Proposed Development – Raymond Terrace HealthOne.

Jacaranda Avenue, Raymond Terrace,

Stormwater Management Plan

for

Hunter New England Local Health Network

March 2011

MPC Project Ref: 11-179

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Contents

Appendices

1. Background Information

1.1 Preamble

The proposed development is a Health Service facility located at the corner of Swan and Jacaranda Streets, Raymond Terrace (Lot 22 D.P. 1088281.- refer to **Appendix A** for site plans). The proposed redevelopment includes the following:

- New two storey Medical Centre and proposed new carparks and accessways. Total Site area is approximately 5300m^2 with a roof area of approximately 1000m^2

1.2 Stormwater Management Plan

In devising this Stormwater Management Plan for the proposed development the following issues have been addressed:

- Water Quality Management
- Stormwater Management (detention)
- Stormwater Harvesting (source controls - infiltration)

The stormwater and environmental management philosophy employed in the Stormwater Management Plan is discussed in Section 3.0.

As well as permanent water management controls, construction phase controls are also addressed, in section 5.0.

In preparing this Stormwater Management Plan review has been undertaken with Port Stephens Council Development Control Plans (DCP).

1.3 Background Information

From review of Council's DCP, we understand the following is required:

- that on-site stormwater harvesting (source control - infiltration) measures would be required for the new impermeable surface of the proposed development ;
- That site discharge from the developed site is not increased from the undeveloped site
- that on-site detention is required for all storms up to and including the 1 in 100 year storm event. The detention is proposed to be provided as aboveground carpark storage.

2. Site and Catchment Details

2.1 The Site

Appendix A shows the site layout for the proposed staged development.

At present the proposed site is approximately 5300m^2 and generally falls west with an elevation of approximately RL 5.5m AHD at the eastern side to an approximate elevation of RL of 3.3m AHD on the western side.

Existing drainage is primarily judged to occur by surface flow to the west and eventually into the existing roadside drainage swale on Swan Street. Site survey information has been provided by de Witt Consulting.

The site does not contain any rivers or creeks themselves, and we understand that flows from residential catchment areas directly around the site are conveyed through the council drainage network to suitable discharge locations.

3. Stormwater and Environmental Management Philosophy

In preparing this Stormwater Management Plan we have consulted with Council officers in relation to stormwater. The requirements to be addressed are as follows:

- Ensure that the rate of rainwater runoff from the pre-developed site is not increased for the developed condition for all storms up to and including the 1 in 100 years ARI event.
- Allow for sediment control systems for any contaminated water from new paved areas that may be able to enter detention systems. Several proprietary pollution control systems will be incorporated into the stormwater management system where appropriate.
- Employ suitable stormwater harvesting measures (source controls). This is primarily achieved for this site using infiltration trenches and permeable paving and will allow for low storm events to have water disperse into the existing soil.
- Ensure that overland flow in the event of a choked or blocked piped system does not impact on neighbouring properties or other buildings on the site.

4. Proposed Stormwater Management Facilities

4.1 Preamble

Section 4.2 gives an outline of the nature and function of stormwater management facilities to be incorporated in the proposed development.

Section 4.3 discusses the design storm events for which the stormwater management system is provided.

The site area is shown in **Appendix A**. The location and operation of stormwater management facilities for the catchment is discussed in Section 4.4.

On going maintenance and monitoring of the stormwater management system is discussed in Section 4.5.

4.2 Nature and Function of Stormwater Management Facilities

The stormwater management plan is shown in **Appendix C**. The principal stormwater management components and their function are listed below:

a). The proposed works consists of redevelopment of the entire site as identified on the stormwater plans in Appendix A. Stormwater systems are designed to cater for roof and hardstand area with all remaining areas being fully landscaped. For the purposes of analysis the site is considered as a single catchment as outlined in **Appendix B1**.

b). Roof rainwater will be directed though a new pipe/pit system and into aboveground carpark detention areas identified on the plans. Water harvesting through using infiltration trenches and permeable paving is proposed.

c). Detention facilities, as well as sediment and pollution control measures, will be incorporated into the network using conventional orifice control pits for controlled release outflow facilities to limit flows to that of the existing pre-developed state. As such stormwater quality for the existing site will not be compromised by the proposed development (refer **Appendix B1**);

4.3 Design Storm Events

Stormwater detention facilities will be designed to cater for all storms up to an including the 1 in 100 year ARI event.

4.4 Site Catchment Area

The site details are approximately as follows:

- Site Area = 5300 m^2
- Existing Impermeable Roof Area = 0 m^2
- Existing Impermeable Hardstand Area = 0 m^2
- Developed Impermeable Roof area = 1000 m^2
- Developed Impermeable Hardstand area = 2700 m^2

4.4.1 Stormwater Harvesting

To acknowledge stormwater re-use on the site we are proposing that the run-off from the new impervious roof areas and hardstand areas is to be directed into infiltration trenches and through permeable paving zones in the main carpark.

4.4.2 Stormwater Detention

Stormwater detention is proposed to collect water from the developed sites impermeable surfaces. The detention facilities proposed are to include carpark surface detention with outflow control systems to control flows to that of the pre-developed site for storms up to and including the 1 in 100 year event. Refer **Appendix B1** for specific outflow details and calculations.

4.5 Maintenance of Stormwater Management Facilities

Maintenance of concrete pits, pipes and paved flow paths will be minimal as they are generally self-cleansing, and hence only involve very occasional cleaning. Regular inspections of control systems should be carried out to ensure satisfactory performance of the drainage systems proposed. Sediment/pollution control pits and any proprietary pollution control devices will be provided prior to entering detention or retention facilities.

5. Construction Phase Erosion and Sediment Controls

The construction phase approach adopted for this site will incorporate principles recommended by the NSW Department of Housing, namely:

- Plan for erosion and sediment control concurrently with engineering design and in advance of earthworks proper assessment of site constraints and integration of the various needs;
- Minimise the area of soil exposure;
- Conserve the topsoil where possible:
- Control water flow from the top of the development area, through the works and out the bottom of the site, for example,
    - divert clean runoff above denuded areas
    - minimize slope gradient and length
    - keep runoff at non-erodible velocities
    - trap soil and water pollutants
- Rehabilitate disturbed lands quickly.

A preliminary design of erosion and sediment controls for the overall site development is shown in **Appendix D**. Controls will be specified to be provided on the site prior to and during all earthworks in accordance with EPA Site Work Practices. Features of the construction phase erosion and sediment controls adopted for this site include:

- Prevention of sediment and polluted runoff water from entering the existing adjacent watercourse. This involves the provision of silt fences, catch drains and sediment traps.
- Control of actual and potential soil erosion – grassing and stabilization of embankments and drainage outlets where required.
- Stabilised stockpile areas to prevent wind and water erosion.
- Scour protection at discharge locations.
- Stabilised site access to provide a firm base for vehicle entry/exit and to prevent the main access from becoming a source of sediment.

6. Summary

This stormwater management plan has been prepared by MPC Consulting Engineers for Hunter New England Local Health Network for the proposed development at Raymond Terrace, and the systems outlined in this report address the requirements of Port Stephens Councils DCP

For further information in relation to this stormwater management plan please contact the undersigned.

Signed:

DEREK PRENTICE

BE (Civil)(Hons), MIEAust, CPEng Structural and Civil, NPER

Director

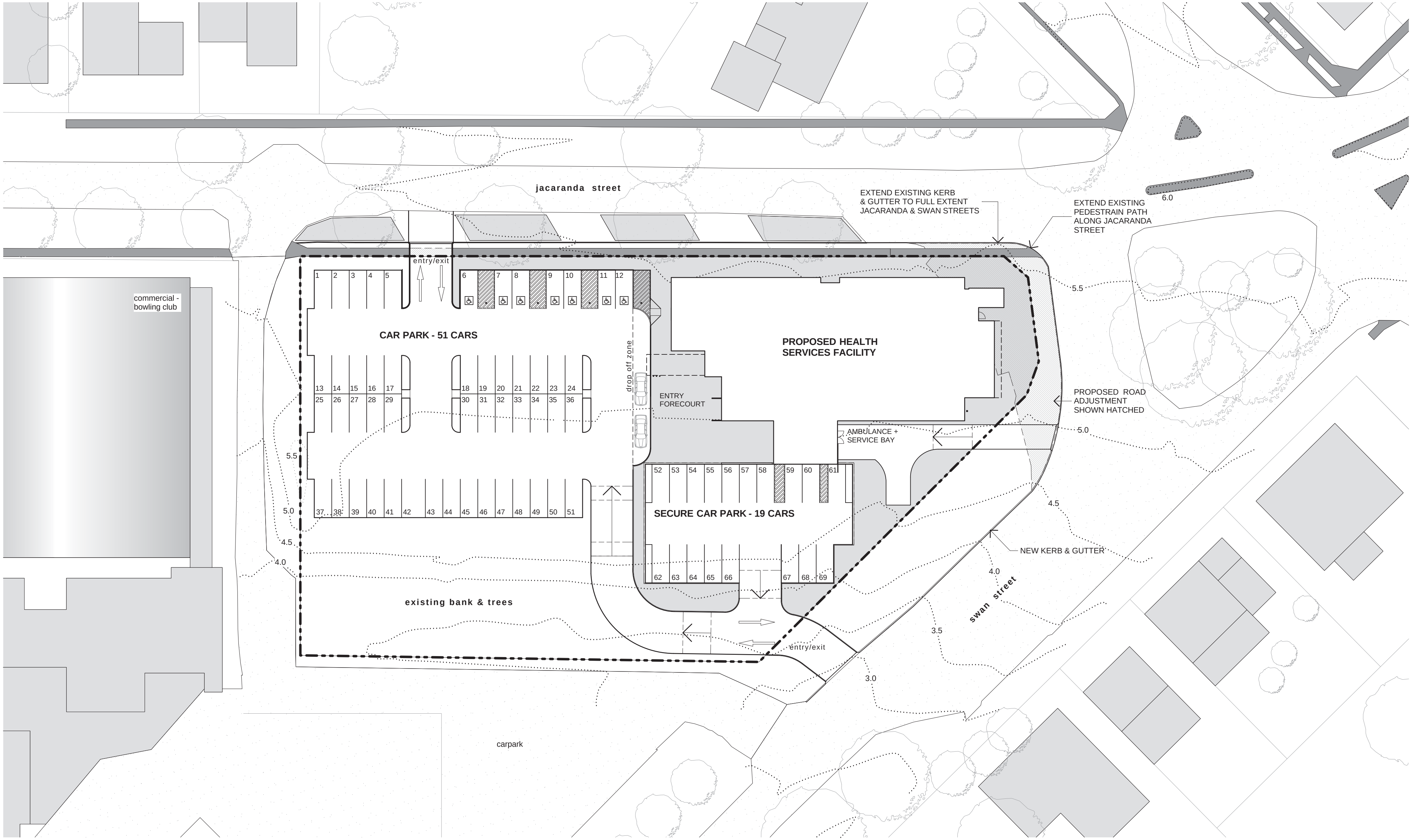
Date:

March 2011

Appendix A

Site Catchment Plan

(Refer to full size drawings for clarity)



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scale	1:500@A3
drawing title	Site Plan
project name and address	Raymond Terrace HealthOne Jacaranda Avenue Raymond Terrace
project no.	1004
drawing no.	DA02
revision	C

PRELIMINARY

cv

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Appendix B

B1 Stormwater Detention Calculations

B1 - STORMWATER DETENTION CALCULATIONS

Landscaped areas of the site are considered to act as existing, yet their percentage pervious area has been accounted for in the stormwater calculations provided in sizing the detention tanks. Any infiltration has been ignored for the purposes of sizing the detention system.

The site catchment has been analysed for detention sizing purposes using computer program RARE Version 1.53 which calculates the pre and post development discharge based on the rational method using AR&R kinematic wave equations for times of concentration. Variations to the co-efficient of runoff for intensity 10yr 1hr < 70mm/hr are automatically calculated using triangular hydrographs.

Stormwater detention has been provided based on the following calculations, and is proposed to be stored as surface detention in carpark areas.

Outflow from the detention areas will be by way of orifice plate chokes for 1 in 5 year, 1 in 20 year, and 1 in 100 year storm events as required. Drainage profiles allowing for overflow in a fully blocked design case will also be provided with all overflow directed off the site.

Port Stephens Council have advised that the 1 in 100 year flood level is RL5.1

The input into RARE is as follows:

Site Area = 5300m^2 – Developed Site Area = **3800 m^2**
% through OSD = 70%
% Impervious pre-developed = 0%
% Impervious post-developed = 100%
Flow Length = 60m, Slope = 3.6%, Roughness = 0.2

ARI	Pre- Developed				Post-Developed				Q (out) l/s	Vol (m^3)
	Tc	C	I (mm/hr)	Q (l/s)	Tc	C	I (mm/hr)			
5	**14**	**0.40**	**90**	**38**	**14**	**0.86**	**90**		**14**	36
10	**13**	**0.43**	**108**	**48**	**13**	**0.91**	**108**		**17**	43
20	**12**	**0.45**	**132**	**62**	**12**	**0.95**	**132**		**22**	51
50	**11**	**0.49**	**167**	**86**	**11**	**1.00**	**167**		**33**	60
100	**10**	**0.51**	**199**	**106**	**10**	**1.00**	**199**		**43**	63

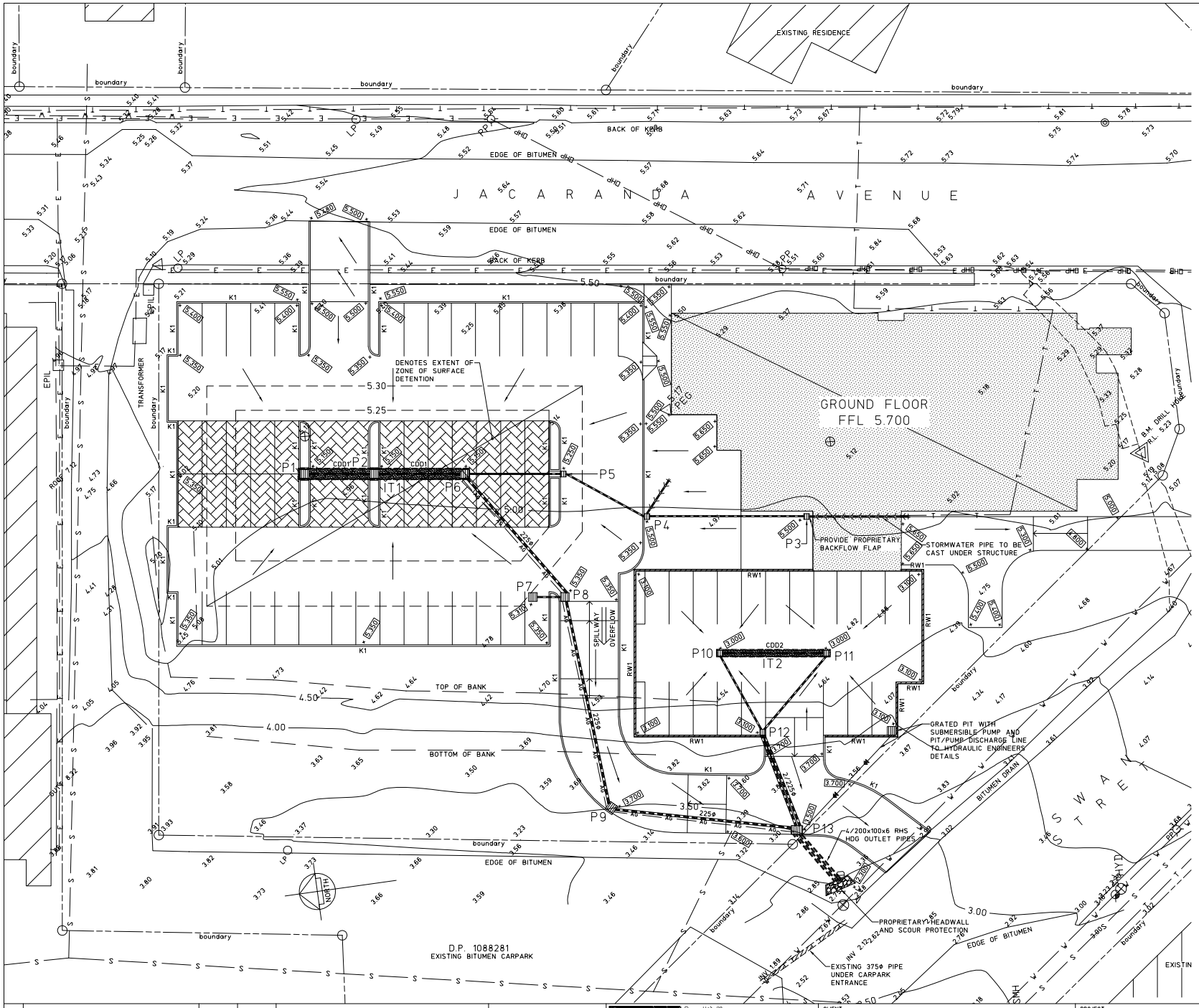
For a 1 in 100 year storm event, it is intended to provide 63m^3 of storage in an aboveground surface detention system with an outflow control chamber utilising multiple orifice plate chokes. Firstly orifice plates for 1 in 5yr choke discharging at 14l/s. The volume of 36m^3 is achieved at approximately RL5.28. Secondly for 1 in 20 year choke additional orifice control pit and plates will be provided at higher level discharging a total of 22l/s. The volume of 51m^3 is achieved at approximately RL5.31. For the 1 in 50year storm no additional chokes are required. The 1 in 100year volume will be fully detailed and discharge through a final choke at 43l/s with a blocked system spillway discharging water off the site.(refer details).

Detention tank surface area details are detailed on the stormwater plans with the 1 in 100yr water level being achieved at approximately RL5.33 AHD. Additional surface detention volume has been detailed by MPC up to an RL of 5.35.

Appendix C

Stormwater Management Plan

(Refer to full size drawings for clarity)



STORMWATER PLAN

SCALE 1:200

STORMWATER NOTES

1. ALL WORKS TO BE IN ACCORDANCE WITH AS3500.3.
2. ALL PIPES TO HAVE A 1% MINIMUM FALL U.N.O.
3. ALL DOWN PIPES (DP) TO BE SPECIFIED BY ARCHITECT. FOR EXACT LOCATION OF DOWN PIPES, REFER TO ARCHITECTURAL DRAWINGS.
4. ALL PIPES TO BE UPVC U.N.O
5. ALL UPVC PIPES TO BE SEWER GRADE AND TO AS1260.
6. ALL REINFORCED CONCRETE PIPES (RCP) TO BE SPIGOT AND SOCKET TYPE WITH RUBBER RINGS CLASS 2 TO AS4058.
7. PITS TO BE CI&D REINFORCED PRE-CAST CONCRETE PITS OR EQUIVALENT PROPRIETARY PITS.
8. ALL LIDS AND GRATES TO BE HEAVY DUTY IN AREAS OF VEHICULAR TRAFFIC, LIGHT DUTY ELSEWHERE, CI&D EQUIVALENT.
9. MINIMUM COVER TO STORMWATER PIPES TO BE AS FOLLOW U.N.O: TRAFFICABLE AREAS - 450mm, LANDSCAPED AREAS - 300mm. PIPES TO BE CONCRETE ENCASED IF MINIMUM COVERS CANNOT BE OBTAINED IN TRAFFICABLE AREAS, REFER TO CLAUSE 3.8 AS3500.3. ALTERNATIVELY USE UPVC SEWER GRADE PIPES UNDER ROAD AND BUILDINGS.
10. PROVIDE 100Φ AG DRAINS IN FILTER SOCKS TO ALL LANDSCAPED AREAS AND PLANTER BEDS. ALL AG DRAINS TO BE BEDDED IN COARSE AGGREGATE AND TO BE CONNECTED TO STORMWATER SYSTEM.
11. ALL PITS, DETENTION TANKS AND PROPRIETARY POLLUTION CONTROL DEVICES TO BE CLEANED OF SEDIMENT AT 3 MONTH MAXIMUM INTERVALS.
12. ALL EXISTING SERVICES TO BE LOCATED PRIOR TO COMMENCEMENT OF WORK.
13. ANY FOOTPATHS, KERB AND GUTTER OR ROADWAY DISTURBED BY WORKS TO BE REINSTATED TO CURRENT COUNCIL REQUIREMENTS.

LEGEND

- DENOTES 150Φ PIPE U.N.O
- DENOTES CHARGED STORMWATER DOWNPIPE CONNECTION TO HYDRAULIC ENGINEERS DETAILS
- 4.00 — DENOTES EXISTING CONTOUR
- 3.63 — DENOTES EXISTING LEVELS
- 5.350 — DENOTES DESIGN SPOT LEVELS
- DENOTES DIRECTION OF SURFACE FLOWS
- 'IT' — DENOTES INFILTRATION TRENCH WITH 150Φ SLOTTED PIPE IT1 - 1000 WIDE x 800 DEEP IT2 - 600 WIDE x 600 DEEP, REFER TO DETAILS
- 'CDD' — DENOTES CONCRETE DISH DRAIN, CDD1 - 900 WIDE x 200 MIN DEEP CDD2 - 600 WIDE x 200 MIN DEEP REFER TO DETAILS
- DENOTES PERMEABLE PAVING TO ARCH DETAILS
- K1 — DENOTES 150 HIGH KERB
- RW1 — DENOTES RETAINING WALL TO FUTURE DETAIL
- AG — DENOTES 100Φ AG DRAIN IN FILTER SOCK

PIT SCHEDULE

PIT No.	SIZE	TYPE	SURFACE LEVEL S.L.	INVERT LEVEL I.L.
P1	900x900	GRATED PIT	5.150	4.400
P2	900x900	GRATED PIT	5.150	4.300
P3	600x600	GRATED PIT	5.500	4.900
P4	600x600	GRATED PIT	5.500	4.800
P5	600x600	GRATED PIT	5.250	4.400
P6	900x900	GRATED PIT	5.150	4.200
P7	900x900	GRATED PIT	5.310	4.200
P8	900x900	GRATED PIT	5.350	4.000
P9	900x900	GRATED PIT	3.700	2.700
P10	600x600	GRATED PIT	3.000	2.600
P11	600x600	GRATED PIT	3.000	2.600
P12	600x600	GRATED PIT	3.100	2.550
P13	1200x900	GRATED PIT	3.500	'PIPE IL' - 2.450

NOTE
PITS 6, 7 AND 8 ARE ORIFICE CONTROL PITS, REFER TO DRAWING C04 FOR DETAILS

NOTE
ALL DOWNPIPES TO CONNECT TO STORMWATER SYSTEM TYPICAL

NOTE
PIT 13 IS THE SEDIMENT CONTROL PIT, REFER TO DRAWING C04 FOR DETAILS

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ISSUE	REASON FOR ISSUE	SIGN & DATE DESIGN REVIEW	SIGN & DATE VERIFICATION
1	D.A. APPROVAL	21.3.11	
0	PRELIMINARY COORDINATION	10.3.11	

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CLIENT
HUNTER NEW ENGLAND LOCAL HEALTH NETWORK

TITLE
STORMWATER PLAN

PROJECT
PROPOSED RAYMOND TERRACE HEALTHONE AT;
JACARANDA AVENUE,
RAYMOND TERRACE

DO NOT SCALE DRAWING

DRAWN	ENGINEER	No in SET	SHEET
L.S.	D.P.	4	A1
SCALES	JOB No	DRG No	ISSUE
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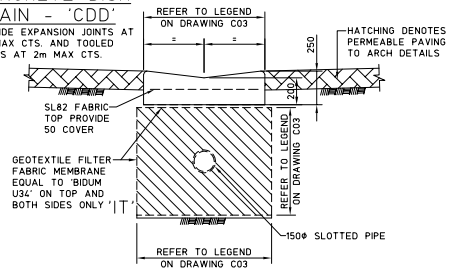
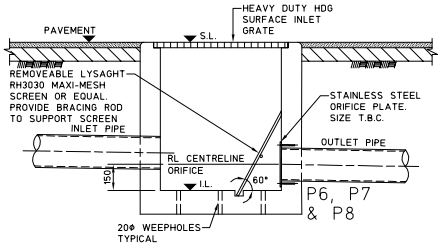
CONCRETE DISH DRAIN - 'CDD'

PROVIDE EXPANSION JOINTS AT 6m MAX CTS. AND TOOLED JOINTS AT 2m MAX CTS.



TYPICAL INFILTRATION TRENCH DETAIL

SCALE 1:20



TYPICAL ORIFICE CONTROL PIT

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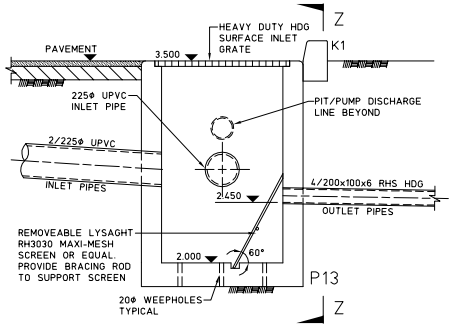

SEDIMENT CONTROL PIT

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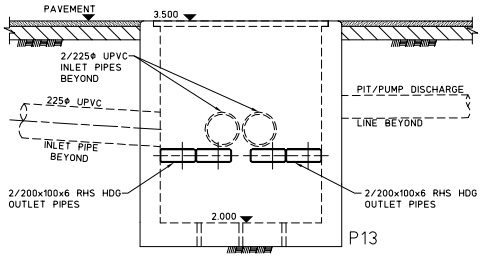

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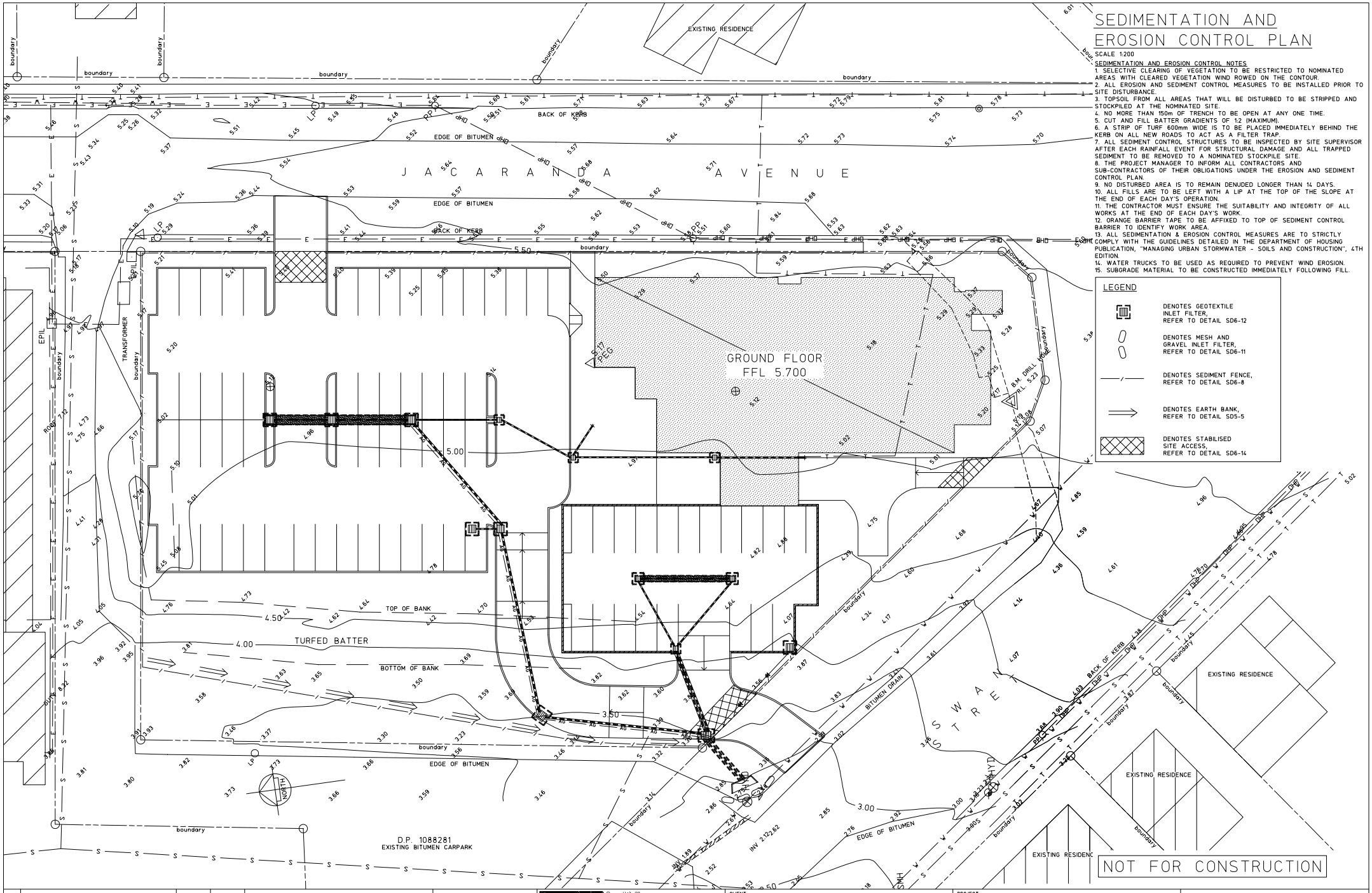
FULL SIZE ON ORIGINAL 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 cm

Appendix D

Erosion and Sediment Control

(Refer to full size drawings for clarity)



SEDIMENTATION AND EROSION CONTROL PLAN

SCALE 1:200

SEDIMENTATION AND EROSION CONTROL NOTES

1. SELECTIVE CLEARING OF VEGETATION TO BE RESTRICTED TO NOMINATED AREAS WITH CLEARED VEGETATION WIND ROWED ON THE CONTOUR.
2. ALL EROSION AND SEDIMENT CONTROL MEASURES TO BE INSTALLED PRIOR TO SITE DISTURBANCE.
3. TOPSOIL FROM ALL AREAS THAT WILL BE DISTURBED TO BE STRIPPED AND STOCKPILED AT THE NOMINATED SITE.
4. NO MORE THAN 150m OF TRENCH TO BE OPEN AT ANY ONE TIME.
5. CUT AND FILL BATTER GRADIENTS OF 1:2 (MAXIMUM).
6. A STRIP OF TURF 600mm WIDE IS TO BE PLACED IMMEDIATELY BEHIND THE KERB ON ALL NEW ROADS TO ACT AS A FILTER TRAP.
7. ALL SEDIMENT CONTROL STRUCTURES TO BE INSPECTED BY SITE SUPERVISOR AFTER EACH RAINFALL EVENT FOR STRUCTURAL DAMAGE AND ALL TRAPPED SEDIMENT TO BE REMOVED TO A NOMINATED STOCKPILE SITE.
8. THE PROJECT MANAGER TO INFORM ALL CONTRACTORS AND SUB-CONTRACTORS OF THEIR OBLIGATIONS UNDER THE EROSION AND SEDIMENT CONTROL PLAN.
9. NO DISTURBED AREA IS TO REMAIN DENUDED LONGER THAN 14 DAYS.
10. ALL FILLS ARE TO BE LEFT WITH A LIP AT THE TOP OF THE SLOPE AT THE END OF EACH DAY'S OPERATION.
11. THE CONTRACTOR MUST ENSURE THE SUITABILITY AND INTEGRITY OF ALL WORKS AT THE END OF EACH DAY'S WORK.
12. ORANGE BARRIER TAPE TO BE AFFIXED TO TOP OF SEDIMENT CONTROL BARRIER TO IDENTIFY WORK AREA.
13. ALL SEDIMENTATION & EROSION CONTROL MEASURES ARE TO STRICTLY COMPLY WITH THE GUIDELINES DETAILED IN THE DEPARTMENT OF HOUSING PUBLICATION, "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION", 4TH EDITION.
14. WATER TRUCKS TO BE USED AS REQUIRED TO PREVENT WIND EROSION.
15. SUBGRADE MATERIAL TO BE CONSTRUCTED IMMEDIATELY FOLLOWING FILL.

LEGEND

- DENOTES GEOTEXTILE INLET FILTER, REFER TO DETAIL SD6-12
- DENOTES MESH AND GRAVEL INLET FILTER, REFER TO DETAIL SD6-11
- DENOTES SEDIMENT FENCE, REFER TO DETAIL SD6-8
- DENOTES EARTH BANK, REFER TO DETAIL SD5-5
- DENOTES STABILISED SITE ACCESS, REFER TO DETAIL SD6-14

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TITLE: SEDIMENTATION AND EROSION CONTROL PLAN

PROJECT: PROPOSED RAYMOND TERRACE HEALTHONE AT; JACARANDA AVENUE, RAYMOND TERRACE

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L.S.	D.P.	4	A1
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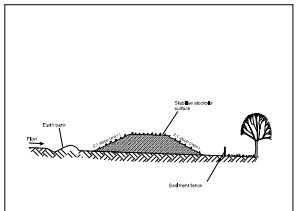
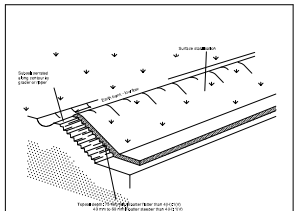


Construction Notes

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, or 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 6-4) 1 to 2 metres downslope.

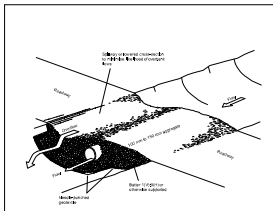
STOCKPILES SD 4-1



Construction Notes

1. Scarify the ground surface along the line of the contour to a depth of 50 mm to 100 mm to break up any hardwearing surfaces and so provide a good bond between the respread material and subsoil.
2. Add soil ameliorants as required by the ESCP or SWMP.
3. Rip to a depth of 300 mm if compacted layers occur.
4. Where possible, replace topsoil to a depth of 40 to 60 mm on lands where the slope exceeds 4(H):1(V) and to at least 75 mm on lower gradients.

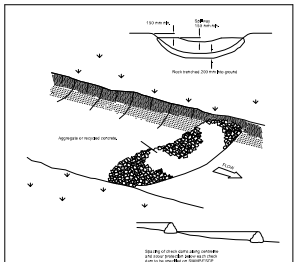
REPLACING TOPSOIL SD 4-2



Construction Notes

1. Prohibit all traffic until the access way is constructed.
2. Strip any topsoil and place a needle-punched geotile over the base of the crossing.
3. Place clean, rigid, non polluting aggregate or gravel in the 100 mm to 150 mm size class over the fabric to a minimum depth of 200 mm.
4. Provide a 3-metre wide cartageway, with sufficient length of culvert pipe to allow less than a 3(H):1 (V) slope on side batters.
5. Install a lower section so as as an emergency spillway, in greater than
6. Ensure that culvert outlets extend beyond the toe of fill embankments.

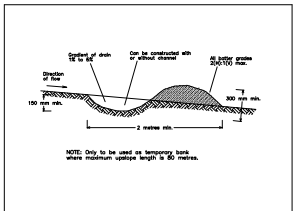
TEMPORARY WATERWAY CROSSING SD 5-1



Construction Notes

1. Check dams can be built with various materials, including rocks, logs, sandbags and sinter bales. The maintenance program should ensure their longevity is retained, especially where constructed with sinter bales. In the case of bales, this might require their replacement each two or 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.

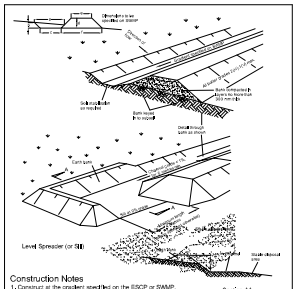
ROCK CHECK DAM SD 5-4



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 (refer to Table 5-2 in Landcom (2004)).

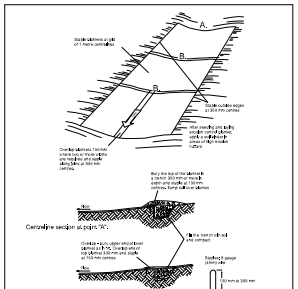
EARTH BANK (LOW FLOW) SD 5-5



Construction Notes

1. Construct as 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, as 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 as 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.

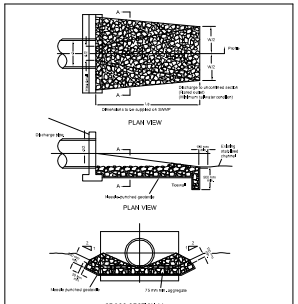
EARTH BANK (HIGH FLOWS) SD 5-6



Construction Notes

1. Remove any rocks, clods, sticks or grass from the surface before laying matting.
2. Ensure that topsoil is at least 75 mm deep.
3. Complete fertilising and seeding before laying the matting.
4. Ensure fabric will be continuously in contact with the soil by grading the surface carefully first.
5. Lay the fabric in "shingle-position", with the end of each upstream roll overlapping those downstream. Ensure each roll is anchored properly at its upslope end.
6. Ensure that the full width of the thalweg is covered by the matting up to the design storm event, usually to the 10-year ARI flow of concentration storm event.
7. Divert water from the subsoil until vegetation is established properly.

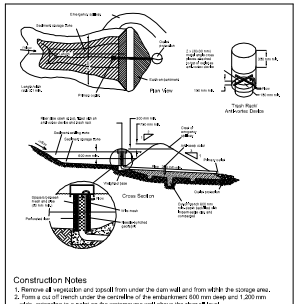
RECP : CONCENTRATED FLOW SD 5-7



Construction Notes

1. Compact the subgrade fill to the density of the surrounding undisturbed material.
2. Prepare a smooth, even foundation for the structure that will ensure that the needle-punched geotextile does not sustain serious damage when covered with rock.
3. Should any minor damage to the geotextile occur, repair it before spreading any aggregate. For repairs, patch one piece of fabric over the damage, making sure that all sides and patches overlap more than 300 mm.
4. Lay rock following the drawing, according to Table 5.2 of Landcom (2004) and with a minimum diameter of 75 mm.
5. Ensure that any concrete or dpmap used for the energy dissipater or the outlet protection conforms to the grading limits specified on the SWMP.

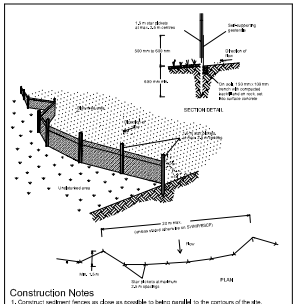
ENERGY DISSIPATER SD 5-8



Construction Notes

1. Remove all vegetation and topsoil from under the dam wall and from within the storage area.
2. Form a cut-off trench under the centreline of the embankment 600 mm deep and 1,200 mm wide, expanding to a point on the watercourse wall above the riser crest level.
3. Impregate the trench free of water and recompact the material with equipment as specified in the SWMP to 98 per cent Standard Proctor Density.
4. Select fill according to the SWMP (e.g. be free from rocks, wood, rock, large stone or foreign material.
5. Prepare the site under the embankment by ripping to at least 100 mm or to help bond the compacted fill to the existing subgrade.
6. Spread the fill in 100 mm to 150 mm layers and compact it at optimum moisture content following the SWMP.
7. Install the pipe outlet with seepage collars as specified in the SWMP and Standard Drawing 6-3b.
8. Form batter grades at 2(H):1(V) upstream and 3(H):1(V) downstream or as specified in the SWMP

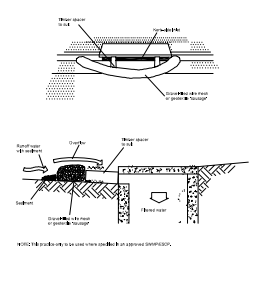
EARTH BASIN - DRY
(APPLIES TO TYPE C SOILS ONLY) SD 6-3



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 so that water flow if concentrated as one point is 50 l/sec per second in the design storm event, usually the 10-year event.
2. Dig 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.

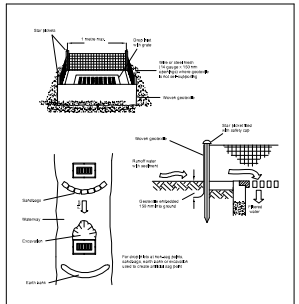
SEDIMENT FENCE SD 6-8



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 (at least 100 with 25 mm or 50 mm gravel.
3. Form an elliptical cross-section about 150 mm high x 400 mm wide.
4. Place the filter so the opening leading 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.

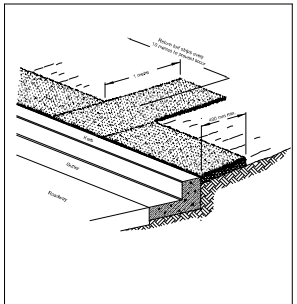
MESH AND GRAVEL INLET FILTER SD 6-11



Construction Notes

1. Fabricate a sediment barrier made from geotextile or sinter bales.
2. Follow Standard Drawing 6-5 for installation procedures for the sinter bales or geotextile. Reduce the pickets 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.

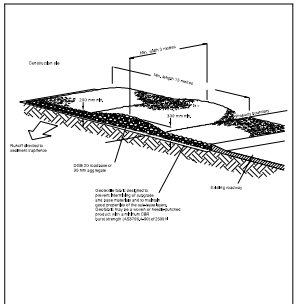
GEOTEXTILE INLET FILTER SD 6-12



Construction Notes

1. Install a 400 mm minimum wide roll of turf on the footpath next to the kerb and at the same level as the top of the kerb.
2. Lay 1-4 metre long turf strips normal to the kerb every 10 metres.
3. Rehabilitate disturbed soil behind the turf strip following the ESCP/SWMP.

KERBSIDE TURF STRIP SD 6-13



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 as 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

SEDIMENTATION AND EROSION CONTROL DETAILS

NOT FOR CONSTRUCTION

ISSUE	REASON FOR ISSUE	SIGN & DATE DESIGN REVIEW	SIGN & DATE VERIFICATION	DATE OF RELEASE	RESPONSIBLE PRINCIPAL SIGNATURE	ISSUE
0	D.A. APPROVAL	21.3.11				

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CLIENT
HUNTER NEW ENGLAND LOCAL HEALTH NETWORK

TITLE
SEDIMENTATION AND EROSION CONTROL DETAILS

PROJECT
PROPOSED RAYMOND TERRACE HEALTHONE AT; JACARANDA AVENUE, RAYMOND TERRACE

DO NOT SCALE DRAWING

DRAWN	ENGINEER	No in SET	SHEET
L.S.	D.P.	4	A1
SCALES	JOB No	DRG No	ISSUE
N.T.S.	11-179	C02	0

FULL SIZE ON ORIGINAL 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 cm