vegetation management plan for riparian area adjacent existing carpark - SSD 5314 pymble ladies college, pymble

prepared by
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Background

This vegetation management plan has been prepared to accompany a development application for a new aquatic & fitness centre, sports ground, car park, dining room, health care & wellbeing centre (PMDL, 2012) within the grounds of Pymble Ladies College.

The proposed development is planned to be carried out in a number of stages and this plan is to be implemented in conjunction with Stage 2 works being the redevelopment of Mollie Drive Field and associated car parking facilities.

The proposed development has been deemed to be a State Significant Development (SSD 5314) and the Director General's environmental assessment requirements were provided by the NSW Department of Planning & Infrastructure on the 2nd July 2012. Although the Director General's requirements did not specifically highlight the need for this plan, this plan was referred to as information to be submitted in the minutes of the pre- lodgment meeting with Ku-ring-gai Council dated 5th April 2012.

Immediately to the north of the site, adjacent the existing car parking area, there is a small drainage line. This drainage line, whilst not identified on the 1: 25,000 topographic maps, is identified in Ku-ring-gai Council's Riparian Policy 2004, map as being a category 3 stream.

The drainage line is an open channel within the upper portion of a small discrete catchment which collects overland flows from parts of the college grounds.

Existing Site
The proposed development is separated from the drainage line by the existing car park and is not directly affected and unlikely to be indirectly affected by the proposed development. The vegetation has been modified in the past and consists of indigenous and exotic species in the canopy, understorey and ground cover layers. The ground covers are predominately exotic species and there are little or no signs of natural regeneration. Because of the level of habitat disturbance and high levels of exotic ground covers, the community is unlikely to recover and is likely to further decline without significant rehabilitation works.

Original Vegetation Community
With very few components of the community remaining, based upon the findings of the Flora & Fauna Report (Footprint Green, 2012) it is likely that the original vegetation prior to development of the site was Sydney Turpentine Ironbark Forest. This assessment is consistent with the vegetation mapping conducted by NSW National Parks & Wildlife Service (2002), Sydney Catchment Management Authority (2009) and Ku-ring-gai Council (2010).

Objective of the plan
The objective of this vegetation management plan is consistent with the NSW Office of Water's guidelines (2012), being: " to provide for a stable watercourse and riparian corridor which emulates the native vegetation communities in the area".

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avon road

entrance from avon road

exit to avon road

bushfire asset protection zone

mown grass under canopy trees

drainage line

area covered by this vegetation management plan

mown grass under canopy trees

bushfire asset protection zone

car park

hockey field

0 5 10 15 20 25

area covered by this vegetation management plan

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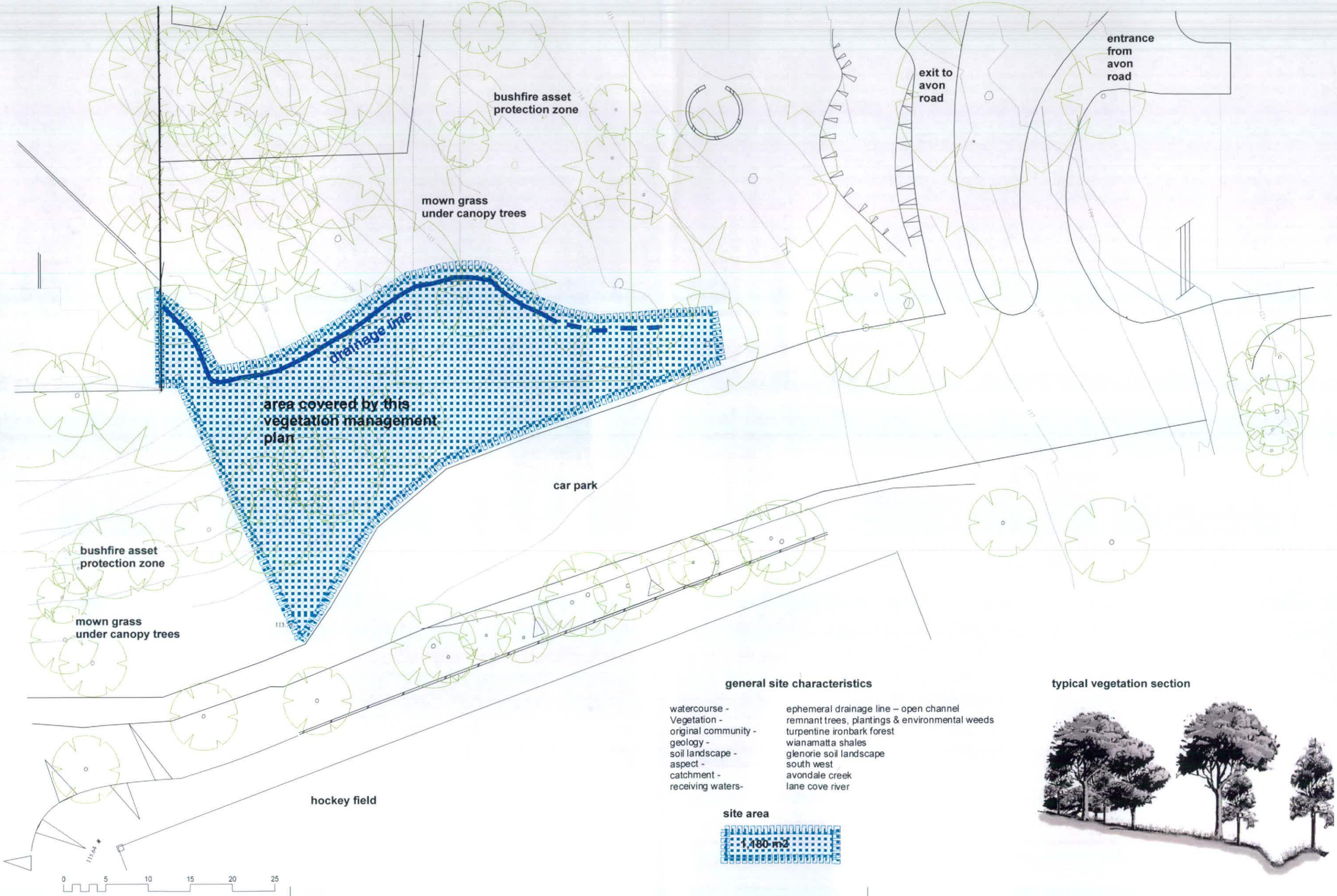

general site characteristics

watercourse -	ephemeral drainage line – open channel
Vegetation -	remnant trees, plantings & environmental weeds
original community -	turpentine ironbark forest
geology -	wianamatta shales
soil landscape -	glenorie soil landscape
aspect -	south west
catchment -	avondale creek
receiving waters-	lane cove river

site area

1,180 m2

typical vegetation section

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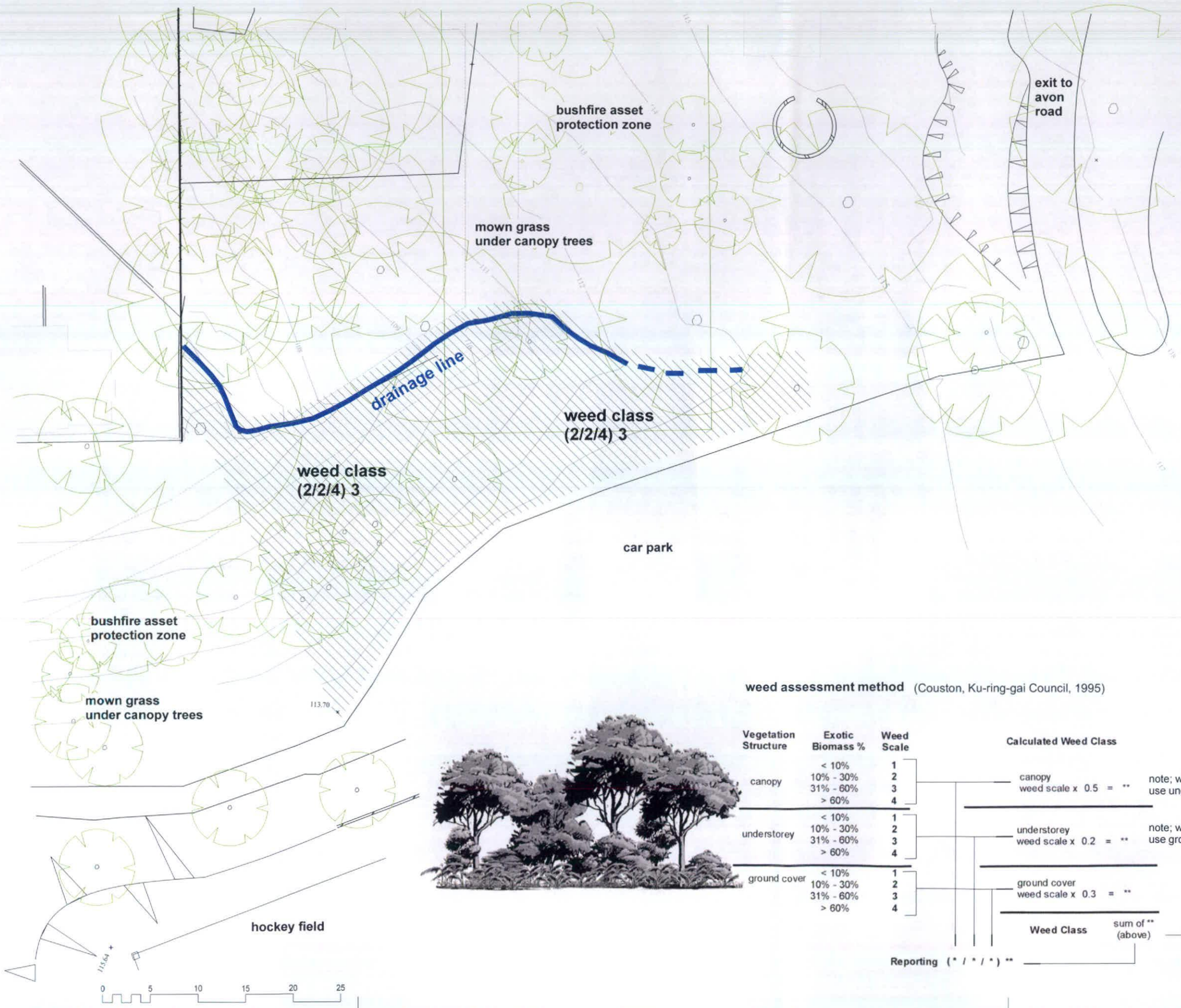

characteristic indigenous species

Genus species	Common Name
Eucalyptus acmenoides	White Mahogany
Eucalyptus saligna	Sydney Blue Gum
Geranium homeanum	-
Microlaena stipoides	Weeping Grass
Pittosporum undulatum	Native Daphne

characteristic non-indigenous native species

Genus species	Common Name
Eucalyptus microcorys	Tallow-wood
Grevillea robusta	Silky Oak
Lophostemon confertus	Brushbox
Melaleuca quinquenervia	Paperpark

characteristic introduced species

Genus species	Common Name
Acer negundo	Box Elder
Agapanthus praecox	Agapanthus
Alocasia macrorrhizos	-
Cinnamomum camphora	Camphor Laurel
Colocasia esculenta	Taro
Cyperus papyrus	-
Dietes bicolor	Dietes
Ehrharta erecta	Panic Veldtgrass
Hedychium gardnerianum	Ginger Lily
Jacaranda mimosifolia	Jacaranda
Jasminum jasminoides	Yellow Flowering Jasmine
Lantana camara	Lantana
Ligustrum lucidum	Large Leaf Privet
Ligustrum sinense	Small Leaf Privet
Liquidambar styraciflua	Sweet Gum
Nerium oleander	Oleander
Ochna serrulata	Ochna
Pennisetum clandestinum	Kikuyu Grass
Ranunculus sp.	Buttercup
Salix sp.	Willow
Senna pendula	Cassia
Sida rhombifolia	Paddy's Lucerne
Solanum mauritianum	Wild Tobacco Tree
Stenotaphrum secundatum	Buffalo Grass
Tradescantia fluminensis	Wandering Jew

weed assessment method (Couston, Ku-ring-gai Council, 1995)

Vegetation Structure	Exotic Biomass %	Weed Scale
canopy	< 10%	1
	10% - 30%	2
	31% - 60%	3
	> 60%	4
understorey	< 10%	1
	10% - 30%	2
	31% - 60%	3
	> 60%	4
ground cover	< 10%	1
	10% - 30%	2
	31% - 60%	3
	> 60%	4

Calculated Weed Class

canopy weed scale x 0.5 = **

note; where the canopy is absent use understorey Weed Scale

understorey weed scale x 0.2 = **

note; where the understorey is absent use ground cover Weed Scale

ground cover weed scale x 0.3 = **

Weed Class sum of ** (above)

Reporting (* / * / *) **

weed class

0 sq m	weed class 1 (little or no weed)
0 sq m	weed class 2 (low levels of weeds)
1,180 sq m	weed class 3 (moderate levels of weeds)
0 sq m	weed class 4 (high levels of weeds)

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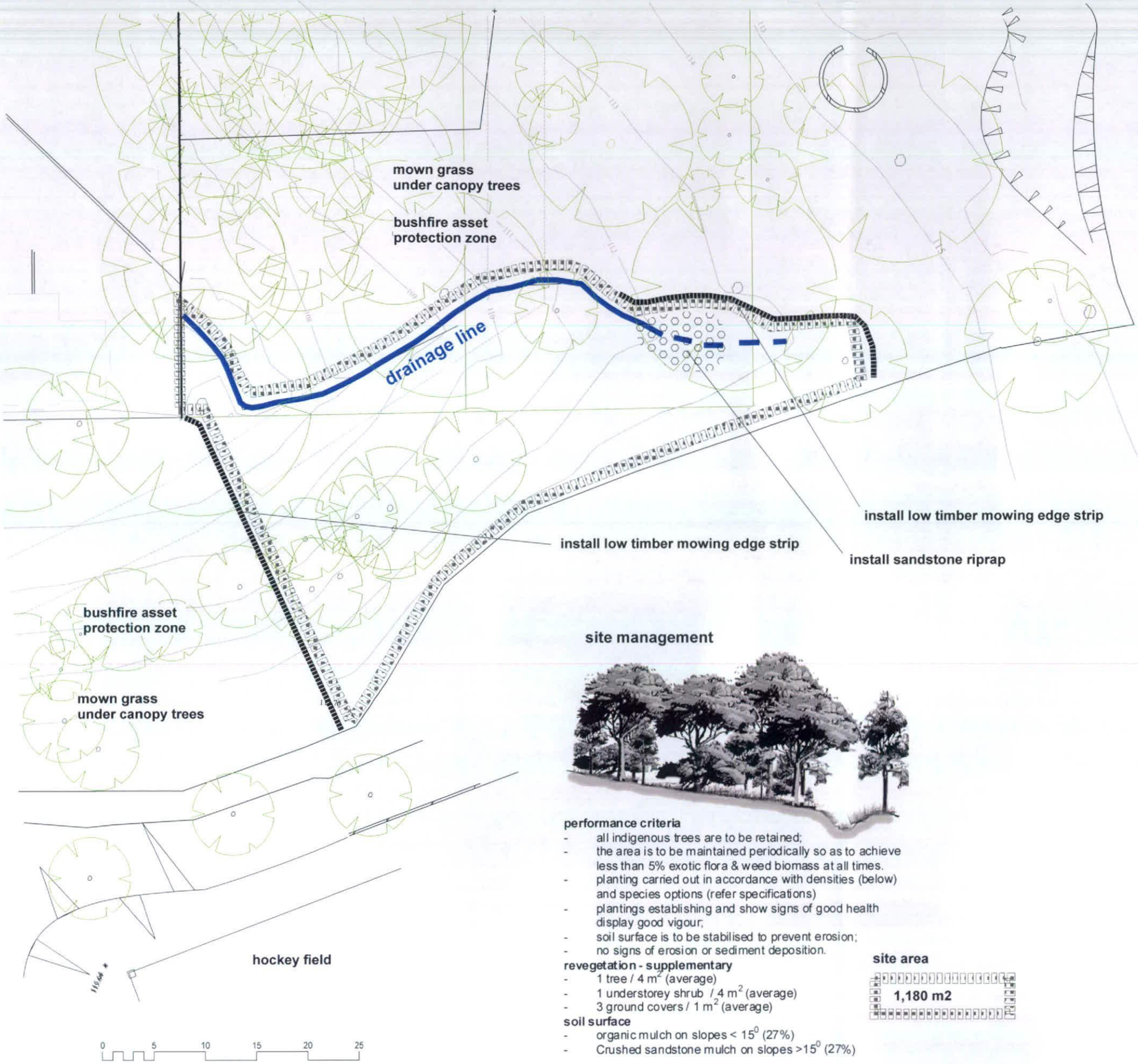

site management

performance criteria

- all indigenous trees are to be retained;
- the area is to be maintained periodically so as to achieve less than 5% exotic flora & weed biomass at all times.
- planting carried out in accordance with densities (below) and species options (refer specifications)
- plantings establishing and show signs of good health display good vigour;
- soil surface is to be stabilised to prevent erosion;
- no signs of erosion or sediment deposition.

revegetation - supplementary

- 1 tree / 4 m^2 (average)
- 1 understorey shrub / 4 m^2 (average)
- 3 ground covers / 1 m^2 (average)

soil surface

- organic mulch on slopes < 15^0 (27%)
- Crushed sandstone mulch on slopes >15^0 (27%)

site area

plan implementation

scope of work

1.1 A qualified and experienced ecological consultant is to tag/mark all exotic & non-indigenous trees to be removed.

1.2 A qualified and experienced arboricultural contractor is to be engaged to remove all exotic & non-indigenous trees tagged / marked.

1.3 A qualified and experienced bushland regeneration contractor who is a member of the Australian Association of Bush Regenerators shall be engaged to undertake the weed control.

1.4 Consideration shall be given to the pre-ordering of plant stock based upon the numbers and species identified in this plan (refer specifications).

1.5 All exotic & non-indigenous trees are to be removed including the hedge row of Oleander adjacent the car park bordering the site. The remaining stumps must be treated with herbicide immediately after felling of the tree. Low stumps and the root systems shall be left on site to assist with soil stabilisation.

1.6 The upper portion of the drainage line grades into non-discrete overland flow path. A low timber mowing edge is to be installed to define the extent the rehabilitation site.

1.7 To minimise the spread of weed material across the site, initial weed control including control of exotic & non-indigenous species is to be carried out across the site using standard bush regeneration techniques (refer specifications).

1.8 The upper section of the drainage line shows initial signs of gully head cutting and is to be stabilized using sandstone riprap material (refer specifications) as shown on this plan.

1.9 Existing rocks logs & branches shall be left within the stream channel to minimize further scouring.

1.10 Where considered necessary temporary sediment control fencing shall be installed 1m from the top of the watercourse bank to minimize the potential for soil or mulch entering the watercourse (refer specifications).

1.11 In the event that unforeseen soil erosion occurs on the rehabilitated bank, it shall be remediated using standard erosion control measures (refer specifications).

1.12 In some areas of the site, weed control may involve the careful scalping the soil with a bobcat ensuring no damage occurs to the root system of trees to be retained. This work must be carried out under the direct supervision of the bushland regeneration contractor.

1.13 Primary weed control shall be carried out across the site using standard bush regeneration techniques (refer specifications)

1.14 The soil across the site shall be stabilized with crushed sandstone mulch or organic mulch (refer specifications).

1.15 Secondary weed control shall be carried out at 2 weekly intervals for a 6 month period after completion of Primary Weed Control (1.11)

1.16 After completion of Secondary Weed Control period, supplementary planting shall be carried out to achieve the plant numbers in the performance criteria in accordance with the species options (refer specifications). Depending on the site's response to weed control, planting of canopy trees may be brought forward if considered to be appropriate after site inspections by College staff or the College's representative.

1.17 The bush regeneration contractor must maintain records, details and photographs of the work undertaken during this period for inclusion in final reports.

year 1 maintenance

2.1 Plant maintenance and replacement (refer specifications) shall be carried out at:
- 1 monthly intervals 0-6 months after completion of planting, and
- 2 monthly intervals 7-12 months after completion of planting.

2.2 Plantings shall be maintained in good health and vigour with a minimum 80% survival rate. In the event that less than 80% of the plant survival rate occurs, plants that are dead, showing significant signs of stress or damage, shall be replaced using species from the species options list (refer specifications).

2.3 Weed control maintenance shall be carried out across the site using standard bush regeneration techniques (refer specifications) at
- 1 monthly intervals 0-6 months after completion of planting, and
- 2 monthly intervals 7-12 months after completion of planting.

2.4 In the event that unforeseen soil erosion occurs on the rehabilitated bank, it shall be remediated using standard erosion control measures (refer specifications).

2.5 The bush regeneration contractor must maintain records, details and photographs of the work undertaken during this period for inclusion in final reports.

year 2 maintenance

3.1 Weed control maintenance shall be carried out across the site using standard bush regeneration techniques (refer specifications) at
- 2 monthly intervals 12-18 months after completion of planting, and
- 3 monthly intervals 18-24 months after completion of planting.

3.2 In the event that unforeseen soil erosion occurs on the rehabilitated bank, it shall be remediated using standard erosion control measures (refer specifications).

3.3 The bush regeneration contractor must maintain records, details and photographs of the work undertaken during this period and provide a final report on the project.

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specifications

bush regeneration

Bushland Regeneration is the activities carried out to provide conditions that facilitate the natural recruitment or germination of endemic flora species. It primarily involves the progressive control of weed species in a systematic manner of primary weed control, follow-up weed control (often several follow –up sessions) and maintenance over an identified works area. Typically work areas progress from areas of little weeds and expand to adjacent works areas. It is recommended that these activities are undertaken by specialised and experienced bush regeneration contractors.

bush regeneration contractors

Bush regeneration contractors are companies or individuals who have experience and qualifications in bush regeneration activities. Contractors must provide an experienced site supervisor with minimum qualifications of a TAFE Certificate II in Bush Regeneration or Conservation & Land Management and must be eligible for membership to Australian Association of Bush Regenerators.

crushed sandstone mulch

Crushed sandstone mulch is to be comprised of clean crushed sandstone, free of clay, weed propagules, road base and other foreign matter and should comprise <5%fines and rocks with a maximum diameter of 100mm. Crushed sandstone mulch shall be laid to a depth of 50-75mm.

erosion & sediment controls

All erosion and sediment controls such as berms, sediment fences, rumble zones sediment basins and site drainage flow paths must be designed and constructed in accordance with Managing Urban Stormwater: Soils and Construction. 4th Edition (Landcom, 2004), New South Wales Government.

herbicide usage

Glyphosate based herbicides can be used in conjunction with weed control techniques and is to be used in accordance with the product label and registration. Herbicide usage must be undertaken in a manner or method that does not cause harm to endemic species or new plantings and there is no contamination of surface or ground waters.

organic mulch

Organic mulch material shall consist of a 75mm (unless otherwise specified) deep layer of chipped wood material of similar standard to Forest Blend ® and is to be free of non-organic material, contaminated chemicals such as hydrocarbons and weed seed.

plant maintenance & replacement

All plantings shall be maintained, (watered, weeded) so as to display good health and vigour. Apart from typical seasonal variations, plantings showing poor vigour, stress or disease will be replaced.

plant stock

All plant material will be tubestock or maxi-cell with the exception of native grasses where viro-cells can be used.

Plants used must be grown from seed or cuttings taken from provenance stock. Greening Australia or local commercial nurseries specialising in native species can be contacted as they have a range of seed from the local provenance. Provided that orders are placed in advance, consignment propagation can be carried out from local stock.

planting

Planting is to be carried out using standard horticultural practices. Because of the nature of the site and environmentally sensitive lands downstream, no fertiliser is to be used in conjunction with planting, however if considered necessary, water retaining crystals can be used. All tree & shrub plantings are to be planted with staked translucent or cardboard grow tubes.

planting species options & diversity

It is recognised that some species listed on this plan may be difficult to propagate or may not be readily available. To overcome this, a range of species options are listed.

In order to introduce diversity and avoid a mass monoculture of plantings, there must be a minimum of:

- 6 canopy species in roughly equal numbers, and
- 8 understorey species in roughly equal numbers
- 10 ground cover species in roughly equal numbers

sandstone riprap material

Non engineered sandstone riprap material is to be laid using rocks that are a minimum 50kg. Typical sandstone dimensions of 50kg rocks are 250mm x 300mm x 300mm.

weed control

Weed control is to be undertaken using standard bush regeneration techniques such as hand weeding or with the use of Glyphosate based herbicides when necessary (eg. cut & paint, stem scrape, spot spraying).

weed material disposal and temporary storage on site.

Weed material containing seed or weed material capable of spreading vegetatively shall be removed from site and disposed of at an appropriate location where it will not cause further environmental damage.

Temporary storage of weed material prior to disposal can occur on site where it is stored, outside drainage lines, on an impervious surface and it is covered with a material that adequately contains the weed debris.

species options for revegetation

trees

Genus species	Common Name
Acacia parramattensis	Parramatta Wattle
Allocasuarina torulosa	Forest Oak
Angophora costata	Sydney Red Gum
Elaeocarpus reticulatus	Blueberry Ash
Eucalyptus paniculata	Grey Ironbark
Eucalyptus pilularis	Blackbutt
Eucalyptus resinifera	Red Mahogany
Syncarpia glomulifera	Turpentine

understorey shrubs

Genus species	Common Name
Clerodendrum tomentosum	Hairy Clerodendrum
Dodonaea triquetra	Hop Bush
Hakea sericea	Willow-leaved Hakea
Hibbertia aspera	-
Indigofera australis	Native Indigo
Maytenus silvestris	Narrow-leaved Orangebark
Notelaea longifolia	Large Mock-olive
Notelaea ovata	-
Ozothamnus diosmifolius	White Dogwood
Pittosporum revolutum	Yellow / Rough Fruit Pittosporum
Platysace linearifolia	Narrow-leaf Platysace
Polyscias sambucifolia	Elderberry Panax
Pultenaea flexilis	Graceful Bush-pea
Pultenaea viscosa	-
Xanthorrhoea media	Grass Tree

ground covers

Genus species	Common Name
Adiantum aethiopicum	Common Maidenhair Fern
Calochlaena dubia	Common Ground Fern
Clematis aristata	Old Man's Beard
Clematis glycinoides	Headache Vine Climber
Dianella caerulea	Blue Flax Lily
Dianella revoluta	Black-anther Flax Lily
Doodia aspera	Prickly Rasp-fern
Eustrephus latifolius	Wombat Berry
Hardenbergia violacea	False Sarsaparilla
Juncus usitatus	Common Rush
Lomandra longifolia	Spiny-headed Mat-rush
Lomandra multiflora	Many-flowered Mat-rush
Microlaena stipoides	Weeping Grass
Morinda jasminoides	Morinda
Pandorea pandorana	Wonga Wonga Vine
Pellaea falcata	Sickle Fern
Pratia purpurascens	Whiteroot
Pseuderanthemum variabile	Pastel Flower
Smilax australis	Sarsaparilla
Themeda australis	Kangaroo Grass

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