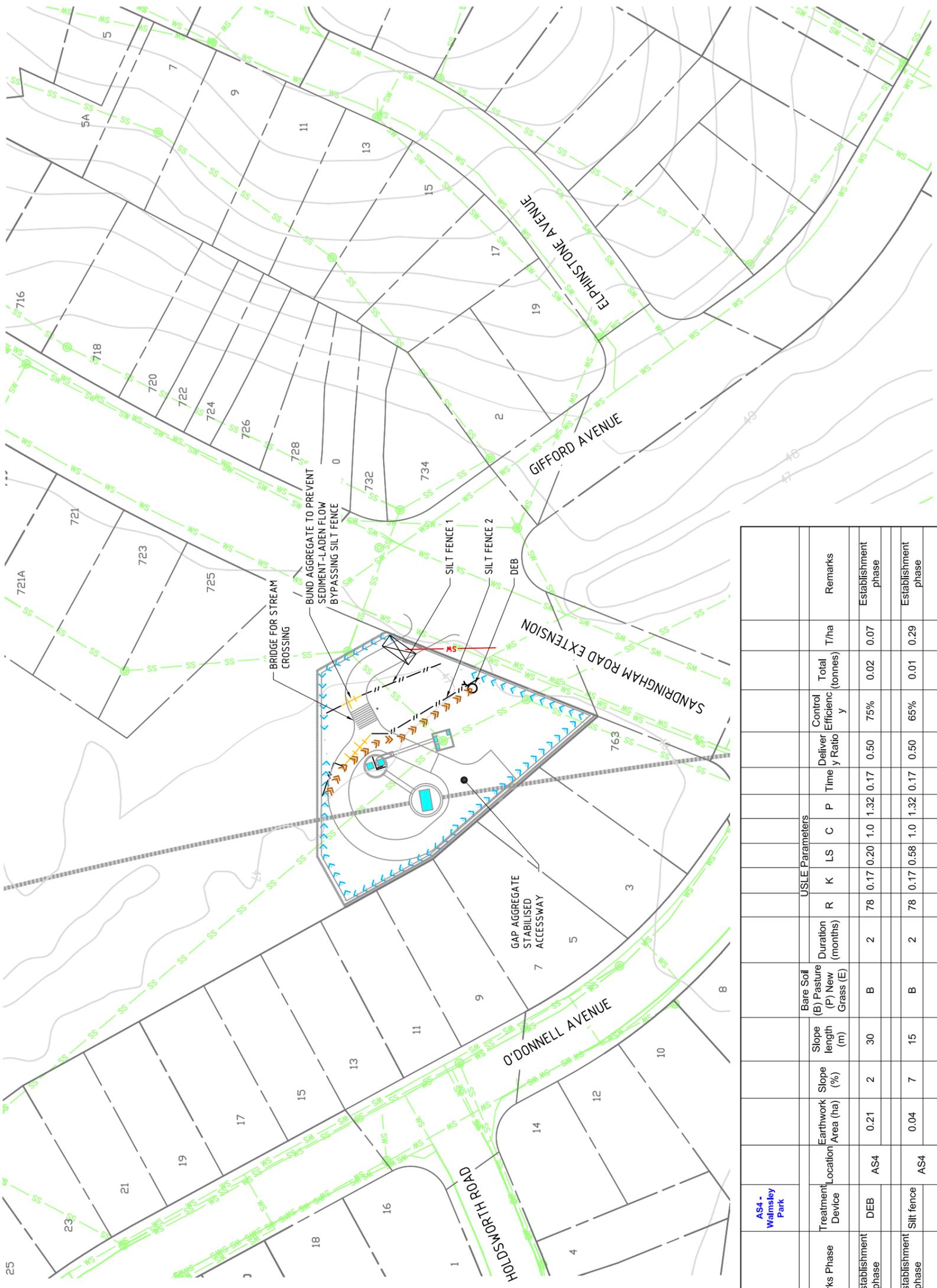
SRP	
CATCHMENT	4,010m ²
3% TREATMENT	120m ³
DEAD STORAGE	40m ³
DEPTH	2m
WIDTH	8m
LENGTH	22m
SILT FENCE	
CATCHMENT	700m ²

Works Phase	Treatment Device	Location	Earthwork k Area (ha)	Slope (%)	Slope length (m)	Bare Soil (B) Pasture (P) New Grass (E)	USLE Parameters				Duration (months)	Control Efficiency (tonnes)	Total T/ha	Remarks	
							R	K	LS	C					P
Site Establishment phase	SRP	AS2	0.34	8	50	B	78	0.17	1.27	1.0	1.32	0.50	0.09	0.03	Flocculated
Site Establishment phase	Silt fence	AS2	0.07	8	40	B	78	0.17	1.14	1.0	1.32	0.50	0.04	0.58	Establishment phase
Site Construction phase	SRP	AS2	0.34	8	50	E	78	0.1	1.27	0.1	1.00	1.50	0.06	0.19	Construction phase
Site Construction phase	GFS	AS2	0.07	8	40	E	78	0.1	1.14	0.1	1.00	1.50	0.02	0.23	Construction phase

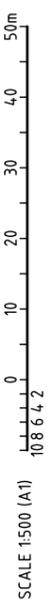
CONSENT ISSUE

SCALE 1:500 (A1)
10 20 30 40 50m

		<p>CENTRAL INTERCEPTOR GENERAL LYON AVENUE (AS2) – EROSION SEDIMENT CONTROL PLAN</p>	<p>CAD FILE MAIN-ESCP-3.1 ORIGINAL SCALE A1 DATE 7-Jun-12 CONTRACT No. 1:500 0538</p>
<p>18/7/12 UPDATED USLE TABLE - SITE ESTABLISHMENT DURATION A 7/6/12 ISSUED FOR CONSENT</p>		<p>OPERATIONS ASSET MANAGER</p>	
<p>ISSUE DATE</p>	<p>BY APPD.</p>	<p>BY DATE</p>	<p>ISSUE</p>
<p>AMENDMENT</p>		<p>MAIN-ESCP-3.1 B</p>	



- NOTES:**
- REFER TO DRAWING ESCP-101 FOR GENERAL NOTES AND LEGEND.
 - REFER TO DRAWING ESCP-102 TO ESCP-103 FOR TP90 DETAILS.



CONSENT ISSUE

DEB	
CATCHMENT	2100m ²
3% TREATMENT	70m ³
LIVE STORAGE	4.7m ³
DEAD STORAGE	23m ³

Works Phase	Treatment Device	Location	Earthwork Area (ha)	Slope (%)	Slope length (m)	Bare Soil (B), Pasture (P) New Grass (E)	USLE Parameters				Control Efficiency	Delivery Ratio	Time	Total (tonnes)	T/ha	Remarks	
							R	K	LS	C							
Site Establishment phase	DEB	AS4	0.21	2	30	B	78	0.17	0.20	1.0	1.32	0.17	0.50	75%	0.02	0.07	Establishment phase
Site Establishment phase	Silt fence	AS4	0.04	7	15	B	78	0.17	0.58	1.0	1.32	0.17	0.50	65%	0.01	0.29	Establishment phase
Site Construction phase	DEB	AS4	0.21	1	50	E	78	0.1	0.15	0.1	1.00	1.50	0.50	75%	0.00	0.02	Construction phase
Site Construction phase	GFS	AS4	0.04	7	15	E	78	0.1	0.58	0.1	1.00	1.50	0.50	65%	0.00	0.12	Construction phase



CAD FILE MAIN-ESCP-5.1	DATE 7-Jun-12
ORIGINAL SCALE A1	CONTRACT No. 0538
1:500	DRAWING No. MAIN-ESCP-5.1
	ISSUE C

CENTRAL INTERCEPTOR
 GENERAL
 WALMSLEY PARK (AS4) – EROSION SEDIMENT CONTROL PLAN



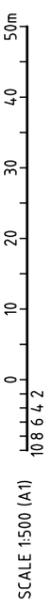
ISSUE	DATE	AMENDMENT	BY	APPD.	DATE	ASSET MANAGER
C	18/7/12	UPDATED USLE TABLE – SITE ESTABLISHMENT DURATION	AGT	AC		
B	26/6/12	ISSUED FOR CONSENT				
A	7/6/12	ISSUED FOR CONSENT				

- NOTES:**
- REFER TO DRAWING ESCP-1.01 FOR GENERAL NOTES AND LEGEND.
 - REFER TO DRAWING ESCP-1.02 TO ESCP-1.03 FOR TP90 DETAILS.



POND A	
CATCHMENT	6600 m ²
3% TREATMENT	200 m ³
LIVE STORAGE	156 m ³
DEAD STORAGE	64.2 m ³

POND B	
CATCHMENT	8200 m ²
3% TREATMENT	246 m ³
LIVE STORAGE	148 m ³
DEAD STORAGE	74 m ³



CONSENT ISSUE

Works Phase	Treatment Device	Location	Earthwork Area (ha)	Slope (%)	Slope length (m)	Bare Soil (B)	Pasture (P)	New Grass (E)	Duration (months)	USLE Parameters						Total (tonnes)	T/ha	Remarks		
										R	K	LS	C	P	Delivery Ratio				Control Efficiency	
Site Establishment phase	SRP A	WS2	0.66	1	80	B			6	78	0.17	0.17	1.0	1.32	0.50	0.50	95%	0.02	0.04	Flocculated
Site Establishment phase	SRP B	WS2	0.82	1	80	B			6	78	0.17	0.17	1.0	1.32	0.50	0.50	95%	0.03	0.04	Flocculated

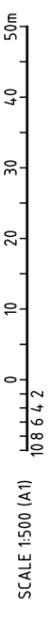
DESIGNED	LC						
DES. CHECKED	AC						
DRAWN	LC						OPERATIONS
DWG. CHECKED	CTC						
REV'D P.MGR							
APP'D P.DIR							ASSET MANAGER
DATE	BY	APPD.	BY	DATE	BY	DATE	
ISSUE	DATE	AMENDMENT					
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<p>CENTRAL INTERCEPTOR</p> <p>GENERAL</p> <p>MAY ROAD (WS2) - EROSION SEDIMENT CONTROL PLAN</p>							
CAD FILE MAIN-ESCP-6.1				DATE 7-Jun-12		CONTRACT No.	
ORIGINAL SCALE A1				1:500		0538	
DRAWING No.				MAIN-ESCP-6.1		ISSUE	
						C	



- NOTES:**
- REFER TO DRAWING ESCP-1.01 FOR GENERAL NOTES AND LEGEND.
 - REFER TO DRAWING ESCP-1.02 TO ESCP-1.03 FOR TP90 DETAILS.

DEB	
CATCHMENT	3700 m ²
3% TREATMENT	11m ³
LIVE STORAGE	74m ³
DEAD STORAGE	37m ³

Works Phase	Treatment Device	Location	Earthwork Area (ha)	Slope (%)	Slope length (m)	Bare Soil (B)	Duration (months)	USLE Parameters					Control Efficiency	Total (tonnes)	T/ha	Remarks	
								R	K	LS	C	P					
Site Establishment phase	DEB	AS5	0.37	8	35	B	2	78	0.17	1.06	1.0	1.32	0.17	0.50	0.14	0.39	Establishment phase
Site Establishment phase	Silt Fence A	AS5	0.05	5	30	B	2	78	0.17	0.52	1.0	1.32	0.17	0.50	0.01	0.26	Establishment phase
Site Construction phase	DEB	AS5	0.37	8	35	E	18	78	0.1	1.06	0.1	1.00	1.50	0.50	0.06	0.15	Construction phase
Site Construction phase	GFS	AS5	0.05	5	30	E	18	78	0.1	0.52	0.1	1.00	1.50	0.50	0.00	0.08	Construction phase



CONSENT ISSUE

		CENTRAL INTERCEPTOR GENERAL KEITH HAY PARK (AS5) – EROSION SEDIMENT CONTROL PLAN	
CAD FILE MAIN-ESCP-7.1 ORIGINAL SCALE A1 1:500	DATE 7-Jun-12 CONTRACT No. 0538		
DRAWING No. MAIN-ESCP-7.1		ISSUE C	

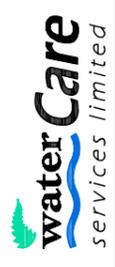


- NOTES:**
1. REFER TO DRAWING ESCP-101 FOR GENERAL NOTES AND LEGEND.
 2. REFER TO DRAWING ESCP-102 to ESCP-103 FOR TP90 DETAILS.
 3. FILL MATERIAL TO BE METAL AND PUSHED OUT FROM EXISTING STABILISED AREA.
 4. FILL AREA TO BE GRADED EACH DAY TO DIRECT SURFACE WATER BACK FROM FILL EDGE.
 5. SEDIMENT SUMP BASE TO BE 500 mm ABOVE MEAN HIGH TIDE AND PUMPED (IF REQUIRED).
 6. VEHICLE WHEEL WASH TO OVERFLOW ONTO WORK AREA FOR TREATMENT BY PERCOLATION THROUGH FILL MATERIAL.

Works Phase	Treatment Device	Location	Earthwork Area (ha)	Slope (%)	Slope length (m)	Bare Soil (B) Pasture (P) New Grass (E)	Duration (months)	USLE Parameters				Control Efficiency	Total (tonnes)	T/ha	Remarks		
								R	K	LS	C						
Site Establishment phase	Sediment Sump	AS6	0.19	1	50	B	2	78	0.1	0.15	1.0	1.32	0.17	0.50	0.01	0.03	Establishment phase
Site Construction phase	Sediment Sump	AS6	0.19	1	50	E	18	78	0.1	0.15	1.00	1.50	1.50	0.50	0.00	0.02	Construction phase

CONSENT ISSUE

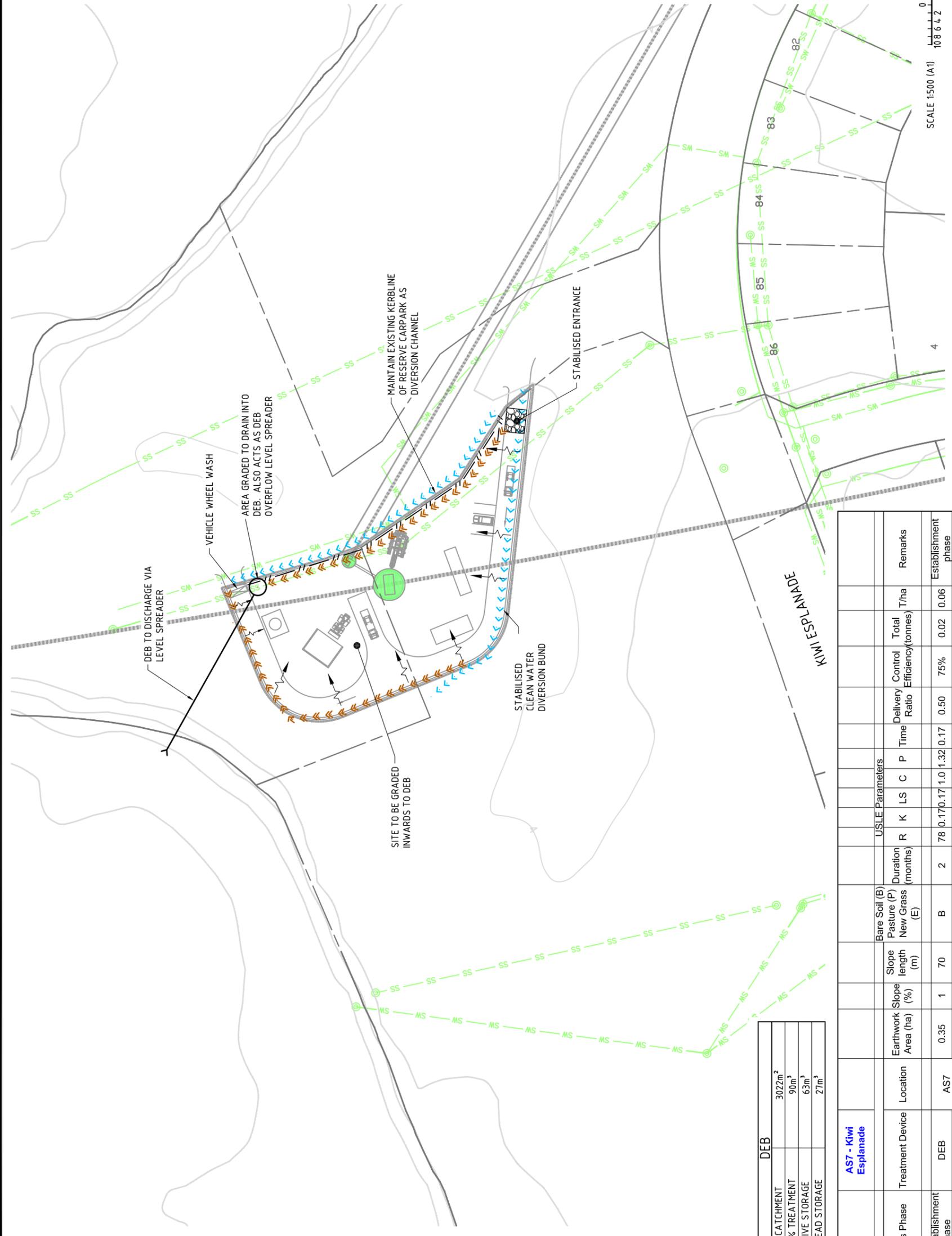
SCALE 1:500 (A1) 0 10 20 30 40 50m

	<p>CENTRAL INTERCEPTOR GENERAL PS23 (AS6) – EROSION SEDIMENT CONTROL PLAN</p>			<p>CAD FILE MAIN-ESCP-8.1 ORIGINAL SCALE A1 1:500</p>	<p>DATE 7-Jun-12 CONTRACT No. 0538</p>	<p>DRAWING No. MAIN-ESCP-8.1</p>	<p>ISSUE C</p>																
<table border="1" style="font-size: 8px;"> <tr><td>DESIGNED</td><td>AC</td></tr> <tr><td>DES. CHECKED</td><td>AG</td></tr> <tr><td>DRAWN</td><td>LC</td></tr> <tr><td>DWG. CHECKED</td><td>CTC</td></tr> <tr><td>REV'D P.MGR</td><td></td></tr> <tr><td>APP'D P.DIR</td><td></td></tr> </table>	DESIGNED	AC	DES. CHECKED	AG	DRAWN	LC	DWG. CHECKED	CTC	REV'D P.MGR		APP'D P.DIR		<table border="1" style="font-size: 8px;"> <tr><td>BY</td><td>DATE</td></tr> <tr><td>ASSET MANAGER</td><td></td></tr> </table>	BY	DATE	ASSET MANAGER		<table border="1" style="font-size: 8px;"> <tr><td>OPERATIONS</td></tr> </table>	OPERATIONS				
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ASSET MANAGER																							
OPERATIONS																							
<table border="1" style="font-size: 8px;"> <tr><td>ISSUE</td><td>DATE</td></tr> <tr><td>A</td><td>7/6/12</td></tr> <tr><td>B</td><td>29/6/12</td></tr> <tr><td>C</td><td>18/7/12</td></tr> </table>	ISSUE	DATE	A	7/6/12	B	29/6/12	C	18/7/12	<table border="1" style="font-size: 8px;"> <tr><td>AMENDMENT</td><td>BY</td><td>APPD.</td></tr> <tr><td></td><td></td><td></td></tr> </table>	AMENDMENT	BY	APPD.											
ISSUE	DATE																						
A	7/6/12																						
B	29/6/12																						
C	18/7/12																						
AMENDMENT	BY	APPD.																					



NOTES:

1. REFER TO DRAWING ESCP-101 FOR GENERAL NOTES AND LEGEND.
2. REFER TO DRAWING ESCP-102 to ESCP-103 FOR TP90 DETAILS.



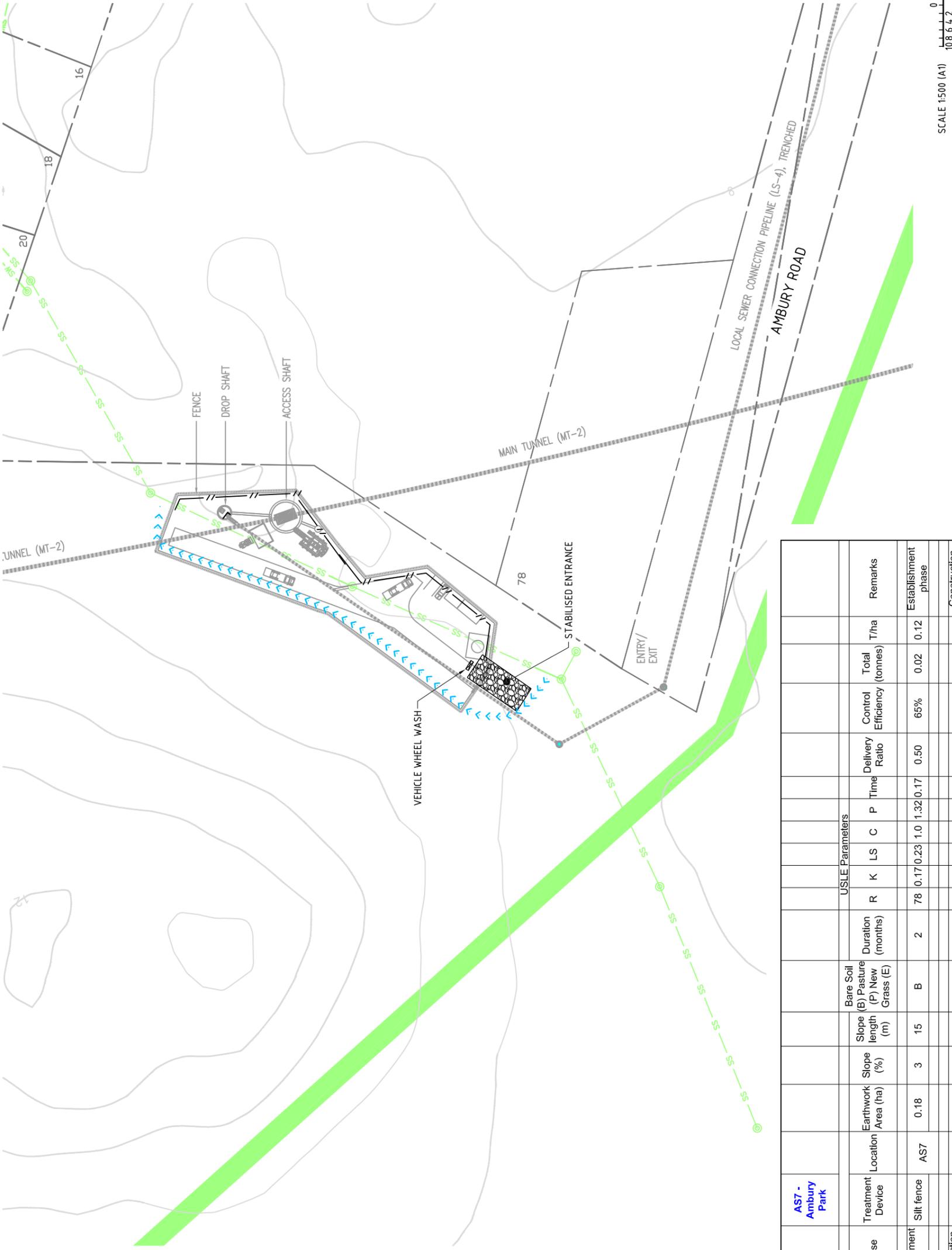
DEB	
CATCHMENT	3022m ²
3% TREATMENT	90m ³
LIVE STORAGE	63m ³
DEAD STORAGE	27m ³

Works Phase	Treatment Device	Location	Earthwork Slope/ Area (ha)	Slope length (m)	Bare Soil (B) Pasture (P) New Grass (E)	Duration (months)	USLE Parameters			Control Efficiency (tonnes)	Total T/ha	Remarks					
							R	K	C P								
Site Establishment phase	DEB	AS7	0.35	1	70	B	2	78	0.17	1.0	1.32	0.17	0.50	75%	0.02	0.06	Establishment phase
Site Construction phase	DEB	AS7	0.35	1	70	E	18	78	0.17	0.1	1.00	1.50	0.50	75%	0.01	0.02	Construction phase

CONSENT ISSUE

SCALE 1:500 (A1)
10 20 30 40 50m

<p style="font-size: 8px; margin-top: 5px;">COPYRIGHT - This drawing, the design and concept, remain the exclusive property of WaterCare Services Limited and may not be used without approval. Copyright reserved.</p>		<p style="margin: 0;">CENTRAL INTERCEPTOR</p> <p style="margin: 0;">GENERAL</p> <p style="margin: 0;">KIWI ESPLANADE UTILITIES (AS7) - EROSION SEDIMENT CONTROL PLAN</p>		<p>CAD FILE MAIN-ESCP-9A.1</p> <p>DATE 7-Jun-12</p>	
		<p>ORIGINAL SCALE A1</p> <p>CONTRACT No.</p> <p>1:500</p> <p>0538</p>	<p>DRAWING No.</p> <p>MAIN-ESCP-9A.1</p>	<p>ISSUE</p> <p>B</p>	
<p>B 18/7/12 UPDATED USLE TABLE - SITE ESTABLISHMENT DURATION</p> <p>A 7/6/12 ISSUED FOR CONSENT</p>	<p>DESIGNED</p> <p>DES. CHECKED</p> <p>DRAWN</p> <p>DWG. CHECKED</p> <p>REV'D P.MGR</p> <p>APP'D P.DIR</p>	<p>LC</p> <p>AC</p> <p>LC</p> <p>CTC</p> <p>BY</p> <p>DATE</p>	<p>OPERATIONS</p> <p>ASSET MANAGER</p>		
<p>AMENDMENT</p>	<p>BY</p> <p>APPD.</p>	<p>BY</p> <p>DATE</p>			



- NOTES:**
1. REFER TO DRAWING ESCP-1.01 FOR GENERAL NOTES AND LEGEND.
 2. REFER TO DRAWING ESCP-1.02 TO ESCP-1.03 FOR TP90 DETAILS.
 3. AMBURY PARK ACCESS TRACK MAY REQUIRE DIVERSION TO BE CONSIDERED DURING CONSTRUCTION. REFER ENGINEER FOR EROSION AND SEDIMENT CONTROLS.

CONSENT ISSUE

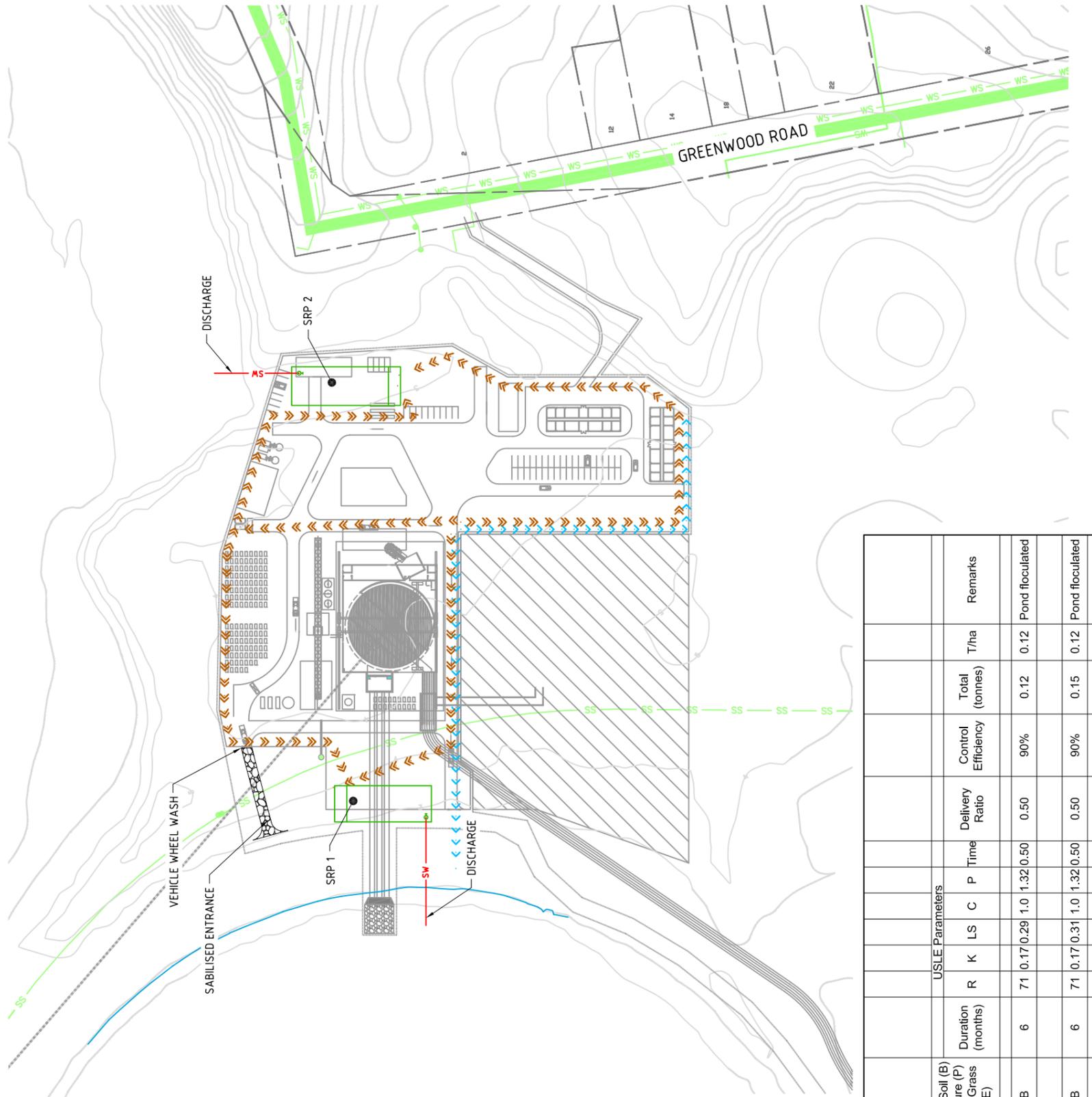
Works Phase	Treatment Device	Location	Earthwork Area (ha)	Slope (%)	Slope length (m)	Bare Soil (B) Pasture (P) New Grass (E)	USLE Parameters							Total T/ha	Remarks		
							R	K	LS	C	P	Time	Delivery Ratio			Control Efficiency	
Site Establishment phase	Silt fence	AS7	0.18	3	15	B	78	0.17	0.23	1.0	1.32	0.17	0.50	65%	0.02	0.12	Establishment phase
Site Construction phase	GFS	AS7	0.18	3	15	E	78	0.1	0.23	0.1	1.00	1.50	0.50	75%	0.01	0.03	Construction phase

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<p>B 18/7/12</p> <p>A 7/6/12</p>	<p>UPDATED USLE TABLE - SITE ESTABLISHMENT DURATION</p> <p>ISSUED FOR CONSENT</p>	<p>AS7</p> <p>AS7</p>	<p>AC</p> <p>AC</p>	<p>BY</p> <p>BY</p>	<p>APPD.</p> <p>APPD.</p>	<p>DATE</p> <p>DATE</p>
<p>DESIGNED</p> <p>DES. CHECKED</p> <p>DRAWN</p> <p>DWG. CHECKED</p> <p>REV'D P.MGR</p> <p>APP'D P.DIR</p>		<p>LC</p> <p>AC</p> <p>LC</p> <p>CTC</p> <p>CTC</p>		<p>OPERATIONS</p> <p>ASSET MANAGER</p>		



NOTES:

1. REFER TO DRAWING ESCP-1.01 FOR GENERAL NOTES AND LEGEND.
2. REFER TO DRAWING ESCP-1.02 TO ESCP-1.03 FOR TP90 DETAILS.



SEDIMENT RETENTION PONDS		
	SRP A	SRP B
CATCHMENT	1 ha	1.2 ha
3% TREATMENT	300m ³	360m ³
DEAD STORAGE	100m ³	120m ³
WIDTH	15m	16m
LENGTH	4.0m	4.5m
DEPTH	2m	2m
		STABILISED SURFACE
		0.4 ha

Works Phase	Treatment Device	Location	Earthwork Area (ha)	Slope (%)	Slope length (m)	Bare Soil (B)	Pasture (P)	New Grass (E)	USLE Parameters						Duration (months)	Control Efficiency	Total (tonnes)	T/ha	Remarks
									R	K	LS	C	P	Time					
Site Establishment Phase	SRP1	WS3	1	2	100	B			71	0.17	0.29	1.0	1.32	0.50	90%	0.12	0.12	Pond flocculated	
Site Establishment Phase	SRP2	WS3	1.2	2	125	B			71	0.17	0.31	1.0	1.32	0.50	90%	0.15	0.12	Pond flocculated	
Site Establishment Phase	Stabilised surface	WS3	0.4	2	125	B			71	0.17	0.31	1.0	1.32	0.50	90%	0.05	0.12	Surface maintained and stabilised	

CONSENT ISSUE

		<p>CENTRAL INTERCEPTOR GENERAL MANGERE PUMP STATION (WS3) – EROSION SEDIMENT CONTROL PLAN</p>	<p>CAD FILE MAIN-ESCP-10.1 ORIGINAL SCALE A1 DATE 7-Jun-12</p>	<p>CONTRACT No. 0538</p>
<p>18/7/12 UPDATED USLE TABLE - SITE ESTABLISHMENT DURATION</p>		<p>ISSUE DATE</p>		
<p>A 7/6/12 ISSUED FOR CONSENT</p>		<p>AMENDMENT</p>		
<p>DESIGNED AC</p>		<p>OPERATIONS</p>		
<p>DRAWN LC</p>		<p>ASSET MANAGER</p>		
<p>DWG. CHECKED CTC</p>		<p>BY</p>		
<p>REV'D P.MGR</p>		<p>DATE</p>		
<p>APP'D P.DIR</p>		<p>BY</p>		
<p>APPD.</p>		<p>DATE</p>		
<p>BY</p>		<p>DATE</p>		
<p>AGT</p>		<p>BY</p>		
<p>AC</p>		<p>DATE</p>		
<p>DES. CHECKED</p>		<p>BY</p>		
<p>DESIGNED</p>		<p>DATE</p>		
<p>FILE PATH: I:\ENVA\Projects\403786\DELIVERABLES\Drawings\Sketches</p>		<p>FILE DATE: 26-Jun-12 12:34 PM</p>		



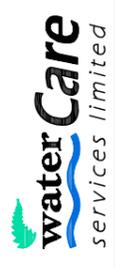
- NOTES:**
1. REFER TO DRAWING ESCP-1.01 FOR GENERAL NOTES AND LEGEND
 2. REFER TO DRAWING ESCP-1.02 TO ESCP-1.03 FOR TP90 DETAILS
 3. CONSTRUCT DEB AS DETAILED IN TP90. DISCHARGE ON PINNED GEOTEXTILE OVERLAYS WITH LARGE ROCKS TO BREAK UP FLOW BEFORE ENTERING STREAM.

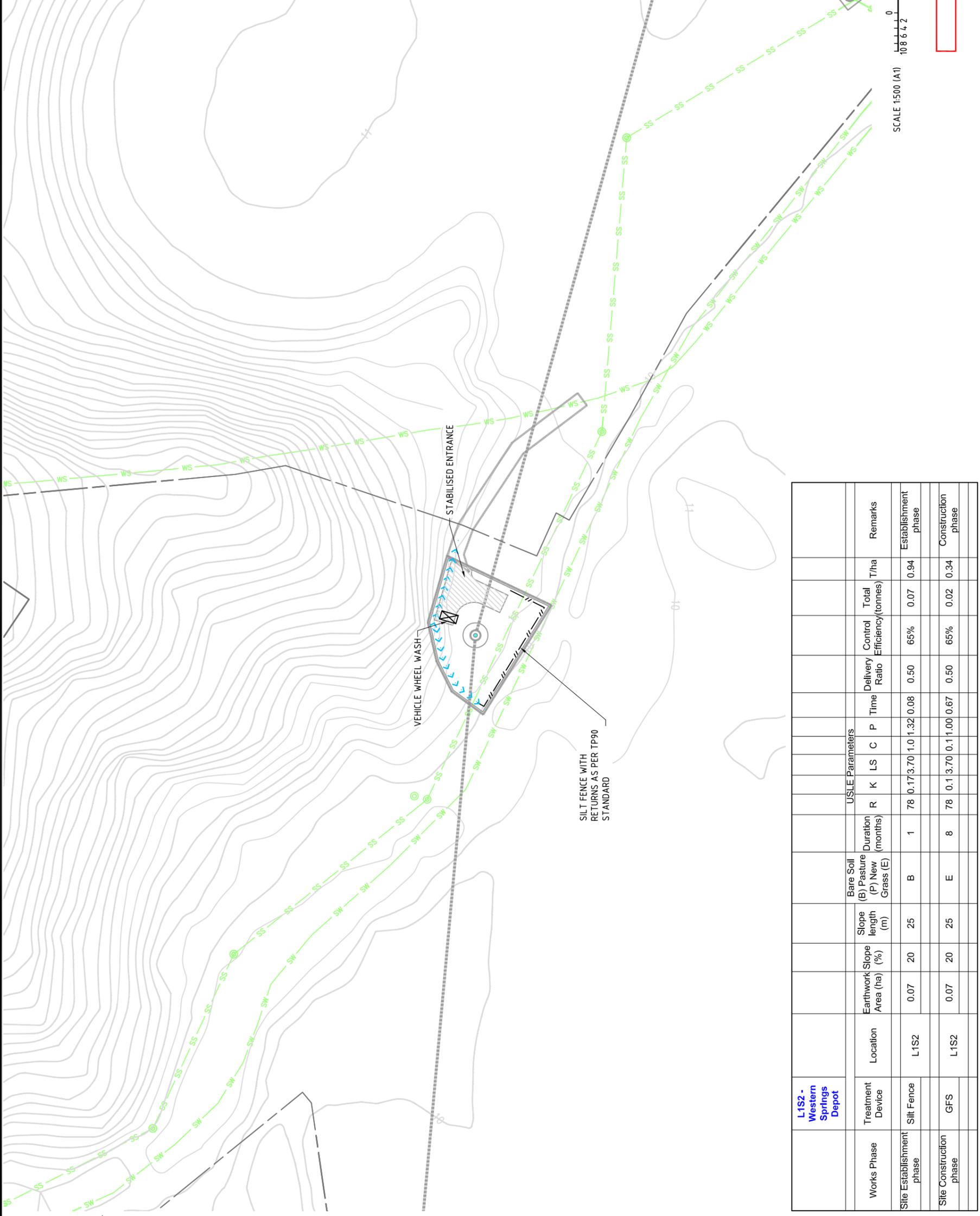


CONSENT ISSUE

DEB	
CATCHMENT	1800 m ²
3% TREATMENT	54m ³
LIVE STORAGE	36m ³
DEAD STORAGE	18m ³

Works Phase	Treatment Device	Location	Earthwork Area (ha)	Slope (%)	Slope length (m)	Bare Soil (B)	Duration (months)	USLE Parameters					Total T/ha	Remarks				
								R	K	LS	C	P			Delivery Ratio	Control Efficiency		
Site Establishment phase	Silt Fence 1	L1S1	0.018	24	25	B	2	78	0.17	4.99	1.0	1.32	0.17	0.50	65%	0.05	2.54	Establishment phase
Site Establishment phase	Silt Fence 2	L1S1	0.007	50	9	B	2	78	0.17	9.99	1.0	1.32	0.17	0.50	65%	0.03	4.93	Establishment phase
Site Establishment phase	DEB	L1S1	0.18	4	52	B	2	78	0.17	0.50	1.0	1.32	0.17	0.50	75%	0.03	0.18	Establishment phase
Site Construction phase	DEB	L1S1	0.18	4	52	E	18	78	0.1	0.50	0.11	1.00	1.50	0.50	75%	0.01	0.07	Construction phase
Site Construction phase	GFS	L1S1	0.025	24	25	E	18	78	0.1	4.99	0.11	1.00	1.50	0.50	65%	0.03	1.02	Construction phase

		CENTRAL INTERCEPTOR GENERAL MOTIONS ROAD (L1S1) – EROSION SEDIMENT CONTROL PLAN	CAD FILE MAIN-ESCP-11.1 ORIGINAL SCALE A1 DATE 7-Jun-12 CONTRACT No. 0538	DRAWING No. MAIN-ESCP-11.1 ISSUE C
C 18/7/12 B 29/6/12 A 7/6/12	UPDATED USLE TABLE – SITE ESTABLISHMENT DURATION ISSUED FOR CONSENT ISSUED FOR CONSENT	AGT AC P.MGR P.DIR	DESIGNED DES. CHECKED DRAWN DWG. CHECKED REV'D	AC AG LC CTC BY DATE
AMENDMENT	BY APPD.	BY APPD.	OPERATIONS	ASSET MANAGER



NOTES:

1. REFER TO DRAWING ESCP-1.01 FOR GENERAL NOTES AND LEGEND.
2. REFER TO DRAWING ESCP-1.02 TO ESCP-1.03 FOR TP90 DETAILS.

CONSENT ISSUE

Works Phase	Treatment Device	Location	Earthwork Area (ha)	Slope (%)	Slope length (m)	Bare Soil (B) Pasture (P) New Grass (E)	Duration (months)	USLE Parameters				Control Efficiency (tonnes)	Total T/ha	Remarks				
								R	K	LS	C P							
Site Establishment phase	Silt Fence	L1S2	0.07	20	25	B	1	78	0.17	3.70	1.0	1.32	0.08	0.50	65%	0.07	0.94	Establishment phase
Site Construction phase	GFS	L1S2	0.07	20	25	E	8	78	0.1	3.70	0.11	1.00	0.67	0.50	65%	0.02	0.34	Construction phase

SILT FENCE WITH RETURNS AS PER TP90 STANDARD

VEHICLE WHEEL WASH

STABILISED ENTRANCE

SCALE 1:500 (A1) 0 10 20 30 40 50m



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<p>DESIGNED AT DES. CHECKED AC DRAWN LC DWG. CHECKED CTC</p>	<p>OPERATIONS</p>	<p>ORIGINAL SCALE A1 1:500</p>	<p>CONTRACT No. 0538</p>
<p>ISSUE DATE</p>	<p>BY APPD.</p>	<p>BY APPD.</p>	<p>DRAWING No. MAIN-ESCP-12.1</p>
<p>C 18/7/12 UPDATED USLE TABLE - SITE ESTABLISHMENT DURATION</p>	<p>ACT</p>	<p>ACT</p>	<p>ISSUE</p>
<p>B 26/6/12 ISSUED FOR CONSENT</p>	<p>REV'D P.MGR</p>	<p>REV'D P.DIR</p>	<p>ISSUE</p>
<p>A 7/6/12 ISSUED FOR CONSENT</p>	<p>AMENDMENT</p>	<p>AMENDMENT</p>	<p>ISSUE</p>



- NOTES:**
1. REFER TO DRAWING ESCP-101 FOR GENERAL NOTES AND LEGEND.
 2. REFER TO DRAWING ESCP-102 to ESCP-103 FOR TP90 DETAILS.
 3. GROUND TO BE REINSTATED TO EXISTING PROFILE.

DEB 1	
CATCHMENT	4830m ²
3% TREATMENT	145m ³
LIVE STORAGE	97m ³
DEAD STORAGE	48m ³

Works Phase	Treatment Device	Location	Earthwork Area (ha)	Slope length (m)	Slope (%)	Bare Soil (B) Pasture (P) New Grass (E)	USLE Parameters			Duration (months)	R	K	LS	C	P	Delivery Ratio	Control Efficiency	Total (tonnes)	T/ha	Remarks
							0.17	0.17	1.0											
Site Establishment phase	DEB	L2S1	0.48	75	1	B	78	0.17	0.17	1.0	1.32	0.17	0.50	75%	0.03	0.06				Establishment phase
Site Construction phase	DEB	L2S1	0.48	75	1	E	78	0.17	0.17	1.00	1.50	0.50	75%	0.01	0.02					Construction phase

SCALE 1:500 (A1)
10 20 30 40 50m

CONSENT ISSUE

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CAD FILE MAIN-ESCP-13.1
DATE 7-Jun-12

ORIGINAL SCALE A1
CONTRACT No. 0538

DRAWING No. MAIN-ESCP-13.1
ISSUE B

CENTRAL INTERCEPTOR
GENERAL
RAWALPINDI RESERVE (L2S1) - EROSION SEDIMENT CONTROL PLAN

OPERATIONS

ASSET MANAGER

ISSUE	DATE	BY	APPD.	DATE	BY
B	18/7/12	UPDATED USLE TABLE - SITE ESTABLISHMENT DURATION	AGT	AC	
A	7/6/12	ISSUED FOR CONSENT	APP'D P.DIR		
		AMENDMENT			



- NOTES:**
1. REFER TO DRAWING ESCP-1.01 FOR GENERAL NOTES AND LEGEND.
 2. REFER TO DRAWING ESCP-1.02 TO ESCP-1.03 FOR TP90 DETAILS.

DEB A	
CATCHMENT	742 m ²
3% TREATMENT	22m ³
LIVE STORAGE	16m ³
DEAD STORAGE	6m ³

DEB B	
CATCHMENT	1623m ²
3% TREATMENT	49m ³
LIVE STORAGE	34m ³
DEAD STORAGE	15m ³

CONSENT ISSUE

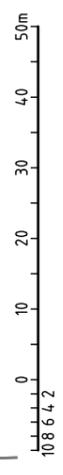
Works Phase	Treatment Device	Location	Earthwork Area (ha)	Slope (%)	Slope length (m)	Bare Soil (B) Pasture (P) New Grass (E)	Duration (months)	USLE Parameters				Total (tonnes)	T/ha	Remarks				
								R	K	LS	C							
Site Establishment phase	DEB A	L2S2	0.07	20	15	B	1	78	0.17	2.86	1.0	1.32	0.08	0.50	75%	0.04	0.52	Establishment phase
Site Establishment phase	DEB B	L2S2	0.16	10	30	B	1	78	0.17	1.36	1.0	1.32	0.08	0.50	75%	0.04	0.25	Establishment phase
Site Establishment phase	Silt fence	L2S2	0.05	30	15	B	1	78	0.17	5.58	1.0	1.32	0.08	0.50	65%	0.07	1.42	Establishment phase
Site Construction phase	DEB A	L2S2	0.07	20	15	E	8	78	0.1	2.86	0.1	1.00	0.67	0.50	75%	0.01	0.19	Construction phase
Site Construction phase	DEB B	L2S2	0.16	10	30	E	8	78	0.1	1.36	0.1	1.00	0.67	0.50	75%	0.01	0.09	Construction phase
Site Construction phase	GFS	L2S2	0.05	30	15	E	8	78	0.1	5.58	0.1	1.00	0.67	0.50	65%	0.03	0.51	Construction phase

DESIGNED	DES. CHECKED	DRAWN	DWG. CHECKED	REV'D P.MGR	APP'D P.DIR	BY	DATE
OPERATIONS	ASSET MANAGER						
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CENTRAL INTERCEPTOR GENERAL NORNGROVE AVENUE (L2S2) - EROSION SEDIMENT CONTROL PLAN							
CAD FILE MAIN-ESCP-14.1		DATE 7-Jun-12		ORIGINAL SCALE A1		CONTRACT No. 0538	
DRAWING No. MAIN-ESCP-14.1		ISSUE		C			



- NOTES:**
1. REFER TO DRAWING ESCP-101 FOR GENERAL NOTES AND LEGEND.
 2. REFER TO DRAWING ESCP-102 TO ESCP-103 FOR TP90 DETAILS.
 3. PLAN SHOWS INDICATIVE LAYOUT REQUIRED DURING MAIN TUNNEL, SHAFT AND CHAMBER CONSTRUCTION. FINAL LAYOUT WITHIN THE CONSTRUCTION BOUNDARY WILL BE DETERMINED BY THE CONTRACTOR TO SUIT THEIR METHODOLOGY.
 4. CONTOUR DRAINS TO BE INSTALLED EACH DAY TO MINIMISE FLOW PATH LENGTH.

CONSENT ISSUE



SEDIMENT RETENTION PONDS	
SRP A	
CATCHMENT	5814m ²
3% TREATMENT	174m ²
DEAD STORAGE	52m ³
WIDTH	9m
LENGTH	25m
DEPTH	2m

Works Phase	Treatment Device	Location	Earthwork Area (ha)	Slope (%)	Slope length (m)	Bare Soil (B) Pasture (P) New Grass (E)	Duration (months)	USLE Parameters				Total Control Efficiency (tonnes)	Remarks					
								R	K	LS	C			P	Time	Delivery Ratio	T/ha	
Site Establishment phase	SRP A	L3S1 south	0.58	33	60	B	2	78	0.17	13.05	1.0	1.32	0.17	0.50	95%	0.55	0.95	Flocculated
Site Construction phase	SRP A	L3S1 south	0.58	33	60	E	18	78	0.1	13.05	0.1	1.00	1.50	0.50	75%	1.10	1.90	Unflocculated

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		<p>ASSET MANAGER</p>	
DESIGNED	LC	DRAWN	LC
DES. CHECKED	AG	DWG. CHECKED	CTC
REV'D P.MGR		APP'D P.DIR	
ISSUE DATE	BY	APPD.	BY DATE

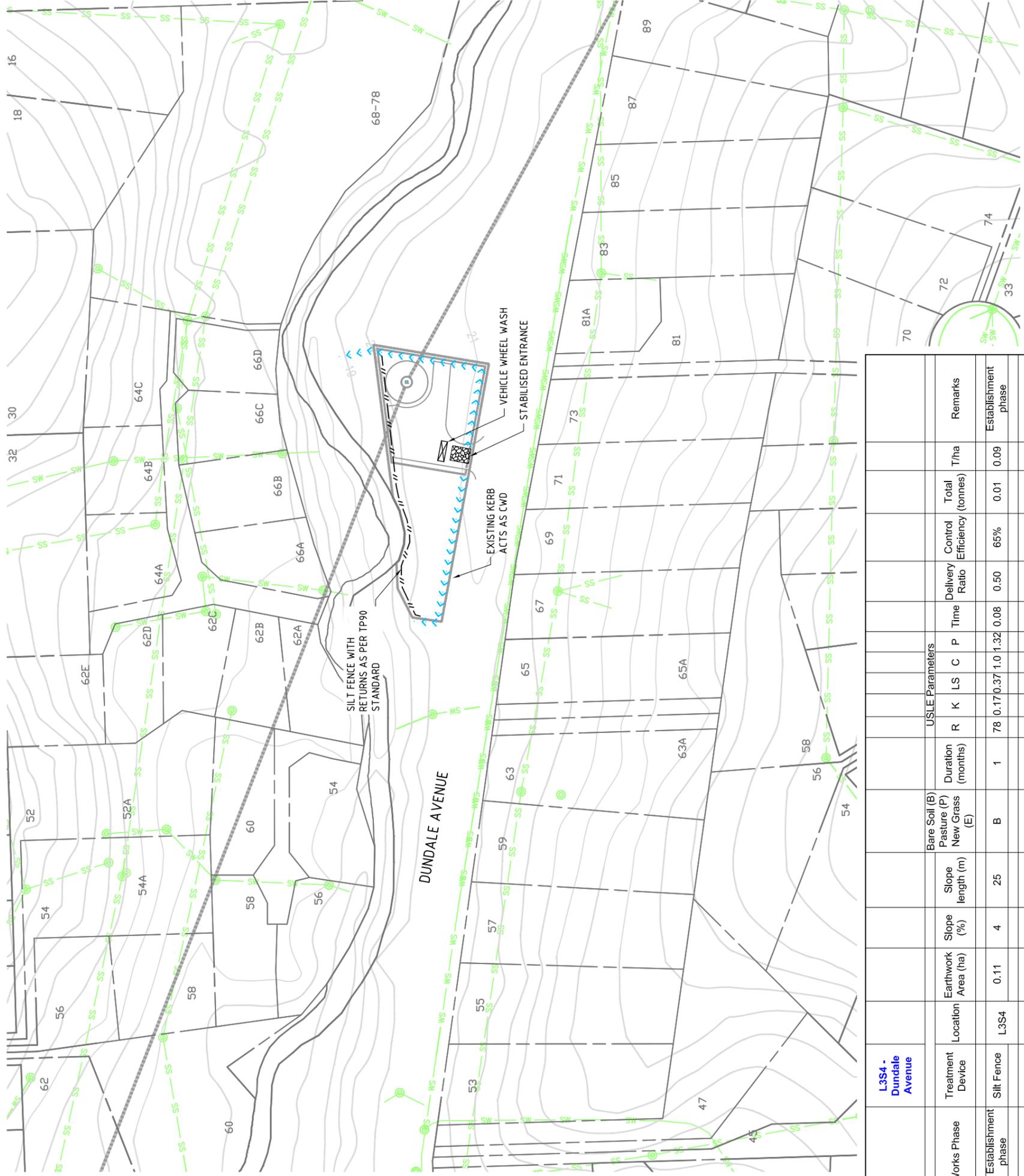
CENTRAL INTERCEPTOR
GENERAL
PS25 (L3S1) - EROSION SEDIMENT CONTROL PLAN

CAD FILE MAIN-ESCP-15.1 DATE 7-Jun-12

ORIGINAL SCALE A1 CONTRACT No. 0538

DRAWING No. MAIN-ESCP-15.1 ISSUE C





NOTES:

1. REFER TO DRAWING ESCP-1.01 FOR GENERAL NOTES AND LEGEND.
2. REFER TO DRAWING ESCP-1.02 TO ESCP-1.03 FOR TP90 DETAILS.

CONSENT ISSUE

Works Phase	Treatment Device	Location	Earthwork Area (ha)	Slope (%)	Slope length (m)	Slope New Grass (E)	Bare Soil (B)	Duration (months)	USLE Parameters				Control Efficiency (tonnes)	Total T/ha	Remarks			
									R	K	LS	C				P		
Site Establishment phase	Silt Fence	L3S4	0.11	4	25	B	1	78	0.17	0.37	1.0	1.32	0.08	0.50	65%	0.01	0.09	Establishment phase
Site Construction phase	GFS	L3S4	0.11	4	25	E	8	78	0.1	0.37	0.1	1.00	0.67	0.50	65%	0.00	0.03	Construction phase

		CENTRAL INTERCEPTOR GENERAL DUNDALE AVENUE (L3S4) – EROSION SEDIMENT CONTROL PLAN	CAD FILE MAIN-ESCP-18.1 ORIGINAL SCALE A1 DATE 7-Jun-12 CONTRACT No. 0538
DRAWING No. MAIN-ESCP-18.1		ISSUE B	

NOTES:

1. REFER TO DRAWING ESCP-101 FOR GENERAL NOTES AND LEGEND
2. REFER TO DRAWING ESCP-102 TO ESCP-103 FOR TP90 DETAILS



DEB	
CATCHMENT	134.0m ²
3% TREATMENT	4.0m ³
LIVE STORAGE	27m ³
DEAD STORAGE	13m ³



CONSENT ISSUE

Works Phase	Treatment Device	Location	Earthwork Area (ha)	Slope (%)	Slope length (m)	Bare Soil (B) Pasture (P) New Grass (E)	Duration (months)	USLE Parameters					Delivery Ratio	Control Efficiency	Total (tonnes) T/ha	Remarks		
								R	K	LS	C	P						
Site Establishment phase	DEB	L3S5	0.079	6.5	50	B	1	78	0.17	0.96	1.0	1.32	0.08	0.50	75%	0.01	0.17	Establishment phase
Site Construction phase	DEB	L3S5	0.079	6.5	50	E	8	78	0.1	0.96	0.1	1.00	0.67	0.50	75%	0.00	0.06	Construction phase

		CAD FILE MAIN-ESCP-19.1 ORIGINAL SCALE A1 DATE 7-Jun-12 CONTRACT No. 0538
CENTRAL INTERCEPTOR GENERAL HAYCOCK AVENUE (L3S5) – EROSION SEDIMENT CONTROL PLAN		DRAWING No. MAIN-ESCP-19.1 ISSUE C
C 18/7/12 B 29/6/12 A 7/6/12	UPDATED USLE TABLE – SITE ESTABLISHMENT DURATION ISSUED FOR CONSENT ISSUED FOR CONSENT	OPERATIONS ASSET MANAGER
ISSUE DATE	BY APPD.	BY DATE