Vegetation Management Plan

AVON ROAD, PYMBLE
10-028S

Avon, Beechworth and Arilla Roads, Pymble

17 NOVEMBER 2010

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Purpose of the Report

This report is composed of the Vegetation Management Plan (VMP) prepared by Urban and Rural Design dated November 2009 and explanatory diagrams prepared by Taylor Brammer Landscape Architects Pty Ltd. This report is compiled in response to the request by NSW Planning to provide additional explanatory diagrams related to proposed works described in the Vegetation Management Plan prepared by Urban and Rural Design dated November 2009.

APPENDICES

A **VMP by Urban and Rural Design, Dated November 2009**

B **Typical Detail Plan - 20metre Drainage Line within site**
C **Typical Detail Plan - General Open Space**

APPENDIX A

Vegetation Management Plan prepared by Urban and Rural Design, Dated November 2009

(Continued on following page)

VEGETATION MANAGEMENT PLAN

FOR

Mr J Neale

FOR THE PROPOSED RESIDENTIAL DEVELOPMENT OF 1 AVON ROAD PYMBLE

URBAN & RURAL DESIGN
NOVEMBER 2009

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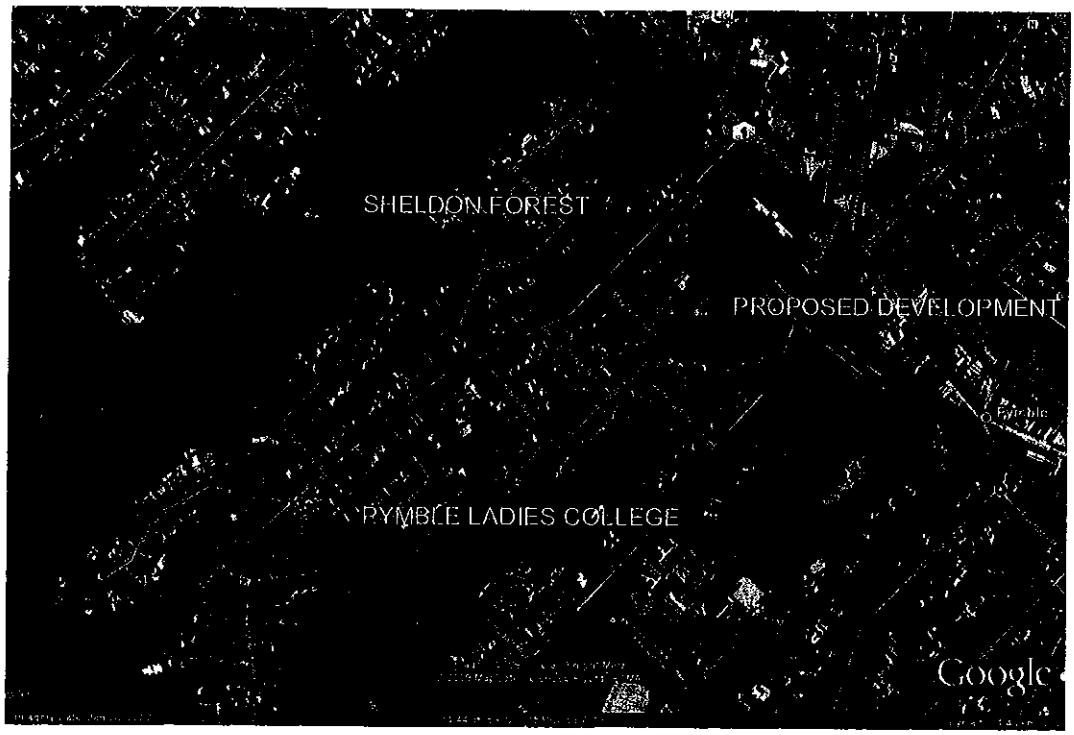
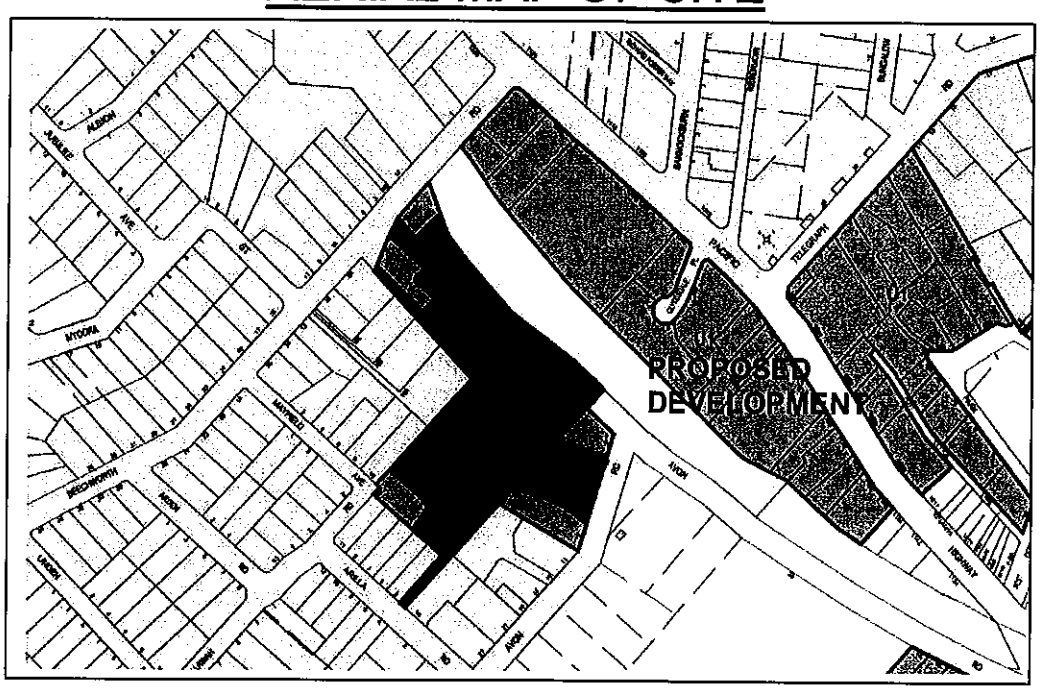


AERIAL MAP OF SITE



SITE BOUNDARIES

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1. INTRODUCTION & BACKGROUND

Mr Jim Neale engaged Urban & Rural Design to undertake a Vegetation Management Plan (VMP) for the proposed residential development for 1, 1a & 5 Avon Road, 1 Arilla Road and 4 & 8 Beechworth Road, within the Ku-ring-gai Local Government area. The property will be hereafter referred to as the subject site (Appendix B).

The subject site is irregular in shape and totals an area of 24,941m2. It is situated on the west of the North Shore railway line and bounded by Avon Road, Arilla Road and Beechworth Road. The land falls moderately away from the railway line and slopes inward from west and east down to an open drainage line that discharges into the Lane Cove River via Rofe Park.

The site was originally cleared for agricultural purposes in the early 1800's and later developed as a housing estate in the 1930's. The site currently is occupied by a number of existing residential dwellings and a tennis court. The landscape is dominated by weeds species concentrated around the open drainage line.

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2. REPORTS ON THE SITE

Recommendations contained in the following reports will be addressed in the VMP.

Bushfire Hazard Assessment Report prepared by Building Code & Bushfire Hazard Solutions Pty Limited in November 2009.

Flora and Fauna Assessment was performed by Aquila Ecological Surveys in June 2009.

Arboricultural Assessment Report prepared by Urban Tree Management April 2002.

3. THE PROPOSAL

It is proposed to create a multi-level residential development with subterranean parking, reestablishing amenity by creating a 'designed park'. The reinstatement of the vegetation association of this area will enhance the buildings whilst providing areas for community open space, and active and passive recreation areas. A pedestrian link between Avon and Beechworth Roads and internal pedestrian walkways will allow the site to be utilized to its full potential. The proposal will involve the demolition of existing buildings and excavation for underground carparks.

The buildings have been designed to respond to the undulating the topography. The proposed development will be arranged in a stepped terrace arrangement in sympathy with the natural ground lines to reduce the visual impact and mass of

the development. Rooftop gardens and courtyards will be incorporated for both private & communal uses. This will enhance the visual amenity from above apartments & balconies overlooking the lower levels of the site.

The following Acts, policy planning, draft LEP and guidelines were considered as part of this proposal:

- The proposal is a Project Application under part 3A of the EPA Act.
- The site is currently identified under schedule 4 of State Environmental Planning Policy 53 (SEPP 53).
- The site has been included in Draft Ku-ring-gai Council LEP Town Centres (2008)
- Ku-ring-gai Council guidelines for Riparian Policy 2004

The initial DA will be a section of the site identified in the landscape plan titled DA Concept Landscape Plan Building 1. The area for DA Building 1 has major excavations to attain the required building envelope and driveway. Four existing trees would be retained – see landscape plan. This will allow for ease of weed removal by machine. Primary and secondary weeding will not be required, however, it will be necessary to comply with the following parts in Section 11:

d. installation of erosion & sediment controls

e. installation of barrier fencing & tree protection barriers

f. fuel management plan within the APZ

h. planting methodology

i. maintenance

Areas from the design intent applicable will be A,B,C,D,E & G.

This VMP is applicable to the entire site or separate zones as per section 8 Management Zones as Defined by VMP and DA Concept Landscape Plan Building 1.0

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4. DESIGN INTENT

The site although highly degraded and largely infested with weeds is occupied by remnant Blue Gum High Forest and a drainage corridor. Through clearing the site of weed species and re-establishing the Blue Gum High Forest and drainage line through riparian species it is possible to create a park-like landscape with the generous ratio of deep soil to open space of 67%.

This park-like landscape increases the amenity to not only the residents of the development but the surrounding neighbourhood. Pedestrians are able to access the site via paths and boardwalks which meander throughout the site along contours without changing the natural topography and eliminating the need for cut and fill. The access to the site from Avon and Beechworth Roads will be from internal roadways and associated paths.

The stepped terrace arrangement of the multi-level residential development will reduce the visual impact of the development further aided by the rooftop gardens and surrounding landscape. The re-establishment of the Blue Gum High Forest and drainage line will enhance and protect flora and fauna survival and diversity through the creation of another vegetation corridor within the Pymble area. The re-establishment of the drainage line through riparian plant species will protect the drainage line banks,improve water quality and increase the amenity of the site.

Another key aspect of the development is the bushfire management strategy. The landscape design has been prepared in accordance with the recommendations made by the Bushfire Consultant in relation to vegetation groupings and proximity to building structures. Fuel management details are contained in section 11f of this report.

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The design is to provide a:

A. 'park-like landscape' using the vegetation association relating to this area and soil types found in all areas except to the front of buildings. This is to link the streetscape and adjacent internal spaces, and to keep the expected characteristics of the Pymble area intact. There will be an increase in planting of the related vegetation association and this community will be used as a "compensatory offset" for the plants that will be removed for the development proposal. These plantings are in keeping with Bushfire guidelines.

B. connection and circulation:

- between the buildings and community spaces,
- between the buildings and open space to the west by a bridge,
- throughout the site by paths and boardwalks,
- to the internal road system

C. Platforms for sitting and viewing. These platforms will be placed on slopes, eliminating the necessity for cut/fill on the landscape, therefore reducing the impact on the existing landscape. The platforms will also provide community open space with privacy screening to make the areas more intimate. Communal sitting spaces have been designed adjacent to buildings.

D. Views within the site, to the south and from the buildings have been considered in the design.

E. Indigenous species selection provides for lower maintenance due to preferred soil types on site, decreased need to fertilise (which reduces the nutrient load into the catchment), increased revegetation possibilities

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with less water requirements than exotics and increased regeneration possibilities over time.

F. Retention of deep soil zones within the development (see plan #1). This is for the promotion of existing and proposed trees health and longevity, allowing infiltration of rainwater and reduction of storm water runoff. Areas over basement car parks have not been included in calculations as per Residential Flat Building Code. However, there will be plantings of trees in these areas.

G. Roof top gardens and courtyards are an integral part of the architecture, yet also part of the landscape .The availability of these areas within easy access to the living spaces will allow the residents to enjoy the outdoors with indigenous plants as a feature. (see plant list #9c) Plant species chosen for this application have been considered in the recommendations made in the bushfire assessment report. Both in-situ and mobile planter boxes are to be used for planting scheme to maximize amenity considering seasonal aspect limitations.

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5. LITERATURE REVIEWS

Consideration has been given to:

1. Recovering Bushland on the Cumberland Plain: Best practice guidelines for the management & restoration of bushland, (2005a), Department of Environment & Conservation (NSW)
2. Flora and Fauna Report, (2009), Aquila Ecological Surveys
3. Arborists Report, (2009), Urban Tree Management
4. Bushfire Hazard Assessment Report, (2009), Building Code & Bushfire Hazard Solutions P/L
5. Ku-ring-gai Council Major Project Proposal,8/2/09,ref 2008/051360
6. SEPP53 sites , Development Control & Design Guidelines (2003)
7. Director General Report,23/4/09,MP08-0207
8. Ku-ring-gai Council Riparian Guidelines (2004)
9. NSW Scientific Committee, (2007b), Blue Gum High Forest in Sydney basis Bioregion – critically endangered ecological community listing
10. McDonald T, Wale K, Bear V, (2002), Restoring Blue Gum High Forest: Lessons from Sheldon Forest, Ecological Management & Restoration, p315-26
11. Information in support of the inclusion of a site in schedule 4 of SEPP 53, (2002), Chris Young Planning

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6. AIMS OF VEGETATION MANAGEMENT PLAN

There has been consideration given to the above literature that relate to the site . A balance needs to be sought to allow appropriate development of the site while allowing for revegetation and maintaining the natural characteristics of the site. The vegetation management plan should be reviewed after two years. The monitoring and reporting of the works will give information as to the effectiveness of management practices and allow for changes to be made to the existing VMP. **(It must be noted this VMP is not a working plan and only describes aims and objectives)**

The flora and fauna report states "under the TSC Act (Threatened Species Act), the subject stand of Sydney blue gums and associated Eucalypts at the subject site qualifies as Blue Gum High Forest despite the remnant being unlikely to be viable in the long term".

The recommendations are :

i. **Bushfire mitigation measures**; A balance is sought between the creation of the required Asset Protection Zones (APZ) and the retention of BGHF trees and inclusion of a drainage corridor within the site. The required APZ's are that the whole site is to be managed in accordance with Appendix 5 of Planning for Bushfire Protection 2006 and Standards for Asset Protection Zones.(taken from Bushfire report)

ii. **maintain or improve biodiversity values;** achieved through the revegetation of species selected from the vegetation association with

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Eucalyptus saligna, Syncarpia glomulifera, Eucalyptus pilularis & Angophora costata.

iii. **conserve biological diversity and promote ecologically sustainable development;** will be maintained and improved by species selected from vegetation association with Eucalyptus saligna, Syncarpia glomulifera, Eucalyptus pilularis & Angophora costata .

iv. **protect areas of high conservation value**; due to the degraded nature of species, reestablishment will protect the long term viability of flora & fauna.

v. **prevent the extinction of threatened species;** reestablishment of species selected from vegetation association with Eucalyptus saligna, Syncarpia glomulifera, Eucalyptus pilularis & Angophora costata will improve habitat for Grey Headed Flying Fox.

vi. **protect the long term viability of local populations of a species population or ecological community;** reestablishment of species selected from vegetation association with Eucalyptus saligna, Syncarpia glomulifera, Eucalyptus pilularis & Angophora costata.

vii. **protect aspects of the environment that are matters of national environmental significance;**

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Grey Headed Flying Fox is listed as threatened species under Environment Protection & Biodiversity Conservation Act. There will be no negative impact on the species and in fact with increased planting the habitat will be improved.

viii. **retention of deep soil areas** (plan #2); The area of deep soil as a percentage of open space is 67%. This is for the promotion of existing and proposed trees health and longevity, allowing infiltration of rainwater and reduction of storm water runoff., also improving the water quality .
Guidelines i-vii taken from 'fFora and Fauna assessment' ,using these points to ensure environmental outcomes are delivered

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The current condition of the site

The site has a number of existing dwellings and a disused tennis court with some low retaining walls. There is a high density of weed infestation over the whole site.

The dwellings have landscaped areas and lawns with introduced plants, for example, citrus & conifers. These areas are degraded due to the weed invasion.

A full description can be found in the Flora and Fauna Report by Aquila Ecological Surveys.

A description of trees on the site, to be retained and removed, can be found in the report by Urban Tree Management.

The site has no identified 'creek' on the Lands Department topographical map provided by Mr Jim Neale (Appendix I) by the Department of Lands. There is no "creek" shown on the Hornsby Topographical Map provided by bushfire consultant Wayne Tucker. For the purposes of this report the drainage line on the survey will not be named as riparian.

The drainage line will have removal of weed infestation & bank stability measures and reinstatement of vegetation association related the soil types in this area as a high priority. The guidelines of Ku-ring-gai Council Riparian Zones 2004 are therefore relevant.

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Target conditions will form the AIM of this report. The aim of this plan is to maintain and improve the existing indigenous vegetation by implementing strategies described in the report, and reviewing their success over time by monitoring and reviewing processes. In addition, the restoration through revegetation will need to consider the impact of bushfire threats in relation to the proposed development.

The approach to restoration will be 'revegetation' based on the following observations:

a. area is highly degraded due to past and present land uses
b. severe weed densities cover the site
c. no evidence that indigenous plant species are regenerating on site
d. midstratum and groundcovers are absent
e. high level of intervention required.

Revegetation can restore many ecosystem functions and maintain hydrological processes, for example, habitat and resources for animals. No earthworks other than for areas within building envelopes would be necessary to achieve this revegetation process –as shown on plan "deep soil/trees to be removed /retained " for the extent of earthworks.

Natural regeneration processes will be encouraged when weed species are removed and revegetation planting has been completed, with seed dispersal occurring over time. The maintenance program is crucial to the success of regeneration processes. Natural landscape resources will be kept as best as able.

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7. OBJECTIVES OF VEGETATION MANAGEMENT PLAN

a. **MANAGEMENT OF WEEDS:** to remove the existing exotic vegetation and weeds (Appendices C,D,E) over the whole site, and replace with vegetation association from plant lists detailed in section 9A & 9B.

Performance criteria: decrease percentage of weed density in 12 months following primary & secondary weeding using techniques covered in section 10.

b. **ESTABLISHMENT OF APZ:**

As per recommendation made on page 1 in the Bushfire Hazard Assessment dated 2nd November 2009, the entire site will be treated as an APZ. Asset protection recommendations from page 3 of the assessment states:

- Do not use ground covers or combustible mulch in the planting adjacent any structure,
- Do not plant a shrub garden against low level glazing on any structure,
- Prune trees to not overhang within 2 – 5 metres (vertically or horizontally) of any structure,
- Concentrate clusters of shrub planting within the Blue Gum High Forest garden or drainage corridor aiming to achieve a 20 % cover over the entire APZ,
- Retain and plant trees as necessary to include interlocking tree canopies within the Blue Gum High Forest,

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- Garden or drainage corridor between. Crown lift trees as necessary to separate crown and shrub layers by at least 2 metres and ensure that a vertical clearance of 4 metres is provided from any access drive,
- Separate tree crowns achieving a break of at least 2 – 5 metres at locations within the Asset Protection Zone to ensure there is no continuous interconnection from the structure through to the Blue Gum High Forest garden or drainage corridor.

As detailed within the Rural Fires Act - 1997 it is "the duty of the owner or occupier of land to take the notified steps (if any) and any other practicable steps to prevent the occurrence of bushfires on, and to minimise the danger of the spread of bush fires on or from" any land vested in or under its control or management. It is important to note that this site has neighbouring assets (occupied dwellings) and any planting must be done so as not to add to or increase the bushfire threat to the existing neighbouring properties.

The grounds should be managed on a routine basis. Particular attention to pruning, crown lifting and removal of dead fuels is made prior to the commencement of the bushfire danger period (1st October to 31st March) and at least once during the bushfire danger period.

Yearly Schedule

Time	Elevated Fuels	Surface Fuels
August	YES	YES
November		YES
February		YES

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All clearing is to be undertaken by hand and/or mechanical means. The use of hand held machine tools is acceptable including chainsaws. Mulching should be undertaken well before the summer months however mulch should not be applied to any garden adjacent any building, as these will be stone, crushed porcelain or similar non combustible material. Raking up of fine ground fuels is also acceptable as a general method of vegetation removal however any large quantities of collected vegetation should be manually moved away from any buildings and not allowed to stockpile. (Building Code & Bushfire Hazard Solutions, 2 Nov 2009)

Performance criteria: monitor & decrease fuel loads & continue maintenance of APZ to guidelines outlined in section 11f

c. RETAIN AND RESTORE INDIGENOUS VEGETATION

Restore species from vegetation association of Eucalyptus saligna, Syncarpia glomulifera, Eucalyptus pilularis & Angophora costata within APZ guidelines. This will provide "compensatory offsets" for trees being removed from the proposed development. Total number is 150.

Retain and protect existing trees and other significant plants observed after weed removal. Trees to be retained or removed are detailed in plan #2.

Performance criteria increase in cover of indigenous vegetation by 'revegatation'. Natural regeneration of plant species will occur in future.

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d. DRAINAGE LINE

The 20m width drainage line provides the benefits to:

- limit drainage line bank & bed erosion
- trap sediment, nutrients and other contaminants that may enter the drainage line.
- provide a healthy habitat for terrestrial & aquatic species
- help control the growth of weedy plants and algae
- enhance recreational & aesthetic values

Performance criteria: retain a percentage of species planted to increase water quality, health and density of indigenous species, bank stability.

e. TO ESTABLISH THE SITE AS A VEGETATION CORRIDOR OR BIO-LINK

Vegetation association would enhance biodiversity and protect the long-term viability of the local populations of species in the Pymble area. Two areas to be considered for this corridor is Sheldon Forest, located to the northwest and PLC to the northeast (Appendix A). Further, the Eucalyptus community will reduce the visual impact of the development and increase the amenity for the residents of the proposed development & surrounding homes.

Restoration will enhance the fauna habitat and vegetation corridor by reinstatement of absent layers in strata. See Vegetation Association section10.

Performance criteria: maintenance and reporting on plant health to increase fauna habitat and fauna population.

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f. STABILISE SOIL IN IDENTIFIED AND AREAS WHERE TOPOGRAPHY WARRANTS SLOPES > 1:4

Identified areas can be determined after weed removal & site topography has been assessed. Indigenous plants will improve water quality and assist in absorption of runoff and reduce the incidence of erosion through planting densities. Soil stability can be achieved by erosion and sediment control measures (section 11d) as well as planting.

Performance criteria: monitor measures in place, monitor maintenance of plants to ensure soil stability is maintained and erosion decreased.

g. TO LIMIT IMPACTS OF SIGNIFICANT FLORA & FAUNA SPECIES DURING AND AFTER CONSTRUCTION

The vegetation at the site does not qualify as the critically endangered ecological community Blue Gum High Forest, however, protection measures need to be put in place for species nominated to be retained as per arborists report and Landscape Plan #2.

Performance criteria: increase in habitat types and niches available for fauna. A sign of a projects success is for the increase of native wildlife which is monitored over time. The increase in diversity of plant species & stratum.

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8. MANAGEMENT ZONES AS DEFINED BY VMP

The site could be managed as a whole or separated into the following zones. These zones could be managed separately according to budgeted costs and according to area to be developed. Each of the zones could be made into smaller areas using a grid system whilst still using section 11, Management of Avon Road site for the carrying out of tasks. The size of the grid will be dependent on the budget available.

A. "drainage line" as denoted by survey - with 20 metres width as stated in Ku-ring-gai Councils Riparian Guidelines 2004 (landscape plan#1)
B. Vegetation association species zones (landscape plan#1 including "compensatory offsets")
C. Trees to be removed/retained (plan #2)
D. Weed infestation /exotic plantings (entire site)
E. Areas between /around the buildings (see landscape plan#1)
F. It does not include storm water management

9. SITE IDENTIFICATION

a. PHYSICAL GEOGRAPHY

The site slopes inward from the west & east flanks down to a central drainage corridor which runs downslope from the railway line in the north in a southerly direction. The drainage line discharges into the Lane Cove Rivers some 2.7 kilometres south of the site.

The Flora & Fauna Survey quote Chapman & Murphy which indicates that the soils in the upper edge of the site are of the West Pennant Hills soil landscape, while those downslope are of the Glenorie soil landscape. On

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upper slopes of the site, both soil landscapes are characterized by red and brown podsolic soils, the underlying geology being Ashfield Shale of the Wianamatta Group

b. CLIMATE

The annual mean rainfall is 1137.9mm. February is the wettest month with a mean rainfall at 142.1mm and July is the driest month with a mean rainfall at 51.7mm.

January is the hottest month with a mean daily temperature of 27.7℃ and the coldest being July with a mean daily temperature of 4.9℃. (Bureau of Meteorology, Macquarie Park)

c. TOPOGRAPHY & CATCHMENT

The land falls moderately away from the railway line and slopes inward from west and east down to an open drainage line that discharges in the Lane Cove River via Sheldon & Rofe Park.

The site has no identified 'creek' on the Lands Department topographical map 1:25000 For the purposes of this report the drainage line on the survey will not be named as riparian.

The rail corridor is at the head of the catchment area. The functionality of this corridor as it is at the "head" of the catchment is reduced.

Due to the drainage line's positioning in the catchment the width of 20 metres total will be taken from Ku-ring-gai Council's Riparian Guidelines (2004). Ku-ring-gai Council's Draft Ku-ring-gai Local Environmental Plan

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(Town Centres) 2008 identifies the site as containing a Category 3 which is described in Riparian Policy 2004.

Category 3 is described as the creek which:

> *"would provide limited habitat value but provide an important contribution to the overall health of the catchment.*
>
> *Typically these would be narrow zones along highly modified streams that may have no indigenous vegetation. These streams would be difficult, and in some cases not possible, to rehabilitate to a natural state. However, these areas will still contribute significantly to downstream water quality maintenance, and if piped or lined with concrete, would cause increased flooding and erosion potential.*

Planting will be from vegetation association list 9b within the drainage line detailed on landscape plan#2.

d. FLORA & FAUNA REPORT RESULTS

The Flora & Fauna Survey conducted a literature review which mapped the site as a combination of Sydney-Turpentine Ironbark Forest and Blue Gum High Forest. However, from the remnant vegetation on the site is Blue Gum High Forest and would have been pre-existing vegetation.

Thus the tree species that will be used to revegetate the site will be a combination of the trees found in Blue Gum High Forest & Sydney-Turpentine Ironbark Forest: Eucalyptus saligna, Eucalyptus pilularis, Syncarpia glomulifera & Angophora costata.

The site is void of indigenous understorey which has been replaced by exotic weed species. This clearing, landscaping and subsequent weed invasion has badly degraded the pre-existing understorey vegetation and resulted in heavy growth of weed species such as: Morning Glory, Lantana, Wandering Jew, Blackberry, Japanese Honeysuckle and Small & Large Leaf Privet.

The report concludes that "the stand of existing Sydney Blue Gums and associated Eucalypts does not qualify as the critically endangered ecological community Blue Gum High Forest (under the Environment Protection and Biodiversity Conservation Act 1999)

Under the Threatened Species Conservation Act "The subject stand of Sydney Blue Gums and associated Eucalypts at the subject site qualifies as Blue Gum High Forest despite the remnant being unlikely to be viable in the long term"

Further, the report concluded that no threatened flora species were found on the site during the survey. Of the species that are listed as endangered it is considered that none is likely to persist in the soil seedbank due to the site's long history of disturbance and weed invasion.

e. BUSHFIRE REPORT RESULTS

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A balance is sought between the creation of the required Asset Protection Zones (APZ) and the retention of BGHF trees and inclusion of a drainage corridor within the site. The required APZ's are that the whole site is to be managed in accordance with Appendix 5 of Planning for Bushfire Protection 2006 and Standards for Asset Protection Zones.

Appendix 5 of Planning for Bushfire Protection 2006 stipulates:

"In terms of priorities of addressing bush fire attack, priority should be given to preventing flame impingement by not allowing fine debris to accumulate close to the building. Secondly, removal of understorey fuels aids in the reduction of flame heights and likely at. Removal of loose bark and fine fuels reduces both heat output and ember generation, ***while the retention of taller trees with canopies will also assist in filtering out embers."***

To maintain a garden that does not contribute to the spread of bush fires, it is necessary to plan the layout of the garden beds and take an active decision to minimise certain features in favour of other features. These should include:

- maintaining a clear area of low cut lawn or pavement adjacent to the house,note landscape plan gravel around building envelopes
- keeping areas under fences, fence posts and gates and trees raked and cleared of fuel,
- utilising non-combustible fencing and retaining walls,
- breaking up the canopy of trees and shrubs with defined garden beds,

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• organic mulch should not be used in bush fire prone areas and non flammable material should be used as ground cover, eg Scoria, pebbles, recycled crushed bricks,

• planting trees and shrubs such that:

- the branches will not overhang the roof,
- the tree canopy is not continuous and
- there is a windbreak in the direction from which fires are likely to approach.

f. ARBORIST REPORT

The report details each tree assessed and considers there Safe Useful Life Expectancy (SULE), significance, retention policy and age class to determine if they are to be removed or retained, however it does not take into consideration proposed building envelope. The VMP addresses the trees to be remove/retained (plan#2) which details recommendations from the report, but also makes recommendations when considering building envelopes.

g. SURROUNDING LANDSCAPE

The site is bounded by residential houses and to the north bounded by the railway line. The aims and objectives of the VMP will enhance the boundaries for the existing residential dwellings by increased privacy with boundary screen plantings. Open space will be increased by reducing

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weed infestations. The reinstatement of Blue Gum High Forest will improve the amenity of the whole site.

10. VEGETATION ASSOCIATION

The species selected for revegetation of this site have been chosen from canopy, understorey and groundcovers that are typical of this area and soil type.

They comprise the following canopy:
Eucalyptus saligna, Syncarpia glomulifera, Eucalyptus pilularis & Angophora costata

The landscape plan has set out groups and individual trees, the following lists & densities are to be used. The percentage of plantings for:

a. **TREES**: 60% Eucalyptus saligus, 10% Angophora costata, 10% Syncarpia glomulifera & 20% Eucalyptus pilularus
b. **SHRUBS:** less than 20 % of open space area as per bushfire guidelines – see landscape plan for shrub siting.
c. **GROUNDCOVERS:** Plant at 4/m2

The **natural drainage area** as per landscape plan; trees as shown, grid of 20m x 5m (100m²) and plant 400 groundcovers and 37 shrubs.

Proposed trees on landscape plan, single planting except where denoted by T1-T20 which denotes planting 5 trees per symbol.

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PLANTING LISTS

A. GENERAL OPEN SPACE

Calochlaena dubia
Cissus hypoglauca
Clerodendrum tomentosum
Eucalyptus globiodea
Hydrocotyle laxiflora
Notelea longifolia longifolia
Oplismenus imbecilis
Entolasia stricta
Glycine clandestine
Persoonia linearis
Poa affinis
Leucopogon juniperus

B. WITHIN 20 METRES DRAINAGE LINE AREA

These plants are more suitable for slopes where moisture is more prevalent around the edges and bottom of slopes or in cultivated areas where moisture is more readily available.

Acmena smithii
Allocasuarina torulosa
Asplenium flabellifolium
Blechnum cartilagineum
Doodia aspera
Eucalytpus pilularis
Eustrephus latifolius

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Glochidion fernandi var fernandi

Lomandra longifolia

Maytenus silvestris

Pandorea pandorana

Pittosporum revolutum

Polyscias sambucifolia subsp

Pseueranthemum variabilis

Adiantum aethiopicum

Alphitonia excelsa

Backhousia myrtiflolia

Breynia oblongifolia

Carex maculata

Clematis aristata

Dianella cearulea

Elaeocarpus reticulates

Eucalyptus paniculata

Eucalyptus saligna

Ficus coronata

Marsdenia rostrata

Morinda jasminoides

Pratia purpurascens

Smilax australis

Tylophora barbata

Rapanea variabilis

Smilax glyciphylla

Viola hederacea

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C. **ROOF TOP GARDENS AND COURTYARDS**
(decorative gravel as mulch)

Glochidion fernandi
Persoonia linearis
Backhousia myrtifolia
Dianella caerulea
Elaeocarpus reticularis
Pandorea pandorana
Maytenus silvestrus
Polyscias sambucifolia
Viola hederacea
Carex maculate
Asplenium flabellifolium

11. MANAGEMENT OF AVON ROAD SITE

The Gantt Chart in Appendix H schedules the following procedures in a weekly and/or monthly occurrence.

a. Weed distribution and eradication methods

Before any building works commence weed eradication would need to be commenced. It should be noted that before the larger weed trees are removed that large screening trees be planted, to assist in the screening of the boundaries of the site for neighbour privacy. The time frame for complete eradication would be lengthy, considering the size of the site.

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Partial eradication of invasive species could realistically be achieved in the short term.

Weed distribution mapping would be necessary to identify the areas under threat. A site visit found it extremely difficult to transverse the site for identification purposes. Some weed eradication measure would be required in the first instance to make pedestrian pathways through the site, and to allow a full mapping to be achieved. Slashing or mowing could be used as an interim measure for access and to reduce biomass.

Any identification would be done by using Ku-ring-gai Council's weed lists:

I. Noxious Weed Act (1993) amended in 2006 with control classes applicable. (Appendix C)
II. Nuisance plants (Appendix D)
III. Urban environmental weeds (Appendix E)

Bush regenerators or someone skilled in weed/indigenous plant identification would be the key to success to this task.

Weed mapping techniques is a simple system that can be used for weed density - this allows for better management of the weeds. A percentage of the area by visual assessment can be done as an interim measure. Applying a grid system is one way of achieving this task (using the survey). Contractors with knowledge in bush revegetation techniques would be required to remove unwanted weeds and plant proposed indigenous species.

The areas of worst condition and areas of high priority would be targeted first. For example, the drainage line running through the centre of the

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property is heavily infested. It is important to clear this area first, so that any water running through this area does not have weed seeds going further into the catchment.

b. Primary weeding

Integrated weed management

This system incorporates many weeding techniques and allows for flexibility depending on the weed type and distance from indigenous species. A time frame is required to achieve the tasks depending on seasonal conditions.

The correct identification of the weed is essential as is its growth stage, density and distribution.

- remove weeds as specified on Council weeds list (Appendices C,D,E). The size of areas to be addressed will depend on resources, by using appropriate techniques depending on weed species.

- spraying / paint of Roundup Bioactive ® or cut & paint to noxious weeds including woody on eroded banks OR handweeding. This is done where there is risk to adjacent indigenous vegetation, generally best after rain for easier removal.

- The Blackberry can be poisoned using Brushoff if there is no water movement. Best results are obtained by spraying during flowering to fruiting stage, December to April when plants are most active. Avoid spraying in drought & cooler months of the year. Repeat treatments will

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be required. If there is water movement Blackberry will need to be removed mechanically.

- Leave site dormant for approximately 2 weeks for the herbicide to work. Some areas may require a repeat application of herbicide.

- As the drainage line feeds into Lane Cove River, any weed biomass requires immediate removal due to slopes and high probability of transport of weed seed via drainage line in the event of rain.

- Management of edges: slashing is a technique used for edge management to maintain a buffer zone.

- Mechanical weeding: where no desirable vegetation remains and the weed percentage cover is dominant, removing by machinery is cost effective and has the effect of removing weed seed banks by 'scalping' the top 10 centimetres of soil. This method can be used for the stands of Bamboo.

Erosion can then become a problem, so forethought is required to quickly deal with these areas so weeds don't grow back and erosion occurs. Fast growing species could be used to colonise quickly then further planting of shrubs and trees.

c. Secondary weeding

- To be done 3-6 months after primary weeding, depending on the amount of re-growth. The site will need to be inspected on a monthly basis and is at the discretion of the contractor whether secondary weeding is required

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within the time frame indicated above. Seasonal factors will have an impact on the extent of vigour of weeds.

- Hand removal of any weeds where necessary. Spraying of diluted herbicide, Roundup Bioactive ® to regrowth of exotic weeds where necessary.

- The section that has been previously regenerated will need hand removal weeds.

d. Installation of erosion & sediment controls

Before any weed eradication measures are commenced erosion and sediment controls would need to be in place.

These can consist of haybales (Appendix G) pegged into place on the downward slope and along the channel, coir logs, erosion & sediment fencing (Appendix F) and/or erosion matting on slopes of 1:2.

In addition, before any building works are commenced erosion and sediment control fences would need to be in place to protect the channel area in particular.

e. Installation of barrier fencing & tree protection barriers

i. **Barrier fencing** is to be installed by planting contractor to the perimeter of the drainage line planting to exclude pedestrian access until plant establishment has concluded. Barrier fencing will not be required throughout the site for species selected from vegetation

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association with Eucalyptus saligna, Syncarpia glomulifera, Eucalyptus pilularis and Angophora costata revegetation as dedicated paths will allow pedestrian access.

ii. **Tree protection barriers**. A qualified arborist is necessary for the determination of the extent and the establishment of the tree protection barriers. "The protection of trees to be retained subject to construction is not contained in the initial report as setbacks and protection measures would be determined at the design stage for buildings and infrastructure. Such work should be undertaken by a Consulting Arboriculturist with membership of IACA Institute of Australian Consulting Arboriculturists www.iaca.org.au. The methodology applied at this time for trees to be retained and protected would be contained in an Arboricultural Impact Assessment (AIA) report with measures adopted from the soon to be released Australian Standard AS4970 Protection of Trees on Development Sites." (Letter from Danny Drape of Urban Tree Management dated 12/5/09)

f. Fuel Management Plan within the APZ

As per recommendations made in the Bushfire Hazard Assessment, the entire site will be treated as an APZ as noted on survey. This requires that there be a 2-5m vertical and horizontal clearance from any tree limb to the proposed buildings. The existing and proposed shrubs do not exceed 20% of the site and no shrubs are to be located against the proposed dwellings. Interlocking tree crowns are permitted in the site.

In response to the recommendations made in the Bushfire Hazard Assessment, bushfire fuels are managed by the following procedures:

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i. raking or manual removal of fine fuels such as leaves, twigs (less than 6mm in diameter). Bark should be removed on a regular basis.

ii. maintain shrubs as clumps or islands and maintain a covering of no more than 20% of the area outside the drainage line zone.

iii. remove noxious and environmental weeds that may quickly spread in the landscape.

iv. prune low branches 2-5m from ground to prevent a ground fire from spreading into trees.

g. Fauna habitat and management

With reference to the Assessment matrix on page 11 of the Flora and Fauna report, the Grey Headed Flying Fox, East Coast Freetail Bat, Common Bent Wing Bat and Powerful Owl species are identified as threatened.

- Trees with hollows and dead trees to be retained, this will only be able to be done when weed infestation is removed for visual assessment,
- Neglible loss of foraging trees, site represents small potential habitat,
- All species are wide ranging and highly mobile,
- Nesting boxes could be sited to assist in return of wildlife using appropriate sizes for selected target species .Planting around the remnants will act as a buffer –this can be seen in the landscape plan. Connecting remnants will increase habitat value,

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h. Planting methodology

i. soil preparation for planting

- If the importation of soil is required it must be first tested and certified by NATA registered soils laboratory to be;
    I. Similar to the naturally occurring local soil
    II. Suitable for the establishment and ongoing viability of drainage line vegetation
    III. Free of any weed propagules and
    IV. Free of any contaminants

- Documentation arising form this testing and certification must be provided to Department of Water & Energy prior to the placement of any soil.

- Soil is not to be proof rolled or subjected to other unsuitable compaction

- NOTE: Basic soil analysis measuring pH, salinity and air field porosity can be performed on site. However, for greater accuracy thorough laboratory analysis is recommended.

Refer to vegetation association details in section 9 for combination of plants used and their densities.

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ii. Plant installation

- Water seedlings the day before
- Dig holes twice the size of tube
- Install tree guards to tree tubes.
- Install mulch, taking account of APZ and bushfire issues
- Refer maintenance section for details on plant establishment

NOTE:

- Surface stabilization –groundcovers
- For planting on banks with a gradient greater than 1:2-use erosion control matting/pegged and plant through by scoring hole with Stanley knife and planting tube stock Use water holding granules in soil mix –use existing site soil if possible .
- Bushfire requirements-roof gardens and courtyards-to have decorative gravel as mulch
- No combustible mulch within APZ. Suggest using decorative gravels.

i. Maintenance

The purpose is to present a 12 month maintenance strategy for the site to address issues such as watering, mulching, weeding, plant staking, fertilising, pest and disease control, replanting, remedial pruning & regular site inspections.

WATERING: During the plant establishment period it is necessary to water plants daily for the first week of installation. Depending on the season of installation it may be necessary to continue watering during the hot dry summer season. However, it is necessary to water at least weekly for 6

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weeks upon installation. Depending on environmental conditions it may be necessary to water during prolonged periods of dry weather.

MULCHING: No combustible mulch to be used within the APZ as indicated in section 9e.

WEEDING: Weeding should be performed on a weekly basis for the first 3 months to eliminate competition with new plants. Further weeding should be performed at least monthly to prevent weeds from overrunning garden beds and setting seed. (See weeding methods)

PLANT STAKING: Plants that are staked should be checked monthly to affirm that the devices are not strangling the plant. They may need to be adjusted according to their growth patterns. Plant stakes need to be maintained for at least 12 months. Each plant needs to be assessed at the end of this period to determine whether they can be removed or remain.

FERTILISING: The plant species chosen and garden bed preparation should eliminate the need for fertilising. Care should be taken always when choosing a fertiliser that it is suitable for use on Australian indigenous.

PEST & DISEASE CONTROL: Monitoring the health of the plants should be done on a weekly basis. It is particularly important during the plant establishment periods to consult a horticulturist if a number of plants are affected by pests or diseases to recommend the appropriate course of action.

REPLANTING: It will be at the discretion of the designer to recommend the replacement of plants if a number of them have died or are of poor health.

REMEDIAL PRUNING: Pruning may be necessary to maintain growth habit or contain growth within garden beds. Limbs on trees 2-5m above ground need to be removed to comply with recommendations detailed in Asset Protection Zone (APZ) above. Further, any limbs overhanging the building will need to be removed also.

j. Monitoring

Changes need to be observed by keeping records before, during and after the proposed works. Keeping comprehensive records provides information on the effectiveness of management practices, allowing managers to determine if the natural vegetation is improving or declining as per the performance criteria detailed in section (DECC2005b). A grid method can be used for each of the monitoring sections.

Monitoring includes:

i. photographs of stages: the photographs should be taken at the same location. This can be assisted by using posts on the corners of grids.
ii. density for weeds: this will provide a quantitative assessment, using the grid method. The size of the grid can be determined after weed removal and site topography can be assessed.

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iii. indigenous vegetation mapping: the proposed revegetated areas and if further regeneration has occurred mapping will provide history to the site.

iv. documentation and reporting: document actions taken, this will allow analysis for ascertaining the effectiveness of the objectives set out in the VMP.

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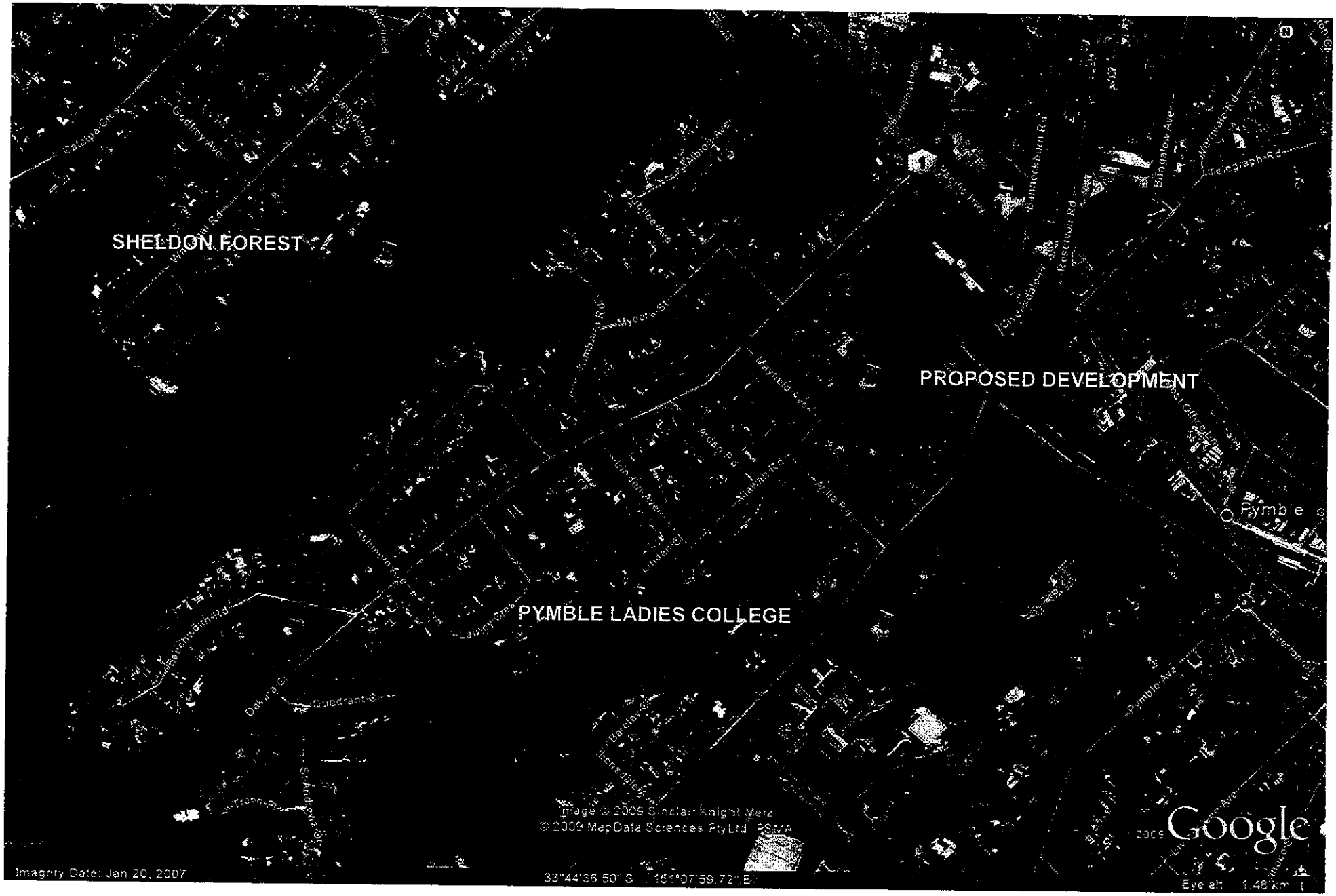
SHELDON FOREST
PROPOSED DEVELOPMENT
PYMBLE LADIES COLLEGE
Pymble
Image © 2009 DigitalGlobe
© 2009 MapData Sciences Pty Ltd PSMA
Imagery Date: Jan 20, 2007
33°44'36.60" S 151°07'59.72" E
Eye alt 1.48 km
Google

Appendix A


PROPOSED DEVELOPMENT
JUBILEE AVE
ALBION
MYOORA
BEECHWORTH
ARDEN
LINDEN
AVE
ST
RD
MAYFIELD
ARILLA
ALLAWAH
AVON
BANNOCKBURN
RICHARD PORTER WAY
RESERVOIR
BUNGALOW
TELEGRAPH
PACIFIC
CLOVERDALE
PARK
HIGHWAY
OFFICE

Appendix B

APPENDIX C

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5. Noxious Weeds - Declared List

Natural Environment

Noxious Weeds - Declared List

Declared under the Noxious Weeds Act (1993)
No 11, March 2006 and Order 20, August 2006.

Weed Information Sheets

Council has prepared information sheets containing images and control guidelines, for weeds in control classes 3 and 4. These may be viewed online or downloaded by clicking on the relevant weed in the Common Name column, below.

Copies of these sheets may also be obtained in person from Customer Services, 818 Pacific Highway, Gordon, or phone 9424 0951 to request that they be mailed to you.

Common Name	Scientific Name	Control Class
African feathergrass	*Pennisetum macrourum*	5
African turnipweed	*Sisymbrium runcinatum*	5
African turnipweed	*Sisymbrium thellungii*	5
Alligator weed - Alligator weed. (PDF 4.39MB)	*Alternanthera philoxeroides*	3
Anchored water hyacinth	*Eichhornia azurea*	1
Annual ragweed	*Ambrosia artemisiifolia*	5
Arrowhead	*Sagittaria montevidensis*	5
Artichoke thistle	*Cynara cardunculus*	5
Asparagus fern - Asparagus fern (PDF 1.24MB)	*Asparagus aethiopicus*	4
Asthma weed - Asthma weed (PDF 382KB)	*Parietaria judaica*	4
Athel tree	*Tamarix aphylla*	5
Balloon vine - Balloon Vine (PDF 467KB)	*Cardiospermum grandiflorum*	4
Bamboo - Bamboo (PDF.570KB)	*Phyllostachys* species	4
Bear-skin fescue	*Festuca gautieri*	5
Bitou bush - Bitou bush (PDF 353KB)	*Chrysanthemoides monilifera* subspecies *rotunda*	3
Black knapweed	*Centaurea nigra*	1
Blackberry - Blackberry (PDF 638KB) except cultivars Black satin, Chehalem, Chester Thornless, Dirksen Thornless, Loch Ness, Murrindindi, Silvan, Smoothstem, Thornfree	*Rubus fruticosus* aggregate species	4
Boneseed - Boneseed (PDF 590KB)	*Chrysanthemoides monilifera* subspecies *monilifera*	3
Bridal creeper - Bridal Creeper (PDF 690KB)	*Asparagus asparagoides*	4
Broomrapes Includes all Orobanche species except the native O. cernua variety australiana and O. minor	*Orobanche* species	1
Burr ragweed	*Ambrosia confertiflora*	5
Cabomba	*Cabomba caroliniana*	5
Camphor laurel - Camphor laurel (PDF 425KB)	*Cinnamomum camphora*	4
Cape broom - Cape broom (PDF 590KB)	*Genista monspessulana*	3
Cape ivy - Cape ivy.pdf (441KB)	*Delairea odorata*	4

Castor oil plant - Castor oil plant (PDF 419KB)	*Ricinus communis*	4
Cats claw creeper - Cats_claw_creeper (PDF 424KB)	*Macfadyena unguis-cati*	4
Cayenne snakeweed	*Stachytarpheta cayennensis*	5
Chilean needle grass - Chilean_needle_grass (PDF 590KB)	*Nassella neesiana*	4
Chinese violet	*Asystasia gangetica* subspecies micrantha	1
Climbing asparagus fern - Climbing_Asparagus fern (PDF 1.19MB)	*Asparagus plumosus*	4
Clockweed	*Gaura lindheimeri*	5
Clockweed	*Gaura parviflora*	5
Corn sowthistle	*Sonchus arvensis*	5
Dodder Includes All Cuscuta species except the native species C. australis, C. tasmanica and C. victoriana	*Cuscuta* species	5
East Indian hygrophila	*Hygrophila polysperma*	1
Elephant grass Giant reed - Giant_Reed (PDF 469KB)	*Arundo donax*	3
English broom - Scotch_Broom (PDF 838KB)	*Cytisus scoparius*	4
Espartillo	*Achnatherum brachychaetum*	5
Eurasian water milfoil	*Myriophyllum spicatum*	1
Fine-bristled burr grass	*Cenchrus brownii*	5
Fountain grass	*Pennisetum setaceum*	5
Gallon's curse	*Cenchrus biflorus*	5
Giant reed - Giant_Reed (PDF 469KB)	*Arundo donax*	4
Glaucous starthistle	*Carthamus glaucus*	5
Golden thistle	*Scolymus hispanicus*	5
Green cestrum - Green_cestrum. (PDF 1.18MB)	*Cestrum parqui*	3
Harrisia cactus - Harrisia (PDF 467KB)	*Harrisia* species	4
Hawkweed	*Hieracium species*	1
Horsetail	*Equisetum species*	1
Hygrophila	*Hygrophila costata*	2

Hymenachne	*Hymenachne amplexicaulis*	1
Karoo thorn	*Acacia karoo*	1
Kochia except Bassia scoparia subspecies trichophylla	*Bassia scoparia*	1
Lagarosiphon	*Lagarosiphon major*	1
Lantana - Lantana (PDF 3.01MB) Lantana species 4	*Lantana* species	4
Long-leaf willow primrose - Ludwigia long (PDF 788KB)	*Ludwigia longifolia*	3
Ludwigia - Ludwigia peru (PDF 330KB)	*Ludwigia peruviana*	3
Madeira vine - Madeira (PDF 1.08MB)	*Anredera cordifolia*	4
Mexican feather grass	*Nassella tenuissima*	1
Mexican poppy	*Argemone mexicana*	5
Miconia	*Miconia* species	1
Mimosa	*Mimosa pigra*	1
Morning glory (coastal) - Morning Glory coastal (PDF 317KB)	*Ipomoea cairica*	4
Morning glory (purple) - Morning Glory purple (PDF 1.06MB)	*Ipomoea indica*	4
Mossman River grass	*Cenchrus echina*	5
Ochna - Ochna (PDF 462KB)	*Ochna serrulata*	4
Onion grass Includes all Romulea species and varieties except R. rosea var. australis	*Romulea* species	5
Oxalis Includes all Oxalis species and varieties except the native species O. chnoodes, O. exilis, O. perennans, O. radicosa, O. rubens, and O. thompsoniae	*Oxalis* species and varieties	5
Pampas grass - Pampas grass (PDF 926KB)	*Cortaderia* species	3
Parthenium weed	*Parthenium hysterophorus*	1
Pellitory Asthma weed - Asthma weed (PDF 382KB)	*Parietaria judaica*	4
Pond apple Annona glabra 1	*Annona glabra*	1
Prickly acacia Acacia nilotica 1	*Acacia nilotica*	1
Prickly pear - Prickly pear (PDF 516KB)	*Cylindropuntia* species	4

Prickly pear except O. ficus-indica	*Opuntia* species	4
Privet (broad leaf) - Privet broad leaf (PDF 376KB)	*Ligustrum lucidum*	4
Privet (narrow leaf) - Privet small leaf (PDF 419KB)	*Ligustrum sinense*	4
Red rice	*Oryza rufipogon*	5
Rhizomatous bamboo Bamboo - Bamboo (PDF 570KB)	*Phyllostachys* species	4
Rhus - Rhus (PDF 860KB)	*Toxicodendron succedaneum*	4
Rubbervine	*Cryptostegia grandiflora*	1
Sagittaria	*Sagittaria platyphylla*	5
Salvinia	*Salvinia molesta*	2
Sand oat	*Avena strigosa*	5
Scotch broom - Scotch Broom (PDF 838KB)	*Cytisus scoparius*	4
Senegal tea plant	*Gymnocoronis spilanthoides*	1
Serrated tussock - Serrated Tussock (PDF 317KB)	*Nassella trichotoma*	4
Siam weed	*Chromolaena odorata*	1
Smooth-stemmed turnip	*Brassica barrelieri* subspecies *oxyrrhina*	5
Soldier thistle	*Picnomon acarna*	5
Spotted knapweed	*Centaurea maculosa*	1
St. John's wort	*Hypericum perforatum*	4
Texas blueweed	*Helianthus ciliaris*	5
Trad Trad Wandering Jew (408KB)	*Tradescantia fluminensis*	4
Turkey rhubarb - Turkey Rhubarb (PDF 311KB)	Acetosa sagittata	4
Tussock paspalum - Tussock paspalum (PDF 1.05MB)	*Paspalum quadrifarium*	3
Wandering Jew Trad - Trad (PDF 408KB)	*Tradescantia fluminensis*	4
Water caltrop	*Trapa* species	1
Water hyacinth	*Eichhornia crassipes*	2

Water lettuce	*Pistia stratiotes*	1
Water soldier	*Stratiotes aloides*	1
Willows Includes all Salix species except S. babylonica, S. x reichardtii, S. x calodendron	*Salix* species	5
Witchweed Includes all Striga species except native species and Striga parviflora	*Striga* species	1
Yellow burrhead	*Limnocharis flava*	1
Yellow nutgrass	*Cyperus esculentus*	5

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5. Nuisance Plants

Natural Environment

Nuisance Plants

Considered by Council to be pest species in public open space. This list of weeds should be read in conjunction with Noxious Weeds - Declared List and Urban Environmental Weeds.

Common Name	Botanical Name
Agapanthus	*Agapanthus orientalis*
African Lovegrass	*Eragrostis curvula*
Albizia/Crested Wattle	*Paraserianthes lophantha*
Bindii	*Soliva pterosperma*
Black Locust	*Robinia pseudoacacia*
Broom	*Genista* spp. (all cultivars & hybrids)
Capeweed	*Arctotheca calendula*

Catsear	*Hypochaeris radicata*
Chilean Whitlow	*Paronychia brasiliana*
Chickweed	*Stellaria media*
Chinese Pistachio	*Pistacia chinensis*
Chinese Tallow	*Sapium sebiferum*
Clover	*Trifolium* spp.
Common Couch	*Cynodon dactylon*
Coreopsis	*Coreopsis lanceolata*
Cootamundra Wattle	*Acacia baileyana*
Creeping Buttercup	*Ranunculus repens*
Crofton Weed	*Ageratina adenophora*
Crowsfoot/Crab Grass	*Eleusine indica*
Cudweed Gnaphalium spp.	*Gnaphalium* spp.
Dandelion	*Taraxacum officinale*
Date Palm	*Phoenix canariensis*
Dock	*Rumex* spp.
Ecklonia	*Aristea ecklonia*
Ehrharta	*Ehrharta* spp.
Fat Hen	*Chenopodium album*
Fennel	*Foeniculum vulgare*
Fireweed	*Senecio madagascariensis*
Fishbone Fern	*Nephrolepis cordifolia*
Fleabane	*Conyza* spp.
Formosan Lily	*Lilium formosanum*
Ginger Lily	*Hedychium gardneranum*
Golden Robinia	*Robinia pseudoacacia* "Frisia"
Green Amaranth	*Amaranthus viridis*
Hemlock	*Conium maculatum*
Honeysuckle	*Lonicera japonica*
Hydrocotyle	*Hydrocotyle bonariensis*
Illawarra Flame Tree*	*Brachychiton acerifolius*
Impatiens/Busy Lizzie	*Impatiens balsamina*
Inkweed	*Phytolacca octandra*
Isotoma	*Isotoma fluviatillis*
Japanese Knotweed	*Persicaria capitata*
Jasmine	*Jasminum polyanthum*
Kikuyu Grass	*Pennisetum clandestinum*

Liquidambar	*Liquidambar styraciflua*
Medic/Burr	*Medic Medicago* spp.
Mist Flower	*Ageratina riparia*
Monbretia	*Crocosmia x crocosmiiflora*
Moth Vine	*Araujia sericiflora*
Mouse Ear Chickweed Cerastium glomeratum	*Cerastium glomeratum*
Mullumbimby Couch	*Cyperus brevifolius*
Nut Grass	*Cyperus rotundus*
Onion Weed	*Nothoscordum borbonicum*
Paddy's Lucerne	*Sida rhombifolia*
Palm Grass	*Setaria palmifolia*
Paspalum	*Paspalum dilatatum*
Passionfruit	*Passiflora edulis*
Pearlwort	*Sagina procumbens*
Plantain	*Plantago* spp.
Potato Vine	*Solanum jasminoides*
Purple Top	*Verbena bonariensis*
Queensland Silver Wattle	*Acacia podalyriifolia*
Rambutan	*Alectryon tomentosum*
Rice Paper Plant	*Tetrapanax papyriferus*
Sand Rocket	*Diplotaxis tenuifolia*
Scaly Tree Fern	*Cyathea cooperi*
Scurfy Pea Bush	*Psoralea pinnata*
Seaside Daisy	*Erigeron karvinskianus*
Silky Oak	*Grevillea robusta*
Spider Plant	*Chlorophytum comosum*
Summer Grass	*Digitaria ciliaris*
Summer Grass/Crab Grass	*Digitaria sanguinalis*
Vetch	*Vicia* spp.
Virginia Creeper	*Parthenocissus quinquefolia*
Western Australia Bluebell	*Sollya heterophylla*
White Root Lobelia	*Pratia concolor*
Wild Tobacco Tree	*Solanum mauritianum*
Wild Watsonia	*Watsonia meriana* c. Bulbillifera
Yellow Kangaroo Paw	*Anigozanthos flavidus*

APPENDIX E

Toolbar Navigation

- Skip Navigation
- Jobs
- Tenders and EOIs
- Forms
- Community Information Directory
- Contact Us
- A-Z
- Sitemap
- Home

Breadcrumb Navigation

1. Home
2. Natural Environment
3. Native Plants, Trees and Weeds
4. Weeds
5. Urban Environmental Weeds

Natural Environment

Urban Environmental Weeds

Identified by Council as species that constantly cause public and private nuisance in Ku-ring-gai. This list should be read in conjunction with Noxious Weeds - Declared List and Nuisance Plants.

Common Name	Botanical name
African Olive	*Olea europaea* subspecies *africana*
Box Elder	*Acer negundo*
Cassia	*Senna pendula*
Celtis	*Celtis* sp.
Climbing Fig	*Ficus pumila*
Cockspur Coral Tree	*Erythrina crista-galli*
Coral Tree	*Erythrina sykesil*

Cotoneaster	*Cotoneaster* species
Firethorn	*Pyracantha* sp.
Golden Wreath Wattle	*Acacia saligna*
Indian Hawthorn	*Rhaphiolepis indica*
Ivy	*Hedera helix*
Rubber Tree	*Ficus elastica*
Tree of Heaven	*Ailanthus altissima*
Weeping Willow	*Salix babylonica*

Sediment Fencing

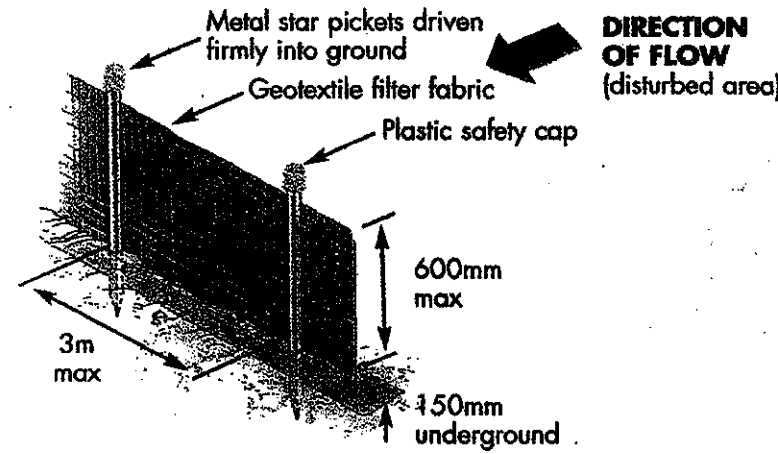
The most efficient and widely accepted sediment barrier for construction sites is a specially manufactured geotextile sediment fence. Sediment fences act like dams - trapping the sediment while allowing water to leave the site. They are effective in retaining suspended solids coarser than 0.02 mm. They are simple to construct, relatively inexpensive and easily moved as development proceeds.

When using a sediment fence, keep in mind that it will be effective within the following parameters:

- It is generally not designed to filter concentrated flows and therefore needs to be placed following the contours whenever possible.
- It should last for up to six months but requires regular maintenance and weekly checks are needed. The performance of a sediment fence diminishes considerably when crushed by delivery of building materials. It must remain vertical and keyed into the soil.
- Where the sediment fence is not installed correctly water will inevitably flow through the point of least resistance. Damaged fences must be repaired promptly.
- Sediment fences need to be trenched in at least 150 mm and buried so the water flows through and not underneath.
- Soil on both sides of the fence must be compacted to avoid seepage under the barrier.

On a typical residential building block (approx. 700sq.m), a sediment fence should work well providing it is situated on the low side of the block. If there needs to be a break in the fence for any reason (say, an access point) a contour bank/diversion bank or bund needs to be constructed to direct water back to the fence. The sediment fence must have uphill returns at either end to prevent sediment flowing around it.

Advantages. It is a simple strategy that is easily installed, shifted or removed. Sediment fences work well and, if maintained, will last for the duration of the construction stage.



Construction Notes

1. Construct sediment fences as close as possible to follow the contours of the site.
2. Drive 1.5 metre long posts into ground, maximum 3 metres apart.
3. Staple to 40 mm square hardwood posts or wire tied to steel posts.
4. Dig a 150 mm deep trench along the up-slope line of the fence for the bottom of the fabric to be entrenched.
5. Backfill trench over base of fabric and compact on both sides.

APPENDIX F

APPENDIX 4

Straw Bale Filter

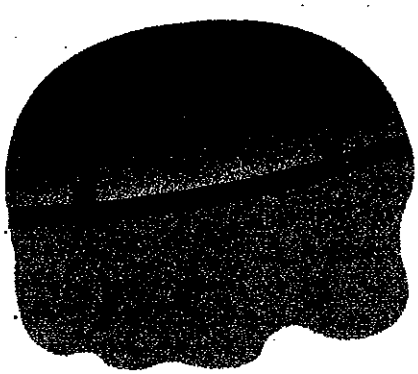
Straw bales are suitable for low flows of water. It is only recommended that these are used in limited applications such as reducing the flow velocity.

The return of straw bales every 20 metres is recommended to ensure some stability for this style of barrier. Please note that they need to be embedded in the ground and held firmly in place with star pickets.

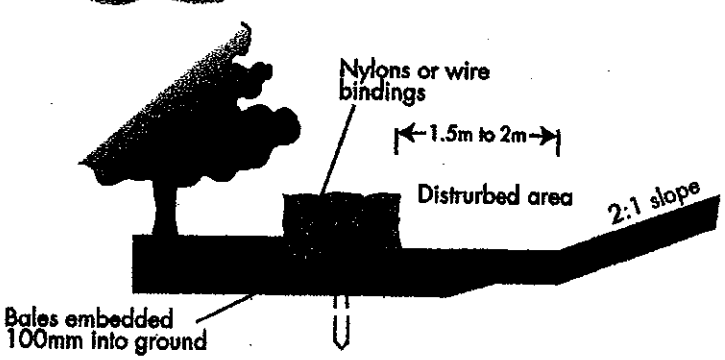
The minimum number of bales to be used is four. If only two bales are used during a storm event, the water will simply hit the bales and flow around, increasing erosion. The bales must dam the run off and allow the sediment to settle behind the bales.

Please note straw bales do not filter sediment-laden waters. They will only hold back water if installed correctly.

Plan



Section



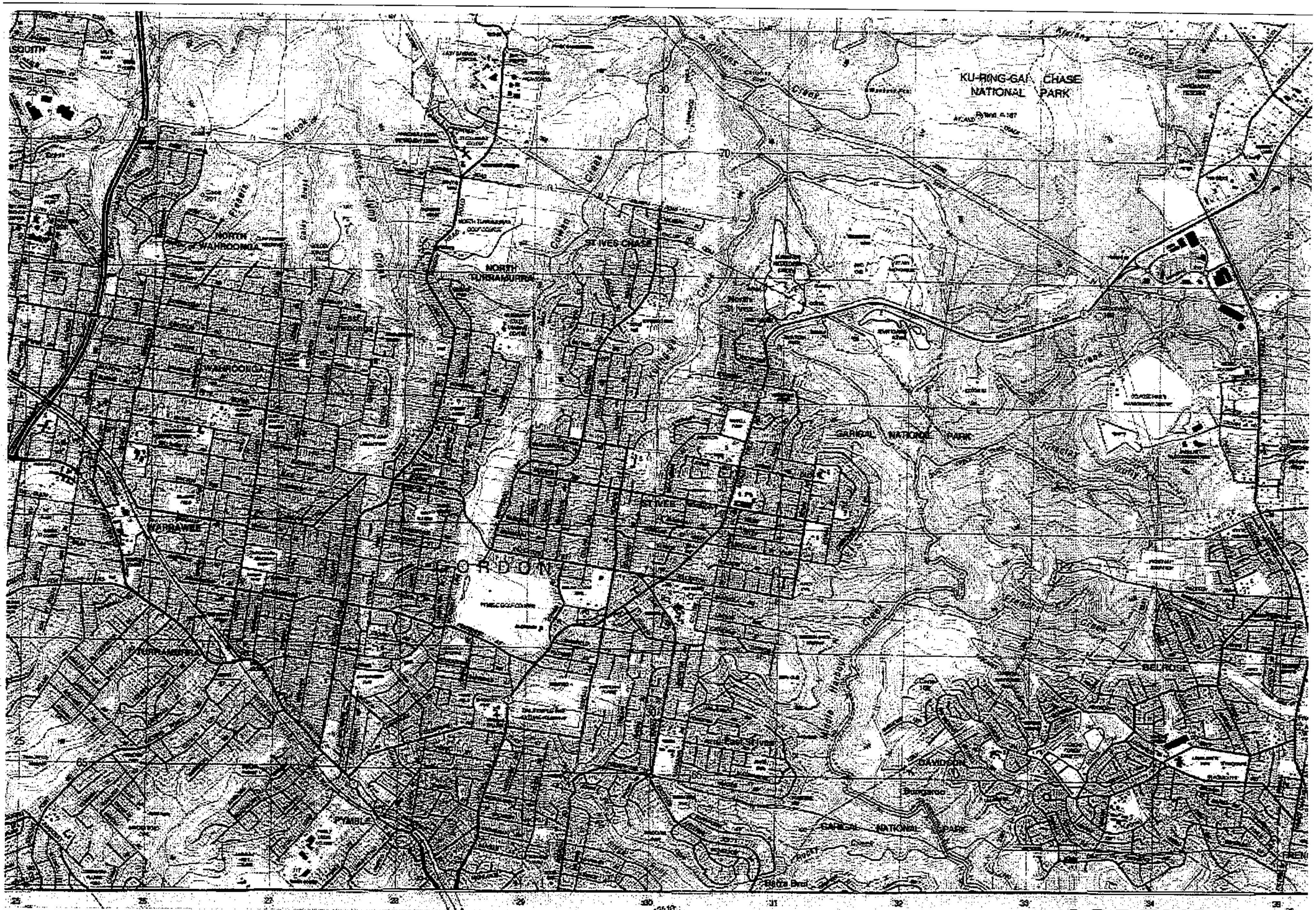
A - GANTT CHART FOR FIRST 6 WEEKS

TASK	1	2	3	4	5	6
Weed mapping						
Weed control via spraying-primary weeding						
Removal of woody weeds by machine						
Install barrier and tree protection measures						
Instal erosion and sediment control devices						
Installation of native plant stock/mulch						
Fuel management plan						
secondary weeding						

B - GANTT CHART FROM MONTH 1 - MONTH 24

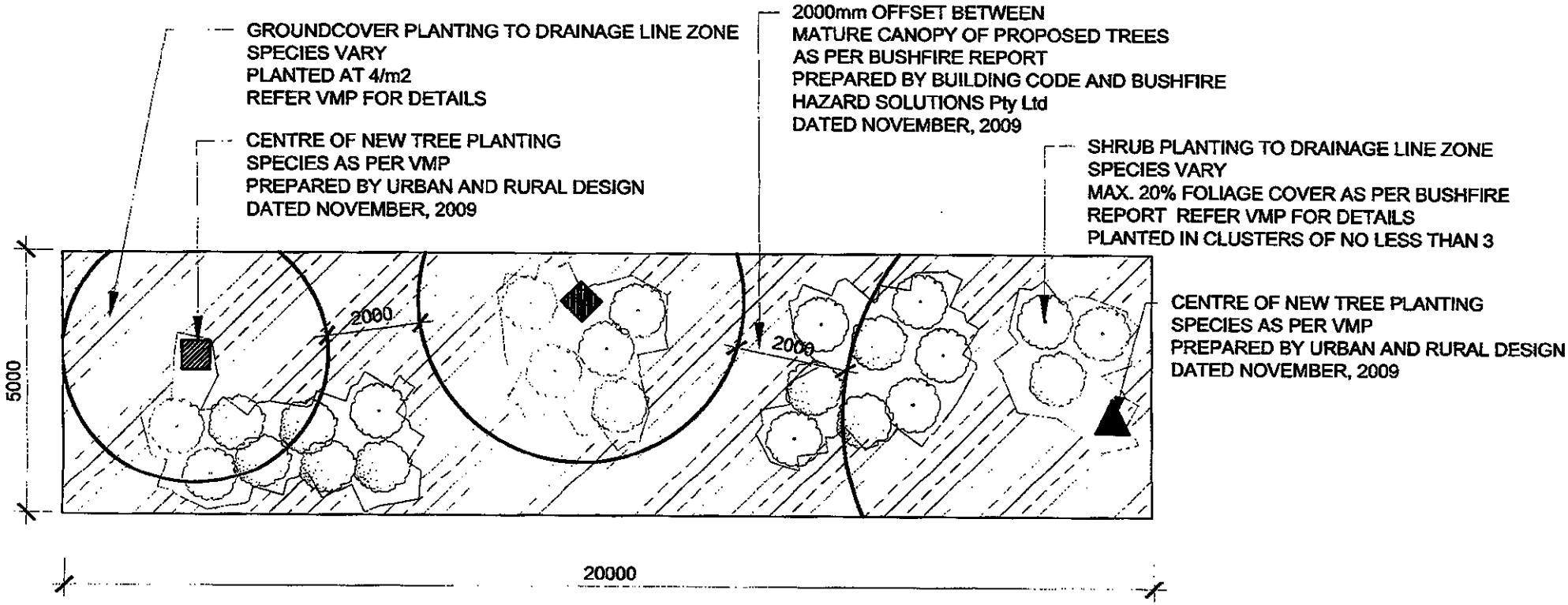
TASK	1	2	3	4	5	6	12	18	24
Complete first 6 weeks per Gantt Chart A									
Monitor monthly-then 6monthly									
Maintenance									
Continue fuel management plan									

APPENDIX H


KU-RING-GAI CHASE NATIONAL PARK
NORTH WAHROONGA
NORTH TURRAMURRA
ST IVES CHASE
WAHROONGA
GARIGAL NATIONAL PARK
GORDON
BELROSE
DAVIDSON
GARIGAL NATIONAL PARK
PYMBLE

APPENDIX I

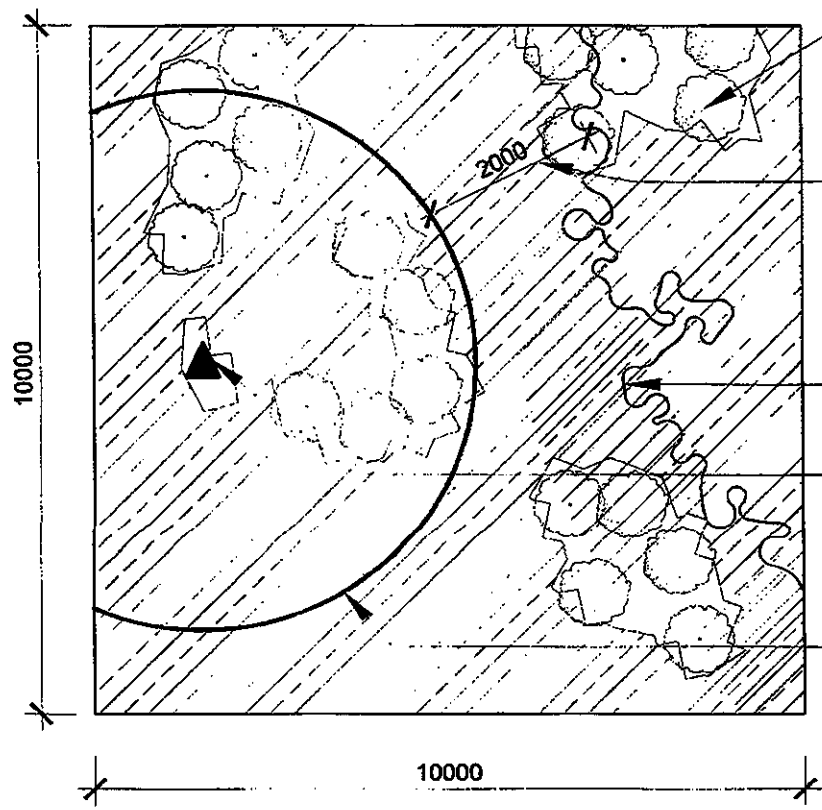
Appendix B
20m Drainage Line Detail Plan 1:100



NOTE:
AREA OF THIS DETAIL PLAN IS 20000 x 5000mm = 100m2
REFER VMP, PREPARED BY URBAN AND RURAL DESIGN
DATED NOVEMBER, 2009

20m DRAINAGE LINE
TYPICAL DETAIL PLAN 1:100@A4

Appendix C
General Open Space Detail Plan 1:100



SHRUB PLANTING TO GENERAL OPEN SPACE ZONE
SPECIES VARY
MAX. 20% FOLIAGE COVER AS PER BUSHFIRE REPORT
REFER VMP FOR DETAILS
PLANTED IN CLUSTERS OF NO LESS THAN 3

2000mm OFFSET BETWEEN
MATURE CANOPY OF PROPOSED TREES AND
EXISTING RETAINED TREE CANOPIES
AS PER BUSHFIRE REPORT
PREPARED BY BUILDING CODE AND BUSHFIRE
HAZARD SOLUTIONS Pty Ltd
DATED NOVEMBER, 2009

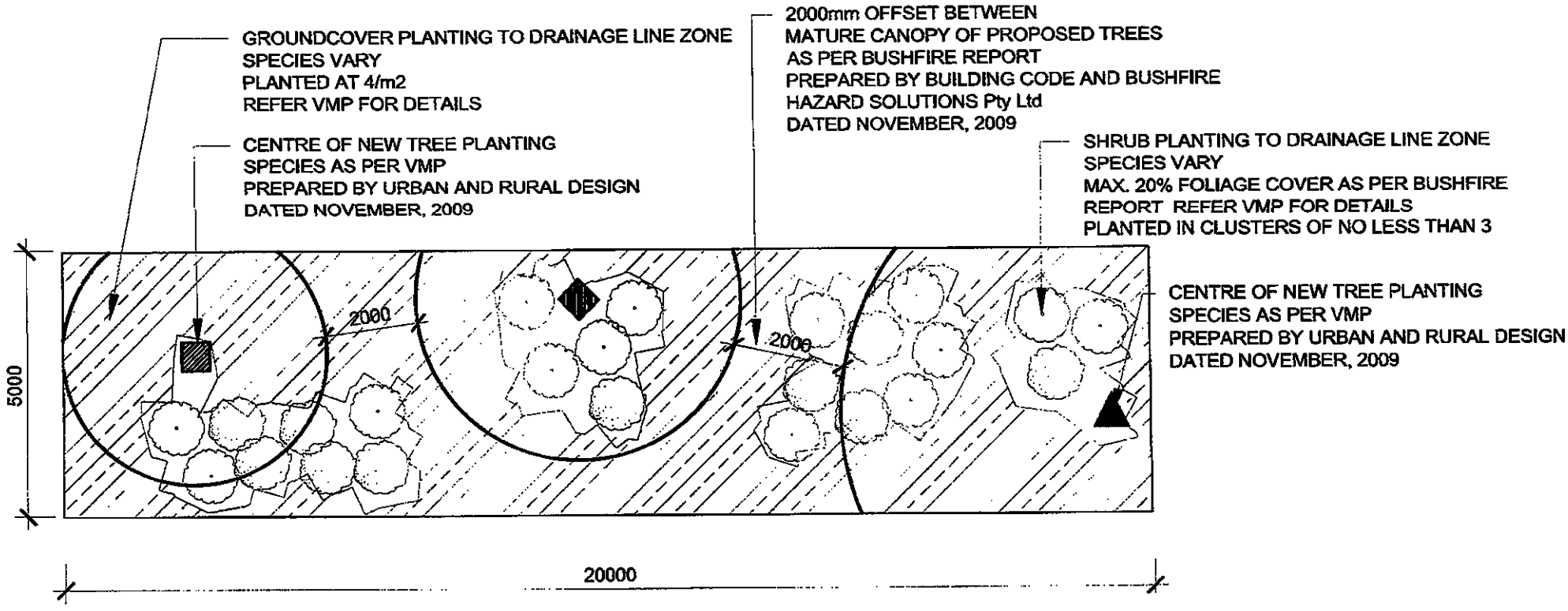
CANOPY OF EXISTING TREE RETAINED

CENTRE OF NEW TREE PLANTING
SPECIES AS PER VMP
PREPARED BY URBAN AND RURAL DESIGN
DATED NOVEMBER, 2009

APPROXIMATE CANOPY OF PROPOSED TREE
REFER VMP
PREPARED BY URBAN AND RURAL DESIGN
DATED NOVEMBER, 2009

GENERAL OPEN SPACE
TYPICAL DETAIL PLAN 1:100@A4

Appendix B
20m Drainage Line Detail Plan 1:100



NOTE:
AREA OF THIS DETAIL PLAN IS 20000 x 5000mm = 100m2
REFER VMP, PREPARED BY URBAN AND RURAL DESIGN
DATED NOVEMBER, 2009

20m DRAINAGE LINE
TYPICAL DETAIL PLAN 1:100@A4

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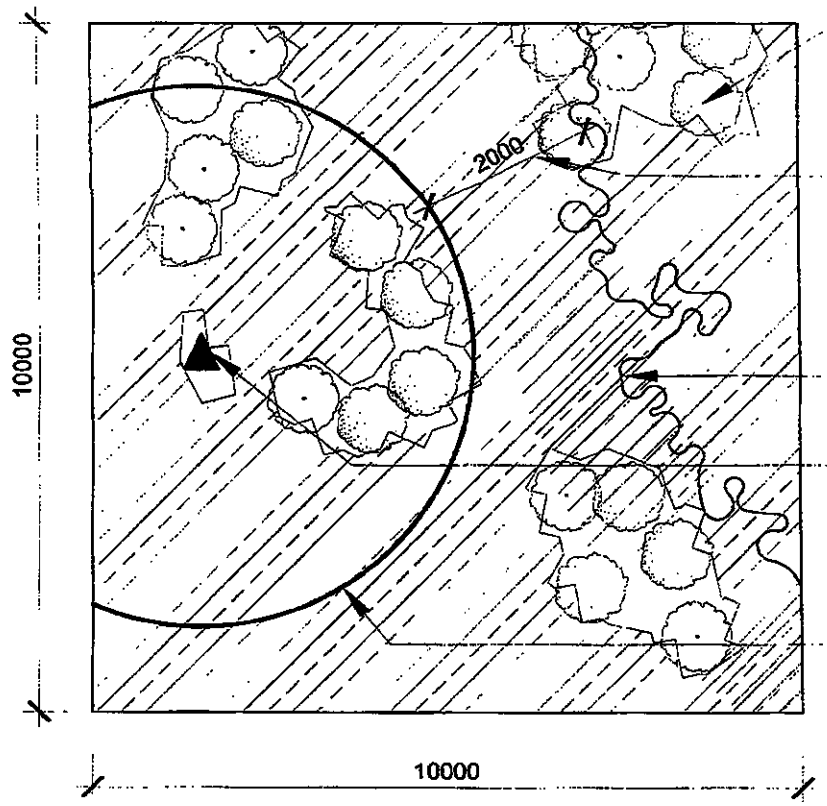
General Open Space Detail Plan 1:100



SHRUB PLANTING TO GENERAL OPEN SPACE ZONE
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