
PERRINS SCHOOL DEVELOPMENT ENVIRONMENTAL MANAGEMENT PLAN

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TABLE OF CONTENTS

1. INTRODUCTION	2
1.1 ELEMENTS OF THE EMP	2
2. INCIDENT/COMPLAINT RESOLUTION	3
3. EMP ELEMENTS	4
ELEMENT E1 – SITE CONTROL	4
ELEMENT E2 – RESIDENTIAL AMENITY	5
ELEMENT E3 – AIR QUALITY	6
ELEMENT E4 – NOISE CONTROL	9
ELEMENT E5 – SITE EROSION CONTROL	11
ELEMENT E6 – WATER QUALITY	13
ELEMENT E7 – MANAGEMENT OF ACID SULPHATE SOILS	16
ELEMENT E8 – SITE RESTORATION AND REHABILITATION	17
ELEMENT E9 – VEGETATION RETENTION/CLEARING	20
ELEMENT E10 – LIGHTING	22
ELEMENT E11 – NUTRIENT MANAGEMENT	23
ELEMENT E12 – ENERGY EFFICIENCY	25
ELEMENT E13 – DECLARED ENVIRONMENTAL WEED PROGRAM	26
ELEMENT E14 – FERAL ANIMAL CONTROL MANAGEMENT	29
ELEMENT E15 – LOCALLY ENDEMIC NATIVE PLANT REHABILITATION PLAN	31
APPENDIX A - STORMWATER QUALITY MANAGEMENT PLAN	37

Working hours on site shall comply with Caloundra City Council By-Laws, generally as follows:

Monday to Friday	6.30 am to 6.30 pm
Saturdays	6.30 am to 6.30 pm
Sunday and Public Holidays	nil

The above hours are applicable only if measures to limit noise emission in accordance with AS 2436 are undertaken.

Monitoring: Weekly inspections by the Contractor of all noise producing sources (including inspection of new items before they commence work on the site) to record details and compliance of sound control measures.

If complaints about noise are received, investigations shall be undertaken by visiting the complainant's locality and listening to noise to determine if audible.

Keep written record of all complaints and subsequent noise monitoring and remediation measures.

Reporting: Monthly reports by the Contractor to the consultant on the monitoring, control measures and corrective action taken.

ELEMENT E5 – SITE EROSION CONTROL

Policy: To minimise the impact of soil erosion on or outside the construction site.

Performance Objectives: Prevention of any material erosion and transport of eroded soil outside the construction site.

Control Measures: The Contractor shall prepare a Site Erosion Control Plan for the site prior to commencing work.

The following mechanisms shall be used to control erosion on the site, and to prevent discharge of sediment contaminated runoff to receiving waters:

- Where possible, earthworks shall be completed in stages, such that a minimal area of ground is open at any one time.
- Perimeter bunds shall be constructed around disturbed areas to divert external catchment flows around these areas. Silt fences shall be used to prevent sediment transport from disturbed areas in close proximity to receiving waters.
- Drains shall be protected from scour using regular check dams made from rock rubble. Drains may be lined with turf, rock or sprayed concrete if required.
- Sediment traps are to be used in conjunction with drainage lines to collect silt contained in the runoff.
- Soil stockpile areas are to be stabilised to prevent erosion.
- Embankment slopes shall be stabilised following construction to retain vegetation, moisture and topsoil and promote successful planting.
- Where areas are required to remain open for any significant period of time prior to revegetation and/or stabilisation, the soil surface shall be covered with straw or other suitable material to prevent raindrop splatter.

Erosion and water quality control activities on the site shall generally be in accordance with the following table:

EVENT	ACTIVITY
Prior to vegetation disturbance or earthworks activity	Construction of retardation basins in areas subject to disturbance
Commencement of construction	<p>Installation of silt fences using appropriate geotextile mesh or other material around any areas likely to be disturbed, to capture all eroded material.</p> <p>Use of other mechanisms such as soil stabilisation techniques, to further prevent sediment transport from the site.</p> <p>Construction of low earth bunds around the upstream side of any working area, so as to divert upstream drainage around the site.</p>
During vegetation clearing and earthworks	<p>Stacking and removal of nominated vegetation.</p> <p>Stockpiling and stabilisation of excavated topsoil and other soil materials to prevent erosion.</p> <p>Maintenance of minimum ground-opened area at any one time.</p>
After completion of earthworks	Revegetation and stabilisation of affected areas, using stockpiled topsoil, so as to prevent erosion and sediment transport.
After completion of project	Vegetation of overland flow paths and any disturbed areas to eliminate ongoing erosion.

Monitoring: The Contractor shall monitor construction and record details of all site drainage works and soil erosion control measures. The Contractor shall make regular site inspections including additional site inspections after flood or heavy rainfall events, and shall record details of any scour, soil erosion or sediment deposits, advise on remedial work undertaken, and report on additional measures applied to prevent future occurrences.

Reporting: Monthly reporting by the Contractor to the consultant covering all maintenance activities and corrective actions.

Corrective Action: If vegetation growth fails in any area, vegetation is to be established, and the revegetation strategy modified appropriately to prevent a repeat. Otherwise, corrective action will consist of replacement of damaged or failed control devices.

ELEMENT E6 – WATER QUALITY

Policy: To minimise the impact of construction activity on water quality in water bodies external to the site, and to ensure that operational works comply with the Stormwater Quality Management Plan (see Appendix A).

Performance

Objectives: To avoid detrimental impact on the water quality and aquatic environment of Currimundi Creek and the Mooloolah River as a result of the discharge of contaminated stormwater runoff.

To comply with the *Environmental Protection Act*, and the subordinate *Environmental Protection Policy (Water)*.

No contaminants, including suspended solids, should be visible in surface runoff leaving the disturbed part of the site.

Control

Measures: The Contractor shall prepare a Water Quality Management Plan for the site, and this plan will be submitted for approval to the consultant for approval.

Building materials stored on site shall be placed in suitably prepared locations, so as to limit the potential for suspended solids to be transported from the site. Existing runoff paths will be diverted around these storage locations, and bunds shall be provided to retain material.

Fuels and oils shall be similarly stored in safe locations on site, where stormwater inundation is unlikely to occur. Any spillages of fuel and oil within the compound shall be attended to immediately to limit the potential for off-site impacts.

The Contractor shall provide temporary control measures as required during the course of the work to prevent soil erosion, scouring, sediment transport and deposition. Suitable temporary control measures, as identified in the Soil Erosion and Sediment Control Guidelines [Institution of Engineers, Australia, 1995] include:

- temporary retardation basins;
- temporary silt fences;
- controls on amount of open ground;
- diversion of upstream catchments around disturbed areas; and
- stabilisation of stockpiles.

Permanent control measures shall be provided as soon as possible after completion in each construction area. Permanent measures to be adopted for this project include:

- revegetation and engineering stabilisation of disturbed areas; and
- construction of vegetated swales on major stormwater drainage lines.

Control measures will employ best management practices, and comply with the requirements of the *Environmental Protection Act*, and the subordinate *Environmental Protection Policy (Water)*.

Monitoring: Regular on site monitoring of water quality will be required. Such monitoring shall include:

- Daily measurements of any discharge from known ASS or PASS sites, recording pH and NFR. This shall also apply to any excavation below RL 5.0 m AHD, whether ASS is recognised or not.
- Regular monitoring of placed fill (1 test per 1,000 m³) of material as designated above.
- Monthly monitoring of water quality in the Mooloolah River and the north arm of Currimundi Creek immediately downstream of the site, for pH, conductivity, suspended solids and dissolved oxygen.
- Three-monthly water quality monitoring for nutrient fraction concentrations at the same locations.

The Contractor shall maintain records of any fauna kills in adjacent waterways and leachate staining.

Reporting: Monthly reports by the Contractor (copy to the Consultant) on the monitoring during construction, including details of any changes from the approved Water Quality Management Plan and of all corrective action taken to maintain the performance requirement. Copies to Department of Environment and Heritage, and Caloundra City Council.

Monthly reports by the Contractor to the Superintendent's Representative on the monitoring during construction, including details of any changes from the approved Water Quality Management Plan and of all corrective action taken to maintain the performance requirement.

**Corrective
Action:**

Water shall not be discharged from the site if the water quality is assessed as unacceptable. Corrective action shall be undertaken by the Contractor to the satisfaction of the consulting engineer. The cause of the problem shall be investigated by the consultant. If it is determined that the deterioration in water quality is originating from within the project area, specific steps shall be taken to address the problem.

ELEMENT E7 – MANAGEMENT OF ACID SULPHATE SOILS

Policy: To avoid detrimental impact on the water quality and aquatic environment of waterbodies external to the site as a result of the discharge of acidic waters during construction activity.

Performance

Objectives: To comply with the *Environmental Protection Act* and to manage acid sulphate soils in accordance with the Department of Natural Resources publication *Sampling and Analysis Procedure for Lowland Acid Sulphate Soils (ASS) in Queensland (QASSIT)* (latest edition) and the NSW EPA *Guidelines for Assessing and Managing Acid Sulphate Soils* (1995).

Control

Measures: Acid sulfate soil management should be in accordance with the approved EMP for the Birtinya Area – Version 2 prepared by Gilbert and Sutherland and the QDNR approval letter dated 09.03.00 for the Geomorphology, Soil Survey, Acid Sulphate Assessment and Modelling of Birtinya Area Report prepared for Lensworth Kawana Estates. The 2nd and 3rd round testing should be in accordance with QDNR's approval letter dated 31.05.00.

Monitoring: Site monitoring of water quality will be in accordance with the above noted approved EMP for the Birtinya Area.

Reporting: Reporting will be in accordance with the above noted approved EMP for the Birtinya Area.

Corrective

Action: Corrective action will be in accordance with the above noted approved EMP for the Birtinya Area.

ELEMENT E8 – SITE RESTORATION AND REHABILITATION

Policy: To provide a completed development of pleasing appearance and ecological values with a suitable vegetated surface treatment of all disturbed areas and rehabilitation of weed infested areas.

Performance

Objectives: To create conditions and implement measures that would ensure the prompt establishment of vegetation, that consists primarily of native species, within all areas that have been disturbed as part of the proposed development.

Control

Measures: The following weed control and rehabilitation measures shall be implemented to ensure that the specified performance objectives are achieved:

- The application of mulch, free from contamination by weed species, to all areas of soil that have been cleared as part of the proposed works and that are to be subsequently planted with trees and shrubs. Particular attention shall be paid to exposed soil on steep slopes.
- Design and implementation of a staged weed control program that forms part of the detailed landscaping and maintenance programs for the redeveloped golf course. The weed control program shall ensure that the area of cleared land that has not been rehabilitated shall be minimised at all times. Such an approach shall reduce the impact of weed clearing activities upon fauna habitat resources.
- Treatment of existing infestations of invasive non-native species using appropriate, species specific means including non-residual herbicides, physical removal of the whole plant, hand pulling of seedlings and cut-stump applications of residual herbicides for woody weeds.
- Removal of weed infested vegetation and weed stockpiles from all clearance areas.

- Stockpiled weed infested vegetation shall not be mulched for re-use on site, nor disposed of at a green waste recycling facility due to the fact that such practices facilitate the re-establishment and/or spread of weed species. Of particular note in this respect is the prevalence of weeds such as the Madeira Vine, which are capable of propagation from fragments of stems or leaves. Appropriate disposal methods include disposal at an appropriate landfill facility, pit burning, or other disposal approved of by Caloundra City Council.
- The prompt and progressive rehabilitation of areas within which infestations of weed species have been treated. Early rehabilitation is required to minimise the risk of subsequent re-establishment of weeds. Such rehabilitation shall involve the planting of native trees, shrubs and understorey species with the emphasis on species that are local to the area and which are components of ecosystem types that originally occurred in the area.
- Soil erosion measures shall be implemented as described in EMP Element Number 5, which will reduce the risk of transportation of weed seeds or viable plants from site in surface water runoff.
- All construction plant shall be cleaned prior to transportation onto the site to prevent the introduction of exotic species.
- Fertiliser application rates shall be closely monitored to ensure that excess material is not washed off by stormwater runoff and discharged to local streams. Controlled-release fertilisers shall be used wherever possible. Retardation basins or other sediment capture devices shall be maintained downstream of disturbed areas until revegetation is judged to be suitably advanced to limit soil erosion.

Monitoring: Monitoring of treated areas to detect the re-emergence of weed species shall be undertaken at intervals of no greater than six months. Any weed species detected shall be treated within appropriate measures to prevent re-establishment and subsequent displacement of native species.

Monitoring of rehabilitation works and landscaping works shall be undertaken at monthly intervals to assess the health and vigour of plantings. Any unhealthy plantings shall be treated or replaced. The frequency of monitoring may be progressively reduced as the plantings become established.

Monitoring of treated areas shall be incorporated into the golf course maintenance program as an ongoing task.

Reporting: Monthly reporting by the Contractor to the consultant covering all monitoring activities.

Corrective Action: Restoration shall be carried out as specified to the satisfaction of the consultant and Caloundra City Council.

1. INTRODUCTION

The aim of the Environmental Management Plan (EMP) is to provide detailed policies, performance criteria and procedures to minimise the impact of the project on the physical and social environment. In particular, the EMP provides monitoring and reporting mechanisms whereby the performance of the system can be measured, and ensure that agreed corrective actions are implemented in a timely manner if problems occur.

The EMP has been prepared in accordance with Queensland Department of Environment Guidelines and good engineering and environmental practice.

A copy of the EMP is to be kept on site at all times, and used as environmental operating procedures for all relevant construction and management activities carried out on site.

1.1 ELEMENTS OF THE EMP

The EMP comprises the following elements related to the construction phase and operational phase activities carried out across the site:

Construction Elements:

1. Site Control
2. Residential Amenity
3. Air Quality
4. Noise Control
5. Site Erosion Control
6. Water Quality
7. Management of Acid Sulphate Soils
8. Site Restoration
9. Vegetation Clearing

Operational Elements:

10. Lighting
11. Nutrient Management
12. Energy Efficiency
13. Declared Environmental Weed Program
14. Feral Animal Control Management
15. Locally Endemic Native Plant Rehabilitation Plan

The Contractor is responsible for ensuring all personnel, including subcontractors, are aware of the contents of the EMP and act accordingly.

ELEMENT E9 – VEGETATION RETENTION/CLEARING

Policy: To ensure the protection of vegetation and to minimise the environmental impact of vegetation clearance.

Performance

Objectives: Maximise the retention of existing native vegetation as far as is practicable given inherent constraints associated with the proposed redevelopment.

Implementation of vegetation clearance, stockpiling, recycling or disposal practices that minimise the re-use of native vegetation and minimise the potential for spreading weed species.

Control

Measures: The following vegetation clearance controls should be implemented to ensure that the specified performance objectives are achieved:

- Prior to the commencement of any vegetation clearance, all areas to be cleared shall be clearly identified on construction plans and in the field.
- The provision of fences and/or trunk girdles to prevent unintended physical damage to the root system, trunk or canopy of native vegetation identified for retention.
- Separation of native and non-native species into different stockpiles as far as is practicable.
- Foliage and branches of cleared native vegetation to be mulched for re-use on site. Trunks of native trees to be stored intact for re-use as timber.

Monitoring: Monitoring of vegetation clearance and associated earthworks components of the proposed works shall be undertaken on a continual basis to confirm that specific controls have been implemented and appropriate work practices are being adopted to achieve the specified performance objectives.

Maintenance of vegetation clearance controls shall be incorporated into the scope of works for the construction of the proposed works.

Reporting: Contractor to report at monthly intervals on monitoring, control measures and corrective action.

Corrective**Action:**

If native trees are identified within the clearance zone that may be retained with minor, practicable modifications to the earthworks, such modifications shall be implemented and the trees protected with fences and/or trunk girdles.

If individual trees or other specific vegetation is identified in the strip adjacent to the clearance zone that requires protection, such protection shall be provided.

Prior to the mulching of cleared vegetation stockpiled on site, the stockpile shall be checked for weed species and, if practicable, the weed species shall be removed for disposal off site to minimise the risk of propagation.

If mature trees (any tree having a DBH greater than 200 mm) that are not to be cleared are damaged, steps shall be undertaken to re-establish the tree if possible, and to carry out relevant rehabilitation works if required.

If disposal methods are not compliant with Caloundra City Council guidelines, necessary changes shall be made to correct the disposal procedures.

ELEMENT E10 – LIGHTING

Policy: To minimise the impact of lighting from the school on the surrounding environment, and to ensure acceptable levels of amenity for the local community.

Performance

Objectives: Minimise the complaints that are received regarding the emission of nuisance lighting from the school complex, and for complaints that are received to be dealt with within two days, so as to ensure that a complaint for the same reasons does not occur again.

Control

Measures: Ensure that the lighting design complies with the relevant design standards, eg. *AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting*.

Ensure that all street lighting provides a localised spread on the surrounding ground surface, and that the lighting of buildings and other areas only provides sufficient illumination for personal safety and security measures.

Prevent the direct transmission of light outside the school complex, affecting nearby residences and motorists.

Monitoring: The School Administration shall keep records of all complaints received regarding nuisance lighting and details of corrective action taken.

Reporting: Reports shall be prepared by the School Administration following the investigation of complaints received regarding nuisance lighting, and sent to the Caloundra City Council. The reports will detail the nature of the complaint received, and the corrective action taken following an investigation of the complaint.

Corrective Action:

Investigate any lighting that causes a complaint to be lodged, and review its design and operation as necessary to eliminate the environmental nuisance.

ELEMENT E11 – NUTRIENT MANAGEMENT

Policy: To manage the application and runoff of nutrients from gardens and playing fields within the school complex to minimise the effect on downstream waterways.

This element is also addressed in the Stormwater Quality Management Plan.

Performance

Objectives: To have no significant impact on the existing water quality within the surrounding water bodies as a result of the nutrient load contained in runoff from the school site.

Control

Measures: Apply fertilisers at the appropriate rate in gardens and other grassed areas to ensure the maximum nutrient removal via plant uptake.

Grade gardens and other grassed areas such that applied fertilisers cannot be directly washed off during heavy rainfall or with excessive watering.

Construct a series of grassed swales or landscaped areas downstream of stormwater discharge points within the school complex to further enhance the infiltration of nutrients into the subsoil.

Construct stormwater quality improvement devices in accordance with the Stormwater Management Plan for the site.

Monitoring: Conduct monitoring of the stormwater runoff from the school complex at a point upstream of the confluence with Currimundi Creek.

Monitoring shall be carried out on a monthly basis following the completion of the first stage of the school construction. This monthly monitoring shall continue until six months after completion of all construction works. Monitoring shall then be carried out every two months for a further year.

The School Administration shall keep records of all water quality monitoring results.

Reporting: A copy of all water quality monitoring results shall be sent to the Caloundra City Council as they become available.

Corrective**Action:**

The application of fertilisers within the school complex shall cease if the water quality monitoring results indicate an increase in the nutrient export rate.

The implementation of all Control Measures shall be reviewed to determine the cause of the increase in nutrient runoff from the site. Additional Control Measures shall be established and incorporated into this EMP if necessary to better manage the runoff of nutrients.

Fertiliser application shall resume when it is determined that all Control Measures, including any additional measures, are in place and functional.

ELEMENT E12 – ENERGY EFFICIENCY

Policy: To incorporate the design of energy efficient buildings and use of energy efficient equipment within the school complex.

Performance

Objectives: Energy efficient designs and equipment shall be utilised where practical in all aspects of the school infrastructure.

Control

Measures: Review all building designs and layouts to ensure the most efficient use of energy is being made across the school complex.

Determine the potential items of equipment that are not energy efficient and identify similar units comprising a higher efficiency rating.

Monitoring: Review the usage of equipment within the school on an ongoing basis to determine those items that are not energy efficient, and source the available alternatives.

Reporting: All improvements regarding the efficient use of energy within the school complex, including building designs and school equipment, shall be documented.

Corrective

Action: Replace non-efficient designs and equipment with a more efficient alternative.

ELEMENT E13 – DECLARED ENVIRONMENTAL WEED PROGRAM

Policy: To prevent the introduction and spread of declared plants within the school grounds and within remnant vegetation in and adjacent to the school.

Performance

Objectives: Declared weeds listed under the *Rural Lands Protection Act 1985* are effectively controlled and removed from the school site.

Declared weeds are prevented from establishing and spreading within the school grounds, particularly within remnant vegetation.

Implementation

Strategies: The majority of the school site has been extensively cleared of native vegetation and is currently dominated by exotic pasture grass species. Weed infestation within the remnant vegetation in the eastern portion of the school site is relatively minor and confined to the edge of the remnant adjacent to cleared areas. Exotic pasture grasses, *Lantana camara* (Lantana), *Schefflera actinophylla* (Umbrella Tree), *Solanum* spp, *Cinnamomum camphora* (Camphor laurel), *Ageratum houstonianum* (Blue Billy Goat Weed), *Conyza* spp (Fleabanes) and *Verbena* species are the most commonly occurring weed species on site.

No declared environmental weeds requiring control under the *Rural Lands Protection Act 1985* were identified within the school site.

Baccharis halimifolia (Groundsel Bush) (P3) is the most commonly occurring declared weed within the area, particularly within disturbed *Melaleuca quinquenervia* communities. As such, regular inspections shall be conducted to identify Groundsel Bush invasion within the school grounds, particularly within the remnant vegetation.

- On going monitoring of weed growth shall be undertaken to identify the presence of declared weeds and to implement weed control strategies as required. Particular attention shall be focused within and adjacent to remnant vegetation within the eastern sector of the school grounds.
- All weed infestations shall be treated promptly to prevent spreading of weed propagules.
- Areas of declared weed invasion shall be sign posted and fenced to prevent access and to reduce the risk of spread.

- Weed control management practices shall involve mechanical control and chemical control as required:
 - ◆ Declared weeds identified on site shall be managed according to the guidelines under the QDNR fact sheets on how most effectively to control and remove declared weeds in Queensland.
 - ◆ It is recommended that environmental weeds are hand pulled and / or spot sprayed. Where weeds can be sprayed without damaging natives it is recommended that weed species are sprayed with a non-residual herbicide such as glyphosate (eg. 1:100 Roundup).
 - ◆ Slashing and burning of weed species, in particular woody weeds such as Lantana and Groundsel, will result in regrowth and is not recommended.
- Any cleared exotic vegetation shall be removed from the school site and disposed at suitable facilities which prevent further weed spread. In addition, to reduce the risk of propagation, exotic vegetation cleared from the site shall not be used as mulch in landscaping.
- In the event that construction activities are carried out on site in areas of declared weeds, all vehicles, equipment and portable infrastructure shall be washed down at designated weed washdown areas.
- During revegetation schemes it should be ensured that a good ground cover of endemic native species is achieved to suppress noxious and environmental weed growth.
- It should be ensured that all topsoil, plant supplies and mulch used during landscaping does not contain any weed propagules.
- The natural vegetation walk and external class within the remnant vegetation in the eastern portion of the school grounds shall be clearly defined and signed to discourage access to intact native vegetation and to prevent the spread of weeds.
- Contractors, schoolchildren and teachers shall undergo an induction training program to identify native plants and declared and environmental weed species within the area.
- Signage shall be erected to inform of potential noxious weed species occurring within the area.

Monitoring: The school shall maintain regular check sheets of noxious weed invasions within the school grounds, particularly within remnant vegetation.

**Corrective
Action:**

Non-conformance with this plan shall be documented and a corrective action request (CAR) issued. All CARs shall be included in the Non-conformance register.

The Contractor shall implement the corrective action as required within the agreed time frame noted on the CAR.

The Contractor shall advise Caloundra City Council upon completion of the corrective action.

ELEMENT E14 – FERAL ANIMAL CONTROL MANAGEMENT

Policy: To maintain the school grounds in a manner which prevents the introduction and spread of feral animals within the school grounds and within remnant vegetation in and adjacent to the school.

Performance

Objectives: Declared feral animals under the *Rural Lands Protection Act 1985* are effectively controlled and removed from the school site.

Feral animals are not introduced to the school site.

Feral animals are prevented from establishing and spreading within the school grounds, particularly within remnant vegetation.

Implementation

Strategies: Feral animals likely to occur in the study site include domestic dogs, domestic cats, feral pigeons, cane toads, rats, house mice and possibly feral cats, foxes, mosquito fish and rabbits.

Rabbits and foxes are declared under the *Rural Lands Protection Act 1985*.

- Regular and on going monitoring of feral animals shall be undertaken to identify the presence of feral animals on site and to implement control strategies as required.
- No feral animals shall be introduced or kept on site.
- To discourage feral animals within the school grounds all waste shall be stored in appropriate containers. Waste shall be collected on a regular basis and comply with Caloundra City Council guidelines.
- On going monitoring of feral animals shall be undertaken to identify the introduction of feral animals and to implement control strategies as required. Particular attention shall be focused within and adjacent to remnant vegetation within the eastern sector of the school grounds.
- All feral animal invasions shall be treated promptly to prevent an increase in the population.
- Declared feral animals identified on site shall be managed according to the guidelines under the QDNR fact sheets on how most effectively to control and remove declared feral animals in Queensland.

2. INCIDENT/COMPLAINT RESOLUTION

Emphasis shall be placed upon the timely resolution of any complaints received in relation to development of the site and the development and implementation of corrective actions in response to non-conformities to the EMP (identified by the monitoring process).

The Performance Objective regarding complaint resolution is for the issue causing each complaint to be resolved in such a manner that there is no further complaint for the same reason.

The Contractor is to maintain an "Incidents and Events Register" which lists the date of the incident or complaint and the type of incident or complaint. For each incident, an incident/ complaint log is to be completed nominating:

- Date of incident;
- Nature of incident and associated information;
- Location of incident;
- Name of person or body which reported incident;
- Employee who received notice of incident;
- Project Manager's review and comment;
- Recommended action to resolve incident;
- List of organisations to be contacted with regard to incident;
- Outcome of actions undertaken subsequent to incident being recorded; and
- Date of resolution of incident.

Each incident is to be assigned a number to be entered on the master Incident and Event Register. Caloundra City Council is to be notified and directions sought with regard to corrective action for incidents that have the potential to cause environmental harm.

- Contractors, schoolchildren and teachers shall undergo an induction training program to identify potential feral animal species within the area.
- Landscaping within the school grounds shall use locally native plant species which attract native wildlife species.

Monitoring: The school shall maintain regular check sheets of feral animal occurrence within the school grounds, particularly within remnant vegetation.

**Corrective
Action:**

Non-conformance with this plan shall be documented and a corrective action request (CAR) issued. All CARs shall be included in the Non-conformance register.

The Contractor shall implement the corrective action as required within the agreed time frame noted on the CAR.

The Contractor shall advise Caloundra City Council upon completion of the corrective action.

ELEMENT E15 – LOCALLY ENDEMIC NATIVE PLANT REHABILITATION PLAN

Policy: To revegetate a minimum area of 0.93ha within the school site using locally endemic flora species with the intent of providing landscaped buffers through the school grounds which reflect the native biodiversity of remnant vegetation within the area.

Performance

Objectives: Revegetation zones within the school grounds shall be densely planted using locally native trees, shrub and groundcover species.

Implementation

Strategies: The majority of the study site has been extensively cleared of native vegetation for cattle grazing. However, a significant patch of remnant vegetation comprised of *Melaleuca* woodland and Eucalypt open forest with a well developed rainforest understorey occurs in the eastern portion of the study site. Part of this remnant vegetation is to be removed for construction of the school grounds.

To replace part of the vegetation loss a minimum area of 0.93ha within the school site shall be revegetated using locally native species. The revegetation scheme shall enhance the ecological condition of the cleared portion of the school site by providing native vegetative cover and resources suitable for locally occurring fauna species.

Species

Selection: Revegetation zones within the school grounds shall be densely planted with a diversity of native species identified in the remnant vegetation within the eastern portion of the school site.

Two native vegetation communities occur within the remnant, including, *Melaleuca* woodland merging into Eucalypt open forest with a rainforest understorey.

The northern portion of the remnant is dominated by mature *Melaleuca quinquenervia* (Broad-leaved Paperbark) woodland with some occurrence of *Glochidion sumatranum* (Umbrella Cheese Tree), *Melicope elleryana* (Pink Doughwood), *Casuarina glauca* (Swamp Oak) and *Allocasuarina littoralis* (Black She Oak). The groundcover is dominated by *Blechnum indicum* and a variety of rush and sedge species. *Lygodium microphyllum* (Climbing Fern), *Hibbertia scandens* (Twining Guinea Flower) and *Parsonsia straminea* (Monkey rope) occur throughout the woodland.

The Melaleuca woodland merges with a mature open forest of *Eucalyptus robusta* (Swamp Messmate) and *Eucalyptus tereticornis* (Forest Red Gum) with a well developed rainforest understorey. The rainforest understorey includes *Symplocos thwaitesii* (Buff Hazlewood), *Commersonia bartramia* (Brown Kurrajong), *Commersonia fraseri* (Brush Kurrajong), *Endiandra discolor* (Rose Walnut), *Alphitonia excelsa* (Red Ash), *Melicope elleryana* (Pink Doughwood), *Guioa semiglaucula* (Guioa), *Notolea longifolia* (Large Mock Olive), *Acmena hemilampra* (Broad Leaved Lilly Pilly), *Mischocarpus pyriformis* (Yellow Pear Fruit), *Jagera pseudorhus* (Foam bark Tree), *Ficus fraseri* (Sandpaper Fig), *Glochidion sumatranum* (Umbrella Cheese Tree), *Pittosporum revolutum*, *Macaranga tanarius*, *Livistona australis* (Cabbage-Tree Palm), *Archontophoenix cunninghamiana* (Piccabeen Palm), *Elaeocarpus obovatus* (Blueberry Ash), *Lophostemon suaveolens* and *Diospyros pentamera* (Black Myrtle).

A variety of vine species occur throughout the understorey including *Flagellaria indica* (Flagellaria), *Ripogonum brevifolium*, *Smilax australis* (Austral Sarsaparilla), *Melodinus australis*, *Parsonsia straminea* (Monkey rope), *Geitonoplesium cymosum* (Scrambling Lily) and *Hibbertia scandens*.

A diverse range of species have been selected for planting within the school grounds to reflect the natural diversity of the area and includes a mixture of groundcover, vine, shrub and tree species identified in the remnant vegetation within the eastern portion of the school site (refer to Table 1).

**TABLE 1. NATIVE SPECIES TO BE IMPLEMENTED
IN THE PLANTING PROGRAM OF THE SCHOOL SITE**

SPECIES	COMMON NAME	LIFE FORM
<i>Acmena hemilampra</i>	Broad Leaved Lilly Pilly	Medium tree to 35m tall.
<i>Allocasuarina littoralis</i>	Black She Oak	Tree up to 10m tall.
<i>Alphitonia excelsa</i>	Red Ash	Small to medium tree to 35m tall. Fruits important to a variety of bird species.
<i>Archontophoenix cunninghamiana</i>	Piccabeen Palm	Trunk up to 20m tall.
<i>Casuarina glauca</i>	Swamp Oak	Tree up to 20m tall.
<i>Commersonia bartramia</i>	Brown Kurrajong	Shrub or medium tree to 20m tall. Forms a quickly established canopy.
<i>Commersonia fraseri</i>	Brush Kurrajong	Shrub or small tree to 8m tall.
<i>Diospyros pentamera</i>	Black Myrtle	Tree up to 40m tall.
<i>Elaeocarpus obovatus</i>	Blueberry Ash	Tree up to 40m tall.
<i>Endiandra discolor</i>	Rose Walnut	Tall tree to 40m tall. Fruits important for a variety of bird species.
<i>Eucalyptus robusta</i>	Swamp Messmate	Tree to 25m tall.
<i>Eucalyptus tereticornis</i>	Forest Red Gum	Tree to 30m tall.
<i>Ficus fraseri</i>	Sandpaper Fig	Small tree.
<i>Flagellaria indica</i>	Flagellaria	Vine
<i>Geitonoplesium cymosum</i>	Scrambling Lily	Vine
<i>Glochidion sumatranum</i>	Umbrella Cheese Tree	Tree.
<i>Guioa semiglauca</i>	Guioa	Tree to 18m tall. Fruits important to a variety of bird species.
<i>Hardenbergia violacea</i>	Native Sarsaparilla	Climbing Ground Cover
<i>Hibbertia scandens</i>	Twining Guinea Flower	Vine
<i>Jagera pseudorhus</i>	Foam bark Tree	Tree up to 9m tall.
<i>Livistona australis</i>	Cabbage-Tree Palm	Single trunk 20-30m tall.
<i>Lophostemon suaveolens</i>	Swamp Mahogany	Tree to 25m tall.
<i>Lomandra longifolia</i>	Long leaved Matrush	Groundcover.
<i>Lomandra multiflora</i>	Many Flowered Matrush	Groundcover.
<i>Lygodium microphyllum</i>	Climbing Fern	Vine
<i>Macaranga tanarius</i>		Shrub or tree up to 6m tall.
<i>Melaleuca quinquenervia</i>	Broad-leaved Paperbark	Tree up to 25m tall.
<i>Melicope elleryana</i>	Pink Doughwood	Medium tree growing to 25m tall. Ornamental tree, very attractive to birds.
<i>Melodinus australis</i>		Vine
<i>Mischocarpus pyriformis</i>	Yellow Pear Fruit	Attractive bushy tree to 18m tall.
<i>Notolea longifolia</i>	Large Mock Olive	Tree to 9m tall.
<i>Parsonsia straminea</i>	Monkey Rope Vine	Vine
<i>Pittosporum revolutum</i>		Shrub up to 3m tall.
<i>Ripogonum brevifolium</i>		Vine
<i>Smilax australis</i>	Austral Sarsaparilla	Vine
<i>Symplocos thwaitesii</i>	Buff Hazlewood	Small Shrub or tree up to 15m or more tall.

**Planting
Strategy:**

The objective of the revegetation scheme is to provide landscaped buffers within the school grounds which reflect the native biodiversity of remnant vegetation within the eastern portion of the school site. The revegetation zones shall aim to create a canopy of Eucalyptus species over a rainforest understorey which will include a variety of tree, shrub, vine and groundcover species.

To more closely approximate natural communities, it is recommended that various species and lifeforms should be planted "mosaic-style" so as to avoid clumping of species and the formation of parallel planting rows. Higher planting densities are initially more expensive but result in a more rapid canopy closure which reduces follow up weeding and maintenance costs. Dense planting at 1 to 7 metre spacing for small to large species, respectively, generally achieve the optimum results.

The ideal time to undertake plantings is from late February to late April. It is important to avoid planting on long hot days and during the summer months when heat stress can decimate planting stock. Plantings shall be undertaken when it is raining or overcast and watered on a regular basis.

Finalised landscaping shall not provide a hazard in the event of a fire. No large trees shall be placed within 5 metres of access roads and paths or school facilities.

**Plant
Sourcing:**

It is preferable that seeds and propagating material to be used in the revegetation scheme are sourced from genetic material originating from the local area so as to maintain the local gene pool. As such, most of the propagating material could be collected from the remnant vegetation on site.

Where possible, it is recommended that existing immature native specimens which are to be cleared from the remnant vegetation in the eastern portion of the school site are salvaged and translocated to the revegetation sites within the school grounds.

Mulching:

The revegetation scheme shall use self seeding, low maintenance, native species in fully mulched beds to reduce maintenance.

Mulching can encourage the growth of seedlings by improving soil water retention and reducing weed invasion. Mulch shall be applied in a continuous layer to a depth of 80-100mm around each planting. All mulch must be free of weed propagules.

Any native vegetation cleared from the adjacent site shall be stockpiled and mulched for planting use. The mulch must be weed free and should be allowed to settle prior to use.

Maintenance: The landscaping program shall include a weed control program, requirements for fertilising and watering and a maintenance program.

It is recommended that fertiliser is applied to each individual planting during the planting process and dynamic lifter applied to plantings, as required, throughout the maintenance period for one year following planting.

Each individual shall be watered following planting. Follow-up watering shall take place as required in the morning or evening and as required to prevent wilting.

One of the most important factors in a successful revegetation program is follow up weed control. It is recommended that weeds are hand pulled and/or spot sprayed with a non residual herbicide such as glyphosate (eg. 1:100 Roundup).

On going monitoring of weed growth shall be undertaken to identify the presence of weeds and to implement weed control strategies as required.

Declared weeds shall be controlled according to the guidelines under the Declared Weed Control Management Plan.

Training: Personnel undertaking works on the site shall undergo an induction training program to identify native plants and weed species on site.

Access and Signage: Signage shall be erected to inform of rehabilitation works within the school grounds and to discourage access to planting areas.

Fencing shall be implemented where possible to control access and human activities in areas adjacent to planting zones.

Monitoring: Regular inspections of landscaped areas shall be conducted to identify weed invasions and to ensure compliance with the Locally Endemic Native Plant Rehabilitation Plan.

Reporting: The Contractor shall submit monthly reports to the Caloundra City Council concerning the performance of this Plan.

Corrective**Action:**

Non-conformance with this plan shall be documented and a corrective action request (CAR) issued. All CARs shall be included in the Non-conformance register.

The Contractor shall implement the corrective action as required within the agreed time frame noted on the CAR.

The Contractor shall advise Caloundra City Council upon completion of the corrective action.

APPENDIX A
STORMWATER QUALITY MANAGEMENT PLAN

1. INTRODUCTION

Runoff from the Perrins School Development will discharge towards Currimundi Creek via existing overland flow paths.

This report describes the stormwater quality improvement devices necessary to ensure that the development does not produce an unacceptable increase in the annual volume of sediment and nutrients discharged from the site towards Currimundi Creek.

Part of the water quality improvement will be achieved by utilising the existing Melaleuca stand (Covenant Area) for surface filtration and adsorption.

2. STORMWATER QUALITY OBJECTIVE

In order to provide best management practice with regard to stormwater management, a series of improvement devices are proposed. The devices will be located in series where practical (the so-called "treatment train") to provide progressive improvement in water quality.

The hierarchy of stormwater treatment devices will be as follows:

- *Primary Level Treatment*
 - Sedimentation of coarse particles within grass swales.
 - Screening of gross pollutants at drainage entry points.
- *Secondary Level Treatment*
 - Sedimentation of finer particles within extended grass swales and overland flow landscape features.
- *Tertiary Treatment*
 - Enhanced sedimentation and filtration in the stilling pond.
 - Filtration and adsorption on to sediments within the existing Melaleuca stand area.

Therefore, the objective of this stormwater management system is to ensure that the development of the school complex does not increase the amount of sediments and nutrients discharged from the site to Currimundi Creek.

3. STORMWATER QUALITY IMPROVEMENT DEVICES

The stormwater management strategy proposal for the site, rather than adopting a single stormwater treatment device, is to introduce a number of devices in series to ensure that the stormwater treatment objective for the site is achieved. The following treatment devices and techniques are proposed for the development:

- Runoff from roofs will be directed to grass swales or overland flow landscape features, or directly into pipes in highly pedestrian zones.
- Remaining surface stormwater runoff will be directed initially to swales or to kerbs, where it will be carried in the kerb and channel for minor flows, and on the road network for major flows. As required, gully pits will be provided to collect the minor event flow and any gross pollutants contained in the runoff.
- Runoff from car park areas will be directed by surface flow features to extended grass swales and rock filter landscape channels for the removal of oils and greases, as well as coarse sediment and other gross pollutants, before entering the pipe system.
- At the end of internal roadways, flow will be discharged to vegetated grasses or rock lined open swales. The grass swales will be relatively shallow to promote pollutant retention and facilitate maintenance. The swales will act as a pretreatment device for the pipe system and stilling pond basin (described below). It is envisaged that no topsoil will be used in the bed of the rock lined swales in order to promote infiltration.
- Due to the relatively flat nature of the site, a piped underground drainage system is required. Discharge from grass or rock lined swales shall be into grated headwalls or field entry pits, to collect any gross pollutants contained in the runoff.
- The outlet to the trunk stormwater pipe system shall terminate at a broad "letterbox" manhole, to facilitate stormwater flows re-emerging to natural surface level into a stilling pond, heavily vegetated at the perimeter. The pond will help promote sedimentation of finer particles and filtration as water exits the pond.
- Stormwater flow shall discharge from the pond, at natural surface level, to the east into and through the Melaleuca stand area, to provide additional filtration and adsorption via a natural vegetation (tertiary treatment) device before exiting the site towards Currimundi Creek.

3. EMP ELEMENTS

ELEMENT E1 – SITE CONTROL

Policy: To maintain construction compounds in a neat and tidy state without build up of litter and to provide a safe facility for the storage of construction equipment and materials.

Performance

Objectives: The site shall be maintained in a safe and tidy condition. Waste materials generated on site shall be stored in safe temporary storage prior to final disposal. All relevant Caloundra City Council by-laws shall be complied with.

Control

Measures: Within the site, the Contractor shall establish a Litter and Waste Control Plan, to manage the collection, storage and removal of all litter and waste on the site, whatsoever its origin.

All litter and waste, including pre-existing materials, construction wastes, human waste, used oils and any other surplus materials shall not be disposed of on site. Material shall not be burnt or buried on site. All such materials shall be collected as they are accumulated, using appropriate methods to enable their future removal from the site and disposal. All such materials shall be stored on site in approved secure confined area(s).

Specific areas shall be set aside for the storage of construction materials. In particular, a safe storage location for fuels and oils shall be provided, in accordance with *AS 1940 The Storage and Handling of Combustible Liquids*. This area shall be bunded in compliance with the standard.

Monitoring: The Contractor shall monitor the construction and record details of work areas, fencing, storage locations and access roads.

Weekly inspections of the site by the Contractor to verify locations and storage of litter and waste on the site.

Reporting: None required.

Corrective

Action: General site clean up to remove all litter and waste.

-
- Additional gratings may be located at various points, eg. walkway crossings, along the swale drainage systems to ensure that gross pollutants such as litter are captured.

It is considered that the overall treatment afforded by the above system will provide stormwater treatment applicable to the standard necessary for the site. When developing the above treatment strategy, due consideration was taken of the need to provide treatment measures which can be readily maintained. It is considered that the above system is practical in terms of maintenance in the long term.

The removal efficiencies and constraints affecting each of the treatment devices are described in Section 4.

4. SYSTEM PERFORMANCE

4.1 Grass Swales

Runoff from the catchment will be generally directed to grass swales and rock lined vegetated swales to allow the removal of coarse particulate matter and the removal of nutrients by the settlement of particulate matter and uptake by vegetation. The swales also provide pretreatment of runoff prior to its entry to the pipe system and stilling pond basin (see Figure 1).

The NSW Environment Protection Agency publication *Managing Urban Stormwater: Treatment Techniques (1997)* indicates the following removal efficiency for grass swales:

- Suspended Solids 75 to 100%
- Total Nitrogen 50 to 75%
- Total Phosphorus 50 to 75%

In comparison, the American Society of Civil Engineers (ASCE) publication *Design and Construction of Urban Stormwater Management Systems (1991)* indicates lower removal efficiencies:

- Suspended Solids 20 to 40 %
- Total Nitrogen 20 to 40 %
- Total Phosphorus 20 to 40 %

In order for optimal performance, the ratio of top width to depth needs to be 6:1 or greater (NSW EPA 1997). The adoption of 1 in 4 side slopes for grass swales will ensure that this criterion is met.

Other relevant design criterion include (NSW EPA 1997):

- Minimum swale lengths of 20 to 30 metres, where possible;
- Upstream portion of each swale to service areas no greater than 2 hectares; and
- Bed width to be between 0.6 metres and 2.5 metres in the upstream portions of swales.
- Rock lined edging may reduce overall width/depth ratios if enhanced with a densely vegetated bed.

4.2 Stilling Pond (Infiltration) Basin

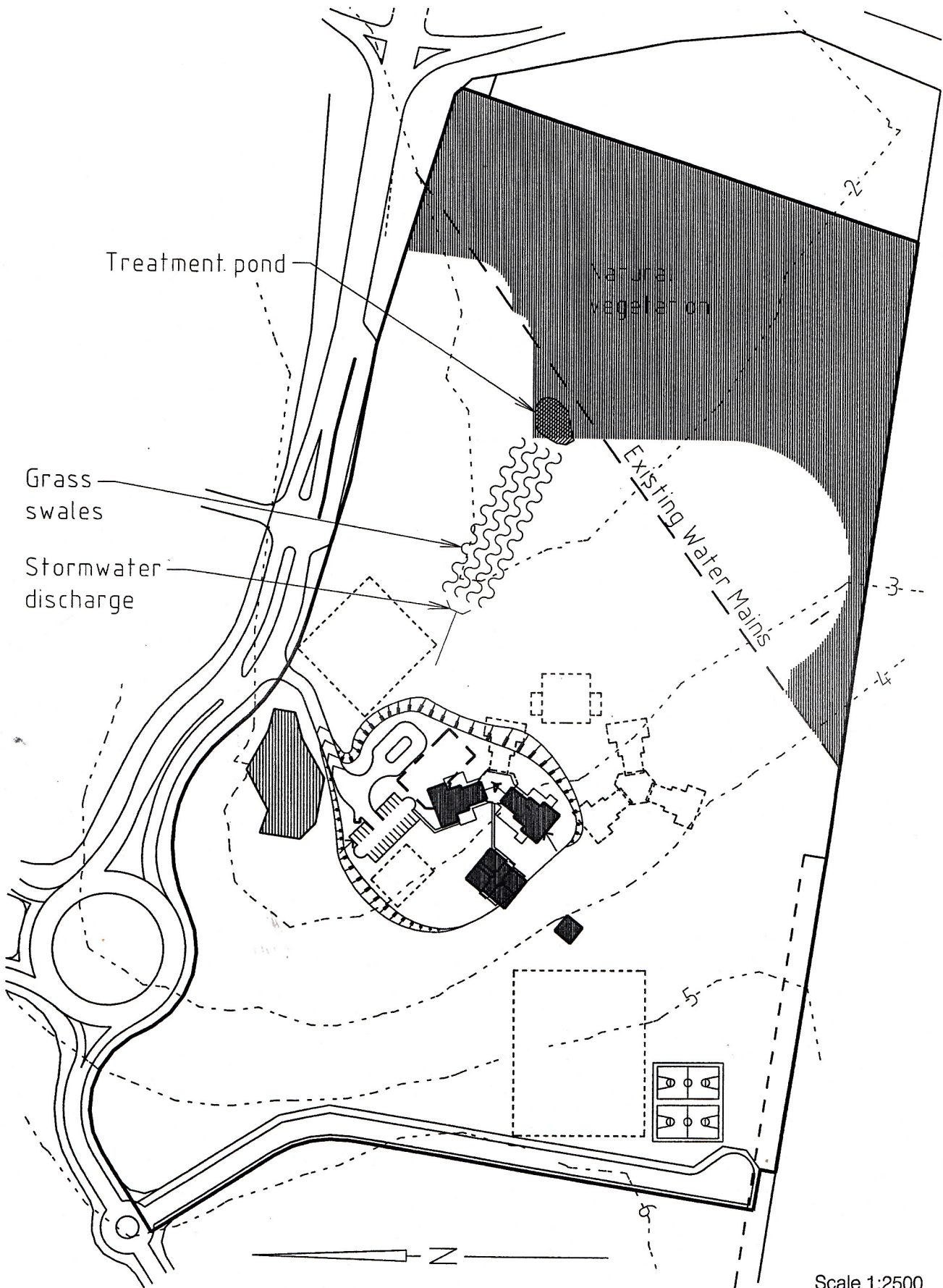
Runoff from the catchment will discharge from the pipe system and nearby swales into the stilling pond basin (see Figure 1). The pond will facilitate stormwater flows re-emerging to natural surface level and entering the Melaleuca stand area for additional filtering and sedimentation processes.

The heavily vegetated perimeter will assist the filtering process, however the scale of the pond area is sufficiently limited to be realistically considered predominantly as a conveyance device, with infiltration and sedimentation benefits.

5. CONCLUSIONS

The following stormwater management techniques are proposed for the Perrins School Development:

- Discharge of roofwater via swales (or pipes);
- Treatment of runoff from car parking areas via extended grass and rock filter swales to remove oils, grease, coarse sediment and other gross pollutants;
- Use of grass and rock lined swales to remove coarse sediment and some nutrients and provide additional infiltration;
- Discharge of all runoff to the stilling pond basin; and
- Discharge of flows from the pond as overland flow into the Melaleuca stand area for additional natural filtration, before flowing or infiltrating towards Currimundi Creek.



Scale 1:2500

STAGE 1 STORMWATER TREATMENT

FIGURE 1

Rev: Orig. Date: 15 September 2000

Project No.: 1478/50

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X-Ref:

PERRINS SCHOOL DEVELOPMENT
LENSWORTH KAWANA WATERS

ELEMENT E2 – RESIDENTIAL AMENITY

Policy: To minimise the impact of the construction on the local community.

Performance

Objectives: No unreasonable disruption to the residential amenity of the local area shall be allowed.

Control

Measures: The Contractor should establish an induction program to the satisfaction of the construction Project Manager, to inform all site workers of environmental protection requirements and practices on the site, prior to their commencement on the site. Particular emphasis will be placed on truck movements to and from site, and compliance with specified operating hours, so as to limit the potential for noise and dust impacts on existing residential areas.

The Contractor shall advise local residents (occupants of all residences and industries located within 500 metres of the marked work area) of the proposed construction and the proposed construction programme; shall provide means to advise residents and landowners in advance of construction activities that may impact upon them; and establish a system to receive complaints and comments from and to seek the cooperation and assistance of the community.

Monitoring: The Contractor shall maintain records of the Contractor's induction training, and all communications of whatever nature with local residents.

Reporting: Monthly reporting by the Contractor on the monitoring, including full details of any contentious issues and actions taken to maintain mutual cooperation.

Corrective

Action: Offending activities resulting in a complaint from a resident or residents shall be stopped or remedial action instigated by the Contractor to the satisfaction of the construction Project Manager.

ELEMENT E3 – AIR QUALITY

Policy: To minimise the impact of construction activity on air quality.

Performance

Objectives: To comply with the *Environmental Protection Act*, the subordinate *Environmental Protection Policy (Air)* and Caloundra City Council By-Laws and health and safety requirements. A set of appropriate standards is given in the Table below.

Control

Measures: The Contractor shall establish an Air Quality Control System to the satisfaction of the consultant, prior to commencing work, to manage air quality control on the site. The following specific issues will be addressed:

FUMES: All equipment shall be efficient, operated in accordance with established operating procedures and maintained to minimise exhaust emissions. Engines shall not be left idling needlessly.

All vehicles and plant shall be properly maintained so as to ensure that emission levels are less than the limits defined by relevant Commonwealth Department of Transport and Regional Services Federal Office of Road Safety Australian Design Rules:

- ADR30 Diesel Engine Exhaust Smoke Emissions
- ADR36 Exhaust Emission Control for Heavy Duty Vehicles
- ADR37 Emission Control for Light Vehicles
- ADR70 Exhaust Emission Control for Diesel Engine Vehicles

ODOURS: All materials (eg. paints) or processes (eg. painting) that generate fumes or odours shall be properly stored and used with efficient equipment to established procedures.

DUST: Dust control measures shall be used on all processes that generate dust. Wind break screens shall be employed where considered necessary between working areas and abutting residential areas.

EARTHWORKS:

Earthworks shall be managed to control dust. Specific control measures include:

- Completion of vegetation clearing in stages, in order that a minimum area of ground is open at any one time;
- Early stabilisation and revegetation of cut or filled areas and slope works using, for example, wood chip layers;
- Watering of all exposed areas, including haul routes; and
- Provision of windbreaks and silt fences as required.

DELIVERIES:

Stockpiles shall be managed to control dust. Specific control measures include:

- Covering of loads entering and leaving the site;
- Collection of material which falls from trucks or their wheels on a daily basis;
- Removal of excess soil from wheels of vehicles which leave site; and
- Regular watering or other suitable dust control of non-sealed access roads.

STOCKPILES:

Deliveries shall be managed to control dust. Specific control measures include:

- Minimisation and stabilisation of stockpile areas;
- Maintenance of stockpiles within designated areas and prevention of spread of stockpile material into adjacent areas;
- Creation of no more stock piles than are necessary, and removal of all stockpiles upon completion of works on site; and
- Provision of windbreaks and silt fences as required.

**RECOGNISED AIR QUALITY CRITERIA AS PER ENVIRONMENTAL
PROTECTION (AIR) AMENDMENT POLICY (No. 1) 1998 - DUST EMISSION**

PARAMETER	MAXIMUM ACCEPTABLE CONCENTRATION
Annual, 24 hour averaged dust concentration, total suspended particulate	90 Fg/m ³
Annual, 24 hour averaged dust concentration, as PM ₁₀	50 Fg/m ³
24 hour average dust concentration, as PM ₁₀	150 Fg/m ³
Visibility	20 km
Average dust deposition rate	120 mg/m ² /day

Note: PM₁₀ is the suspended particulate matter less than 10 microns in diameter.

Monitoring: Daily inspections of the site by the Contractor of the types, locations and details of control measures in place. Weekly recording by the Contractor on the effectiveness of control measures in place.

Maintain regular records of meteorological conditions, ie. wind speed, direction and rainfall. (Records to be obtained from closest weather station).

Recording by the Contractor of all air quality complaints received and details of all control measures undertaken. No dust is to be visible at the site boundary at any time. Where this is observed, control measures as outlined above are to be implemented.

Reporting: Monthly reports by the Contractor to the consultant on the monitoring activities, control measures and corrective action undertaken.

Corrective Action: If air quality complaints are received by the Contractor or Council from adjacent residents, the Contractor will investigate those complaints. If necessary, air quality control measures shall be reviewed and upgraded if appropriate.

ELEMENT E4 – NOISE CONTROL

Policy: To control noise generated by construction activities and minimise the impact of noise to ensure acceptable levels of amenity for the local community.

Performance

Objectives: To comply with the *Environmental Protection Act*, Caloundra City Council By-Laws and recognised noise criteria as contained in Environmental Guideline E1 "Noise from Construction, Reconstruction, Maintenance and Demolition Sites".

Control

Measures: The Contractor shall establish a Noise Control Plan to minimise noise levels that would be an annoyance to adjacent residential areas. All noise generating mobile and stationary plant and equipment, and processes shall be controlled to minimise noise emission in accordance with AS 2436.

Control measures may include:

- The fitting of effective residential grade exhaust silencers to all mobile plant;
- The fitting of engine acoustic shielding;
- Using exhaust silencers on compressed air exhausts;
- The use of physical noise barriers such as earth mounds or mobile screens; and
- Review of times of operation of plant.

Lighting devices shall be used instead of whistles, bells and buzzers to control site operations. Audible alarms shall only be used for safety warnings.

In addition, all vehicles leaving or entering the site or used within the site shall be operated and maintained in a manner which ensures that the noise levels produced by the vehicles are within the limits of the Commonwealth Department of Transport and Regional Services Federal Office of Road Safety Australian Design Rule *ADR28- External Noise of Motor Vehicles*.

In the event of the adjusted noise level for a single noise source or activity exceeding the maximum noise level by more than 10 dB(A), consideration shall be given to restricting the times during which the activity can take place to a number of separate hours each day. Persons affected by the noise shall be consulted with regard to suitable hours and advised of the agreed operations schedule.