5. Construction Management Plan

5.1 Introduction

A Construction Management Plan (CMP) has been prepared by Ardill Payne and Partners (APP) for the proposed civil works associated with the construction of Stage 1 of Pacific Pines Estate, at Montwood Drive, Lennox Head, in accordance with the Department of Planning's Director-General's Environmental Assessment Requirements.

This plan incorporates the following areas:

- Site clearing and bulk earthworks
- Civil infrastructure construction
- Traffic and pedestrian management
- Materials storage and waste management
- Soil and water management
- Noise and vibration management
- Flora and fauna management
- Pavement damage and restoration

5.2 Site Details and Proposed Development

5.2.1 Existing Site

The total development area comprises approximately 80.48 hectares and is described in real property terms as Lot 234 in DP 1104071. Stage 1 comprises approximately 24.7 hectares. The site is bordered by previous stages 1 to 4 to the south, Lot 233 in DP 1104071 to the east, Lennox Meadows Estate to the north, and undeveloped land and proposed playing fields to the west. Access to the site is via either Hutley Drive to the north or Montwood Drive to the south.

The site is situated on the eastern bank of North Creek. Site elevations within the development area range from approximately RL 2.0m to RL 50.0m AHD. The majority of the site slopes west, draining into a man-made Water Quality Control Pond (WQCP) before entering North Creek. The site is a valley with a central low lying area surrounded by steep to gently inclined slopes.

The majority of the site has been cleared of native trees and shrubs due to its recent use as cattle grazing land, with vegetation consisting primarily of open grassland and remnant stands. Some endangered environmental communities have been identified and will be managed in accordance with the landscape report.

5.2.2 Proposed Development

Stage 1 of the proposed development will comprise the clearing and filling of the central low lying area create a number of conventional residential allotments, “super lots” for future integrated housing development, public open space, a medium density site, the extension of Hutley Drive from Lennox Meadows Estate, and the embellishment of the playing fields to include amenities and parking.

Fill material to complete the bulk earthworks will primarily be sourced on-site from a ridge located north-east of the proposed Stage 1. Approval to excavate and relocate this material was granted under DA 1999/248 (Stage 3A) dated 16 August 1999. Haulage routes will be contained within the construction site and will not access public roads. Construction vehicles will access the site via either Hutley Drive or Montwood Drive.

The proposed site layout is shown on **Figure 1**.

5.2.3 Signage

Prior to commencement of works, a sign detailing the project and containing the names and contact numbers of the Developer, Contractor, Consulting Engineer, and Principal Certifying Authority shall be erected and maintained in a prominent position at the site.

The sign information shall also contain the name and a 24hr contact number for the Site Manager, and state that “Unauthorised entry to the site is prohibited”.

5.3 Site Clearing and Bulk Earthworks

5.3.1 Construction Details

Construction activities will commence with the filling of the low lying areas of the site to finished levels in accordance with approved drawings. Fill material will be obtained from an on-site source and will be free from contaminants, including Potential Acid Sulfate Soils.

5.3.2 Works Program

Generally proposed site clearing and bulk earthworks will include the following stages:

- Implementation of Management Plans
- Removal of existing vegetation where permitted
- Bulk earthworks

5.3.3 Overhead Power

Overhead power lines shall be “tagged” where necessary to alert the operators of construction equipment such as cranes, excavators, tippers, etc.

5.3.4 Hours of Operation

Construction activities will be restricted to between 7:00am and 6:00pm on weekdays and 8:00am and 1:00pm on Saturdays. No noisy construction activities will occur on Sundays or public holidays.

Activities disturbing traffic flows are not permitted on weekends or public holidays to avoid peak periods.

5.3.5 Site Access

The site access for all construction and work vehicles shall be via either Hutley Drive or Montwood Drive.

5.3.6 Refuse / Solid Waste

All demolition rubble (pipes, concrete, etc) will be removed from the site during the site clearing phase. Prior to construction, the Principal Contractor will nominate a position for solid waste storage, and will ensure that adequate storage is provided for the duration of the building works. Solid waste will be stored in a skip bin or similar fitted with a lid to contain blowable waste. Waste shall be removed from the site by a licensed waste removal company to a Council Approved waste facility.

5.3.7 Trees

Trees removed during the site clearing shall be chipped and stockpiled on site for later reuse in landscaping. Burning of trees is not permitted without a permit.

Any trees not approved for removal shall be suitably protected during construction.

5.4 Civil Infrastructure Construction

5.4.1 Construction Details

Construction activities will include the construction of roads, stormwater drainage, sewer and water reticulation, electrical and telecommunications reticulation, embellishment of the playing fields and landscaping.

5.4.2 Construction Program

Generally, proposed construction on the site will include the following stages:

- Implementation of Management Plans
- Construction of roads and services

5.4.3 Overhead Power

Overhead power lines shall be "tagged" where necessary to alert the operators of construction equipment such as cranes, excavators, concrete pumps, tippers, etc.

5.4.4 Hours of Operation

Construction activities will be restricted to between 7:00am and 6:00pm on weekdays and 8:00am and 1:00pm on Saturdays. No noise generating construction activities will occur on Sundays or public holidays.

Activities disturbing traffic flows are not permitted on weekends or public holidays to avoid peak periods.

5.4.5 Deliveries and Access to the Site

The site access for all delivery, construction and work vehicles will be via either Hutley Drive or Montwood Drive. No access to the construction site will be available via Stoneyhurst Drive, Fox Valley Way or Lakeside Way.

5.4.6 Refuse / Solid Waste

Prior to construction, the Principal Contractor will nominate a position for solid waste storage, and will ensure that adequate storage is provided for the duration of the building works. Solid waste will be stored in a skip bin or similar fitted with a lid to contain blowable waste. Waste shall be removed from the site by a licensed waste removal company to a Council Approved waste facility.

5.4.7 Traffic and Pedestrian Management

Shall be in accordance with the management measures outlined in Section 5.5 of this Management Plan.

5.4.8 Soil and Water Management

Shall be in accordance with the management measures outlined in Section 5.7 of this Management Plan.

5.4.9 Noise and Vibration Management

Shall be in accordance with the management measures outlined in Section 5.8 of this Management Plan.

5.4.10 Flora and Fauna Management

Shall be in accordance with the management measures outlined in Section 5.9 of this Management Plan.

5.5 Traffic and Pedestrian Management

5.5.1 Introduction

A Traffic Control Plan (TCP) will be required for the site. If the number of truck movements on the public roads are greater than 20 per shift, a Vehicle Movement Plan will be required in accordance with the Roads and Traffic Authority's Manual "Traffic Control at Work Sites – Version 2".

The Principal Contractor refers to a nominated employee of the main construction company engaged by the developer on the site. The Site Manager is the Principal Contractors most senior employee on the site who is responsible for overall construction activities. The Principal Contractor is responsible for the performance of the Site Manager.

5.5.2 Existing Environment in the Immediate Vicinity

The site is located at the southern end of Lennox Head in an expanding development area. The existing traffic environment is summarised as follows:

5.5.2.1 Adjoining Development

The site is bordered by previous stages 1 to 4 and the WQCP to the south, Lot 233 in DP 1104071 to the east, Lennox Meadows Estate to the north, and undeveloped land and proposed playing fields to the west. A children's playground is located at the end of Montwood Drive adjoining the construction site.

The construction site will accessed from the north via Hutley Drive, and from the south via Montwood Drive. No access to the construction site will be available via Stoneyhurst Drive, Fox Valley Way or Lakeside Way.

5.5.2.2 Road Pavements

Pavement widths of adjacent roads, and condition and type of surface, are as follows:

- **Hutley Drive** – two way, two lane traffic; 13m wide between kerbs. Asphaltic concrete surface in good condition. A concrete footpath/cycleway is located on the eastern side of the road.
- **Montwood Drive** – two way, two lane traffic; 11m wide between kerbs. Asphaltic concrete surface in good condition.

5.5.2.3 Parking

There is currently very little demand for parking in the vicinity if the construction site.

5.5.2.4 Traffic Flows

Traffic flows on Hutley Drive and Montwood Drive are highest during peak periods which generally occur on weekends and public holidays and school holidays. Local traffic peak periods may also occur on week days between about 7:30am to 9:00am, and 4:30pm to 6:00pm.

5.5.2.5 Services

Existing services (water, sewer, stormwater, power and Telstra) are generally located within the road reserves adjoining the proposed development.

The Principal Contractor is to confirm the location of services prior to commencing work on the site.

5.5.2.6 Footpaths / Cycleways

A concrete paved footpath is located along the eastern side of Hutley Drive north of the site. This footpath links Lennox Meadows Estate to the village via an underpass beneath the Lennox Head bypass road.

5.5.3 Traffic Management Proposals

The following traffic management proposals shall be read in conjunction with the attached drawing:

- **Heavy Vehicle Movement Plan** – Hutley and Montwood Drives are the proposed routes that heavy vehicles associated with the development will use.

Prior to the implementation of any traffic control, an RTA Accredited Certifier shall inspect the site to ensure that control devices are in place and that they are adequate for the conditions at the time of construction.

Traffic Control Plans will be prepared at time of construction.

5.5.3.1 Pedestrians / Cyclists

Construction fencing shall be erected to separate the construction site from the adjoining developed areas, and appropriate warning signage shall be erected to prohibit pedestrian access to the site.

Signage shall state that “Unauthorised entry to the site is prohibited”.

The Site Manager will ensure that construction works do not damage or obstruct the pedestrian and cycle routes external to the site, and will undertake regular inspections to ensure they are safe and adequate. These requirements will be covered in the Principal Contractor’s Environmental Management Plan for the site.

5.5.3.2 Construction Traffic

Access to the site for all construction vehicles will be via either Hutley Drive or Montwood Drive.

Site Clearing and Bulk Earthworks

It is noted that because all haulage vehicle movements will occur on site, haulage traffic is not expected to impact upon existing traffic flows.

All construction vehicles will enter and leave the site in a forward direction. A Heavy Vehicle Movement Plan for heavy vehicles associated with the development is shown on **Figure 2**. Vehicle speeds on roads adjoining the development are presently 50km/hr.

Lockable gates will provided in the fence to permit access to the construction site by authorized personnel only. Warning signs will be erected in Hutley Drive and Montwood Drive warning of the increased truck activity on these roads.

Civil Infrastructure Construction

Where possible, deliveries will occur between the hours of 7:00am and 6:00pm on weekdays. The site access for delivery trucks will be via either Hutley Drive or Montwood Drive.

Delivery vehicles and concrete trucks will be able to enter and leave the site in a forward direction. All loading and unloading will be undertaken on site.

Subcontractors

The Site Manager shall ensure that all subcontractors are aware of the requirements of this plan and enforcement of its requirements. All subcontractors will be advised at "Tool Box Meetings" of parking and access requirements.

Parking

It is proposed that during construction adequate parking for construction vehicles will be available on the site. Parking of construction vehicles will be prohibited along Hutley Drive and Montwood Drive.

5.5.3.3 Signage

Signage shall be in accordance with the Traffic Control Plans prepared at time of construction. Changes are not permitted, except during emergencies, without the approval of the RTA Accredited Certifier.

5.5.3.4 Emergency Contacts and Responsibilities

Throughout construction a sign shall be prominently displayed on the site with contact details of an appropriately trained person to contact in the event of an accident or emergency on the site or associated with the development.

The Principal Contractor is responsible for implementing traffic control devices and for ensuring that they are properly maintained. The Site Manager is to notify the RTA Accredited Certifier of any discrepancies or amendments which may be required during the construction period. Additionally the Site Manager shall ensure that all sub-contractors and suppliers are aware of the requirements of the Traffic Control Plan and adhere to these requirements.

A notice shall be placed in the local newspaper to advise of the commencement of job and possible disruption to traffic and changed pedestrian conditions.

5.6 Materials Storage and Waste Management

5.6.1 Materials Storage

Prior to construction, the Principal Contractor will nominate a position for materials storage. The Principal Contractor will be responsible for providing adequate storage area for the duration of the construction. The Site Manager will be responsible for storage management during construction.

Fuels and oils will not be stored on site. Some earthmoving machinery may be refuelled on site from 4WD mounted tanks. Any spills shall not be permitted to discharge to any watercourse. Regular machine and truck maintenance will not be undertaken on site.

5.6.2 Waste Management

The Principal Contractor will be responsible for providing a waste management procedure for the duration of the construction. The Site Manager will be responsible for waste management during construction.

All demolition rubble (pipes, concrete, etc) will be removed from the site during the site clearing phase. Waste shall be removed from the site by licensed contractors to a Council approved waste facility.

Trees removed during the site clearing shall be chipped and stockpiled on site for later reuse in landscaping. Burning of trees is not permitted without a permit.

In-situ material assessed by the Geotechnical Consultant as being unsuitable as subgrade material under filled areas shall be excavated and removed from the site to an approved location. This material shall be assessed for Potential Acid Sulfate Soils and treated accordingly.

5.7 Soil and Water Management

5.7.1 Overview

The Environmental Consultant referred to in the following sections is a Consultant independent to the Principal Contractor, who is employed directly by the Developer.

Soil and water management shall cover the following stages:

- Site clearing and bulk earthworks
- Civil infrastructure construction

The stages are covered below and sediment and erosion control plans and details are included with the Construction Drawings for the project. Treatment measures are covered in Sections 7.2 to 7.5, and the monitoring and testing requirements for the project are provided in Section 0.

Site clearing and bulk earthworks involves the removal from the site of the existing vegetation and structures affected by the works, and the winning, hauling, placing and compacting of approved on-site fill material to bring the site to finished levels in accordance with approved plans. Termination of any existing services shall be by licensed contractors prior to their removal.

Civil infrastructure construction involves the construction of roads and the installation of services.

The following issues may be raised during site clearing, bulk earthworks, and civil infrastructure construction:

- Management/Identification of PASS
- Dust control due to excavations and filling
- Prevention of sediment leaving the site
- Dewatering of excavations

Temporary sediment controls are described in Section 7.4 below. The Site Manager will ensure that these procedures are followed and that sediment controls are maintained and adequate. All loads shall be covered. The Site Manager is responsible for monitoring the condition of adjacent streets and organising for cleaning of the road surfaces if required.

5.7.2 Dewatering

Water discharged from the site needs to meet the background water quality levels.

Any rain water or ground water that collects in excavations shall be pumped from the excavation to a temporary sediment basin, or allowed to infiltrate back into the soil.

Prior to discharging to the street system it may be necessary to treat the ponded water to achieve the background levels using the chemicals and methods listed in **Table 1**.

Table 1 Water Treatment Methods

Parameter	**Methods**
pH	Agricultural Lime or Hydrated lime with approval
Suspended Solids	Gypsum or approved flocculation agent
Dissolved Oxygen	Aeration of clean water prior to release
BOD	Aeration, filtration and clarification of water prior to release

Generally water treatment will involve pumping any ponded water to a temporary sediment basin where lime and flocculation agents, if required, are added, and the water may be aerated. The water will then be allowed to settle out, after which it will be retested. Upon attaining a satisfactory water quality, the ponded water may be released to the stormwater system.

5.7.3 Dust

Dust from the site shall be managed to prevent excessive degradation in air quality or nuisance to adjacent sites. This will be measured by limiting complaints from neighbours to less than one per week.

Dust shall be managed by limiting the disturbed areas to a manageable size, and progressively rehabilitating the site as the filling proceeds. During bulk earthworks, dust shall be controlled onsite by watering sprays or similar, as well as the following when necessary:

- Limiting traffic on disturbed areas
- Covering of stockpiles with anchored geofabric
- Dust covers provided on trucks and dumpers
- Surfaces shall be left in a rough cloddy condition to increase roughness and slow wind surface speed.

Where wind speed exceeds about 10m/s (36km/hr), or a watering spray/truck is not available, activities generating dust shall cease until the Site Manager is satisfied that dust controls are operating effectively and air quality is not causing a nuisance.

In the event that dust control is unsatisfactory then some of the following measures may be utilised:

- Inspect existing controls and clean, upgrade or improve as required
- Open weave barrier fencing is to be provided on the windward side at right angles to the prevailing wind direction in accordance with the Department of Housing's "*Managing Urban Stormwater: Soils and Construction*" guideline
- Disturbed areas are to be covered with geotextile
- Temporary access and haul roads, and parking areas, shall be sealed with a gravel layer
- Construction activities to stop, disturbed areas stabilised and the Dust Control measures reviewed

In the event of continuing complaints from neighbours, dust monitoring shall be conducted in accordance with AS3580.10.1 (1991).

The Site Manager is responsible for visually monitoring air quality and the adequacies of dust control measures at least daily, and as required to ensure that the above requirements are satisfied and performance is satisfactory. In the event of unsatisfactory dust control as indicated by excessive complaints, the Principal Contractor is responsible for initiating a review of the dust controls and dust monitoring as required.

5.7.4 Erosion and Sediment Control

Erosion of the site shall be minimised and sediment should not adversely impact surrounding water bodies or areas. Generally the quality of stormwater runoff from the site will be maintained by:

- Limiting traffic on disturbed areas
- Careful management of stockpiles. It may be necessary to cover stockpiles
- The implementation of sediment control structures such as temporary sediment traps, sediment fencing and truck shake-down areas
- Street cleaning as required to remove sediment.

A concept Erosion and Sediment Control Plan has been prepared and is included in Section 4 of the Main Report.

5.7.5 Acid Sulfate Soil Management

It is possible that Potential Acid Sulfate Soils (PASS) will be excavated as part of the proposed site clearing and bulk earthworks construction. PASS may be excavated when removing unsuitable subgrade material from areas to be filled. An Acid Sulphate Management Plan has been prepared for the site and is provided in section 7 of the Engineering Report for the Part 3A Application for Pacific Pines November 2007. Refer to Appendix G Volume 2 of this submission to the Department of Planning.

5.7.6 Monitoring requirements

Surface water samples shall be collected in laboratory supplied containers. Soil samples (for PASS assessment) shall be a minimum of 0.3kg and stored in sealed plastic bags or airtight containers with all free air removed. Samples shall be placed in cold storage and sent to a NATA registered laboratory for analysis within 24hrs of collection.

A diary is to be kept onsite for the sole purpose of monitoring soil and water and shall be available for inspection by the Engineer, Council or State Government officers at all times. This is to include:

- all monitoring results;
- calibration times and dates;
- laboratory test results for liming rates, water quality monitoring, confirmatory testing;
- Details of soil batches covering test results, volumes, removal dates, etc;
- Details of inspections, site instructions, completion of remedial works, etc.

A report incorporating these results shall be forwarded to the Engineer on a monthly basis.

5.7.6.1 Site Clearing and Bulk Earthworks

The site is to be inspected by an Environmental Consultant at the start of any excavation to ensure that appropriate erosion and sediment controls are in place Should it be necessary to dewater excavations, the Environmental Consultant shall be onsite to record water quality. Only when satisfactory water quality is achieved may water be discharged from the site.

Excavated soil samples are to be collected to assess neutralising lime requirements. Following the addition of lime as specified, the Environmental Consultant will collect confirmatory samples for analysis.

The Environmental Consultant will instruct a designated staff member of the Principal Contractor who is permanently onsite on how to sample and monitor the water quality, and on how to obtain soil samples for PASS assessment.

Dust control shall be monitored by the Site Manager as described above. In the event of excessive complaints, the Environmental Consultant shall be notified who will liaise with the Principal Contractor to correct the problem.

5.8 Noise and Vibration Management

We recommend that the construction firm observe the following treatments and principles to manage potential noise impacts:

- Ensuring that works are conducted between 7:00am and 6:00pm Monday to Friday, and 8:00am to 1:00pm Saturdays. In special cases, if the time restrictions cannot be met, the construction manager should contact Council for a temporary relaxation of the time restriction. It would be necessary to notify all potentially affected residents that out of hours work will be conducted, and the times for such works.
- Maintenance of the internal haulage roads. These roads shall be inspected regularly, and potholes or rough areas be smoothed to reduce truck “bounce”.
- Maintenance of equipment. Regular maintenance of stationary and mobile equipment, including off-site vehicles. By maintaining equipment, noise emissions from older equipment will be similar to that of new equipment.
- Use and siting of equipment. By locating noisy equipment as far away from noise sensitive premises as is practical, distance separation will reduce potential noise impacts. Unloading building materials should be conducted as far away from noise sensitive premises as possible.

- Assign the task of managing noise emissions to a person (the 'responsible person') that is likely to be present on-site most of the time that activity is occurring. This person would be responsible for handling noise complaints sensitively, and ensuring that work does not commence before the times specified above.
- Encouraging workers to not congregate outside the site before 6.45 a.m.
- If complaints arise regarding noise, the complaint will be directed to the 'responsible person', who will determine the source of the noise, and take immediate steps to mitigate the noise. This may involve moving the noise source further away from affected premises, replacing the equipment, or in some cases, engaging a qualified acoustic consultant to provide specialist control advice.

5.9 Flora and Fauna Management

A Flora and Fauna Assessment for the site has been completed by Geolink and Cardno. Dieke Richards has prepared a landscape strategy in response to this report. All civil works shall be managed to protect species identified in this report as requiring protection. Refer Illustration P3 of the Stage 1 Landscape Plan.

5.10 Pavement Damage and Restoration

Prior to the commencement of construction it is recommended that a dilapidation survey be carried out on the surrounding street system to assess their existing condition.

The Site Manager shall be responsible for monitoring the condition of the pavements during construction in terms of cleanliness and structural integrity, and organising street cleaning and/or remedial works as required. Following completion of construction, the condition of the pavements shall be jointly inspected by Council and Principal Contractor and assessed against the initial dilapidation survey. Remedial works as agreed between these parties shall be the responsibility of the Principal Contractor.

Issue	Date	Amendment	App'd

ARDILL PAYNE & PARTNERS

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Project:

PACIFIC PINES ESTATE

OFF NORTH CREEK ROAD

LENNOX HEAD

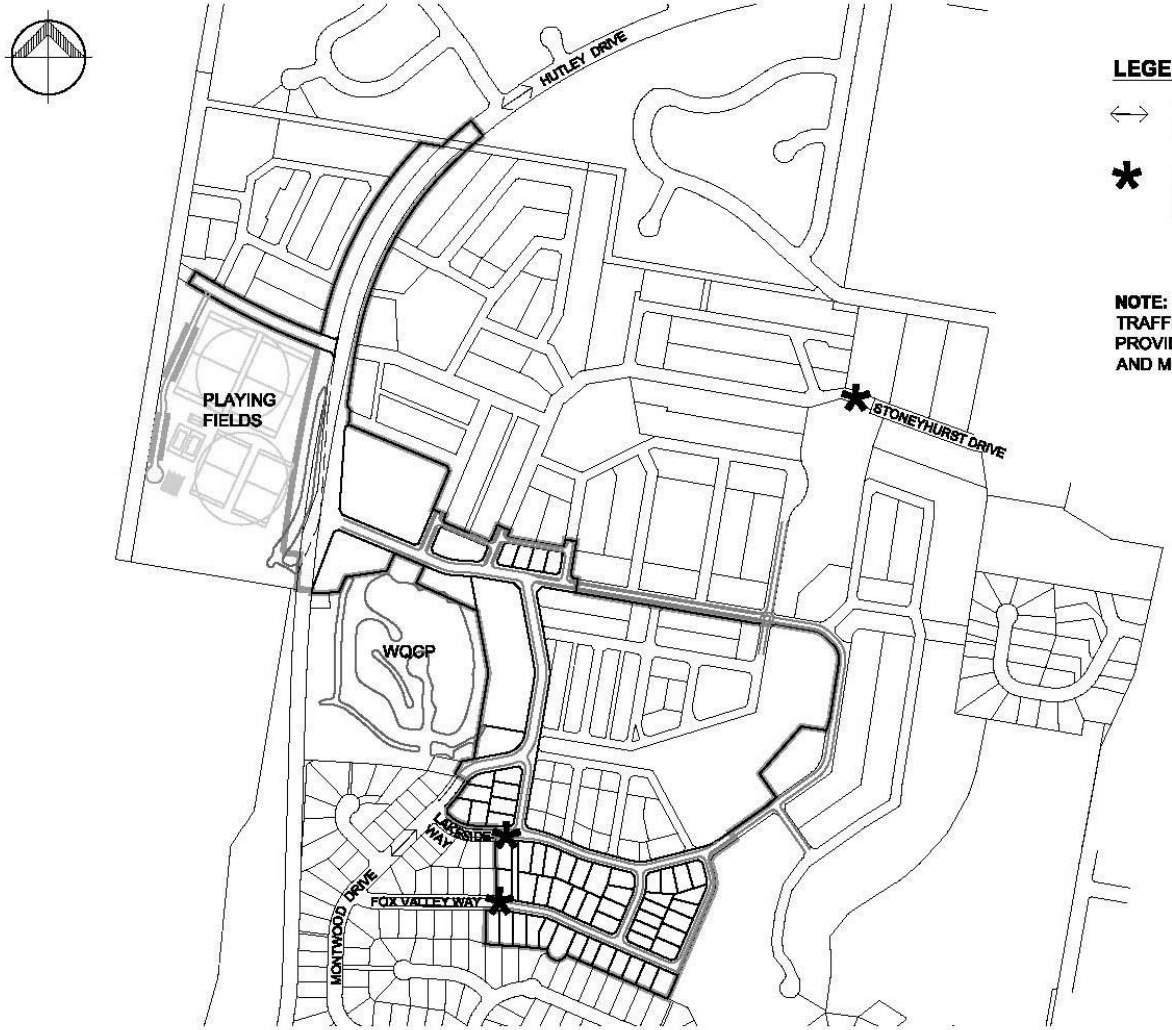
Client:

PETRAC PTY LTD

Title:

SITE LAYOUT

Design	TC	Scale at A4	NTS
Drawn	NB	Datum	AHD
Date	6-9-07	Filename	6501-CMP-FIG2.dwg
Checked		Approved	
Job No.	6501	Dwg. No.	FIG-1
		Issue	



LEGEND:

⟷ HEAVY VEHICLE ACCESS

* NO ACCESS TO CONSTRUCTION SITE

NOTE:
TRAFFIC CONTROL TO BE PROVIDED IN HUTLEY DRIVE AND MONTWOOD DRIVE

Issue	Date	Amendment	App'd

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Project:
PACIFIC PINES ESTATE
OFF NORTH CREEK ROAD
LENNOX HEAD

Client:
PETRAC PTY LTD

Title:
HEAVY VEHICLE MOVEMENTS

Design	TC	Scale at A4	NTS
Drawn	NB	Datum	AHD
Date	6-9-07	Filename	6501-CMP-FIG2.dwg
Checked		Approved	
Job No.	6501	Dwg. No.	FIG-2
		Issue	