Approved
pursuant to
Orders 2, 7, 12

Heather Watson
Director Metropolitan &
Regional Projects North
25/7/12.

ADDITIONAL SOIL & WATER MANAGEMENT PLAN

FOR MAJOR REMOVAL EVENTS:
- ROCK WALL RELOCATION
-ACOUSTIC MOUND RELOCATION
- INITIAL STOCKPILE REDUCTION

FOR

INTERNATIONAL HEALTH PRECINCT

LA VIE DEVELOPMENTS PTY LTD

AVONDALE ROAD
PENROSE

JULY 2012

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& Partners

Consulting Civil-Structural Engineers

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1. Introduction

1.1 General

Jordan Mealey & Partners has been contracted to provide a soil and water management plan for the removal of the:

- existing acoustic mound
- existing stacked rock retaining wall
- initial stockpile reduction/removal (50% of excavated material)

This soil and water management plan will cover the removal of the existing acoustic mound, the removal of the stacked rock retaining wall and the initial stockpile reduction.
The following report has been developed in accordance with "Soils and Construction, Volume 1, 4th Edition, Managing Urban Stormwater, Landcom (March 2004)".
This Soil and Water Management plan is to be read in conjunction with the Engineering and Architectural plans for the development and contractors and sub-contractors are to ensure all soil and water management measures outlined in this document are undertaken and maintained throughout the duration of the project.

1.2 Objectives

The objectives of this Soil & Water Management Plan are :

- To provide measures for sediment control
- To reduce pollution to downstream areas and receiving water
- Reduce land degradation
- To limit dust emission through dust suppression measures

2. Site

2.1 Description

The site is located on the corner of Avondale and Huntley Roads, Penrose. The site drains to the Avondale Road stormwater drainage system to the North, the natural watercourse to the West and into the Goolagong Street stormwater drainage system to the South-East. Each of these three catchments has an existing sediment control basin which is used to treat the stormwater before it leaves the site.

3. Erosion & Sediment Control - Construction

The erosion and sediment control measures are shown on the Site management plans which are Appendix A.

1) During construction land disturbance is to be minimised. Disturbance of soil is to be limited to a maximum distance of 5m from any earth, civil or construction works.
2) Sediment control fences are to be placed downstream of all construction work to prevent sediment being transported into the waterways.
3) Uphill of the construction work earth banks are to be constructed to direct stormwater from higher in the catchment around the development areas.
4) Inlet pit filters are to be installed around existing inlet pits in the construction zones.
5) Access areas shall be set by the construction manager and maintained throughout the duration of the project. Access should be limited these areas to minimise erosion and degradation of the area.
6) Dust levels shall be monitored using existing dust monitoring stations.
7) Where possible dust emissions shall be minimised during the earthworks phase through the use of sprinklers using water pumped from the sediment basins. Additional water will be brought on site using a water cart if required. Dust suppression shall be continued on exposed earth areas and stockpiles until grass/vegetation takes hold.
8) Watering of vegetation is to be maintained throughout the construction process to ensure soil & disturbed earth remains covered to limit dust and sediment emission. Water shall be pumped from the sediment basins or brought on site using a water cart if required.
9) All erosion and sediment control devices are to be maintained throughout the duration of the construction process.
10) All stockpiles are to be protected from erosion through the use of sediment fences, seeding and upstream mounds/drains.
11) All vehicles must enter and exit via the stabilised entry
12) All vehicles must be inspected and cleaned, if required. Before leaving the site.
13) All sediment control measures shall be inspected and cleaned after each storm event.

SUBJECT TO THE MODIFICATION OF SEDIMENT BASINS OUTLINED IN SECTION 7 TO COMPLY WITH ORDER No. 24.

4. Existing Erosion & Sediment Control

All existing erosion and sediment controls are functioning adequately and are to remain until construction is completed. These items shall be maintained and monitored as per Martens Consulting Engineers maintenance schedule and log, Appendix H (table 9) and Appendix I (table 10).

4.1 Sediment Basins

All three existing sediment basins have been designed by Martens Consulting Engineers. ~~The catchment areas for these sediment basins is not increasing therefore the sediment basins will remain unchanged as they are currently functioning adequately.~~ Sediment basins are to be maintained as per Martens Consulting Engineers maintenance schedule, Appendix H (table 9).

SENTENCE DELETED. REFER TO SECTION 7 FOR BASIN DETAILS.

4.2 Sediment Basin Stored Water Monitoring, Treatment & Discharge

Water that is stored in the existing sediment basins is to be treated as per the Martens Consulting Engineers Inspection and test plan, Appendix H (table 9). Flocculent is to be added to the basins at the completion of each storm event. The water is to be decanted after a minimum 36 hours and when suspended solids are less than 50mg/L. Sediment is to be removed when sediment storage zone is 50% full. Water from the basins will also be pumped to sprinklers on site to ensure early take up of grass/seeding.

4.3 Drainage Channels

Existing channels are to remain. Any existing channel that is altered during earthworks is to be reinstated as soon as possible.

4.4 Stabilised Site Access

The existing stabilised site access is to be modified as per the work schedule.

4.5 Dust Monitoring

The four existing dust monitoring stations are to remain. Dust monitors are to be checked to ensure they are functioning correctly and repaired where required.

4.6 Sediment Fences

All existing sediment fences are to remain in current locations and they are to be checked and repairs made where necessary.

5. Work Schedule

5.1 Stage 1

5.1.1 Stabilized Site Access

The access point is to be move into the site further, allowing the gate to be moved in from the site boundary to provide a safe stopping point for cars when the gate is being unlocked or locked. The stabilised site access is to be reconstructed as per SD 6-14. The access is to be a minimum length of 15m and at least 3m wide. The steel sediment grate (cattle grid) is to be installed on top of DGB20 or 30mm aggregate. The cattle grid is to be installed on the raised portion of the stabilised access to ensure stormwater is directed to the existing drainage channel.

5.1.2 Drainage Channel X

A new drainage channel is to be constructed along the Goolagong street boundary below the acoustic mound. The channel is to be lined with jute and rock check dams installed as per drawing SD 5-4. Rock check dams to be spaced so that top of each check dam is level with the bottom of the previous check dam.

5.1.3 Drainage Pit

A new drainage pit is to be constructed at the end of the new drainage channel X. The pit is to have a sediment fence installed around it as per drawing SD 6-12. The pit is to be connected to the existing Council stormwater network via the pit on Goolagong street with a 375mm diameter pipe at min 2% grade.

5.1.4 Haul Road

A new haul road is to be set up between the Acoustic Mound and the proposed area for the Relocated Acoustic Mound. The area is to be stripped and made suitable for repeated truck movements for the duration of the Stage 2 & 3 events.

5.1.5 Earth Bridges

Two earth bridges are to be constructed over the gas main pipeline. The earth bridges are to be constructed on top of steel plates to prevent damage to the pipeline. The builder is to ensure the top of the earth bridge is a minimum 900mm above the pipeline for a minimum of 5m on both sides of the pipeline. Excavated material is to be sourced from site stockpiles and to be adequately compacted to withstand truck loadings.

5.1.6 Drainage Channel Y

A new drainage channel is to be constructed to direct upstream stormwater flows around the relocated acoustic mound stockpile. The channel is to be lined with jute and rock check dams installed as per drawing SD 5-4. Rock check dams to be spaced so that top of each check dam is level with the bottom of the previous check dam. The drainage channel is to direct the stormwater to the existing headwall on Avondale road.

5.1.7 Earth Bank & Diversion Drain

An earth bank and diversion drain is to be constructed above and beside the proposed relocated acoustic mound stockpile to direct upstream flow around the stockpile (see drawing SD 4-1)

5.1.8 Sediment Fence

A sediment fence is to be installed below the proposed location of the acoustic mound stockpile (see drawing SD 4-1).

5.1.9 Stage 1 Timeframe

- The estimated time to complete the items listed in stage 1 is one week.

5.2 Stage 2

5.2.1 Relocated Acoustic Mound Stockpile

To be read in conjunction with Methodology by Southern Geotechnics.

All excavated material that has been used to construct the acoustic mound is to be removed to return that area back to its natural slope and level. Approximate volume of material to be removed is 9780m^3. This material is to be stockpiled in the area shown on the CEH Plans and the Site Management Plan (Appendix C & D) The proposed stockpile is to have maximum slope of 2(H):1(V). All earthwork relating to this event is to be completed as quick as possible after commencing to ensure exposure time is minimised. The surface of the stockpile is to be stabilised by spray seeding immediately after earthwork is completed. The relocation of the acoustic mound

stockpile will be completed on or before 4/11/2012 being six months from the date of the court order. In determining the six month period above the period of assessment of the soil and water management plan by the department of planning is not included in the six month period.

5.2.2 Stacked Rock Wall Removal

To be read in conjunction with Methodology by Southern Geotechnics.

Stacked rocks are to be removed and stacked in the location shown on the CEH plans and Site Management Plan (Appendix C & D). Rocks are to be removed starting from the top, removing one layer at a time. As each rock layer is removed the retained earth is to be re-shaped to ensure bank stability is maintained. Care is to be taken to ensure Basin C stability is not impacted upon during deconstruction of the stacked rock wall. The new earth bank that replaces the stacked rock wall is to be battered at 4(H):1(V) ensuring that the crest of the Eastern bank of Basin C is a minimum 7m wide. Maximum allowable batter is 2(H):1(V) where minimum bank crest width requires a steeper batter bank. All earthwork relating to this event is to be completed as quick as possible after commencing to ensure exposure time is minimised. The area where the rock wall was removed is to be stabilised by spray seeding immediately after Rock Wall removal is completed. The relocation of the stacked rock wall will be completed on or before the 4/11/2012 being six months from the date of the court order. In determining the six month period above the period of assessment of the soil and water management plan by the department of planning is not included in the six month period.

5.2.3 Reinstate Channel C1

After acoustic mound and stacked rock wall have been removed drainage channel C1 is to be reinstated to ensure the catchment boundary for Basin C1 remains the same. Channel size is to remain as per Martens design (2.02m(W) x 0.3(B)m x 0.29m(D))

5.2.4 Stage 2 Timeframe

- The estimated time to complete the Acoustic Mound relocation is 4 weeks.
- The estimated time to complete the Stacked Rock Wall removal is 6 weeks.
- The estimated time to reinstate Channel C1 is 2 days.

5.3 Stage 3

5.3.1 Initial Stockpile Reduction

To be read in conjunction with Methodology by Southern Geotechnics.

50% of the stockpile is to be removed from the site. This material is also to include the bank modification due to the stacked rock wall removal. The material will be removed from the site to a destination that is still to be confirmed. Authorities will be subsequently notified once destination is determined. Approximate amount of excavated material to be removed is 37600m^3. All earthwork relating to this event is to be completed as quick as possible after commencing to ensure exposure time is minimised. The surface of the remaining stockpile is to be stabilised by spray seeding immediately after the initial stockpile reduction earthwork is completed. The initial stockpile reduction will be completed on or before the 4/2/2013 being nine months from the date of the court order. In determining the nine month period above the period of assessment of the soil and water management plan by the department of planning is not included in the nine month period.

5.3.2 Stage 3 Timeframe

- The Initial Stockpile reduction involves the removal of stockpiled material to an offsite location. This will take place after Stages 1 & 2 but a specific timeframe cannot be predicted as the material is going to be used as fill for a development on another site which we have no control over. Therefore the only timeframe that can be provided is that it will be completed after Stage 2 and on or before the 4/2/2013 being nine months from the date of the court order. In determining the nine month period above the period of assessment of the soil and water management plan by the department of planning is not included in the nine month period.

6. Drainage Channel Design

6.1 Drainage Channel X

- Catchment area = 5715m^2
- I = 194mm/hr (10yr 5min storm)
- C = 0.9
- Q = CIA, Q = 0.277m^3/s
- n = 0.035 (Jute matt)
- S = 0.04
- Using Q = A x ((A/P^(2/3))/n) x S^0.5
- Required Channel Dimensions: Top width = 1.75m, Base Width = 1m, Depth = 0.15m
- An additional 100mm freeboard to be provided.
- Final Channel Dimensions: Top width = 2.25m, Base Width = 1m, Depth = 0.25m

6.2 Drainage Channel Y

- Catchment area = 3700m^2
- I = 194mm/hr (10yr 5min storm)
- C = 0.9
- Q = CIA, Q = 0.180m^3/s
- n = 0.035 (Jute matt)
- S = 0.04
- Using Q = A x ((A/P^(2/3))/n) x S^0.5
- Required Channel Dimensions: Top width = 1.85m, Base Width = 1.1m, Depth = 0.15m
- An additional 100mm freeboard to be provided.
- Final Channel Dimensions: Top width = 2.35m, Base Width = 1.1m, Depth = 0.25m

7. Sediment Basins

7.1 Sediment Basin Data

Soil testing and analysis was completed by Martens Engineers for the previous Soil & Water Management plan (See Appendix J). Sediment Basin modifications outlined in the Soil & Water management plan have been based on Martens testing results.

7.1.1 Basin Catchment Areas

Catchment areas are as specified in the Martens Soil & Water Management plan.

7.1.2 Soil Hydraulic Group

The soil hydraulic group determined by Martens for basin design purposes with regards to the Landcom blue book is soil hydraulic group C.

7.1.3 Rainfall Data

The 85th percentile 5 day rainfall depths for Albion Park and Wollongong are 41.9mm/period and 43.5mm/period (LANDCOM, Blue Book). To correspond with the method previously used by Martens to calculate the rainfall for the site the design rainfall is the average of these two figures being 42.7mm/period.

7.1.4 Volumetric Runoff Coefficient

The volumetric runoff coefficient for the 85th percentile rainfall depth is 0.58 (Table F2, LANDCOM, Blue Book)

7.1.5 C10 Runoff Coefficient

The C10 runoff coefficient for the 85th percentile rainfall depth is 0.83 (Table F3, LANDCOM, Blue Book).

7.1.6 Rainfall Erosivity Factor (R)

The rainfall erosivity factor remains unchanged by the increase in storm event and therefore the 5000 value determine by Martens remains the same.

7.1.7 Soil Erodability Factor (K)

The soil erodability factor remains unchanged by the increase in storm event and therefore the 0.038 value determine by Martens remains the same.

7.1.8 Length/Gradient Factor (LS)

The length/gradient factor remains unchanged by the increase in storm event and therefore the 1.19 for catchment A, 5.065 for catchment B and 5.065 for catchment C calculated by Martens remain the same.

7.1.9 Data Summary

ITEM	Catchment		
	A	B	C
Catchment Area (ha)	2.5784	1.2573	1.7971
Soil Hydraulic Group	C	C	C
5 Day 8th Percentile Rainfall (mm)	42.7	42.7	42.7
Cv - Volumetric Runoff Coefficient	0.58	0.58	0.58
C10 Runoff Coefficient	0.83	0.83	0.83
R - Rainfall Erosivity Factor	5000	5000	5000
K - Soil Erodability Factor	0.038	0.038	0.038
LS - Length/Gradient Factor	1.19	5.065	5.065

7.2 Sediment Basin Designs

7.2.1 Minimum Settlement Volume

$$V_{settle} = 10 \times C_v \times A \times R_{(y\ \%tile,5\ day)}$$

7.2.2 *Minimum Sediment Zone Volume*

$$V_{sediment} = \frac{0.17 \times A(R \times K \times LS \times 1.3 \times 1.0)}{1.3}$$

7.2.3 *Total Sediment Basin Volume*

$$V_{total} = V_{settle} + V_{sediment}$$

7.2.4 *Settling Zone Depth*

The minimum settling zone depth as specified in the Landcom (Blue Book) is 600mm.

7.2.5 *Minimum Sediment Basin Size Calculations*

The required sizes of the sediment basins are outlined in the table below.

ITEM	BASIN		
	A	B	C
Settlement Volume (m^3)	639	428	445
Settling Zone Depth (mm)	600	600	600
Sediment Zone Volume (m^3)	100	282	294
Total Basin Volume (m^3)	739	710	739

7.2.5 *Existing Sediment Basin Sizes*

Works as executed surveys were conducted by Craven Elliston & Hayes surveyors. Their surveys and certification of the existing sizes are Appendix K.

The existing sizes are summarised in the table below.

ITEM	BASIN		
	A	B	C
Settlement Volume (m^3)	447	414	413
Settling Zone Depth (mm)	860	640	600
Sediment Zone Volume (m^3)	125	282	421
Total Basin Volume (m^3)	572	696	834

7.3 Sediment Basin A Modifications

ITEM	EXISTING	REQUIRED	DIFFERENCE
Settlement Volume (m^3)	447	639	192
Settling Zone Depth (mm)	860	600	-260
Sediment Zone Volume (m^3)	125	100	-25
Total Basin Volume (m^3)	572	739	167

To increase the settling zone capacity the basin needs to be increased in size to the South-West by an additional 224m^2. The additional area will need to be excavated to a minimum RL29.28m. See Sediment Basin A Modification Plan which is Appendix L.

7.3 Sediment Basin B Modifications

ITEM	EXISTING	REQUIRED	DIFFERENCE
Settlement Volume (m^3)	414	428	14
Settling Zone Depth (mm)	640	600	-40
Sediment Zone Volume (m^3)	282	282	0
Total Basin Volume (m^3)	696	710	14

To increase the total basin capacity and the settling zone capacity the weir is to be raised by 25mm. See Sediment Basin B Modification Plan which is Appendix M.

7.4 Sediment Basin C Modifications

ITEM	EXISTING	REQUIRED	DIFFERENCE
Settlement Volume (m^3)	413	445	32
Settling Zone Depth (mm)	600	600	0
Sediment Zone Volume (m^3)	421	294	-127
Total Basin Volume (m^3)	834	739	-95

Total basin capacity is already sufficient. The settling zone capacity needs to be increased by 32m^3. To achieve this the settling zone depth needs to be increased by 100mm from 600mm to 700mm. This requires the existing decanting pipe (arm) to be lowered. To do this the pit and pipes will need to be lowered to RL36.3m. See Sediment Basin C Modification Plan which is Appendix N.

7.5 Sediment Basin Weir Check

The weir for each sediment basin has previously been designed by Martens for the 1% rainfall event for the catchment sizes which have remained the same. Therefore the weir requirements remain as per the Martens report outlined in the table below.

ITEM	BASIN		
	A	B	C
Design 1% Flow Rate (m^3/s)	2.35	1.47	1.54
Crest Width (m)	6.92	4.33	4.53
Maximum (m)	0.3	0.3	0.3

7.5.1 Constructed Sediment Basin A Weir Check

The existing weir has been constructed to be 7m wide at RL30.3m. The existing top of the weir bank is RL30.64m. The top level of this sediment basin is not being altered, therefore this existing weir size remains satisfactory.

7.5.2 Constructed Sediment Basin B Weir

The existing weir has been constructed to be 4.4m wide at RL30.24m. The existing top of the weir bank is RL30.80m. The modified weir level will be RL30.265. The top of water level over the revised weir is therefore RL30.265m+0.3m = RL30.565m. Therefore the weir size will still be satisfactory once it has been raised to the new level.

7.5.3 Constructed Sediment Basin C Weir

The existing weir has been constructed to be 7m wide at RL37.0m. The existing top of weir bank is RL37.50m. Top of water level over weir is RL37.00m+0.3m = RL37.30m. The existing weir is acceptable.

8. Inspection & Reporting

Inspection of the erosion and sediment controls is to take place as per the inspection frequencies outlined for each item in both the Jordan Mealey & Partners Monitoring Schedule (Appendix F) and the Martens Consulting Engineers Inspection and Test Plan (Appendix H). The Jordan Mealey & Partners Log Sheet (Appendix G) and the Martens Consulting Engineers Site Log Sheet (Appendix I) shall be completed after each storm event and to the required inspection intervals outlined. The Martens Log calls for rainfall readings to be taken each day. Additional daily readings of temperature, wind speed and wind direction are to be taken and logged on the Jordan Mealey & Partners log sheet. Copies of the log sheets shall be provided to the Applicant on Monday of each week by email to John Sparkes, Compliance Manager, Department of Planning and Infrastructure, john.sparkes@planning.nsw.gov.au.

9. Monitoring & Maintenance

Weekly reviews of the sediment and erosion control measures are to be done by the management team (project and site managers) using the Schedules and Log Sheets attached to this document as Appendix F, G, H & I. The site manager is to inspect all erosion and sediment devices at the intervals specified during construction. The site manager, project manager and certifying engineer shall meet and discuss the observations, dust monitoring results and rainfall monitoring data to

decide whether the installed measures are adequate. If at any stage during construction the inspections show sediment and erosion control is not adequate additional measures shall be installed.

The certifying engineer shall inspect the erosion and sediment control devices once they are installed to provide certification prior to earthworks taking place. Any proposed changes to the erosion and sediment devices should be reported to the certifying engineer prior to them being made. The certifying engineer shall also inspect the site following any major rainfall event.

All existing sediment and erosion control measures are to be maintained and monitored as per Martens Consulting Engineers maintenance schedule and log, Appendix H (table 9) and Appendix I (table 10).

Yours faithfully,

Mr. G.A. Mealey.

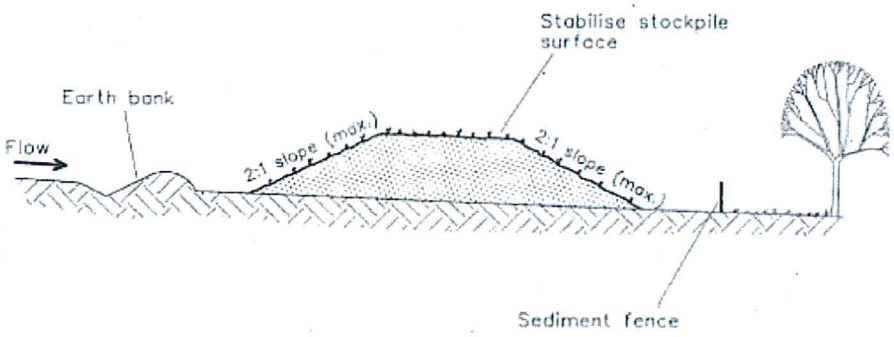
9. References

LANDCOM, (March 2004). Soils and Construction (Blue Book), Volume 1, 4th Edition, Managing Urban Stormwater,

MARTENS CONSULTING ENGINEERS, (January 2011) Soil and Water Management Plan - Stage 1 Construction Works, International Health Precinct, P1103325JR01V01.

APPENDIX

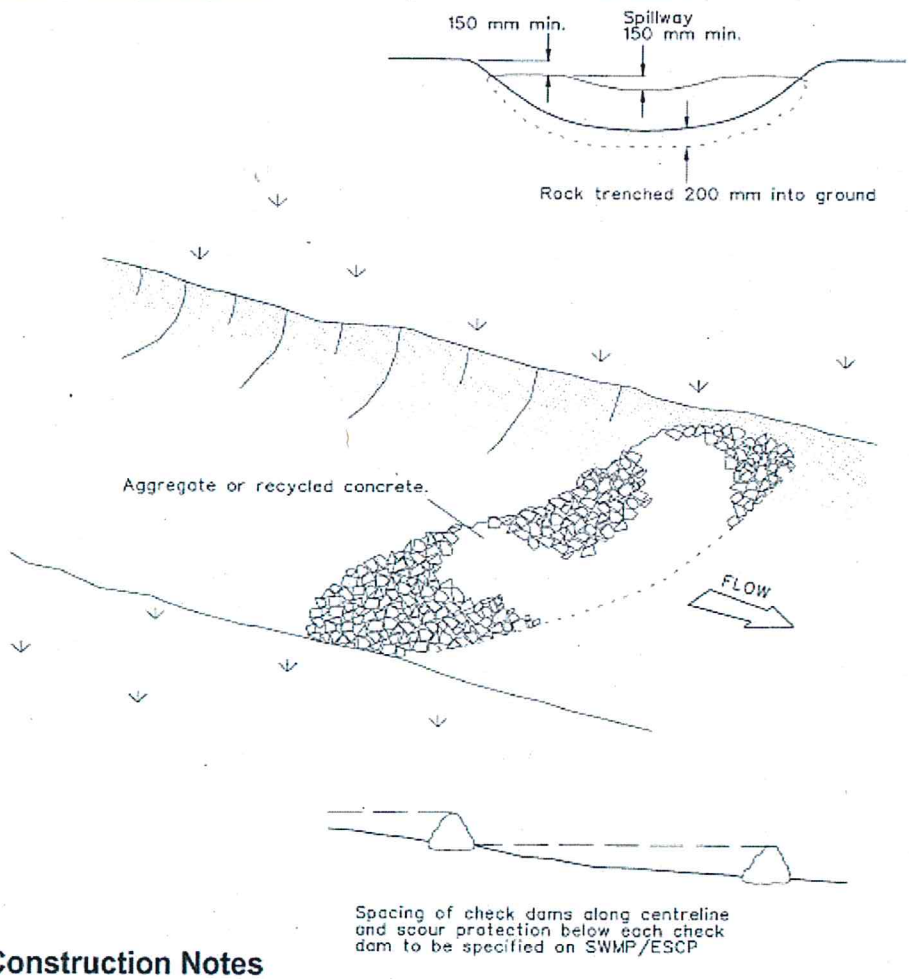
Appendix A – LANDCOM BLUE BOOK DIAGRAMS



Construction Notes

1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

STOCKPILES **SD 4-1**

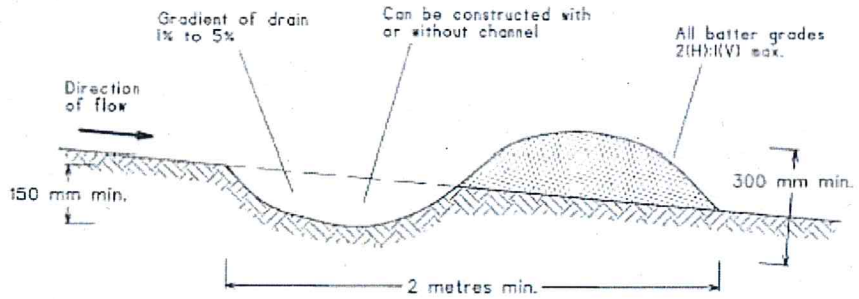


Construction Notes

1. Check dams can be built with various materials, including rocks, logs, sandbags and straw bales. The maintenance program should ensure their integrity is retained, especially where constructed with straw bales. In the case of bales, this might require their replacement each two to four months.
2. Trench the check dam 200 mm into the ground across its whole width. Where rock is used, fill the trenches to at least 100 mm above the ground surface to reduce the risk of undercutting.
3. Normally, their maximum height should not exceed 600 mm above the gully floor. The centre should act as a spillway, being at least 150 mm lower than the outer edges.
4. Space the dams so the toe of the upstream dam is level with the spillway of the next downstream dam.

ROCK CHECK DAM

SD 5-4

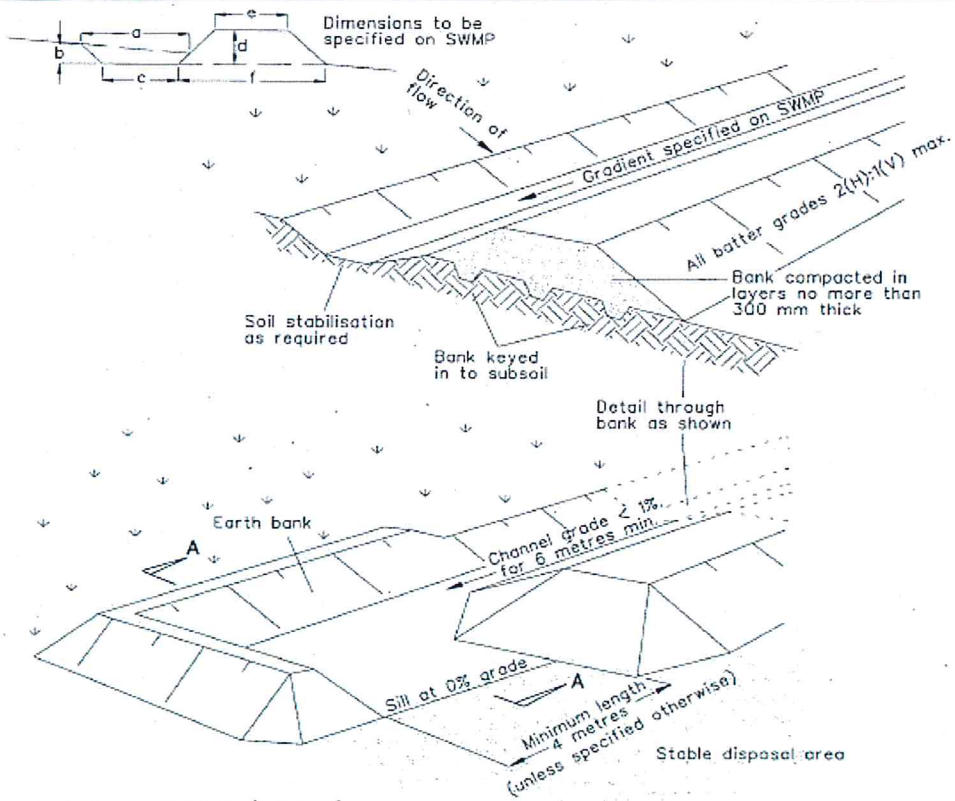


NOTE: Only to be used as temporary bank where maximum upslope length is 80 metres.

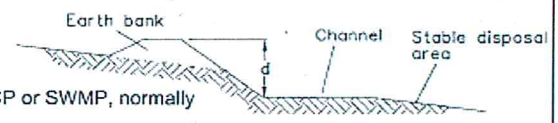
Construction Notes

1. Build with gradients between 1 percent and 5 percent.
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V shaped.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction.

EARTH BANK (LOW FLOW) **SD 5-5**



Level Spreader (or Sill)

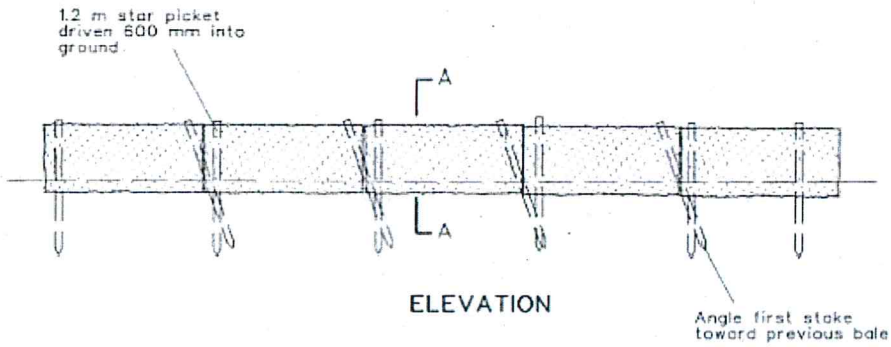


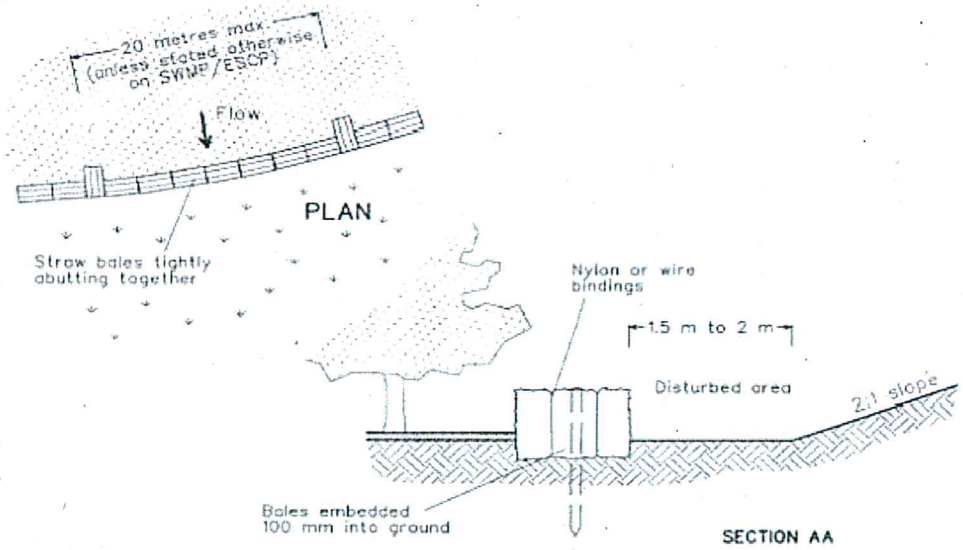
Section AA

Construction Notes

1. Construct at the gradient specified on the ESCP or SWMP, normally between 1 and 5 percent
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V-shaped, at the dimensions shown on the SWMP.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction following Table 5.2 in Landcom (2004).
7. Where discharging to erodible lands, ensure they outlet through a properly constructed level spreader.
8. Construct the level spreader at the gradient specified on the ESCP or SWMP, normally less than 1 percent or level.
9. Where possible, ensure they discharge waters onto either stabilised or undisturbed disposal sites within the same subcatchment area from which the water originated. Approval might be required to discharge into other subcatchments.

EARTH BANK (HIGH FLOWS) SD 5-6

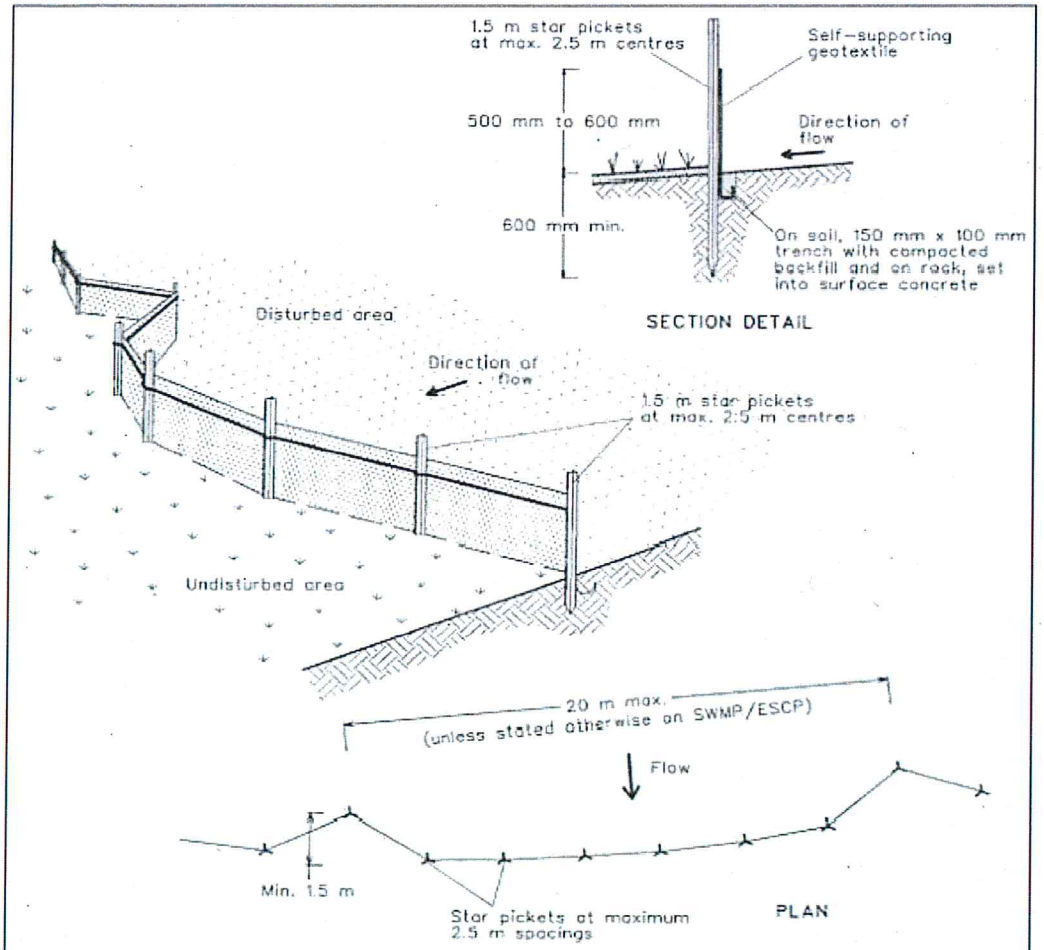




Construction Notes

1. Construct the straw bale filter as close as possible to being parallel to the contours of the site.
2. Place bales lengthwise in a row with ends tightly abutting. Use straw to fill any gaps between bales. Straws are to be placed parallel to ground.
3. Ensure that the maximum height of the filter is one bale.
4. Embed each bale in the ground 75 mm to 100 mm and anchor with two 1.2 metre star pickets or stakes. Angle the first star picket or stake in each bale towards the previously laid bale. Drive them 600 mm into the ground and, if possible, flush with the top of the bales. Where star pickets are used and they protrude above the bales, ensure they are fitted with safety caps.
5. Where a straw bale filter is constructed downslope from a disturbed batter, ensure the bales are placed 1 to 2 metres downslope from the toe.
6. Establish a maintenance program that ensures the integrity of the bales is retained - they could require replacement each two to four months.

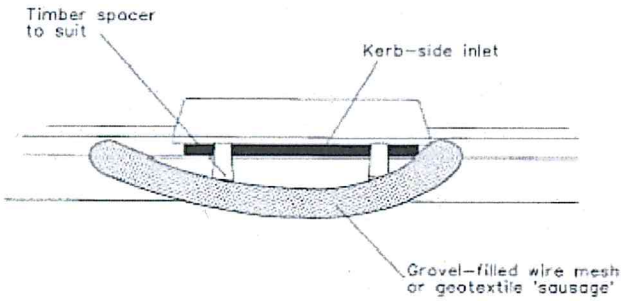
STRAW BALE FILTER SD 6-7

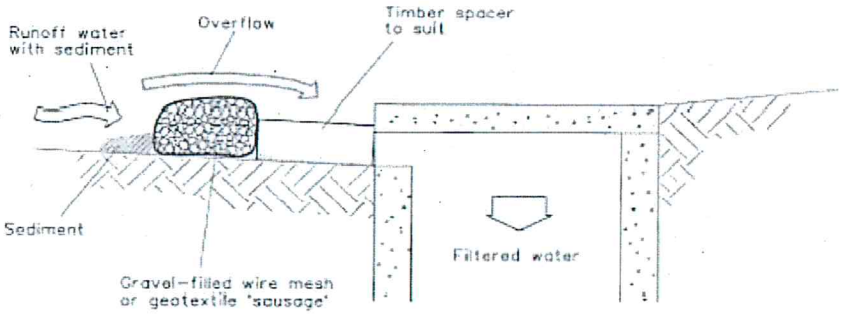


Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

SEDIMENT FENCE **SD 6-8**



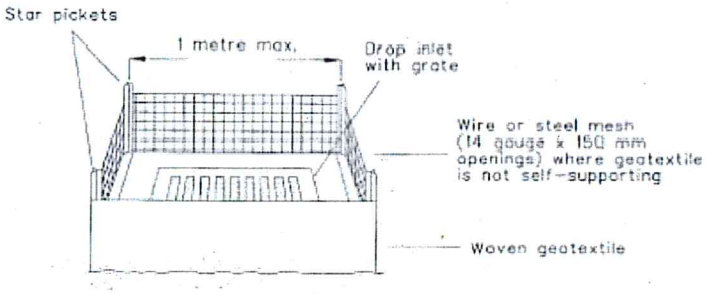


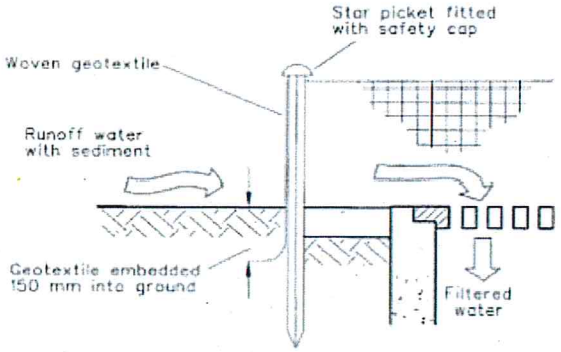
NOTE: This practice only to be used where specified in an approved SWMP/ESCP.

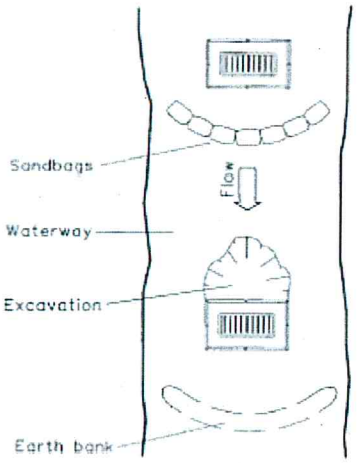
Construction Notes

1. Install filters to kerb inlets only at sag points.
2. Fabricate a sleeve made from geotextile or wire mesh longer than the length of the inlet pit and fill it with 25 mm to 50 mm gravel.
3. Form an elliptical cross-section about 150 mm high x 400 mm wide.
4. Place the filter at the opening leaving at least a 100-mm space between it and the kerb inlet. Maintain the opening with spacer blocks.
5. Form a seal with the kerb to prevent sediment bypassing the filter.
6. Sandbags filled with gravel can substitute for the mesh or geotextile providing they are placed so that they firmly abut each other and sediment-laden waters cannot pass between.

MESH AND GRAVEL INLET FILTER **SD 6-11**





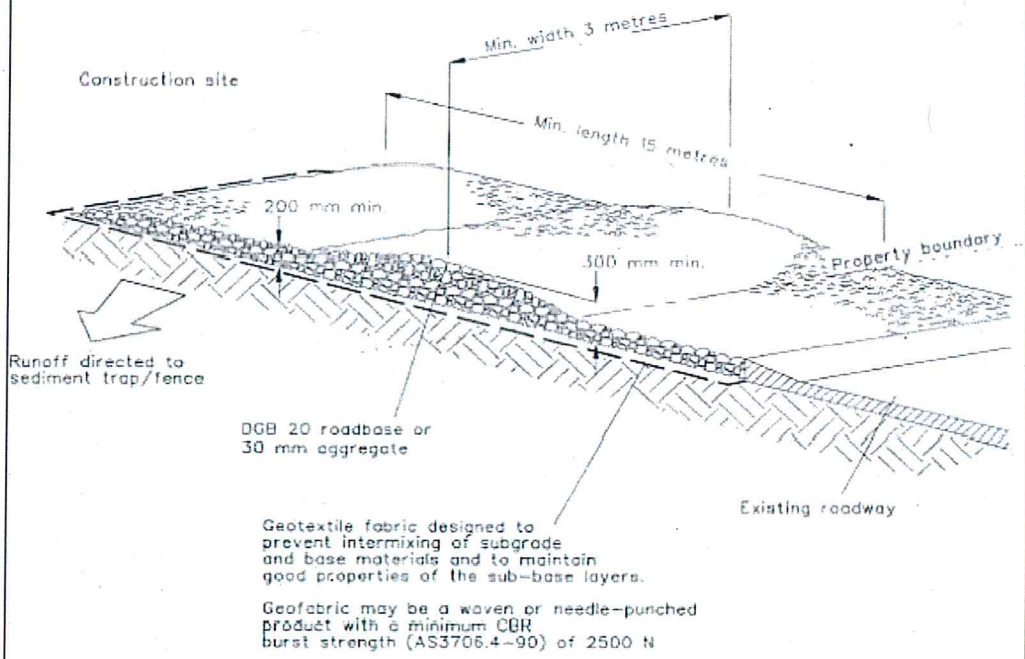


For drop inlets at non-sag points, sandbags, earth bank or excavation used to create artificial sag point

Construction Notes

1. Fabricate a sediment barrier made from geotextile or straw bales.
2. Follow Standard Drawing 6-7 and Standard Drawing 6-8 for installation procedures for the straw bales or geofabric. Reduce the picket spacing to 1 metre centres.
3. In waterways, artificial sag points can be created with sandbags or earth banks as shown in the drawing.
4. Do not cover the inlet with geotextile unless the design is adequate to allow for all waters to bypass it.

GEOTEXTILE INLET FILTER **SD 6-12**

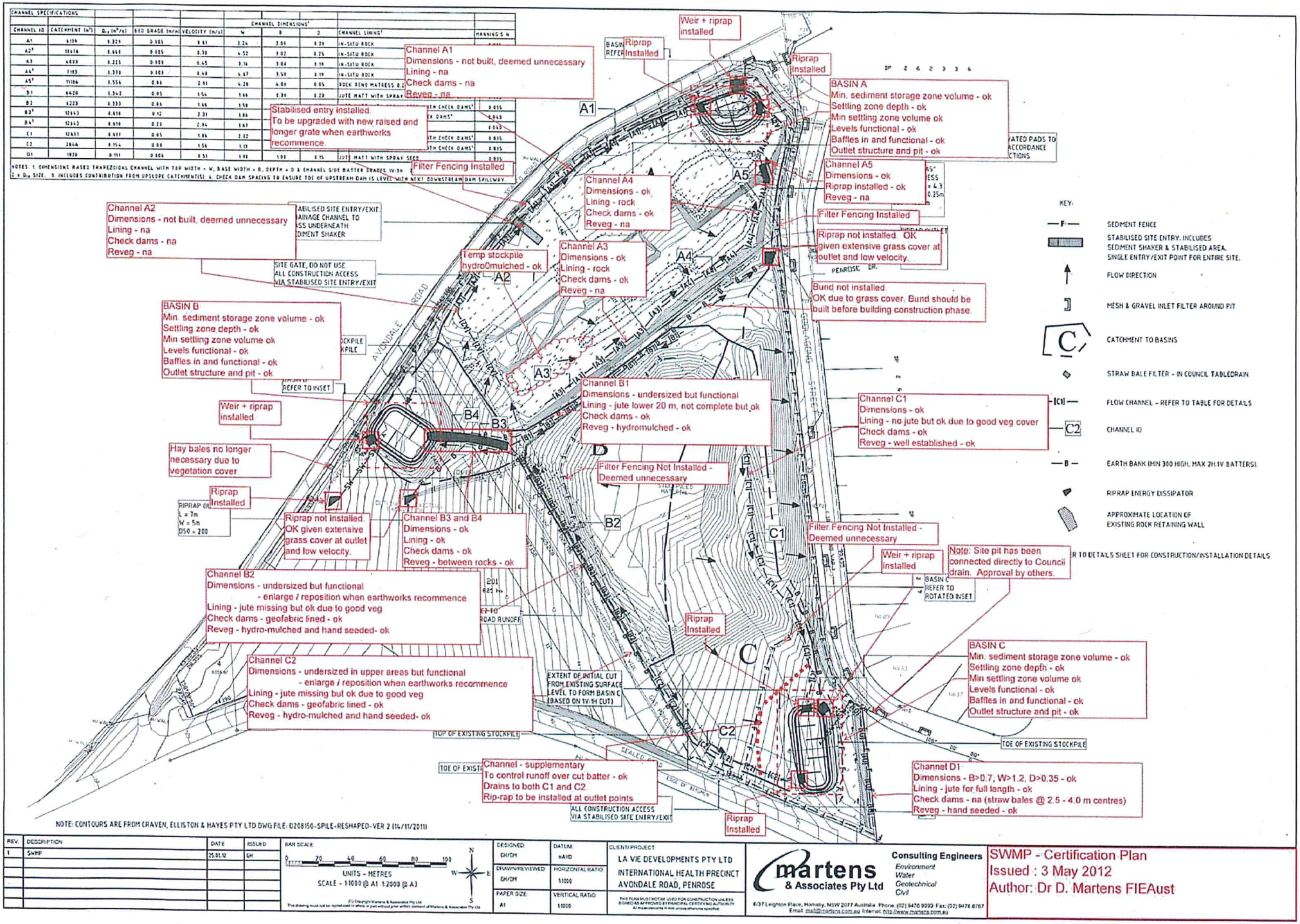


Construction Notes

1. Strip the topsoil, level the site and compact the subgrade.
2. Cover the area with needle-punched geotextile.
3. Construct a 200-mm thick pad over the geotextile using road base or 30-mm aggregate.
4. Ensure the structure is at least 15 metres long or to building alignment and at least 3 metres wide.
5. Where a sediment fence joins onto the stabilised access, construct a hump in the stabilised access to divert water to the sediment fence

STABILISED SITE ACCESS — SD 6-14

Appendix B – MARTENS CONSULTING ENGINEERS EXISTING SWMP CERTIFICATION PLAN



CHANNEL ID	CATCHMENT (ha)	$Q_{1:5}$ (m³/s)	BED GRADE (m/m)	VELOCITY (m/s)	CHANNEL DIMENSIONS[1] W	B	D	CHANNEL LINING[2]	MANNING'S N
A1	6139	0.329	0.005	3.61	3.24	2.00	0.29	IN-SITU ROCK	
A2[3]	13576	0.668	0.005	0.78	4.52	3.02	0.25	IN-SITU ROCK	
A3	4699	0.225	0.103	0.45	3.16	3.00	0.19	IN-SITU ROCK	
A4[3]	7189	0.338	0.103	0.48	4.37	3.50	0.19	IN-SITU ROCK	
A5[3]	11186	0.556	0.04	2.91	4.28	4.00	0.05	ROCK REND MATRESS 0.2	
B1	6420	0.342	0.03	1.54	1.66	0.30	0.23	JUTE MATT WITH SPRAY SEED	
B2	6223	0.333	0.03	1.66	1.58			[3]TH CHECK DAMS[4]	0.035
B3[3]	12643	0.618	0.12	2.31	1.86			K DAMS[4]	0.040
B4[3]	12643	0.618	0.23	2.94	1.61			[3]TH CHECK DAMS[4]	0.035
C1	12611	0.617	0.05	1.86	2.02			[3]TH CHECK DAMS[4]	0.035
C2	2646	0.154	0.09	1.56	1.13				0.035
D1	1920	0.111	0.006	0.51	1.93	1.00	0.15	JUTE MATT WITH SPRAY SEED	0.035

NOTES: 1. DIMENSIONS BASED TRAPEZOIDAL CHANNEL WITH TOP WIDTH = W, BASE WIDTH = B, DEPTH = D & CHANNEL SIDE BATTER GRADES 1V:3H (2 x $D_{1:5}$ SIZE. 3. INCLUDES CONTRIBUTION FROM UPSLOPE CATCHMENT(S). 4. CHECK DAM SPACING TO ENSURE TOE OF UPSTREAM DAM IS LEVEL WITH NEXT DOWNSTREAM DAM SPILLWAY.

REV.	DESCRIPTION	DATE	ISSUED
1	SWMP	25.01.12	GH

BAR SCALE: 0 20 40 60 80 100 UNITS – METRES
SCALE – 1:1000 @ A1 1:2000 @ A3

DESIGNED: GH/DM | DRAWN/REVIEWED: GH/DM | PAPER SIZE: A1
DATUM: mAHD | HORIZONTAL RATIO: 1:1000 | VERTICAL RATIO: 1:1000

CLIENT/PROJECT: LA VIE DEVELOPMENTS PTY LTD
INTERNATIONAL HEALTH PRECINCT
AVONDALE ROAD, PENROSE

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THIS PLAN MUST NOT BE USED FOR CONSTRUCTION UNLESS SIGNED AS APPROVED BY PRINCIPAL CERTIFYING AUTHORITY
All measurements in mm unless otherwise specified

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