



## Development Services Attachments Wednesday, 21 September 2016

| REPORT NUMBER | REPORT TITLE AND ATTACHMENT DESCRIPTION  | PAGE NUMBER(S) |
|---------------|--|----------------|
| <b>9.1.1</b>  | <b>Retrospective Transport Depot: Lot 6 (RN 290) Brand Highway, Muchea</b> <ol style="list-style-type: none"> <li>1. Locality Plan</li> <li>2. Application report with plans</li> <li>3. Stormwater Management Plan</li> <li>4. Hay Pressing Approval – 2000</li> <li>5. Transport Depot Approval – 2012</li> <li>6. Rezoning Enquiry – 1996</li> <li>7. Schedule of Submissions</li> <li>8. Images from site visit</li> <li>9. Extract from Shire of Chittering Local Planning Strategy 2001 – 2015</li> <li>10. Additional information prepared by the applicant dated 1 September 2016</li> </ol> | 1 – 371        |
| <b>9.1.2</b>  | <b>Masterplan for the Superlight Aircraft Club of Western Australia</b> <ol style="list-style-type: none"> <li>1. Locality Plan</li> <li>2. Original Masterplan by Applicant</li> <li>3. Amended Masterplan by Applicant</li> </ol>  | 372 – 389      |
| <b>9.1.3</b>  | <b>Proposed Scheme Amendment No. 54: Rezoning of Lot 300 (RN 45) Settlement Road, Bindoon from 'Agricultural Resource' to 'Rural Smallholdings'</b> <ol style="list-style-type: none"> <li>1. Council Minutes (28 October 2015)</li> <li>2. Schedule of submissions</li> </ol>   | 390 – 484      |
| <b>9.1.4</b>  | <b>Proposed Scheme Amendment No. 59: Rezoning from 'Agricultural Resource' to 'Special Use–Tourist Development' - Lot 4 Great Northern Highway, Bindoon</b> <ol style="list-style-type: none"> <li>1. Locality Plan</li> <li>2. Schedule of submissions</li> </ol>   | 485 – 493      |

LOCALITY PLAN  
LOT 6 BRAND HIGHWAY, MUCHEA



17 December 2015

Our Ref: LAM BRD DA



Chief Executive Officer  
Shire of Chittering  
PO Box 70  
BINDOON WA 6502

**Attn: Brendan Jeans, Senior Planning Officer**

Dear Brendan,

**RE: PLANNING APPLICATION FOR RETROSPECTIVE WORKS AND 'TRANSPORT DEPOT' USE AND PROSPECTIVE WORKS AT LOT 6 (290) BRAND HIGHWAY, MUCHEA**

We act on behalf of Lampson (Australia) Pty Ltd, the register proprietor of Lot 6 (290) Brand Highway, Muchea (subject site). Enclosed is a retrospective planning application for works and a 'Transport Depot' use and prospective works at the subject site.

Please find attached a planning report which includes the following:

- A completed and signed application form;
- A copy of the certificate of title;
- Copies of the proposed site plan and associated elevations for existing buildings; and
- Copies of the accompanying management plans and information associated with the operation.

Please note that Lampson have appointed an engineering consultant to undertake a Stormwater Drainage and Catchment Plan and Report. This information will be made available shortly and thereafter provided to the Shire for its consideration as part of its assessment of the planning application.

The development fee has been calculated based upon both the retrospective and prospective aspects of the planning application. The fee has been calculated as follows:

|  | Value:               | Application Fee: |
|--|----------------------|------------------|
| Retrospective works undertaken by Lampson: | Dome shade: \$14,000 | \$147 x 3        |
| Prospective works:                         | Hardstand: \$5,000   | \$147            |
| <b>Total:</b>                              |                      | <b>\$588.00</b>  |

With respect to the planning application fee totalling \$588.00, we understand that the Shire is able to process phone credit card payments. Please contact the following person for electronic payment upon receipt of the application:

- Terrence Chisholm – Managing Director Lampson (Australia) Pty Ltd:
  - [REDACTED]
  - [REDACTED]

We respectfully seek Council's favourable support for this proposal and look forward to hearing from you regarding the progress of this application

Should you have any queries or require any further information in the meantime, please do not hesitate to contact our office on [REDACTED].

Yours sincerely

**ALLERDING AND ASSOCIATES**



**TOM HOCKLEY**  
**ASSOCIATE**

cc. Client (via email)



# APPLICATION FOR PLANNING APPROVAL

## RETROSPECTIVE TRANSPORT DEPOT

LOT 6 (NO. 290) BRAND HIGHWAY,  
MUCHEA

SHIRE OF CHITTEING

Prepared for: Lampson (Australia) Pty Ltd & Megalift Pty Ltd  
Prepared by: Allering and Associates

DECEMBER 2015

Allering  
& Associates

Town Planners, Advocates  
and Subdivision Designers

125 Hamersley Road, Subiaco WA 6008  
T: (08) 9382 3000 F: (08) 9382 3005 I: [www.alleringassoc.com](http://www.alleringassoc.com)



TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY ..... 2

2.0 INTRODUCTION ..... 2

2.1 BACKGROUND ..... 2

2.2 LOCATION ..... 2

2.3 SITE DETAILS..... 4

2.4 SERVICING ..... 4

2.4.1 Water Supply..... 4

2.4.2 Waste Management ..... 4

2.4.3 Power Supply..... 4

2.4.4 Telecommunications ..... 4

2.4.5 Gas ..... 4

2.4.6 Movement Network..... 5

3.0 ABOUT LAMPSON (AUSTRALIA) PTY LTD ..... 5

4.0 CONTEXT & RATIONALE ..... 5

4.1 IMPORTANCE OF OPERATION IN THIS LOCATION ..... 5

4.2 EXISTING LAND USE ..... 5

4.3 SURROUNDING LAND USES ..... 5

5.0 OVERVIEW OF PROPOSED DEVELOPMENT..... 5

5.1 BUSINESS OPERATIONS ..... 7

5.2 STAFF ..... 7

5.3 HOURS OF OPERATION..... 8

5.4 CAR PARKING ..... 8

5.5 SECURITY AND ACCESS ..... 8

5.6 TRAFFIC MANAGEMENT ..... 8

5.7 SITE MANAGEMENT ..... 9

5.8 LANDSCAPING ..... 10

6.0 STATE PLANNING CONTEXT..... 12

6.1 STATE PLANNING STRATEGY 2050 (2014)..... 12

6.2 DRAFT WHEATBELT LAND USE PLANNING STRATEGY (2011) ..... 12

6.3 MUCHEA EMPLOYMENT NODE STRUCTURE PLAN (2011) ..... 12

6.4 STATE PLANNING POLICY NO. 1: STATE PLANNING FRAMEWORK ..... 13

6.5 STATE PLANNING POLICY NO. 2: ENVIRONMENT AND NATURAL RESOURCES POLICY ..... 14

6.6 STATE PLANNING POLICY NO. 3: URBAN GROWTH AND SETTLEMENT ..... 14

6.7 ENVIRONMENTAL PROTECTION AUTHORITY GUIDANCE STATEMENT NO. 3 – SEPARATION DISTANCES BETWEEN INDUSTRIAL AND SENSITIVE LAND USES ..... 14

7.0 LOCAL STATUTORY PLANNING CONTEXT ..... 15

7.1 LOCAL PLANNING SCHEME..... 15

7.1.1 Agricultural Resource Zone ..... 15

7.1.2 Special Control Area – Water Prone Area (Ellen Brook Palusplain)..... 15

7.1.3 Land Use..... 16

7.2 LOCAL PLANNING POLICY NO. 13 – CAR PARKING REQUIREMENTS ..... 16

7.3 LOCAL PLANNING POLICY NO. 18 – SETBACKS ..... 18

8.0 LOCAL STRATEGIC PLANNING CONTEXT.....18

8.1 SHIRE OF CHITTERING LOCAL PLANNING STRATEGY 2001-2015 ..... 18

9.0 ENVIRONMENT .....19

9.1 ACID SULFATE SOILS..... 19

9.2 TOPOGRAPHY..... 20

9.3 SITE CONTAMINATION ..... 20

9.4 WETLANDS AND WATERWAYS..... 20

9.5 SIGNIFICANT VEGETATION ..... 20

9.6 INDIGENOUS HERITAGE ..... 20

10.0 CONCLUSION .....21

FIGURE 1 – LOCATION PLAN

FIGURE 2 – PHOTOGRAPH OF EXISTING RAILWAY CROSSING

FIGURE 3 – SITE PLAN

FIGURE 4 – AERIAL PHOTOGRAPH OF DEVELOPMENT AREA

FIGURE 5 – AERIAL PHOTOGRAPH OF SUBJECT SITE

FIGURE 6 – PHOTOGRAPH OF EQUIPMENT SHED

FIGURE 7 – PHOTOGRAPH OF MAIN STORAGE AREA

FIGURE 8 – PHOTOGRAPH OF INSIDE MAIN STORAGE AREA

FIGURE 9 – PHOTOGRAPH OF SHADE STRUCTURE

FIGURE 10 – PHOTOGRAPH OF EASTERN STORAGE AREA

FIGURE 11 – PHOTOGRAPH OF SECURED SITE ENTRY

FIGURE 12 – DEVELOPMENT SITE PLAN

FIGURE 13 – PHOTOGRAPH OF CROSSOVER – NORTH

FIGURE 14 – PHOTOGRAPH OF CROSSOVER – SOUTH

FIGURE 15 – MUCHEA EMPLOYMENT NODE ROAD NETWORK

FIGURE 16 – MIUCHEA EMPLOYMENT NODE LOCATION

FIGURE 17 – 200M RADIUS FROM SUBJECT SITE

FIGURE 18 – TPS6 MAP

FIGURE 19 – ACID SULFATE SOILS MAP

FIGURE 20 – GEOMORPHIC WETLANDS MAP

ANNEXURE 1 – FORM 7 – FORM OF APPLICATION FOR PLANNING APPROVAL

ANNEXURE 2 – HISTORIC AERIAL PHOTOGRAPHS

ANNEXURE 3 – CERTIFICATE OF TITLE

ANNEXURE 4 – DEVELOPMENT PLANS

ANNEXURE 5 – TRAFFIC MANAGEMENT PLAN

ANNEXURE 6 – ENVIRONMENTAL MANAGEMENT PLAN

ANNEXURE 7 – SPILL MANAGEMENT PLAN

©2015 Allerding & Associates All Rights Reserved. Copyright in the whole and every part of this document belongs to Allerding & Associates and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or in or on any media to any person without the prior written consent of Allerding & Associates.

## 1.0 EXECUTIVE SUMMARY

We act on behalf of Lampson (Australia) Pty Ltd (**Lampson**), the landowners of Lot 6 (No. 290) Brand Highway, Muchea (**subject site**). This report has been prepared in support of a retrospective application for planning approval to allow the continued operation of 'Transport Depot' land use associated with the Lampson operations. The report has also been prepared in support of an extension to the hardstand area to provide an opportunity for overflow storage to the south of the existing Lampson site. Lampson currently occupy only a small (approximately 3ha) portion of the overall 39ha site area. The potential future expansion area of approximately 1ha will result in an overall site area of approximately 4ha. Refer to the Location Plan included at **Figure 1** showing the location of the Lampson operation at the subject site. The portion of the subject site that Lampson currently occupies is referred to within this report as the 'development area'.

The development works the retrospective application seeks to rectify are associated with storage sheds and other related structures which are understood to have been removed as a result of a fire at the subject site in 2012, but which have now been re-erected by the previous landowner.

The subject site is already used by Lampson as the Perth based division of its Australia wide operations. The key elements of the operation include the storage and distribution of crane elements as well as rigging and jacking equipment. The equipment is sent out to site, assembled, then dismantled prior to being returned to site where the components are stored in pieces ready to be assigned to the next project. Some assembly of equipment on-site will be required to undertake periodic safety inspections and maintenance or for handling the components for loading or storage purposes. However, any assembly, maintenance and repair work occurring at the site forms only a subsidiary element to the Transport Depot operations.

Lampson seeks the Shire's support for the above operations under Clause 8.4.1 of the Shire of Chittering Town Planning Scheme No. 6 (**TPS6**).

Specifically, approval is sought for the following retrospective development:

1. Construction of two storage sheds which are understood to have been constructed in the exact location as those previous buildings damaged by fire;
2. Construction of a dome shade storage area in proximity to the southern boundary of the development area;
3. Construction of the office building and staff amenities block; and
4. Construction of associated water storage tanks within the property.

Planning approval is also sought under Clause 8.1 of TPS6 for a small extension to the south of the existing development area to facilitate additional storage if required by Lampson in the future. The extension area would be constructed to the same standard as the existing hardstand within the development area. The extension area would be appropriately graded to ensure that surface flows are directed to the existing drainage network within the development area which has been found to have sufficient capacity to accommodate predevelopment flows having regard to the additional drainage the extension will create.

In the circumstances of this case, where the Shire has already previously considered and approved another 'Transport Depot' operation of a significantly larger scale at the subject site, the development works and land use the subject of this application represent a form which is of a lesser scale in terms of development footprint, numbers of staff and traffic generation. The previous 'Transport Depot' proposal also sought to occupy a large portion of the cleared paddock area, while retaining the former hay bailing operation in the north-west corner of the subject site.

In this case, Lampson seeks to occupy the existing hardstand in the north-west corner of the subject site ('development area') which is understood to have previously operated for the purposes of other light and rural industries including black granite works and hay bailing. Lampson also seeks approval for a minor (approximately 1ha) extension to the hardstand area to the south to allow for overflow storage of large inert components such as boom sections and similar steelwork. Such storage would have a low impact on the surrounding landscaping being low profile in nature and stored horizontally in rows similar to that which presently exists at the site to the east of the large shed.

Accordingly, it is our view that the proposal is both capable and appropriate for approval in this location and we respectfully request the Shire grant approval on that basis.

A copy of the Shire of Chittering's Form 7 – Form of Application for Planning Approval is included as **Annexure 1** of this report.

## 2.0 INTRODUCTION

### 2.1 Background

The Shire's records indicate that industrial operations involving black granite works were operational from before 1988 to around 2000 when the land use changed to hay bailing operations. The historic Shire records provided to us by Lampson indicate that the black granite works included a number of structures at the site, however the type of structures and their location is unknown. We understand that the hay bailing operations continued to around 2012 when a fire destroyed a significant number of buildings on site. These previous activities are understood to have operated from the development area that Lampson currently occupies.

Based on a review of the aerial photography of the development area for the period between 2009 and 2015, it is apparent that the development at the site occupied a significantly greater footprint to that which presently exists. The historic aerial photographs are included at **Annexure 2**. A number of larger buildings were removed as a result of fire damage and based on discussions with Shire staff, the two main storage sheds which have been constructed in the development area were rebuilt by the previous owner following the fire. The Shire has no record of building permits being issued for the current buildings or those that existed at the site prior to the fire.

### 2.2 Location

The site is located approximately 800m north of the centre of Muchea and approximately 44km north-west of the Perth CBD.



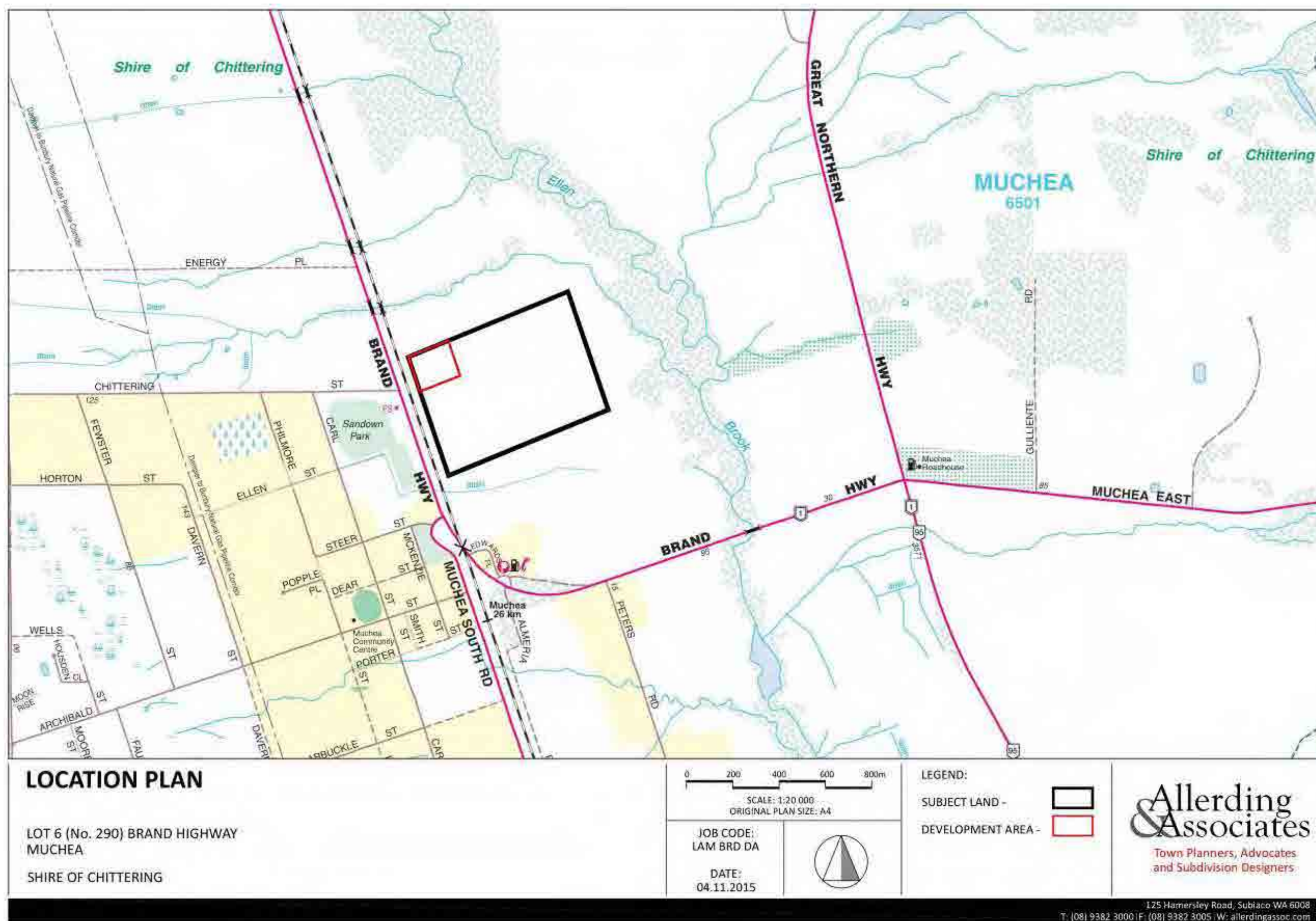


Figure 1 – Location Plan



As depicted in the Location Plan at refer **Figure 1** the subject site is located east of Brand Highway and is bound to the north and south by rural properties. The subject site is bound to the east by Ellen Brook.

Vehicle access to the development area is provided by Brand Highway to the west via an unsealed access road. The access road crosses a Public Transport Authority (PTA) owned railway line which runs in a north to south orientation along the western boundary of the subject site. Refer to **Figure 2** for a photograph of the existing railway line crossing.

## 2.3 Site Details

As outlined in the Site Plan (included at **Figure 3**), the subject site has a total area of 39.131ha.

The lot is held in freehold and is described on the respective Certificate of Title as Lot 6 on Plan 13866, Volume 1651, Folio 436.

The Certificate of Title is included as **Annexure 3**.

## 2.4 Servicing

The following summarises the intended servicing arrangements for the Site.

### 2.4.1 Water Supply

The subject site is not connected to a reticulated water supply and relies on rainwater tanks fed from water captured on the roofs of sheds. There are currently three rainwater tanks connected directly to each of the two sheds and the office building which provide an adequate supply of potable water for the business operations. Two large fire tanks located to the west of the smaller shed are connected to the fire fighting equipment on site and are maintained with an adequate level of water for fire fighting purposes at all times.

### 2.4.2 Waste Management

Based on a review of the historic Shire records supplied by Lampson, the subject site is serviced by septic tanks. A review of the dial before you dig system returned no records of reticulated sewer in the vicinity of the subject site.

### 2.4.3 Power Supply

The development area is connected to mains power which is of a sufficient capacity to service the operations. The connection is via a high voltage power line supplied from the main distribution line to the western side of Brand Highway.

### 2.4.4 Telecommunications

The development area has telephone and broadband internet connections available.

### 2.4.5 Gas

The subject site is not serviced by a gas network.

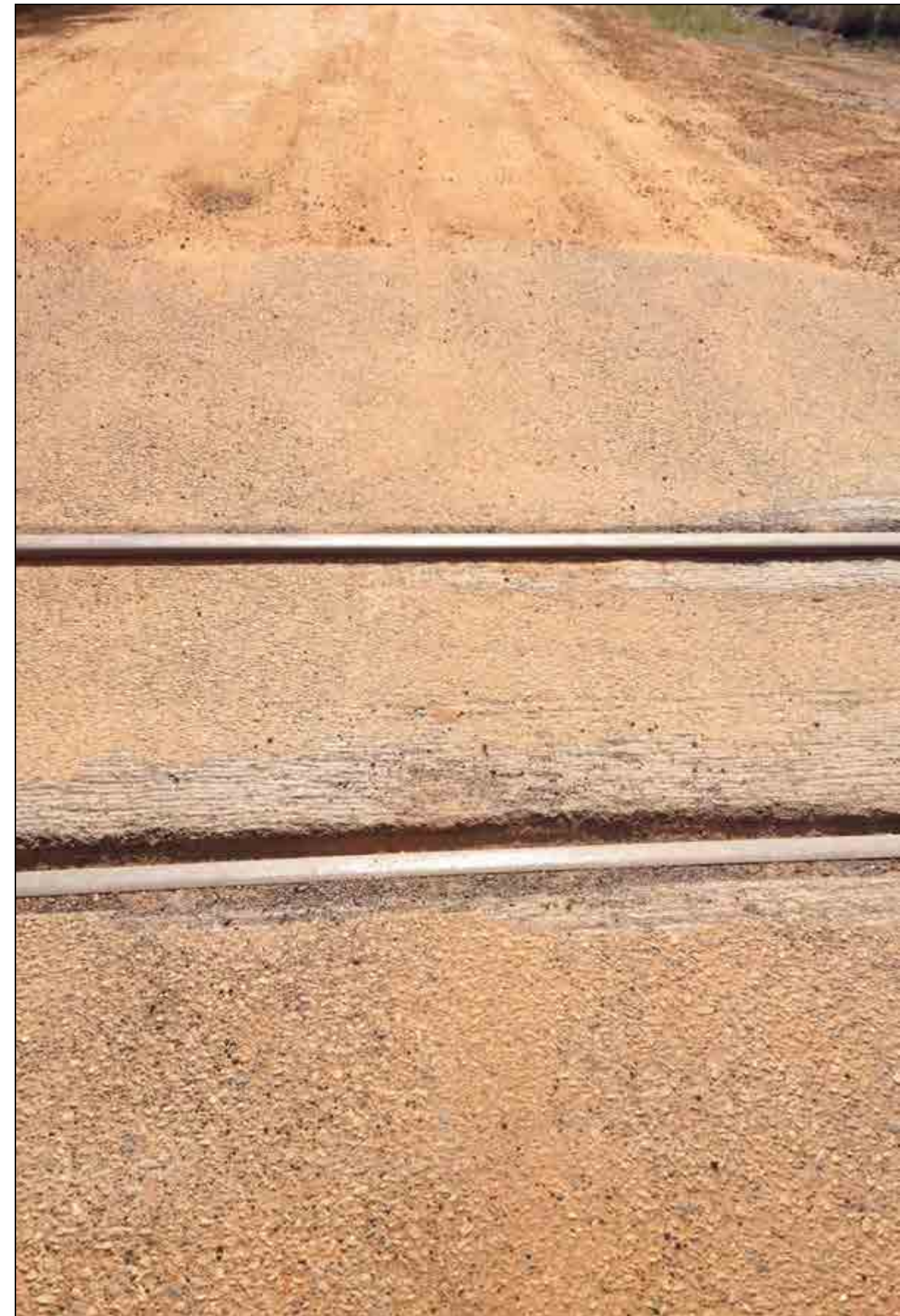


Figure 2 – Existing Railway Crossing

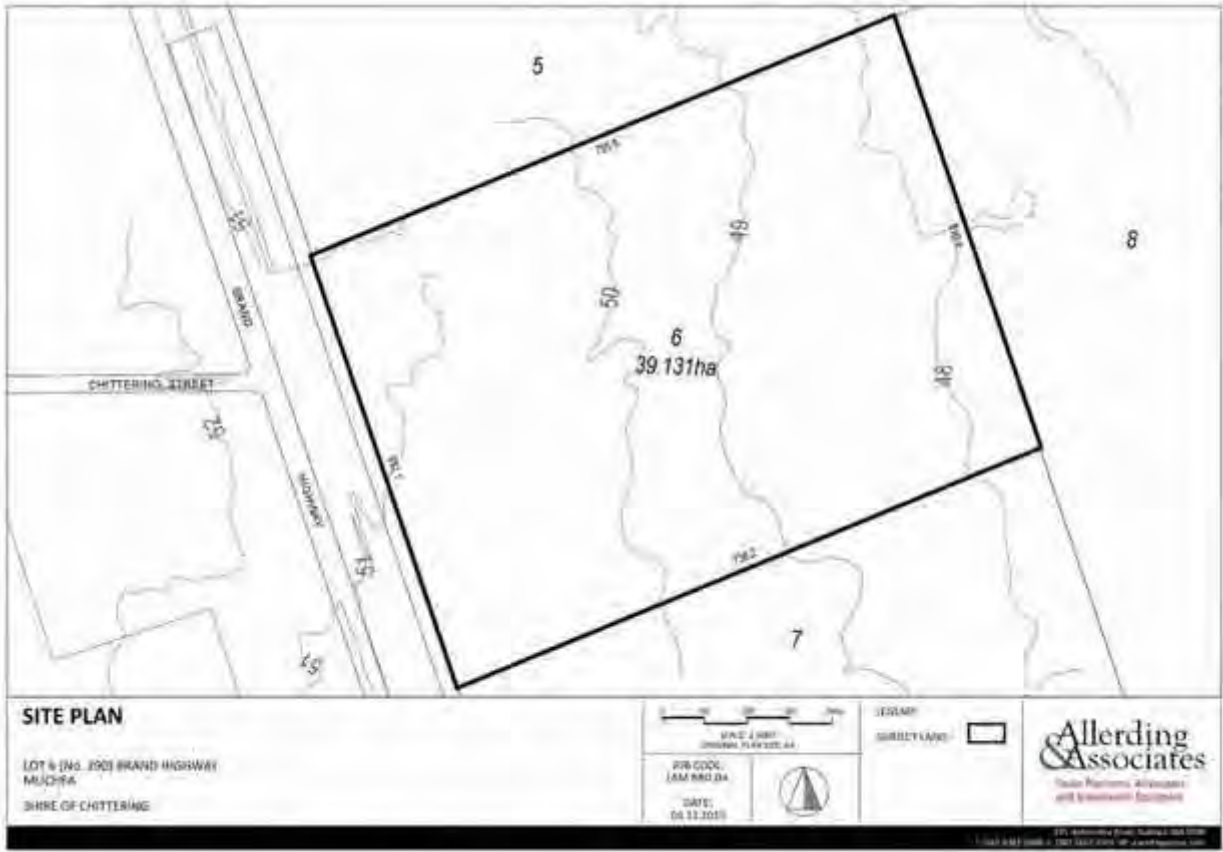


Figure 3 – Site Plan

2.4.6 Movement Network

The entrance to the development area is via Brand Highway to the west. Brand Highway provides direct and convenient access to regional centres to the north and the Perth CBD and locations to the south.

3.0 ABOUT LAMPSON (AUSTRALIA) PTY LTD

Lampson (Australia) Pty Ltd is a supplier of Lifting and Transport equipment and related services. Nationally Lampson has operated since 1991 with their initial clients being from the petrochemical industry including BP, Shell, Ampol and Caltex. 24 years later Lampson services have been extended to include mining, civil, defence, oil, gas and other general industry.

Among the general supply of cranes and transport Lampson also specialises in Heavy Lift and Transport Services and are an original equipment manufacturer of the patented Lampson Transi-Lift Crane. The capacity of cranes within Lampson's fleet range from 30 tonnes to 3000 tonnes and are offered on long term bare and dry lease or on a project specific operated basis. The trailer range includes on-road semi-trailer and floats plus various off-road heavy transport crawlers and Self Propelled Modular Trailer types.

Lampson employs approximately 90 personnel nationally however the number fluctuates with industry demands. It is common to travel experienced personnel between sites and states in order to service their varied client base. Many of Lampson's site locations are in remote areas which further contributes to the variation of clientele.

4.0 CONTEXT & RATIONALE

4.1 Importance of Operation in this Location

Lampson's Muchea site will continue to service the surrounding Western Australian areas and will from time to time supply equipment, services and personnel to other states or internationally. It is proposed that the other Lampson depots in Karratha, Darwin, Gladstone and Newcastle will support and also rely on the Muchea depot in the future. Lampson's other branches have been of benefit to their areas of operation with the common goal of being a good community member. The location of the this depot is important to Lampson given the proximity to a good inland road network providing access to both north and south of the Muchea locality. Lampson also have clients and suppliers in the Perth Metropolitan Region which is conveniently accessible from the current Muchea location. Local personnel employment will develop in time once the Lampson Muchea operation is established and it is intended that other suitable suppliers that operate or are moving into the area are utilised once these become available. In this regard, Lampson intends to ultimately offer their services and equipment to other local business as they establish their presence at this location.

4.2 Existing Land Use

As shown in the Aerial Photographs at Figures 4 and 5, the development area in the north-west corner of the subject site is currently occupied by Lampson for its transport depot operations. The remainder of the subject site is vacant.

4.3 Surrounding Land Uses

The neighbouring land to the north, south and east of the subject site is utilised as grazing and cropping land. The land to the north-west of the subject site is occupied by a quarry operator which undertakes the storage and distribution of stone from the site. To the west of the subject site is the Muchea Polocrosse Club at Sandown Park.

5.0 OVERVIEW OF PROPOSED DEVELOPMENT

Lampson is seeking retrospective planning approval for a Transport Depot land use at the subject site. in addition, retrospective approval for the following works are sought, which are capable and appropriate for approval under Clause 8.4.1 of TPS6:

1. Construction of two storage sheds which are understood to have been constructed in the exact location as those previous buildings damaged by fire (refer Figures 6, 7 and 8);
2. Construction of a dome shade storage area in proximity to the southern boundary of the development area (refer Figure 9);
3. Construction of the office building and staff amenities block; and
4. Construction of associated water storage tanks within the property.

The proposed Development Site Plan is included at Figure 12 below which identifies the location of the existing structures. A full set of Development Plans are included at Annexure 4.





Figure 4 – Aerial Photo of Development Area



## 5.1 Business Operations

The transport depot will function as a storage compound for the various types of cranes and associated machinery that are leased to Lampson's clients. The equipment is sent out to site in parts and assembled on site. The equipment is then dismantled prior to being returned to site where the components are stored in pieces ready to be assigned to the next project. The only assembling of equipment on site occurs when periodic safety inspections and maintenance is undertaken. Small cranes are occasionally used to move crane components within the external storage area to the east of the large shed (refer to **Figure 10** for a photograph of the eastern storage area). Any maintenance and repair work occurring at the site forms only a subsidiary element to the Transport Depot operations.

## 5.2 Parking and Storage of Cranes and Transport Equipment

The parking and storage of cranes, crane components and trucks is the predominant activity that occurs as part of the Lampson operations. As demonstrated in the Development Site Plan at **Figure 12** and the Aerial Photo at **Figure 4**, the site comprises the following parking and storage areas:

- **Eastern External Storage Area** – The eastern external storage area comprises the eastern half of the Lampson Transport Depot site. This area comprises a gravel hardstand base and is utilised for the storage of various components including rigging equipment, boom sections, crawlers and other large items. The components are grouped and stored in rows to allow access for loading onto transport by crane. Trailers are also parked in the southern portion of the area awaiting unloading or preloaded for future transportation. No mechanical servicing occurs in this area and it is primarily utilised for the long term storage of large items that will not fit into the larger (main) storage building.
- **Main Storage Building** – The main storage building is located centrally within the site and is constructed on a sealed concrete base. The main storage building is utilised for the storage of parts that either require protection from the elements, are of an expensive nature or are small and are grouped with similar items. Mechanical servicing or structural repair of crane equipment occurs within the main building with adequate spill response equipment readily available should spills occur.
- **External Concrete Storage Area** – The external concrete storage area is located to the western side of the main storage building and is utilised for general works including welding and cutting of steel, pre-assembly or disassembly of rigging equipment and storage or maintenance of cranes not suitable for inside the main storage building.
- **Equipment Shed** – The equipment shed is constructed on a sealed concrete base and is utilised for the storage of rigging equipment or other small items as required. The shed also contains an electrical switchboard and a pump assembly for fire protection.
- **External Truck and Transport Equipment Parking** – Trucks and trailers used for the transportation of cranes and equipment are stored in the south west corner of the site. The trailer storage area comprises gravel hardstand and is located to allow for access to the road around the site. The access for transport vehicles throughout the site is via the entry gate in the north west, then around the storage area to the east of the site, then to the parking and storage area in the south west. Trailers can also park in the loading ramp to the south of the main storage building which can be accessed by forklift through the large loading ramp door.



• **Figure 5 – Aerial Photograph of Subject Site**



• **Figure 6 – Photograph of Equipment Shed**



- Portable Environmental Protection Shelter – The dome shaped shelter is currently located to the southern boundary of the Lampson Transport Depot adjacent to the main storage building. The shelter is constructed of canvas over steel rib frame fastened by welding to the top of shipping containers. The shelter is presently positioned to act as a shaded work area or to provide protection from rain for personnel working on items that are too large to fit inside the main storage building. The Portable Environmental Protection Shelter is relocatable and is positioned over larger items that require protection from environmental conditions and also to provide protection from the elements for any personnel that may work on this equipment. Alternatively, equipment may be brought into the shelter and stored or repaired as required by forklift or small crane. The shelter could be positioned in two or three locations every year depending on the work load and number of larger items requiring work. The shelter is disassembled prior to being relocated and in erecting the structure the manufacturer instructions for the securing of the steel frame and canvas cover are followed at all times.
- Proposed Southern External Storage Future Expansion Area – The proposed southern external storage area will be utilised for the storage of large boom sections and similar steel work. The components stored in this area would be consistent with the items stored in the existing eastern external storage area in that they comprise of items that are grouped and stored in rows to allow access for loading onto transport by crane. A description of the proposed expansion area is provided in Section 5.10.

### 5.3 Staff

The staff and labour personnel on site would generally be up to 10 per day but may vary subject to where work is located elsewhere in Australia. The staff would typically comprise of:

- 1 to 2 clerical staff;
- 1 to 2 management staff;
- 1 to 2 truck/crane drivers;
- 1 storeman;
- 1 to 2 tradesmen (metal/mechanic); and
- 1 to 2 riggers.

No additional staff or labour personnel are anticipated as a result of the construction of the proposed future extension to the storage area.

### 5.4 Hours of Operation

The Lampson transport depot will operate from 6:30am to 5:00pm Monday to Friday and from 6:30am to 3:00pm on weekends and public holidays.

### 5.5 Car Parking

A total of six undercover parking bays are currently provided on site. Space for an additional four parking bays are provided to the south of the undercover parking area.

The staff and labour personnel on site would generally be up to 10 per day. Of the staff accommodated at the site, approximately eight will park vehicles in the designated parking area and the two to three tradesmen and storemen personnel will park their vehicles within the large shed to enable access to tools during the day.

No visitor vehicles other than those associated with general product deliveries such as rubbish removal and water deliveries are expected to access the site.

The existing parking bays on site meet the minimum dimensions of 2.75m in width and 7.5m in length and there is sufficient space on site to enable vehicles to enter and exit in forward gear.

### 5.6 Security and Access

The existing Lampson site is secured by a 2m high electrified fence around the boundary of the development area. The vehicle access point is secured by a gate which is locked after business hours. Refer to **Figure 11** for a photograph of the site entry.

Access to the subject site is from a single entry and exit point via Brand Highway. Refer to **Figure 13** for a photograph of the existing crossover to the subject site from Brand Highway facing north and **Figure 14** facing south.

### 5.7 Traffic Management

Lampson has prepared a Traffic Management Plan which is included at **Annexure 5**.

The Lampson transport depot receives deliveries of equipment and delivers equipment on a regular basis. Equipment is packed on trucks in parts and assembled at the at the delivery location.

These incoming and outgoing deliveries are expected to occur in varying trucking configurations and frequencies including:



Figure 7 – Photograph of main storage shed in background

- One truck and trailer pocket road train (28m long) per month;
- One truck and trailer 40' trailer (25m long) per month; and
- Two truck and trailer (21m long) per week.

Vehicles will enter and exit the subject site from Brand Highway only. 90% of vehicles will turn left out of the subject site and travel south towards Perth along Brand Highway. Vehicles will then generally travel south along Muchea South Road then west along Neaves Road if accessing the north-west corridor or east toward Great Northern Highway if accessing the eastern suburbs of Perth.

As demonstrated in the Traffic Management Plan, the traffic volumes generated by the Lampson operations will not exceed the capacity of Brand Highway and it is likely that the impact on this road will be further reduced once the Perth to Darwin Highway is constructed which will divert traffic around the Muchea townsite. The impact of the operations on adjoining properties as a result of added traffic movements is also considered to be negligible given that travel is generally confined to the regional road network.

No additional vehicle movements are anticipated as a result of the construction of the proposed future extension to the storage area.

## 5.8 Site Management

The transport depot will operate under a range of management controls both through physical infrastructure and procedures to ensure compliance with the relevant regulations.



Figure 8 – Photograph of inside main storage shed



Figure 9 – Photograph of shade structure

An Environmental Management Plan (**EMP**) has been prepared in consultation with Management and employees. The EMP documents the management initiatives that will be used to minimise the impacts of its day to day activities on the environment and includes the policy framework, operating procedures, and incident reporting resources. A copy of the EMP prepared by Lampson is included in **Annexure 6**. Lampson has extensive experience in the environmental management of its operations, including longstanding and comprehensively developed measures to mitigate externalities associated with truck movements, as well as the management of on-site operations to address risks to both personnel and the environment.

The EMP is supported by a Traffic Management Plan (**TMP**) and a Spills Management Plan (**SMP**) (**Annexure 7**) as a risk management strategy for the key elements of the Lampson operations.

### 5.8.1 Hydrocarbon and Chemical Management

Hydraulic and engine oil is stored in the original containers supplied by the distributor and then placed in plastic bund modules. The liquids are dispensed in volumes required for each particular application and taken to the equipment located on a concreted surface, mainly within the main storage building. The plastic bund modules also have a spill tray to catch any liquid that may spill during transfer into the smaller containers. Any servicing work completed on the concreted areas would also be completed with adequate spill trays to catch any inadvertent release of liquids.

Lampson's established handling and containment measures for spills also require that all servicing is to be completed away from drains and any accidental spills would be captured by trays. Lampson also keep mobile spill kits in the main storage building that include 'kitty litter' or pads for absorption of any spilt liquid, as well as shovels and bins to remove such liquid laden material from the ground. Servicing of equipment is completed on the concreted areas such that collection and disposal of any material is completed without the need to excavate soil and remove from the working area.

Any liquid waste that has been absorbed and cleared from the spill site is stored in sealed containers within the main storage shed and then removed on an 'as required' basis by the waste removal contractor.

The a Spills Management Plan included at **Annexure 7** outlines the action response and reporting procedures for spills that occur on site.



### 5.8.2 Surface Water and Stormwater Management

A Stormwater Drainage and Catchment Plan and accompanying report is currently being prepared by the engineering consultants. This engineering documentation will detail the surface water movements throughout the development site and address how water will be treated during and after a heavy rainfall event. This information will be provided to the Shire as soon as it is made available.

### 5.9 Landscaping

The development area contains existing landscaping along the southern and eastern boundaries and a portion of the northern boundary. The operations are screened from Brand Highway by existing mature vegetation within the road and rail reserves to the west of the subject site. Due to the height of some of the cranes and machinery stored on site, landscaping will not completely screen the machinery from the public realm. However the physical setback of the external crane storage areas within the Lampson transport depot site from Brand Highway of around 100m ensures that the visual impact is considerably reduced and consequently does not result in any undue or adverse amenity impacts.

### 5.10 Proposed Future Expansion Area

The proposed future external storage expansion area will extend approximately 50m to the south of the existing Lampson site and will be constructed with an impermeable gravel hardstand base consistent with the remainder of the development site. Due to the flat level topography of this portion of the subject site, only limited earthworks would be required in order to direct stormwater flow to the existing network throughout the site. Given that the proposed expansion area is cleared, no removal of vegetation would be required and vehicles would be capable of passing through breaks in the existing tree line which currently forms the southern boundary of the existing development area.

This area will be utilised for the storage of large boom sections and similar steel work as required. The components stored in this area would be consistent with the items stored in the existing eastern external storage area in that they comprise of items that are grouped and stored in rows to allow access for loading onto transport by crane. No mechanical servicing occurs in this area and it is primarily utilised for storage of items with limited movable parts meaning that contaminant runoff is prevented.

The proposed storage expansion area would be fenced with a continuation of the existing 2m high electrified fence which is constructed around the perimeter of the existing development area.



Figure 10 – Photograph of eastern storage area



Figure 11 – Photograph of secured site entry

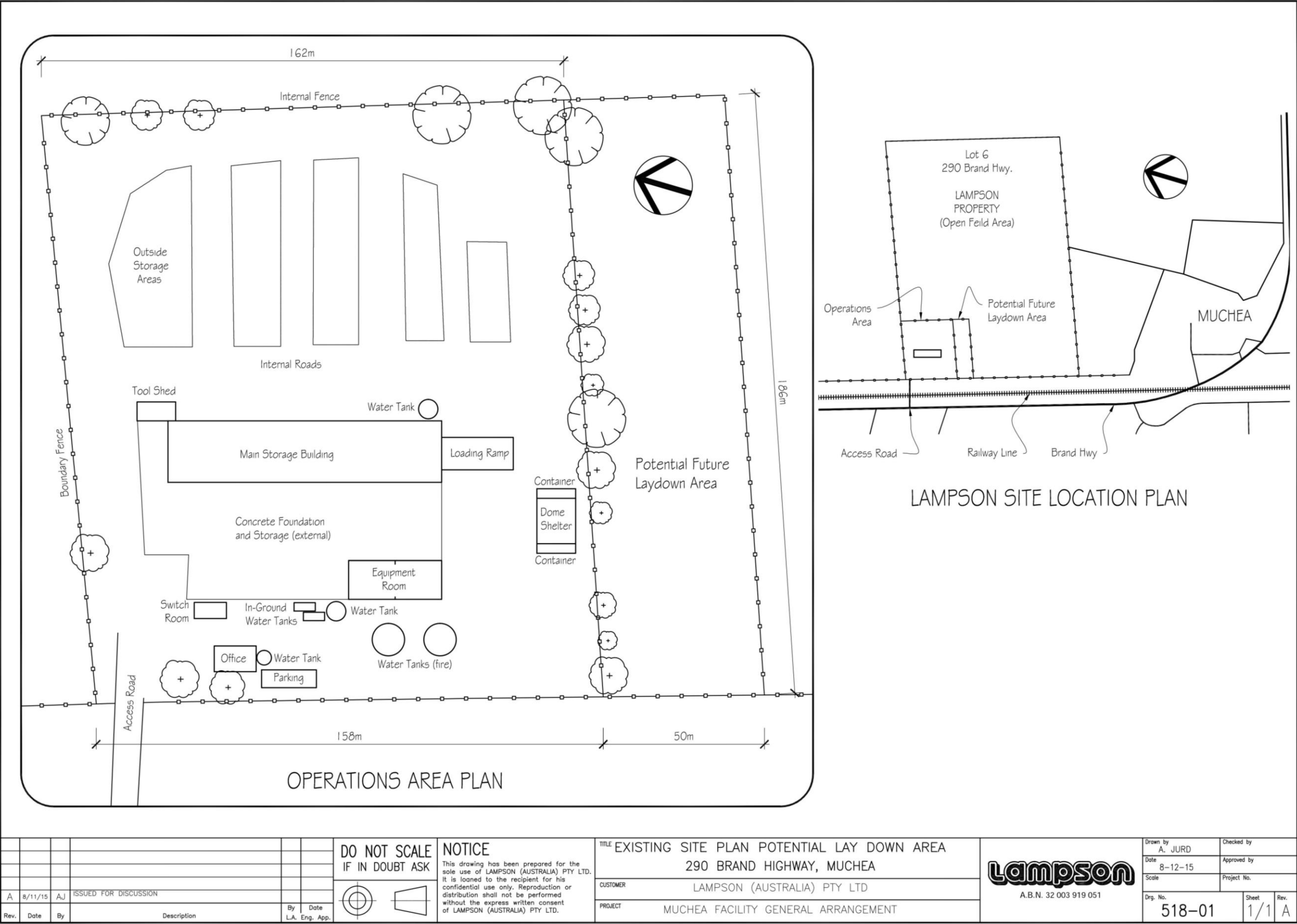


Figure 12 – Development Site Plan





Figure 13 - Photograph of the existing crossover from Brand Highway facing north



Figure 14 – Photograph of the existing crossover from Brand Highway facing south

## 6.0 STATE PLANNING CONTEXT

### 6.1 State Planning Strategy 2050 (2014)

The State Planning Strategy 2050 is the highest order planning instrument in the Western Australian planning system. The Strategy is a guide through which public authorities and local governments can express or frame their legislative mandates and/or influence in land use planning, land development and related matters.

The State Planning Strategy 2050 identifies that the South West sector, inclusive of the Wheatbelt area, will continue to be the population centre of the State. This means that a high level and range of employment opportunities will continue to be available in the South West.

The State Planning Strategy 2050 also identifies the Wheatbelt Land Use Planning Strategy as a strategic document to outline landuse planning priorities and directives for the region.

### 6.2 Draft Wheatbelt Land Use Planning Strategy (2011)

The Wheatbelt Land Use Planning Strategy is a guidance document for the Wheatbelt region that aims to guide land use planning decision-making. The strategy is part of the State Planning Framework and will identify key economic, social and environmental drivers and their likely implications. As a key element to the progression of economic and regional development, the WAPC will seek to finalise a structure plan for the proposed Muchea Employment Node, which will establish a site for strategic industry, linked to consolidated and improved transport routes. As noted below, whilst the subject site is located outside of the Muchea Employment Node area, the Transport Depot operations will not diminish the viability of the node and will likely provide a valuable service to the future development of the locality.

### 6.3 Muchea Employment Node Structure Plan (2011)

The Muchea employment node (the employment node) is located at the intersection of the Brand Highway and Great Northern Highway, and is an area set aside for service-based uses such as transport, livestock, fabrication, warehousing, wholesaling and general commercial use. The employment node was originally identified as a future industrial area in the North-East Corridor Extension Strategy (2003). The node was recognised as having potential as an industrial area that could take advantage of long-term transport opportunities offered by the proposed Perth-Darwin National Highway (refer **Figure 15**).

Whilst the subject site is not included within the Muchea Employment Node, the services provided by Lampson will be beneficial to the future development of this node and is both a capable and appropriate use given both the historic operations on the site, including black granite works and hay bailing operations, and the existing discretions provided under the planning framework for this sort of activity. In addition, the continued operation of the Transport Depot at the subject site will not compromise the future development of the Muchea Employment Node given that the subject site is already established as a commercial site which has operated for the purposes of light and rural industrial land uses for over 25 years. Refer to **Figure 16** for the location of the subject site in proximity to the Muchea Employment Node Structure Plan area.



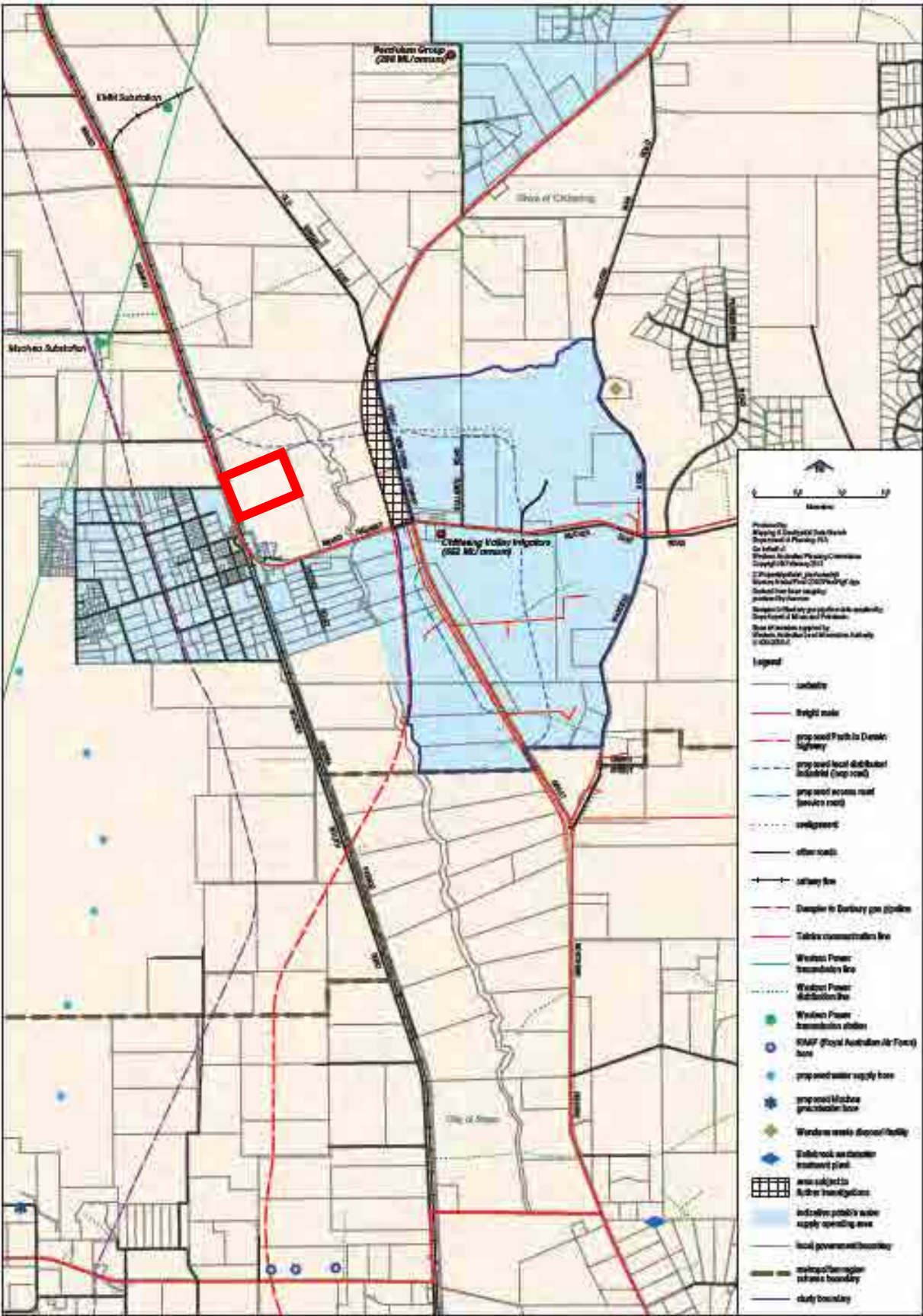


Figure 7: Road network and service infrastructure

Figure 15 – Muchea Employment Node Road Network (subject site shown in red box)

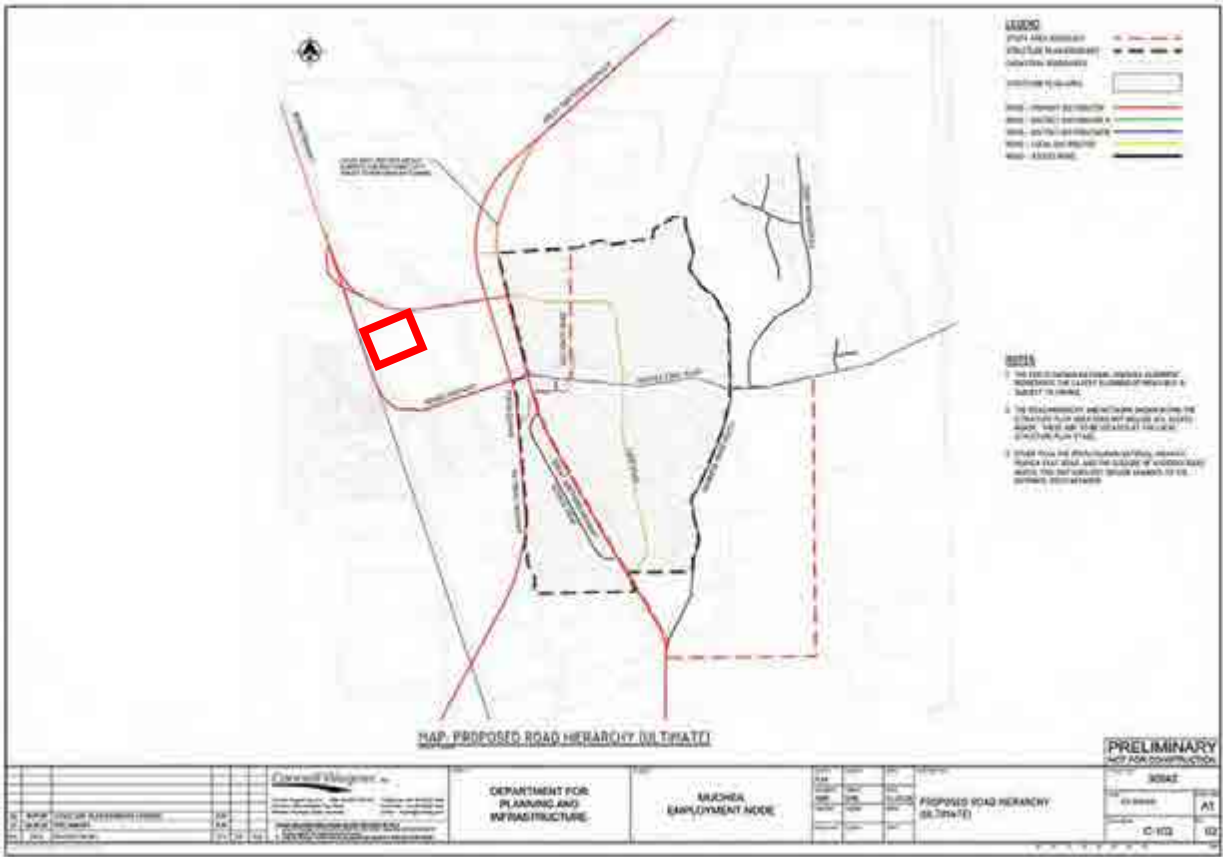


Figure 16 – Muchea Employment Node Location (subject site shown in red box)

6.4 State Planning Policy No. 1: State Planning Framework

The State Government’s broad planning framework, State Planning Policy No. 1 (SPP1) is in part a consequence of the State Planning Strategy (WAPC 1997) in bringing together in a statutory planning framework, existing State and regional policies and articulating general principles for land use planning and development. It sets the key principles relating to the environment, community, economy, infrastructure and regional development which should guide the way in which future planning decisions are made having regard to each of those five elements. Under Part A (General Principles for Land Use Planning and Development) of that Policy, it states:

*The primary aim of planning is to provide for the sustainable use and development of land.*

The State Planning Strategy identifies the principles which further define this primary aim and describe the considerations which influence good decision-making in land use planning and development. Planning should take account of, and give effect to, these principles and related policies to ensure integrated decision making throughout government. These elements include the following:

A1 Environment

The protection of environmental assets and the wise use and management of resources are essential to encourage more ecologically sustainable land use and development.

The Lampson site operates under an Environmental Management Plan which has been prepared in accordance with the International Organisation of Standardisation to provide business with a structure for managing environmental impacts.

Further, Lampson has developed a series of management plans including a traffic management plan and spill management plan to further support the high level of environmentally wise operative practices that occur on site.

### A3 Economy

Planning should contribute to the economic wellbeing of the State through the provision of land, facilitating decisions and resolving land use conflicts. Planning should provide for economic development by:

- Providing land for industry.
- Promoting local employment opportunities.
- Avoiding land use conflicts.

The Lampson site is strategically located within Muchea to supply an essential service to developers of major infrastructure projects in the Wheatbelt and Perth Metropolitan Region.

The operation will continue to provide an important source of employment for the area and in particular will contribute to an appropriate land use mix that will enhance the vitality and diversity of land uses within Muchea.

### A4 Infrastructure

Planning should ensure that physical and community infrastructure by both public and private agencies is coordinated in a way that is efficient, equitable, accessible and timely. This means:

- Planning for land use and development in a manner that allows for the logical and efficient provision and maintenance of infrastructure.
- Protecting key infrastructure, including ports, airports, roads, railways and service corridors from inappropriate land use and development.

The Lampson site is located abutting the Brand Highway which provides an important transport linkage to the Perth Metropolitan Region to the south and areas of the Wheatbelt and beyond to the north. The subject site is well suited to this form of land use given its separation from the more sensitive land uses further to the south.

Based on the above, it is considered the proposal and associated flow on effects contribute to a more sustainable future and is therefore consistent with the sustainable development principles contained in SPP1.

## 6.5 State Planning Policy No. 2: Environment and Natural Resources Policy

The overarching objective of State Planning Policy No. 2 (SPP2) is to promote and assist in the wise and sustainable use and management of natural resources.

The policy is divided into a series of general and specific policy measures. One of those measures is the consideration of greenhouse gas emissions and energy efficiency.

The general measures under that policy are to actively seek opportunities for improved environmental outcomes including support for development which provides for environmental restoration and enhancement; and to take into account the potential for economic, environmental and social (including cultural) effects on natural resources.

More specifically, the policy recognises that ensuring that decision making takes into account the need for the primary objective being the reduction to reduce greenhouse gas emissions by means including increasing energy efficiency.

In terms of implementing the policy, section 6 notes that:

*“...the purpose of this policy is to inform local governments and the Town Planning Appeals Tribunal of those aspects of State level planning policy concerning the environment and natural resources which should be taken into account in planning decision making while recognising the inherent difficulties of balancing conflicting needs.”*

The relevance of this policy is that a key consideration to this matter is the significance of this locality in terms of both its proximity to transport networks and the northern extents of the Perth Metropolitan Region. The principle of ensuring that services and machinery, such as those provided by Lampson, are located in close proximity to their product delivery points is a relevant planning consideration and one which assists in meeting the objectives outlined in this planning policy. Further, the operations are being undertaken in accordance with established management practices adopted under an Environmental Management Plan implemented as part of the day to day operation of the site. This will ensure that environmental impacts will be appropriately mitigated.

## 6.6 State Planning Policy No. 3: Urban Growth and Settlement

The policy sets out the principles and considerations which apply to planning for urban growth and settlement in Western Australia. The introduction to the policy recognises that the spread of urban development intensifies pressures on valuable land and water resources, and imposes costs on the provision of infrastructure and services.

The policy recognises a desirable objective being sustainable and liveable neighbourhoods that coordinate new development with the efficient economic and timely provision of infrastructure and services.

Part of the policy measures, outlined in Sections 5.4 and 5.5, are to plan cost effective and resource efficient development to promote affordable housing. It also recognises that appropriate coordination of services and infrastructure is required for new growth and settlements. Whilst this applies to conventional urban services such as water and sewerage, it also applies to infrastructure provision including those services necessary to enable cost effective and affordable housing and development.

The provision of affordable and sustainable development in the locality is related to the proximity of services such as those provided by Lampson which, in particular, supports civil and general industry. The location of the Lampson site will therefore assist in providing for necessary services for the development of infrastructure in the Perth Metropolitan Region and Wheatbelt which will ultimately support the establishment and expansion of urban land for development.

## 6.7 Environmental Protection Authority Guidance Statement No. 3 – Separation Distances between Industrial and Sensitive Land Uses

EPA Guidance Statement No 3 outlines the generic buffers between Industrial Land Uses and Sensitive Land Uses. The document stipulates a 200m buffer for a ‘Transport vehicles depot’. A review of the land surrounding the subject site has found that there are no sensitive land uses (dwellings) within 200m of the operations (refer to **Figure 17**).





Figure 17 – 200m radius from the Lampson operations

## 7.0 LOCAL STATUTORY PLANNING CONTEXT

### 7.1 Local Planning Scheme

#### 7.1.1 Agricultural Resource Zone

The subject site is situated in the 'Agricultural Resource Zone' under the Shire of Chittering Town Planning Scheme No. 6 (TPS6). A TPS6 Plan is provided at **Figure 18**.

The objectives of the Agricultural Resource Zone are outlined at Clause 4.2.5 of TPS6 as follows:

*To preserve productive land suitable for grazing, cropping and intensive horticulture and other compatible productive rural uses in a sustainable manner;*

*To protect the landform and landscape values of the district against despoliation and land degradation;*

*To encourage intensive agriculture and associated tourist facilities, where appropriate;*

*To allow for the extraction of basic raw materials where it is environmentally and socially acceptable.*

#### 7.1.2 Special Control Area – Water Prone Area (Ellen Brook Palusplain)

Pursuant to Part 6 – Special Control Areas of TPS6, the subject site is located within a Water Prone Area associated with the Ellen Brook Palusplain as it is mapped as being subject to inundation or flooding. Clause 6.1 of TPS6 states that:

*In respect of a Special Control Area shown on a Scheme Map, the provisions applying to the Special Control area apply in addition to the provisions of the underlying zone or reserve and any general provisions of the Scheme.*

The purpose of the Water Prone Area – Ellen Brook Palusplain is described in Clause 6.3.2 as follows:

- To manage development in areas where there is high risk of inundation so as to protect people and property from undue damage and where there is a potential risk to human health.*
- To preclude development and the use of land which may increase the amount of nutrients from entering the surface and/or sub-surface water systems.*
- To ensure that wetland environmental values and ecological integrity are preserved and mentioned.*

The Planning Requirements are listed at Clause 6.3.3 as follows:

*The Local Government will impose conditions on any Planning Approval relating to-*

- the construction and occupation of any dwelling or outbuilding;*
- the type of effluent disposal system used in this area shall be high performance with bacterial and nutrient stripping capabilities to the specifications of Council and the Health Department and shall be located in a position determined by Council;*
- minimum floor levels for any building above the highest known water levels;*
- any land use that may contribute to the degradation of the surface or sub-surface water quality.*
- no development other than for conservation purposes will be permitted within 30 metres of any natural water body;*
- damming, draining or other developments which may alter the natural flow of surface water will not be permitted unless such works are part of an approved Catchment Management Plan.*

In considering applications for Planning Approval, the Local Government shall have regard to those matters listed in Clause 6.3.4 of TPS6:

- the likely impact on the health and welfare of future occupants;*
- the proposed activities for the land and their potential increase in the risk of causing an increase in nutrients entering the water regimes;*
- any provision or recommendation from any Catchment Management Plan.*
- the likely impact on any wetland;*
- buffer distances from any wetland.*

Clause 6.3.5 of TPS6 also notes that the Local Government may refer any Application for Planning Approval or any amendment to vary a Special Control Area boundary to any relevant authority or community organisation. The portion of the subject site currently occupied by Lampson is located approximately 900m from Ellen Brook to the east and approximately 180m from the creek line to the north. No environmentally sensitive wetlands have been identified on or surrounding the subject land.



The adopted environmental management principles will ensure that there is no risk to the groundwater or environmental qualities of the locality as a result of the operations. Further, the Transport Depot is located approximately 450m from the nearest residence and is therefore appropriately separated to mitigate any noise impacts that may arise as a result of the operations.

7.1.3 Land Use

It is proposed that the existing Lampson operations are formalised as a 'Transport Depot'. A 'Transport Depot' is defined in Schedule 1 of TPS6 as follows:

*means premises used or intended for use for the parking or garaging of:*

- a) *two or more motorised commercial vehicles with or without any number of non-motorised commercial vehicles; or*
- b) *two or more non-motorised commercial vehicles with or without any number of motorised commercial vehicles;*

*and the use includes the maintenance and repair of vehicles so parked or garaged on the land but not of other vehicles*

The Zoning Table contained within Schedule 2 of TPS6 lists a 'Transport Depot' in the Agricultural Resource zone as an "A" use, meaning that the use is not permitted unless the Shire has exercised its discretion by granting Planning Approval after giving special notice in accordance with clause 9.4.



Figure 18 – TPS6 Map

7.2 Planning and Development (Local Planning Schemes) Regulations 2015

The Planning and Development (Local Planning Schemes) Regulations 2015 (**the Planning and Development Regulations**) were gazetted on 25 August and came into effect on 19 October 2015. The Planning and Development Regulations have introduced a set of deemed provisions that now form part of TPS2. In particular, Clause 67 deals with matters to be considered by local government and include the following key provisions relevant to this application:

- (a) *the aims and provisions of this Scheme and any other local planning scheme operating within the Scheme area;*
- (b) *the requirements of orderly and proper planning including any proposed local planning scheme or amendment to this Scheme that has been advertised under the Planning and Development (Local Planning Schemes) Regulations 2015 or any other proposed planning instrument that the local government is seriously considering adopting or approving;*
- (c) *any approved State planning policy;*
- (d) *any environmental protection policy approved under the Environmental Protection Act 1986 section 31(d);*
- (e) *any policy of the Commission;*
- (f) *any policy of the State;*
- (g) *any local planning policy for the Scheme area;*
- (h) *any structure plan, activity centre plan or local development plan that relates to the development;*
- (m) *the compatibility of the development with its setting including the relationship of the development to development on adjoining land or on other land in the locality including, but not limited to, the likely effect of the height, bulk, scale, orientation and appearance of the development;*
- (n) *the amenity of the locality including the following —*
  - (i) *environmental impacts of the development;*
  - (ii) *the character of the locality;*
  - (iii) *social impacts of the development;*
- (o) *the likely effect of the development on the natural environment or water resources and any means that are proposed to protect or to mitigate impacts on the natural environment or the water resource;*
- (p) *whether adequate provision has been made for the landscaping of the land to which the application relates and whether any trees or other vegetation on the land should be preserved;*
- (r) *the suitability of the land for the development taking into account the possible risk to human health or safety;*
- (s) *the adequacy of —*

- (i) *the proposed means of access to and egress from the site; and*
- (ii) *arrangements for the loading, unloading, manoeuvring and parking of vehicles;*
- (t) *the amount of traffic likely to be generated by the development, particularly in relation to the capacity of the road system in the locality and the probable effect on traffic flow and safety;*
- (w) *the history of the site where the development is to be located;*
- (x) *the impact of the development on the community as a whole notwithstanding the impact of the development on particular individuals;*
- (y) *any submissions received on the application;*
- (za) *the comments or submissions received from any authority consulted under clause 66;*
- (zb) *any other planning consideration the local government considers appropriate.*

Having regard to the key matters to be considered by local government, the retrospective application for planning approval is consistent with the applicable planning framework and will support the growth of Muchea and its nearby employment node by providing services necessary for construction and infrastructure upgrades in the area. The Lampson operations will also continue to provide for employment opportunities for the local community.

Given the history of the site, the current operations and proposed expansion area are considered to be entirely compatible within its setting being located on a major transport route and being separated from dwellings to ensure that any visual and noise impacts associated with the operations are limited. In this regard, amenity impacts are addressed and environmental impacts can be adequately managed through the suite of environmental management plans implemented by, inclusive of stormwater management, spill management and traffic management. Any impacts on groundwater as a result of the continued operations are therefore considered to be negligible.

The Lampson site is well landscaped around its perimeter resulting in visual screening from Brand Highway to the west, as well as neighbouring properties to the north, south and east. It is noted that in addition to the landscaping within the Lampson site, there is also established vegetation within the neighbouring road and railway reserves to the west of the site which contribute to the depth of screening to mitigate against the visual impact of stored cranes and equipment within the site. Should the Shire consider that landscaping along the southern boundary of the proposed expansion area would assist with screening from the south, Lampson would be willing to accept a condition requiring that landscaping is provided in this location before the expansion area becomes operational.

Access to the site and traffic generation as outlined in the Traffic Management Plan are considered acceptable having regard to the capacity of Brand Highway and the existing driveway and rail crossing arrangements and access throughout the site. It is recognised that whilst the Lampson operations fall within the definition of Transport Depot under TPS6, the vehicle movements per day are low compared to other forms of transport depots given that the majority of movements are associated with deliveries of Lampson cranes and machinery to project sites. This means that there are no third party deliveries of transportable items which need to be transported from vehicle to vehicle on site which results in lower overall vehicle movements.

The Shire's endorsement of the retrospective application for planning approval will result in an overall community benefit through the establishment of a nationally significant supplier of Lifting and Transport equipment and related services in Muchea which has an opportunity to further expand its services in the future. There is an opportunity for the Lampson operations to positively contribute to the growth and development of the Muchea community, including the viability of the Muchea Employment Node.

In considering any submissions by neighbouring landowners or authorities consulted as part of the planning application process, it is expected that the Shire will provide an opportunity to review and respond to any comments following the consultation period and prior to the Shire's final determination of the matter.

### 7.3 Local Planning Policy No. 13 – Car Parking Requirements

In accordance with the requirements set out in Clause 5 of Local Planning Policy No. 13 – Car Parking Requirements (**LPP13**), car parking bays are to be provided as follows:

#### 5.1 Provision of car parking bays

- a) *A person shall not develop or use land or erect, use or adapt any buildings for any purpose unless car parking bays of the number specified in Table 1 are constructed and maintained in accordance with the provisions of the Scheme;*
- b) *Where an application is made for planning consent and the purpose for which the land or building is to be used is not specified in Table 1, the Local Government shall determine the number of car parking bays to be provided, based on the number of employees and likely visitors to the site.*

#### 5.2 Standards

- a) *Subject to requirements of the Building Code of Australia for disabled access, the dimensions of each space shall not be less than 2.75 metres wide and 7.5 metres long.*

*The Local Government may vary the dimensions specified:*

- i) *by up to 10% where obstructions, site dimensions or topography result in the loss of one car parking space in any run or group of car parking spaces;*
- ii) *where the provision of car parking space dimensions are enlarged to accommodate larger vehicle. In such cases, the area set aside shall be not less than if the standards specified were applied.*
- b) *Cars (and if relevant trucks and buses) are to enter and exit each site in the forward direction;*

A 'Transport Depot' land use is not included in Table 1 of LPP13 and therefore the Shire is to determine car parking bays based on the number of employees and likely visitors to the site.

As outlined in Part 5, the staff and labour personnel on site would generally be up to 10 per day. Of the staff accommodated at the site, approximately eight will park vehicles in the designated parking area and the two to three tradesmen and storemen personnel will park their vehicles within the large shed to enable access to tools during the day.





As depicted on the development site plan, a total of six undercover parking bays are currently provided on site. Space for an additional four parking bays are provided to the south of the undercover parking area.

No visitor vehicles other than those associated with general product deliveries such as rubbish removal and water deliveries are expected to access the site.

The existing parking bays on site meet the minimum dimensions of 2.75m in width and 7.5m in length and there is sufficient space on site to enable vehicles to enter and exit in forward gear.

Therefore, the existing parking arrangement on site is considered to adequately provide for the needs of the Lampson staff.

#### 7.4 Local Planning Policy No. 18 – Setbacks

The objectives of the Shire's Local Planning Policy No. 18 – Setbacks (LPP18) are listed as follows:

*To maintain the rural character of the Shire;*

*To allow maximum flexibility for building while maintaining rural character, ensuring light, safety and visual privacy, preserving natural vegetation, protecting water courses and wetlands from encroachment and keeping firebreaks clear.*

The key policy provisions under Clause 5 of LPP18 relevant to this planning application are outlined below:

5.4 *In the special control area that is Water Prone and areas liable to flooding the minimum building setback is 30m from an existing water body or highest known flood level, as decided by Council.*

5.7 *Otherwise, the following minimum setbacks generally apply to buildings (including retaining walls), dams and water tanks:*

*(a) Agricultural Resource Zone*

*Highway – 100m*

*Major Road – 50m*

*Other Road – 30m*

*Rear – 30m*

*Side – 30m*

5.11 *Council may permit variations to the minimum setbacks specified in 5.5 and 5.7 above, as permitted by TPS No. 6, in the following circumstances:*

*(c) commercial or industrial use*

*(f) other cases where it is reasonable to do so, as determined by Council.*

For the purposes of this retrospective planning application, the existing structures on site have been assessed to determine their compliance with the setback requirements under Clauses 5.4 and 5.7.

Having regard to Clause 5.4, the development site is separated from the creek line to the north by around 200m. To the east, the development area is separated from Ellen Brook by approximately 900m.

The existing office building and covered car parking structure is set back from Brand Highway by approximately 90m. The existing tool shed to the north of the large shed is setback from the northern side boundary by approximately 20m, while the main part of the large shed is set back approximately 30m from the northern boundary. Considering these minor variations, the Council has the discretion to approve the development due to the commercial nature of the operations being undertaken at the site. In addition, as demonstrated in the aerial photography included at **Annexure 2**, the physical location of the office block, parking structure, large shed and the tool shed to the north of it has not changed since prior to 2009. Indeed the overall footprint of the development has now significantly reduced.

It is therefore considered that the boundary setbacks are acceptable and capable of approval by Council.

#### 8.0 LOCAL STRATEGIC PLANNING CONTEXT

##### 8.1 Shire of Chittering Local Planning Strategy 2001-2015

The subject site is located within the 'Ellen Brook Palusplain', which is further identified and addressed in the Strategy:





## 9.2 Topography

As seen in the Site Plan at **Figure 3**, the topography of the land is generally level and provides no difficulties for development. The subject site falls from 51m AHD in the west to 48m AHD in the east. The development area is generally at a level of 51m AHD across the site.

There are no environmental constraints on the subject site with respect to the topography or surface drainage.

## 9.3 Site Contamination

The Department of Environment Regulation (DER) Contaminated Sites Register did not identify any recorded contamination at the subject site. There is no known contamination that has occurred as a result of the fire that occurred at the premises in 2012. Following the fire, those buildings that suffered fire damaged were removed and disposed of off-site by the previous landowner.

## 9.4 Wetlands and Waterways

A review of the WA Atlas Wetland Management Category Mapping was undertaken which identified the subject site within a 'Multiple Use' wetland (refer **Figure 20**). Multiple Use wetlands are generally described as 'wetlands with few remaining important attributes and functions', their respective management objectives involving:

*Use, development and management should be considered in the context of ecologically sustainable development and best management practice catchment planning through landcare.*

The existing wetland classification which exists over the subject site is not a barrier to its continued use on the basis of the previous development that has taken place on the site, but also in the context of the overall environmental management practices adopted.

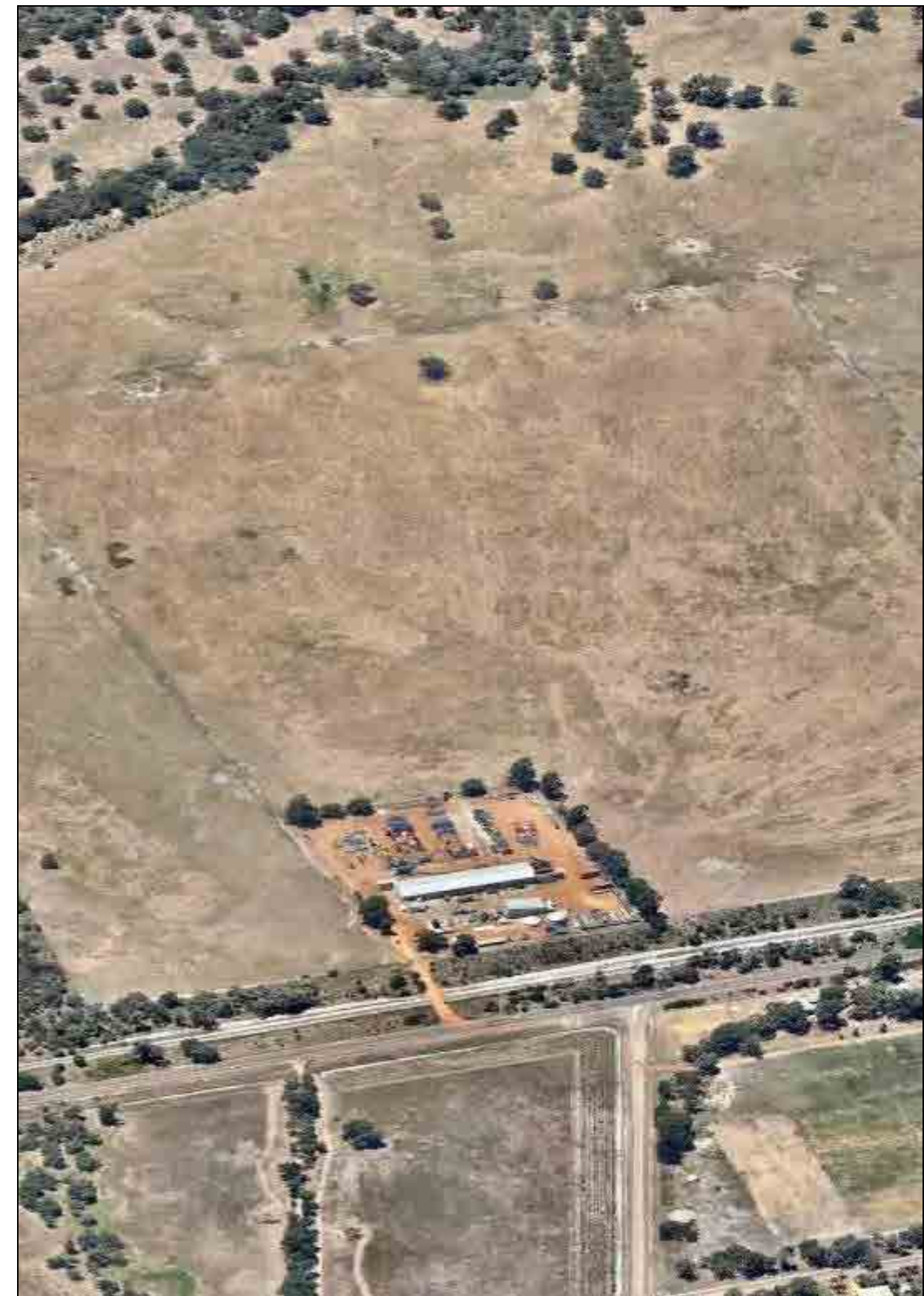
Lampson have appointed an engineering consultant to undertake a Stormwater Drainage and Catchment Plan and Report to demonstrate how water is captured and retained on-site following a storm event. This information will be provided to the Shire in due course to support the proposal. As noted previously, Lampson also operate under the terms of an EMP and Spills Management Plan which assist to further mitigate against any impacts to groundwater as a result of site operations.

## 9.5 Significant Vegetation

The Site has previously been completely cleared of all existing vegetation.

## 9.6 Indigenous Heritage

A search was undertaken on the Department of Indigenous Affairs Aboriginal Heritage Enquiry System which returned no results of Registered Aboriginal Sites on or around the subject site.



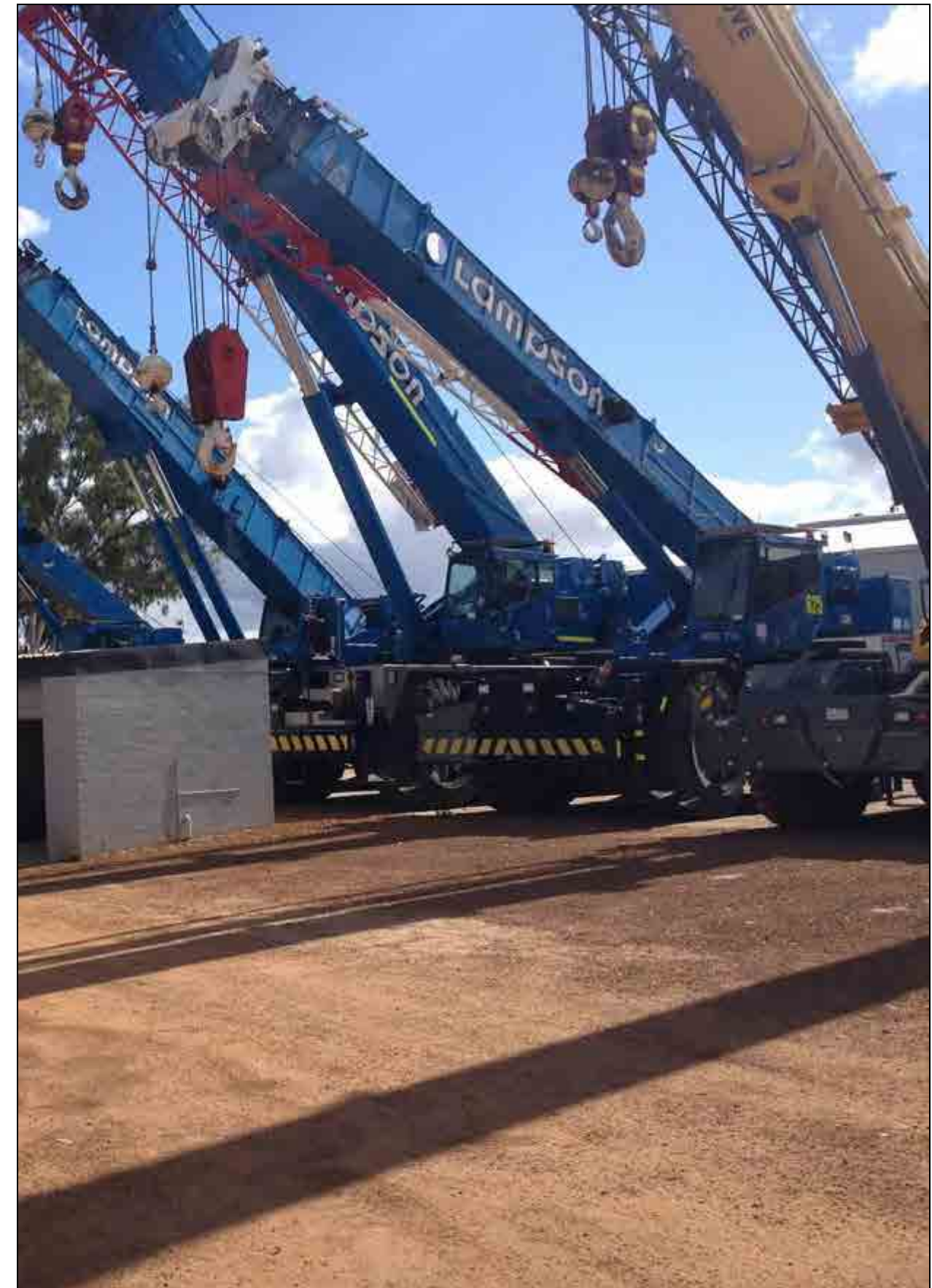


## 10.0 CONCLUSION

The land use and development works detailed as part of this application accurately reflect Lampson's existing business operations. The operations are consistent with the 'Transport Depot' land use under TPS6 and it is therefore considered that there are sound reasons for the Shire to exercise its discretion under clause 8.4.1 to grant retrospective planning approval for this proposal. In particular, we consider that in relation to the subject site:

- The granting of retrospective planning approval for the works already undertaken with respect to the two storage sheds, office building, staff amenities block and water storage tanks simply represents a formalisation of works that have existed at the subject site for a number of years.
- The granting of planning approval for the proposed future expansion area provides for a logical extension to the development site area which is capable of being undertaken with minimal environmental impact or impact on the local amenity. Approval of the expansion area will assist in ensuring the viability of the Lampson Muchea site and will improve the overall functionality of the Transport Depot.
- The land use is in compliance with the State and local planning framework and is designed to operate in accordance with State environmental legislation;
- The land use ensures the establishment of a lifting and transport equipment operation which supports the development of the Perth Metropolitan Region and the wider region of the Wheatbelt and South-West;
- The subject site is well suited to supplying lifting and transport equipment to the regions given its proximity to an established transport network;
- The management, efficiency and operations of the proposed Lampson operations represent established practices in environmental management;
- The proposed Lampson transport depot is consistent with the current zoning of the site and consistent with the orderly and proper planning of the locality; and
- The Lampson Transport Depot will function to serve the local community by providing employment opportunities as the operation is established.

For these reasons we respectfully seek the Shire's support for the existing works and Transport Depot operation on Lot 6 (290) Brand Highway, Muchea.





**ANNEXURE 1 –  
FORM 7 –  
FORM OF APPLICATION FOR PLANNING APPROVAL**



Shire of Chittering  
6177 Great Northern Highway  
(PO Box 70)  
BINDOON WA 6502  
E: [chatter@chittering.wa.gov.au](mailto:chatter@chittering.wa.gov.au)  
T: 9576 4600 / F: 9576 1250  
W: [www.chittering.wa.gov.au](http://www.chittering.wa.gov.au)

## Schedule Seven Application for Planning Approval

Town Planning Scheme No 5

|   |  |                         |                    |
|---|--|-------------------------|--------------------|
| <b>Owner/s Details:</b>   |  |                         |                    |
| Name:   | LAMPSON (AUSTRALIA) PTY LTD  |                         |                    |
| Address:  | LOT 3 AWABA ROAD, TORONTO NSW  |                         |                    |
| Contact Numbers:  | Home:  |                         | Work: 02 4959 6222 |
|   | Mobile:  |                         | Fax: 02 4950 4645  |
|   | Email:   |                         |                    |
|   | Contact Person:  | JOHN KLEEN              |                    |
| Owners Signature:   |  | Date:                   | 17/12/2015         |
| Owners Signature:   |  | Date:                   |                    |
| <i>The handwritten signature of the owner(s) is required on all applications. This application will not proceed without that / those signature/s.</i>                       |  |                         |                    |
| <b>Applicant Details:</b>   |  |                         |                    |
| Name:   | TOM HOCKLEY  |                         |                    |
| Address:  | ALLERDING & ASSOCIATES 125 HAMERSLEY ROAD SORIANO 6008   |                         |                    |
| Contact Numbers:  | Home:  | -                       | Work: 9382 3000    |
|   | Mobile:  | -                       | Fax: 9382 3005     |
|   | Email:   |                         |                    |
|   | Contact Person:  | TOM HOCKLEY             |                    |
| Applicants Signature:   |  | Date:                   | 17/12/2015         |
| <i>The handwritten signature of the applicant is required on all applications. This application will not proceed without that signature.</i>                                |  |                         |                    |
| <b>Property Details:</b>  |  |                         |                    |
| Lot No:   | 6  | House/Street No:        | 290                |
| Diagram/Plan No:  | 13866  | Cert. of Title Vol. No: | 1651               |
| Title encumbrances (easements, restrictive covenants etc):  | REFER TO ATTACHED CERTIFICATE OF TITLE   |                         |                    |
| Street name:  | BRAND HIGHWAY  |                         |                    |
| Nearest Street Intersection:  | CHITTERING STREET  |                         |                    |
| Suburb:   | MUCHEA   |                         |                    |
| <b>Existing Building / Land Use:</b>  |  |                         |                    |
| Description of proposed development and/or use:   | BUILDINGS AND HANDSTANDS ASSOCIATED WITH A TRANSPORT DEPOT   |                         |                    |
| Nature of any existing buildings and/or use:  | TWO SHEDS, ONE SHADE STRUCTURE, TRANSPORTABLE OFFICE BUILDING & HANDSTAND                          |                         |                    |
| Approximate cost of proposed development (less GST)   | \$19,000 (REFER TO COVER LETTER)<br>(please note this is the replacement value of the development) |                         |                    |
| Estimated date of completion:   | DECEMBER 2017  |                         |                    |
| <i>This application is to be submitted with two copies of all plans which are no larger than A3 in size.<br/>A separate application is required for a Building License.</i> |  |                         |                    |

Please see over...

Page 1 of 2





Shire of Chittering  
 6177 Great Northern Highway  
 (PO Box 70)  
 BINDOON WA 6502  
 E: [chatter@chittering.wa.gov.au](mailto:chatter@chittering.wa.gov.au)  
 T: 9576 4600 / F: 9576 1250  
 W: [www.chittering.wa.gov.au](http://www.chittering.wa.gov.au)

## Information Sheet Application for Planning Approval

*Town Planning Scheme No 6*

### Accompanying Material

Every application for Planning Approval shall be accompanied by:

#### 1. The correct Fees

##### Planning Application Fees

|  |   |
|--|---|
| Not more than \$50,000                     | \$147.00  |
| More than \$50,000 but less than \$500,000 | 0.32% of value amount less GST  |
| More than \$500,000 but less than \$2.5m   | \$1,700 + 0.257% for every \$1 over \$500,000   |
| Retrospective Approvals                    | Three times the amount of the application fee as detailed above. (i.e. \$147 x 3 = \$448) |



#### 2. Schedule 7 Planning Application form

(Please see reverse)

#### 3. Two (2) copies of plans to scale on paper no larger than A3 size, showing:

- A site plan detailing:
  - street names;
  - lot numbers and tenure of the subject land and all adjoining parcels of land;
  - north point; and
  - dimensions of site.
- Floor plans, elevations, and sections of the proposed building to be erected or altered; and
- The location of any buildings or structures already on the site.

### Credit Card Payments

|                   |   |
|-------------------|---|
| Card Type:        | <input type="checkbox"/>  <input type="checkbox"/>                                      |
| Cardholders Name: |   |
| Card Number:      | <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> - <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> |
| Expiry Date:      |   |
| Security Code:    |   |
| Signature:        |   |
| Amount:           |   |

Page 2 of 2

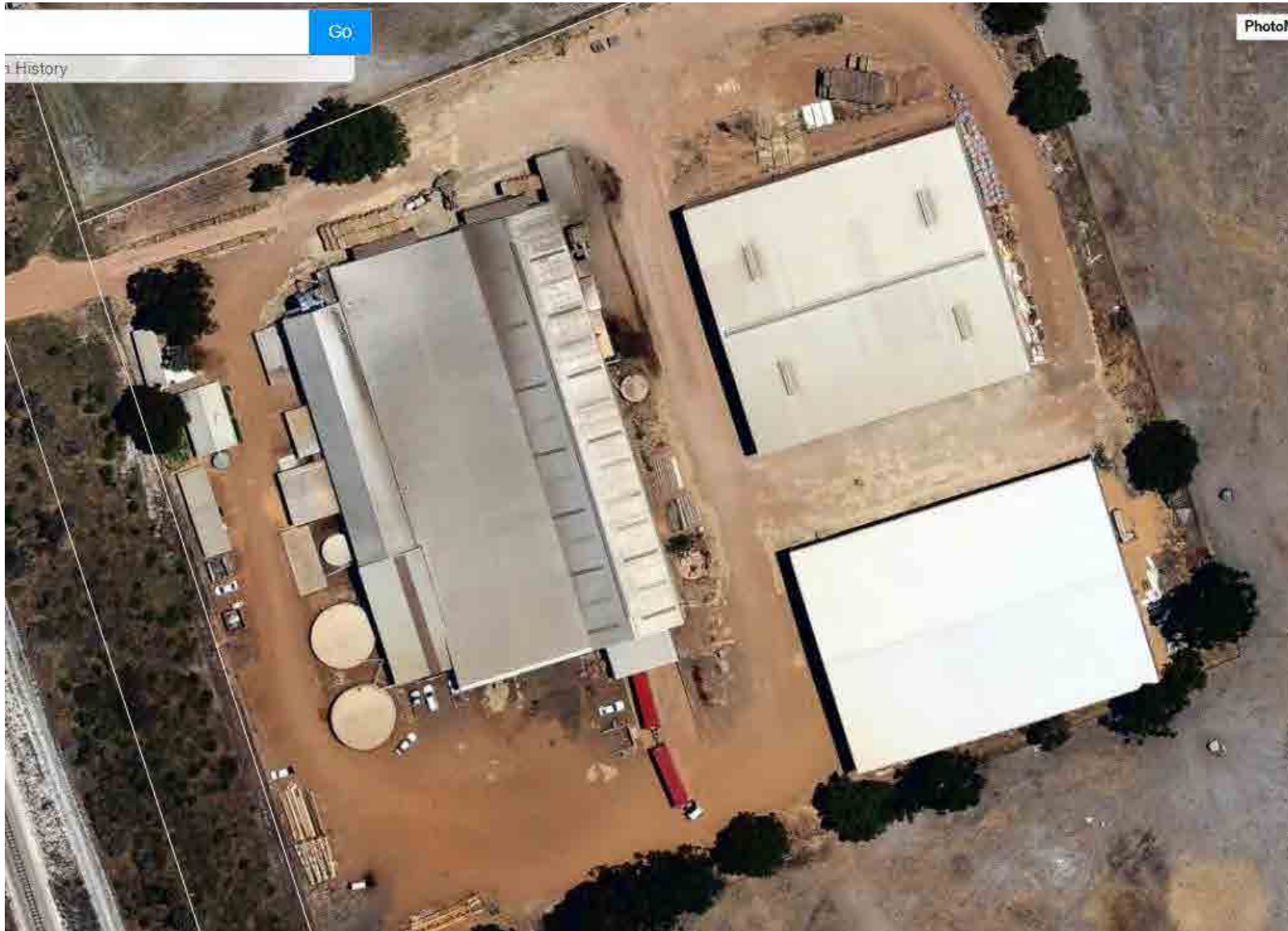
**ANNEXURE 2 –  
HISTORIC AERIAL PHOTOGRAPHS**



## Recent Site History 2009 to 2015



9 February 2009 (before fire)

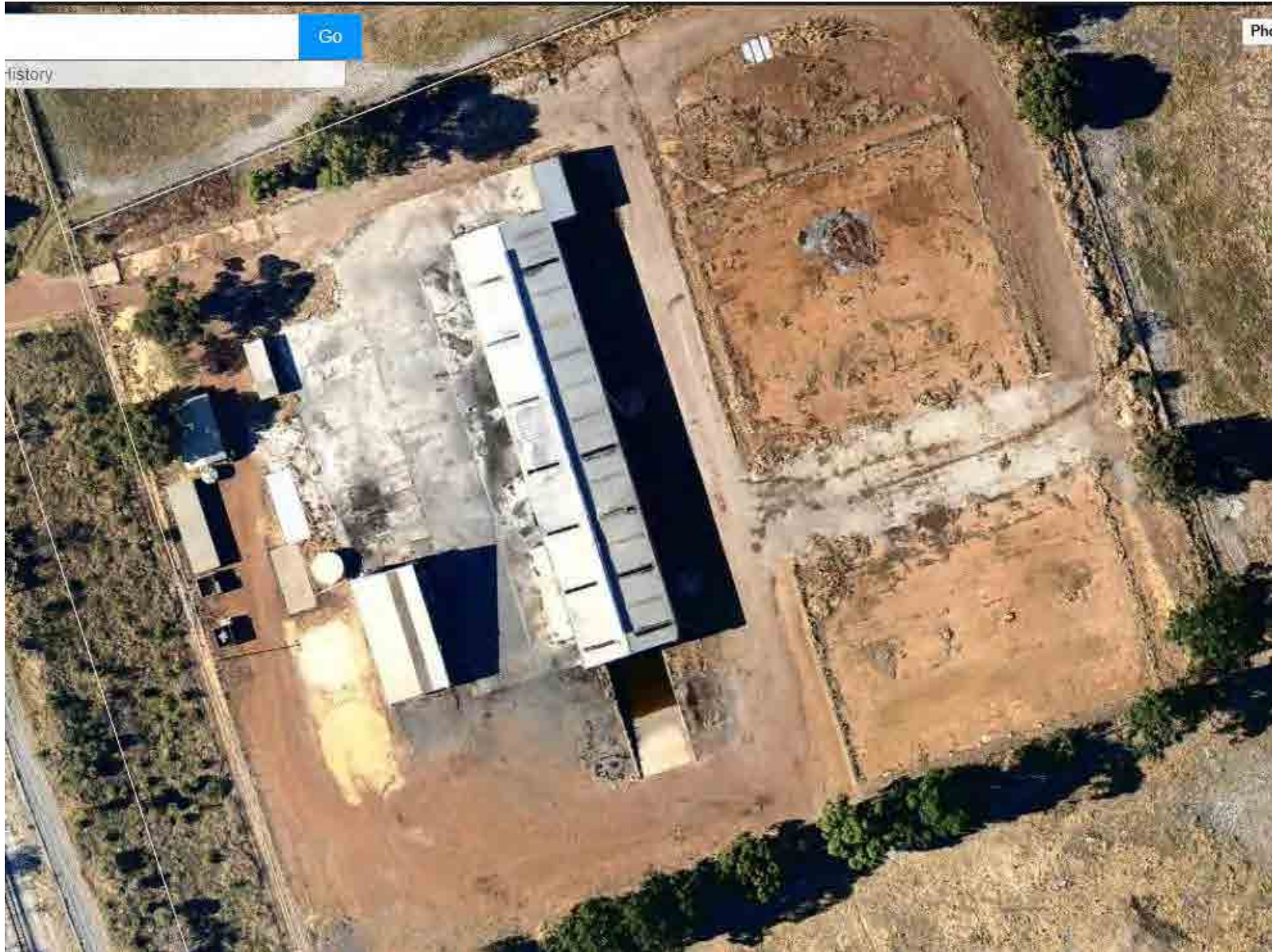


17 January 2012 (before fire)



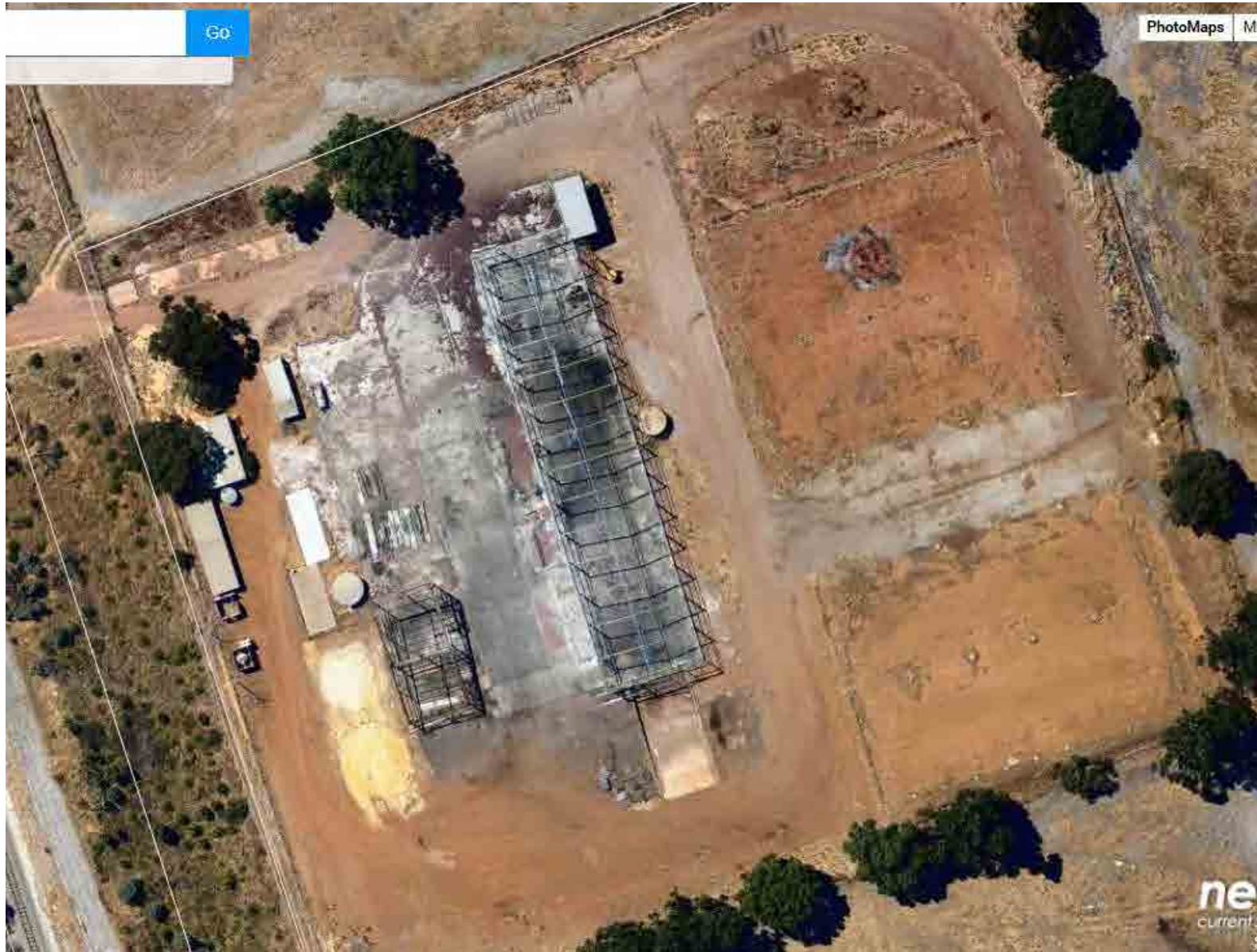


27 October 2012 (after fire)



14 December 2013 (remaining structures after fire – identical to current structures)





2 March 2014

(building frames about to be re-clad – damaged cladding removed due to fire damage but frames remain)





9 August 2014 (sheds re-clad and large water tanks reinstated)





21 February 2015 (Lampson operational)

**ANNEXURE 3 –  
CERTIFICATE OF TITLE**



64V

WESTERN



AUSTRALIA

|                                    |  |
|------------------------------------|--|
| REGISTER NUMBER<br><b>6/P13866</b> |  |
| DUPLICATE EDITION<br><b>4</b>      | DATE DUPLICATE ISSUED<br><b>20/10/2015</b> |

# **RECORD OF CERTIFICATE OF TITLE** UNDER THE TRANSFER OF LAND ACT 1893

VOLUME  
**1651**FOLIO  
**436**

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.



REGISTRAR OF TITLES



## **LAND DESCRIPTION:**

LOT 6 ON PLAN 13866

## **REGISTERED PROPRIETOR:** (FIRST SCHEDULE)

LAMPSON (AUSTRALIA) PTY LTD OF LOT 3 AWABA ROAD TORONTO NSW  
(T N149062 ) REGISTERED 15 OCTOBER 2015

## **LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:** (SECOND SCHEDULE)

- EXCEPT AND RESERVING METALS, MINERALS, GEMS AND MINERAL OIL SPECIFIED IN TRANSFER 6923/1933. AS TO THE SAID LOCATION 1352 ONLY SKETCH ON VOL 1651 FOL 436.
- H632804 LEASE TO MILNE FEEDS PTY LTD OF 103-105 WELSHPOOL ROAD, WELSHPOOL  
EXPIRES: SEE LEASE. AS TO PORTION ONLY. REGISTERED 27.12.2000.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.  
\* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.  
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

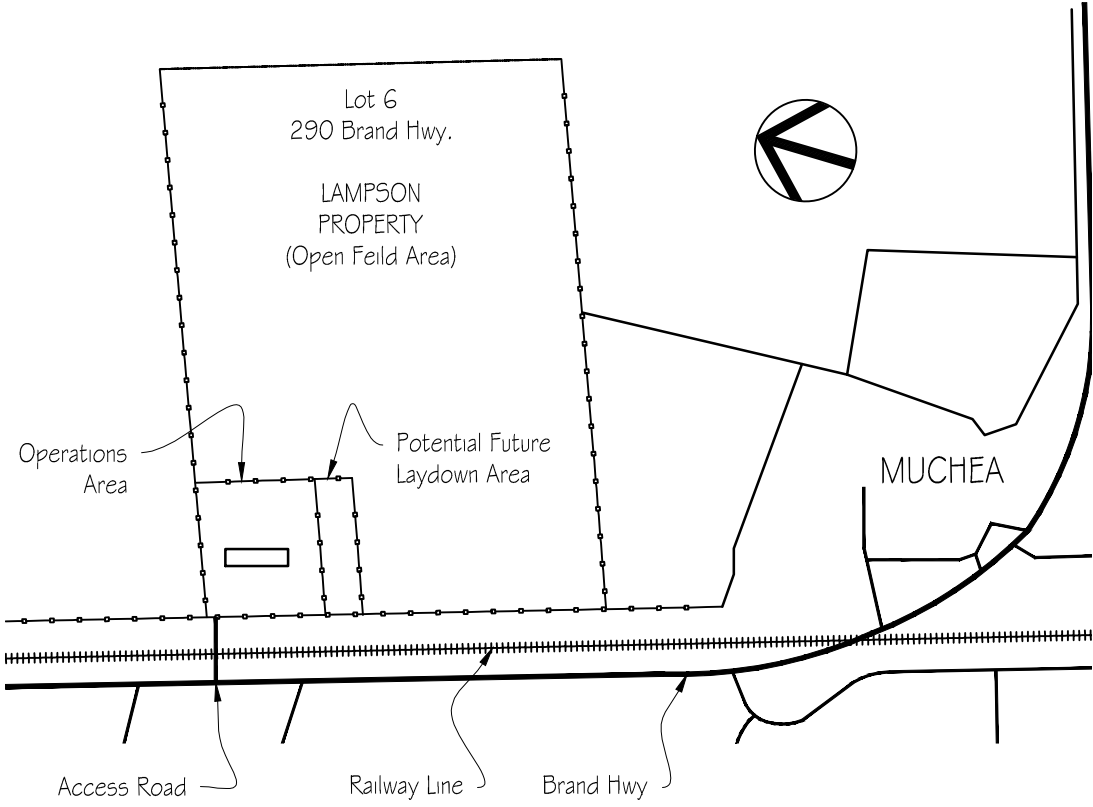
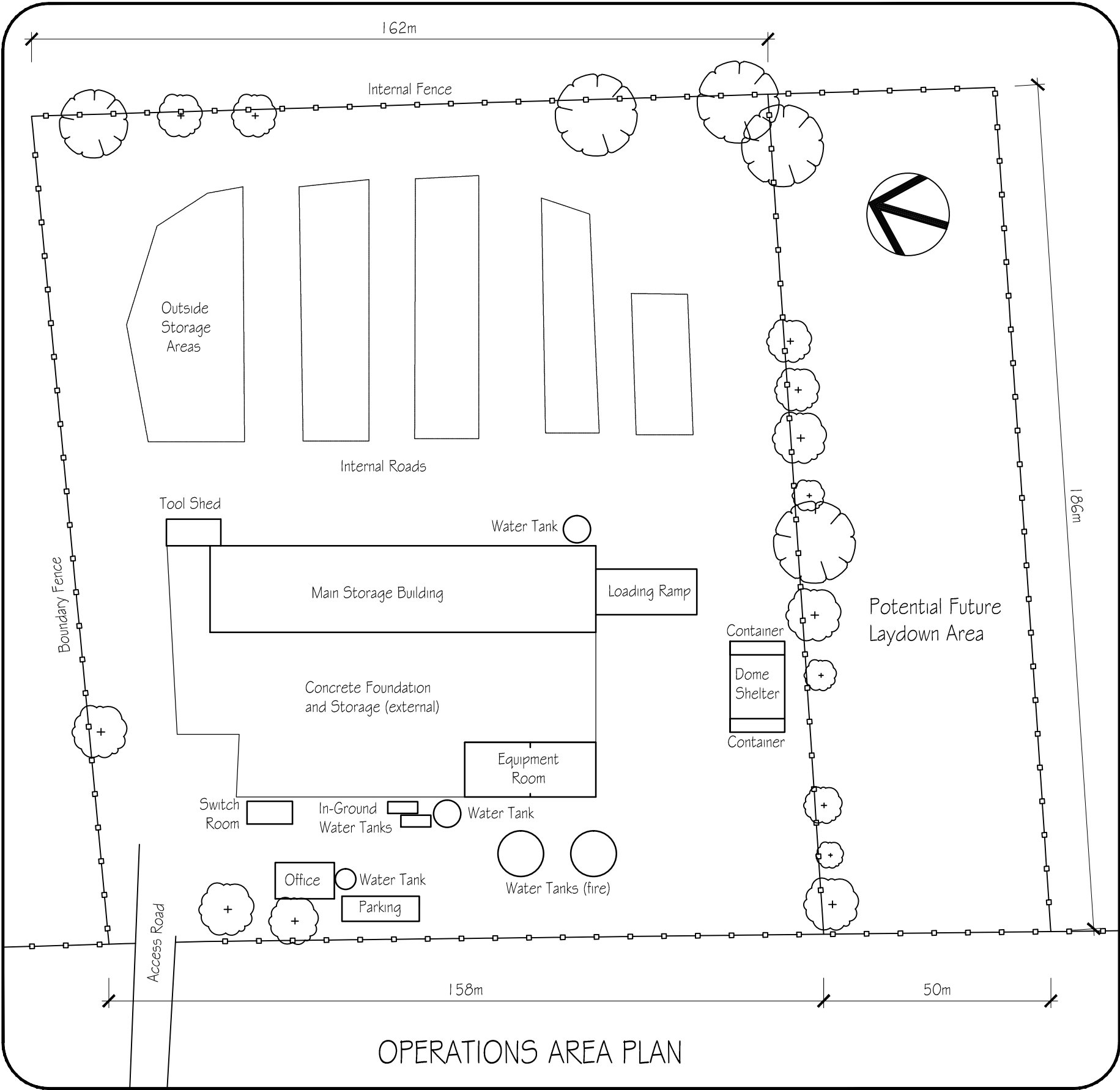
## **STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1651-436 (6/P13866).  
PREVIOUS TITLE: 1651-430.  
PROPERTY STREET ADDRESS: 290 BRAND HWY, MUCHEA.  
LOCAL GOVERNMENT AREA: SHIRE OF CHITTERING.

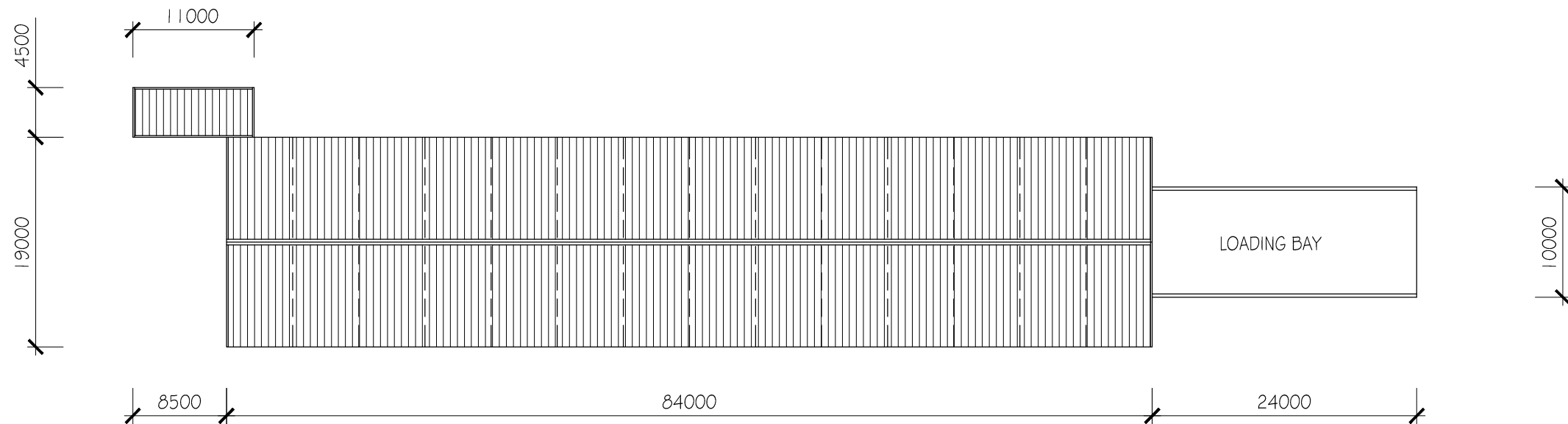
**ANNEXURE 4 –  
DEVELOPMENT PLANS**



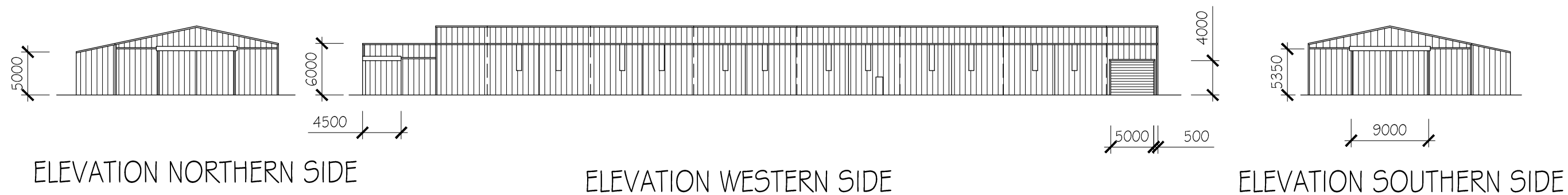


LAMPSON SITE LOCATION PLAN

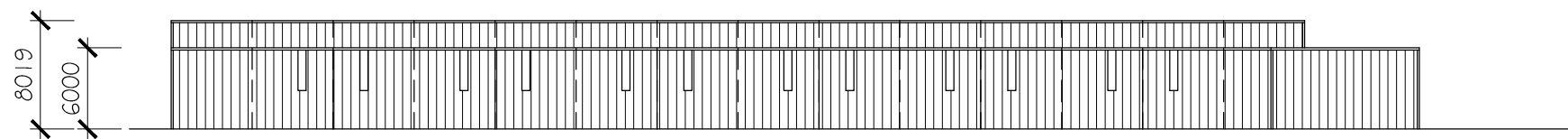
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | </ |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----|



# MAIN STORAGE BUILDING PLAN



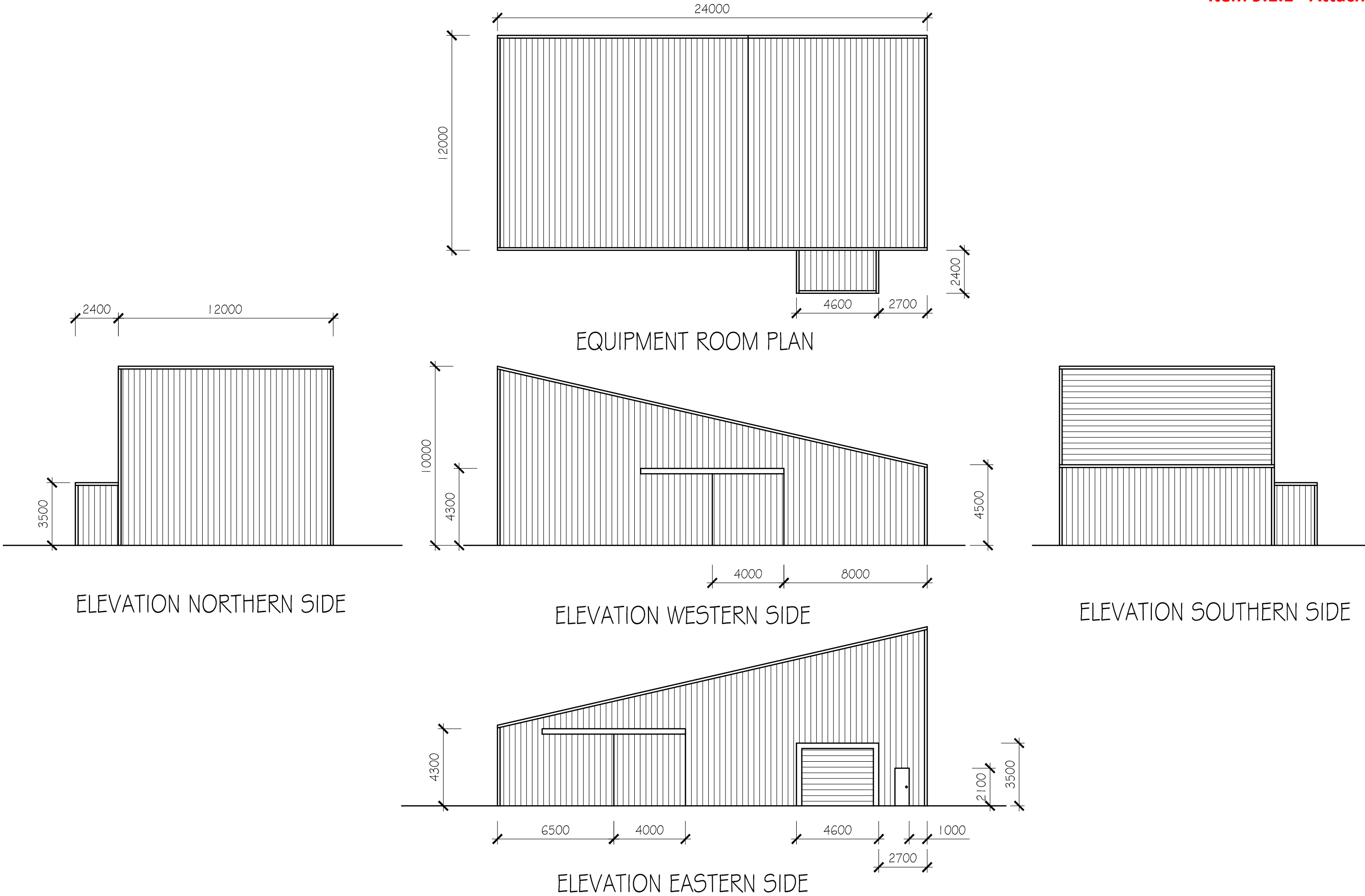
## ELEVATION WESTERN SIDE



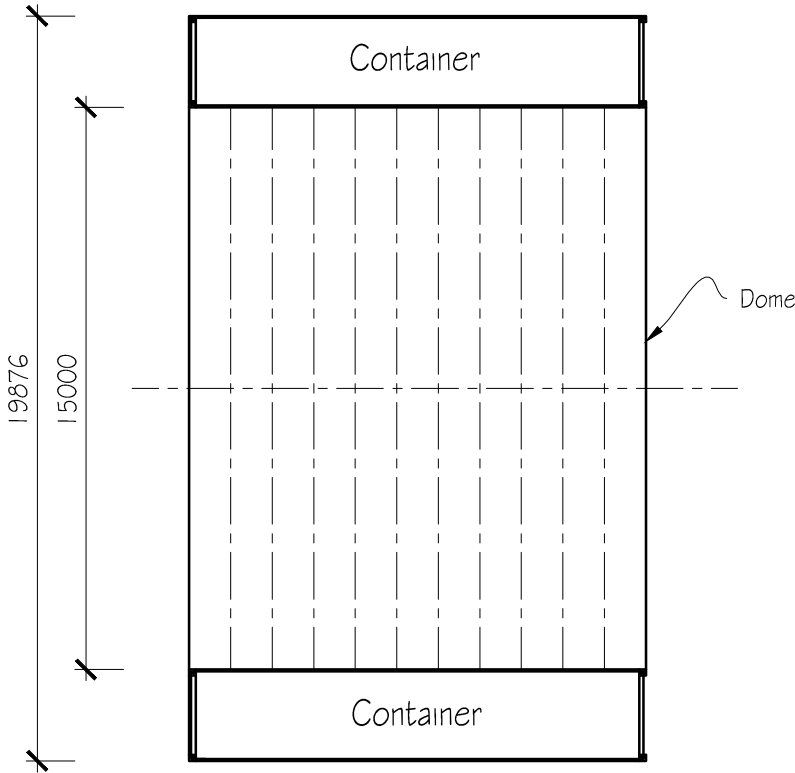
### ELEVATION EASTERN SIDE

[illegible]

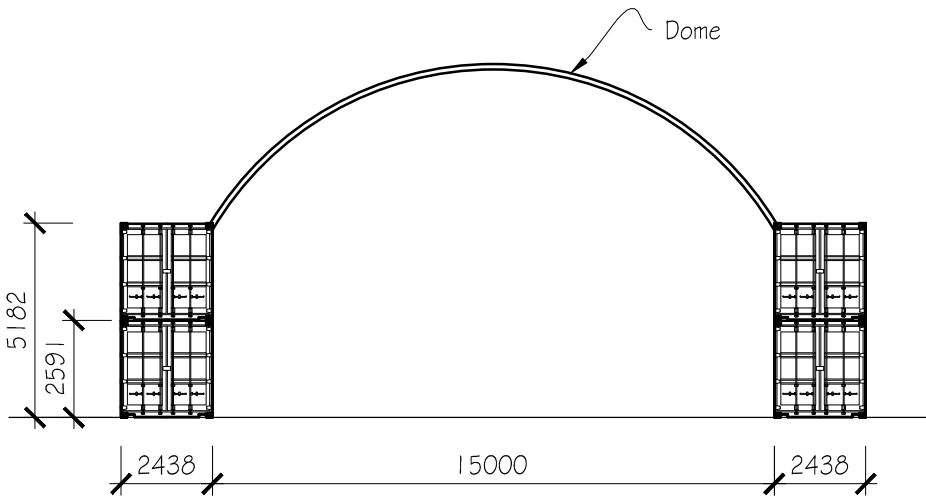




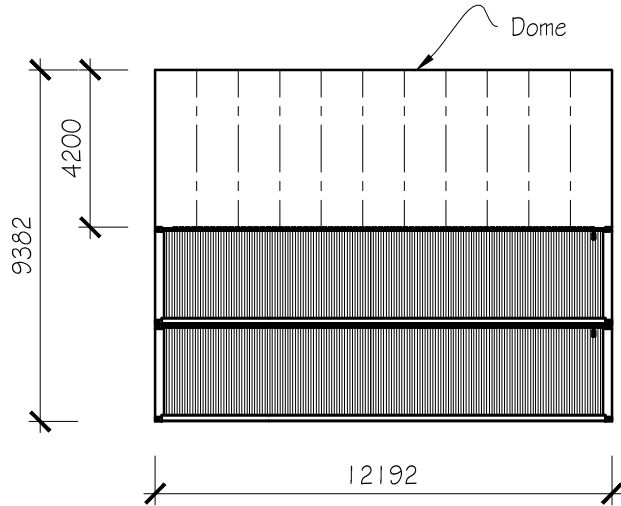
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|



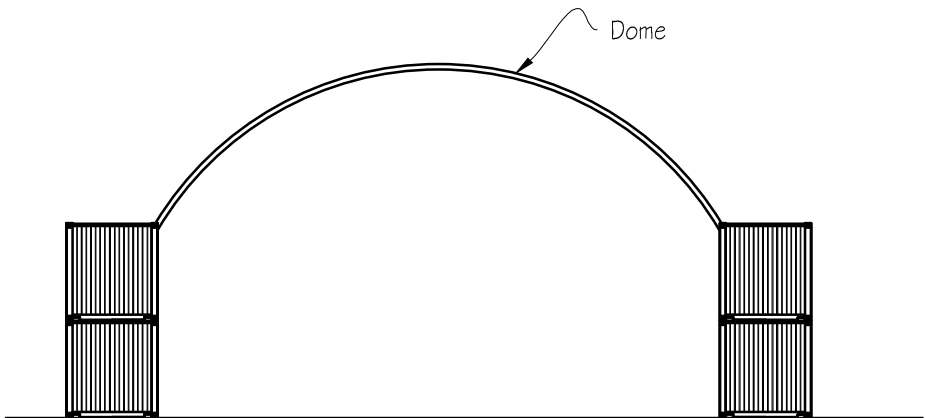
DOME SHELTER PLAN



NORTHERN END VIEW



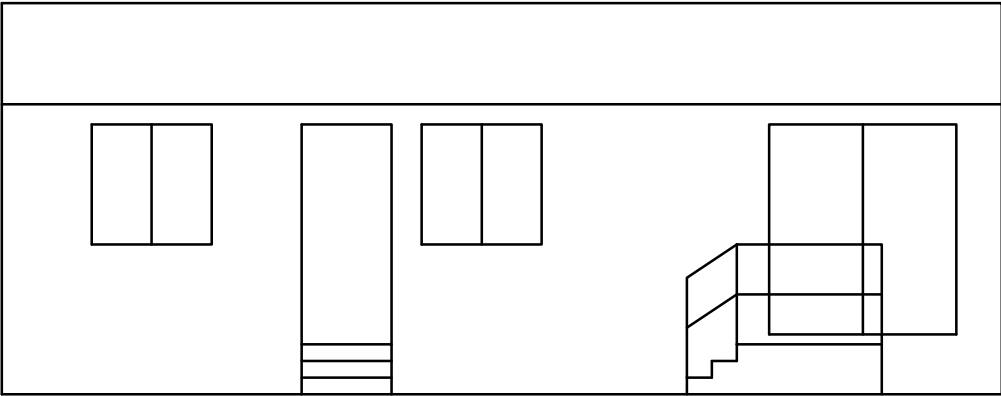
WESTERN ELEVATION



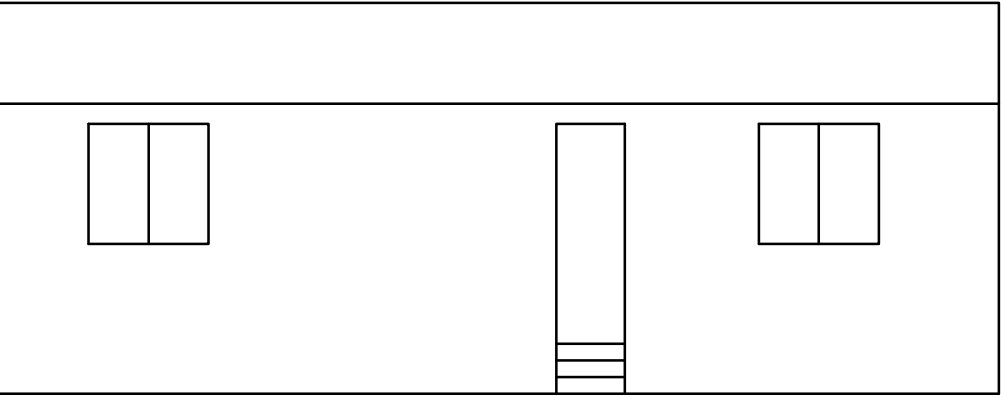
SOUTHERN END VIEW

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

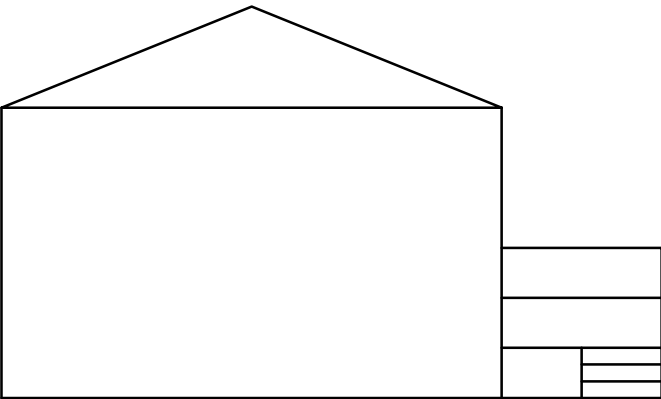




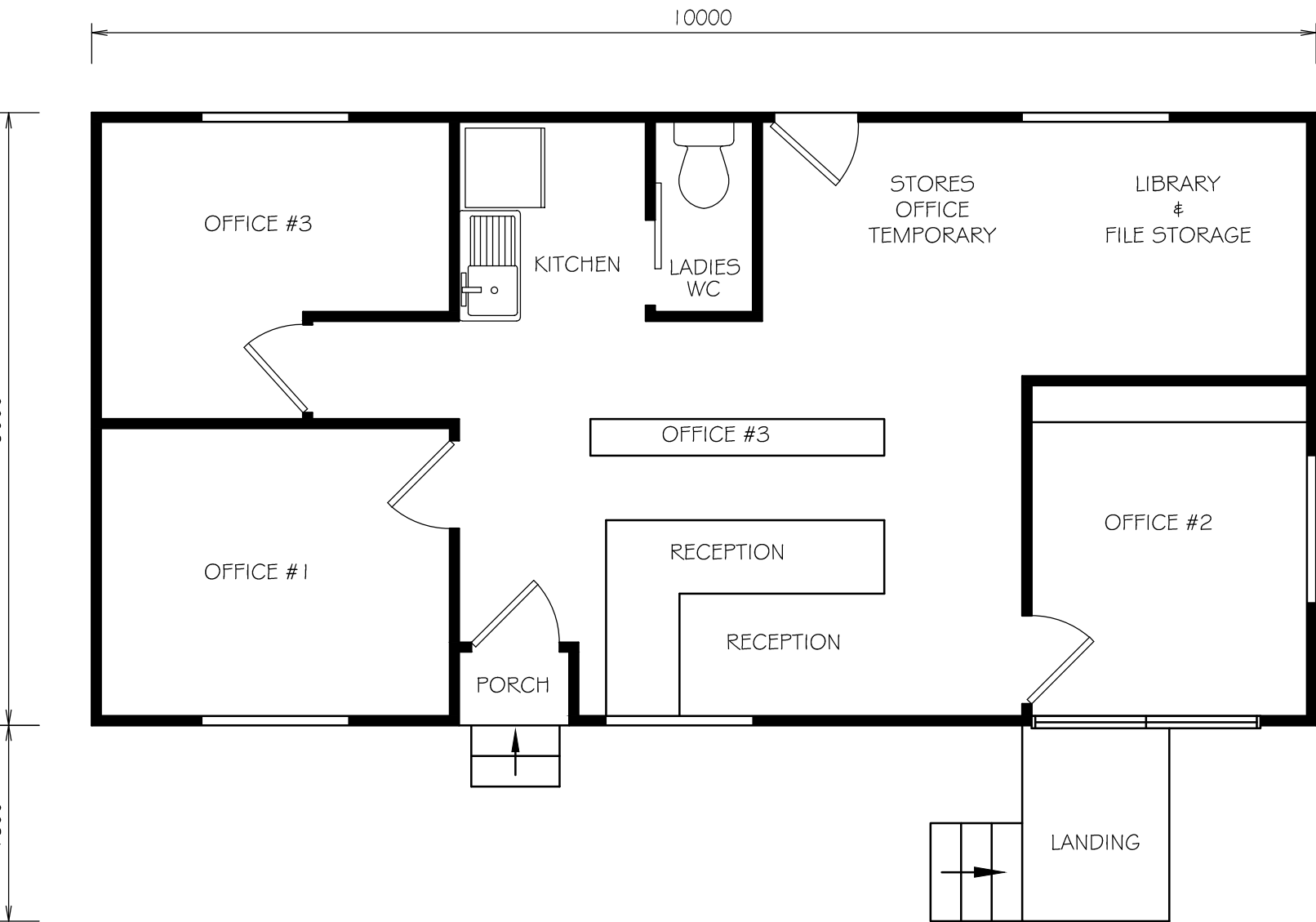
ELEVATION WESTERN SIDE



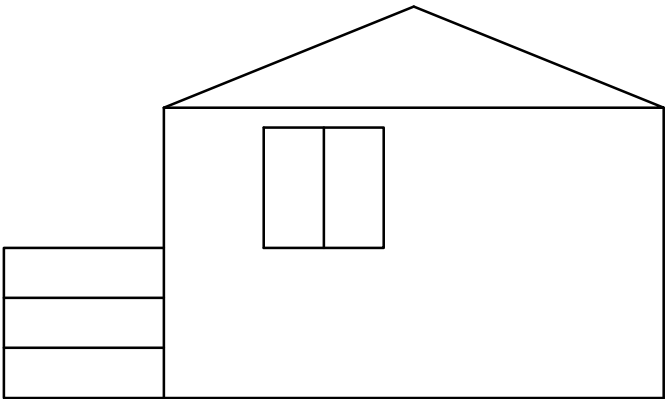
ELEVATION EASTERN SIDE



ELEVATION NORTHERN SIDE



LAMPSON SITE OFFICE PLAN



ELEVATION SOUTHERN SIDE

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

**ANNEXURE 5 –  
TRAFFIC MANAGEMENT PLAN**





## **Access to the Lampson Australia Muchea site**

### **Traffic Management Plan (TMP)**

#### **Purpose of this plan**

This TMP has been developed to address the potential traffic impacts on the access and exit to Lampson Australia Muchea Site. Which include the following:

- Details of traffic Routes
- The number and Type of vehicles to be used from and with the site per day
- Speed limits to be observed along routes to and from the site
- Behaviour requirement for vehicle drivers to and from the site and within the site.

#### **Details of traffic routes**

Access to the Muchea site from the east and the west is via the Brand Highway. It is a state road and has 2 lanes with a speed limit of 110kph, classified as a primary distributor road with limited access acceptable to service individual properties. The traffic counts for 2014/2015 section of the Brand Hwy north of Muchea South Road. There was on average 3,900 vehicle movements per day (Monday to Saturday) for this section of the Brand Hwy.

With the future construction of the Perth to Darwin Highway the overall vehicle movements will reduce as there will only be the local traffic using the road.

The access road into the site is a dirt road that runs across a railway line. At the intersection of the railway line and the dirt road there is a stop sign. Once over the railway line it is a short distance to the main gate. There is ample area on both sides of the railway tracks for the trucks to enter and leave the site without blocking the railway crossing as shown in drawing number 502-01. 90% of the traffic leaving or entering the site do from a south direction.

#### **The number and type of vehicles**

The vehicle movements to and from the site during a standard day will be:

- Staff cars (light vehicle)
- General product deliveries (light vehicle)
- Lampson transport (heavy vehicles)

The estimated traffic movement associated with Lampson's daily work is summarised below.

- Staff Cars - 10 per day
- General product deliveries – Rubbish removal truck 1 per week and water truck 1 per month



- Lampson equipment – 1 x truck and trailer pocket road train (28m long) per month, 1 x truck and trailer 40' trailer (25m long) per month and 2 x truck and trailer (21m long) per week.

There will be days where there are no deliveries of product or Lampson equipment and other days where the maximum number of vehicle movements may be higher than the average stated above.

## **Traffic Noise**

The following will be applied to minimise the traffic noise impacts:

- Apply and strictly adhere to low speed limits within site and access road (10kph)
- Ensure a clearly defined access road is available and that the road surface are adequately maintained
- Ensure all vehicles are fitted with adequate noise control equipment in good working order.
- Vehicles should not arrive or leave the site before 6:30am and after 5pm during the week and before 6:30am and after 3pm on weekends and public holidays

## **Speed limits**

The speed limit on the Brand Highway is 110kph. All Lampson drivers will slow down and indicate and then turn into the site. Stop at the railway crossing, and when safe to do so, then cross the railway crossing and enter the Lampson yard where the speed is 10kph for site and access road. There will be clear and concise signage at the Lampson site.

## **Employees**

The number of employee at the Lampson Site is average 10 per day. Lampson hours of work are from 6:30am to 5:00pm Monday to Friday and 6:30am to 3:00pm on weekends and public holidays.



**ANNEXURE 6 –  
ENVIRONMENTAL MANAGEMENT PLAN**

**Lampson (Australia) Pty Ltd**

# **Environmental Planner**



## Table of Contents

|   |    |
|---|----|
| Outline.....  | 4  |
| Normative Reference .....   | 5  |
| Introduction .....  | 6  |
| Scope .....   | 8  |
| Terms and Definitions .....   | 10 |
| EMS POLICIES.....   | 12 |
| General Requirements .....  | 13 |
| Environmental Policy.....   | 14 |
| Planning.....   | 16 |
| Environmental Aspects .....   | 17 |
| Legal & Other Requirements.....   | 19 |
| Objectives, Targets and Action Plans .....                                | 20 |
| Implementation & Operation.....   | 21 |
| Structure & Responsibility .....  | 22 |
| Training, Competence and Awareness .....                                  | 23 |
| Communications .....  | 24 |
| EMS Documentation .....   | 25 |
| Document Version Control .....  | 26 |
| Operations Control.....   | 27 |
| Emergency Preparedness & Response .....                                   | 28 |
| Checking.....   | 29 |
| Monitoring & Measurement .....  | 30 |
| Evaluation of Compliance .....  | 31 |
| Non-Conformance, Corrective and Prevention Action .....                   | 32 |
| Control of Records.....   | 33 |
| Internal Environmental Audits .....                                       | 34 |
| Management Reviews.....   | 35 |
| EMS PROCEDURES .....  | 36 |
| Procedure 1 - Environmental Aspects .....                                 | 37 |
| Procedure 2 - Legal & Other Requirements .....                            | 39 |
| Procedure 3 - Legal Compliance .....                                      | 41 |
| Procedure 4 - Objectives, Targets & Action Plans .....                    | 43 |
| Procedure 5 - Environmental Assessment .....                              | 45 |
| Procedure 6 - Structure & Responsibility .....                            | 47 |
| Procedure 7 - Training, Competence & Awareness.....                       | 50 |
| Procedure 8 - Communications .....  | 52 |
| Procedure 9 - EMS Documentation .....                                     | 55 |
| Procedure 10 - Document Version Control .....                             | 57 |
| Procedure 11 - Review of Suppliers .....                                  | 59 |
| Procedure 12 - Regulatory Approvals .....                                 | 61 |
| Procedure 13 - Operations Control.....                                    | 64 |
| Procedure 14 - Emergency Preparedness & Response .....                    | 66 |
| Procedure 15 - Monitoring & Measuring .....                               | 69 |
| Procedure 16 - Environmental Alerts.....                                  | 72 |
| Procedure 17 - Evaluation of Compliance .....                             | 74 |
| Procedure 18 - Non-Conformances, Corrective and Preventative Action ..... | 76 |
| Procedure 19 - Control of Records.....                                    | 78 |

|   |     |
|---|-----|
| Procedure 20 - Internal Environmental Audits .....  | 81  |
| Procedure 21 - EMS Management Reviews .....         | 84  |
| EMS FORMS .....                                     | 86  |
| EF1 - Register of Environmental Aspects .....       | 87  |
| EF2 - Non-Conformity Report.....                    | 89  |
| EF3 - External Communication .....                  | 91  |
| EF4 - Environmental Action Plan.....                | 93  |
| EF5 - Responsibility .....                          | 96  |
| EF6 - Job Description.....                          | 98  |
| EF7 - Employment Application Form .....             | 99  |
| EF8 - Training Record.....                          | 105 |
| EF9 - Performance Review .....                      | 106 |
| EF10 - Service Report.....                          | 111 |
| EF11 - Register of Environmental Legislations ..... | 113 |
| EF12 - Supplier Sustainability Review .....         | 115 |
| EF13 - Environment Record Master List.....          | 117 |
| EF14 - Approved Suppliers List.....                 | 118 |
| EF15 - Purchase Order .....                         | 119 |
| EF16 - Goods Received .....                         | 121 |
| EF17 - Requisition .....                            | 123 |
| EF18 - Contract Review Action .....                 | 124 |
| EF19 - Schedule of Environmental Audits .....       | 125 |
| EF20 - Emergency Report.....                        | 127 |
| EF21 - Calibration Record.....                      | 130 |
| EF22 - Archives Register .....                      | 131 |
| EF23 - Management Review Record .....               | 132 |
| EF24 - Internal Environmental Audit Report .....    | 133 |
| EF25 - Terms of Reference for EMS Committee .....   | 134 |
| EF26 - Environmental Complaint Form .....           | 136 |

# **Lampson (Australia) Pty Ltd**

## **Outline**



## **Normative Reference**

### **Policy Ref**

PN0003

### **Policy**

Normative Reference

### **Description**

ISO 14000 is a series of generic standards that are developed by the worldwide federation known as the International Organisation for Standardisation (ISO). These standards provide business with a structure for managing environmental impacts.

### **Purpose**

Within the ISO 14000 series of standards, there are two types of standards:

- guidance and;
- requirements.

### **Scope**

Guidance standards are descriptive documents intended to provide guidance only and the requirements standard ISO 14001 is intended to provide the system requirements.

### **Procedure**

The following documents were used as reference during the preparation of the Environmental Management System (EMS): ISO 14001:2004 EMS – Requirements with guidance for use. ISO 14004:2004 EMS – General guidelines on principles, systems and support techniques.

## **Introduction**

### **Policy Ref**

PN0083

### **Policy**

Introduction

### **Description**

The Environmental Management System Manual includes the policies, procedures and forms that are to be used at Lampson (Australia) Pty Ltd to meet the requirements of the international standard ISO 14001:2004.

### **Purpose**

The Environmental Management System (EMS) Manual has been developed and is used to document the organisation's environmental business practices that have been put in place to meet the environmental objectives of the organisation.

### **Scope**

The following guidelines are to be adhered to by all employees, supervisors and employees.

### **Procedure**

The manual includes the following specific sections:

- EMS Policies - Describing the high level strategy and intent
- EMS Procedures - Detailing the specific action that is required
- EMS Forms - The forms or reports that are to be used in each circumstance

The EMS Policies are divided into sections that correlate to the Environmental Management System sections of ISO 14001:2004 as follows:

- 4.1 General Requirements
- 4.2 Environmental Policy
- 4.3 Planning
- 4.4 Implementation and Operation
- 4.5 Checking
- 4.6 Management Review

The EMS Manual documents the policies, procedures and forms at Lampson (Australia) Pty Ltd that are in place to ensure the organisation is well placed to meet the environmental objectives of the organisation, as detailed in the Environment Policy.

The EMS Manual has been developed in accordance with the guidelines contained in ISO 14001:2004, the internationally recognised standard for environmental management systems.

The EMS Manual is used internally to guide the organisation's management and employees through the various requirements of ISO 14001:2004 that must be met and maintained in order to ensure compliance with the standard.



## Scope

### Policy Ref

PN0084

### Policy

Scope

### Description

Lampson (Australia) Pty Ltd has been operating since 1991 and is engaged in the business of:

HEAVY LIFT CRANES AND HEAVY TRANSPORTATION

This manual details the steps and processes that Lampson (Australia) Pty Ltd has implemented to meet its environmental objectives and to meet the requirements of ISO 14001: 2004, the international standard for environmental management systems.

### Purpose

The purpose of this policy is to explain the general procedures relating to Scope

### Scope

The following guidelines are to be adhered to by all employees, supervisors and employees. The scope of the Environmental Management System (EMS) is as follows:

#### Geographical

The EMS covers all administration offices and operations in:

- Toronto NSW
- Gladstone QLD
- Muchea WA
- Karratha WA
- Melbourne VIC
- Sydney NSW

#### Functional

The EMS covers all normal business activities relating to the provision of:

- Heavy Lift Crane
- Heavy Transportation

### Revision and issue status

| ISSUE NO. | SECTION NO.   | REVISION NO. | DATE ISSUED | CHANGES MADE                        |
|-----------|---------------|--------------|-------------|-------------------------------------|
| 1.        | Entire manual | A            |             | Final draft for review and approval |
|           |               |              |             |                                     |
|           |               |              |             |                                     |

|  |  |  |  |  |
|--|--|--|--|--|
|  |  |  |  |  |
|  |  |  |  |  |

### **Procedure**

The EMS Manual is applicable to the environmental aspects that the organisation has identified as those which it can control and those which it can influence.

The manual is a "controlled" document however "uncontrolled" copies can be distributed to any interested party.

The EMS Manual is intended to be used as a public document to demonstrate the organisation's commitment to minimising the environmental impact from its main business activities.

## Terms and Definitions

### Policy Ref

PN0085

### Policy

Terms and Definitions

### Description

Lampson (Australia) Pty Ltd has guidelines for all employees regarding Terms and Definitions

### Purpose

The purpose of this policy is to explain the general procedures relating to Terms and Definitions

### Scope

The following guidelines are to be adhered to by all employees, supervisors and employees.

### Procedure

Auditor - Person with the competence and qualifications to audit.

Environmental Aspect - Element of the company's activities, products or services that can interact on or with the environment.

Environmental Impact - Any change to the environment, whether adverse or beneficial, wholly or partially resulting from the company's environmental aspects.

Environmental Performance - Measurable results of the organisation's environmental management of its environmental aspects.

Environmental Policy - The organisation's statement of its overall intentions and direction related to its environmental performance.

Environmental Objective - Overall environmental goal that is consistent with the environmental policy that the organisation sets to achieve.

Interested Party - Individual or group concerned with or affected by the environmental performance of the organisation.

Prevention of Pollution - Use of processes, practices, techniques, materials, products, services or energy to avoid, reduce or control pollution, in order to reduce any adverse environmental impacts.





## **Lampson (Australia) Pty Ltd**

# **EMS POLICIES**

## **General Requirements**

### **Policy Ref**

PN0087

### **Policy**

General Requirements

### **Description**

Lampson (Australia) Pty Ltd has guidelines for all employees regarding General Requirements

### **Purpose**

The purpose of this policy is to explain the general procedures relating to General Requirements.

### **Scope**

The following guidelines are to be adhered to by all employees, supervisors and employees.

### **Procedure**

The Policies that follow are identified with a reference to the specific ISO 14001:2004 section of the standard where appropriate.

The Managing Director is responsible for ensuring the establishment, implementation and maintenance of the Environmental Management System and for ensuring the environmental policy and the environmental objectives are defined and documented in the EMS Manual.

The process approach for the EMS shall integrate the business activities of the organisation, evaluate and document how the requirements of ISO 14001:2004 are fulfilled and incorporate a continual improvement philosophy.



## **Environmental Policy**

### **Policy Ref**

PN0088

### **Policy**

Environmental Policy

### **Description**

Lampson (Australia) Pty Ltd is striving for a sustainable future and as such, the organisation is committed to minimising the impact on the environment from its business operations.

### **Purpose**

The purpose of this policy is to explain the general procedures relating to Environmental Policy

### **Scope**

The following guidelines are to be adhered to by all employees, supervisors and employees.

### **Procedure**

To support this objective, we will:

- Comply with applicable local, state, and federal environmental regulations
- Continually seek to improve the environmental performance of our business
- Engage employees, clients and suppliers in reducing the organisation's carbon footprint
- Train appropriate employees in sustainability management
- Maintain and support.
- Lead by example and aim to become advocates for sustainability in our sector
- Encourage the development of innovative sustainable products and services
- Adopt sustainable procurement practices
- Actively encourage and support our suppliers to adopt sustainable practices
- Measure and periodically report on our progress towards our sustainability goals
- Use finite resources, including paper, energy, fuel and water as efficiently as possible

In particular we will:

#### **Emissions**

- Calculate the carbon footprint of our business operations
- Minimise our carbon footprint through reduction strategies
- Promote energy efficiency to our employees, customers and suppliers
- Consider purchasing carbon offsets where appropriate

#### **Waste**

- Minimise waste by evaluating procedures to ensure they are as efficient as possible
- Actively promote recycling of paper, cardboard and other materials

#### **Water**

- Actively promote water conservation across the organisation

This policy is explained and discussed at the general induction training given to all new employees and has been communicated to all current employees. All employees are expected to know what the environmental policy means to them and how it affects their job or position within the organisation.

Signed: \_\_\_\_\_

Managing Director, Lampson (Australia) Pty Ltd

Date: \_\_\_\_\_

\_\_\_\_\_

Review Date:

# **Lampson (Australia) Pty Ltd**

## **Planning**



## Environmental Aspects

### Policy Ref

PN0089

### Policy

Environmental Aspects

### Description

Lampson (Australia) Pty Ltd has guidelines for all employees regarding Environmental Aspects.

### Purpose

The purpose of this policy is to explain the general procedures relating to Environmental Aspects

### Scope

The following guidelines are to be adhered to by all employees, supervisors and employees.

### Procedure

Lampson (Australia) Pty Ltd shall establish, implement, document and maintain a process to identify environmental aspects and related environmental impacts that the organisation can control or have influence over.

A consistent risk analysis approach shall be used to determine the significance of the environmental aspects and impacts.

"EMS Procedure 1- Environmental Aspects" shall be used to identify how the organisation's business activities, products, and services impacts on the environment.

The identification of environmental aspects shall take into account the possible environmental impacts of normal business operations and business activities at the various stages of production or service delivery including:

- Design & development
- Manufacturing or implementation processes
- Monitoring the environmental performances of suppliers and contractors
- Transportation and business travel
- Waste management and treatment

All identified environmental aspects shall be maintained in a register and reviewed at least annually by the Managing Director using EMS Form "EF1 - Register of Environmental Aspects".



## Legal & Other Requirements

### Policy Ref

PN0090

### Policy

Legal & Other Requirements

### Description

Lampson (Australia) Pty Ltd has guidelines for all employees regarding Legal & Other Requirements.

### Purpose

The purpose of this policy is to explain the general procedures relating to Legal & Other Requirements

### Scope

The following guidelines are to be adhered to by all employees, supervisors and employees.

### Procedure

Lampson (Australia) Pty Ltd shall establish, implement, document and maintain a process to identify the current federal, state and local government environmental laws and regulations, industry codes of practice, and other contractual agreements that are applicable within the constraints of its normal business operating activities.

"EMS Procedure 2- Legal & Other Requirements" shall be used to identify the environmental legal and other requirements relevant to Lampson (Australia) Pty Ltd and the EMS.

"Form EF11 - Register of Environmental Legislations" shall be used by the relevant personnel to meet the requirements of this policy.



## **Objectives, Targets and Action Plans**

### **Policy Ref**

PN0091

### **Policy**

Objectives, Targets and Action Plans

### **Description**

Lampson (Australia) Pty Ltd has guidelines for all employees regarding Objectives, Targets and Action Plans.

### **Purpose**

The purpose of this policy is to explain the general procedures relating to Objectives, Targets and Action Plans

### **Scope**

The following guidelines are to be adhered to by all employees, supervisors and employees.

### **Procedure**

Lampson (Australia) Pty Ltd shall establish and continually review environmental objectives, targets and action plans on a regular basis as part of the Environmental Management System (EMS).

"EMS Procedure 4 - Objectives, Targets and Action Plans" describes the process for setting objectives and targets to address the environmental aspects identified and ensure compliance with relevant environmental legislation and regulations.

The procedure also sets out guidelines for preparing action plans to achieve the objectives and meet the targets set.

Objectives, targets and action plans shall be developed for all relevant functions and levels of the organisation.

Objectives shall be measurable and practical, taking into account the business requirements of the organisation.

Targets shall be easily measurable and achievable but set at a level that challenges the organisation.

Action Plans shall have defined outcomes, a designated owner and an estimated timeframe. Refer EMS Form "EF4 - Environmental Action Plan".

## **Lampson (Australia) Pty Ltd**

# **Implementation & Operation**

## Structure & Responsibility

### Policy Ref

PN0070

### Policy

Structure & Responsibility

### Description

Lampson (Australia) Pty Ltd has guidelines for all employees regarding Structure & Responsibility

### Purpose

The purpose of this policy is to explain the general procedures relating to Structure & Responsibility

### Scope

The following guidelines are to be adhered to by all employees, supervisors and employees.

### Procedure

Lampson (Australia) Pty Ltd shall establish, implement, document and maintain a system to define the relevant personnel to ensure the ongoing management, review and continual improvement of the Environmental Management System (EMS).

The Managing Director has appointed the OHS manager as the "EMS Executive" to take responsibility for the establishment, management and ongoing review of the EMS. The OHS Manager shall appoint an "EMS Manager" to assist in the establishment, management and ongoing review of the EMS.

The OHS Manager shall ensure that the EMS is established, implemented and maintained consistent with ISO 14001: 2004, and shall regularly report to the Managing Director on the performance of the system including recommendations for improvement.

"EMS Procedure 6 - Structure and Responsibility" shall be used to ensure the availability of resources and to assign roles, responsibilities and authorities of the personnel associated with the EMS.

Resources include human resources, infrastructure, financial, technological resources, and any others as required.

An Organisation Chart that displays the relevant management levels and positions that are included in the EMS shall be maintained and made readily available to all employees.

An Employee Register that details the name of the current incumbent in each position included in the EMS shall be maintained and made readily available to all employees.



## **Training, Competence and Awareness**

### **Policy Ref**

PN0071

### **Policy**

Training, Competence and Awareness

### **Description**

Lampson (Australia) Pty Ltd has guidelines for all employees regarding Training, Competence and Awareness

### **Purpose**

The purpose of this policy is to explain the general procedures relating to Training, Competence and Awareness

### **Scope**

The following guidelines are to be adhered to by all employees, supervisors and employees.

### **Procedure**

Lampson (Australia) Pty Ltd shall establish, implement, document and maintain a system to ensure that persons occupying positions that are included in the Environmental Management System (EMS) are competent and able to perform the required tasks. Competence is ensured through appropriate education, training, and/or experience.

Training needs are identified as they relate to the EMS, the significant aspects, and the environmental legal and other requirements.

"EMS Procedure 7- Training, Competence and Awareness" details the various training provided to personnel involved in activities that affect the EMS. The procedure ensures that all employees are aware of the need to conform to all EMS policies and procedures and are aware of their specific EMS responsibilities.

Employees shall be made aware of the significant aspects and the legal and other requirements associated with their respective responsibilities, why improved performance is beneficial, and what the consequences of not following procedures and requirements are.

In addition to job-specific expertise and knowledge, all personnel included in the EMS (including contractors) shall be provided with general awareness on items such as the environmental policy and emergency response procedures.

## **Communications**

### **Policy Ref**

PN0072

### **Policy**

Communications

### **Description**

Lampson (Australia) Pty Ltd has guidelines for all employees regarding Communications

### **Purpose**

The purpose of this policy is to explain the general procedures relating to Communications

### **Scope**

The following guidelines are to be adhered to by all employees, supervisors and employees.

### **Procedure**

Lampson (Australia) Pty Ltd shall establish, implement, document and maintain a process to ensure effective internal and external communication of Environmental Environment System (EMS) requirements and related activities.

"EMS Procedure 8 - Communications" describes how internal communication related to the EMS is carried out within the various levels and locations of the organisation.

"EMS Procedure 8 - Communications" also describes how the organisation will communicate to external stakeholders and the general public on relevant EMS issues. In addition, the procedure covers environment related complaints from the general public and provides guidelines on responding accordingly.

## **EMS Documentation**

### **Policy Ref**

PN0073

### **Policy**

EMS Documentation

### **Description**

Lampson (Australia) Pty Ltd has guidelines for all employees regarding EMS Documentation

### **Purpose**

The purpose of this policy is to explain the general procedures relating to EMS Documentation

### **Scope**

The following guidelines are to be adhered to by all employees, supervisors and employees.

### **Procedure**

Lampson (Australia) Pty Ltd shall establish, implement, document and maintain a process to adequately format all EMS documentation.

EMS documentation relates to the EMS Manual including the Environmental Policies, Environmental Procedures and Environmental Forms as well as objectives, targets, action plans, environmental records and any other document identified as needed for the achievement of the organisation's objective to minimise the environmental impact of its business activities.

"EMS Procedure 9 - EMS Documentation" provides details of the required format of all EMS Documentation.

## Document Version Control

### Policy Ref

PN0074

### Policy

Document Version Control

### Description

Lampson (Australia) Pty Ltd has guidelines for all employees regarding Document Version Control

### Purpose

The purpose of this policy is to explain the general procedures relating to Document Version Control

### Scope

The following guidelines are to be adhered to by all employees, supervisors and employees.

### Procedure

Lampson (Australia) Pty Ltd shall establish, implement, document and maintain a process for version control of all Environmental Management System (EMS) documentation.

EMS documentation relates to the EMS Manual including the Environmental Policies, Environmental Procedures and Environmental Forms as well as the objectives, targets, action plans, environmental records and any other document identified as needed for the achievement of the organisation's objective to minimise the environmental impact of its business activities.

"EMS Procedure 10 - Document Version Control" is used to ensure that only the most current version of all EMS Documentation is suitably authorised and available for distribution and provides guidelines for:

- Approving documents for adequacy prior to issue
- Reviewing and updating as necessary and re-approving documents
- Ensuring that changes and current revision status of documents are identified
- Ensuring that relevant versions of applicable documents are available at points of use
- Ensuring that documents remain legible and readily identifiable
- Ensuring that documents of external origin are identified and their distribution controlled, and
- Preventing the unintended use of obsolete documents and to apply suitable identification to them if they are retained for any purpose.





## **Operations Control**

### **Policy Ref**

PN0075

### **Policy**

Operations Control

### **Description**

Lampson (Australia) Pty Ltd has guidelines for all employees regarding Operations Control

### **Purpose**

The purpose of this policy is to explain the general procedures relating to Operations Control

### **Scope**

The following guidelines are to be adhered to by all employees, supervisors and employees.

### **Procedure**

Lampson (Australia) Pty Ltd shall establish, implement, document and maintain a system for the operational controls related to the Environmental Management System (EMS).

Operational controls shall be put in place to ensure that the organisation can conform to the overall objectives contained in the EMS.

Operational controls relate to the activities where it is deemed that their absence could lead to deviations from the objectives contained in the EMS.

"EMS Procedure 13 - Operations Control" is used to establish, implement and maintain a system of operational control to ensure that the activities and processes that could have an impact on the environment are carried out under controlled conditions.

## **Emergency Preparedness & Response**

### **Policy Ref**

PN0076

### **Policy**

Emergency Preparedness & Response

### **Description**

Lampson (Australia) Pty Ltd has guidelines for all employees regarding Emergency Preparedness & Response

### **Purpose**

The purpose of this policy is to explain the general procedures relating to Emergency Preparedness & Response

### **Scope**

The following guidelines are to be adhered to by all employees, supervisors and employees.

### **Procedure**

Lampson (Australia) Pty Ltd shall establish, implement, document and maintain a process for the identification of potential emergencies and accidents that could impact the environment and be prepared to respond to actual situations.

By having a planned response to emergencies the organisation will be able to meet the strategic goal of minimising the negative impacts on the environment from business activities.

"EMS Procedure 14- Emergency Preparedness & Response" details the processes that shall be put in place to minimise the environmental impact from emergencies and accidents including the potential risk from the spill of pollutants and the release of hazardous materials into the environment.

# **Lampson (Australia) Pty Ltd**

## **Checking**



## Monitoring & Measurement

### Policy Ref

PN0077

### Policy

Monitoring & Measurement

### Description

Lampson (Australia) Pty Ltd has guidelines for all employees regarding Monitoring & Measurement

### Purpose

The purpose of this policy is to explain the general procedures relating to Monitoring & Measurement

### Scope

The following guidelines are to be adhered to by all employees, supervisors and employees.

### Procedure

Lampson (Australia) Pty Ltd shall establish, implement, document and maintain a process for monitoring and measuring the effectiveness of activities that have been undertaken at Lampson (Australia) Pty Ltd to meet the objectives detailed in the Environment Management System (EMS).

The monitoring and measurement process relates to the activities associated with the objectives, targets and environmental action plans defined in the environmental policy and detailed in "EMS Procedure 4 - Objectives, Targets & Action Plans".

"EMS Procedure 15 - Monitoring & Measurement" outlines the process for monitoring and measuring the effectiveness of activities that have been undertaken to meet the organisation's environmental objectives detailed in the EMS.

As a component of monitoring and measurement, the system of environmental alerts provides a check and balance for compliance to legal requirements.

"EMS Procedure 16 - Environmental Alerts" outlines the process to inform the regulators and manager of environmental alerts that have the potential of non-compliances with regulatory and other requirements.

## Evaluation of Compliance

### Policy Ref

PN0078

### Policy

Evaluation of Compliance

### Description

Lampson (Australia) Pty Ltd has guidelines for all employees regarding Evaluation of Compliance

### Purpose

The purpose of this policy is to explain the general procedures relating to Evaluation of Compliance

### Scope

The following guidelines are to be adhered to by all employees, supervisors and employees.

### Procedure

Lampson (Australia) Pty Ltd shall establish, implement, document and maintain a process for the evaluation of compliance with the applicable environmental legal and other requirements to which the organisation is required to abide by.

"EMS Procedure 17 - Evaluation of Compliance" outlines the methods to evaluate the compliance with applicable legal environmental requirements and with other requirements.

The procedure details the process to track the effectiveness of action taken to evaluate the compliance with applicable environmental legal requirements and with other requirements to which the organisation is required to abide by.

The procedure supplements the monitoring and measuring activities and completes the improvement action loop by providing a method for processing, tracking and analysing the effectiveness of any corrective and preventive actions undertaken.

## **Non-Conformance, Corrective and Prevention Action**

### **Policy Ref**

PN0079

### **Policy**

Non-Conformance, Corrective and Prevention Action

### **Description**

Lampson (Australia) Pty Ltd has guidelines for all employees regarding Non-Conformance, Corrective and Prevention Action.

### **Purpose**

The purpose of this policy is to explain the general procedures relating to Non-Conformance, Corrective and Prevention Action

### **Scope**

The following guidelines are to be adhered to by all employees, supervisors and employees.

### **Procedure**

Lampson (Australia) Pty Ltd shall establish, implement, document and maintain a system to identify and correct actual and potential non-conformities that can impact the environment and respond effectively to actual situations.

"EMS Procedure 18 - Non-Conformances, Corrective and Preventative Action" outlines the process to identify and prevent actual and potential EMS non-conformities and to provide a process to correct them and take actions to mitigate their environmental impacts.

The procedure makes sure the non-conformances are not only first addressed to mitigate environmental impact, but that further investigation occurs to determine their cause, and action taken to avoid recurrence. Preventive actions are then those actions resulting from an evaluation as to why non-conformities occurred and taking action to prevent their recurrence.

Non-conformity is defined as non-fulfillment of an EMS requirement and includes environmental related complaints from the public, reported spills, environmental alerts, emergency events, and failures to comply with environmental management policy or procedure.

## Control of Records

### Policy Ref

PN0080

### Policy

Control of Records

### Description

Lampson (Australia) Pty Ltd has guidelines for all employees regarding Control of Records.

### Purpose

The purpose of this policy is to explain the general procedures relating to Control of Records

### Scope

The following guidelines are to be adhered to by all employees, supervisors and employees.

### Procedure

Lampson (Australia) Pty Ltd shall establish, implement, document and maintain a process to control the records that are used in the Environmental Management System (EMS) to ensure the system is functioning and that the organisation is in conformance to ISO 14001: 2004 and to the EMS requirements.

"EMS Procedure 19 outlines the methods for the maintenance of environmental records to provide evidence of conformity to requirements and of the effective operation of the EMS.

The procedure defines the controls needed for identification, storage, protection, retrieval, retention time and disposition of environmental records associated with the EMS including:

- EMS Reviews
- Environmental compliance records
- EMS Internal audit results
- Minutes of relevant meetings
- Records of communication with environmental regulatory agencies
- Non-conformity and incidence reports including records of emergency response
- Inspection, maintenance and calibration records
- Any completed EMS Forms
- Staff training and performance records



## **Internal Environmental Audits**

### **Policy Ref**

PN0081

### **Policy**

Internal Environmental Audits

### **Description**

Lampson (Australia) Pty Ltd has guidelines for all employees regarding Internal Environmental Audits.

### **Purpose**

The purpose of this policy is to explain the general procedures relating to Internal Environmental Audits

### **Scope**

The following guidelines are to be adhered to by all employees, supervisors and employees.

### **Procedure**

Lampson (Australia) Pty Ltd shall conduct internal environmental audits at planned intervals to ascertain if the Environmental Management System (EMS) is regularly updated and maintained.

The internal environmental audits also seek to determine whether the EMS of Lampson (Australia) Pty Ltd conforms to the requirements of ISO 14001: 2004, the international standard relating to environmental management systems.

"EMS Procedure 20 - Internal Environment Audits" outlines the process for establishing an internal environmental audit program that will include an internal environmental audit schedule taking into account the importance of the areas to be audited, as well as the results of previous internal audits.

The procedure also ensures that internal environmental audit criteria, scope, frequency, methods, responsibilities and requirements for planning and conducting audits, and for reporting and maintaining results are defined and documented.

## Management Reviews

### Policy Ref

PN0082

### Policy

Management Reviews

### Description

Lampson (Australia) Pty Ltd has guidelines for all employees regarding Management Reviews

### Purpose

The purpose of this policy is to explain the general procedures relating to Management Reviews

### Scope

The following guidelines are to be adhered to by all employees, supervisors and employees.

### Procedure

Lampson (Australia) Pty Ltd shall conduct a Management Review of the Environmental Management System (EMS) at planned intervals to ensure that the EMS is operating and functioning as planned, and is suitable, adequate and effective.

"EMS Procedure 21- EMS Management Reviews" describes the process of conducting a management review of the EMS at planned intervals to ensure that the Managing Director is in a position to ascertain if the EMS is operating and functioning as planned, and is suitable, adequate and effective.

The inputs for the EMS Management Review include results of internal audits, external communications, environmental performance, status of objectives and targets, status of corrective and preventive actions, follow up on actions from prior EMS Management Reviews, changing conditions or situations, and recommendations for improvement.

A record of discussions and outcomes shall be kept of the EMS Management Review including minutes of any meeting that is held to discuss the EMS Management Review.

**Lampson (Australia) Pty Ltd**

# **EMS PROCEDURES**

## **Procedure 1 - Environmental Aspects**

### **Policy Ref**

PN0023

### **Policy**

Procedure 1 - Environmental Aspects

### **Description**

Details the guidelines for identifying and documenting the Environmental Aspects of Lampson (Australia) Pty Ltd.

### **Purpose**

The purpose of this procedure is to describe the process to identify the environmental aspects of the organisation's activities, operations, products or services that can interact with the environment.

### **Scope**

The relationship between environmental aspects and environmental impacts is one of cause and effect where:

- an environmental aspect refers to an element of the organisation's activities, operations, products or services, which can have a beneficial or adverse impact on the environment.
- an environmental impact refers to the change, which takes place in the environment as a result of the aspect.

### **Responsibility**

The Senior Manager is responsible for identifying the environmental aspects within the scope of this EMS, that can be controlled or those that can be influenced by taking into account planned or new activities, products and services.

### **Procedure**

All relevant activities, processes and services which are identified as environmental aspects are documented using "Form EF1 - Register of Environmental Aspects" and any other appropriate diagrammatic or graphical means, where necessary for greater clarity.

As a guide, specific environmental aspects to be assessed could fall into the following:

- Direct use of transport fuels by vehicles on company business
- Direct use of water by employees in the workplace
- Direct use of paper/cardboard by employees in the workplace
- All forms of waste generated by employees in the workplace

A register of aspects identified shall be maintained and reviewed at least annually by the Managing Director. New aspects that should be added and any old aspects that should be deleted are recorded accordingly.

Selected environmental aspects are classified as Significant Aspects based on established criteria and are subject to relevant legislation, regulation or other permit requirements.



The criteria for environmental impact are detailed in "Form EF1 - Register of Environmental Aspects -Table of Aspect Frequency, Severity & Environmental Impact".

**Records**

Notes of activities are recorded and issued to summarise items such as the decisions taken, the actions taken, results, conclusions reached and next actions required, are retained as environmental records, per "EMS Procedure 19 - Control of Records".

**Record of Revisions**

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

**Record of Approval**

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |

## **Procedure 2 - Legal & Other Requirements**

### **Policy Ref**

PN0024

### **Policy**

Procedure 2 - Legal & Other Requirements

### **Description**

Details the guidelines for identifying and documenting the Legal & Other Requirements of Lampson (Australia) Pty Ltd.

### **Purpose**

The purpose of this procedure is to describe the process to establish a method to identify the applicable environmental legal and other requirements that are relevant to Lampson (Australia) Pty Ltd.

### **Scope**

Reviews of federal, state and local government environmental laws and regulations, industry codes of practice, and other contractual agreements are undertaken within the constraints of the business operating parameters of Lampson (Australia) Pty Ltd.

### **References**

- ISO-14001:2004, Section 4.3.2
- ISO-14001:2004, Section 4.5.2

### **Responsibility**

The Senior Manager is responsible for the implementation and maintenance of this procedure and for establishing and maintaining an up-to-date listing of the environmental legislations and other regulations relevant to Lampson (Australia) Pty Ltd.

### **Procedure**

The Senior Manager will establish and maintain an up-to-date listing of the environmental legislations and other regulations relevant to Lampson (Australia) Pty Ltd using Form EF11: Register of Environmental Legislations.

Environmental legal and other requirements relevant to Lampson (Australia) Pty Ltd are to be identified and evaluated for their significance associated with the activities, operations, products or services.

This will include:

- Legislative and regulatory requirements,
- Industry codes of practice,
- Agreements with public authorities,
- Non regulatory guidelines.

This Register of Environmental Legislations is to be reviewed at least on a quarterly basis. A subscription

to an environmental law updating service will be considered to assist with the above task.

**Records**

Records are retained consistent with "EMS Procedure 19 - Control of Records".

**Record of Revisions**

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

**Record of Approval**

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |

## **Procedure 3 - Legal Compliance**

### **Policy Ref**

PN0025

### **Policy**

Procedure 3 - Legal Compliance

### **Description**

Details the guidelines for identifying and documenting Legal Compliance of Lampson (Australia) Pty Ltd.

### **Purpose**

The aim of this procedure is to ensure that Lampson (Australia) Pty Ltd has a documented means of evaluating compliance with relevant environmental legislation and regulations associated with its operations as defined by ISO 14001:2004.

### **Scope**

This procedure covers the identification, correction and prevention of regulatory violations.

### **References**

- ISO 14001:2004

### **Responsibility**

The senior Manager is responsible for establishing a system to ensure that all relevant employees are aware of their duties regarding the compliance of all relevant laws and regulations.

The Senior Manager will monitor compliance with all relevant laws and regulations and will report any non-compliance to the Managing Director.

All Site Manager and Site Supervisor are responsible for knowing and complying with the environmental laws and regulations pertinent to their areas as well as having a working knowledge of the requirements of the organisation's EMS.

### **Procedure**

Compliance assessments are accomplished through quarterly inspections conducted by Manager to ensure that permit conditions and other regulatory requirements associated with its operations are met on a continuous basis.

Periodic site visits are scheduled by the Managing Director to ensure that all personnel, equipment, and resources required to meet compliance activities are implemented correctly and effectively.

Site Manager and Site Supervisor shall undertake any actions that are identified from internal audits or as a result of new or modified regulations and permit conditions.



**Records**

Records are retained consistent with "EMS Procedure 19: Control of Records".

**Record of Revisions**

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

**Record of Approval**

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |

## **Procedure 4 - Objectives, Targets & Action Plans**

### **Policy Ref**

PN0026

### **Policy**

Procedure 4 - Objectives, Targets & Action Plans

### **Description**

Details the guidelines for identifying and documenting the Objectives, Targets & Action Plans at Lampson (Australia) Pty Ltd.

### **Purpose**

The purpose of this procedure is to describe the process of establishing the objectives, targets and action plans to achieve the commitments listed in the Environmental Policy and address the identified environmental aspects from the organisations normal business activities.

### **Scope**

Objectives, Targets and Action Plans are established to meet the aims of the Environmental Policy. The Objectives, Targets and Action Plans that are established are consistent with legal and other requirements and show a commitment to continual improvement. The Objectives, Targets and Action Plans are developed with due consideration of the major environmental aspects that have been determined in "EMS Procedure 1 - Environmental Aspects".

### **References**

- ISO-14001: 2004, Section 4.3.3
- ISO-14001: 2004, Section 4.5.2

### **Responsibility**

The Senior Manager is responsible for co-ordinating the activities associated with the implementation and maintenance of this procedure covering Objectives, Targets and Action Plans.

The senior Manager is responsible for developing a DRAFT Objectives and Targets for each of the major environmental aspects identified in "EMS Procedure 1 - Environmental Aspects".

The Senior Manager is responsible for developing DRAFT Action Plans using "Form EF4 - Environmental Action Plan" that takes into account the frequency and severity of the environmental aspects identified.

The Senior Manager is responsible for taking the DRAFT Objectives, Targets and Action Plans to Managing Director for final approval and endorsement.

### **Procedure**

#### **Objectives**

- An objective statement shall be developed for each major environmental aspect identified in "EMS Procedure 1 - Environmental Aspects".
- The objective statement should be clear and specific e.g. "We aim to reduce electricity usage in our Administration area"

#### Targets

- Targets shall be set for each major environmental aspect identified in "EMS Procedure 1 - Environmental Aspects".
- Targets should be readily measurable and set over a specific time e.g. "We aim to reduce electricity usage in our Administration area by 10% over the next 12 months"
- Targets should be achievable but should also stretch the organisation to achieve.

#### Action Plans

- Action Plans shall be developed to address each major environmental aspect identified in "EMS Procedure 1 - Environmental Aspects".
- Each program shall have a nominated owner, specific deliverables and an expected timeframe.
- Programs shall be listed on "Form EF4 - Environmental Action Plan"
- Progress to date shall be reported at each manager meeting and at least quarterly at Managing Director.
- Programs shall be updated or revised as decided by the managing Director.

#### Records

Records are retained consistent with "EMS Procedure 19: Control of Records".

#### Record of Revisions

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

#### Record of Approval

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |

## **Procedure 5 - Environmental Assessment**

### **Policy Ref**

PN0027

### **Policy**

Procedure 5 - Environmental Assessment

### **Description**

Details the guidelines for conducting Environmental Assessments at Lampson (Australia) Pty Ltd

### **Purpose**

The aim of this procedure is to ensure that Lampson (Australia) Pty Ltd takes into account the environmental implications of any new products, services, processes, plant and equipment before the decision to proceed is taken.

### **Scope**

This procedure applies to the designing or purchase of any new products, services, processes, plant and equipment, their use and eventual disposal by of Lampson (Australia) Pty Ltd.

### **References**

- ISO-14001:2004, Section 4.3.3 & 4.3.4

### **Responsibility**

The Site manager is responsible for managing the environmental assessment of any new products, services, processes, plant and equipment.

### **Procedure**

We will evaluate the possible environmental impacts associated with the choice of any new products, services, processes, plant and equipment and will explore the use of alternatives that could be more environmentally responsible.

In designing any new products or services, we will ensure that their use and final disposal have minimum environmental impacts and when possible, incorporate features of recycling into the design.

In the production or implementation process, we will take steps to minimise waste generation, energy usage, water usage and use of transport fuels.

The environmental impacts of the entire process will be considered at every stage in order to achieve the objectives contained in the organisation's Environment Policy.

### **Records**

Records are retained consistent with "EMS Procedure 19: Control of Records".

### **Record of Revisions**



| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

Record of Approval

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |

## **Procedure 6 - Structure & Responsibility**

### **Policy Ref**

PN0028

### **Policy**

Procedure 6 - Structure & Responsibility

### **Description**

Details the Structure & Responsibility for the management and ongoing review of the Environmental Management System (EMS) at Lampson (Australia) Pty Ltd

### **Purpose**

The purpose of this procedure is to establish and assign roles, responsibilities and authorities of the personnel associated with the management and ongoing review EMS.

### **Scope**

The positions, levels and committees contained in this procedure relate to Lampson (Australia) Pty Ltd.

### **References:**

- ISO 14001:2004 International standard Clause 4.4.1

### **Procedure**

An up to date Organisation Chart and Employee Register are available from the Human Resources area. Each of the following positions, levels and committees have responsibility for the functions described and are responsible for ensuring they are carried out either personally or by another designated authority.

#### **Positions**

##### **Managing Director**

- The Managing Director is the highest authority within the organisation at a Management level and the person ultimately responsible for approving the Environmental Management System (EMS).
- The Managing Director authorises and assigns the resources necessary to carry out the EMS planning, implementation, operation, and environmental monitoring activities. In particular the Managing Director will appoint a senior manager as the "EMS Executive" as a unique role or as part of a range of high level responsibilities.

##### **Senior Manager**

- The Senior Manager has been designated by the Managing Director as the "EMS Executive" with the responsibility to oversee the establishment, ongoing management and review of the EMS and is the person who is required to report to the Managing Director on any progress, opportunities for improvement or non-conformities. e.g. General Manager - Operations
- The Senior Manager is responsible for establishing and subsequently chairing the EMS Meetings.

- The Senior Manager heads the management team to formulate the environmental policy and overall sustainability objective.
- The Senior Manager commits to the development, implementation and maintenance of the EMS and approves the EMS Policies.
- The Senior Manager appoints personnel to and regularly reviews the performance of the EMS.
- The Senior Manager receives and reviews incident reports, corrective and preventive action plans for non-conformances that have or have the potential for a significant impact on the environment, on safety, on expenditures, and public reputation.

The Senior Manager co-ordinates the internal environmental audits.

#### Site Manager

- The Site Manager ensures compliance with environmental laws, regulations, company policies, and applicable codes of practice. e.g. Compliance Manager.
- The Site Manager maintains records and control documents used to ensure environmental compliance.
- The Site Manager serves in the role of "EMS Manager" and assists the Senior Manager in the establishment, ongoing management and review of the EMS.
- The Site Manager participates in regularly scheduled meetings to perform initial reviews of the EMS implementation phases.
- The Site Manager ensures that the EMS requirements described in the EMS Policies Manual and ISO 14001: 2004 are established, implemented and maintained.
- The Site Manager co-ordinates the maintenance of records to document and report on the performance of the EMS to the Senior Manager for review and make recommendations for improvements to the system.
- The Site Manager liaises with external agencies on matters relating to the EMS.
- The Site Manager liaises with the person responsible for the human resources function to ensure that all relevant job descriptions include details of the responsibilities and actions required to carry out the management, reporting and ongoing review of the EMS.

#### HR Manager

- The HR Manager ensures that all staff are adequately trained in their responsibilities and roles relating to the EMS.
- The HR Manager is responsible for identifying training requirements for each position relating to the EMS.
- The HR Manager is responsible for maintaining records of employee qualifications regarding their role relating to the EMS.
- The HR Manager ensures that employees are familiar with and have access to manuals, procedures, work instructions and records that relate to environmental issues.

All these personnel have the freedom, responsibility and authority to initiate action to:

- Prevent the occurrence of any EMS nonconformity,
- Identify and record any environmental quality problem,
- Recommend corrective action to improve the environmental performance of any product, system, and process,
- Control further processing or delivery of non-conforming operations until the deficiency or unsatisfactory condition has been corrected,
- Verify the implementation of corrective action.

OTHER EMPLOYEES - relates to all other employees in the organisation that do not have a specific environmental role assigned to them in the EMS. All other employees are responsible to:

- Discharge their duties in an environmentally responsible manner,
- Be aware of their roles and responsibilities with respect to the EMS and emergency preparedness and response,
- Respond to environmental incidents to the extent of their control only when it is safe to do so,
- Report any environmental incidents immediately to the supervisor of the area affected,
- Report any environmental alerts to their supervisor in a timely manner,
- Participate as required in the development and implementation of action plans,
- Be aware of the importance of conformance with environmental policies and procedures,
- Be aware of the significant environmental aspects of their work activities,
- Understand the effect on the environment of departing from specified operating procedures and the potential legal consequences to the employee and the organisation.

### Job Descriptions

The job descriptions for all relevant positions include clear details of the responsibilities and actions required in relation to the management, reporting and ongoing review of the EMS. Refer "Environmental Form: EF6 - Job Description".

### Consultants

External consultants and external expertise may be used where necessary; to assist internal resources achieve the organisation's EMS objectives. Specific tasks and agreed deliverables must be documented and signed before the commencement of the consultancy.

### Records

Records are retained consistent with "EMS Procedure 19: Control of Records".

### Record of Revisions

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

### Record of Approval

| Task       | Name/Signature | Job Title | Date |
|------------|----------------|-----------|------|
| Written By |                |           |      |



## Procedure 7 - Training, Competence & Awareness

### Policy Ref

PN0029

### Policy

Procedure 7 - Training, Competence & Awareness

### Description

Details the guidelines for Training, Competence and Awareness in relation to the environment and the EMS at Lampson (Australia) Pty Ltd.

### Purpose

This aim of this procedure is to ensure that all employees receive the relevant level of training to allow them to competently carry out their roles and responsibilities as specified in the EMS and also to ensure that adequate training records are maintained.

### Scope

This procedure applies to all full time, part-time, temporary and casual employees as well as permanent on-site contractors.

### Responsibility

- The HR Manager will prepare and maintain job descriptions. The job descriptions identify education, experience and skills required for the job. Refer "EMS Form EF6 - Job Description".
- The HR Manager is responsible for identifying and organising the relevant level of training to ensure that employees can competently carry out their roles and responsibilities relating to the EMS (as specified in their job description).
- The HR Manager is responsible for ensuring that all employees receive basic sustainability awareness training and training on the organisation's high level environmental objectives, targets and action plans.

The HR Manager is responsible for ensuring that all relevant training records are accurately maintained.

### Procedure

- The HR Manager will ensure that on commencement, all new staff receive training on:
  - Basic environmental and sustainability awareness
  - The environmental objectives, targets and action plans of the organisation
  - Their responsibilities in relation to the EMS and the consequences of not meeting their EMS obligations.
- The HR Manager will ensure that an initial skills audit or competency assessment of each employee is conducted, regarding their role and responsibility in relation to the EMS (as expressed in their job description) and will identify any skills or competency gaps.

- Where a skill or competency gap is identified, the P6 will organise appropriate training (either internal or external) and shall prioritise and schedule the training within a reasonable time frame.
- A record of all environmental training undertaken shall be maintained for each employee using "EMS Form EF8: Training Record".
- Annual performance reviews shall reflect the updated training history of each staff member and potentially identify any new training needs.

### Records

The following records are retained as per "EMS Procedure 19: Control of Records".

- EMS Form EF6: Job Description
- EMS Form EF7: Employment Application Form
- EMS Form EF8: Training Record
- EMS Form EF9: Performance Review
- EMS Form EF10: Service Report

### Record of Revisions

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

### Record of Approval

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |

## **Procedure 8 - Communications**

### **Policy Ref**

PN0030

### **Policy**

Procedure 8 - Communications

### **Description**

Details the guidelines for internal and external communications in relation to the environment and the EMS at Lampson (Australia) Pty Ltd.

### **Purpose**

This aim of this procedure is to ensure that there is an effective communication strategy that enables the organisation to communicate with relevant internal and external stakeholders about the environmental management system and on any environmental matters relating to the normal business operations of the organisation.

### **Scope**

The procedure applies to the requirements for both internal and external communication relating to the environmental performance of Lampson (Australia) Pty Ltd.

This procedure covers all communication from external sources regarding environmental matters and is to ensure that comments, concerns or complaints from external parties are addressed in a timely, accurate, efficient and consistent manner.

### **References**

- ISO 14001:2004, Sections 4.4.3

### **Responsibility**

- The PSite Manager has the main responsibility for the overall implementation of this procedure.
- The Site Manager is responsible for circulating environmental information within the organisation.
- The Site Manager is responsible for responding to any external requests on the organisation's environmental performance.
- The Site Manager is responsible for ensuring an adequate level of information publicly available is made available to all stakeholders and the general public.

All other employees receiving complaints or communications from external parties shall pass them to the Site Manager for investigation and action.

### **Procedure**

#### **Internal communications**

- Communication to Managing Director on the high level environmental performance and any major non-conformances to the EMS are provided at least on a quarterly basis at scheduled meetings.
- Communication to all employees on the requirements of the EMS, the environmental objectives, targets and action plans and announcements of any major environmental achievement is provided through:
  - All staff emails
  - Notice boards in key locations
  - Toolbox Talk meetings

#### External communications

- Communication to the general public on the organisation's high level environmental objectives, targets and action plans and announcements of any major environmental achievement is provided through:
  - The organisation's website
  - Annual Report
  - Media Press releases issued in accordance with the organisation's Media Policy/Protocols and approved by the Managing Director.

#### Complaints

- Any employee who receives a comment, concern, or complaint from a customer or member of the public relating to the environment is required to refer the comment, concern, or complaint to the Site Manager. The name and address of the person, the nature of the issue, and the operating area involved is to be recorded.
- In case of an environmental complaint, the details of the complaint shall be recorded on "EM Form EF26: Environmental Complaint Form".
- The complaint shall be investigated in sufficient details for the likely source of the problem to be identified: this shall include consideration as to whether the incident is likely to create an environmental hazard.
- The Site Manager shall ensure that, regardless of the outcome and any intended action.
- If the complaint is found to be valid and justified, it should be treated as a Non-Conformity and treated in accordance with the "EMS Procedure 18 - Non-Conformances, Corrective and Preventative Action".

#### Records

Records are retained consistent with "EMS Procedure 19: Control of Records".

#### Record of Revisions

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

#### Record of Approval

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |





## **Procedure 9 - EMS Documentation**

### **Policy Ref**

PN031

### **Policy**

Procedure 9 - EMS Documentation

### **Description**

Details the format for the Environmental Management System (EMS) Documentation at Lampson (Australia) Pty Ltd.

### **Purpose**

The aim of this procedure is to provide details of the required format for all EMS Documentation.

### **Scope**

EMS documentation relates to the EMS Manual including the Environmental Policies, Environmental Procedures and Environmental Forms as well as objectives, targets, action plans, environmental records and any other document identified as needed for the achievement of the organisation's objective to minimise the environmental impact of its business activities.

### **References**

- ISO 14001:2004, Section 4.4.5

### **Responsibility**

- The Senior Manager is responsible for maintaining this procedure and establishing a consistent format for documenting the EMS Manual.
- The responsibility for the implementation of each procedure is identified in the individual approved and issued procedure.
- In a supporting role the Senior Manager is responsible for the provision of the documents and information required and necessary for the effective communication of environmental objectives.

### **Procedure**

#### **EMS Manual**

The EMS Manual includes the policies and procedures that the organisation follows in order to meet the requirements of ISO 14001: 2004. The manual also includes the forms that are required to document and record critical activities. The EMS Manual is prepared by the Senior manager with assistance from Employee and the Managing Director. The manual is issued with the approval of the Managing Director and in accordance with "EMS Procedure 10 - Document Version Control".

### **Environmental Policy**

The Environmental Policy is a statement of the organisation's commitment to minimising the impact on the environment from the organisation's business activities, products or services.

The Environmental Policy states the organisation's major environmental objectives which together with the other major strategic objectives are intended to ensure the long term sustainability of Lampson (Australia) Pty Ltd. The Environmental Policy is available to be viewed by all major stakeholders, including employees, suppliers and customers. The policy is reviewed annually by the Senior Manager and Managing Director to ensure that it continues to be relevant and effective.

### Environmental Procedures (EP)

The Environmental Procedures are developed by the Senior Manager in consultation with the Managing Director and are issued in accordance with "EMS Procedure 10 - Document Version Control". Environmental Procedures describe in detail how the organisation will satisfy the requirements of ISO 14001: 2004. The Environmental Procedures include an aim, scope, list of references, responsibilities and records. The Environmental Procedures may be reviewed at any time to reflect a change in circumstances or improvements to the system, but in any case they will be reviewed at least annually by the Senior Manager and the Managing Director.

### Environmental Forms (EF)

Environmental Forms are developed by the Senior Manager in consultation with the Managing Director and are issued in accordance with "EMS Procedure 10 - Document Version Control". The Environmental Forms provide the basis to record the necessary steps for each environmental-related activity in logical sequence so that the activities can be consistently repeated to the standard required in the procedures. Environmental Forms will be reviewed and updated as necessary to reflect changing circumstances in order to accurately describe each task.

### Records

Records are retained consistent with "EMS Procedure 19: Control of Records".

### Record of Revisions

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

### Record of Approval

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |

## **Procedure 10 - Document Version Control**

### **Policy Ref**

PN0032

### **Policy**

Procedure 10 - Document Version Control

### **Description**

Describes the documentation version control procedures for the Environmental Management System (EMS) at Lampson (Australia) Pty Ltd.

### **Purpose**

The aim of this procedure is to ensure that only the most current version of all EMS Documentation is suitably authorised and available for distribution.

### **Scope**

EMS documentation relates to the EMS Manual including the Environmental Policies, Environmental Procedures and Environmental Forms as well as objectives, targets, action plans, environmental records and any other document identified as needed for the achievement of the organisation's objective to minimise the environmental impact of its business activities.

### **References**

- ISO14001: 2004 Section 4.4.4 & 4.4.5

### **Responsibility**

- The Site Manager is responsible for ensuring an appropriate level of documentation version control is in place to ensure that only the most current version of the EMS Manual and related documents is available.

All other employees are responsible for reviewing the documents as they use them and submitting document change requests to update documents as necessary.

### **Procedure**

EMS Manual

- The EMS Manual will be issued by the Senior Manager after checking that it has the appropriate authorisation.
- The EMS Manual will be issued to appropriate persons according to the need for relevant instructions to be available where they will assist the effectiveness of the Environmental Management System.
- A master copy of the EMS Manual will be available as a reference to all staff.
- Each version of the EMS Manual will be identified by a version number and "last date reviewed".
- Superseded or obsolete EMS Manuals will be marked "Superseded" and only used for reference and not as part of the normal operations of the EMS.
- Copies of the EMS Manual may be issued to persons outside the organisation only with the prior approval of

the Managing Director. These copies shall be in an un-modifiable form i.e. Hardcopy or PDF format.

- If the EMS Manual is maintained in electronic form it shall be backed-up at least weekly and a copy of the backup kept off site for security reasons.
- All environmental documents will be identified by a title, version number and date of issue.

#### EMS Procedures

- All environmental documents will be identified by a title, version number and date of issue.
- A record of approval will include the name and job title of the person who wrote the procedure and the relevant date. It shall also include the name and job title of the person who approved the procedure and the date of approval.
- Any revisions will include a description of the changes made, the sections affected and the revision date.

#### Records

Records are retained consistent with "EMS Procedure 19: Control of Records".

#### Record of Revisions

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

#### Record of Approval

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |

## **Procedure 11 - Review of Suppliers**

### **Policy Ref**

PN0033

### **Policy**

Procedure 11 - Review of Suppliers

### **Description**

Describes the guidelines regarding the Review of Suppliers at Lampson (Australia) Pty Ltd

### **Purpose**

The aim of this procedure is to ensure that major suppliers are not in conflict with the organisation's environmental objectives and are not involved in activities or practices that could potentially pose a reputational risk to Lampson (Australia) Pty Ltd.

In addition this procedure ensures that any environmentally sensitive goods and services supplied to Lampson (Australia) Pty Ltd are properly identified and managed accordingly.

### **Scope**

This procedure applies to all major suppliers providing goods and/or services to Lampson (Australia) Pty Ltd and to specific environmentally sensitive goods and services supplied to Lampson (Australia) Pty Ltd.

### **References**

- ISO 14001:2004, Sections 4.4.6

### **Responsibility**

The Site Manager is responsible for evaluating if any major supplier is in conflict with the organisation's environmental objectives and is involved in activities or practices that could potentially pose a reputational risk to Lampson (Australia) Pty Ltd.

The Site Manager is responsible for deciding which purchased goods or services have a significant environmental aspect.

### **Procedure**

#### **Supplier Review and Approval**

All current major suppliers and any new prospective major supplier will be asked to complete "EMS Form EF12 - Supplier Sustainability Review" at least on an annual basis, in order to gain an understanding on the supplier's approach to the environment. In particular the supplier shall answer the following key questions:

- Does your company have a Commitment Statement or a Sustainability Charter that highlights the intention to minimise the impact on the environment from its business activities?
- Has your company ever been prosecuted or received an improvement notice regarding any breach of environmental legislation in the past 10 years?



- Does your company act ethically at all times when communicating and remunerating all parties that it has business dealings with including employees, contractors, suppliers, customers, government authorities and investors?

The Site Manager will evaluate the results of each Supplier Sustainability Review and will determine if the current or prospective supplier potentially poses a reputation risk to Lampson (Australia) Pty Ltd and if the supplier is a suitable fit to the organisation's commitment to the environment.

If the Site manager is of the view that any current or new prospective major supplier potentially poses a reputation risk to Lampson (Australia) Pty Ltd and is not a suitable fit to the organisation's commitment to the environment, the view shall be expressed to the Senior Manager who will then make a business decision on the approval of the supplier.

The Site Manager will ensure that current and prospective major suppliers are advised of the review process within a reasonable time period.

#### **Managing environmentally sensitive goods and services**

The Site Manager shall examine the "EMS Form1 - Register of Environmental Aspects" to determine if any goods or services purchased by Lampson (Australia) Pty Ltd have a significant environmental aspect. In making this assessment the following are taken into consideration:

- Whether the supplier or contractor is required to comply with any Environmental Regulations or Codes of Practice.
- The impact of the supplier's or subcontractor's operations on the environment, under normal, abnormal and emergency conditions
- The risk of an environmental incident created by the supplier's or subcontractor's operations on-site work that could cause an environmental impact for Lampson (Australia) Pty Ltd.

In appropriate circumstances we may ask to inspect the goods at the supplier's premises and if this is the case, such a request will be specified in writing. We will similarly arrange for our customer to inspect the goods or services at the supplier's premises if the customer so requires.

#### **Records**

Records are retained consistent with "EMS Procedure 19: Control of Records" including:

- "EMS Form EF 12: Supplier Sustainability Review"

#### **Record of Revisions**

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

#### **Record of Approval**

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |

## **Procedure 12 - Regulatory Approvals**

### **Policy Ref**

PN0034

### **Policy**

Procedure 12 - Regulatory Approvals

### **Description**

Describes the process for seeking Regulatory Approvals at Lampson (Australia) Pty Ltd.

### **Purpose**

This procedure describes the method to be implemented to secure the necessary approval from regulatory agencies for processes and activities at Lampson (Australia) Pty Ltd that could have a negative impact on the environment.

### **Scope**

This procedure provides clear guidelines on environmental related activities at Lampson (Australia) Pty Ltd that require regulatory approval.

### **References**

- ISO 14001:2004, Section 4.3.2
- ISO 14001:2004, Section 4.4.6

### **Responsibility**

The Site Manager is responsible for ensuring that any environmental activity or process that requires regulatory approval is duly authorised by the relevant authority.

Where operations are identified as potentially requiring environmental permits the Site Manager shall manage the investigation and permit approval process by coordinating the necessary resources and personnel as appropriate and report to Managing Director.

### **Procedure**

Where operations are identified as potentially requiring environmental permits the Site manager shall manage the investigation and permit approval process by coordinating the necessary resources and personnel as appropriate.

The Site manager shall develop a strategy to secure permits in concurrence with existing operational timing plans and shall communicate with the relevant regulatory agencies in writing and in a timely fashion.

The Site manager shall coordinate the preparation, submission and negotiation of permit applications. Permits obtained shall be reviewed to ensure that they adequately cover the operation(s) concerned.

The Site Manager will review the terms and conditions in new permits and modify or establish operational controls necessary to ensure compliance with the permit.

**Records**

Records will be retained as per "EMS Procedure 19: Control of Records".

**Record of Revisions**

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

**Record of Approval**

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |

## **Procedure 13 - Operations Control**

### **Policy Ref**

PN0035

### **Policy**

Procedure 13 - Operations Control

### **Description**

Describes the system for Operations Control relating to activities and processes that affect the Environmental Management System (EMS) at Lampson (Australia) Pty Ltd.

### **Purpose**

The purpose of this procedure is to establish, implement and maintain a system of operational control to ensure that the activities and processes that could have an impact on the environment are carried out under controlled conditions.

### **Scope**

Operational controls relate to operations and activities where it is deemed that their absence could lead to deviations from the objectives and targets contained in the Environmental Policy.

The organisation considers the different operations and activities contributing to its significant environmental and legal impacts when developing or modifying operational controls.

The Managing Director has the prime responsibility for ensuring adequate operational controls in place for activities and processes that could have an impact on the environment.

### **References**

- ISO14001:2004, Section 4.4.6

### **Responsibility**

The Managing Director has the prime responsibility for ensuring adequate operational controls are in place for activities and processes that could have an impact on the environment.

### **Procedure**

The planning and development of operational controls shall follow the following process:

- High significance environmental impacts are identified for action.
- High significance legal impacts are identified for action.
- High significance items are candidates for Action Plans per procedure, "EMS Procedure 4 - Objectives, Targets and Action Plans".



Operational controls are to be developed for each Action Plan in order to ensure that the objectives and targets contained in the Environmental Policy are achieved.

**Records**

Records will be retained as per "EMS Procedure 19: Control of Records".

**Record of Revisions**

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

**Record of Approval**

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |

## **Procedure 14 - Emergency Preparedness & Response**

### **Policy Ref**

PN036

### **Policy**

Procedure 14 - Emergency Preparedness & Response

### **Description**

The guidelines for ensuring that environmental impacts are considered when developing an Emergency Preparedness & Response Plan at Lampson (Australia) Pty Ltd.

### **Purpose**

The aim of this procedure is to detail the processes that shall be put in place to minimise the environmental impact from emergencies and accidents including the potential risk from the spill of pollutants or the release of hazardous materials into the environment.

### **Scope**

This procedure applies to the environmental consequences of any emergency or accident at all Lampson (Australia) Pty Ltd locations that may result in the spill of pollutants or the release of hazardous materials into the environment while protecting the health of employees.

This procedure applies to spills where environmental incidents include accidental emissions to the atmosphere as well as accidental releases of pollutants and hazardous materials to water ways and land.

### **References**

- ISO 14001:2004, Section 4.4.7

### **Responsibility**

The Site Manager is responsible for organising an investigation and assessment on potential situations that may lead to emergencies/accidents and recommending preventive measures to mitigate the environmental impacts. All other employees are responsible for detecting and reporting dangerous situations that may lead to emergencies and assisting with emergency assessment and investigation.

### **Procedure**

#### **Details**

Potential Emergencies/Accidents

Potential emergency situations and accidents that may occur at or near all Lampson (Australia) Pty Ltd locations include:

- Fire
- Explosion
- Toxic Gas leak

- Toxic chemical spill
- Natural disasters - lightning, earthquake, flood, extreme weather
- Structural failure
- Electrical power short-circuit
- Crash and collision
- Sabotage, vandalism, terrorist attack, etc.

### Identifying significant environmental risks

All significant environmental risks arising from the potential emergencies or accidents listed above shall be identified and recorded. These may include details of the:

- Location, type and amount of any hazardous materials stored on-site
- Location, volume, age, secondary containment and inspection history of storage tanks
- Location, type and capacity of waste treatment facilities
- Location, types and magnitude of neighbourhood hazards
- Unloading, loading, transfer points for chemicals, transport fuel, oil

### Emergency Preparedness

Based on the result of the identification of significant environmental risks arising from potential emergencies or accidents, a number of emergency preparedness resources and tools shall be put in place based on the likelihood and impact of the environmental risk. These may include:

- Spill absorbents, containment booms, neutralising chemicals
- Specific alarms and lighted emergency signs
- Specialised portable emergency equipment
- Specialised fire fighting equipment to deal with hazardous materials
- Protective gloves, goggles, suits
- Escape respirators, gas masks, self-contained breathing apparatus
- Training of emergency personnel to deal with environmental hazards

### Emergency Response Plan

In addition to the above, the organisation has an Emergency Response Plan for all business locations to deal with all potential emergency or accident situations.

All employees have received sufficient training on the Emergency Response Plan and are aware of their responsibilities and action required in the event of an emergency or accident.

The emergency command structure, including specific personal responsibilities, reporting relationships, phone numbers for Emergency Response Team members, facility managers and supervisors are posted in strategic locations.

Emergency drills are held at least annually to simulate various types of emergencies. After a drill, emergency response team reviews effectiveness of procedures and revise them if necessary.

A copy of the Emergency Response Plan is available on request.

### Post Emergency

Following an environmental emergency, the cause of the emergency and corresponding emergency procedures shall be reviewed. Corrective and preventative actions will be identified and implemented as necessary.

Where applicable, regulatory agencies shall be notified by the P4 of environmental incidents in accordance with "EMS Procedure 12: Regulatory approvals".

**Records**

Records will be retained as per "EMS Procedure 19: Control of Records".

**Record of Revisions**

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

**Record of Approval**

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |

## **Procedure 15 - Monitoring & Measuring**

### **Policy Ref**

PN0037

### **Policy**

Procedure 15 - Monitoring & Measuring

### **Description**

Details the procedures for monitoring & measuring the effectiveness of activities that have been undertaken at Lampson (Australia) Pty Ltd to meet the organisation's environmental objectives.

### **Purpose**

The purpose of this procedure is to establish a system to monitor and measure the effectiveness of the organisation's actions to meet the objectives detailed in the EMS.

### **Scope**

The monitoring and measurement procedures relate to the activities associated with the objectives, targets and environmental action plans defined in the environmental policy and detailed in "EMS Procedure 4 - Objectives, Targets & Action Plans".

### **References**

- ISO14001:2004, Section 4.5.1

### **Responsibility**

The Senior Manager is responsible for ensuring that effective procedures are put in place to monitor and measure the effectiveness of the activities that are undertaken at Lampson (Australia) Pty Ltd to meet the organisation's environmental objectives.

### **Procedure**

Effective monitoring and measurement of environmental programs and management activities are based on the normal sequence of activities for:

- The initial review of the EMS
- The identification of significant impacts
- The setting of Objectives and Targets
- The development of Action Plans
- The identification of operational controls
- The monitoring & measuring of Action Plans

### **Action Plans**

Progress on the environmental action plans is monitored and reported to managing Director at regular periods as defined in "EMS Procedure 4 - Objectives, Targets & Action Plans".



The outcomes and results of activities listed in the Action Plans are measured against the original targets to ascertain the effectiveness of the activities.

Any activity or initiative that is falling short of original estimates by more than 20% for the same timeframe shall be the subject of a report from the responsible employee that will include details on how results

### Monitoring and measuring Carbon Emissions

The main carbon emissions relating to the business activities of the organisation shall be monitored and measured using a reliable carbon calculator or carbon management system that meets the requirements of ISO 14064 - the international standard for the quantification and reporting of greenhouse gas emissions.

The following activities that result in carbon emissions shall be monitored and measured:

- Use of electricity
- Use of gas
- Water Usage
- Use of transport fuels for vehicle travel
- Use of paper and cardboard
- Specific waste consigned to landfill
- General waste consigned to landfill

Use of renewable energy sources and/or green power and any recycling or other carbon offsetting will be taken into account in the total carbon footprint calculation.

Total carbon emissions shall be expressed as a unit of carbon dioxide equivalent (co2e) and reported on a full time equivalent basis and a per square metre basis to allow for a consistent comparison between reporting periods.

### Non-conformances

The frequency and severity of Non-Conformance Reports shall be monitored as a guide to the effectiveness of the organisation's environmental activities. A marked decrease in the number of major non-conformances will indicate that the organisation's environmental action plans are being effective. However, an increase in the number of major non-conformances will indicate that the organisation's environmental action plans are ineffective and need to be revised and amended to address the increase in reportable environmental incidents.

### Use of monitoring and measuring equipment

Staff using monitoring and measuring equipment must ensure that it is labeled to indicate that it has current calibration. The equipment will only be used in appropriate environmental circumstances that will not influence test results. Calibration records will be maintained using "EMS Form EF21 - Calibration Record".

### Records

Records will be retained as per "EMS Form EF19 - Control of Records".

### Record of Revisions

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

### Record of Approval

| Task       | Name/Signature | Job Title | Date |
|------------|----------------|-----------|------|
| Written By |                |           |      |

|             |  |  |  |
|-------------|--|--|--|
| Approved By |  |  |  |
|-------------|--|--|--|

## **Procedure 16 - Environmental Alerts**

### **Policy Ref**

PN0038

### **Policy**

Procedure 16 - Environmental Alerts

### **Description**

Details the process for all employees regarding Environmental Alerts at Lampson (Australia) Pty Ltd.

### **Purpose**

The purpose of this procedure is to establish a system to inform the regulators and Managing director of environmental alerts that have the potential of non-compliances with regulatory and other requirements.

### **Scope**

This procedure is applicable to all departments, branches and work sites at Lampson (Australia) Pty Ltd.

### **References**

- ISO14001:2004

### **Responsibility**

The Site Manager is responsible for ensuring that systems are in place to capture and communicate Environmental Alerts that have the potential of becoming an EMS non-conformity.

The supporting roles and responsibilities of personnel involved in environmental alerts are further detailed in the details listed below.

### **Procedure**

All employees have three basic responsibilities:

- Recognise the environmental alert problem
- Correct the problem, if possible, and report it to a higher authority
- If you cannot correct it, contact the area supervisor who will take proper corrective action.

When contacted by an employee regarding an environmental alert problem, the supervisor will:

- Assess the problem
- Take the appropriate corrective action
- If the supervisor cannot determine the appropriate action that should be undertaken, he/she must discuss it with their manager.
  - Once the situation has been addressed, the supervisor records all details including date, time, names of people involved, action taken (by whom), etc.

- This information is required to complete the corrective action process and any potential inclusion in a future Action Plan as detailed in procedure "EMS Procedure 4 - Objectives, Targets & Action Plans".
- The supervisor immediately forwards the information to the Site Manager.
- Upon notification of an environmental alert, the Site Manager reports to the Managing Director who determines whether the incident is to be reported to the regulatory agencies and follows the appropriate regulatory reporting requirements.
- If the incident is a potential non-compliance, the supervisor notifies their manager who reports the incident through the normal communications channels.
- If the incident involves a non-conformance to a certificate of approval, the supervisor notifies the Site Manager who Notifies the Managing Director who notifies the appropriate regulatory authority.
- The Site Manager reports all environmental alerts to the Managing Director.
- All Environmental Alerts are investigated per "EMS Procedure 18 - Non-conformances and Corrective and Prevention Action". The Site Manager prepares an environmental non-conformance report to continue the investigation process for the environmental alert.

### Records

Records will be retained as per "Environmental Procedure 19 - Control of Records".

### Record of Revisions

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

### Record of Approval

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |

## **Procedure 17 - Evaluation of Compliance**

### **Policy Ref**

PN0039

### **Policy**

Procedure 17 - Evaluation of Compliance

### **Description**

Describes the process for the Evaluation of Compliance of environmental legislation and regulations relevant to Lampson (Australia) Pty Ltd.

### **Purpose**

The purpose of this procedure is to establish an effective system to evaluate the compliance with applicable environmental legal requirements and with other requirements to which the organisation is required to abide by.

### **Scope**

The evaluation of compliance activities are associated with the environmental programs that result from the fundamental needs of the environmental policy, and from the assessments of environmental aspects, environmental impacts, and environmental legal & other requirements.

This procedure supplements the monitoring and measuring activities and completes the improvement action loop by providing a method for processing, tracking, following up on effectiveness of the corrective and preventive actions resulting from the environmental action reports.

### **References**

- ISO14001:2004

### **Responsibility**

The Site Manager is responsible for co-ordinating the activities necessary to evaluate the compliance with applicable environmental legal requirements and with other requirements to which the organisation is required to abide by.

### **Procedure**

- The Site Manager co-ordinates a compliance review with the Managing Director at least once every 12 months.
- "EMS Form EF11 - Register of Environmental Legislation", is used and reviewed to ensure that the applicable requirements are current and have been addressed.
- "EMS Form EF4 - Action Plan", is used and reviewed to ensure that the appropriate improvement, corrective and preventive actions have been included and addressed in the relevant Action Plans.
- Evaluation of compliance findings are summarised and identified action items are followed up.



**Records**

Records will be retained as per "Environmental Procedure 19 - Control of Records".

**Record of Revisions**

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

**Record of Approval**

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |

## **Procedure 18 - Non-Conformances, Corrective and Preventative Action**

### **Policy Ref**

PN0040

### **Policy**

Procedure 18 - Non-Conformances, Corrective and Preventative Action

### **Description**

Details the process for all employees regarding EMS Non-conformances, Corrective and Preventative Action at Lampson (Australia) Pty Ltd.

### **Purpose**

The aim of this procedure is to outline the process to identify and prevent actual and potential EMS non-conformances and to provide a process to correct them and take actions to mitigate their environmental impacts.

### **Scope**

Non-conformity is defined as non-fulfillment of an EMS requirement and includes environmental related complaints from the public, reported spills, environmental alerts, emergency events, and failures to comply with environmental management policy or procedure.

### **References**

- ISO 14001: 2004 Section 4.5.3

### **Responsibility**

The Site Manager is responsible for co-ordinating reports of EMS non-conformances and dealing with the appropriate manager or employee to ensure the non-conformity is addressed. The Site manager is also responsible for communicating any major non-conformity to the Managing Director who will communicate relevant regulatory as required.

All employees are responsible for reporting any EMS non-conformity as detailed below.

### **Procedure**

- Any employee who detects an EMS non-conformity or environmental incident (including a spill or complaint from the public) must report it to the Site Manager.
- The incident is subsequently recorded on an "EMS Form EF2 - Non-Conformity Report".
- The Site Manager shall determine whether any long-term preventive action is necessary. The details of any further action shall be entered on the Non-Conformity Report and circulated to the relevant personnel.

- The Site Manager shall monitor the progress of the further action and upon completion, shall evaluate its effectiveness in preventing a repeat of the incident. The results shall be documented in the Non-conformity Report and discussed With the Managing Director.

**Records**

Records will be retained as per "EMS Form EF19 - Control of Records" including

- "EMS Form EF2 - Non-conformity Report"

**Record of Revisions**

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

**Record of Approval**

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |

## **Procedure 19 - Control of Records**

### **Policy Ref**

PN0041

### **Policy**

Procedure 19 - Control of Records

### **Description**

Details the process for all employees regarding the Control of Records relating to the EMS at Lampson (Australia) Pty Ltd.

### **Purpose**

The aim of this procedure is to outline the methods for the maintenance of environmental records to provide evidence of conformity to requirements and of the effective operation of the EMS.

### **Scope**

This procedure applies to the identification, collection, storage, protection, retrieval, retention time and disposal of environmental records associated with the EMS including:

- EMS Reviews
- Environmental compliance records
- EMS Internal audit results
- Meeting with the managing director
- Records of communication with environmental regulatory agencies
- Non-conformity and incidence reports including records of emergency response
- Inspection, maintenance and calibration records
- Any completed EMS Forms
- Staff training and performance records

### **References**

- ISO 14001: 2004 Section 4.5.4

### **Responsibility**

The Site Manager is responsible for ensuring that environmental records are maintained as detailed in this procedure.

The Site Manager is responsible for co-ordinating the suitable retention period for each type of environmental record and organising an environment record master list accordingly.

The Site Manager is responsible for approving access to environmental records to external parties.

All employees are responsible for collecting, storing and retrieving environmental records in accordance with this procedure.

## Procedure

### Record Storage

Environmental records associated with the EMS will generally make reference to the EMS and are filed with other documents relating to that section of the EMS. Alternatively they are filed in the Department which actions them.

All environmental records are stored and maintained in a way that will protect them from theft, loss or deterioration.

Environmental records will be legible and accessible.

Environment records that are maintained in electronic form it are backed-up at least weekly and a copy of the backup kept off site for security reasons

### Record Access

All employees have ready access to the relevant environmental records that they need for carrying out their responsibilities as specified in the EMS.

Access to the organisation's environmental records is limited to employees and authorised visitors.

Unless agreed to contractually, the organisation does not provide access to environmental records to external parties unless prior approval is granted by the Managing Director.

### Record Disposal

Records that are no longer required for daily use may be archived and the details recorded on "EMS Form EF22 - Archives Register".

The Site Manager ensures that an environment record master list is maintained, detailing the statutory period that records must be retained before they may be destroyed. Refer Form EF13: Environmental Record Master List.

Environmental Records that are required for legal and business purposes are not be destroyed without the approval of the Company Secretary.

### Records

The following documents are kept as Environmental records:

- "EMS Form EF13 - Environment Record Master List"
- "EMS Form EF22 - Archives Register"

### Record of Revisions

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

### Record of Approval

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |





## **Procedure 20 - Internal Environmental Audits**

### **Policy Ref**

PN0042

### **Policy**

Procedure 20 - Internal Environmental Audits

### **Description**

Details the guidelines for conducting Internal Environmental Audits on the Environmental Management System (EMS) at Lampson (Australia) Pty Ltd.

### **Purpose**

The aim of this procedure is to detail the process for performing internal environment audits at Lampson (Australia) Pty Ltd in order to determine the effectiveness of the EMS.

### **Scope**

Internal environmental audits at Lampson (Australia) Pty Ltd are carried out on a schedule established each year in order to ascertain if the EMS is regularly updated and maintained and to determine whether the EMS conforms to the requirements of ISO 14001:2004.

### **References**

- ISO14001:2004, Sections 4.5.2 and 4.5.5

### **Responsibility**

The Senior Manager is responsible for ensuring that a suitably qualified and experienced employee or contractor is appointed as the Internal Environmental Auditor in order to perform internal environmental audits.

The Internal Environmental Auditor is responsible for preparing an Internal Environmental Audit Plan for approval by the Managing Director and Senior Manager will carry out the internal environment audits according to the approved Internal Environmental Audit Plan.

All Employees are required to give their full co-operation to ensure that internal environment audits are carried out efficiently and transparently.

### **Procedure**

#### **Internal Environment Auditors**

The Managing Director will appoint a suitably qualified and experienced employee or contractor to serve the role of Internal Environmental Auditor to perform internal environmental audits.

The Internal Environmental Auditor is the senior internal environmental auditor but other employees or contractors may be appointed or engaged to assist, depending on the workload. An employee appointed as

Internal Environmental Auditor or in an assisting role will not conduct internal environment audits within a department where they have previously held direct responsibilities.

### **Scheduling of Internal Environmental Audits**

The Internal Environmental Auditor shall prepare an Internal Environmental Audit Plan that will detail what areas will be audited and when the audits will take place during the next twelve month period ahead.

Frequency of internal audits will depend on the importance of the activity being audited in achieving overall environmental aims. Audits may be conducted across all functions within one department or across all departments on one particular subject.

### **Internal Environmental Auditing Activities**

The Internal Environmental Auditor will first review the outcome of any previous audit of the area concerned and check that there are no outstanding corrective or preventive actions.

The Internal Environmental Auditor will use "EMS Form EF24 - Internal Environmental Audit Report" to document areas where operations do not conform with the requirements of the EMS.

Prior to an audit the Internal Environmental Auditor will plan his or her activity by preparing a list of areas to inspect and questions to ask in relation to the operation of the EMS in each area.

### **Internal Environmental Audit Report**

At the conclusion of each internal environmental audit the Internal Environmental Auditor shall prepare a report for the Senior Manager summarising audits carried out, the findings of any EMS non-conformities and resulting corrective actions or suggested improvements to current EMS procedures.

The Senior Manager will submit the Internal Environmental Auditor's report to the Managing Director and will also provide a summary of findings.

The Site Manager will ensure that issues requiring corrective action arising from the Internal Environmental Audit Report are included in the Action Plan.

### **Follow-up**

The Site Manager will follow-up issues requiring corrective action arising from the Internal Environmental Audit Report to ascertain if they have been addressed effectively.

### **Records**

The "EMS Form EF24 - Internal Environmental Audit Report" will be kept as an environmental record as per "EMS Procedure 19 - Control of Records".

### **Record of Revisions**

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

Record of Approval

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |

## **Procedure 21 - EMS Management Reviews**

### **Policy Ref**

PN0043

### **Policy**

Procedure 21 - EMS Management Reviews

### **Description**

Details the guidelines for conducting EMS Management Reviews at Lampson (Australia) Pty Ltd.

### **Purpose**

The purpose of this procedure is to describe the process of conducting a management review of the EMS at planned intervals to ensure that the L1 is in a position to ascertain if the EMS is operating and functioning as planned, and is suitable, adequate and effective.

### **Scope**

This procedure is in place to ensure that Management at Lampson (Australia) Pty Ltd have sufficient information to form a view on the effectiveness of the EMS and how the organisation is tracking against its environmental objectives.

### **References**

- ISO 14001:2004, Section 4.6

### **Responsibility**

The Senior Manager is responsible for providing the Managing Director with a verbal or written report on the effectiveness of the EMS and an update on the results of the organisation's environmental objectives at least on a semi-annually basis.

### **Procedure**

The verbal or written report from the Senior Manager to the Managing Director will include an update on:

- Any actions outstanding from the previous EMS management review
- Any EMS non-conformities, public environmental complaints
- Any Internal Environmental Audit reports
- Progress towards the Objectives, Targets and Action Plans
- Any major proposed changes to the EMS Manual
- Any major review of environmental training needs
- Information on any other environmental issue as deemed appropriate

### **Records**

Minutes of the meeting shall be retained as per "EMS Procedure 19: Control of Records".



**Record of Revisions**

| Revision Date | Description | Sections Affected |
|---------------|-------------|-------------------|
|               |             |                   |

**Record of Approval**

| Task        | Name/Signature | Job Title | Date |
|-------------|----------------|-----------|------|
| Written By  |                |           |      |
| Approved By |                |           |      |

# **Lampson (Australia) Pty Ltd**

## **EMS FORMS**

## EF1 - Register of Environmental Aspects

### Policy Ref

PN0044

### Policy

EF1 - Register of Environmental Aspects

### Procedure

#### EF1 - Register of Environmental Aspects Form

| No. | Environmental Aspects                     | Environmental Impact                                      | Estimated Frequency<br>Note 1 | Estimated Severity<br>Note 2 | Estimated Impact<br>Note 3 | C02e Total<br>Note 4 | C02e %<br>Note 5 |
|-----|---|---|-------------------------------|------------------------------|----------------------------|----------------------|------------------|
| 1   | Electricity usage                         | Increase greenhouse gasses due to burning of fossil fuels |                               |                              |                            |                      |                  |
| 2   | Gas usage                                 | Increase greenhouse gasses due to burning of fossil fuels |                               |                              |                            |                      |                  |
| 3   | Transport fuel usage - Vehicles           | Increase greenhouse gasses due to burning of fossil fuels |                               |                              |                            |                      |                  |
| 4   | Transport fuel usage - Air Travel         | Increase greenhouse gasses due to burning of fossil fuels |                               |                              |                            |                      |                  |
| 5   | Transport fuel usage - Taxis and Couriers | Increase greenhouse gasses due to burning of fossil fuels |                               |                              |                            |                      |                  |
| 6   | Paper and Cardboard usage                 | Use of tree based resources contributes to de-forestation |                               |                              |                            |                      |                  |
| 7   | Use of water                              | Using scarce natural resources                            |                               |                              |                            |                      |                  |
| 8   | Organic Waste - food etc.                 | Increases landfill which creates methane                  |                               |                              |                            |                      |                  |
| 9   | Glass, Metal and Plastic waste            | Increases landfill which creates methane                  |                               |                              |                            |                      |                  |
| 10  | Liquid wastes                             | Pollutes waterways  |                               |                              |                            |                      |                  |

|    |                                |  |  |  |  |  |  |
|----|--------------------------------|--|--|--|--|--|--|
|    |                                | and rivers   |  |  |  |  |  |
| 11 | General Waste                  | Increases landfill which creates methane                   |  |  |  |  |  |
| 12 | Use of raw materials           | May be using finite resources or contributing to land fill |  |  |  |  |  |
| 13 | Wastewater discharges          | Pollutes waterways and rivers                              |  |  |  |  |  |
| 14 | Odour                          | Air pollution  |  |  |  |  |  |
| 15 | Air Emissions                  | Air pollution  |  |  |  |  |  |
| 16 | Storage of Hazardous Materials | Could lead to dangerous spills or fire risk                |  |  |  |  |  |
| 17 | Others (please specify)        |  |  |  |  |  |  |

| Note 1 : Estimated Frequency                                      | Factor | Note 2: Estimated Severity                                      | Factor |
|---|--------|---|--------|
| Rare (less than once a year)                                      | 1      | Minimal environmental impact                                    | 1      |
| Probable (4 or less times a year)                                 | 2      | Low environmental impact  | 2      |
| Likely (5 to 10 times a year)                                     | 3      | Moderate environmental impact                                   | 3      |
| Common (almost monthly)   | 4      | High environmental impact ( violates environmental regulations) | 7      |
| Frequent (daily/weekly or more)                                   | 5      | Severe environmental impact (emergency situations)              | 10     |
| Note 3: Environmental impact = Frequency of occurrence × Severity |        |   |        |
| Note 4: CO2e Total from Carbon Footprint Calculation              |        |   |        |
| Note 5: CO2e Percentage from Carbon Footprint Calculation         |        |   |        |

## EF2 - Non-Conformity Report

### Policy Ref

PN0045

### Policy

EF2 - Non-Conformity Report

### Procedure

#### EF2 - Non-Conformity Report

|  |            |       |
|--|------------|-------|
| Description of the Nonconformity (To be completed by the person detecting the non-conformity)            |            |       |
|  |            |       |
| Possible Causes (to be completed by the person detecting the non-conformity)                             |            |       |
|  |            |       |
| Immediate Action (to be completed by the person detecting the non-conformity)                            |            |       |
|  |            |       |
| Describe what was done to rectify the problem. Was product removed? Who was informed?                    |            |       |
|  |            |       |
| Name:<br>(of person detecting non-conformity)  | Signature: | Date: |
| <b>Action: Send form to EMS Manager</b><br>Investigation of Root Causes (to be completed by EMS Manager) |            |       |
|  |            |       |

|   |            |          |
|---|------------|----------|
|   |            |          |
| Investigation Completed By:   | Signature: | Date:    |
| <i>Action: EMS Manager to discuss nonconformity with Department Manager</i>           |            |          |
| Further Corrective Action Required And Taken (to be completed by Department Manager)  |            |          |
| Preventive Action Taken (to be completed by Department Manager)                       |            |          |
| Action Taken By<br>(Dpt. Manager Name)  | Signature  | Date     |
| <i>Action: EMS Manager to check at next audit whether preventive action effective</i> |            | Yes / No |





|                                      |            |       |
|--------------------------------------|------------|-------|
|                                      |            |       |
| Approved by :<br>(Managing Director) | Signature: | Date: |

Decision Made (planning, design, production, marketing and disposal, where pertinent):

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Desirable Result:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Approved at Meeting held on:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

| Action Required | Action taken by | Commencement date | Target Completion date | Actual Completion date |
|-----------------|-----------------|-------------------|------------------------|------------------------|
|                 |                 |                   |                        |                        |
|                 |                 |                   |                        |                        |
|                 |                 |                   |                        |                        |
|                 |                 |                   |                        |                        |
|                 |                 |                   |                        |                        |
|                 |                 |                   |                        |                        |
|                 |                 |                   |                        |                        |
|                 |                 |                   |                        |                        |
|                 |                 |                   |                        |                        |
|                 |                 |                   |                        |                        |
|                 |                 |                   |                        |                        |

## EF4 - Environmental Action Plan

### Policy Ref

PN0047

### Policy

EF4 - Environmental Action Plan

### Procedure

#### EF4 - Environmental Action Plan

|                           |   |
|---------------------------|---|
| <b>Overall Objective:</b> | The organisation is committed to minimising the impact on the environment from its business operations. |
|---------------------------|---|

In order to achieve this objective we will:

| Action Steps  | Impact | Effort | By Who | By When |
|---|--------|--------|--------|---------|
| 1. Allocate responsibility of EMS Executive to a senior executive and arrange appropriate training  |        |        |        |         |
| 2. Allocate responsibility of EMS Manager to a senior manager and arrange appropriate training  |        |        |        |         |
| 3. Amend position descriptions for all roles to include sustainability  |        |        |        |         |
| 4. Develop and seek approval for an Environmental Commitment Statement  |        |        |        |         |
| 5. Develop an Environment Policy that complies with ISO 14001:2004  |        |        |        |         |
| 6. Develop Environmental Procedures that comply with ISO 14001:2004   |        |        |        |         |
| 7. Organise training to ensure all parties understand their roles and responsibilities as stated in the Environmental Policy and Procedures |        |        |        |         |
| 8. Organise sustainability awareness training workshops for employees across all sites  |        |        |        |         |
| 9. Develop a basic sustainability module for the new staff induction program  |        |        |        |         |

|   |  |  |  |  |
|---|--|--|--|--|
| 10. Measure the carbon footprint of the organisation for the past year using a reputable carbon management system   |  |  |  |  |
| 11. Set a carbon reduction target for next year based on the previous year calculation and communicate to all stakeholders                                      |  |  |  |  |
| 12. Develop procedures to capture data to measure the carbon footprint of the organisation on an ongoing basis  |  |  |  |  |
| 13. Review all waste management processes with a view to maximising re-cycling opportunities in order to minimise waste to landfill.                            |  |  |  |  |
| 14. Review all use of paper and cardboard with a view to minimising use.  |  |  |  |  |
| 15. Conduct a water management awareness campaign for employees   |  |  |  |  |
| 16. Develop a Sustainable Procurement Policy.   |  |  |  |  |
| 17. Review all major supplies (materials, stationery etc.) to ascertain if there are more environmentally responsible alternatives within the same price range. |  |  |  |  |
| 18. Conduct a Sustainability review of all major suppliers to ensure there is no major conflict with the organisation's environmental objectives.               |  |  |  |  |
| 19. Establish a register of all environmental legislation relevant to the organisation.   |  |  |  |  |
| 20. Investigate a subscription service for updates on all environmental legislation relevant to the company   |  |  |  |  |
| 21. Investigate the costs and benefits of seeking formal ISO 14001 accreditation from a reputable third party.  |  |  |  |  |
| 22. Investigate the costs and benefits of becoming carbon neutral.  |  |  |  |  |
| 23. Seek quotes on training an internal resource to conduct Internal Audits.  |  |  |  |  |
| 24.   |  |  |  |  |
| 25.   |  |  |  |  |

Policies and Procedures Prepared For: Lampson

|     |  |  |  |  |
|-----|--|--|--|--|
| 26. |  |  |  |  |
| 27. |  |  |  |  |
| 28. |  |  |  |  |
| 29. |  |  |  |  |
| 30. |  |  |  |  |

## EF5 - Responsibility

### Policy Ref

PN0048

### Policy

EF5 - Responsibility

### Procedure

#### EF5 - Responsibility

| Policy Ref: | Procedure Ref: | Description   | Responsibility    |
|-------------|----------------|---|-------------------|
| 4.2         |                | Overall responsibility for the development and implementation of the environmental policy   | Senior Manager    |
| 4.3.1       | Procedure 1    | Overall responsibility for the determination of environmental aspects, and those that have the potential for causing significant impact on the environment. | Managing Director |
| 4.3.2       | Procedure 2    | Overall responsibility for identification of legal and other requirements.  | Managing Director |
| 4.3.2       | Procedure 3    | Responsibility for ensuring all employees are aware of their regulatory duties.   | Senior Manager    |
| 4.3.3       | Procedure 4    | Overall responsibility for establishing objectives and targets.   | Managing Director |
| 4.3.3       | Procedure 4    | Overall responsibility for implementing and monitoring the results of action plans according to the specified time-frames.                                  | Senior Manager    |
| 4.3.4       | Procedure 5    | Overall responsibility for managing the environmental assessment of any new products, services, processes, plant and equipment.                             | Senior Manager    |
| 4.4.1       | Procedure 7    | Overall responsibility for ensuring the availability of resources essential to establish, implement, maintain and improve the EMS.                          | Managing Director |
| 4.4.2       | Procedure 7    | Overall responsibility for the identification and provision of training needs.  | HR Manager        |
| 4.4.3       | Procedure 7    | Responsibility for coordinating internal and external communication with regulatory agencies  | Managing Director |



|       |              |  |                   |
|-------|--------------|--|-------------------|
| 4.4.4 | Procedure 8  | Overall responsibility for the establishment and maintenance of the environmental management system documentation.   | Senior Manager    |
| 4.4.5 | Procedure 9  | Overall responsibility for the control of the EMS documents and those pertaining to compliance with ISO 14001: 2004 requirements.  | Senior Manager    |
| 4.4.6 | Procedure 10 | Overall responsibility for document version control.   | Senior Manager    |
| 4.4.5 | Procedure 11 | Overall responsibility for reviewing and evaluating current and new suppliers to ensure they are consistent with the organisations environmental objectives.   | Site manager      |
| 4.4.6 | Procedure 12 | Overall responsibility for establishing and implementing and reviewing procedures for compliance to regulatory approvals.  | Site manager      |
| 4.4.6 | Procedure 13 | Overall responsibility for the monitoring and measurement of key characteristics of its operational and activities that can have a significant environmental impact.                                       | Managing Director |
| 4.4.7 | Procedure 14 | Overall responsibility for emergency preparedness, response and post-emergency evaluation for mitigating future emergencies  | Site manager      |
| 4.5.1 | Procedure 15 | Responsibility for ensuring that effective procedures are put in place to monitor and measure the effectiveness of the activities that are undertaken to meet the organisation's environmental objectives. | Senior Manager    |
| 4.5.2 | Procedure 17 | Overall responsibility for establishing and implementing and reviewing procedures for compliance to regulatory approvals.  | Managing Director |
| 4.5.3 | Procedure 18 | Overall responsibility for establishing and implementing procedures for dealing with actual and potential non-conformities   | Senior Manager    |
| 4.5.4 | Procedure 19 | Overall responsibility for establishing and maintaining environmental records.   | Senior manager    |
| 4.5.5 | Procedure 20 | Overall responsibility for conducting EMS audits.  | Senior Manager    |
| 4.6   | Procedure 21 | Overall responsibility for conducting EMS reviews.   | Senior manager    |

EF6 - Job Description

Policy Ref

PN0049

Policy

EF6 - Job Description

Procedure

EF6 - Job Description

|               |  |
|---------------|--|
| Job Title     |  |
| Department    |  |
| Reports To    |  |
| Prepared By   |  |
| Date Prepared |  |
| Approved By   |  |
| Date Approved |  |

|   |
|---|
| Overview  |
|   |
| Essential Duties and Responsibilities <ul style="list-style-type: none"><li></li><li></li><li></li><li></li></ul> |
| Supervisory Responsibilities <ul style="list-style-type: none"><li></li><li></li><li></li><li></li></ul>          |
| Qualifications <ul style="list-style-type: none"><li></li><li></li><li></li><li></li></ul>                        |

## EF7 - Employment Application Form

### Policy Ref

PN0050

### Policy

EF7 - Employment Application Form

### Procedure

#### EF7 - Employment Application Form

The applicant is required to fill in all the information in this application form. The information you provide along with the personal interview will be used to make a decision on your suitability for the position.

Important note: Lampson (Australia) Pty Ltd is an EEO (Equal Employment Opportunity) employer and does not discriminate against any current or future employee.

Position applying for: \_\_\_\_\_

How did you find out about this position?

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

### Applicant Details

Last Name \_\_\_\_\_ First name \_\_\_\_\_

Address \_\_\_\_\_

Suburb \_\_\_\_\_ State \_\_\_\_\_ P/code \_\_\_\_\_

Contact Phone (        ) \_\_\_\_\_ Mobile \_\_\_\_\_

Do you drive? (This has no bearing on your employment) Yes / No Drivers licence number \_\_\_\_\_

Have you ever lost your driver's licence? (This has no bearing on your employment)

Date of Birth \_\_\_\_\_ Marital Status (optional) \_\_\_\_\_

Emergency contact (name) \_\_\_\_\_ Relationship to you \_\_\_\_\_

Contact Phone (            ) \_\_\_\_\_ Mobile  
\_\_\_\_\_

Do you have any special medical conditions that may hinder your job tasks or are there any adjustments that we need to make to accommodate you? (This has no bearing on your employment)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

List your qualifications related to this position and any relevant certificates, diplomas or other.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Briefly list your skills relating to this position

- 
- 
- 
- 

Provide previous employment details (start with your most recent)

Dates from / to: \_\_\_\_\_

Position \_\_\_\_\_ Employer \_\_\_\_\_

Address \_\_\_\_\_

Suburb \_\_\_\_\_ State \_\_\_\_\_ P/Code  
\_\_\_\_\_

Contact Person \_\_\_\_\_ Position \_\_\_\_\_ Phone \_\_\_\_\_

Can we contact this employer as part of our reference checking process? Yes / No

Position \_\_\_\_\_ Employer \_\_\_\_\_

Address \_\_\_\_\_

Suburb \_\_\_\_\_ State \_\_\_\_\_ P/Code  
\_\_\_\_\_

Contact Person \_\_\_\_\_ Position \_\_\_\_\_ Phone \_\_\_\_\_

Can we contact this employer as part of our reference checking process? Yes / No

Position \_\_\_\_\_ Employer \_\_\_\_\_

Address \_\_\_\_\_

Suburb \_\_\_\_\_ State \_\_\_\_\_ P/Code \_\_\_\_\_

Contact Person \_\_\_\_\_ Position \_\_\_\_\_ Phone \_\_\_\_\_

Is there any further information that you wish to add?

---

---

---

### References

Provide three references including, names, contact numbers, relationship to you (e.g., supervisor)

1. Name \_\_\_\_\_ Contact Number \_\_\_\_\_ Relationship \_\_\_\_\_

2. Name \_\_\_\_\_ Contact Number \_\_\_\_\_ Relationship \_\_\_\_\_

3. Name \_\_\_\_\_ Contact Number \_\_\_\_\_ Relationship \_\_\_\_\_

### Educational History

School attended \_\_\_\_\_ Date last attended \_\_\_\_\_

Highest level achieved \_\_\_\_\_

Major achievements at this level

- 
- 
- 
- 
- 
- 

Provide referee & contact number \_\_\_\_\_

Further education \_\_\_\_\_

Institution attended \_\_\_\_\_ Date attended \_\_\_\_\_

Course/s completed \_\_\_\_\_

Level achieved \_\_\_\_\_

Major achievements

- 
- 
- 
- 
- 

**Provide referee & contact number** \_\_\_\_\_

Further education \_\_\_\_\_

Institution attended \_\_\_\_\_ Date attended \_\_\_\_\_

Course/s completed \_\_\_\_\_

Level achieved \_\_\_\_\_

Major achievements

- 
- 
- 
- 
- 

From what date will you be able to start work? \_\_\_\_\_

What type of employment do you seek? [ ] full-time [ ] part-time [ ] casual [ ] contract

This job may require travelling. Do you have any concerns about travelling?

---



---



---

Have you ever applied for a position with this company? Yes / No

Have you worked for this company previously? Yes / No



|                                |          |
|--------------------------------|----------|
| Do you have a criminal record? | Yes / No |
| _____                          | _____    |
| _____                          | _____    |
| _____                          | _____    |
| _____                          | _____    |
| _____                          | _____    |

Employee Declaration

To the best of my knowledge, I believe that the above statements are true and correct. I understand that any deliberately false, misleading or incomplete statements may lead to my dismissal, if employed.

I, \_\_\_\_\_ give this company permission to conduct the relevant reference checks and obtain the required information from past employers and or other relevant parties. I understand that this will be done in an ethical and legal manner and will not compromise my current employment situation.

Signed \_\_\_\_\_ Date \_\_\_\_\_

Reference checks

|   | Reference | Comments |
|---|-----------|----------|
| 1 |           |          |
| 2 |           |          |
| 3 |           |          |
|   |           |          |
|   |           |          |

Is a second interview required?                      Yes/No                      Date and Time:

\_\_\_\_\_

Has the person been notified?                      Yes/No

NOTES

## EF8 - Training Record

### Policy Ref

PN0051

### Policy

EF8 - Training Record

### Procedure

#### EF8 - Training Record

|  |                       |                   |
|--|-----------------------|-------------------|
| Employee Name:   | Date of Commencement: |                   |
| Position:  | Department:           |                   |
| Qualifications on Commencement:  |                       |                   |
| Date _____   | Qualification _____   | Institution _____ |
| Date _____   | Qualification _____   | Institution _____ |
| Date _____   | Qualification _____   | Institution _____ |
| WORK SKILLS ON COMMENCEMENT: (Work experience)   |                       |                   |
| <ul style="list-style-type: none"> <li>▪</li> <li>▪</li> <li>▪</li> <li>▪</li> <li>▪</li> <li>▪</li> </ul> |                       |                   |

| Date Training Commenced | Duration Hrs/Days/Wks | Course Completed | Name Of Trainer Or Training Body |
|-------------------------|-----------------------|------------------|----------------------------------|
|                         |                       |                  |                                  |
|                         |                       |                  |                                  |
|                         |                       |                  |                                  |
|                         |                       |                  |                                  |
|                         |                       |                  |                                  |
|                         |                       |                  |                                  |
|                         |                       |                  |                                  |
|                         |                       |                  |                                  |
|                         |                       |                  |                                  |
|                         |                       |                  |                                  |

Policies and Procedures Prepared For: Lampson

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
|--|--|--|--|

## EF9 - Performance Review

### Policy Ref

PN0052

### Policy

EF9 - Performance Review

### Procedure

#### EF9 - Performance Review

| KEY to Ratings |                          |
|----------------|--------------------------|
| 1              | Unsatisfactory           |
| 2              | Needs Improvement        |
| 3              | Meets Job Requirements   |
| 4              | Exceeds Job Requirements |
| 5              | Outstanding              |

| QUANTITY                         | N/A | 1 | 2 | 3 | 4 | 5 |
|----------------------------------|-----|---|---|---|---|---|
| Meets productivity standards     |     |   |   |   |   |   |
| Completes work in timely manner  |     |   |   |   |   |   |
| Strives to increase productivity |     |   |   |   |   |   |
| Works quickly                    |     |   |   |   |   |   |
| Achieves established goals       |     |   |   |   |   |   |
| Overall                          |     |   |   |   |   |   |

| ENVIRONMENTAL                             | N/A | 1 | 2 | 3 | 4 | 5 |
|---|-----|---|---|---|---|---|
| Demonstrates accuracy and thoroughness    |     |   |   |   |   |   |
| Displays commitment to excellence         |     |   |   |   |   |   |
| Looks for ways to improve the environment |     |   |   |   |   |   |
| Applies feedback to improve performance   |     |   |   |   |   |   |
| Monitors own work to ensure quality       |     |   |   |   |   |   |
| Overall                                   |     |   |   |   |   |   |

| JOB KNOWLEDGE                                       | N/A | 1 | 2 | 3 | 4 | 5 |
|---|-----|---|---|---|---|---|
| Competent in required job skills and knowledge      |     |   |   |   |   |   |
| Exhibits ability to learn and apply new skills      |     |   |   |   |   |   |
| Keeps abreast of current developments               |     |   |   |   |   |   |
| Requires minimal supervision                        |     |   |   |   |   |   |
| Displays understanding of how job relates to others |     |   |   |   |   |   |
| Uses resources effectively                          |     |   |   |   |   |   |
| Overall   |     |   |   |   |   |   |

| PROBLEM SOLVING                                | N/A | 1 | 2 | 3 | 4 | 5 |
|--|-----|---|---|---|---|---|
| Identifies problems in a timely manner         |     |   |   |   |   |   |
| Gathers and analyses information skilfully     |     |   |   |   |   |   |
| Develops alternative solutions                 |     |   |   |   |   |   |
| Resolves problems in early stages              |     |   |   |   |   |   |
| Works well in group problem solving situations |     |   |   |   |   |   |
| Overall  |     |   |   |   |   |   |

| COMMUNICATIONS                                     | N/A | 1 | 2 | 3 | 4 | 5 |
|--|-----|---|---|---|---|---|
| Expresses ideas and thoughts verbally              |     |   |   |   |   |   |
| Expresses ideas and thoughts in written form       |     |   |   |   |   |   |
| Exhibits good listening and comprehension          |     |   |   |   |   |   |
| Keeps others adequately informed                   |     |   |   |   |   |   |
| Selects and uses appropriate communication methods |     |   |   |   |   |   |
| Overall  |     |   |   |   |   |   |

| INITIATIVE                             | N/A | 1 | 2 | 3 | 4 | 5 |
|--|-----|---|---|---|---|---|
| Volunteers readily                     |     |   |   |   |   |   |
| Undertakes self-development activities |     |   |   |   |   |   |



|  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|
| Seeks increased responsibilities               |  |  |  |  |  |  |
| Takes independent actions and calculated risks |  |  |  |  |  |  |
| Looks for and takes advantage of opportunities |  |  |  |  |  |  |
| Asks for help when needed                      |  |  |  |  |  |  |
| Overall  |  |  |  |  |  |  |

| ADAPTABILITY   | N/A | 1 | 2 | 3 | 4 | 5 |
|--|-----|---|---|---|---|---|
| Adapts to changes in the work environment            |     |   |   |   |   |   |
| Manages competing demands                            |     |   |   |   |   |   |
| Accepts criticism and feedback                       |     |   |   |   |   |   |
| Changes approach or method to best fit the situation |     |   |   |   |   |   |
| Overall  |     |   |   |   |   |   |

| PLANNING & ORGANISATION               | N/A | 1 | 2 | 3 | 4 | 5 |
|---------------------------------------|-----|---|---|---|---|---|
| Prioritises and plans work activities |     |   |   |   |   |   |
| Uses time efficiently                 |     |   |   |   |   |   |
| Plans for additional resources        |     |   |   |   |   |   |
| Integrates changes smoothly           |     |   |   |   |   |   |
| Sets goals and objectives             |     |   |   |   |   |   |
| Works in an organised manner          |     |   |   |   |   |   |
| Overall                               |     |   |   |   |   |   |

| CO-OPERATION                                  | N/A | 1 | 2 | 3 | 4 | 5 |
|---|-----|---|---|---|---|---|
| Establishes and maintains effective relations |     |   |   |   |   |   |
| Exhibits tact and consideration               |     |   |   |   |   |   |
| Displays positive outlook and pleasant manner |     |   |   |   |   |   |
| Offers assistance and support to co-workers   |     |   |   |   |   |   |
| Works cooperatively in group                  |     |   |   |   |   |   |

|                                     |  |  |  |  |  |  |
|-------------------------------------|--|--|--|--|--|--|
| situations                          |  |  |  |  |  |  |
| Works actively to resolve conflicts |  |  |  |  |  |  |
| Overall                             |  |  |  |  |  |  |

| JUDGEMENT  | N/A | 1 | 2 | 3 | 4 | 5 |
|--|-----|---|---|---|---|---|
| Displays willingness to make decisions                 |     |   |   |   |   |   |
| Exhibits sound and accurate judgement                  |     |   |   |   |   |   |
| Supports and explains reasoning for decisions          |     |   |   |   |   |   |
| Includes appropriate people in decision-making process |     |   |   |   |   |   |
| Makes timely decisions                                 |     |   |   |   |   |   |
| Overall  |     |   |   |   |   |   |

| DEPENDABILITY  | N/A | 1 | 2 | 3 | 4 | 5 |
|--|-----|---|---|---|---|---|
| Responds to requests for service and assistance        |     |   |   |   |   |   |
| Follows instructions, responds to management direction |     |   |   |   |   |   |
| Takes responsibility for own actions                   |     |   |   |   |   |   |
| Commits to doing the best job possible                 |     |   |   |   |   |   |
| Keeps commitments                                      |     |   |   |   |   |   |
| Meets attendance and punctuality guidelines            |     |   |   |   |   |   |
| Overall  |     |   |   |   |   |   |

| INNOVATION                                | N/A | 1 | 2 | 3 | 4 | 5 |
|---|-----|---|---|---|---|---|
| Displays original thinking and creativity |     |   |   |   |   |   |
| Meets challenges with resourcefulness     |     |   |   |   |   |   |
| Generates suggestions for improving work  |     |   |   |   |   |   |
| Develops innovative approaches and ideas  |     |   |   |   |   |   |
| Overall                                   |     |   |   |   |   |   |

|                |  |  |  |  |  |  |
|----------------|--|--|--|--|--|--|
| Summary Scores |  |  |  |  |  |  |
|----------------|--|--|--|--|--|--|

**Plans for Improvement**

---

---

---

---

**Employee Comments**

---

---

---

---

**Employee Acknowledgement**

I have reviewed this document and discussed the contents with my manager. My signature means that I have been advised of my performance status and does not necessarily imply that I agree with the evaluation.

|                    |       |
|--------------------|-------|
| <hr/>              | <hr/> |
| Employee Signature | Date  |

**Reviewer Comments**

---

---

---

---

|                    |       |
|--------------------|-------|
| <hr/>              | <hr/> |
| Reviewer Signature | Date  |

EF10 - Service Report

Policy Ref  
PN0053

Policy  
EF10 - Service Report

Procedure

EF10 - Service Report

|                     |  |
|---------------------|--|
| Customer:           | Date of Service:   |
| Service Technician: | Reason For Service:<br>[ ]Programmed [ ]Call-Out [ ] Return<br>To Base |
| Job Number:         | If Programmed, What Type?<br>[ ] 1 Month [ ] 6 Month [ ] 12 Months     |

| Item | Activity | Acceptance<br>Criteria | Test Result | Checked Ok<br>(Initial) |
|------|----------|------------------------|-------------|-------------------------|
| 1    |          |                        |             |                         |
| 2    |          |                        |             |                         |
| 3    |          |                        |             |                         |
| 4    |          |                        |             |                         |
| 5    |          |                        |             |                         |
| 6    |          |                        |             |                         |
| 7    |          |                        |             |                         |
| 8    |          |                        |             |                         |
| 9    |          |                        |             |                         |
| 10   |          |                        |             |                         |

|            |
|------------|
| Parts Used |
|            |

|                |
|----------------|
| Service Report |
|----------------|

|                          |
|--------------------------|
| Further action required? |
| Next service due:        |

|                 |                       |    |
|-----------------|-----------------------|----|
| Service Charge: | Labour (       hrs.): | \$ |
|                 | Parts:                | \$ |
|                 | Sundries:             | \$ |
|                 | <b>TOTAL:</b>         | \$ |

\_\_\_\_\_  
Signature of Service Technician

## EF11 - Register of Environmental Legislations

### Policy Ref

PN0054

### Policy

EF11 - Register of Environmental Legislations

### Procedure

#### EF11 - Register of Environmental Legislations

##### National

- ["The Environment Protection and Biodiversity Conservation Act 1999"](#)

##### Australian Capital Territory

- ["Environmental Protection Act 1997"](#)
  - The [Environment protection for business and industry](#) page covers the environmental legislation and codes of practice affecting ACT businesses.

##### New South Wales

- ["Protection of the Environment Operations Act 1997"](#)
  - Other [NSW environmental legislation](#)

##### Northern Territory

- ["Environmental Assessment Act 1982"](#)
  - [Environmental Protection Legislation](#)
  - [Environmental Assessments](#)

##### Queensland

- ["Environmental Protection Act 1994"](#)
  - Information for [Business and industry](#).
  - [Voluntary environmental codes of practice](#).

##### South Australia

- ["Environment Protection Act 1993"](#)
  - [Environment protection legislation](#)
  - [Codes of practice](#)

##### Tasmania

- ["Environmental Management and Pollution Control Act 1994"](#)
  - Information on [Environmental policies, publications, procedures and strategies](#)

##### Victoria

- ["Environment Protection Act 1970"](#)
  - Other VIC [Environmental legislation](#)
  - [Publications and Codes of practice](#)

##### Western Australia

- ["Environment Protection Act 1986"](#)
  - Information on environmental [legislation](#)



## Register

[illegible]

## EF12 - Supplier Sustainability Review

### Policy Ref

PN0055

### Policy

EF12 - Supplier Sustainability Review

### Procedure

#### EF12 - Supplier Sustainability Review

|                 |                  |
|-----------------|------------------|
| Supplier Name   |                  |
| Address         |                  |
| Contact Name    |                  |
| Contact Details | Phone:<br>Email: |

| Area   | Yes | No |
|--|-----|----|
| Does your company have a Commitment Statement or a Sustainability Charter that highlights the intention to minimise the impact on the environment from its business activities?                        |     |    |
| Does your company have an Environmental Policy that clearly communicates the key areas that the company will focus on in order to minimize its impact on the environment from its business activities? |     |    |
| Does your company have a Sustainable Procurement policy that favours the purchase of goods, products, materials and services that have a low impact on the environment?                                |     |    |
| Has your company measured its environmental impact of its business activities by conducting a formal carbon footprint review using reputable carbon management software?                               |     |    |
| Does your company have a detailed action plan on how it intends to reduce the carbon emissions and environmental impacts from its business activities?   |     |    |
| Does your company have an internal "Sustainability Committee" or "Green Team" that plays an active role in looking to continually improve the environmental performance of your company?               |     |    |
| Has your company facilitated any sustainability awareness education for  |     |    |

|   |  |  |
|---|--|--|
| staff, management and other key stakeholders?   |  |  |
| Has your company ever been prosecuted or received an improvement notice regarding any breach of environmental legislation in the past 10 years?   |  |  |
| Does your company regularly contribute to any community cause (or causes) by way of monetary or non-monetary assistance?  |  |  |
| Does your company act ethically at all times when communicating and remunerating all parties that it has business dealings with including employees, contractors, suppliers, customers, government authorities and investors? |  |  |
| Please complete and return to:  |  |  |

**Lampson (Australia) Pty Ltd USE ONLY**

|   |  |
|---|--|
| Supplier assessed as:<br><input type="checkbox"/> Approved<br><input type="checkbox"/> More Information Required<br><input type="checkbox"/> Unapproved | Assessed By:<br>Date Assessed:<br>Review Date: |
|---|--|

EF13 - Environment Record Master List

Policy Ref  
PN0056

Policy  
EF13 - Environment Record Master List

Procedure  
EF13 - Environment Record Master List

| KEY for Item column:      |           |                               |         |           |                            |
|---------------------------|-----------|-------------------------------|---------|-----------|----------------------------|
| EM = Environmental Manual |           | EP = Environmental Procedures |         |           |                            |
| EF = Environmental Forms  |           | AP = Action Plans             |         |           |                            |
| Name of Recipient         | Item Type | Rev No                        | Copy No | Date Sent | Statutory Retention Period |
|                           |           |                               |         |           |                            |
|                           |           |                               |         |           |                            |
|                           |           |                               |         |           |                            |
|                           |           |                               |         |           |                            |
|                           |           |                               |         |           |                            |
|                           |           |                               |         |           |                            |
|                           |           |                               |         |           |                            |
|                           |           |                               |         |           |                            |
|                           |           |                               |         |           |                            |
|                           |           |                               |         |           |                            |
|                           |           |                               |         |           |                            |
|                           |           |                               |         |           |                            |
|                           |           |                               |         |           |                            |

EF14 - Approved Suppliers List

Policy Ref  
PN0057

Policy  
EF14 - Approved Suppliers List

Procedure

EF14 - Approved Suppliers List

| Supplier/Contractor Details | Scope of goods/services provided | Basis of Approval | Comments |
|-----------------------------|----------------------------------|-------------------|----------|
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |
|                             |                                  |                   |          |

|                                     |           |      |
|-------------------------------------|-----------|------|
| Approved By<br>(Purchasing Manager) | Signature | Date |
|-------------------------------------|-----------|------|



|    |  |  |  |             |  |
|----|--|--|--|-------------|--|
| 7  |  |  |  |             |  |
| 8  |  |  |  |             |  |
| 9  |  |  |  |             |  |
| 10 |  |  |  |             |  |
| 11 |  |  |  |             |  |
| 12 |  |  |  |             |  |
| 13 |  |  |  |             |  |
| 14 |  |  |  |             |  |
| 15 |  |  |  |             |  |
| 16 |  |  |  |             |  |
| 17 |  |  |  |             |  |
| 18 |  |  |  |             |  |
| 19 |  |  |  |             |  |
| 20 |  |  |  |             |  |
|    |  |  |  | Order Total |  |

|  |                   |
|--|-------------------|
| Delivery Date Required   | Delivery Address  |
| SPECIAL REQUIREMENTS:<br><br>Standards to be met, inspection requirements, acceptance criteria etc.<br>▪<br>▪<br>▪<br>▪<br>▪ |                   |
| ORDER PLACED BY:<br><br>Name   | <br><br>Signature |



## EF16 - Goods Received

### Policy Ref

PN0059

### Policy

EF16 - Goods Received

### Procedure

#### EF16 - Goods Received

|                               |                |
|-------------------------------|----------------|
| Supplier Name                 |                |
| Description of Goods Received |                |
| Received By                   |                |
| Name                          |                |
| Signature                     |                |
| Date Received                 | ____/____/____ |

Delivery docket received? Yes / No

Quantity correct? Yes / No

If not correct, state quantity received

Goods match description on docket? Yes / No

If not, give description of goods received

Goods received in good condition? Yes / No

If not, state damage sustained

|  |
|--|
| Goods Passed Receiving Inspection<br>■<br>■<br>■ |
| Stored in Bin Number:                            |

OR

|  |
|--|
| Goods Failed Receiving Inspection<br>■<br>■<br>■ |
| Action Taken:                                    |



**EF17 - Requisition****Policy Ref**

PN0060

**Policy**

EF17 - Requisition

**Procedure****EF17 - Requisition**

| Description Of Goods Required<br>Include Any Special Characteristics Or<br>Standards With Which The Goods Must<br>Comply | Part Number<br>If Known | Quantity<br>Required | Job Number |
|--|-------------------------|----------------------|------------|
|  |                         |                      |            |
|  |                         |                      |            |
|  |                         |                      |            |
|  |                         |                      |            |
|  |                         |                      |            |
|  |                         |                      |            |
|  |                         |                      |            |

|                            |                                  |
|----------------------------|----------------------------------|
| Preferred Supplier:        | Name Of Person Requesting Goods: |
| Preferred Delivery Method: | Date Of Requisition:             |
| Date Required:             | Requisition Approved By:         |

EF18 - Contract Review Action

Policy Ref  
PN0061

Policy  
EF18 - Contract Review Action

Procedure  
EF18 - Contract Review Action

|                               |  |
|-------------------------------|--|
| Scope of Work                 |  |
| Relevant Compliance Standards |  |
| Delivery Requirements         |  |
| Pricing Details               |  |
| Resource Requirements         |  |
| Insurance Requirements        |  |
| Contract Risks                |  |

## EF19 - Schedule of Environmental Audits

### Policy Ref

PN0062

### Policy

EF19 - Schedule of Environmental Audits

### Procedure

#### EF19 - Schedule of Environmental Audits

For the Year \_\_\_\_\_

| Topic                              | ISO<br>14001:<br>2004<br>Section | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|------------------------------------|----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Environmental policy               | 4.2                              |     |     |     |     |     |     |     |     |     |     |     |     |
| Environmental aspects              | 4.3.1                            |     |     |     |     |     |     |     |     |     |     |     |     |
| Legal & other requirements         | 4.3.2                            |     |     |     |     |     |     |     |     |     |     |     |     |
| Objectives, Targets & Action Lists | 4.3.3                            |     |     |     |     |     |     |     |     |     |     |     |     |
| Structure & responsibility         | 4.4.1                            |     |     |     |     |     |     |     |     |     |     |     |     |
| Training, Competence & Awareness   | 4.4.2                            |     |     |     |     |     |     |     |     |     |     |     |     |
| Communications                     | 4.4.3                            |     |     |     |     |     |     |     |     |     |     |     |     |
| EMS Documentation                  | 4.4.4                            |     |     |     |     |     |     |     |     |     |     |     |     |
| Document control                   | 4.4.5                            |     |     |     |     |     |     |     |     |     |     |     |     |
| Operational control                | 4.4.6                            |     |     |     |     |     |     |     |     |     |     |     |     |
| Emergency preparedness & response  | 4.4.7                            |     |     |     |     |     |     |     |     |     |     |     |     |

|   |       |  |  |  |  |  |  |  |  |  |  |  |  |
|---|-------|--|--|--|--|--|--|--|--|--|--|--|--|
| Monitoring and measurement                    | 4.5.1 |  |  |  |  |  |  |  |  |  |  |  |  |
| Evaluation of compliance                      | 4.5.2 |  |  |  |  |  |  |  |  |  |  |  |  |
| Nonconformity, corrective & preventive action | 4.5.3 |  |  |  |  |  |  |  |  |  |  |  |  |
| Control of Records                            | 4.5.4 |  |  |  |  |  |  |  |  |  |  |  |  |
| Management review                             | 4.6   |  |  |  |  |  |  |  |  |  |  |  |  |

## EF20 - Emergency Report

### Policy Ref

PN0063

### Policy

EF20 - Emergency Report

### Procedure

#### EF20 - Emergency Report

| Description Of The Emergency (to be completed by the person detecting the emergency)                       |            |       |
|--|------------|-------|
| <ul style="list-style-type: none"> <li>▪</li> <li>▪</li> <li>▪</li> <li>▪</li> <li>▪</li> <li>▪</li> </ul> |            |       |
| Location:<br>Date & Time:  |            |       |
| Possible Causes (to be completed by the person detecting the emergency)                                    |            |       |
| <ul style="list-style-type: none"> <li>▪</li> <li>▪</li> <li>▪</li> <li>▪</li> <li>▪</li> <li>▪</li> </ul> |            |       |
| Emergency Response (to be completed by the person detecting the emergency)                                 |            |       |
| Describe what was done in response to the emergency.   |            |       |
| Name:<br>(Of Person Detecting Emergency)   | Signature: | Date: |



|  |            |       |
|--|------------|-------|
| <b>Send form to EMS Manager</b>  |            |       |
| Investigation Of Root Causes (to be completed by Safety Officer or EMS Manager/Environmental Manager)                                  |            |       |
|  |            |       |
| <b>Investigation Of Emergency Response &amp; Preparedness (to be completed by Safety Officer or EMS Manager/Environmental Manager)</b> |            |       |
|  |            |       |
| Investigation Completed By:<br>(Name)  | Signature: | Date: |

|   |
|---|
| <b>EMS Manager to discuss Emergency with Department Manager</b> |
| Post Emergency Evaluation Summary                               |
|   |

|  |            |          |
|--|------------|----------|
|  |            |          |
| Corrective Action Required And Taken (to be completed by Department Manager) |            |          |
|  |            |          |
| Preventive Action Taken (to be completed by Department Manager)              |            |          |
|  |            |          |
| EMS Manager to check at next audit whether preventive action effective       |            | YES / NO |
| Action Taken By:<br>(Depart Mgr. Name)                                       | Signature: | Date:    |

EF21 - Calibration Record

Policy Ref  
PN0064

Policy  
EF21 - Calibration Record

Procedure

EF21 - Calibration Record

| ITEM OF EQUIPMENT | EQUIP NO. | DATE CALIB'D | BY WHOM | RESULTS | CALIB'N PERIOD | DATE DUE |
|-------------------|-----------|--------------|---------|---------|----------------|----------|
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |
|                   |           |              |         |         |                |          |

EF22 - Archives Register

Policy Ref  
PN0065

Policy  
EF22 - Archives Register

Procedure

EF22 - Archives Register

| Box No | Date Filed | Filed By | Summary of Contents | Destruction Date |
|--------|------------|----------|---------------------|------------------|
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |
|        |            |          |                     |                  |



## EF23 - Management Review Record

### Policy Ref

PN0066

### Policy

EF23 - Management Review Record

### Procedure

#### EF23 - Management Review Record

| No. | Item  | Report/ Decision | Action<br>(Name of person) | Target date for<br>completion |
|-----|---|------------------|----------------------------|-------------------------------|
| 1   | Matters arising from last Management Review                             |                  |                            |                               |
| 2   | Results of internal audits  |                  |                            |                               |
| 3   | External communications including complaints                            |                  |                            |                               |
| 4   | Environmental performance   |                  |                            |                               |
| 5   | Objectives and Targets status   |                  |                            |                               |
| 6   | Corrective & Preventive Actions status                                  |                  |                            |                               |
| 7   | New developments in Environmental legislations & ISO 14001 requirements |                  |                            |                               |
| 8   | Recommendations for improvements  |                  |                            |                               |
|     |   |                  |                            |                               |
|     | Meeting closed at:  |                  |                            |                               |

## EF24 - Internal Environmental Audit Report

### Policy Ref

PN0067

### Policy

EF24 - Internal Environmental Audit Report

### Procedure

#### EF24 - Internal Environmental Audit Report

| No. | Item  | Report/ Decision | Action<br>(Name of person) | Target date for<br>completion |
|-----|---|------------------|----------------------------|-------------------------------|
| 1   | Matters arising from last Management Review                             |                  |                            |                               |
| 2   | Results of internal audits  |                  |                            |                               |
| 3   | External communications including complaints                            |                  |                            |                               |
| 4   | Environmental performance   |                  |                            |                               |
| 5   | Objectives and Targets status   |                  |                            |                               |
| 6   | Corrective & Preventive Actions status                                  |                  |                            |                               |
| 7   | New developments in Environmental legislations & ISO 14001 requirements |                  |                            |                               |
| 8   | Recommendations for improvements  |                  |                            |                               |
|     |   |                  |                            |                               |
|     | Meeting closed at:  |                  |                            |                               |



## EF25 - Terms of Reference for EMS Committee

### Policy Ref

PN0086

### Policy

EF25 - Terms of Reference for EMS Committee

### Description

Lampson (Australia) Pty Ltd has guidelines for all employees regarding EF25 - Terms of Reference for EMS Committee

### Purpose

The purpose of this policy is to explain the general procedures relating to EF25 - Terms of Reference for EMS Committee

The C1 has been established as an internal working committee of Lampson (Australia) Pty Ltd. Its purpose is to investigate and implement strategies to achieve the goals and objectives contained in the Environment Management System (EMS).

### Objectives

The objectives of the Committee are to:

- Assist in the ongoing operation and continual improvement of the EMS.
- Review and make recommendations on the Environmental Policy.
- Review and make recommendations on the EMS procedures.
- Review environmental audit plans and reports.
- Set and review environmental objectives and targets.
- Conduct the EMS management review.

### Scope

The following guidelines are to be adhered to by all employees, supervisors and employees.

### Procedure

#### Authority

The C1 has the power only to recommend a course of action to the management.

#### Roles and Responsibilities

The role of the C1 is to consider matters within the defined scope and to provide recommendations and advice on environmental issues.

The C1 is charged with considering matters relating to the organization's environmental and sustainability goals, including:

- Environmental Sustainability
- Waste Management;
- Energy Efficiencies
- Water Usage
- Recycling Initiatives
- Review of Supplies and Packaging
- Staff Training and Awareness
- New product opportunities

**Membership**

Membership of the committee will be no less than 3 and no more than 5 employees. External consultants, clients or suppliers may be invited to attend meetings to advise the committee.

**1. Appointment of Chairperson**

The Chairperson of the C1 shall be appointed by the Committee, for a period of no more than two (2) years.

When the incumbent Chairperson has served out their two year appointment the position will be declared vacant and the Committee will appoint a new Chairperson. The retiring Chairperson is eligible to be re-elected.

In the absence of the appointed Chairperson from a meeting, the meeting will appoint an Acting Chairperson from the members present for the duration of that particular meeting.

**2. Role of Chairperson**

The Chairperson becomes the spokesperson on behalf of Committee in discussing matters relating to the Environment Committee with the Business Owners and other stakeholders.

**3. Role of Committee Members**

The role of a Committee Member is to consider and make recommendations on matters relating to achieving the organization's Environmental Goals.

**4. Meetings**

- 4.1. Quorum: The quorum for the C1 is half of the members plus one.
- 4.2 Frequency: Meetings are held at least every two months at a time determined by the committee.
- 4.3 Meeting Records: The Chairperson will ensure that minutes are recorded for each meeting.

**5. Review**

The C1 shall review these Terms of Reference at the first meeting of each calendar year.

## EF26 - Environmental Complaint Form

### Policy Ref

PN0069

### Policy

EF26 - Environmental Complaint Form

### Procedure

#### EF26 - Environmental Complaint Form

Complainant's Name: \_\_\_\_\_

Contact details: \_\_\_\_\_

Write your description of the nature of the complaint.

---

---

---

---

---

---

---

---

Date: \_\_\_\_\_

Time the incident occurred: \_\_\_\_\_



**ANNEXURE 7 –  
SPILL MANAGEMENT PLAN**



## Spill Response and Reporting

### General spill response guidelines

Lampson see that all oil / chemical spills, regardless of size, must be contained and cleaned up in a safe and effective manner.

### Oil spill response

Incidental spills are generally those where:

- The spill is small (e.g. less than 20 L)
- The spill can be easily contained and cleaned up
- The spill is unlikely to reach a waterway or storm water drain.
- Clean up procedures do not pose a health or safety hazard
- Proper response equipment is available for a safe clean up (e.g.

All spills must be report to the Site Manager and Supervisor. Site Manager to decide the appropriate response to incidental spills. Always fill out incident report after the clean-up.

Non-Incidental Spills are generally those where:

- The spill is large enough to spread beyond the immediate area
- The spill cannot be contained
- The spill may reach a waterway or storm drain
- The spill requires special equipment or training to clean up
- The spill poses a hazard to human health or the environment
- There is a danger of fire or explosion.

Report the spill immediately to the Site Manager and Supervisor. Site Manager or Supervisor to evacuate the site (if applicable) and to call emergency services if necessary.

Most spills in general will be clean up by Lampson employees. For all other spills where Lampson employees are unable to control or contain a spill release, emergency services will be called.



## **Oil spill response steps**

### **Incidental spills**

1. Secure the area
2. Control and contain the spill
3. Clean up the spill
4. Notify the Site Manager
5. Complete an incident form

### **Non-Incidental**

1. Secure the area
2. Control and contain the spill
3. Notify the Site Manager
4. Contact emergency service and evacuate the site if necessary.
5. Site clean up
6. Complete an incident form

## **Spill Notification procedure**

Site Manager must make contact with the Managing director for all spills so any additional notifications can be made as required.



**Report Name:** Property Stormwater Drainage Management Strategy  
290 Brand Highway - Muchea

**Project Title:** Retrospective Approval for Operations on Lot 6 (H290)  
Brand Highway Muchea



| Revision | Description    | Author | Checked | Approved | Date       |
|----------|----------------|--------|---------|----------|------------|
| 0        | Issued for Use | EBF    | EBF     | EBF      | 02/02/2016 |
| 1        | Final Issue    | EBF    | EBF     | EBF      | 08/03/2016 |

| <b>TABLE OF CONTENTS</b>                                       | <b>PAGE</b> |
|--|-------------|
| <b>1. PREAMBLE.....</b>  | <b>4</b>    |
| <b>2. INTRODUCTION .....</b>                                   | <b>5</b>    |
| 2.1 Property Location & Ownership .....                        | 5           |
| 2.2 Property Ownership .....                                   | 6           |
| 2.3 Existing Land Use .....                                    | 6           |
| 2.4 Adjacent Land Uses .....                                   | 7           |
| 2.5 Site Contamination.....                                    | 7           |
| 2.6 Wetlands and Waterways .....                               | 7           |
| 2.7 Significant Vegetation .....                               | 7           |
| 2.8 Regional Context - Property Catchment .....                | 8           |
| <b>3. BIOPHYSICAL INFORMATION – EXISTING ENVIRONMENT .....</b> | <b>10</b>   |
| 3.1 Climate & Rainfall .....                                   | 10          |
| 3.2 Topography.....  | 10          |
| 3.3 Geology and Soils.....                                     | 11          |
| 3.4 Groundwater .....  | 11          |
| 3.5 Landscaping.....   | 11          |
| 3.6 Land degradation hazards .....                             | 11          |
| <b>4. SITE OPERATIONS MANAGEMENT ISSUES .....</b>              | <b>13</b>   |
| 4.1 General .....  | 13          |
| 4.2 Surrounding Land use and interfaces .....                  | 14          |
| 4.3 Groundwater Management & Water Usage .....                 | 14          |
| 4.4 Wetlands.....  | 14          |
| 4.5 Hydrocarbon Contamination Management .....                 | 14          |
| 4.6 Dust.....  | 15          |
| 4.7 Surface Water Flows.....                                   | 15          |
| 4.7.1 Design Concept.....                                      | 21          |
| 4.8 Stormwater Management.....                                 | 22          |
| 4.9 Water Sustainability Initiatives .....                     | 29          |
| 4.10 Water Efficient Measures .....                            | 29          |
| 4.10.1 Office Facility water efficiency .....                  | 29          |
| 4.10.2 Water Supply & Water Recycling .....                    | 29          |
| 4.10.3 Waste Water Management.....                             | 29          |
| <b>5. CONCLUSIONS AND RECOMMENDATIONS .....</b>                | <b>30</b>   |
| <b>6. ACKNOWLEDGEMENTS .....</b>                               | <b>31</b>   |

**Appendix**

Appendix 1 – Drawings & Diagrams.....32

Appendix 2 – Calculations .....33

Appendix 3 – Photos .....34

1. PREAMBLE

Peritas Civil was commissioned by Allering Associates on behalf of Lampson (Australia) Pty Ltd (**Lampson**), the landowners of Lot 6 (No. 290) Brand Highway, Muchea (**subject site**) to prepare a Stormwater Drainage Management Strategy in support of a retrospective application for planning approval to allow the continued operation of the 'Transport Depot' land use associated with the Lampson operations.

Lampson seeks to continue to occupy only a small (approximately 3ha) portion of the overall 39.131 ha site area. Refer to the Lampson Site Plan included at **Figure 1 & 2** showing the location of the Lampson operation at the subject site. The portion of the subject site that Lampson currently occupies is referred to within this report as the 'development area'.

The subject property is located immediately north of the Muchea Townsite and east of the Brand Highway at Lot 6 (No 209) Brand Highway and is located in the Ellen Brook catchment area. The site is located approximately 800m north of the centre of Muchea and approximately 44km north-west of the Perth CBD

The Chittering Landcare Centre website features a draft 'Catchment Management Plan', (CMP) for the Ellen Brook prepared in 2000 by Evangelisti & Associates (Aust) Pty Ltd this report has considered the general requirements referred to in this report. This report confines itself to those management aspects that the landowners actually have control over.

This report supports the planners report and application for retrospective approval for the Lampson facility as a "transport depot" and describes the layout of the property, the physical characteristics of the land in terms of soil type, slope, condition of rivers or streams and other physical features including dams, wood lots, vegetation, fences and any other physical improvements proposed.

This report also describes the current and intended use of the land as it relates to the proposed development and use of the land as a rural industry and transport depot. The plan provides site location details, size and scope of any proposed developments. It also gives an indication as to the reason the proposed developments are thought necessary.

The stormwater drainage strategy also covers the proposed extensions to the current facility being a 50m extension of the existing and storage hardstand area to the south.

Figure 1 – Existing Site Operations Area



## 2. INTRODUCTION

### 2.1 Property Location & Ownership

The subject site is located at Lot 6 (No 209) Brand Highway, Muchea and identified on Deposited Plan 13866 and Certificate of title Volume 1651, Folio 436. The property occupies a total area of 39.131 hectares. Refer to **Figure 2 & 3** below.

The property is owned by Lampson (Australia) Pty Ltd and has been used as a rural industry property for many years by previous owners.

The Shire's records indicate that industrial operations involving black granite works were operational from before 1988 to around 2000 when the land use changed to hay bailing operations. The historic Shire records provided by Lampson indicate that the black granite works included a number of structures at the site, however the type of structures and their location is unknown. We understand that the hay bailing operations continued to around 2012 when a fire destroyed a significant number of buildings on site. These previous activities are understood to have operated from the development area that Lampson currently occupies.

Based on a review of the aerial photography of the development area by Allering Associates for the period between 2009 and 2015, it is apparent that the development at the site occupied a significantly greater footprint to that which presently exists. A number of larger buildings were removed as a result of fire damage and based on discussions with Shire staff, the two main storage sheds which have been constructed in the development area were rebuilt by the previous owner following the fire. The Shire has no record of building permits being issued for the current buildings or those that existed at the site prior to the fire.

The current application before the Shire seeks to continue the use of the property as a storage depot Rural Industry.

**Figure 2 – Site Location Plan**

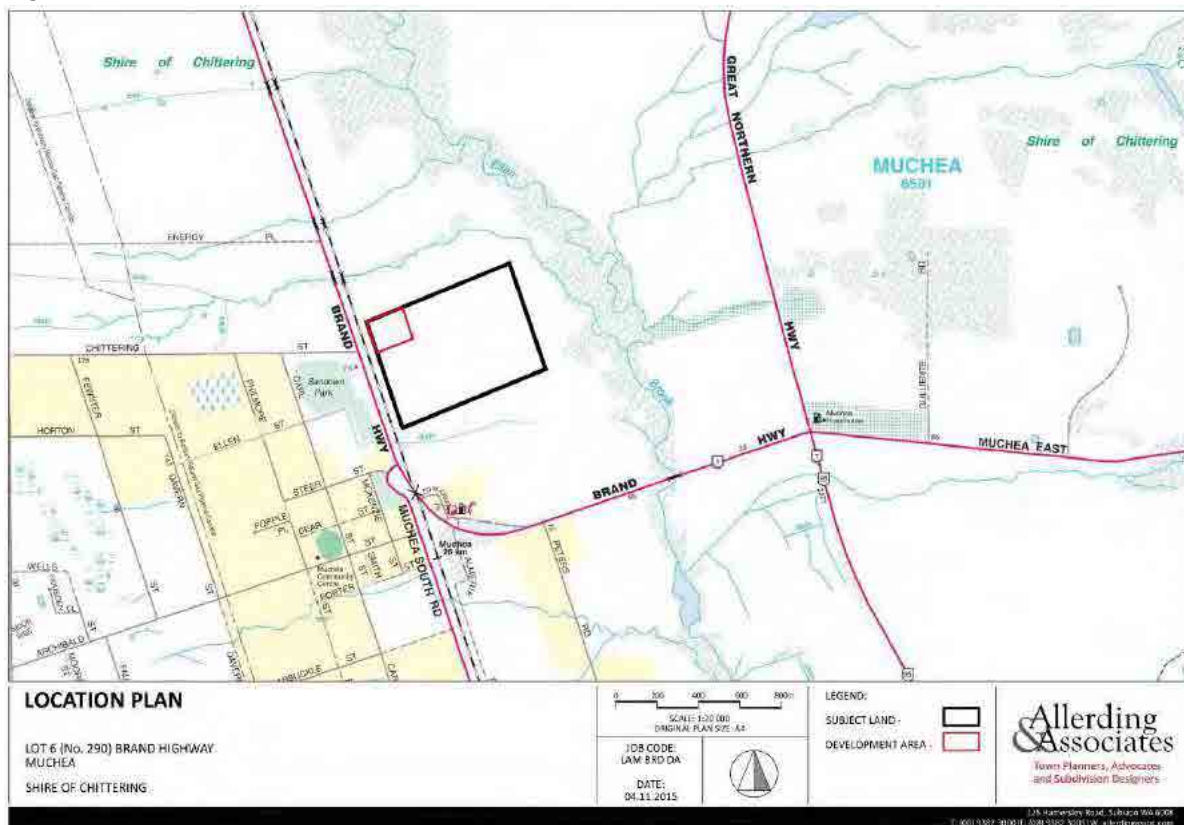




Figure 3– Aerial Photo of Subject Property



2.2 Property Ownership

Lampson (Australia) Pty Ltd is a supplier of Lifting and Transport equipment and related services. Nationally Lampson has operated since 1991 with their initial clients being from the petrochemical industry including BP, Shell, Ampol and Caltex. 24 years later Lampson services have been extended to include mining, civil, defence, oil, gas and other general industry.

Among the general supply of cranes and transport Lampson also specialises in Heavy Lift and Transport Services and are an original equipment manufacturer of the patented Lampson Transi-Lift Crane. The capacity of cranes within Lampson's fleet range from 30 tonnes to 3000 tonnes and are offered on long term bare and dry lease or on a project specific operated basis. The trailer range includes on-road semi-trailer and floats plus various off-road heavy transport crawlers and Self Propelled Modular Trailer types.

Lampson employs approximately 90 personnel nationally however the number fluctuates with industry demands. It is common to travel experienced personnel between sites and states in order to service their varied client base. Many of Lampson's site locations are in remote areas which further contributes to the variation of clientele.

2.3 Existing Land Use

As shown in the Aerial Photographs at **Figures 3** and **6**, the development area in the north-west corner of the subject site is currently occupied by Lampson for its transport depot operations. The remainder of the subject site is vacant.

A summary of the land use areas for the Subject land is presented in Table 2.1 below:

**Table 2.1 – Land Use areas Summary**

| Land Use   | Area (ha)     |
|--|---------------|
| Main Storage Buildings and roofed structures and tanks and associated infrastructure (Offices etc) | 0.248         |
| Unsealed access roads & unsealed pavements and hardstands (permeable pavements)                    | 1.500         |
| Concrete Hardstand areas and central laydown area  | 0.313         |
| Verges to Facility area (vegetated in some instances but not formally landscaped)                  | 0.936         |
| Balance rural property   | 36.134        |
| <b>TOTAL</b>   | <b>39.131</b> |

## 2.4 Adjacent Land Uses

The neighbouring land to the north, south and east of the subject site is utilised as grazing and cropping land. The land to the north-west of the subject site is occupied by a quarry operator which undertakes the storage and distribution of stone from the site. To the west of the subject site is the Muchea Polocrosse Club at Sandown Park.

## 2.5 Site Contamination

The Department of Environment Regulation (DER) Contaminated Sites Register did not identify any recorded contamination at the subject site. There is no known contamination that has occurred as a result of the fire that occurred at the premises in 2012. Following the fire, those buildings that suffered fire damaged were removed and disposed of off-site.

## 2.6 Wetlands and Waterways

A review of the WA Atlas Wetland Management Category Mapping was undertaken which identified the subject site within a 'Multiple Use' wetland (refer to planning report for details. Multiple Use wetlands are generally described as 'wetlands with few remaining important attributes and functions', their respective management objectives involving:

*Use, development and management should be considered in the context of ecologically sustainable development and best management practice catchment planning through landcare.*

The existing wetland classification which exists over the subject site is not a barrier to its continued use on the basis of the previous development that has taken place on the site, but also in the context of the overall environmental management practices adopted.

As detailed in this report Lampson will implement a stormwater management strategy to ensure that runoff is captured and retained on-site following a storm event. Where necessary, the water will be treated to ensure that it does not negatively impact the groundwater resource.

## 2.7 Significant Vegetation

The Site has previously been completely cleared of all existing vegetation.



## 2.8 Regional Context - Property Catchment

The property ultimately forms part of the upper reaches of the Ellen Brook Catchment.

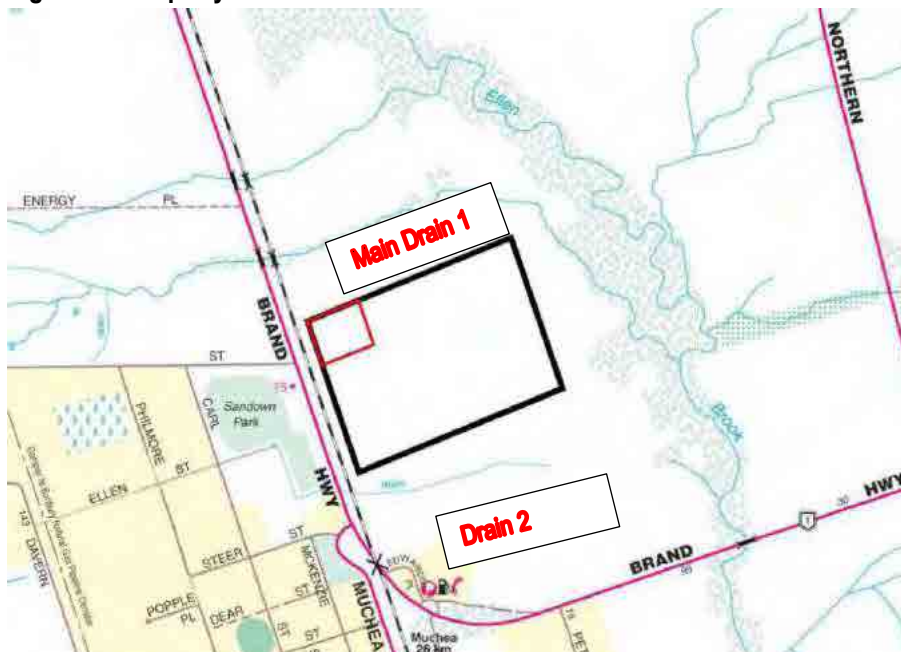
The Ellen Brook Catchment has an area of  $\sim 720\text{km}^2$  and is significantly situated in the Chittering Shire area extending more or less north south  $\sim 20\text{km}$  north of Perth.

The Ellen Brook Catchment forms part of the Avon Catchment which has a total area of  $\sim 122,000\text{km}^2$ . The Ellen Brook Catchment has been extensively cleared for agriculture, urban and industrial development although there is significant remnant bush remaining on the Bassendean sand land unit.

The property lies between two main catchments that effectively bypass the property, hence is not influenced by external catchments or incoming stormwater from other properties.

Referring to **Figure 4** below, it can be seen that a watershed/creek line labelled “**Main Drain 1**” bypasses the site to the north. A second watershed from the northern section of the Muchea townsite bypasses the property on the south, labelled “**Drain 2**” in **Figure 4** below.

**Figure 4 – Property Catchment Location**



The Main Drain 1 catchment west of Brand Highway can be seen in **Figure 5** below and has an approximate total area of 285.29 Ha.

**Figure 5 – Main Drain 1 - Total Catchment**



Below are details of the existing runoff features and watersheds for the subject site (**Figure 6 below**) and of the Operations Area in **Figure 7 below**

**Figure 6 – Stormwater Drainage paths within Subject Property**



**Figure 7 – Stormwater Drainage paths exit locations from the Facility Operations Area**





### 3. BIOPHYSICAL INFORMATION – EXISTING ENVIRONMENT

#### 3.1 Climate & Rainfall

The climate and rainfall of the property is typical of the Ellen Brook catchment and experiences a Mediterranean climate of hot dry summers and cool wet winters. Temperatures typically range from 17°C to 29°C in summer and from 9°C to 18°C in winter (Thurlow, et. al., 1986).

Average rainfall for the southern portion of the Ellen Brook catchment is 820mm/yr and this decreases to less than 660 mm/yr in the northern regions of the catchment (Hammond and Mauger, 1985). Ninety percent of the rainfall occurs between May and October. The break of season is usually mid-April to mid-May and the growing season lasts about seven months. Annual pan evaporation is 1934 mm and the average daily evaporation is 10.8 mm in January falling to 1.8 mm in June.

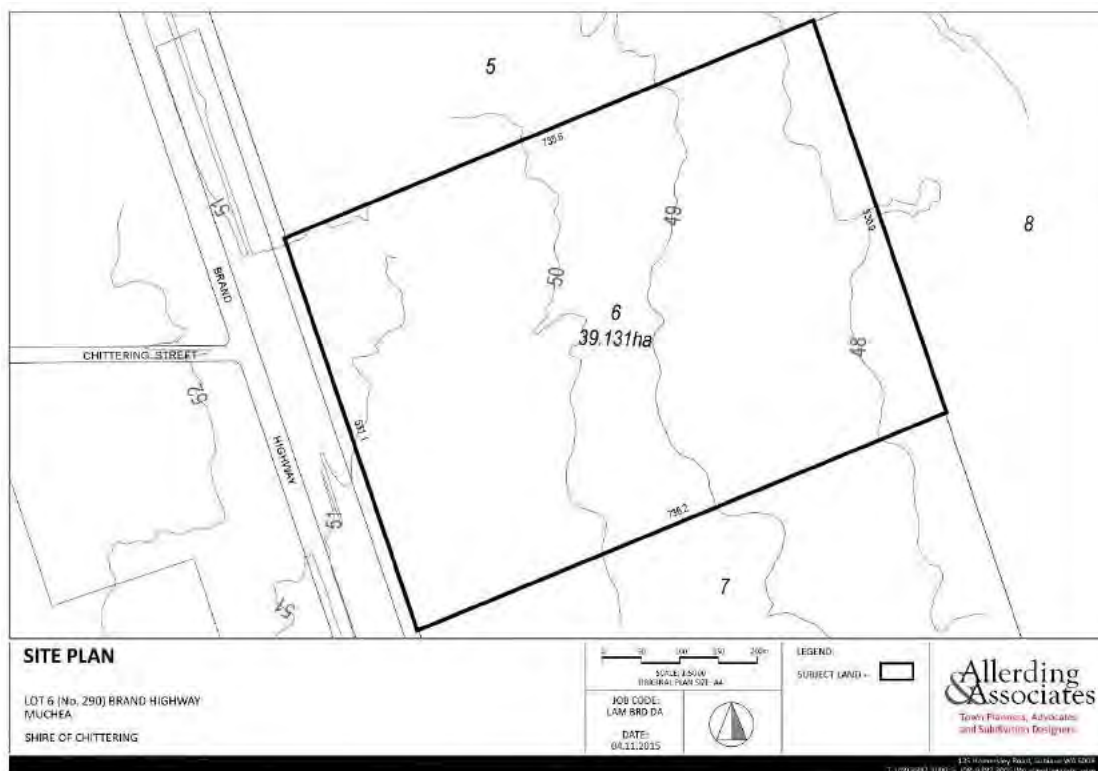
#### 3.2 Topography

The subject land is currently used for a transport depot but these operations are only located on a very small portion (3ha out of 39.131 ha) of the site. The balance of the site is cleared pasture that is maintained in accordance with site zoning requirements.

The site is well graded and gently slopes from west to east with a high point at the north-western corner where the transport depot is located with a level of approximately RL 51m AHD to RL 58m AHD (Australian Height Datum) at the eastern boundary.

Gradients vary from 1 in 100 to 1 in 300 with an average slope of 1 in 200. Refer to the existing contour plan in **Figure 8** Below.

**Figure 8 – Subject Land Topography**



### **3.3 Geology and Soils**

Whilst a formal Geotechnical investigation was not undertaken for this report, a desktop study utilising existing Geological Maps was used for a global review of general soil conditions.

Reference to the Geological Survey Map series indicates that the primary soil condition for the area is classified as Sand (S7 & S8) overlaying Sandy Gravels and clays. This is consistent with site observations. Soils are easily excavated and are very permeable in the surficial layers allowing good drainage via soakage and retention above groundwater.

The Western Australian Planning Commission's Bulletin 64, Acid Sulfate Soils (ASS) Maps shows the site is located in the Moderate to Low Risk of Actual (ASS) within 3m of the surface high to moderate risk of ASS at depths of >3m. l

In consideration of the topographical and geological location of the site coupled with the Moderate to Low Risk Classification of the site, and the proposed depth to which works are proposed (less than 2m) ASS is not considered to be a constraint on the site.

### **3.4 Groundwater**

The groundwater levels move seasonally and is generally ~1.0 metre below ground level and the observed lateral movement is +/- 30cm.

### **3.5 Landscaping**

The development area contains existing landscaping along the southern and eastern boundaries and a portion of the northern boundary.

The operations are screened from Brand Highway by existing mature vegetation within the road and rail reserves to the west of the subject site.

Due to the height of some of the cranes and machinery stored on site, landscaping will not completely screen the machinery from the public realm. However the physical setback of the external crane storage areas within the Lampson transport depot site from Brand Highway of around 100m ensures that the visual impact is considerably reduced and consequently does not result in any undue or adverse amenity impacts.

### **3.6 Land degradation hazards**

#### **Phosphorus**

Preliminary analysis of the Agriculture Western Australia land resource data indicates that low lying soils with very low P binding capacity are most at risk of losing P to drainage. This assessment shows that most of the low lying areas along the central axis of the coastal plain are highly susceptible to phosphorus export. This is not surprising as the Ellenbrook catchment has been identified as one of the greatest contributors of phosphorus into the Swan River estuary.

There has been no application of phosphate fertiliser to date and none is proposed as part of the ongoing use of the property for the transport depot.

## **Nitrogen**

Annual total nitrogen loads from the Ellen Brook catchment have been estimated at 77 tonnes which equates to seven percent of the total TN load to the Swan-Canning estuary (Donohue et al, 1994).

The pasture on the subject land whilst dominated by grasses does include nitrogen fixing plants that to date have not required nitrogenous fertiliser application.

## **Waterlogging**

Preliminary analysis of the Agriculture Western Australia land resource data indicates that the land units most susceptible to waterlogging and seasonal inundation are associated with the central portion of the coastal catchment. Some of these very low-lying areas remain waterlogged from July to mid-September each year. These areas are highly productive in terms of pasture production in spring when plentiful water, light and nutrients stimulate lush pasture growth. Unfortunately these are the very areas that of most concern for nutrient export because they need draining to establish grazing pastures and consequently lose fertilizer nutrients to drainage.

The subject property has a gently undulating land surface with a low profile slope to the east discharging into the Ellen Brook with poorly defined creek systems on the property. Some pre-existing drains have been cleaned maintained to assist the water to move through the property without significantly altering the natural drainage system through the property.

The current drainage system does not restrict the flow of water through the site. The only seasonal flooding occurs in relation to the Main Roads culvert under Brand Highway to the north of the property and away from the property, where minor annual flooding occurs that is confined to the creek bed (Main Drain 1).

## **Salinity**

The *Chittering Salinity and Erosion Study* published by Agriculture Western Australia represents the only significant source of data available on the extent of existing soil salinity and soil erosion problems within the Shire of Chittering. Along with land unit attribute data associated with the Agriculture Western Australia land resource mapping, this information may be used to determine land degradation 'hot spots' for salinity (both existing and potential) within the Shire.

There is no salinisation evident on the property.

## 4. SITE OPERATIONS MANAGEMENT ISSUES

### 4.1 General

Refer to the Planning Application prepared by Allering & Associates (dated November 2015) for a detailed summary of the operation of the site. Below is the site plan (**Figure 9**) showing the facilities (existing and proposed) on the subject site.

**Figure 9 – Subject Land – General Site Layout of Facility Operations Area (Showing Current operations and Futuer expansion of the Facility hardsarnsd area )**

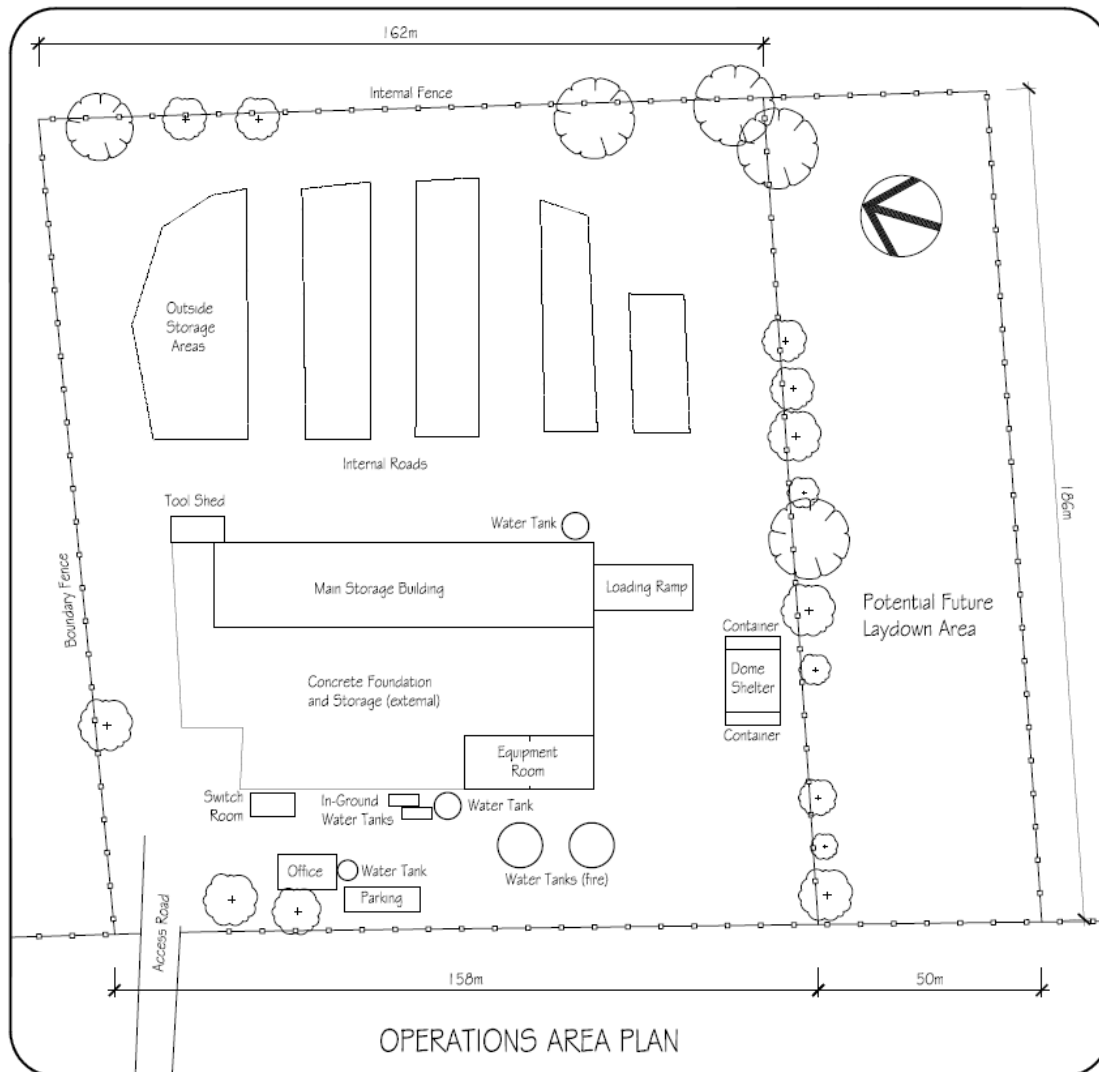


Figure 10 – Subject Land – Aerial with Future Expansion Area Highlighted



#### 4.2 Surrounding Land use and interfaces

Refer to **Section 2.4** above for details of adjacent land uses.

#### 4.3 Groundwater Management & Water Usage

As described earlier that facility has a low water usage and is adequately catered for by use of rainwater tanks. Groundwater is not extracted or used and there is no use of the shallow groundwater for agricultural pursuits.

#### 4.4 Wetlands

As described earlier in this report, there are no natural wetlands on the property although there are several areas where runoff collects before overtopping shallow watershed areas in the very low relief landscape.

#### 4.5 Hydrocarbon Contamination Management

The issue of hydrocarbon containment management has been considered in the planning and design of the development at 290 Brand Highway. The range of factors considered includes spills of diesel, accidental droplets of oils and greases from vehicles under maintenance (inside the storage sheds) and in storage on the open hardstands.

The first and most important safety and management measure is storage. The Owners have adopted a containerised storage system with a capture tank adjacent to the main storage shed with triple cell interceptor and pump-out facility bundled with interior capable of holding the volume of contents should there be a spill. Refer to site plan (**Figure 11**) indicating location of the external below ground containment tank (noted as “Oil Trap”.

The operational procedures for the site will further address any minor diesel or oil leakage from vehicles by constructing the hardstand from a thick layer of gravel (200-250mm) and in major traffic areas sealed or in concrete. The gravel will absorb accidental spills and confine the leakage to the gravel layer itself.



Should spills occur, the gravel will be removed to an approved disposal facility if the quantity of spillage (unlikely to occur) justifies this action.

The storage shed has a concrete floor that incorporates sealing and a drain point to provide a containment drain and connection to the external treatment tank adjacent to the workshop as described above.

Workshop spills will also be limited as handling and containment measures will include mobile storage units that will be placed under works areas when oils are being handled and will be limited to specified areas within the shed/workshop and service area facility.

The vegetated swales within the operations areas and other plant species, soil and water microbiota is a well-documented process as a way to naturally reduce the pollutants to 'safe' compounds. These will be considered when selecting the plantings in the soakage swales.

### 4.6 Dust

The nature of the laydown, (Concrete main hardstand for heavy traffic and tightly compacted and well-maintained gravel hardstand) will limit any dust generation issues. Additionally the have a limited traffic throughput and would be limited to loading / offloading operations at very confined and relatively intense /short periods of activity where equipment is being stored or brought in for maintenance. Adequate water is available on site should the need arise for watering or dust control, however, this is not considered an issue that the facility would need to address.

### 4.7 Surface Water Flows

**Refer to section 4.8 & 4.9 for a more comprehensive discussion regarding stormwater management proposed for the site.**

Generally site stormwater is conveyed utilising shallow open swales and open drains and existing watersheds/outfalls. A number of internal culverts have been placed in the operations area to allow access to the property and convey runoff to treatment and soakage zones in close proximity to the operations footprint. The shallow relief drains and watersheds in and through the property are well grassed and stable with no evident erosion issues. **Refer to Figure 11 below** and photos below for typical views of the property.

Figure 11 – Operations Area – Existing Stormwater Drainage Feature and catchment locations

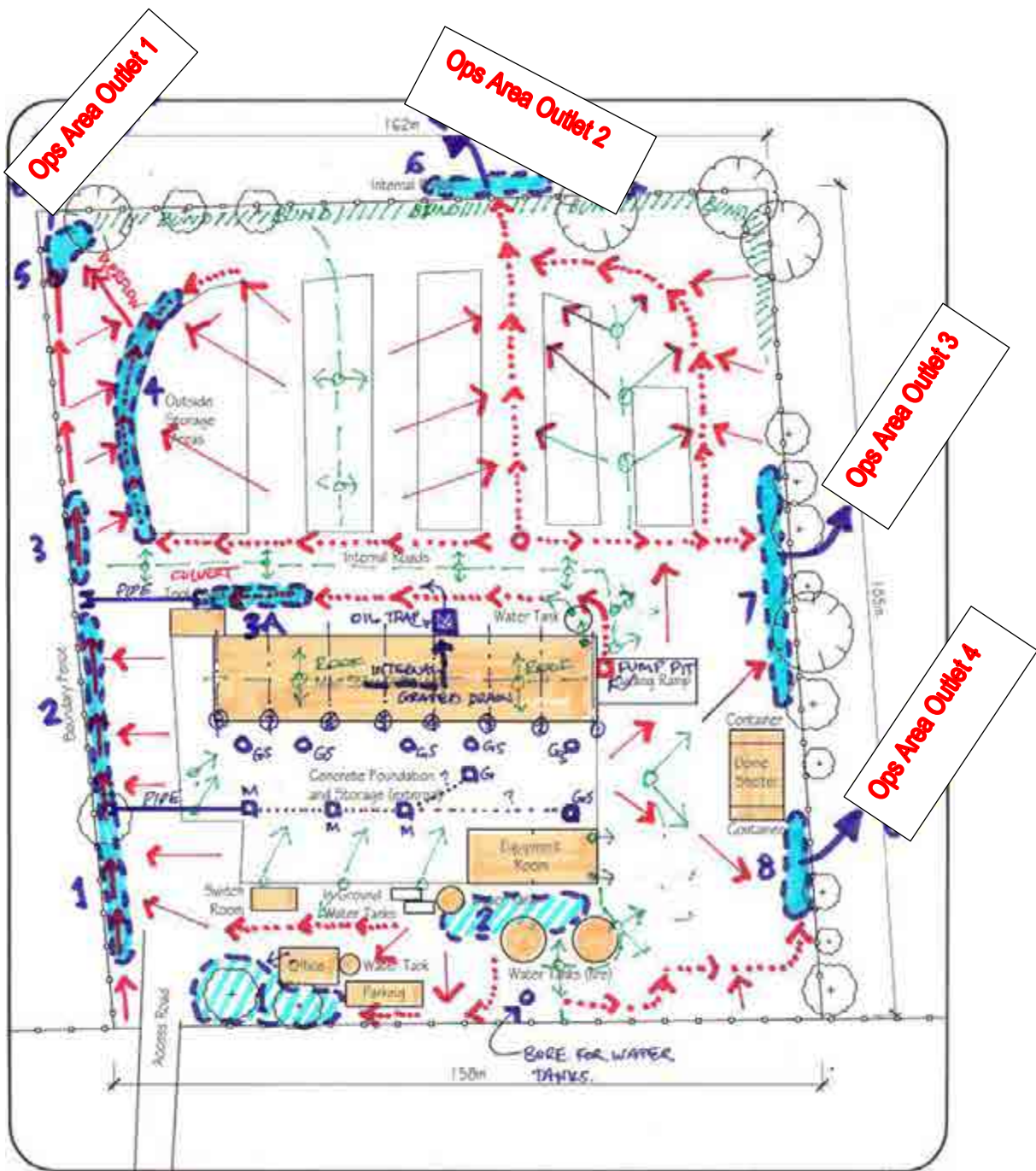


Figure 12 – LEGEND to FIGURE 11



Photo A (Below) – Existing rural paddock generally east and south of the Operations Area (stable grassland with a series of natural watersheds and soakage areas as shown in **Figure 6** that overflow to the east boundary of the property.



**Photo B (Below)** – Existing stable gravel hardstand typical of Operations Area external pavement and storage area.



**Photo C (Below)** – Concrete Hardstand areas between Main storage shed and Offices with positive drainage collection system (gully and pipe network generally discharging to the north of the property to the boundary swale drains).





**Photo D (Below)** – Gravel swale within Storage hardstand area to contain runoff from adjacent storage areas.



**Photo E (Below)** – Partly vegetated swale within Storage hardstand area to contain runoff from adjacent storage areas.





**Photo F (Below)** – Piped outlet from concrete hardstand area and piped network between storage shed and offices. Swale area needs to be reshaped and additional planting added to assist as part of treatment train for sediment and nutrient trapping.



**Photo G (Below)** – Boundary swale along northern boundary of property.



#### 4.7.1 Design Concept

The main objective of the design approach to be adopted for Lot 6 (No. 290) is to minimise stormwater conveyance after collection, and maximise the amount of stormwater which can be locally recharged and managed by direct infiltration to the superficial aquifer, in accordance with Department of Water (DOW) urban water management objectives. This in turn reduces the potential for entrained contaminants to be exported from the site in surface runoff to receiving water bodies, thereby reducing the risk of poor water quality in the downstream systems.

The site's roof runoff will generally be collected for re-use at individual facility allotments that have sufficient sand fill or permeable pavements or collected and piped to swales or open drains on site. Allowance has been made in the stormwater infiltration swales and basin sizing for the small additional contributing flows from the operating footprint of the transport depot and related facilities.

The drainage system will consist of:

- Water Harvesting rainwater tanks will contain the 1 in 1 year, 1 hour event with overflows to natural soakage area to recharge the groundwater.
- Concrete drainage culverts below the main access road and drainage swales strategically located to capture and attenuate post development flow to pre-development standards. The drainage swales and open drains within the development area are designed and are constructed in accordance with Local authority standards (typically to contain up to 1 in 20 year ARI flows). Any future extensions of the facility will be designed to accommodate a similar strategy based on relocation or extension of the existing swales and open drains within the Operations Area.
- Overland flow paths for major flows during severe storms. These flows will generally be contained within the operations areas but with overflows directed to the rural watersheds of the property and shallow natural swales in the topography that will convey peak flows across the stable pasture maintained in the balance of the property.

All storm flows up to and including the 1 in 100 year storm will be directed to either the existing soakage basins and /or proposed upgrade swales located throughout the site. The on-site retention and infiltration basin/swales will include an acceptable treatment train to strip nutrients which will help to limit the impact of the development upon the surrounding catchments water quality.

Wherever practically possible the design incorporates aspects of water sensitive design through the use of dry infiltration swales and basins & off shoulder drainage for roads to convey water to the natural watersheds and shallow swales that run through the site after provision of sediment traps at strategic locations at the exists to the operations footprint. Beyond the operations area the natural grasses and soakage areas across the site as detailed previously are an additional insurance to entrap nutrients and control discharge to required volumes.

Peak flow calculations for each of the **four** operations area outlets culverts indicate that they are all capable of handling the 20 year rainfall event, which is put into context by the fact that the Main Roads culvert under Brand Highway just meets the requirement to handle a 10 year rainfall event. The 20 year rainfall event is the standard used in agricultural planning.

The peak flow calculation used is:

$$Q_p = cA_d n \quad \text{where } Q_p \text{ is the peak flow, } A_d \text{ is the catchment area, and } c \text{ is the catchment coefficient, which varies according to vegetation cover and rainfall event.}$$

The peak flow then fits into the calculation allowing for the diameter of the pipe or open drainage swale system using a Western Australian Department of Agriculture formula:

$$v = \frac{1}{n} R^{2/3} s^{1/2} \quad \text{where } v = \text{average velocity of flow}$$

$$R = \text{hydraulic radius} = \frac{\text{cross sectional area}}{\text{wetted perimeter}}$$

$$s = \text{slope of bed}$$

$$n = \text{Manning's roughness coefficient}$$



As mentioned the Main Roads culvert system under the Brand Highway does cause flooding into adjacent properties during a rainfall event greater than the 10 year event but the subject site is independent of any other catchment systems and is self-contained in catering adequate for its own needs and any potential future extension to the facility.

There will be no extraction or use from any surface water flows from any water surface. There will be no damming or restriction on any surface water flow through the property.

The quality of the surface water leaving the property has not been monitored, however, based on the type of operations and small footprint is considered unnecessary for the application at hand or for the proposed extensions based on current and past operations performance. There are no problematic issues associated with this kind of facility operations that have necessitated strict surveillance.

#### 4.8 Stormwater Management

This summarised Stormwater Management Strategy as described in context with the above water usage and other management initiatives addresses water usage, groundwater and stormwater management for this site.

This has been prepared in accordance with the design objectives outlined in *"Better Urban Water Management"* (2008) and seeks to:

- Maximise water conservation by minimising the amount of potable water used and buildings to achieve efficient water use;
- Provide water quality management by seeking to maintain post development annual discharge volumes and peak flows to predevelopment (rural) conditions and seeking to maintain the surface water and ground water quality to pre development levels; and

As described in **Section 2.7**- Property Catchment, the site does not have any entering waters and has adequate capacity in the existing property (due to the small operations footprint) to cater for the current and future operations needs of the transport depot facility.

A summary of the land use areas for the Subject land is presented in Table 5.1 below:

**Table 5.1 (Previously 2.1) – Land Use areas Summary**

| Land Use   | Area (ha)     |
|--|---------------|
| Main Storage Buildings and roofed structures and tanks and associated infrastructure (Offices etc) | 0.248         |
| Unsealed access roads & unsealed pavements and hardstands (permeable pavements)                    | 1.500         |
| Concrete Hardstand areas and central laydown area  | 0.313         |
| Verges to Facility area (vegetated in some instances but not formally landscaped)                  | 0.936         |
| Balance rural property   | 36.134        |
| <b>TOTAL</b>   | <b>39.131</b> |

Catchment characteristics are summarised in table 5.2 below.

**Table 5.2 – Sub-catchment Characteristics**

| Catchment Description   | Building area (m2) | Hardstand Area - Concrete (m2) | Hardstand Area - Gravel (m2) | Total Catchment area (m2)  |
|---|--------------------|--------------------------------|------------------------------|--|
| Operations Area sub-catchment <b>C1</b>   | 235                |                                | 3,417                        | <b>3,652</b>   |
| Operations Area sub-catchment <b>C1A</b>  | 180                |                                | 385                          | <b>565 m2</b> - This area manages its own flow and soaks in situ (no overflow) |
| Operations Area sub-catchment <b>C2</b>   | 720                | 3,130                          | 771                          | <b>4,621</b>   |
| Operations Area sub-catchment <b>C3</b>   | 780                |                                | 1,850                        | <b>2,630</b>   |
| Operations Area sub-catchment <b>C4</b>   | -                  |                                | 4,303                        | <b>4,303</b>   |
| Operations Area sub-catchment <b>C5</b>   |                    |                                | 642                          | <b>642</b>   |
| Operations Area sub-catchment <b>C6</b>   |                    |                                | 8,092                        | <b>8,092</b>   |
| Operations Area sub-catchment <b>C7</b>   | 120                |                                | 2,158                        | <b>2,278</b>   |
| Operations Area sub-catchment <b>C8</b>   | 445                |                                | 2,742                        | <b>3,187</b>   |
| <b>Total Catchment Operations Area (excl. rural property balance 36.134 ha)</b> | <b>2,480</b>       | <b>3,130</b>                   | <b>24,360</b>                | <b>29,970</b>  |

**Table 5.2A – Sub-catchment Characteristics (including Future Expansion of Operations Area)**

| Catchment Description   | Building area (m2) | Hardstand Area - Concrete (m2) | Hardstand Area - Gravel (m2) | Total Catchment area (m2) |
|---|--------------------|--------------------------------|------------------------------|---------------------------|
| Operations Area Catchments <b>C1 – C9</b>   | 2,480              | 3,130                          | 24,360                       | <b>29,970</b>             |
| Operations Area sub-catchment <b>C7A (Southern Expansion area to subcatchment C7)</b> |                    |                                | 6,750                        | <b>6,750</b>              |
| Operations Area sub-catchment <b>C8A (Southern Expansion area to subcatchment C8)</b> |                    |                                | 2,550                        | <b>2,550</b>              |
| <b>Total Catchment Operations Area (excl. rural property balance 32.207 ha)</b>       | <b>2,480</b>       | <b>3,130</b>                   | <b>33,660</b>                | <b>39,270</b>             |

**Table 5.3 Pre-development Catchment Flows (total Flows from Operations Area)**

| ARI             | Pre-development Parameter | Catchment Area = 39.131 ha |
|-----------------|---------------------------|----------------------------|
|                 |                           | Rational Method            |
| <b>1-year</b>   | <b>Q (m³/s)</b>           | <b>0.401</b>               |
|                 | C                         | 0.207                      |
|                 | tc                        | 32 mins                    |
| <b>10-year</b>  | <b>Q (m³/s)</b>           | <b>0.929</b>               |
|                 | Coefficient C             | 0.259                      |
|                 | tc                        | 32 mins                    |
| <b>100-year</b> | <b>Q (m³/s)</b>           | <b>1,759</b>               |
|                 | Coefficient C             | 0.299                      |
|                 | tc                        | 32 mins                    |

The total volume of runoff is determined by the amount of rainfall less the losses, largely infiltration whilst the rate of runoff is determined by the slope and roughness (Manning's n) of the surface. The initial loss-continuing loss model has been adopted in the hydrological model with loss rates and roughness land types:

**Table 5.4 - Catchment Characteristics**

| Infiltration Land Type | Manning's n | Initial Loss (mm) | Proportional Continuing Loss (mm) |
|------------------------|-------------|-------------------|-----------------------------------|
| Short grass            | 0.15        | 0.0               | Varies according to C-value       |

A comparison of pre- and post-development flows indicates that the development of the subject land will not increase stormwater flows into the downstream environment:

**Table 5.5 - Pre- and Post-Development Peak Discharges**

| ARI (years)  | Pre-Development Peak Discharge from Operations Area (m³/s) | Retained Volume on site (m³) | Post-Development Peak Discharge From Operations Area (m³/s) |
|--------------|--|------------------------------|---|
| 1-year ARI   | 0.401  |                              | 0.401 (Balance retained on site)                            |
| 10-year ARI  | 0.929  |                              | 0.929 (Retained on site)                                    |
| 100-year ARI | 1,759  |                              | 1,759 (Retained on site)                                    |

Post development catchment and infiltration swales (predominately immediately east of the Operations Area) are in similar proximity to areas where pre-development infiltration would have occurred, hence pre and post conditions are maintained. All storm events from the operations area catchments will be contained within the infiltration basins hence there will be no post development discharge from these catchments other than via infiltration.

The small amount of additional runoff generated from the roof of the services and maintenance facility is initially stored in rainwater tanks located adjacent to the storage shed and office (refer to photo below). This is also part of the rainwater harvesting and re-use initiatives utilised around the site wherever the opportunity is available.



Once the tanks are full and in cases of heavy downpours where they may be filled to capacity, the owners have connected the tanks to an overflow system that pipes the overflow to a recharge swale to the east of the storage shed.

This overflows to other swales and open drains that make their way east to the ultimate overflow from the operations areas into the rear paddocks and to the natural watersheds across the property. It will be necessary to formalise some additional landscaping in the operations areas swales to enhance the natural nutrient capture of the balance of the property.

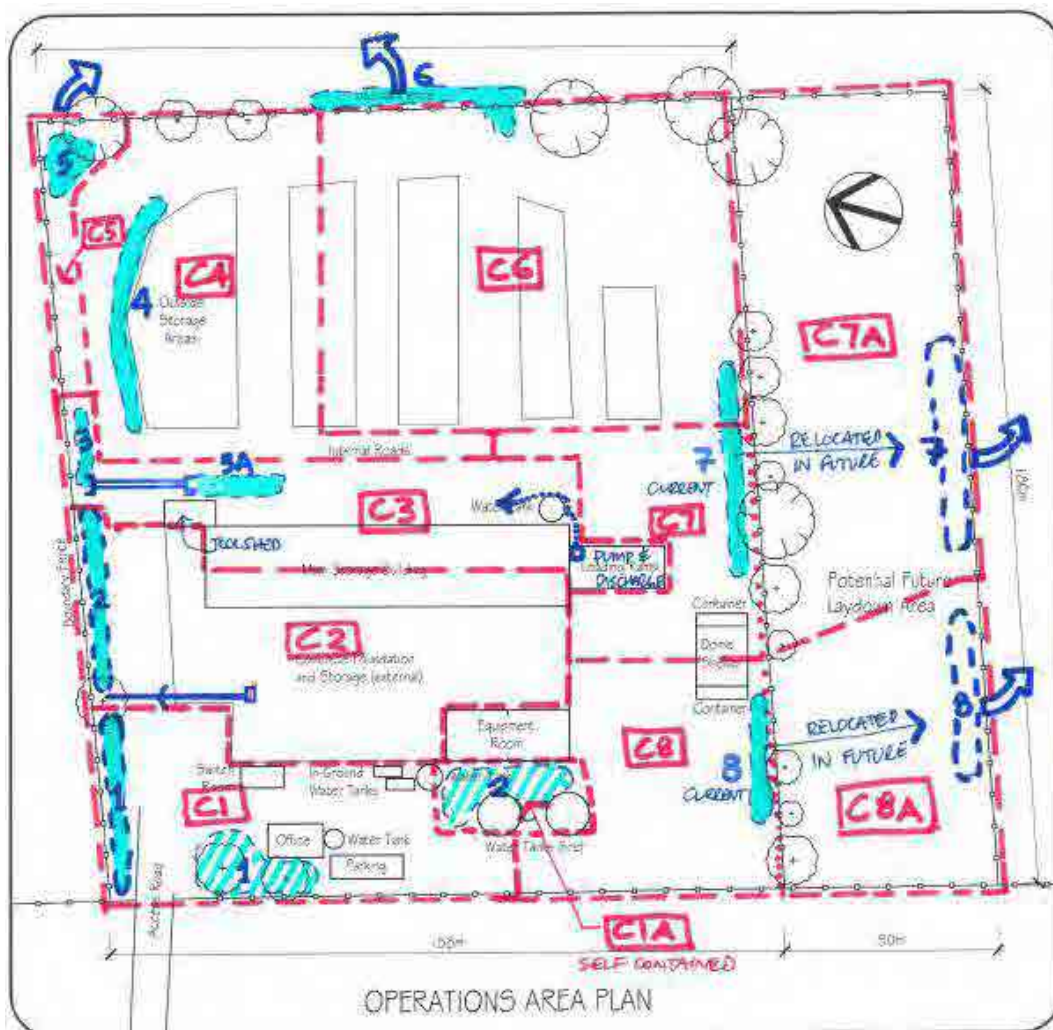
Swale revegetation is summarised in **Table 5.6** below:

**Table 5.6 – Swale Revegetation Requirements**

| Swale Location  | Description   | Swale Area (m2) | Revegetation Requirements  |
|---|---|-----------------|--|
| Operations Area sub-catchment <b>C1 (Northern Swale)</b>          | Existing Swale adjacent to and north of the entry road from the gates heading east  | 200             | Existing Swale adequately sized and operating efficiently.   |
| Operations Area sub-catchment <b>C1 (Southern swale)</b>          | Existing Swale adjacent to the site offices and covered carpark structures south of the site entry gates  | 250             | Existing Swale adequately sized and operating efficiently. <b>No vegetation required.</b>  |
| Operations Area sub-catchment <b>C1A</b>                          | Existing soakage area between Equipment Room and Fire Tanks   | 300             | Existing soakage area adequately sized and operating efficiently. <b>No vegetation required.</b>                                 |
| Operations Area sub-catchment <b>C2</b>                           | Existing swale/soakage adjacent to and north of the access track along the northern boundary of the facility and between piped outlets from catchment C2 & C3   | 200             | Existing swale/soakage area adequately sized and operating efficiently.  |
| Operations Area sub-catchment <b>C3 &amp; C3A</b>                 | Existing swale adjacent to and north of the access track along the northern boundary of the facility and downstream of piped outlets from toolshed area. Swale C3A from eastern side of the Main Storage Building and overflow from rainwater tanks and Loading Ramp area | 230             | Existing swale/soakage area adequately sized and operating efficiently.  |
| Operations Area sub-catchment <b>C4</b>                           | Existing swale adjacent to and north of the Outside storage area  | 300             | Existing swale area adequately sized and operating efficiently   |
| Operations Area sub-catchment <b>C5</b>                           | Soakage area in north-east corner of the site. Not well defined but provides supplementary soakage to open drain along northern boundary linking swale 3 in catchment C3 to swale 5 and overflow to Outlet 1  | 450             | <b>Existing soakage area to be expanded</b> to provide required volume as noted in Table 5.7 below. <b>Area to be vegetated.</b> |
| Operations Area sub-catchment <b>C6</b>                           | Existing swale adjacent to the eastern boundary   | 200             | Existing swale adequately sized and operating efficiently.   |
| Operations Area sub-catchment <b>C7</b>                           | Existing soakage area east of the Dome Shelter adjacent to southern boundary. Requires re-shaping and vegetation to be added. Will be relocated when the future the facility and hardstand area is expanded southwards ( <b>see Figure 9</b> )                            | 300             | <b>Existing soakage area to be expanded</b> to provide required volume as noted in table 5.7 below. <b>Area to be vegetated.</b> |
| Operations Area sub-catchment <b>C8</b>                           | Existing soakage area west of the Dome Shelter adjacent to southern boundary. Requires re-shaping and vegetation to be added. Will be relocated when the future the facility and hardstand area is expanded southwards ( <b>see Figure 9</b> )                            | 250             | <b>Existing soakage area to be expanded</b> to provide required volume as noted in table 5.7 below. <b>Area to be vegetated.</b> |
| <b>Total Swale Areas</b><br><b>Catchment Operations Area (m2)</b> |   | <b>2,680</b>    |  |



Figure 13 – Operations Area Subcatchment Plan



The volumes of runoff that are to be retained for the Operations Area for the respective return period storms are identified below in Table 5.7. Calculations in Appendix 2.

Table 5.7 – Operations Area Sub-Catchment Swale Summary – Required volumes

| Catchment Number                       | Catchm't<br>Gross<br>Area (m2) | Swale<br>Area<br>(m2) | ARI    | TWL<br>(mAHD)   | Storage Volume<br>(m³)                                       | Surface<br>Area at TWL<br>(m²)              | Swale / Soakage Area<br>Details |   |
|--|--------------------------------|-----------------------|--------|---|--|---|---------------------------------|---|
|  |                                |                       |        |   |  |   | Base<br>Level<br>(m AHD)        | Side<br>Slope<br>(v:h)                  |
| Operations area<br>Catchment C1 Swale  | 3,652                          | 450                   | 1-yr   | N/A   | Overflow soaks<br>away without need<br>for storage in swales | N/A as no<br>storage depth<br>Req'd (450m2) | RL51.00                         | 1:3 with<br>4-4.5m<br>wide<br>base min. |
|  |                                |                       | 10-yr  | RL 51.01  | 6.0  | 450   |                                 |   |
|  |                                |                       | 100-yr | RL 51.102   | 47.00  | 473   |                                 |   |
| Operations area<br>Catchment C1A Swale | 565                            | 300                   | 1-yr   | Overflow Area self-contained and soaks away without need<br>for storage in swales |  |   | N/A                             | N/A                                     |
|  |                                |                       | 10-yr  | Overflow Area self-contained and soaks away without need<br>for storage in swales |  |   |                                 |   |
|  |                                |                       | 100-yr | Overflow Area self-contained and soaks away without need<br>for storage in swales |  |   |                                 |   |
| Operations area<br>Catchment C2 Swale  | 4,621                          | 200                   | 1-yr   | N/A   | N/A  | N/A   | RL51.00                         | 1:3 with<br>4-4.5m<br>wide<br>base min. |
|  |                                |                       | 10-yr  | RL 51.27  | 59.0   | 242   |                                 |   |
|  |                                |                       | 100-yr | RL 51.53  | 129.0  | 287   |                                 |   |
| Operations area<br>Catchment C3 Swale  | 2,630                          | 230                   | 1-yr   | RL 51.02  | 4.0  | 233   | RL51.00                         | 1:3 with<br>4-4.5m<br>wide<br>base min. |
|  |                                |                       | 10-yr  | RL 51.08  | 19.0   | 243   |                                 |   |
|  |                                |                       | 100-yr | RL 51.19  | 48.0   | 262.0                                       |                                 |   |
| Operations area<br>Catchment C4 Swale  | 4,303                          | 300                   | 1-yr   | RL 51.02  | 7.0  | 304.0                                       | RL51.00                         | 1:3 with<br>4-4.5m<br>wide<br>base min. |
|  |                                |                       | 10-yr  | RL 51.01  | 30.0   | 318   |                                 |   |
|  |                                |                       | 100-yr | RL 51.23  | 74.00  | 344   |                                 |   |
|  |                                |                       |        |   |  |   |                                 |   |
| Operations area<br>Catchment C5 Swale  | 642                            | 450                   | 1-yr   | N/A   | N/A  | N/A   | RL51.00                         | 1:3 with<br>4-4.5m<br>wide<br>base min. |
|  |                                |                       | 10-yr  | N/A   | N/A  | N/A   |                                 |   |
|  |                                |                       | 100-yr | N/A   | N/A  | N/A   |                                 |   |
| Operations area<br>Catchment C6 Swale  | 8,092                          | 300                   | 1-yr   | RL 51.09  | 27.0   | 316   | RL51.00                         | 1:3 with<br>5.0m<br>wide<br>base min.   |
|  |                                |                       | 10-yr  | RL 51.27  | 87.0   | 351   |                                 |   |
|  |                                |                       | 100-yr | RL 51.53  | 188.0  | 406   |                                 |   |
| Operations area<br>Catchment C7 Swale  | 2,278                          | 300                   | 1-yr   | N/A   |  |   | RL51.00                         | 1:3 with<br>4-4.5m<br>wide<br>base min. |
|  |                                |                       | 10-yr  | RL 51.03  | 8.0  | 305   |                                 |   |
|  |                                |                       | 100-yr | RL 51.08  | 25.00  | 315   |                                 |   |
| Operations area<br>Catchment C8 Swale  | 3,187                          | 250                   | 1-yr   | RL 51.02  | 4.0  | 253   | RL51.00                         | 1:3 with<br>4-4.5m<br>wide<br>base min. |
|  |                                |                       | 10-yr  | RL 51.08  | 20.0   | 263   |                                 |   |
|  |                                |                       | 100-yr | RL 51.19  | 51.00  | 283   |                                 |   |



**Table 5.8 Operations Area Sub-Catchment Swale Summary – Future Hardstand Expansions (Upgrade of swale requirements)**

| Catchment Number   | Catchm't Gross Area (m2) | Swale Area (m2) | ARI    | TWL (mAHD) | Storage Volume (m³) | Surface Area at TWL (m²) | Swale / Soakage Area Details |                                |
|--|--------------------------|-----------------|--------|------------|---------------------|--------------------------|------------------------------|--------------------------------|
|  |                          |                 |        |            |                     |                          | Base Level (m AHD)           | Side Slope (v:h)               |
| Operations area Catchment C7A<br>Future Swale upgrade requirements | 9,028                    | 600             | 1-yr   | RL 51.03   | 15.0                | 607                      | RL51.00                      | 1:3 with 4-4.5m wide base min. |
|  |                          |                 | 10-yr  | RL 51.11   | 65.0                | 628                      |                              |                                |
|  |                          |                 | 100-yr | RL 51.25   | 159.00              | 667                      |                              |                                |
| Operations area Catchment C8A<br>Future Swale upgrade requirements | 5,737                    | 250             | 1-yr   | RL 51.06   | 16.0                | 261                      | RL51.00                      | 1:3 with 4-4.5m wide base min. |
|  |                          |                 | 10-yr  | RL 51.21   | 58.0                | 286                      |                              |                                |
|  |                          |                 | 100-yr | RL 51.43   | 125.00              | 328                      |                              |                                |

#### 4.9 Water Sustainability Initiatives

The site will be developed following “waterwise” principles with water conservation strategies for household use, irrigation and processing water with water recycling and re-use as a central feature.

#### 4.10 Water Efficient Measures

##### 4.10.1 Office Facility water efficiency

Any additions to the facility will be required to comply with the green star efficiency codes and standards.

There are a number of established landscape zones and are adequately catered for by current supply. New areas will be required to be established and it is envisaged that these will be provided with manual watering during the establishment phase. As the balance of the rural property has adequate capacity for additional in line treatment and soakage of runoff prior to discharging from the site to the east, this is considered adequate for current and future needs based on current operations and this application.

##### 4.10.2 Water Supply & Water Recycling

The subject site is not connected to a reticulated water supply and relies on rainwater tanks fed from water captured on the roofs of sheds and a bore and tank system for fire fighting purposes. There are currently three rainwater tanks connected directly to the two sheds and the office building which provide an adequate supply of potable water for the business operations. Two large fire tanks located to the west of the smaller shed are connected to the fire fighting equipment on site and are maintained with an adequate level of water for fire fighting purposes at all times from the on-site bore located immediately west of the tanks.

##### 4.10.3 Waste Water Management

The subject site is serviced by septic tanks. There is no reticulated sewer in the vicinity of the subject site and current operations are adequately catered for by the existing system. The site has a very low volume treatment requirement based on the small staff and operations personnel that are required to be at the facility at any one time.

## 5. CONCLUSIONS AND RECOMMENDATIONS

This report addresses the surface water collection and disposal strategy (Stormwater Management Strategy) in support of the operations undertaken on the subject site and has been prepared in line with the Shire of Chittering guidelines.

We summarise our findings and recommendations as follows:

- The site has no problematic soils or ASS issues that require attention in relation to the proposed operations and works.
- The proposed operations are based on maintaining strong environmental management of the catchment by:
  - Ensuring workshop and storage shed floor areas are internally collected and separated in an interceptor system prior to discharging to a soakage swale.
  - Storage of equipment and machinery and operations stock items (steel, timber miscellaneous equipment) is stored on a pavement base that captures all internal catchment runoff and directs it to a treatment area prior to discharging to the existing outfalls on the property to ensure that surface water is collected to containment ponds for soakage disposal.
  - Reuse of water along with water harvesting techniques adopted on site minimise the volume of water used.
  - Water Quality monitoring for surface water and stormwater entering the site and leaving the site is not considered necessary for the current operations, however, future applications may need to consider this if the usage footprint is extended substantially or land use changes.
  - Surface water conveyance through the property is further managed by monitoring of watershed and shallow swales and limiting any potential erosion by regular maintenance. Any new storage and surface water management features proposed will also be designed and constructed to ensure minimal maintenance is required.
  - Hydrocarbon contamination risk is rigidly managed by containerised capture and limiting risk to defined work areas so that any potential contamination is quickly managed and the risk of this occurring is minimised.
- Sustainability Initiatives will continue on site with the use of rainwater tanks, water recycling and recharge of clean waters and surface waters.
- Revegetation of swales within catchments C5, C7 and C8 will be required to ensure nutrient capture is sufficiently provided and maintained. **Refer to Table 5.6** for further details.

Based on the proposed measures and close monitoring processes that the proponents undertake and maintain the land is both capable of sustaining the operations to acceptable environmental standards. The existing and proposed enhancements to the collection and runoff containment system will adequately manage the stormwater runoff to maintain the balanced catchment requirements by limiting flows to pre-development conditions and to maintaining water quality within the area.

The proposed southern future extension of the hardstand area can be accommodated within the current facilities and stormwater treatment initiatives and would only require the relocation of drainage swales Nos. 7 & 8 (and sizes in accordance with the requirements shown in **Table 5.8** above) as noted previously with appropriate plantings to ensure any potential nutrients are managed within the treatment swales.

## **6. ACKNOWLEDGEMENTS**

The following sources were used to prepare this report and are acknowledged to from part of references for this application:

- Application for Planning Approval – Retrospective “Transport depot”  
Lot 6 (No 290) Brand Highway Muchea  
Prepared by Allering & Associates, November 2015

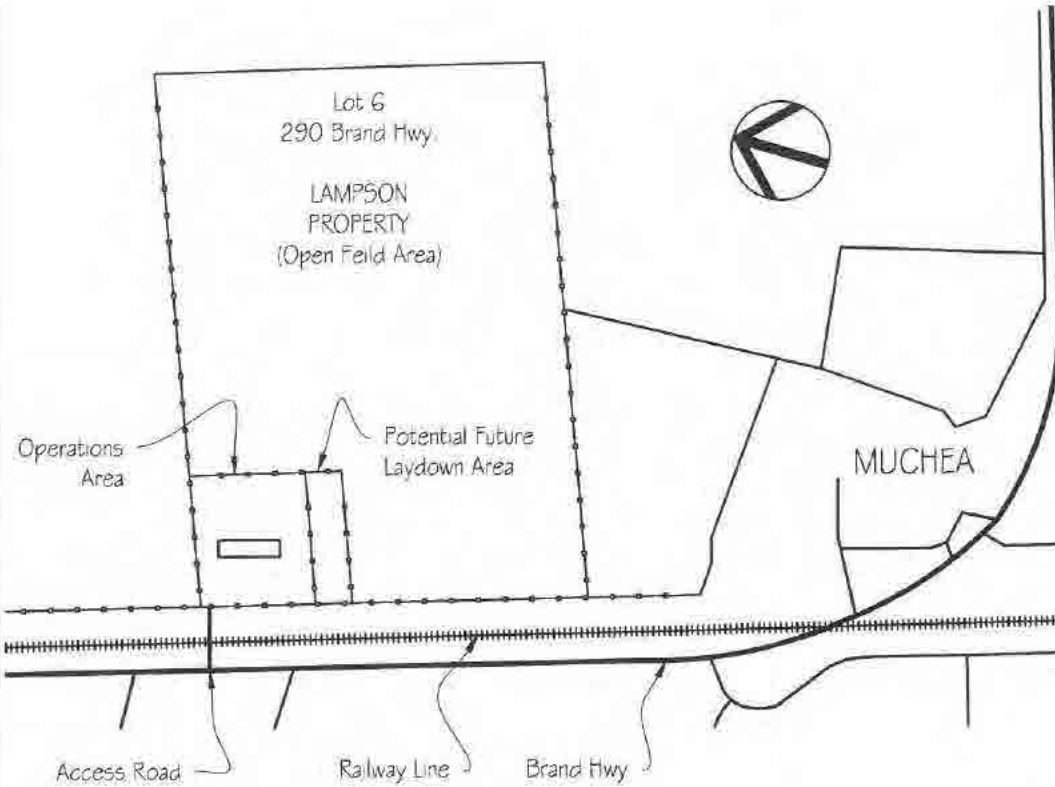
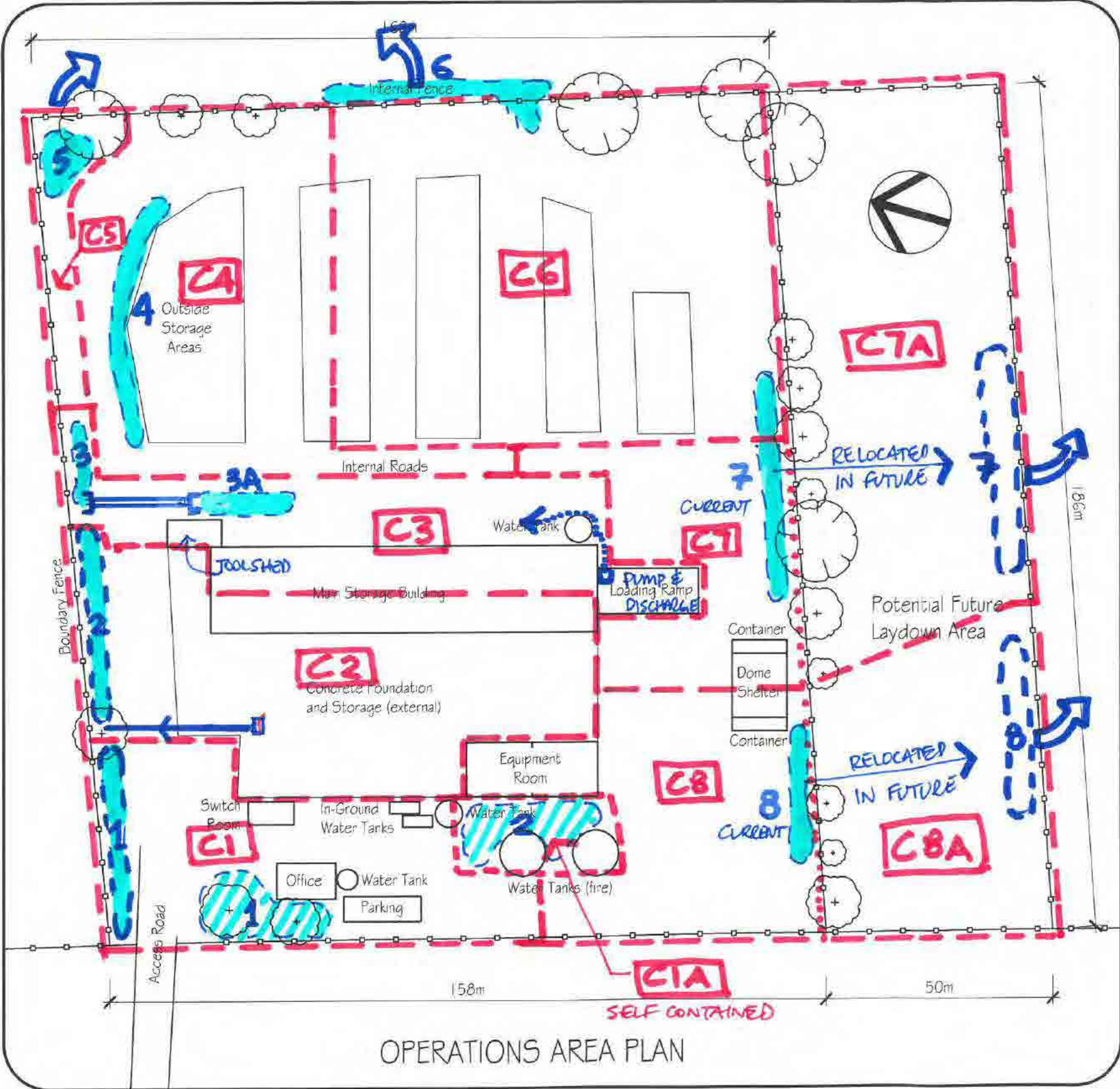
Appendix 1 – Drawings & Diagrams











CATCHMENT PLAN

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|



Appendix 2 – Calculations

## Runoff Coefficients

|                                   |       |
|-----------------------------------|-------|
| Catchment Area (km <sup>2</sup> ) | 0.391 |
| Mainstream Length (km)            | 0.8   |
| Equal Area Slope (m/km)           | 3.875 |
| Average Recurrence Interval       | 1     |
| Rainfall Location                 | SWAN  |

|                              |             |
|------------------------------|-------------|
| <b>Urban Rational Method</b> | AR&R 14.5.5 |
| Impervious fraction f        | 15%         |
| I (10yr,1hr)                 | 28.5        |
| C (10yr,1hr)                 | 0.146       |
| Fy                           | 0.800       |
| C1                           | 0.207       |

|  |               |
|--|---------------|
| <b>WA Rural Regional Method</b>                    | AR&R 5.4.7    |
| Clearing % (0-100)                                 | 20            |
| <u>Jarrah Forest - lateritic soils</u>             |               |
| C10  | 0.050         |
| Fy   | 0.608         |
| C1   | 0.030         |
| <u>Jarrah Forest - loamy soils</u>                 |               |
| C10  | 0.301         |
| Fy   | 0.396         |
| C1   | 0.119         |
| <u>Karri Forest - loamy soils &lt; 15% cleared</u> |               |
| C10  | Not available |
| Fy   | 0.699         |
| C1   | Not available |
| <u>Wheatbelt - loamy soils &gt; 75% cleared</u>    |               |
| C10  | Not available |
| Fy   | 0.228         |
| C1   | Not available |
| <u>Wheatbelt - lateritic soils</u>                 |               |
| C10  | 0.138         |
| Fy   | 0.248         |
| C1   | 0.034         |

## Peak Flow

|                              |                  |
|------------------------------|------------------|
| Time of Concentration Method | Friends Equation |
| Peak Flow Method             | Urban Rational   |
| Time of Concentration (min)  | 47.9             |
| Fy                           | 0.800            |
| Runoff C                     | 0.207            |
| Rainfall I(1) (mm/hr)        | 17.8             |
| Equivalent Area (ha)         | 8.111            |
| Peak Flow Q(1) (l/s)         | 401              |

|  |               |
|--|---------------|
| <b>WA Rural Index Flood Method</b>                 | AR&R 5.4.7    |
| Annual Rainfall P (mm)                             | 800           |
| <u>Jarrah Forest - lateritic soils</u>             |               |
| Q2 (m <sup>3</sup> /s)                             | 0.021         |
| Fy   | 0.592         |
| Q1 (m <sup>3</sup> /s)                             | 0.013         |
| <u>Jarrah Forest - loamy soils</u>                 |               |
| Q2 (m <sup>3</sup> /s)                             | 0.126         |
| Fy   | 0.433         |
| Q1 (m <sup>3</sup> /s)                             | 0.054         |
| <u>Karri Forest - loamy soils &lt; 15% cleared</u> |               |
| Q2 (m <sup>3</sup> /s)                             | Not available |
| Fy   | 0.614         |
| Q1 (m <sup>3</sup> /s)                             | Not available |
| <u>Wheatbelt - loamy soils &gt; 75% cleared</u>    |               |
| Q2 (m <sup>3</sup> /s)                             | Not available |
| Fy   | 0.087         |
| Q1 (m <sup>3</sup> /s)                             | Not available |
| <u>Wheatbelt - lateritic soils</u>                 |               |
| Q2 (m <sup>3</sup> /s)                             | 0.210         |
| Fy   | 0.087         |
| Q1 (m <sup>3</sup> /s)                             | 0.018         |

|  | Runoff C for ARI |       |       |       |       |       |
|--|------------------|-------|-------|-------|-------|-------|
|  | 1                | 5     | 10    | 20    | 50    | 100   |
| Urban Rational Method                    | 0.207            | 0.246 | 0.259 | 0.272 | 0.293 | 0.299 |
| Jarrah Forest - lateritic soils          | 0.030            | 0.043 | 0.050 | 0.057 | 0.065 | 0.071 |
| Jarrah Forest - loamy soils              | 0.119            | 0.241 | 0.301 | 0.361 | 0.427 | 0.477 |
| Karri Forest - loamy soils < 15% cleared | N/A              | N/A   | N/A   | N/A   | N/A   | N/A   |
| Wheatbelt - loamy soils > 75% cleared    | N/A              | N/A   | N/A   | N/A   | N/A   | N/A   |
| Wheatbelt - lateritic soils              | 0.034            | 0.093 | 0.138 | 0.200 | 0.274 | 0.329 |

| ARI       | 1     | 5     | 10    | 20    | 50    | 100   |
|-----------|-------|-------|-------|-------|-------|-------|
| Fy        | 0.800 | 0.950 | 1.000 | 1.050 | 1.150 | 1.200 |
| Runoff C  | 0.207 | 0.246 | 0.259 | 0.272 | 0.293 | 0.299 |
| I (mm/hr) | 17.8  | 28.9  | 33.0  | 38.8  | 47.1  | 54.1  |
| Q (l/s)   | 401   | 774   | 929   | 1,146 | 1,500 | 1,759 |
| Prop Loss | 0.793 | 0.754 | 0.741 | 0.728 | 0.707 | 0.701 |
| Area (ha) | 39.1  |       |       |       |       |       |
| tc (min)  | 47.9  |       |       |       |       |       |

### Time of Concentration for Overland Flow

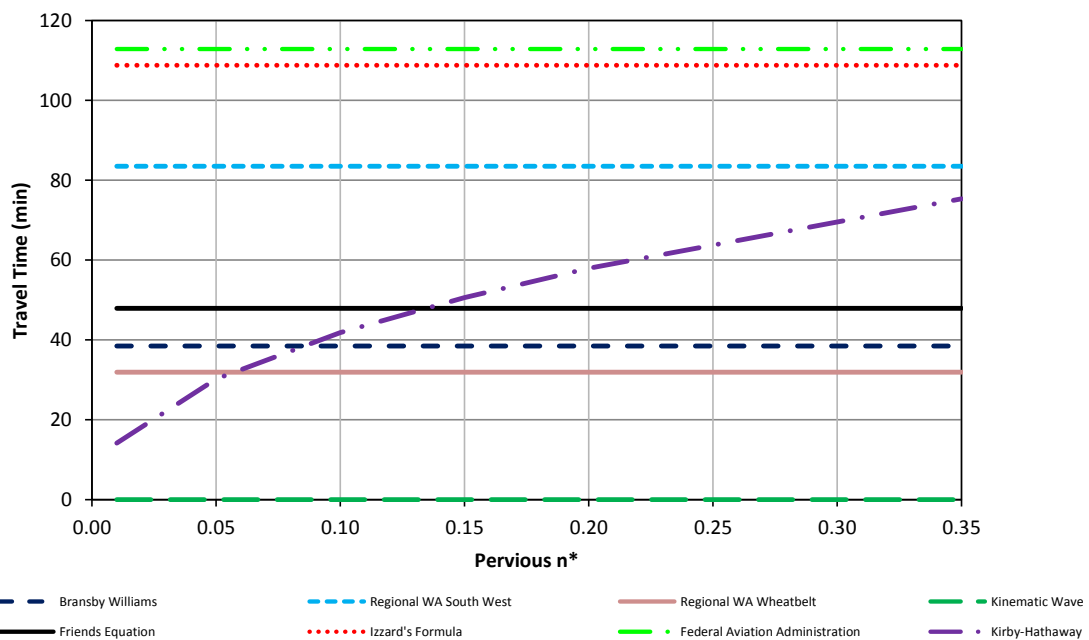
|                               |        |
|-------------------------------|--------|
| Catchment Area (ha)           | 39.131 |
| Mainstream Length (m)         | 800    |
| Equal Area Slope (m/m)        | 0.39%  |
| Pervious Surface Roughness n* | 0.150  |
| Average Recurrence Interval   | 1      |
| Rainfall Location             | SWAN   |

| Surface Roughness   | Kinematic n* | Horton's Roughness |
|---------------------|--------------|--------------------|
| Smooth asphalt      | 0.010        | 0.010              |
| Asphalt paving      | 0.014        | 0.015              |
| Bare sand           | 0.014        | 0.015              |
| Gravel              | 0.020        | 0.020              |
| Bare clay/loam      | 0.020        | 0.020              |
| Packed clay         | 0.030        | 0.025              |
| Sparse vegetation   | 0.100        | 0.035              |
| Short prairie grass | 0.150        | 0.040              |
| Light turf          | 0.200        | 0.045              |
| Dense turf          | 0.350        | 0.060              |
| Dense shrub/forest  | 0.400        | 0.070              |

|                                      |       |                    |
|--------------------------------------|-------|--------------------|
| Time of Concentration (min)          |       |                    |
| Bransby Williams                     | 38.5  | AR&R 1987 Eqn 5.3  |
| Regional WA South West               | 83.5  | AR&R 1987 Eqn 5.14 |
| Regional WA Wheatbelt                | 31.9  | AR&R 1987 Eqn 5.23 |
| Kinematic Wave (sheet flow)          | N/A   | AR&R 1987 Eqn 14.2 |
| Friends Eqn (US Dept of Agriculture) |       |                    |
| Horton's roughness                   | 0.040 |                    |
| Time of Concentration (min)          | 47.9  | AR&R 1977 Fig 12.2 |
| Izzard's Formula                     | 108.8 |                    |
| Federal Aviation Administration      |       |                    |
| Runoff C                             | 0.207 |                    |
| Time of Concentration (min)          | 112.9 |                    |
| Kirby Hathaway                       | 50.6  |                    |

Average (min) 50.5

|                                 | Overland travel time for values of Pervious n* |       |       |       |       |       |
|---------------------------------|--|-------|-------|-------|-------|-------|
|                                 | 0.010  | 0.050 | 0.100 | 0.150 | 0.200 | 0.350 |
| Bransby Williams                | 38   | 38    | 38    | 38    | 38    | 38    |
| Regional WA South West          | 84   | 84    | 84    | 84    | 84    | 84    |
| Regional WA Wheatbelt           | 32   | 32    | 32    | 32    | 32    | 32    |
| Kinematic Wave                  | N/A  | N/A   | N/A   | N/A   | N/A   | N/A   |
| Friends Equation                | 48   | 48    | 48    | 48    | 48    | 48    |
| Izzard's Formula                | 109  | 109   | 109   | 109   | 109   | 109   |
| Federal Aviation Administration | 113  | 113   | 113   | 113   | 113   | 113   |
| Kirby-Hathaway                  | 14   | 30    | 42    | 51    | 58    | 75    |




C1\_Swale\_Drainage\_1yr

# SUMP/SWALE VOLUME CALCULATOR


Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity




Location

CHITTERING




Storm Duration

24 hours



Storm Event

1 year



Design Intensity

2.0 mm/hr

Catchment Details

Catchment Area : 3,652 m<sup>2</sup>

Run-off Coefficient : 0.80

Flow Rate : 1.6 L/s

Outflow Details

Soil Characteristics : Fine Sand

Infiltration Rate : 0.0001 m/s → 0.045 m<sup>3</sup>/s (Total Soakage)

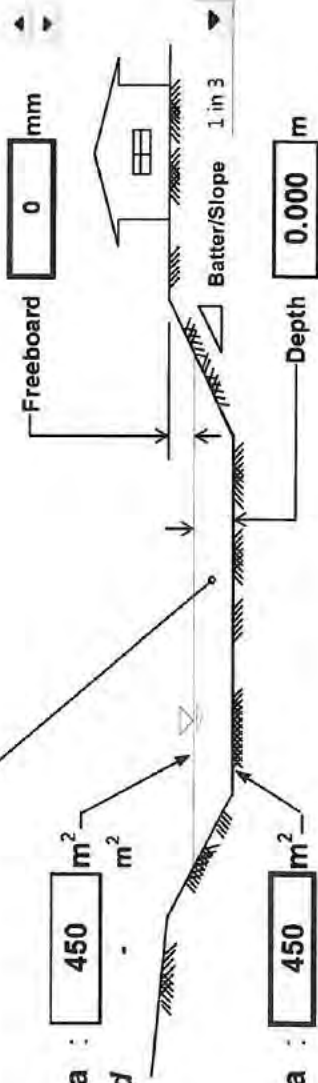
Additional Outlet : 0.000 m<sup>3</sup>/s

Storage Details

Volume Required : 0 m<sup>3</sup>

Total Surface Area : 450 m<sup>2</sup>  
no freeboard

Total Base Area : 450 m<sup>2</sup>



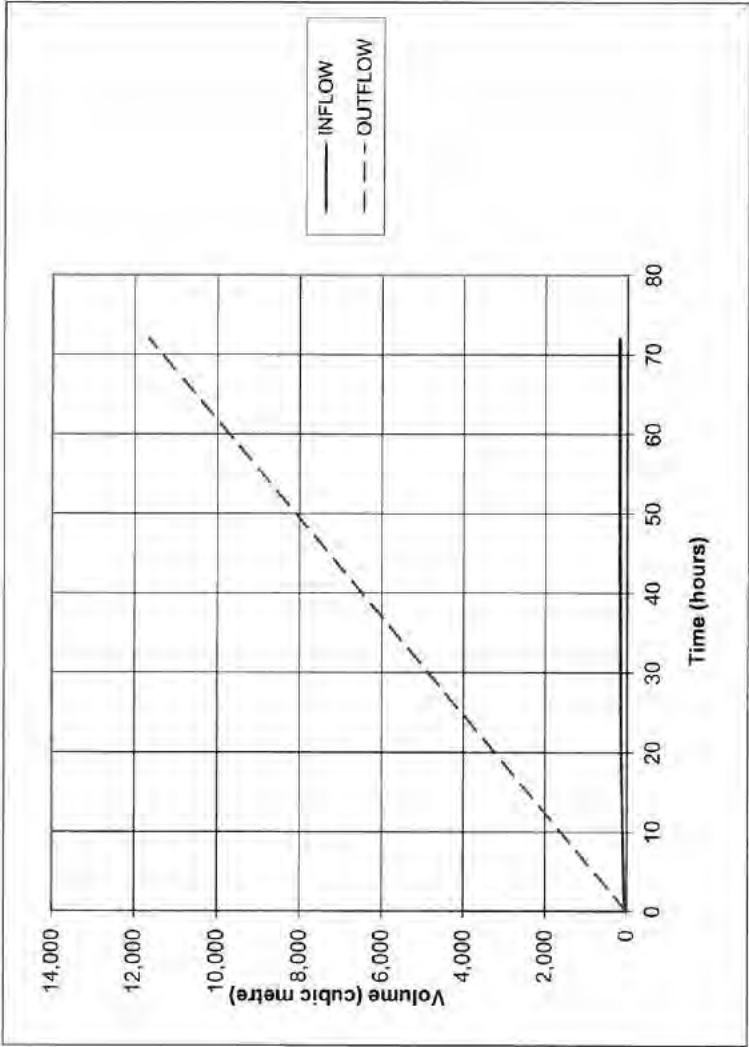
Freeboard : 0 mm

Batter/Slope : 1 in 3

Depth : 0.000 m

PERITAS CIVIL PTY LTD

PRINT DATE: 10/03/2016







| TIME     | INFLOW | OUTFLOW             |                  | STORAGE |
|----------|--------|---------------------|------------------|---------|
|          |        | Ground Infiltration | Allowable Outlet |         |
|          | m³     | m³                  | m³               | m³      |
| 6 min.   | 15     | 16                  | 0                | -1      |
| 9 min.   | 19     | 24                  | 0                | -6      |
| 12 min.  | 22     | 32                  | 0                | -11     |
| 15 min.  | 24     | 41                  | 0                | -16     |
| 20 min.  | 28     | 54                  | 0                | -26     |
| 30 min.  | 33     | 81                  | 0                | -48     |
| 45 min.  | 39     | 122                 | 0                | -83     |
| 1 hour   | 43     | 162                 | 0                | -119    |
| 2 hours  | 56     | 324                 | 0                | -268    |
| 3 hours  | 66     | 486                 | 0                | -420    |
| 6 hours  | 85     | 972                 | 0                | -887    |
| 10 hours | 104    | 1,620               | 0                | -1,516  |
| 12 hours | 111    | 1,944               | 0                | -1,833  |
| 24 hours | 141    | 3,888               | 0                | -3,747  |
| 48 hours | 173    | 7,776               | 0                | -7,603  |
| 60 hours | 183    | 9,720               | 0                | -9,537  |
| 72 hours | 190    | 11,664              | 0                | -11,474 |

C:\\_Swale\_Drainage\_10yr

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

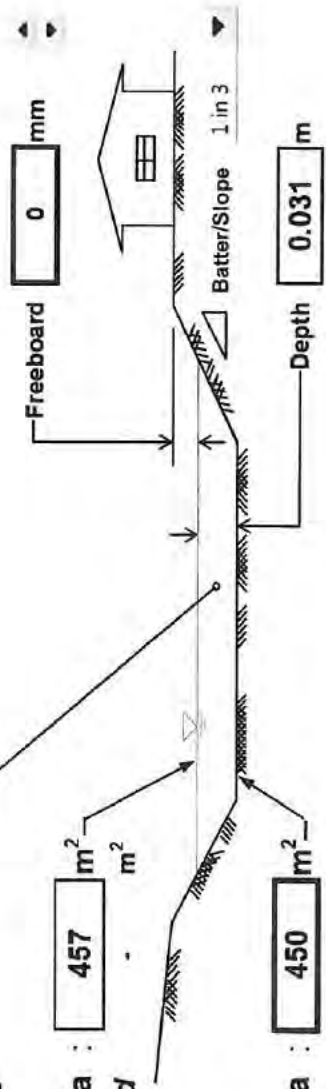
Design Rainfall Intensity

|   |  |
|---|--|
| <b>Location</b><br> : CHITTERING | <b>Storm Duration</b><br> : 24 hours    |
| <b>Storm Event</b><br> : 10 year | <b>Design Intensity</b><br> : 3.5 mm/hr |

|   |  |
|---|--|
| <b>Catchment Details</b><br><b>Catchment Area</b> : 3,652 m <sup>2</sup><br><b>Run-off Coefficient</b> : 0.80<br><b>Flow Rate</b> : 2.9 L/s | <b>Soil Characteristics</b><br>Infiltration Rate : 0.0001 m/s → 0.045 m <sup>3</sup> /s (Total Soakage)<br>Additional Outlet : 0.000 m <sup>3</sup> /s |
|---|--|

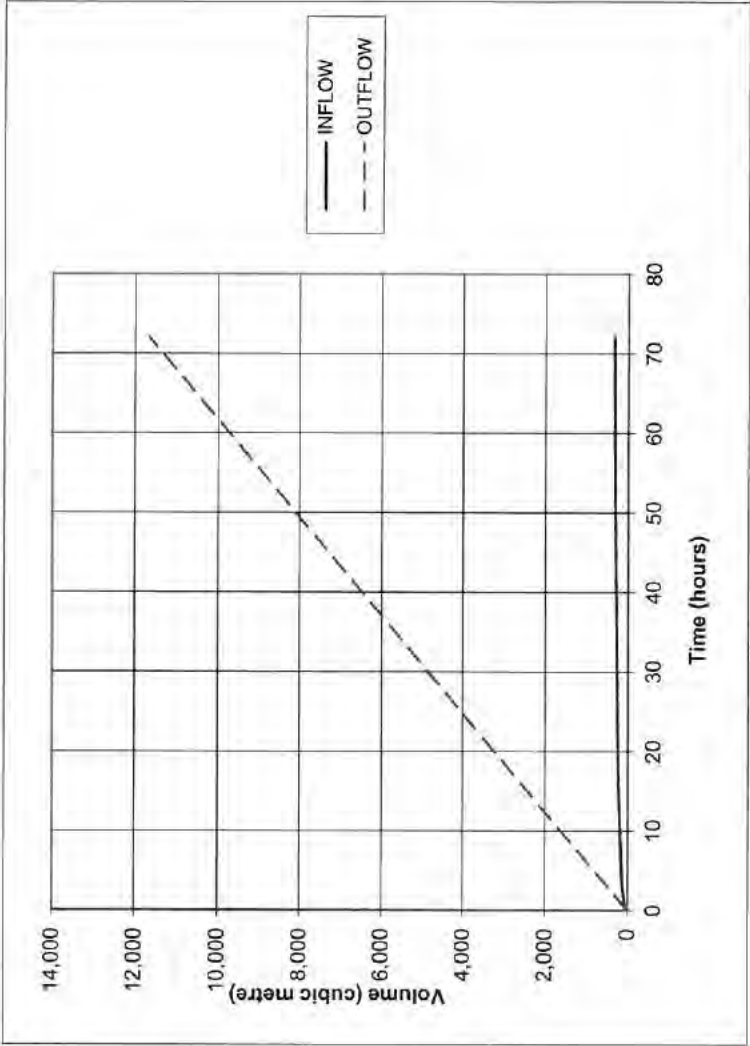
|   |  |
|---|--|
| <b>Storage Details</b><br><b>Volume Required at 6 minutes</b> : 14 m <sup>3</sup><br><b>Total Surface Area no freeboard</b> : 457 m <sup>2</sup><br><b>Total Base Area</b> : 450 m <sup>2</sup> |  |
|---|--|

PERITAS CIVIL PTY LTD

PRINT DATE: 10/03/2016










| TIME     | INFLOW         | OUTFLOW             |                  | STORAGE        |
|----------|----------------|---------------------|------------------|----------------|
|          |                | Ground Infiltration | Allowable Outlet |                |
|          | m <sup>3</sup> | m <sup>3</sup>      | m <sup>3</sup>   | m <sup>3</sup> |
| 6 min.   | 30             | 16                  | 0                | 14             |
| 9 min.   | 38             | 24                  | 0                | 13             |
| 12 min.  | 43             | 32                  | 0                | 11             |
| 15 min.  | 48             | 41                  | 0                | 8              |
| 20 min.  | 54             | 54                  | 0                | 0              |
| 30 min.  | 63             | 81                  | 0                | -18            |
| 45 min.  | 73             | 122                 | 0                | -48            |
| 1 hour   | 80             | 162                 | 0                | -82            |
| 2 hours  | 104            | 324                 | 0                | -220           |
| 3 hours  | 120            | 486                 | 0                | -366           |
| 6 hours  | 153            | 972                 | 0                | -819           |
| 10 hours | 184            | 1,620               | 0                | -1,436         |
| 12 hours | 196            | 1,944               | 0                | -1,748         |
| 24 hours | 249            | 3,888               | 0                | -3,639         |
| 48 hours | 307            | 7,776               | 0                | -7,469         |
| 60 hours | 324            | 9,720               | 0                | -9,396         |
| 72 hours | 337            | 11,664              | 0                | -11,327        |




# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

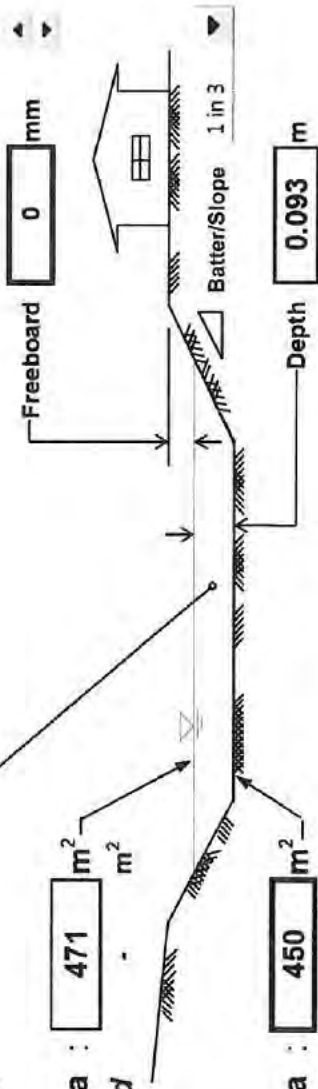
|   |  |  |  |
|---|--|--|--|
| <b>Location</b> :  : CHITTING     |  | <b>Storm Duration</b> :  : 24 hours  |  |
| <b>Storm Event</b> :  : 100 year  |  | <b>Design Intensity</b> :  : 5.6 mm/hr  |  |

|                          |                      |   |  |
|--------------------------|----------------------|---|--|
| <b>Catchment Details</b> |                      | <b>Soil Characteristics</b> : Fine Sand  |  |
| Catchment Area :         | 3,652 m <sup>2</sup> | Infiltration Rate :   | 0.0001 m/s → 0.045 m <sup>3</sup> /s (Total Soakage) |
| Run-off Coefficient :    | 0.80                 | Additional Outlet :   | 0.000 m <sup>3</sup> /s                              |
| Flow Rate :              | 4.5 L/s              |   |  |

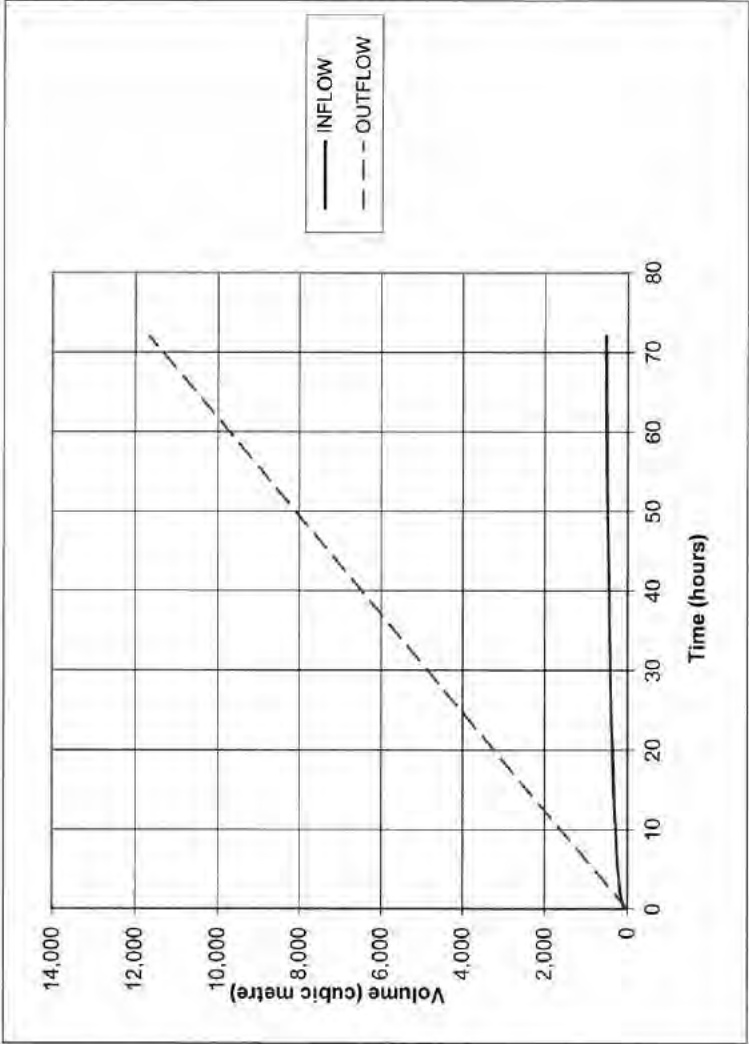
  

|                                   |                    |
|-----------------------------------|--------------------|
| <b>Storage Details</b>            |                    |
| Volume Required at 12 minutes :   | 43 m <sup>3</sup>  |
| Total Surface Area no freeboard : | 471 m <sup>2</sup> |
| Total Base Area :                 | 450 m <sup>2</sup> |

PERITAS CIVIL PTY LTD



| TIME     | INFLOW         | OUTFLOW             |                  | STORAGE        |
|----------|----------------|---------------------|------------------|----------------|
|          |                | Ground Infiltration | Allowable Outlet |                |
|          | m <sup>3</sup> | m <sup>3</sup>      | m <sup>3</sup>   | m <sup>3</sup> |
| 6 min.   | 54             | 16                  | 0                | 38             |
| 9 min.   | 66             | 24                  | 0                | 42             |
| 12 min.  | 75             | 32                  | 0                | 43             |
| 15 min.  | 83             | 41                  | 0                | 43             |
| 20 min.  | 93             | 54                  | 0                | 39             |
| 30 min.  | 107            | 81                  | 0                | 26             |
| 45 min.  | 122            | 122                 | 0                | 0              |
| 1 hour   | 132            | 162                 | 0                | -30            |
| 2 hours  | 169            | 324                 | 0                | -155           |
| 3 hours  | 193            | 486                 | 0                | -293           |
| 6 hours  | 244            | 972                 | 0                | -728           |
| 10 hours | 290            | 1,620               | 0                | -1,330         |
| 12 hours | 309            | 1,944               | 0                | -1,635         |
| 24 hours | 391            | 3,888               | 0                | -3,497         |
| 48 hours | 483            | 7,776               | 0                | -7,293         |
| 60 hours | 510            | 9,720               | 0                | -9,210         |
| 72 hours | 530            | 11,664              | 0                | -11,134        |



# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

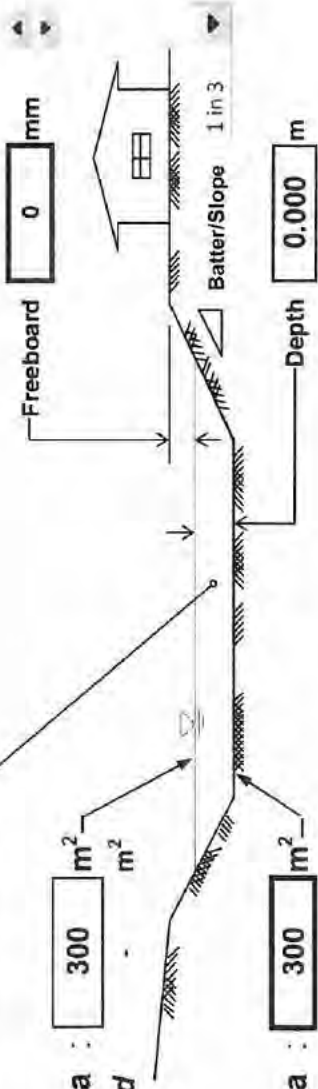
|  |  |                                     |  |
|--|--|-------------------------------------|--|
| <b>Location</b> :  : CHITTERING |  | <b>Storm Duration</b> : 24 hours    |  |
| <b>Storm Event</b> :  : 1 year  |  | <b>Design Intensity</b> : 2.0 mm/hr |  |

|                          |                      |   |   |
|--------------------------|----------------------|---|---|
| <b>Catchment Details</b> |                      | <b>Soil Characteristics</b> : Fine Sand |   |
| Catchment Area           | : 565 m <sup>2</sup> | Infiltration Rate                       | : 0.0001 m/s → 0.03 m <sup>3</sup> /s (Total Soakage) |
| Run-off Coefficient      | : 0.80               | Additional Outlet                       | : 0.000 m <sup>3</sup> /s                             |
| Flow Rate                | : 0.3 L/s            |   |   |

|                        |                                      |
|------------------------|--------------------------------------|
| <b>Storage Details</b> |                                      |
| Volume Required        | : 0 m <sup>3</sup>                   |
| Total Surface Area     | : 300 m <sup>2</sup><br>no freeboard |
| Total Base Area        | : 300 m <sup>2</sup>                 |

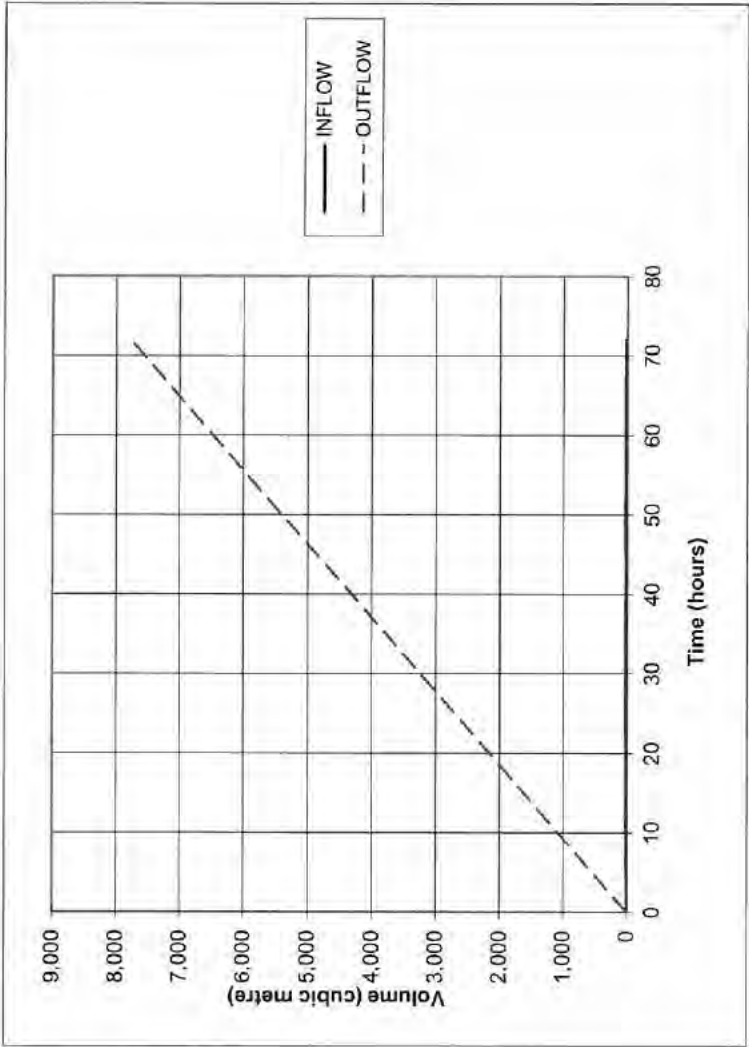
  


Freeboard : 0 mm  
Batter/Slope : 1 in 3  
Depth : 0.000 m

PERITAS CIVIL PTY LTD

PRINT DATE: 11/03/2016







| TIME     | INFLOW | OUTFLOW             |                  | STORAGE |
|----------|--------|---------------------|------------------|---------|
|          |        | Ground Infiltration | Allowable Outlet |         |
|          | m³     | m³                  | m³               | m³      |
| 6 min.   | 2      | 11                  | 0                | -8      |
| 9 min.   | 3      | 16                  | 0                | -13     |
| 12 min.  | 3      | 22                  | 0                | -18     |
| 15 min.  | 4      | 27                  | 0                | -23     |
| 20 min.  | 4      | 36                  | 0                | -32     |
| 30 min.  | 5      | 54                  | 0                | -49     |
| 45 min.  | 6      | 81                  | 0                | -75     |
| 1 hour   | 7      | 108                 | 0                | -101    |
| 2 hours  | 9      | 216                 | 0                | -207    |
| 3 hours  | 10     | 324                 | 0                | -314    |
| 6 hours  | 13     | 648                 | 0                | -635    |
| 10 hours | 16     | 1,080               | 0                | -1,064  |
| 12 hours | 17     | 1,296               | 0                | -1,279  |
| 24 hours | 22     | 2,592               | 0                | -2,570  |
| 48 hours | 27     | 5,184               | 0                | -5,157  |
| 60 hours | 28     | 6,480               | 0                | -6,452  |
| 72 hours | 29     | 7,776               | 0                | -7,747  |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

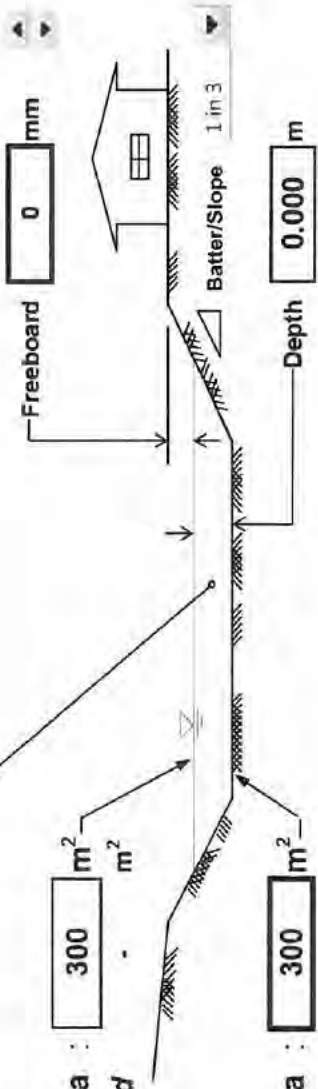
|  |  |                                     |  |
|--|--|-------------------------------------|--|
| <b>Location</b> :  : CHITTERING |  | <b>Storm Duration</b> : 24 hours    |  |
| <b>Storm Event</b> :  : 10 year |  | <b>Design Intensity</b> : 3.5 mm/hr |  |

|                          |                      |   |   |
|--------------------------|----------------------|---|---|
| <b>Catchment Details</b> |                      | <b>Soil Characteristics</b> : Fine Sand |   |
| Catchment Area           | : 565 m <sup>2</sup> | Infiltration Rate                       | : 0.0001 m/s → 0.03 m <sup>3</sup> /s (Total Soakage) |
| Run-off Coefficient      | : 0.80               | Additional Outlet                       | : 0.000 m <sup>3</sup> /s                             |
| Flow Rate                | : 0.4 L/s            |   |   |

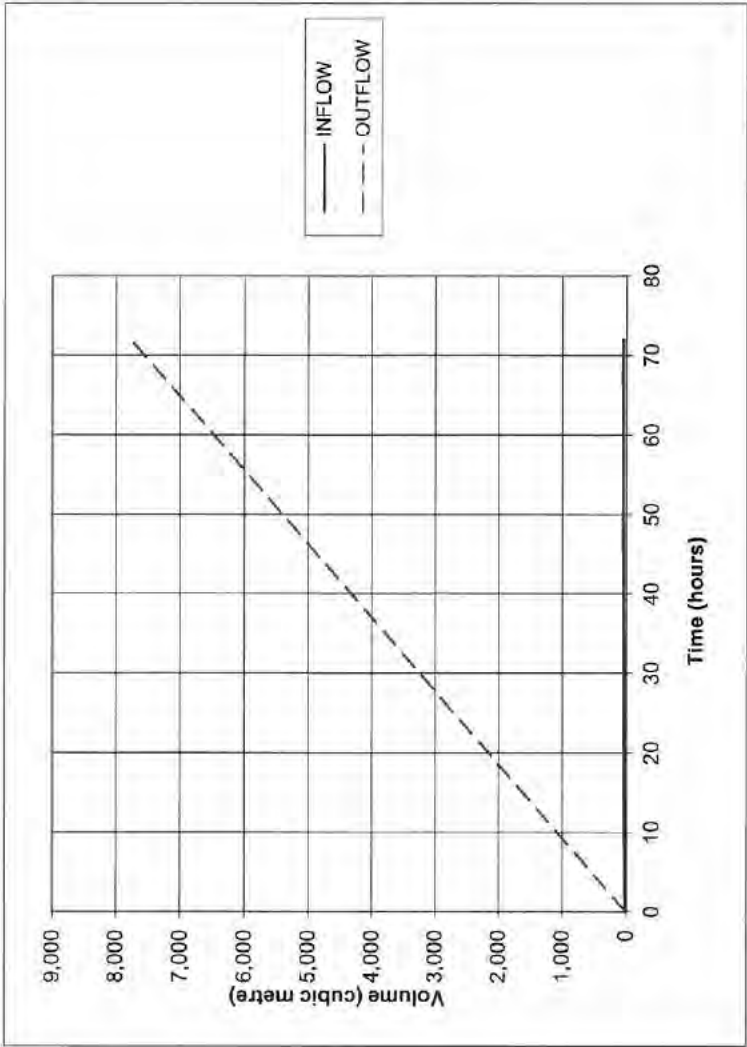
|                        |                                     |
|------------------------|-------------------------------------|
| <b>Storage Details</b> |                                     |
| Volume Required        | : 0 m <sup>3</sup>                  |
| Total Surface Area     | : 300 m <sup>2</sup> - no freeboard |
| Total Base Area        | : 300 m <sup>2</sup>                |

PERITAS CIVIL PTY LTD

PRINT DATE: 11/03/2016





| TIME     | INFLOW<br>m <sup>3</sup> | OUTFLOW                               |                                    | STORAGE<br>m <sup>3</sup> |
|----------|--------------------------|---------------------------------------|------------------------------------|---------------------------|
|          |                          | Ground Infiltration<br>m <sup>3</sup> | Allowable Outlet<br>m <sup>3</sup> |                           |
| 6 min.   | 5                        | 11                                    | 0                                  | -6                        |
| 9 min.   | 6                        | 16                                    | 0                                  | -10                       |
| 12 min.  | 7                        | 22                                    | 0                                  | -15                       |
| 15 min.  | 7                        | 27                                    | 0                                  | -20                       |
| 20 min.  | 8                        | 36                                    | 0                                  | -28                       |
| 30 min.  | 10                       | 54                                    | 0                                  | -44                       |
| 45 min.  | 11                       | 81                                    | 0                                  | -70                       |
| 1 hour   | 12                       | 108                                   | 0                                  | -96                       |
| 2 hours  | 16                       | 216                                   | 0                                  | -200                      |
| 3 hours  | 19                       | 324                                   | 0                                  | -305                      |
| 6 hours  | 24                       | 648                                   | 0                                  | -624                      |
| 10 hours | 29                       | 1,080                                 | 0                                  | -1,051                    |
| 12 hours | 30                       | 1,296                                 | 0                                  | -1,266                    |
| 24 hours | 38                       | 2,592                                 | 0                                  | -2,554                    |
| 48 hours | 47                       | 5,184                                 | 0                                  | -5,137                    |
| 60 hours | 50                       | 6,480                                 | 0                                  | -6,430                    |
| 72 hours | 52                       | 7,776                                 | 0                                  | -7,724                    |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

|                               |  |                                     |  |
|-------------------------------|--|-------------------------------------|--|
| <b>Location</b> : CHITTING    |  | <b>Storm Duration</b> : 24 hours    |  |
| <b>Storm Event</b> : 100 year |  | <b>Design Intensity</b> : 5.6 mm/hr |  |

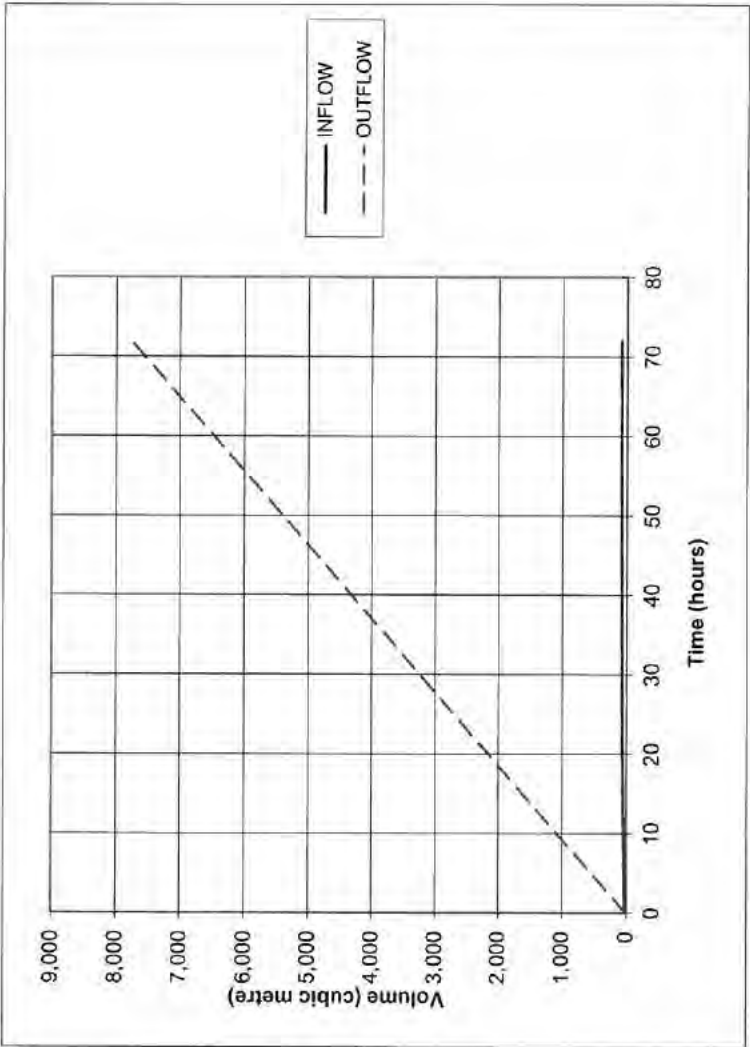
  

|  |                                   |  |  |
|--|-----------------------------------|--|--|
| <b>Catchment Details</b>                   |                                   | <b>Soil Characteristics</b>  |  |
| <b>Catchment Area</b> : 565 m <sup>2</sup> | <b>Run-off Coefficient</b> : 0.80 | <b>Infiltration Rate</b> : 0.0001 m/s → 0.03 m <sup>3</sup> /s (Total Soakage) | <b>Additional Outlet</b> : 0.000 m <sup>3</sup> /s |
| <b>Flow Rate</b> : 0.7 L/s                 |                                   |  |  |

|  |                              |
|--|------------------------------|
| <b>Storage Details</b>   |                              |
| <b>Volume Required</b> : 0 m <sup>3</sup>                      | <b>Freeboard</b> : 0 mm      |
| <b>Total Surface Area</b> : 300 m <sup>2</sup><br>no freeboard | <b>Batter/Slope</b> : 1 in 3 |
| <b>Total Base Area</b> : 300 m <sup>2</sup>                    | <b>Depth</b> : 0.000 m       |

PERITAS CIVIL PTY LTD







| TIME     | INFLOW | OUTFLOW             |                  | STORAGE |
|----------|--------|---------------------|------------------|---------|
|          |        | Ground Infiltration | Allowable Outlet |         |
|          | m³     | m³                  | m³               | m³      |
| 6 min.   | 8      | 11                  | 0                | -2      |
| 9 min.   | 10     | 16                  | 0                | -6      |
| 12 min.  | 12     | 22                  | 0                | -10     |
| 15 min.  | 13     | 27                  | 0                | -14     |
| 20 min.  | 14     | 36                  | 0                | -22     |
| 30 min.  | 17     | 54                  | 0                | -37     |
| 45 min.  | 19     | 81                  | 0                | -62     |
| 1 hour   | 20     | 108                 | 0                | -88     |
| 2 hours  | 26     | 216                 | 0                | -190    |
| 3 hours  | 30     | 324                 | 0                | -294    |
| 6 hours  | 38     | 648                 | 0                | -610    |
| 10 hours | 45     | 1,080               | 0                | -1,035  |
| 12 hours | 48     | 1,296               | 0                | -1,248  |
| 24 hours | 61     | 2,592               | 0                | -2,531  |
| 48 hours | 75     | 5,184               | 0                | -5,109  |
| 60 hours | 79     | 6,480               | 0                | -6,401  |
| 72 hours | 82     | 7,776               | 0                | -7,694  |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

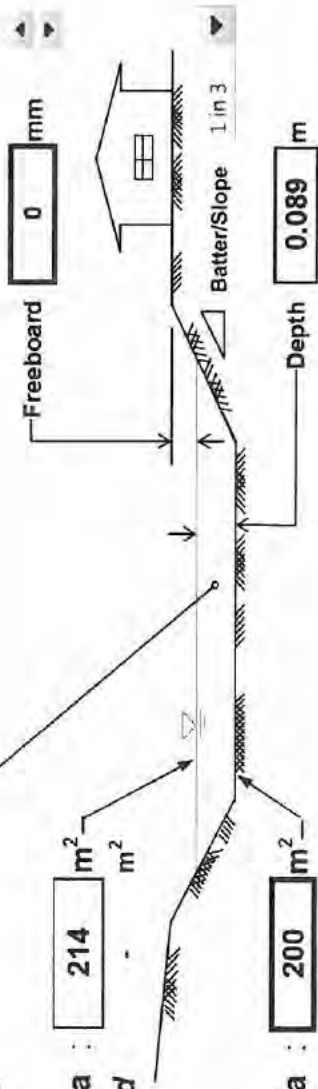
Design Rainfall Intensity

|  |  |
|--|--|
| <b>Location</b><br> : CHITTING  | <b>Storm Duration</b><br> : 24 hours    |
| <b>Storm Event</b><br> : 1 year | <b>Design Intensity</b><br> : 2.0 mm/hr |

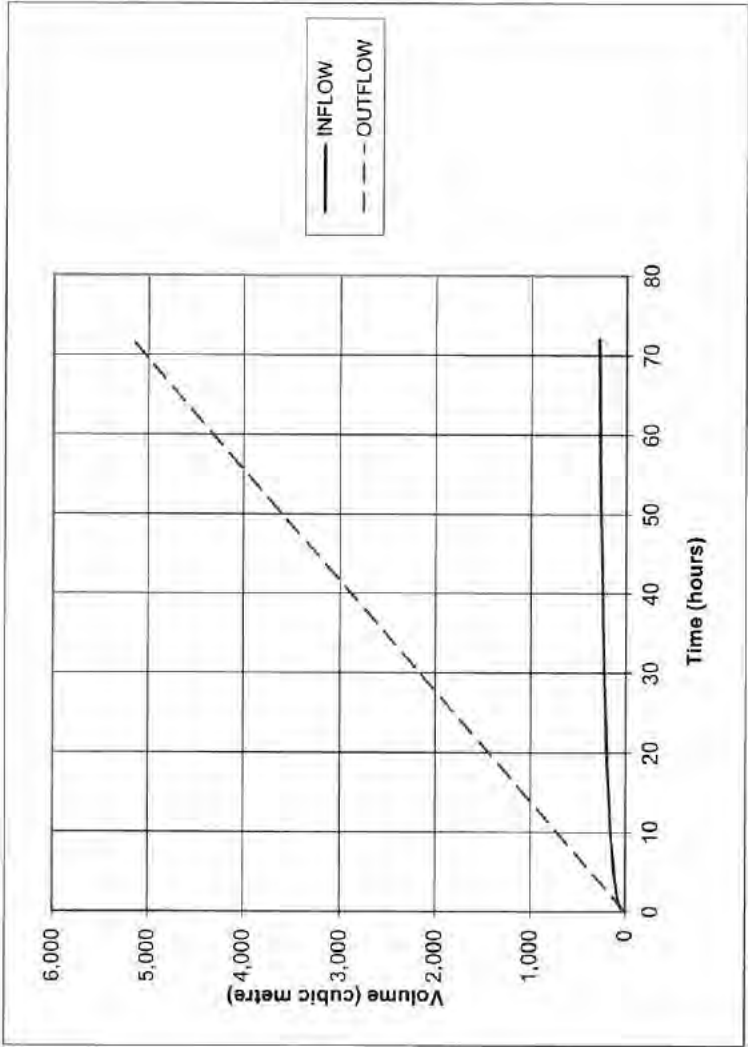
|  |  |
|--|--|
| <b>Catchment Details</b><br>Catchment Area : 4,621 m <sup>2</sup><br>Run-off Coefficient : 0.95<br>Flow Rate : 2.4 L/s | <b>Outflow Details</b><br>Soil Characteristics : Fine Sand<br>Infiltration Rate : 0.0001 m/s → 0.02 m <sup>3</sup> /s (Total Soakage)<br>Additional Outlet : 0.000 m <sup>3</sup> /s |
|--|--|

|   |  |
|---|--|
| <b>Storage Details</b><br>Volume Required at 14 minutes : 18 m <sup>3</sup><br>Total Surface Area no freeboard : 214 m <sup>2</sup><br>Total Base Area : 200 m <sup>2</sup> |  |
|---|--|

PERITAS CIVIL PTY LTD









| TIME     | INFLOW<br>m³ | OUTFLOW                   |                        | STORAGE<br>m³ |
|----------|--------------|---------------------------|------------------------|---------------|
|          |              | Ground Infiltration<br>m³ | Allowable Outlet<br>m³ |               |
| 6 min.   | 22           | 7                         | 0                      | 15            |
| 9 min.   | 28           | 11                        | 0                      | 17            |
| 12 min.  | 33           | 14                        | 0                      | 18            |
| 15 min.  | 36           | 18                        | 0                      | 18            |
| 20 min.  | 42           | 24                        | 0                      | 18            |
| 30 min.  | 49           | 36                        | 0                      | 13            |
| 45 min.  | 58           | 54                        | 0                      | 4             |
| 1 hour   | 64           | 72                        | 0                      | -8            |
| 2 hours  | 84           | 144                       | 0                      | -60           |
| 3 hours  | 99           | 216                       | 0                      | -117          |
| 6 hours  | 128          | 432                       | 0                      | -304          |
| 10 hours | 157          | 720                       | 0                      | -563          |
| 12 hours | 167          | 864                       | 0                      | -697          |
| 24 hours | 211          | 1,728                     | 0                      | -1,517        |
| 48 hours | 261          | 3,456                     | 0                      | -3,195        |
| 60 hours | 275          | 4,320                     | 0                      | -4,045        |
| 72 hours | 286          | 5,184                     | 0                      | -4,898        |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

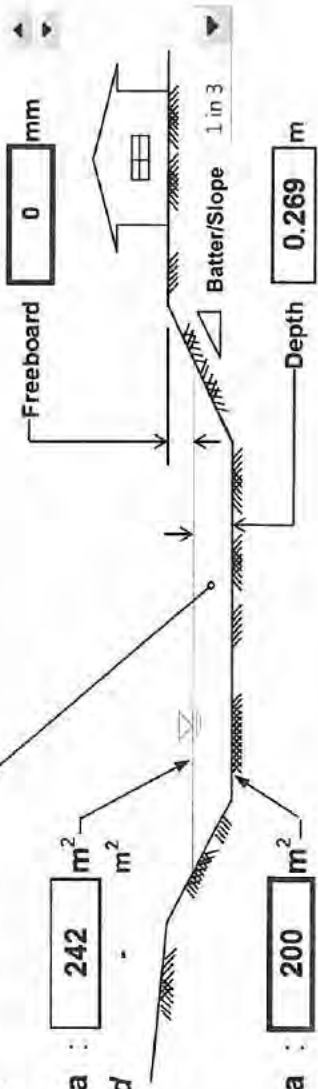
Design Rainfall Intensity

|   |  |
|---|--|
| <b>Location</b><br> : CHITTERING | <b>Storm Duration</b><br> : 24 hours    |
| <b>Storm Event</b><br> : 10 year | <b>Design Intensity</b><br> : 3.5 mm/hr |

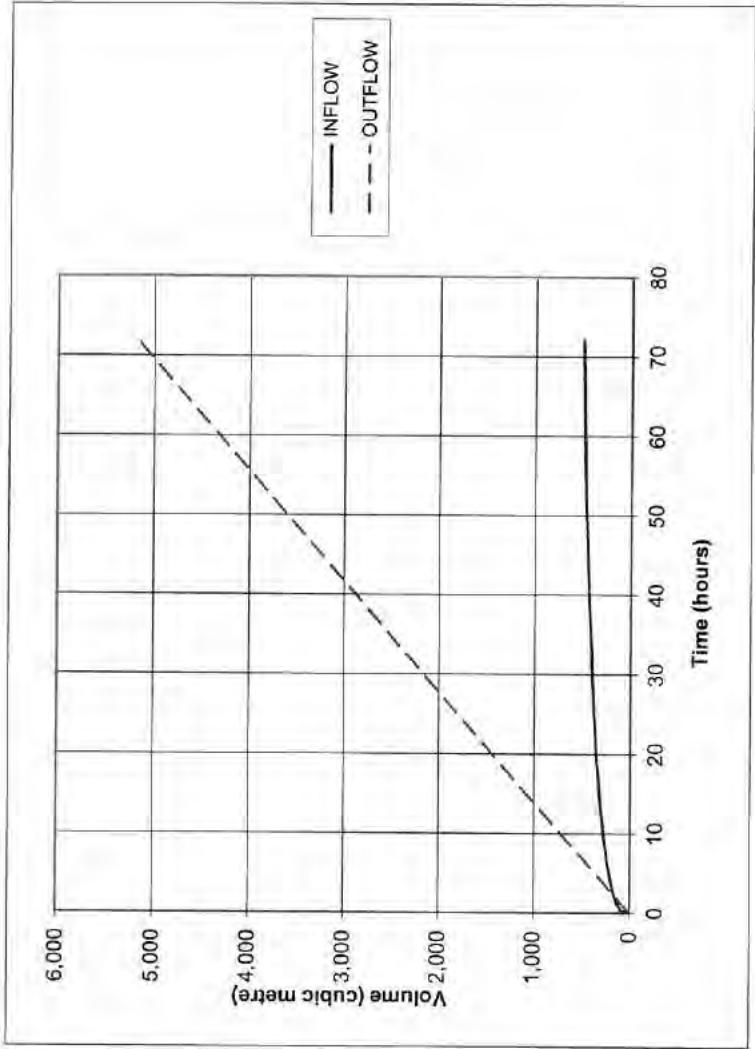
|  |  |
|--|--|
| <b>Catchment Details</b><br>Catchment Area : 4,621 m <sup>2</sup><br>Run-off Coefficient : 0.95<br>Flow Rate : 4.3 L/s | <b>Outflow Details</b><br>Soil Characteristics : Fine Sand<br>Infiltration Rate : 0.0001 m/s → 0.02 m <sup>3</sup> /s (Total Soakage)<br>Additional Outlet : 0.000 m <sup>3</sup> /s |
|--|--|

|   |  |
|---|--|
| <b>Storage Details</b><br>Volume Required at 29 minutes : 59 m <sup>3</sup><br>Total Surface Area no freeboard : 242 m <sup>2</sup><br>Total Base Area : 200 m <sup>2</sup> |  |
|---|--|

PERITAS CIVIL PTY LTD


















| TIME     | INFLOW<br>m³ | OUTFLOW                   |                        | STORAGE<br>m³ |
|----------|--------------|---------------------------|------------------------|---------------|
|          |              | Ground Infiltration<br>m³ | Allowable Outlet<br>m³ |               |
| 6 min.   | 46           | 7                         | 0                      | 38            |
| 9 min.   | 57           | 11                        | 0                      | 46            |
| 12 min.  | 65           | 14                        | 0                      | 51            |
| 15 min.  | 72           | 18                        | 0                      | 54            |
| 20 min.  | 82           | 24                        | 0                      | 58            |
| 30 min.  | 95           | 36                        | 0                      | 59            |
| 45 min.  | 110          | 54                        | 0                      | 56            |
| 1 hour   | 120          | 72                        | 0                      | 48            |
| 2 hours  | 156          | 144                       | 0                      | 12            |
| 3 hours  | 180          | 216                       | 0                      | -36           |
| 6 hours  | 230          | 432                       | 0                      | -202          |
| 10 hours | 277          | 720                       | 0                      | -443          |
| 12 hours | 295          | 864                       | 0                      | -569          |
| 24 hours | 374          | 1,728                     | 0                      | -1,354        |
| 48 hours | 461          | 3,456                     | 0                      | -2,995        |
| 60 hours | 487          | 4,320                     | 0                      | -3,833        |
| 72 hours | 506          | 5,184                     | 0                      | -4,678        |

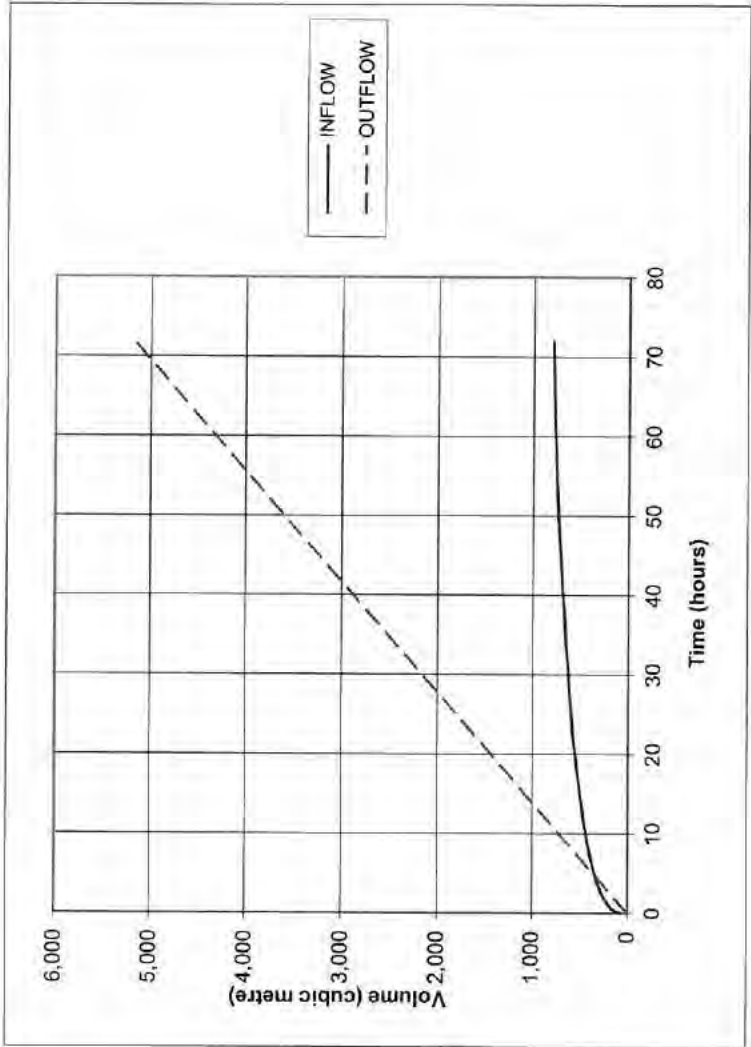
# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

|   |  |   |  |
|---|--|---|--|
| <b>Location</b> :  : CHITTING :     |  | <b>Storm Duration</b> :  : 24 hours :     |  |
| <b>Storm Event</b> :  : 100 year :  |  | <b>Design Intensity</b> :  : 5.6 mm/hr :  |  |
| <b>Catchment Details</b>  |  | <b>Outflow Details</b>  |  |
| <b>Catchment Area</b> : 4,621 m <sup>2</sup>  |  | <b>Soil Characteristics</b> : Fine Sand :    |  |
| <b>Run-off Coefficient</b> : 0.95   |  | <b>Infiltration Rate</b> : 0.0001 m/s → 0.02 m <sup>3</sup> /s (Total Soakage)  |  |
| <b>Flow Rate</b> : 6.8 L/s  |  | <b>Additional Outlet</b> : 0.000 m <sup>3</sup> /s :   |  |
| <b>Storage Details</b>  |  |   |  |
| <b>Volume Required at 44 minutes</b> : 129 m <sup>3</sup>   |  | <b>Freeboard</b> : 0 mm :    |  |
| <b>Total Surface Area no freeboard</b> : 287 m <sup>2</sup>   |  | <b>Batter/Slope</b> : 1 in 3 :   |  |
| <b>Total Base Area</b> : 200 m <sup>2</sup>   |  | <b>Depth</b> : 0.528 m :   |  |

PERITAS CIVIL PTY LTD





| TIME     | INFLOW<br>m³ | OUTFLOW                      |                           | STORAGE<br>m³ |
|----------|--------------|------------------------------|---------------------------|---------------|
|          |              | Ground<br>Infiltration<br>m³ | Allowable<br>Outlet<br>m³ |               |
| 6 min.   | 81           | 7                            | 0                         | 74            |
| 9 min.   | 99           | 11                           | 0                         | 88            |
| 12 min.  | 113          | 14                           | 0                         | 99            |
| 15 min.  | 125          | 18                           | 0                         | 107           |
| 20 min.  | 140          | 24                           | 0                         | 116           |
| 30 min.  | 161          | 36                           | 0                         | 125           |
| 45 min.  | 183          | 54                           | 0                         | 129           |
| 1 hour   | 198          | 72                           | 0                         | 126           |
| 2 hours  | 253          | 144                          | 0                         | 109           |
| 3 hours  | 291          | 216                          | 0                         | 75            |
| 6 hours  | 367          | 432                          | 0                         | -65           |
| 10 hours | 436          | 720                          | 0                         | -284          |
| 12 hours | 465          | 864                          | 0                         | -399          |
| 24 hours | 588          | 1,728                        | 0                         | -1,140        |
| 48 hours | 725          | 3,456                        | 0                         | -2,731        |
| 60 hours | 766          | 4,320                        | 0                         | -3,554        |
| 72 hours | 796          | 5,184                        | 0                         | -4,388        |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

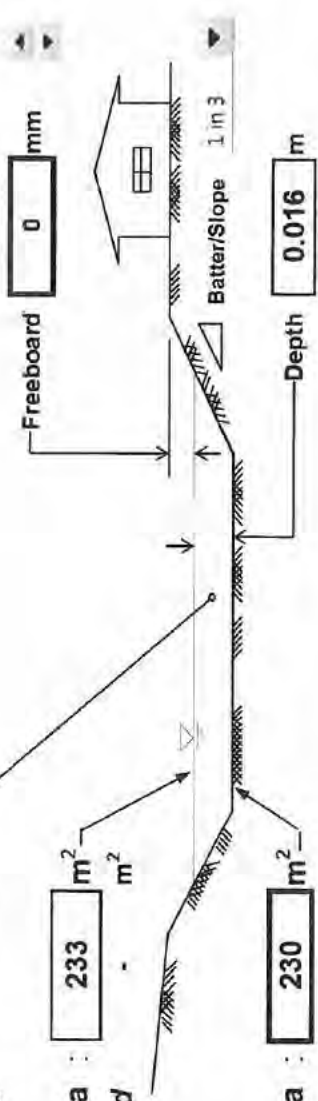
|   |  |                                     |  |
|---|--|-------------------------------------|--|
| <b>Location</b> :  : CHITTING  |  | <b>Storm Duration</b> : 24 hours    |  |
| <b>Storm Event</b> :  : 1 year |  | <b>Design Intensity</b> : 2.0 mm/hr |  |

|                          |                        |   |  |
|--------------------------|------------------------|---|--|
| <b>Catchment Details</b> |                        | <b>Soil Characteristics</b> : Fine Sand |  |
| Catchment Area           | : 2,630 m <sup>2</sup> | Infiltration Rate                       | : 0.0001 m/s → 0.023 m <sup>3</sup> /s (Total Soakage) |
| Run-off Coefficient      | : 0.90                 | Additional Outlet                       | : 0.000 m <sup>3</sup> /s                              |
| Flow Rate                | : 1.3 L/s              |   |  |

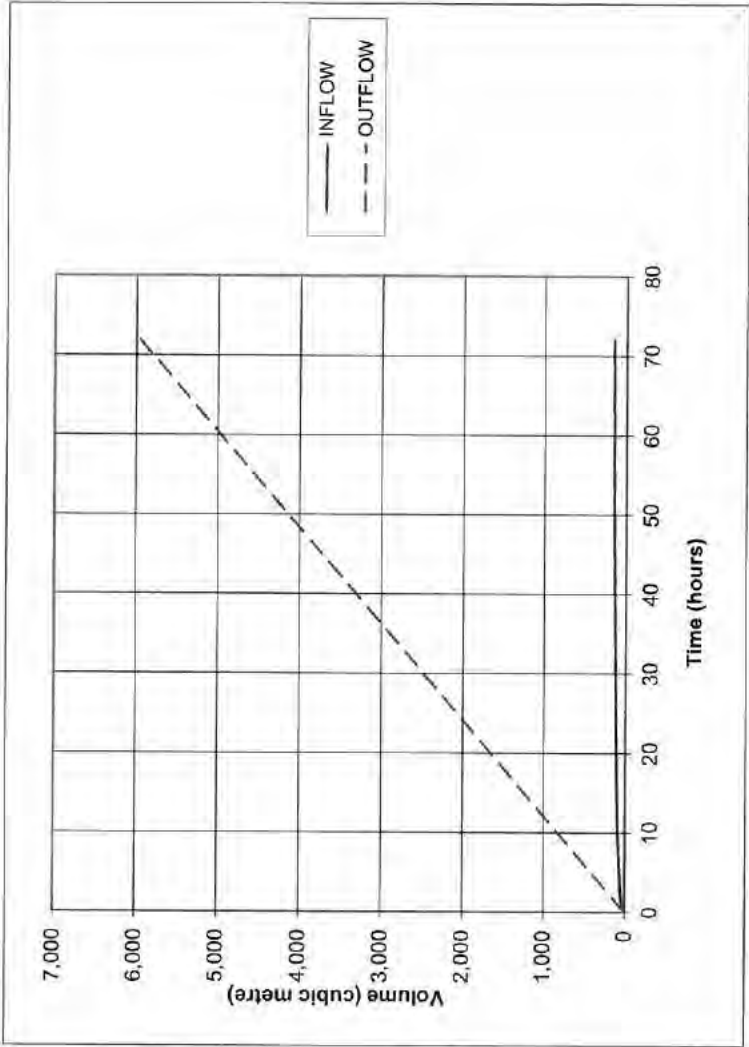
|                                 |                      |
|---------------------------------|----------------------|
| <b>Storage Details</b>          |                      |
| Volume Required at 6 minutes    | : 4 m <sup>3</sup>   |
| Total Surface Area no freeboard | : 233 m <sup>2</sup> |
| Total Base Area                 | : 230 m <sup>2</sup> |

The diagram illustrates a cross-section of a swale. On the left, a house is shown. The swale is defined by a freeboard (0 mm) and a batter/slope of 1 in 3. The depth of the swale is 0.016 m. The total surface area (no freeboard) is 233 m<sup>2</sup>, and the total base area is 230 m<sup>2</sup>. The volume required at 6 minutes is 4 m<sup>3</sup>.

PERITAS CIVIL PTY LTD









| TIME     | INFLOW         |  | OUTFLOW                            |                                 | STORAGE |
|----------|----------------|--|------------------------------------|---------------------------------|---------|
|          | m <sup>3</sup> |  | Ground Infiltration m <sup>3</sup> | Allowable Outlet m <sup>3</sup> |         |
| 6 min.   | 12             |  | 8                                  | 0                               | 4       |
| 9 min.   | 15             |  | 12                                 | 0                               | 3       |
| 12 min.  | 18             |  | 17                                 | 0                               | 1       |
| 15 min.  | 20             |  | 21                                 | 0                               | -1      |
| 20 min.  | 22             |  | 28                                 | 0                               | -5      |
| 30 min.  | 27             |  | 41                                 | 0                               | -15     |
| 45 min.  | 31             |  | 62                                 | 0                               | -31     |
| 1 hour   | 35             |  | 83                                 | 0                               | -48     |
| 2 hours  | 46             |  | 166                                | 0                               | -120    |
| 3 hours  | 53             |  | 248                                | 0                               | -195    |
| 6 hours  | 69             |  | 497                                | 0                               | -428    |
| 10 hours | 85             |  | 828                                | 0                               | -743    |
| 12 hours | 90             |  | 994                                | 0                               | -904    |
| 24 hours | 114            |  | 1,987                              | 0                               | -1,873  |
| 48 hours | 141            |  | 3,974                              | 0                               | -3,834  |
| 60 hours | 148            |  | 4,968                              | 0                               | -4,820  |
| 72 hours | 154            |  | 5,962                              | 0                               | -5,807  |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

|   |  |
|---|--|
| <b>Location</b><br> : CHITTERING | <b>Storm Duration</b><br> : 24 hours    |
| <b>Storm Event</b><br> : 10 year | <b>Design Intensity</b><br> : 3.5 mm/hr |

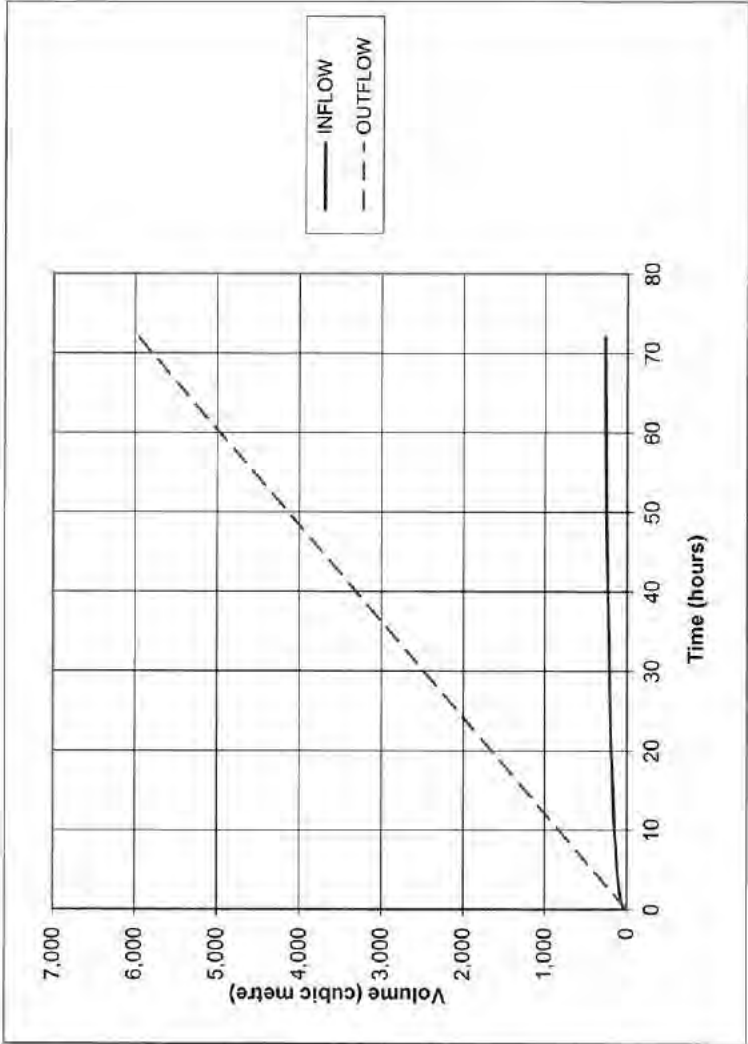
|  |   |
|--|---|
| <b>Catchment Details</b>   | <b>Soil Characteristics</b>   |
| Catchment Area : 2,630 m <sup>2</sup><br>Run-off Coefficient : 0.90<br>Flow Rate : 2.3 L/s | Infiltration Rate : 0.0001 m/s → 0.023 m <sup>3</sup> /s (Total Soakage)<br>Additional Outlet : 0.000 m <sup>3</sup> /s |

|  |  |
|--|--|
| <b>Storage Details</b>   | <b>Outflow Details</b>                                       |
| Volume Required at 12 minutes : 19 m <sup>3</sup><br>Total Surface Area : 243 m <sup>2</sup><br>no freeboard<br>Total Base Area : 230 m <sup>2</sup> | Freeboard : 0 mm<br>Batter/Slope : 1 in 3<br>Depth : 0.079 m |

PERITAS CIVIL PTY LTD





| TIME     | INFLOW<br>m³ | OUTFLOW                   |                        | STORAGE<br>m³ |
|----------|--------------|---------------------------|------------------------|---------------|
|          |              | Ground Infiltration<br>m³ | Allowable Outlet<br>m³ |               |
| 6 min.   | 25           | 8                         | 0                      | 16            |
| 9 min.   | 31           | 12                        | 0                      | 18            |
| 12 min.  | 35           | 17                        | 0                      | 19            |
| 15 min.  | 39           | 21                        | 0                      | 18            |
| 20 min.  | 44           | 28                        | 0                      | 16            |
| 30 min.  | 51           | 41                        | 0                      | 10            |
| 45 min.  | 59           | 62                        | 0                      | -3            |
| 1 hour   | 65           | 83                        | 0                      | -18           |
| 2 hours  | 84           | 166                       | 0                      | -82           |
| 3 hours  | 97           | 248                       | 0                      | -151          |
| 6 hours  | 124          | 497                       | 0                      | -373          |
| 10 hours | 149          | 828                       | 0                      | -679          |
| 12 hours | 159          | 994                       | 0                      | -834          |
| 24 hours | 201          | 1,987                     | 0                      | -1,786        |
| 48 hours | 248          | 3,974                     | 0                      | -3,726        |
| 60 hours | 262          | 4,968                     | 0                      | -4,706        |
| 72 hours | 273          | 5,962                     | 0                      | -5,689        |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

|                               |  |                                     |  |
|-------------------------------|--|-------------------------------------|--|
| <b>Location</b> : CHITTERING  |  | <b>Storm Duration</b> : 24 hours    |  |
| <b>Storm Event</b> : 100 year |  | <b>Design Intensity</b> : 5.6 mm/hr |  |

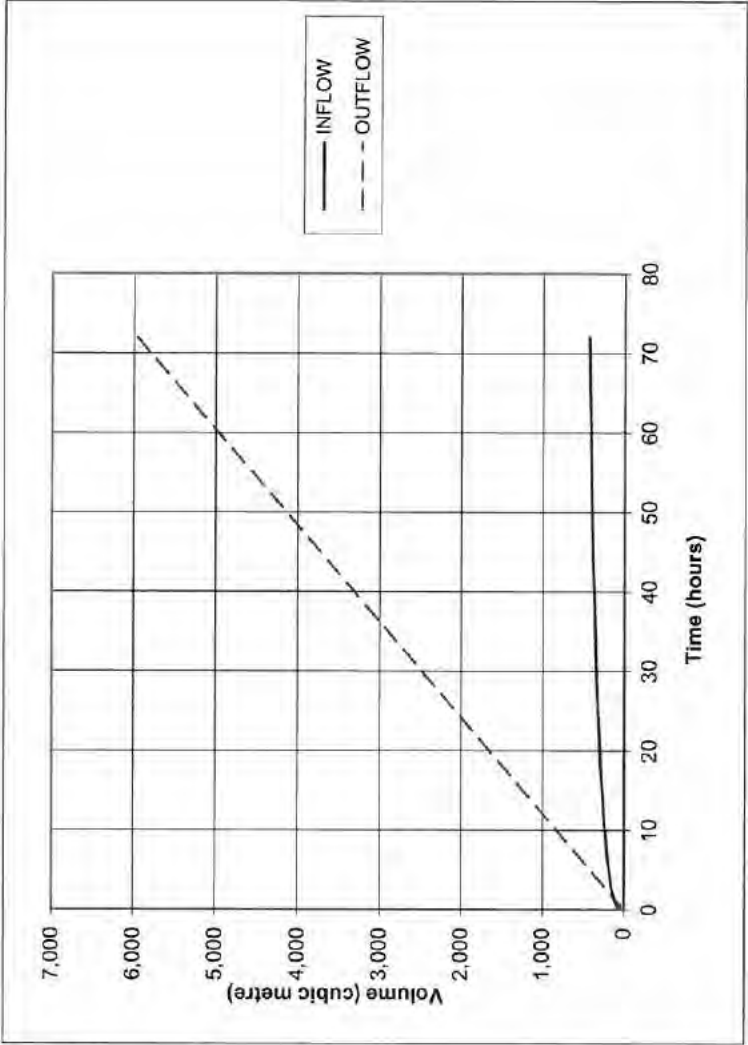
  

|  |                                   |  |   |
|--|-----------------------------------|--|---|
| <b>Catchment Details</b>                     |                                   | <b>Soil Characteristics</b> : Fine Sand            |   |
| <b>Catchment Area</b> : 2,630 m <sup>2</sup> | <b>Run-off Coefficient</b> : 0.90 | <b>Infiltration Rate</b> : 0.0001 m/s →            | <b>0.023 m<sup>3</sup>/s</b><br>(Total Soakage) |
| <b>Flow Rate</b> : 3.7 L/s                   |                                   | <b>Additional Outlet</b> : 0.000 m <sup>3</sup> /s |   |

|   |                              |
|---|------------------------------|
| <b>Storage Details</b>                                      |                              |
| <b>Volume Required at 21 minutes</b> : 48 m <sup>3</sup>    | <b>Freeboard</b> : 0 mm      |
| <b>Total Surface Area no freeboard</b> : 262 m <sup>2</sup> | <b>Batter/Slope</b> : 1 in 3 |
| <b>Total Base Area</b> : 230 m <sup>2</sup>                 | <b>Depth</b> : 0.194 m       |

PERITAS CIVIL PTY LTD










| TIME     | INFLOW<br>m³ | OUTFLOW                   |                        | STORAGE<br>m³ |
|----------|--------------|---------------------------|------------------------|---------------|
|          |              | Ground Infiltration<br>m³ | Allowable Outlet<br>m³ |               |
| 6 min.   | 44           | 8                         | 0                      | 35            |
| 9 min.   | 54           | 12                        | 0                      | 41            |
| 12 min.  | 61           | 17                        | 0                      | 45            |
| 15 min.  | 67           | 21                        | 0                      | 47            |
| 20 min.  | 75           | 28                        | 0                      | 48            |
| 30 min.  | 87           | 41                        | 0                      | 45            |
| 45 min.  | 99           | 62                        | 0                      | 36            |
| 1 hour   | 107          | 83                        | 0                      | 24            |
| 2 hours  | 137          | 166                       | 0                      | -29           |
| 3 hours  | 157          | 248                       | 0                      | -92           |
| 6 hours  | 198          | 497                       | 0                      | -299          |
| 10 hours | 235          | 828                       | 0                      | -593          |
| 12 hours | 250          | 994                       | 0                      | -743          |
| 24 hours | 317          | 1,987                     | 0                      | -1,670        |
| 48 hours | 391          | 3,974                     | 0                      | -3,583        |
| 60 hours | 413          | 4,968                     | 0                      | -4,555        |
| 72 hours | 429          | 5,962                     | 0                      | -5,532        |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

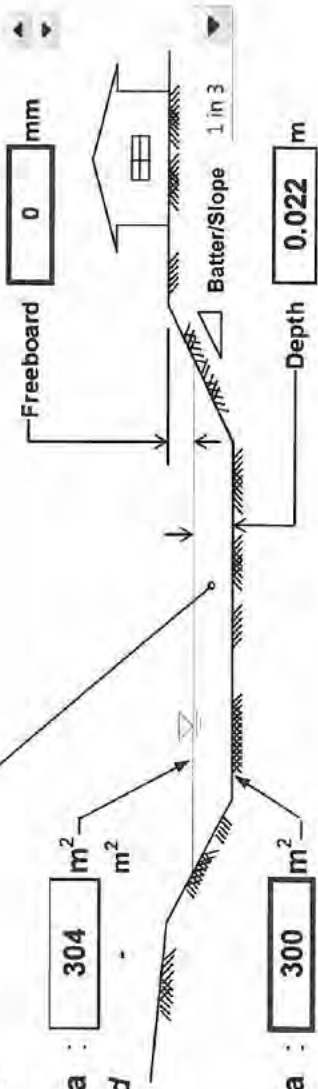
|   |  |  |  |
|---|--|--|--|
| <b>Location</b> :  : CHITTING   |  | <b>Storm Duration</b> :  : 24 hours  |  |
| <b>Storm Event</b> :  : 1 year  |  | <b>Design Intensity</b> :  : 2.0 mm/hr  |  |

|                          |                      |                             |   |
|--------------------------|----------------------|-----------------------------|---|
| <b>Catchment Details</b> |                      | <b>Soil Characteristics</b> |   |
| Catchment Area :         | 4,303 m <sup>2</sup> | Infiltration Rate :         | 0.0001 m/s → 0.03 m <sup>3</sup> /s (Total Soakage) |
| Run-off Coefficient :    | 0.80                 | Additional Outlet :         | 0.000 m <sup>3</sup> /s                             |
| Flow Rate :              | 1.9 L/s              |                             |   |

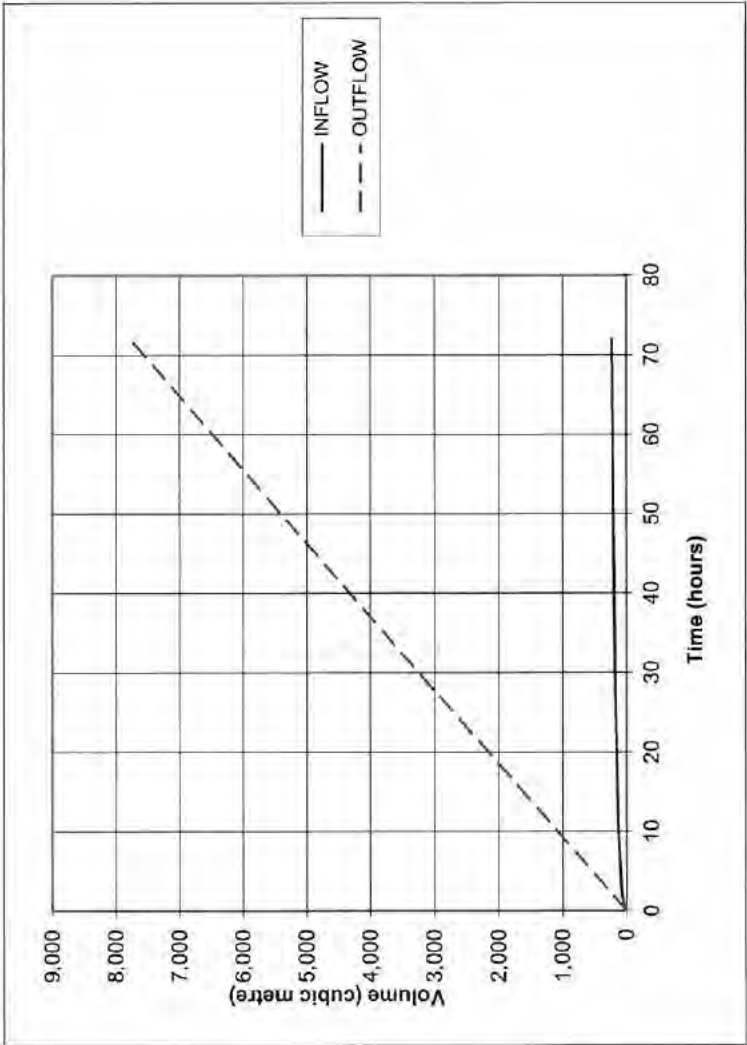
  

|                                   |                    |
|-----------------------------------|--------------------|
| <b>Storage Details</b>            |                    |
| Volume Required at 6 minutes :    | 7 m <sup>3</sup>   |
| Total Surface Area no freeboard : | 304 m <sup>2</sup> |
| Total Base Area :                 | 300 m <sup>2</sup> |

PERITAS CIVIL PTY LTD
















| TIME     | INFLOW | OUTFLOW                |                     | STORAGE |
|----------|--------|------------------------|---------------------|---------|
|          |        | Ground Infiltration m³ | Allowable Outlet m³ |         |
| 6 min.   | 18     | 11                     | 0                   | 7       |
| 9 min.   | 22     | 16                     | 0                   | 6       |
| 12 min.  | 26     | 22                     | 0                   | 4       |
| 15 min.  | 29     | 27                     | 0                   | 2       |
| 20 min.  | 33     | 36                     | 0                   | -3      |
| 30 min.  | 39     | 54                     | 0                   | -15     |
| 45 min.  | 45     | 81                     | 0                   | -36     |
| 1 hour   | 50     | 108                    | 0                   | -58     |
| 2 hours  | 66     | 216                    | 0                   | -150    |
| 3 hours  | 77     | 324                    | 0                   | -247    |
| 6 hours  | 100    | 648                    | 0                   | -548    |
| 10 hours | 123    | 1,080                  | 0                   | -957    |
| 12 hours | 131    | 1,296                  | 0                   | -1,165  |
| 24 hours | 166    | 2,592                  | 0                   | -2,426  |
| 48 hours | 204    | 5,184                  | 0                   | -4,980  |
| 60 hours | 216    | 6,480                  | 0                   | -6,264  |
| 72 hours | 224    | 7,776                  | 0                   | -7,552  |

# SUMP/SWALE VOLUME CALCULATOR

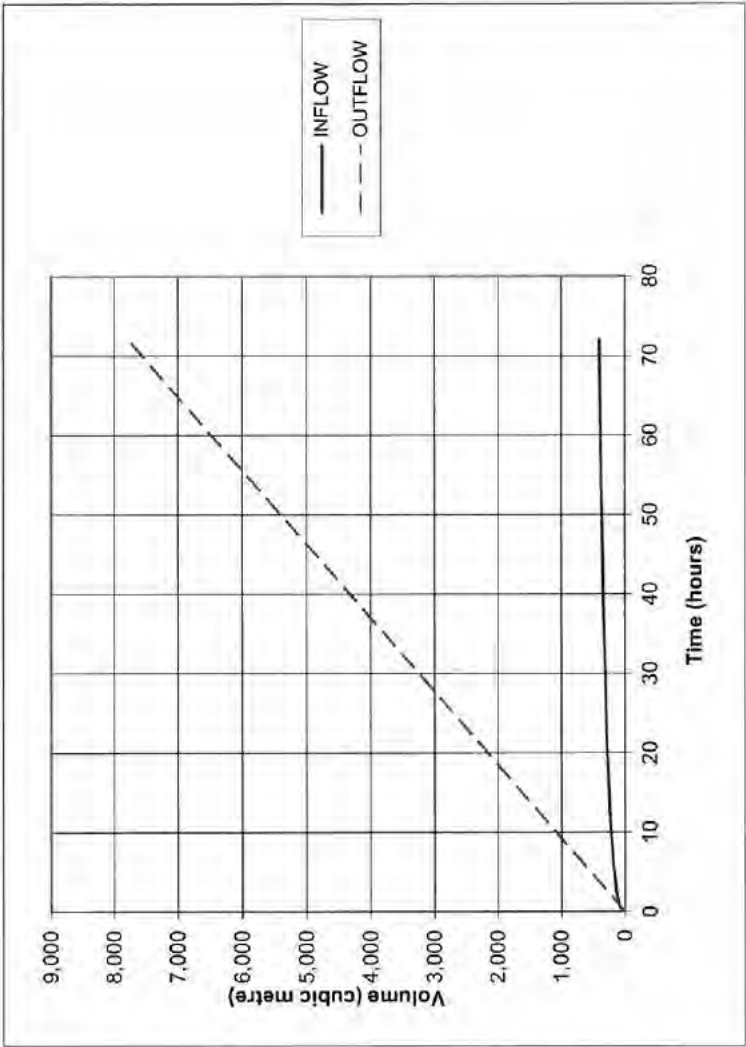
Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

|  |  |   |  |
|--|--|---|--|
| <b>Location</b> :  : CHITTERING :  |  | <b>Storm Duration</b> :  : 24 hours :     |  |
| <b>Storm Event</b> :  : 10 year :  |  | <b>Design Intensity</b> :  : 3.5 mm/hr :  |  |
| Outflow Details  |  |   |  |
| <b>Catchment Details</b>   |  | <b>Soil Characteristics</b> : Fine Sand :    |  |
| <b>Catchment Area</b> : 4,303 m <sup>2</sup>   |  | <b>Infiltration Rate</b> : 0.0001 m/s → 0.03 m <sup>3</sup> /s (Total Soakage)  |  |
| <b>Run-off Coefficient</b> : 0.80  |  | <b>Additional Outlet</b> : 0.000 m <sup>3</sup> /s  |  |
| <b>Flow Rate</b> : 3.4 L/s   |  |   |  |
| Storage Details  |  |   |  |
| <b>Volume Required at 14 minutes</b> : 30 m <sup>3</sup>   |  | <b>Freeboard</b> : 0 mm :    |  |
| <b>Total Surface Area no freeboard</b> : 318 m <sup>2</sup>  |  | <b>Batter/Slope</b> : 1 in 3 :   |  |
| <b>Total Base Area</b> : 300 m <sup>2</sup>  |  | <b>Depth</b> : 0.096 m  |  |

PERITAS CIVIL PTY LTD







| TIME     | INFLOW<br>m³ | OUTFLOW                   |                        | STORAGE<br>m³ |
|----------|--------------|---------------------------|------------------------|---------------|
|          |              | Ground Infiltration<br>m³ | Allowable Outlet<br>m³ |               |
| 6 min.   | 36           | 11                        | 0                      | 25            |
| 9 min.   | 44           | 16                        | 0                      | 28            |
| 12 min.  | 51           | 22                        | 0                      | 30            |
| 15 min.  | 57           | 27                        | 0                      | 30            |
| 20 min.  | 64           | 36                        | 0                      | 28            |
| 30 min.  | 75           | 54                        | 0                      | 21            |
| 45 min.  | 86           | 81                        | 0                      | 5             |
| 1 hour   | 94           | 108                       | 0                      | -14           |
| 2 hours  | 122          | 216                       | 0                      | -94           |
| 3 hours  | 141          | 324                       | 0                      | -183          |
| 6 hours  | 180          | 648                       | 0                      | -468          |
| 10 hours | 217          | 1,080                     | 0                      | -863          |
| 12 hours | 231          | 1,296                     | 0                      | -1,065        |
| 24 hours | 293          | 2,592                     | 0                      | -2,299        |
| 48 hours | 361          | 5,184                     | 0                      | -4,823        |
| 60 hours | 382          | 6,480                     | 0                      | -6,098        |
| 72 hours | 397          | 7,776                     | 0                      | -7,379        |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

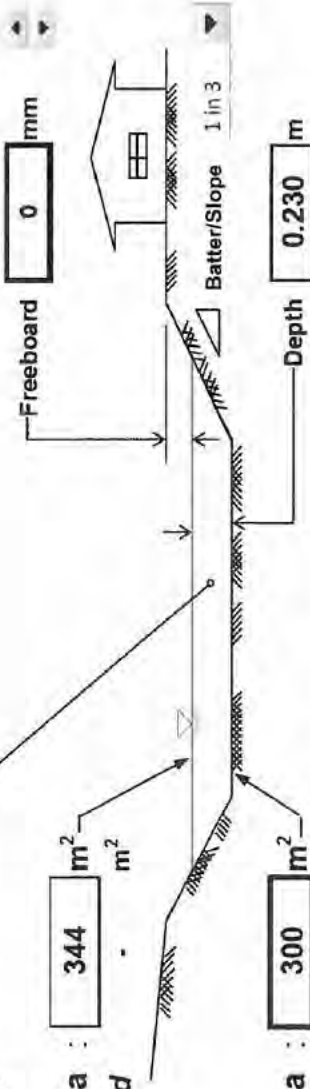
|   |  |                                     |  |
|---|--|-------------------------------------|--|
| <b>Location</b> :  : CHITTERING  |  | <b>Storm Duration</b> : 24 hours    |  |
| <b>Storm Event</b> :  : 100 year |  | <b>Design Intensity</b> : 5.6 mm/hr |  |

|                          |                        |   |   |
|--------------------------|------------------------|---|---|
| <b>Catchment Details</b> |                        | <b>Soil Characteristics</b> : Fine Sand |   |
| Catchment Area           | : 4,303 m <sup>2</sup> | Infiltration Rate                       | : 0.0001 m/s → 0.03 m <sup>3</sup> /s (Total Soakage) |
| Run-off Coefficient      | : 0.80                 | Additional Outlet                       | : 0.000 m <sup>3</sup> /s                             |
| Flow Rate                | : 5.3 L/s              |   |   |

|                                 |                      |
|---------------------------------|----------------------|
| <b>Storage Details</b>          |                      |
| Volume Required at 23 minutes   | : 74 m <sup>3</sup>  |
| Total Surface Area no freeboard | : 344 m <sup>2</sup> |
| Total Base Area                 | : 300 m <sup>2</sup> |

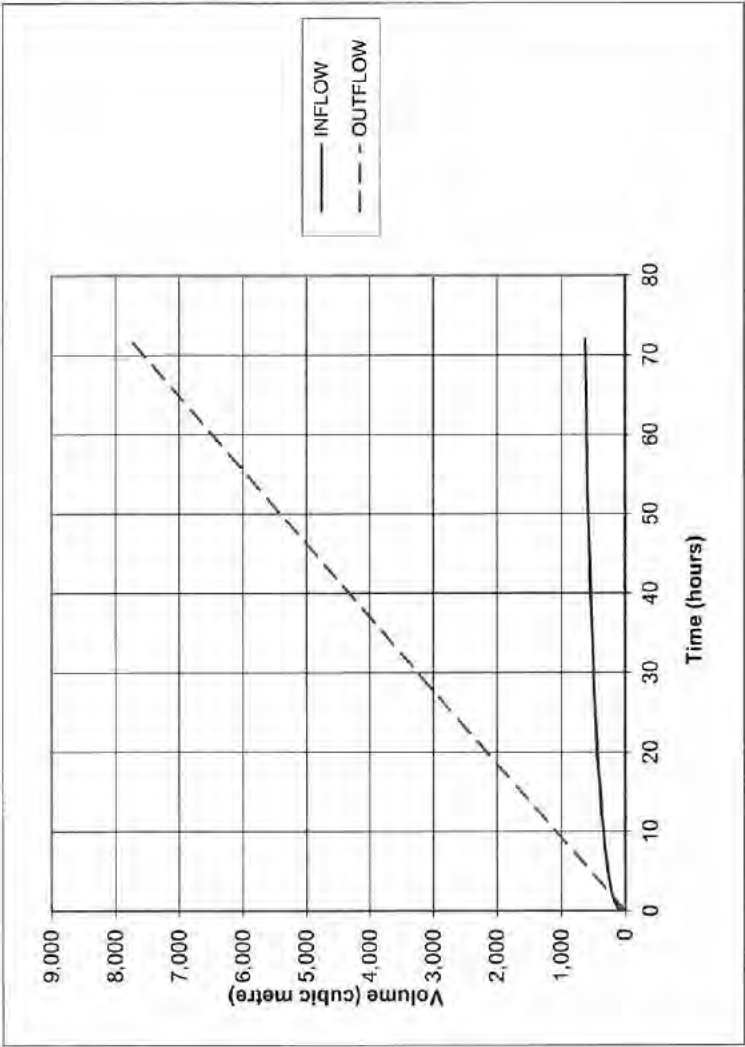
Freeboard : 0 mm

Batter/Slope : 1 in 3

Depth : 0.230 m

PERITAS CIVIL PTY LTD

PRINT DATE: 11/03/2016





| TIME     | INFLOW<br>m³ | OUTFLOW                   |                        | STORAGE<br>m³ |
|----------|--------------|---------------------------|------------------------|---------------|
|          |              | Ground Infiltration<br>m³ | Allowable Outlet<br>m³ |               |
| 6 min.   | 63           | 11                        | 0                      | 53            |
| 9 min.   | 78           | 16                        | 0                      | 62            |
| 12 min.  | 89           | 22                        | 0                      | 67            |
| 15 min.  | 98           | 27                        | 0                      | 71            |
| 20 min.  | 109          | 36                        | 0                      | 73            |
| 30 min.  | 126          | 54                        | 0                      | 72            |
| 45 min.  | 143          | 81                        | 0                      | 62            |
| 1 hour   | 155          | 108                       | 0                      | 47            |
| 2 hours  | 199          | 216                       | 0                      | -17           |
| 3 hours  | 228          | 324                       | 0                      | -96           |
| 6 hours  | 288          | 648                       | 0                      | -360          |
| 10 hours | 342          | 1,080                     | 0                      | -738          |
| 12 hours | 364          | 1,296                     | 0                      | -932          |
| 24 hours | 461          | 2,592                     | 0                      | -2,131        |
| 48 hours | 569          | 5,184                     | 0                      | -4,615        |
| 60 hours | 601          | 6,480                     | 0                      | -5,879        |
| 72 hours | 624          | 7,776                     | 0                      | -7,152        |

# SUMP/SWALE VOLUME CALCULATOR

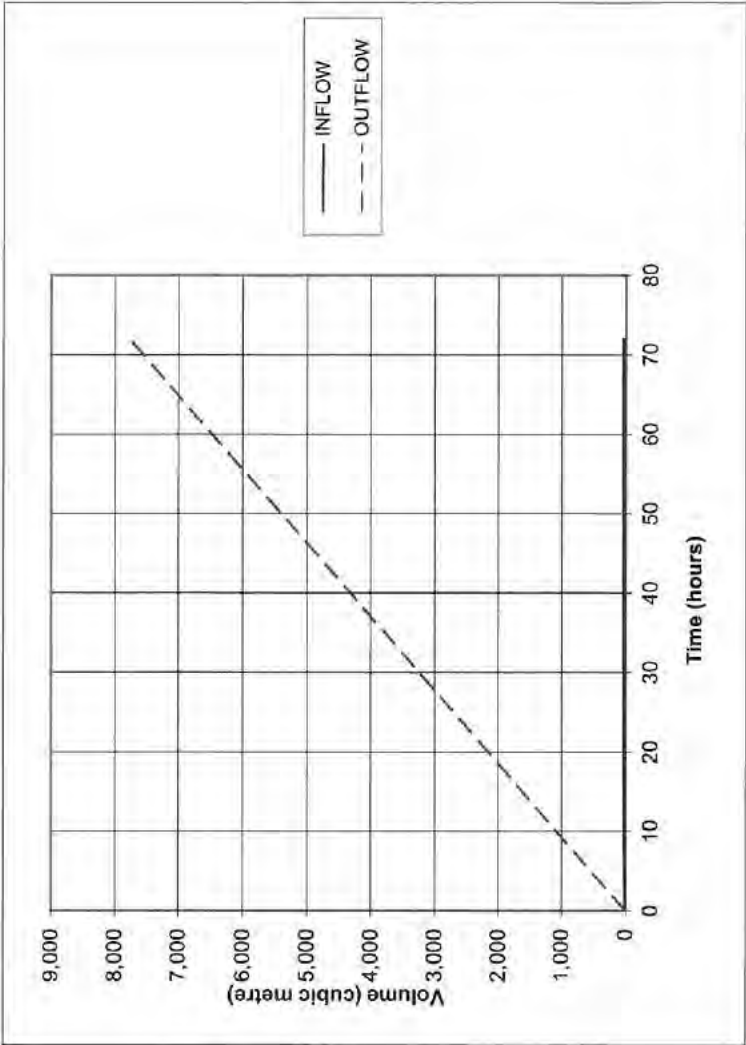
Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

|  |  |   |  |
|--|--|---|--|
| <b>Location</b> :  : CHITTERING |  | <b>Storm Duration</b> : 24 hours  |  |
| <b>Storm Event</b> :  : 1 year  |  | <b>Design Intensity</b> : 2.0 mm/hr                                     |  |
| Outflow Details  |  |   |  |
| <b>Catchment Details</b>   |  | <b>Soil Characteristics</b> : Fine Sand                                 |  |
| Catchment Area : 642 m <sup>2</sup>  |  | Infiltration Rate : 0.0001 m/s → 0.03 m <sup>3</sup> /s (Total Soakage) |  |
| Run-off Coefficient : 0.80   |  | Additional Outlet : 0.000 m <sup>3</sup> /s                             |  |
| Flow Rate : 0.3 L/s  |  |   |  |
| Storage Details  |  |   |  |
| <b>Volume Required</b> : 0 m <sup>3</sup>  |  | <b>Freeboard</b> : 0 mm   |  |
| <b>Total Surface Area</b> : 300 m <sup>2</sup><br>no freeboard   |  | <b>Batter/Slope</b> : 1 in 3  |  |
| <b>Total Base Area</b> : 300 m <sup>2</sup>  |  | <b>Depth</b> : 0.000 m  |  |

PERITAS CIVIL PTY LTD









| TIME     | INFLOW<br>m³ | OUTFLOW                   |                        | STORAGE<br>m³ |
|----------|--------------|---------------------------|------------------------|---------------|
|          |              | Ground Infiltration<br>m³ | Allowable Outlet<br>m³ |               |
| 6 min.   | 3            | 11                        | 0                      | -8            |
| 9 min.   | 3            | 16                        | 0                      | -13           |
| 12 min.  | 4            | 22                        | 0                      | -18           |
| 15 min.  | 4            | 27                        | 0                      | -23           |
| 20 min.  | 5            | 36                        | 0                      | -31           |
| 30 min.  | 6            | 54                        | 0                      | -48           |
| 45 min.  | 7            | 81                        | 0                      | -74           |
| 1 hour   | 8            | 108                       | 0                      | -100          |
| 2 hours  | 10           | 216                       | 0                      | -206          |
| 3 hours  | 12           | 324                       | 0                      | -312          |
| 6 hours  | 15           | 648                       | 0                      | -633          |
| 10 hours | 18           | 1,080                     | 0                      | -1,062        |
| 12 hours | 20           | 1,296                     | 0                      | -1,276        |
| 24 hours | 25           | 2,592                     | 0                      | -2,567        |
| 48 hours | 30           | 5,184                     | 0                      | -5,154        |
| 60 hours | 32           | 6,480                     | 0                      | -6,448        |
| 72 hours | 33           | 7,776                     | 0                      | -7,743        |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

|   |  |
|---|--|
| <b>Location</b><br> : CHITTING   | <b>Storm Duration</b><br> : 24 hours    |
| <b>Storm Event</b><br> : 10 year | <b>Design Intensity</b><br> : 3.5 mm/hr |

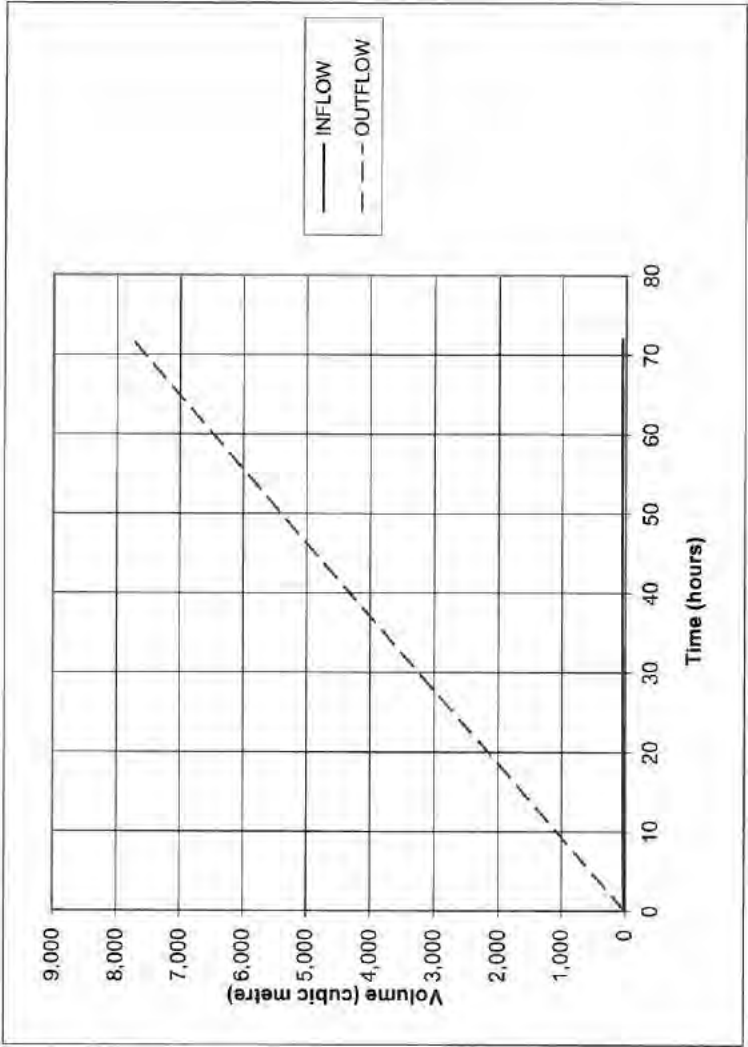
|  |  |
|--|--|
| <b>Catchment Details</b>   | <b>Soil Characteristics</b>  |
| Catchment Area : 642 m <sup>2</sup><br>Run-off Coefficient : 0.80<br>Flow Rate : 0.5 L/s | Infiltration Rate : 0.0001 m/s → 0.03 m <sup>3</sup> /s (Total Soakage)<br>Additional Outlet : 0.000 m <sup>3</sup> /s |

|   |  |
|---|--|
| <b>Storage Details</b>  | <b>Outflow Details</b>                                       |
| Volume Required : 0 m <sup>3</sup><br>Total Surface Area : 300 m <sup>2</sup><br>no freeboard<br>Total Base Area : 300 m <sup>2</sup> | Freeboard : 0 mm<br>Batter/Slope : 1 in 3<br>Depth : 0.000 m |

PERITAS CIVIL PTY LTD









| TIME     | INFLOW<br>m³ | OUTFLOW                   |                        | STORAGE<br>m³ |
|----------|--------------|---------------------------|------------------------|---------------|
|          |              | Ground Infiltration<br>m³ | Allowable Outlet<br>m³ |               |
| 6 min.   | 5            | 11                        | 0                      | -5            |
| 9 min.   | 7            | 16                        | 0                      | -10           |
| 12 min.  | 8            | 22                        | 0                      | -14           |
| 15 min.  | 8            | 27                        | 0                      | -19           |
| 20 min.  | 10           | 36                        | 0                      | -26           |
| 30 min.  | 11           | 54                        | 0                      | -43           |
| 45 min.  | 13           | 81                        | 0                      | -68           |
| 1 hour   | 14           | 108                       | 0                      | -94           |
| 2 hours  | 18           | 216                       | 0                      | -198          |
| 3 hours  | 21           | 324                       | 0                      | -303          |
| 6 hours  | 27           | 648                       | 0                      | -621          |
| 10 hours | 32           | 1,080                     | 0                      | -1,048        |
| 12 hours | 35           | 1,296                     | 0                      | -1,261        |
| 24 hours | 44           | 2,592                     | 0                      | -2,548        |
| 48 hours | 54           | 5,184                     | 0                      | -5,130        |
| 60 hours | 57           | 6,480                     | 0                      | -6,423        |
| 72 hours | 59           | 7,776                     | 0                      | -7,717        |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

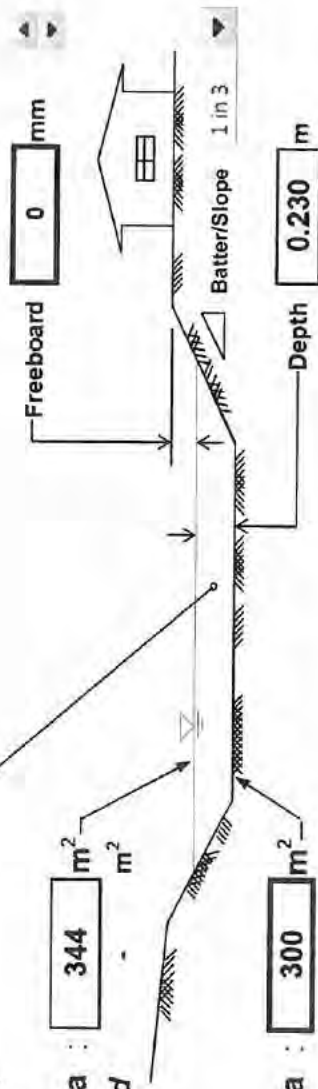
|   |  |   |  |
|---|--|---|--|
| <b>Location</b> :  : CHITTING    |  | <b>Storm Duration</b> :  : 24 hours    |  |
| <b>Storm Event</b> :  : 100 year |  | <b>Design Intensity</b> :  : 5.6 mm/hr |  |

|                              |                      |                             |   |
|------------------------------|----------------------|-----------------------------|---|
| <b>Catchment Details</b>     |                      | <b>Soil Characteristics</b> |   |
| <b>Catchment Area</b> :      | 4,303 m <sup>2</sup> | <b>Infiltration Rate</b> :  | 0.0001 m/s → 0.03 m <sup>3</sup> /s (Total Soakage) |
| <b>Run-off Coefficient</b> : | 0.80                 | <b>Additional Outlet</b> :  | 0.000 m <sup>3</sup> /s                             |
| <b>Flow Rate</b> :           | 5.3 L/s              |                             |   |

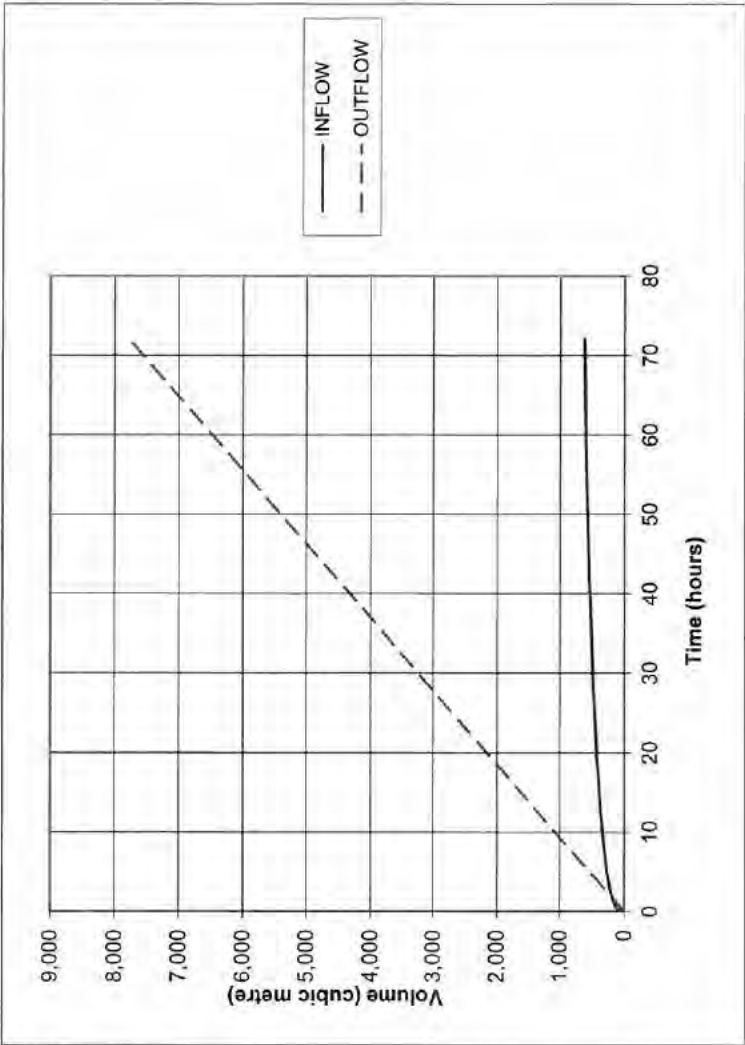
  

|  |                    |
|--|--------------------|
| <b>Storage Details</b>                   |                    |
| <b>Volume Required at 23 minutes</b> :   | 74 m <sup>3</sup>  |
| <b>Total Surface Area no freeboard</b> : | 344 m <sup>2</sup> |
| <b>Total Base Area</b> :                 | 300 m <sup>2</sup> |

The diagram illustrates a swale cross-section. A house is shown on the left. The swale has a freeboard of 0 mm. The batter/slope is 1 in 3. The depth of the swale is 0.230 m. The swale is shown with a freeboard and a batter/slope.

PERITAS CIVIL PTY LTD







| TIME     | INFLOW         | OUTFLOW             |                  | STORAGE        |
|----------|----------------|---------------------|------------------|----------------|
|          |                | Ground Infiltration | Allowable Outlet |                |
|          | m <sup>3</sup> | m <sup>3</sup>      | m <sup>3</sup>   | m <sup>3</sup> |
| 6 min.   | 63             | 11                  | 0                | 53             |
| 9 min.   | 78             | 16                  | 0                | 62             |
| 12 min.  | 89             | 22                  | 0                | 67             |
| 15 min.  | 98             | 27                  | 0                | 71             |
| 20 min.  | 109            | 36                  | 0                | 73             |
| 30 min.  | 126            | 54                  | 0                | 72             |
| 45 min.  | 143            | 81                  | 0                | 62             |
| 1 hour   | 155            | 108                 | 0                | 47             |
| 2 hours  | 199            | 216                 | 0                | -17            |
| 3 hours  | 228            | 324                 | 0                | -96            |
| 6 hours  | 288            | 648                 | 0                | -360           |
| 10 hours | 342            | 1,080               | 0                | -738           |
| 12 hours | 364            | 1,296               | 0                | -932           |
| 24 hours | 461            | 2,592               | 0                | -2,131         |
| 48 hours | 569            | 5,184               | 0                | -4,615         |
| 60 hours | 601            | 6,480               | 0                | -5,879         |
| 72 hours | 624            | 7,776               | 0                | -7,152         |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

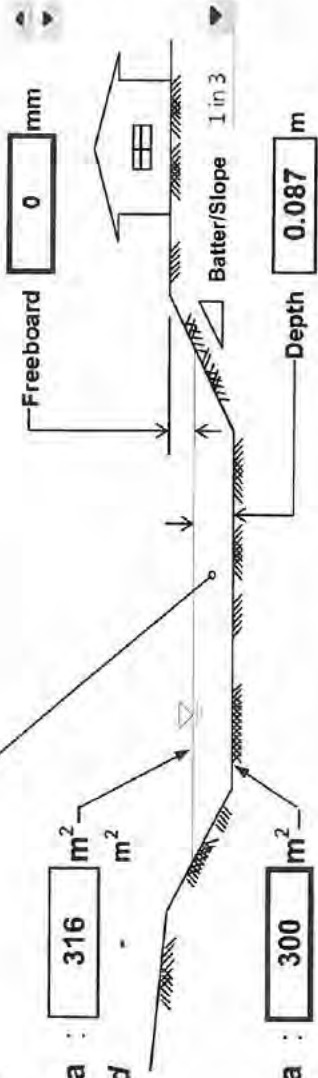
|  |  |
|--|--|
| <b>Location</b><br> : CHITTING  | <b>Storm Duration</b><br> : 24 hours    |
| <b>Storm Event</b><br> : 1 year | <b>Design Intensity</b><br> : 2.0 mm/hr |

|  |  |
|--|--|
| <b>Catchment Details</b>                     | <b>Soil Characteristics</b>  |
| <b>Catchment Area</b> : 8,092 m <sup>2</sup> | <b>Infiltration Rate</b> : 0.0001 m/s → 0.03 m <sup>3</sup> /s (Total Soakage) |
| <b>Run-off Coefficient</b> : 0.80            | <b>Additional Outlet</b> : 0.000 m <sup>3</sup> /s                             |
| <b>Flow Rate</b> : 3.6 L/s                   |  |

|   |
|---|
| <b>Storage Details</b>                                      |
| <b>Volume Required at 14 minutes</b> : 27 m <sup>3</sup>    |
| <b>Total Surface Area no freeboard</b> : 316 m <sup>2</sup> |
| <b>Total Base Area</b> : 300 m <sup>2</sup>                 |

Freeboard : 0 mm

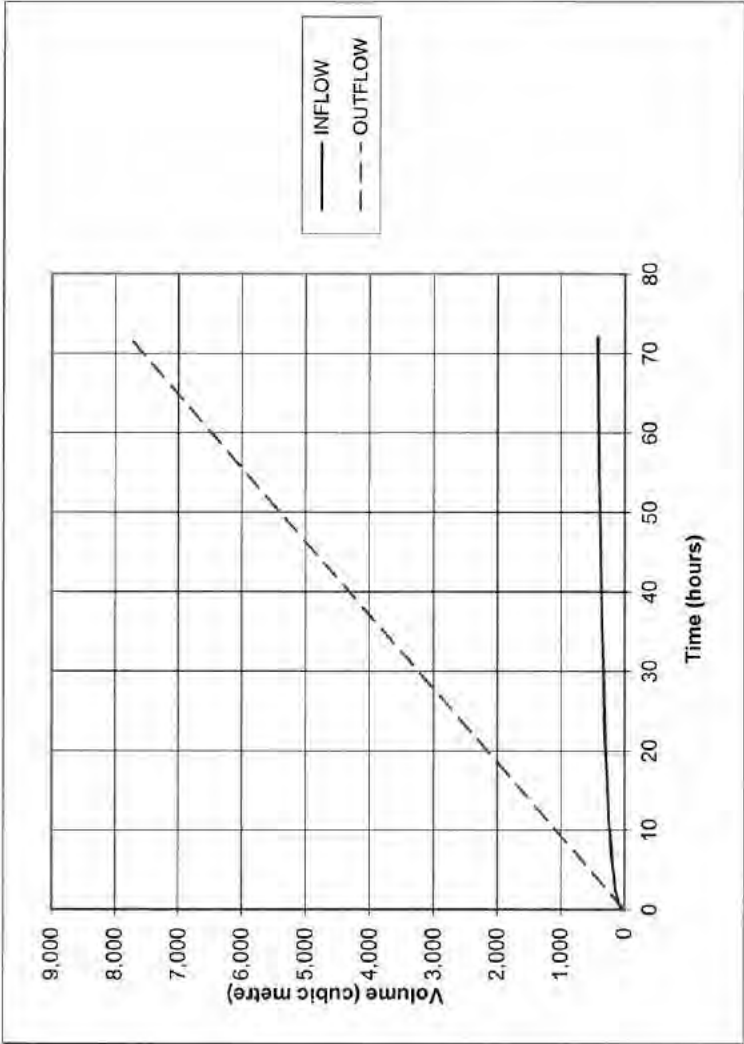
Batter/Slope : 1 in 3

Depth : 0.087 m

PERITAS CIVIL PTY LTD

PRINT DATE: 11/03/2016







| TIME     | INFLOW<br>m³ | OUTFLOW                   |                        | STORAGE<br>m³ |
|----------|--------------|---------------------------|------------------------|---------------|
|          |              | Ground Infiltration<br>m³ | Allowable Outlet<br>m³ |               |
| 6 min.   | 33           | 11                        | 0                      | 22            |
| 9 min.   | 41           | 16                        | 0                      | 25            |
| 12 min.  | 48           | 22                        | 0                      | 27            |
| 15 min.  | 54           | 27                        | 0                      | 27            |
| 20 min.  | 61           | 36                        | 0                      | 25            |
| 30 min.  | 73           | 54                        | 0                      | 19            |
| 45 min.  | 85           | 81                        | 0                      | 4             |
| 1 hour   | 95           | 108                       | 0                      | -13           |
| 2 hours  | 125          | 216                       | 0                      | -91           |
| 3 hours  | 145          | 324                       | 0                      | -179          |
| 6 hours  | 189          | 648                       | 0                      | -459          |
| 10 hours | 231          | 1,080                     | 0                      | -849          |
| 12 hours | 246          | 1,296                     | 0                      | -1,050        |
| 24 hours | 312          | 2,592                     | 0                      | -2,280        |
| 48 hours | 384          | 5,184                     | 0                      | -4,800        |
| 60 hours | 406          | 6,480                     | 0                      | -6,074        |
| 72 hours | 422          | 7,776                     | 0                      | -7,354        |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

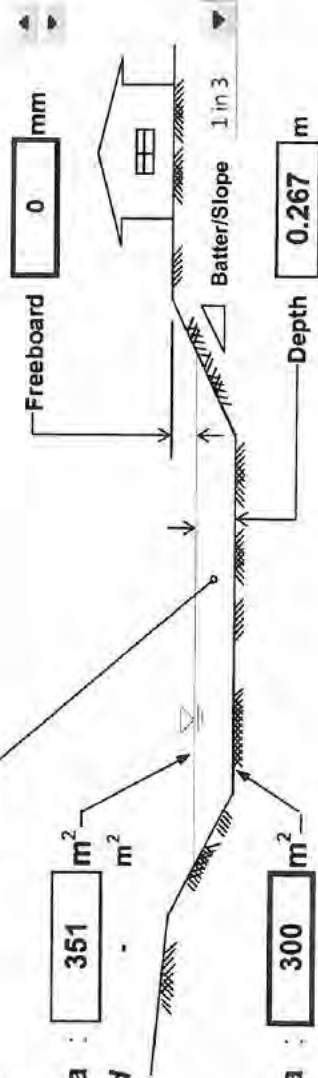
|  |  |                                     |  |
|--|--|-------------------------------------|--|
| <b>Location</b> :  : CHITTERING |  | <b>Storm Duration</b> : 24 hours    |  |
| <b>Storm Event</b> :  : 10 year |  | <b>Design Intensity</b> : 3.5 mm/hr |  |

|                              |                      |                               |   |
|------------------------------|----------------------|-------------------------------|---|
| <b>Catchment Details</b>     |                      | <b>Outflow Details</b>        |   |
| <b>Catchment Area</b> :      | 8,092 m <sup>2</sup> | <b>Soil Characteristics</b> : | Fine Sand   |
| <b>Run-off Coefficient</b> : | 0.80                 | <b>Infiltration Rate</b> :    | 0.0001 m/s → 0.03 m <sup>3</sup> /s (Total Soakage) |
| <b>Flow Rate</b> :           | 6.4 L/s              | <b>Additional Outlet</b> :    | 0.000 m <sup>3</sup> /s                             |

|  |                    |
|--|--------------------|
| <b>Storage Details</b>                   |                    |
| <b>Volume Required at 28 minutes</b> :   | 87 m <sup>3</sup>  |
| <b>Total Surface Area no freeboard</b> : | 351 m <sup>2</sup> |
| <b>Total Base Area</b> :                 | 300 m <sup>2</sup> |

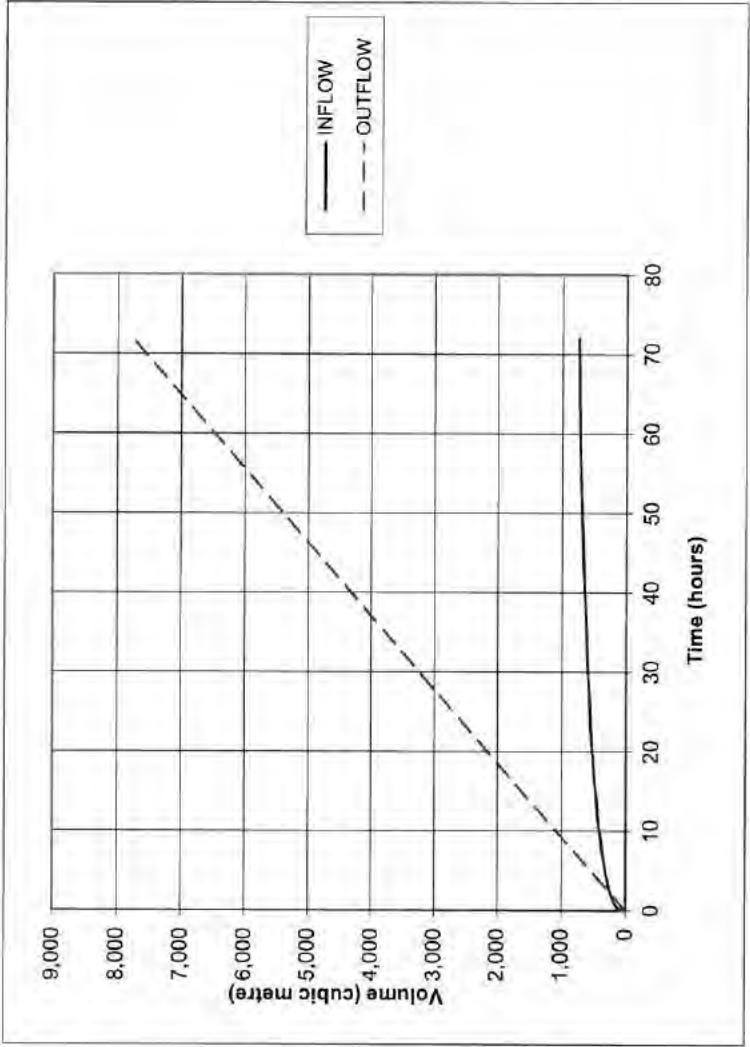
  


The diagram illustrates a swale cross-section adjacent to a house. Key components labeled include: Freeboard (0 mm), Batter/Slope (1 in 3), and Depth (0.267 m). Arrows indicate the flow path from the house into the swale.

PERITAS CIVIL PTY LTD

PRINT DATE: 11/03/2016









| TIME     | INFLOW<br>m³ | OUTFLOW                      |                           | STORAGE<br>m³ |
|----------|--------------|------------------------------|---------------------------|---------------|
|          |              | Ground<br>Infiltration<br>m³ | Allowable<br>Outlet<br>m³ |               |
| 6 min.   | 67           | 11                           | 0                         | 57            |
| 9 min.   | 84           | 16                           | 0                         | 67            |
| 12 min.  | 96           | 22                           | 0                         | 75            |
| 15 min.  | 107          | 27                           | 0                         | 80            |
| 20 min.  | 120          | 36                           | 0                         | 84            |
| 30 min.  | 141          | 54                           | 0                         | 87            |
| 45 min.  | 162          | 81                           | 0                         | 81            |
| 1 hour   | 177          | 108                          | 0                         | 69            |
| 2 hours  | 230          | 216                          | 0                         | 14            |
| 3 hours  | 265          | 324                          | 0                         | -59           |
| 6 hours  | 339          | 648                          | 0                         | -309          |
| 10 hours | 409          | 1,080                        | 0                         | -671          |
| 12 hours | 435          | 1,296                        | 0                         | -861          |
| 24 hours | 551          | 2,592                        | 0                         | -2,041        |
| 48 hours | 680          | 5,184                        | 0                         | -4,504        |
| 60 hours | 718          | 6,480                        | 0                         | -5,762        |
| 72 hours | 746          | 7,776                        | 0                         | -7,030        |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

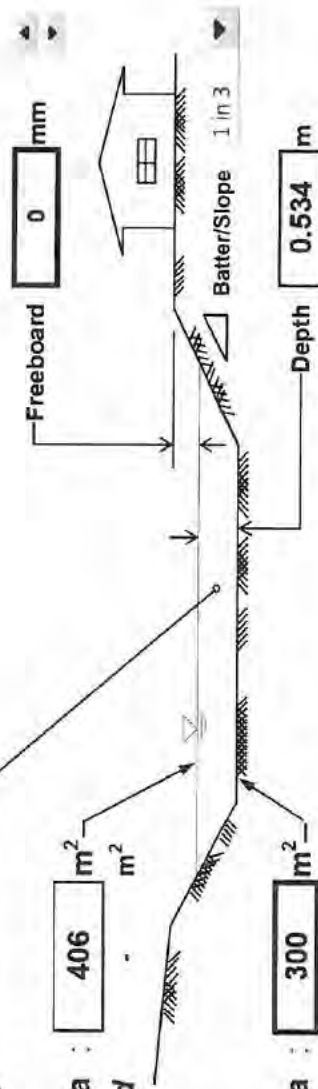
|  |  |
|--|--|
| <b>Location</b><br> : CHITTING    | <b>Storm Duration</b><br> : 24 hours    |
| <b>Storm Event</b><br> : 100 year | <b>Design Intensity</b><br> : 5.6 mm/hr |

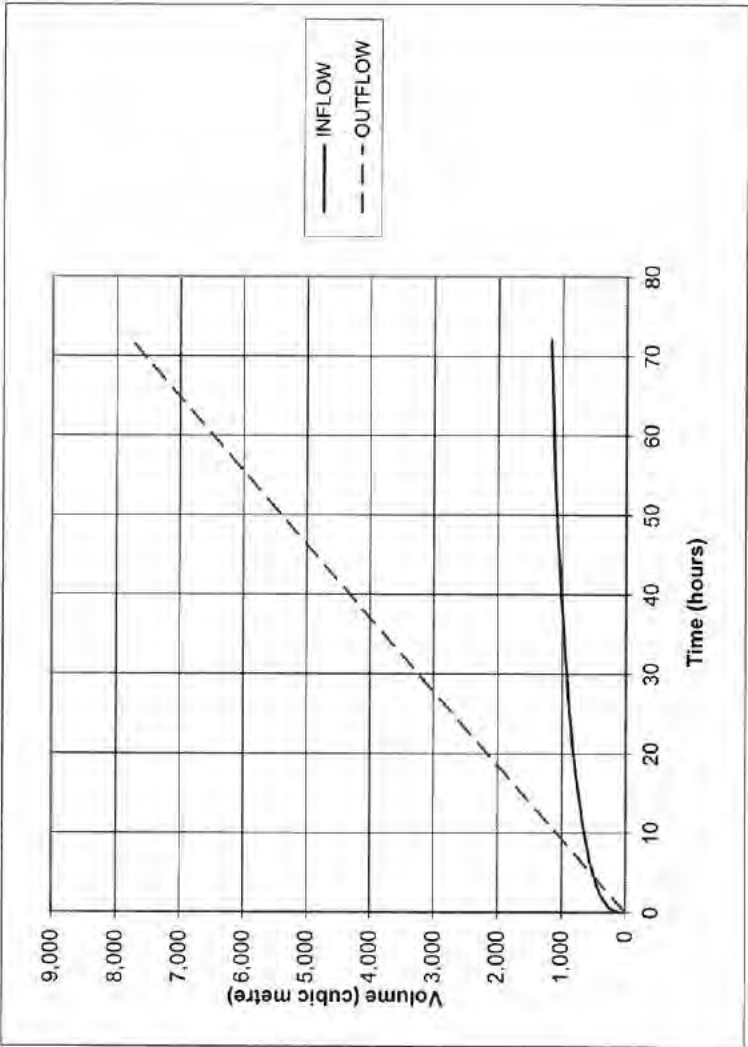
|  |  |
|--|--|
| <b>Catchment Details</b>                     | <b>Soil Characteristics</b>  |
| <b>Catchment Area</b> : 8,092 m <sup>2</sup> | <b>Infiltration Rate</b> : 0.0001 m/s → 0.03 m <sup>3</sup> /s (Total Soakage) |
| <b>Run-off Coefficient</b> : 0.80            | <b>Additional Outlet</b> : 0.000 m <sup>3</sup> /s                             |
| <b>Flow Rate</b> : 10.0 L/s                  |  |

|   |                              |
|---|------------------------------|
| <b>Storage Details</b>                                    | <b>Freeboard</b> : 0 mm      |
| <b>Volume Required at 44 minutes</b> : 188 m <sup>3</sup> | <b>Batter/Slope</b> : 1 in 3 |
| <b>Total Surface Area</b> : 406 m <sup>2</sup>            | <b>Depth</b> : 0.534 m       |
| <b>Total Base Area</b> : 300 m <sup>2</sup>               |                              |

PERITAS CIVIL PTY LTD





| TIME     | INFLOW<br>m³ | OUTFLOW                   |                        | STORAGE<br>m³ |
|----------|--------------|---------------------------|------------------------|---------------|
|          |              | Ground Infiltration<br>m³ | Allowable Outlet<br>m³ |               |
| 6 min.   | 119          | 11                        | 0                      | 108           |
| 9 min.   | 146          | 16                        | 0                      | 130           |
| 12 min.  | 167          | 22                        | 0                      | 146           |
| 15 min.  | 184          | 27                        | 0                      | 157           |
| 20 min.  | 206          | 36                        | 0                      | 170           |
| 30 min.  | 238          | 54                        | 0                      | 184           |
| 45 min.  | 269          | 81                        | 0                      | 188           |
| 1 hour   | 292          | 108                       | 0                      | 184           |
| 2 hours  | 374          | 216                       | 0                      | 158           |
| 3 hours  | 429          | 324                       | 0                      | 105           |
| 6 hours  | 541          | 648                       | 0                      | -107          |
| 10 hours | 643          | 1,080                     | 0                      | -437          |
| 12 hours | 685          | 1,296                     | 0                      | -611          |
| 24 hours | 867          | 2,592                     | 0                      | -1,725        |
| 48 hours | 1,070        | 5,184                     | 0                      | -4,114        |
| 60 hours | 1,130        | 6,480                     | 0                      | -5,350        |
| 72 hours | 1,174        | 7,776                     | 0                      | -6,602        |

C7\_Swale\_Drainage\_1yr

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

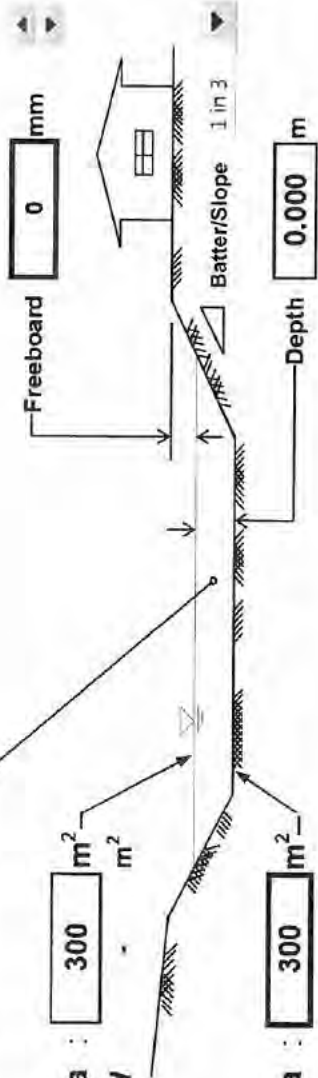
|   |  |                                     |  |
|---|--|-------------------------------------|--|
| <b>Location</b> :  : CHITTING  |  | <b>Storm Duration</b> : 24 hours    |  |
| <b>Storm Event</b> :  : 1 year |  | <b>Design Intensity</b> : 2.0 mm/hr |  |

|                          |                        |   |   |
|--------------------------|------------------------|---|---|
| <b>Catchment Details</b> |                        | <b>Soil Characteristics</b> : Fine Sand |   |
| Catchment Area           | : 2,278 m <sup>2</sup> | Infiltration Rate                       | : 0.0001 m/s → 0.03 m <sup>3</sup> /s (Total Soakage) |
| Run-off Coefficient      | : 0.80                 | Additional Outlet                       | : 0.000 m <sup>3</sup> /s                             |
| Flow Rate                | : 1.0 L/s              |   |   |

|                        |                      |
|------------------------|----------------------|
| <b>Storage Details</b> |                      |
| Volume Required        | : 0 m <sup>3</sup>   |
| Total Surface Area     | : 300 m <sup>2</sup> |
| no freeboard           |                      |
| Total Base Area        | : 300 m <sup>2</sup> |

Freeboard : 0 mm

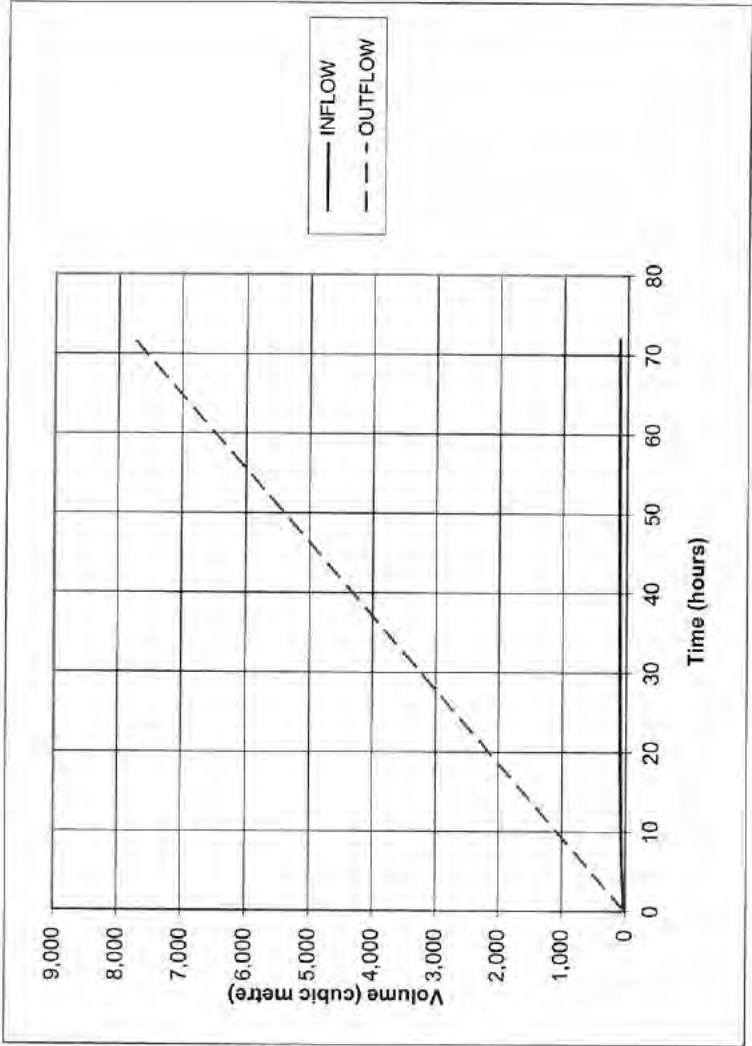
Batter/Slope : 1 in 3

Depth : 0.000 m

PERITAS CIVIL PTY LTD

PRINT DATE: 11/03/2016





| TIME     | INFLOW<br>m³ | OUTFLOW                   |                        | STORAGE<br>m³ |
|----------|--------------|---------------------------|------------------------|---------------|
|          |              | Ground Infiltration<br>m³ | Allowable Outlet<br>m³ |               |
| 6 min.   | 9            | 11                        | 0                      | -2            |
| 9 min.   | 12           | 16                        | 0                      | -5            |
| 12 min.  | 14           | 22                        | 0                      | -8            |
| 15 min.  | 15           | 27                        | 0                      | -12           |
| 20 min.  | 17           | 36                        | 0                      | -19           |
| 30 min.  | 21           | 54                        | 0                      | -33           |
| 45 min.  | 24           | 81                        | 0                      | -57           |
| 1 hour   | 27           | 108                       | 0                      | -81           |
| 2 hours  | 35           | 216                       | 0                      | -181          |
| 3 hours  | 41           | 324                       | 0                      | -283          |
| 6 hours  | 53           | 648                       | 0                      | -595          |
| 10 hours | 65           | 1,080                     | 0                      | -1,015        |
| 12 hours | 69           | 1,296                     | 0                      | -1,227        |
| 24 hours | 88           | 2,592                     | 0                      | -2,504        |
| 48 hours | 108          | 5,184                     | 0                      | -5,076        |
| 60 hours | 114          | 6,480                     | 0                      | -6,366        |
| 72 hours | 119          | 7,776                     | 0                      | -7,657        |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

|                              |  |                                     |  |
|------------------------------|--|-------------------------------------|--|
| <b>Location</b> : CHITTERING |  | <b>Storm Duration</b> : 24 hours    |  |
| <b>Storm Event</b> : 10 year |  | <b>Design Intensity</b> : 3.5 mm/hr |  |

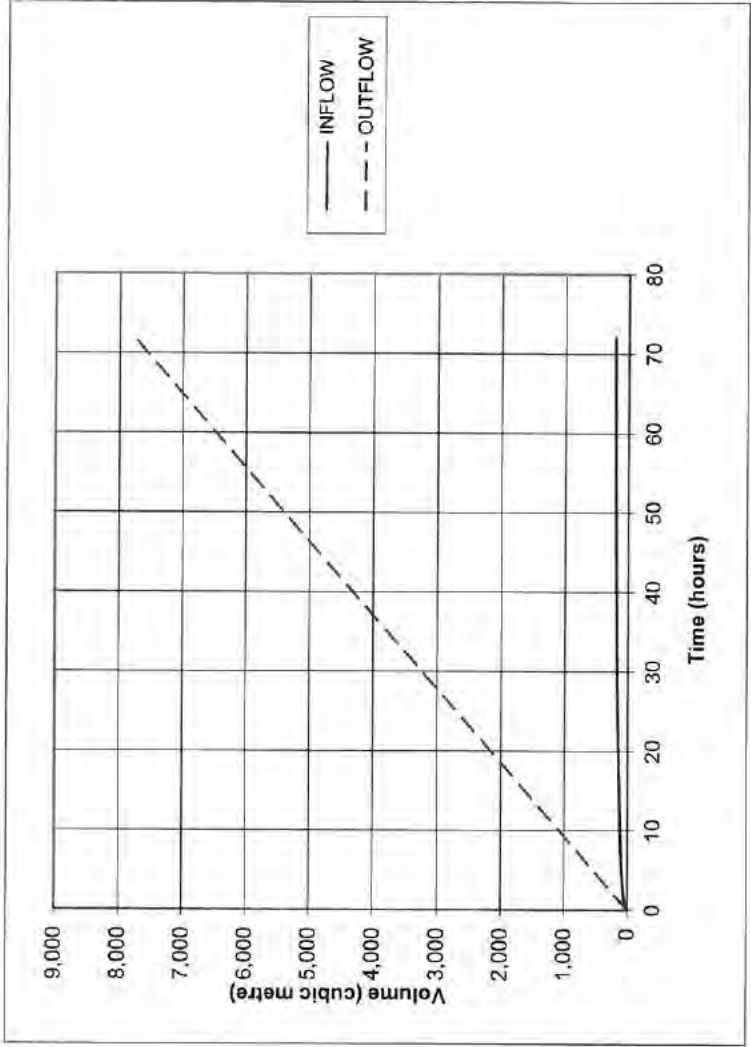
|  |                                   |  |  |
|--|-----------------------------------|--|--|
| <b>Catchment Details</b>                     |                                   | <b>Soil Characteristics</b> : Fine Sand            |  |
| <b>Catchment Area</b> : 2,278 m <sup>2</sup> | <b>Run-off Coefficient</b> : 0.80 | <b>Infiltration Rate</b> : 0.0001 m/s →            | <b>0.03 m<sup>3</sup>/s</b><br>(Total Soakage) |
| <b>Flow Rate</b> : 1.8 L/s                   |                                   | <b>Additional Outlet</b> : 0.000 m <sup>3</sup> /s |  |

|   |                              |
|---|------------------------------|
| <b>Storage Details</b>                                      |                              |
| <b>Volume Required at 6 minutes</b> : 8 m <sup>3</sup>      | <b>Freeboard</b> : 0 mm      |
| <b>Total Surface Area no freeboard</b> : 305 m <sup>2</sup> | <b>Batter/Slope</b> : 1 in 3 |
| <b>Total Base Area</b> : 300 m <sup>2</sup>                 | <b>Depth</b> : 0.027 m       |

PERITAS CIVIL PTY LTD









| TIME     | INFLOW<br>m³ | OUTFLOW                   |                        | STORAGE<br>m³ |
|----------|--------------|---------------------------|------------------------|---------------|
|          |              | Ground Infiltration<br>m³ | Allowable Outlet<br>m³ |               |
| 6 min.   | 19           | 11                        | 0                      | 8             |
| 9 min.   | 24           | 16                        | 0                      | 7             |
| 12 min.  | 27           | 22                        | 0                      | 5             |
| 15 min.  | 30           | 27                        | 0                      | 3             |
| 20 min.  | 34           | 36                        | 0                      | -2            |
| 30 min.  | 40           | 54                        | 0                      | -14           |
| 45 min.  | 46           | 81                        | 0                      | -35           |
| 1 hour   | 50           | 108                       | 0                      | -58           |
| 2 hours  | 65           | 216                       | 0                      | -151          |
| 3 hours  | 75           | 324                       | 0                      | -249          |
| 6 hours  | 96           | 648                       | 0                      | -552          |
| 10 hours | 115          | 1,080                     | 0                      | -965          |
| 12 hours | 123          | 1,296                     | 0                      | -1,173        |
| 24 hours | 155          | 2,592                     | 0                      | -2,437        |
| 48 hours | 191          | 5,184                     | 0                      | -4,993        |
| 60 hours | 202          | 6,480                     | 0                      | -6,278        |
| 72 hours | 210          | 7,776                     | 0                      | -7,566        |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

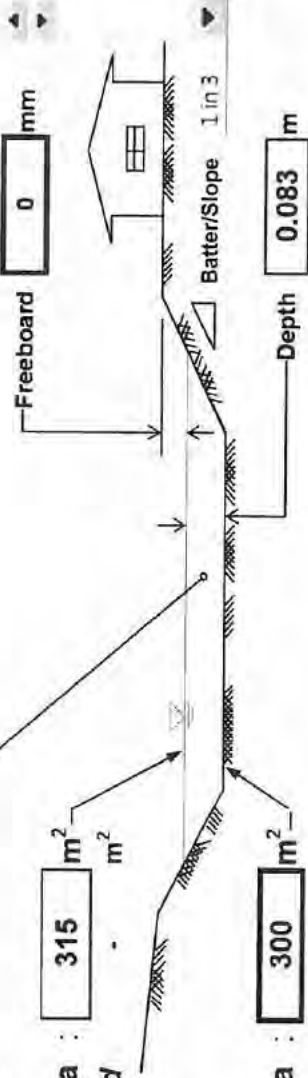
Design Rainfall Intensity

|  |  |
|--|--|
| <b>Location</b><br> : CHITTING    | <b>Storm Duration</b><br> : 24 hours    |
| <b>Storm Event</b><br> : 100 year | <b>Design Intensity</b><br> : 5.6 mm/hr |

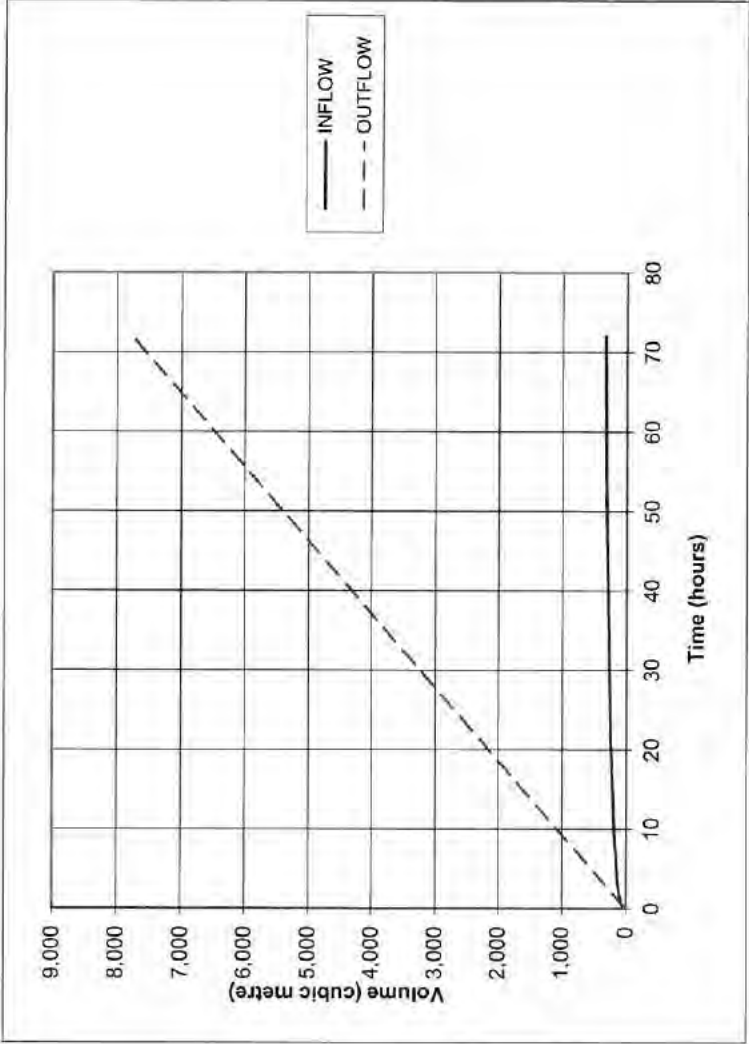
|  |  |
|--|--|
| <b>Catchment Details</b><br>Catchment Area : 2,278 m <sup>2</sup><br>Run-off Coefficient : 0.80<br>Flow Rate : 2.8 L/s | <b>Outflow Details</b><br>Soil Characteristics : Fine Sand<br>Infiltration Rate : 0.0001 m/s → 0.03 m <sup>3</sup> /s (Total Soakage)<br>Additional Outlet : 0.000 m <sup>3</sup> /s |
|--|--|

|  |  |
|--|--|
| <b>Storage Details</b><br>Volume Required at 12 minutes : 25 m <sup>3</sup><br>Total Surface Area : 315 m <sup>2</sup><br>no freeboard<br>Total Base Area : 300 m <sup>2</sup> |  |
|--|--|

PERITAS CIVIL PTY LTD





| TIME     | INFLOW         | OUTFLOW             |                  | STORAGE        |
|----------|----------------|---------------------|------------------|----------------|
|          |                | Ground Infiltration | Allowable Outlet |                |
|          | m <sup>3</sup> | m <sup>3</sup>      | m <sup>3</sup>   | m <sup>3</sup> |
| 6 min.   | 34             | 11                  | 0                | 23             |
| 9 min.   | 41             | 16                  | 0                | 25             |
| 12 min.  | 47             | 22                  | 0                | 25             |
| 15 min.  | 52             | 27                  | 0                | 25             |
| 20 min.  | 58             | 36                  | 0                | 22             |
| 30 min.  | 67             | 54                  | 0                | 13             |
| 45 min.  | 76             | 81                  | 0                | -5             |
| 1 hour   | 82             | 108                 | 0                | -26            |
| 2 hours  | 105            | 216                 | 0                | -111           |
| 3 hours  | 121            | 324                 | 0                | -203           |
| 6 hours  | 152            | 648                 | 0                | -496           |
| 10 hours | 181            | 1,080               | 0                | -899           |
| 12 hours | 193            | 1,296               | 0                | -1,103         |
| 24 hours | 244            | 2,592               | 0                | -2,348         |
| 48 hours | 301            | 5,184               | 0                | -4,883         |
| 60 hours | 318            | 6,480               | 0                | -6,162         |
| 72 hours | 331            | 7,776               | 0                | -7,445         |



# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

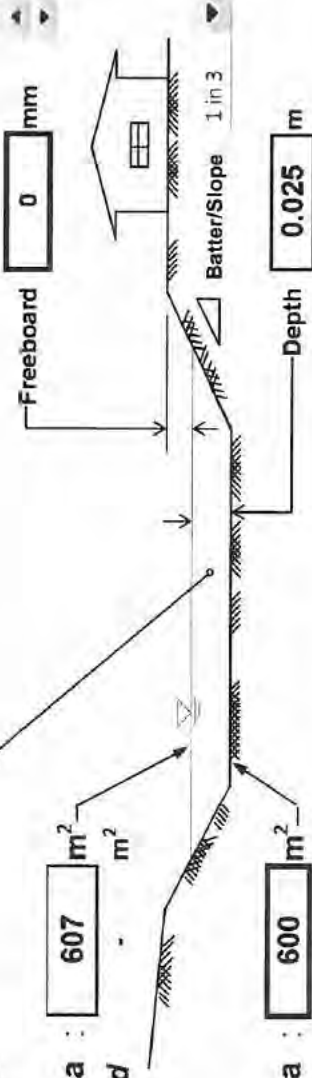
Design Rainfall Intensity

|   |  |
|---|--|
| <b>Location</b><br> : CHITTERING | <b>Storm Duration</b><br> : 24 hours    |
| <b>Storm Event</b><br> : 1 year  | <b>Design Intensity</b><br> : 2.0 mm/hr |

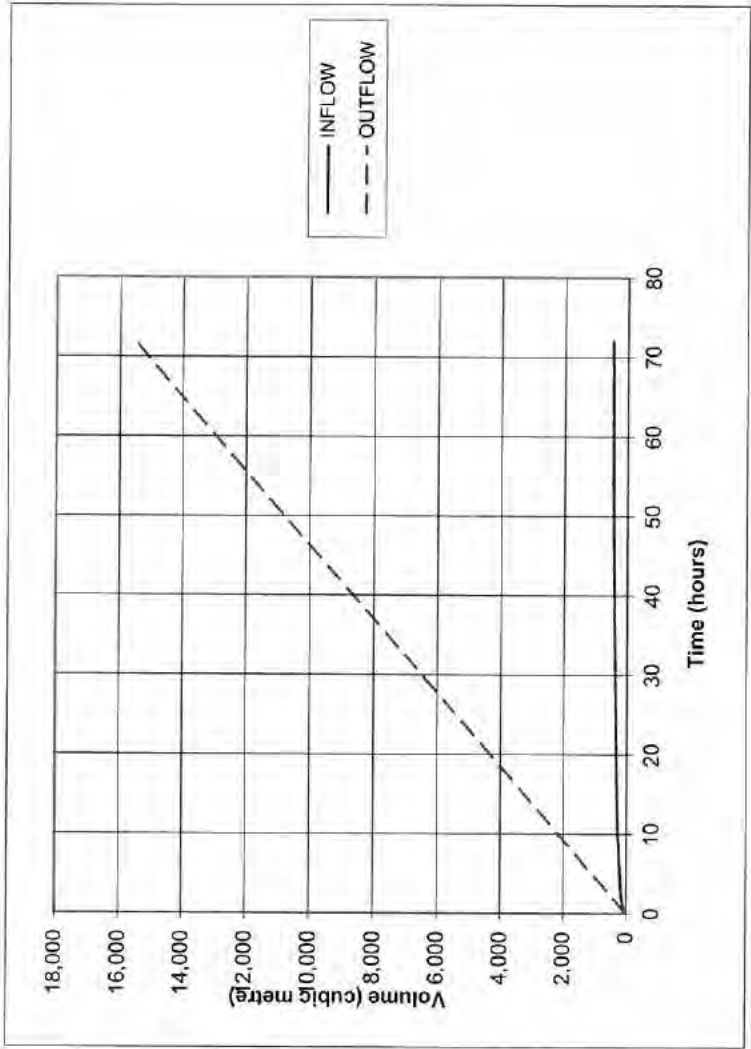
|   |   |
|---|---|
| <b>Catchment Details</b><br><b>Catchment Area</b> : 9,028 m <sup>2</sup><br><b>Run-off Coefficient</b> : 0.80<br><b>Flow Rate</b> : 4.0 L/s | <b>Soil Characteristics</b><br>Infiltration Rate : 0.0001 m/s → 0.06 m <sup>3</sup> /s (Total Soakage)<br>Additional Outlet : 0.000 m <sup>3</sup> /s |
|---|---|

|   |  |
|---|--|
| <b>Storage Details</b><br><b>Volume Required at 6 minutes</b> : 15 m <sup>3</sup><br><b>Total Surface Area no freeboard</b> : 607 m <sup>2</sup><br><b>Total Base Area</b> : 600 m <sup>2</sup> |  |
|---|--|

PERITAS CIVIL PTY LTD













| TIME     | INFLOW<br>m³ | OUTFLOW                   |                        | STORAGE<br>m³ |
|----------|--------------|---------------------------|------------------------|---------------|
|          |              | Ground Infiltration<br>m³ | Allowable Outlet<br>m³ |               |
| 6 min.   | 37           | 22                        | 0                      | 15            |
| 9 min.   | 46           | 32                        | 0                      | 14            |
| 12 min.  | 54           | 43                        | 0                      | 11            |
| 15 min.  | 60           | 54                        | 0                      | 6             |
| 20 min.  | 69           | 72                        | 0                      | -3            |
| 30 min.  | 81           | 108                       | 0                      | -27           |
| 45 min.  | 95           | 162                       | 0                      | -67           |
| 1 hour   | 106          | 216                       | 0                      | -110          |
| 2 hours  | 139          | 432                       | 0                      | -293          |
| 3 hours  | 162          | 648                       | 0                      | -486          |
| 6 hours  | 211          | 1,296                     | 0                      | -1,085        |
| 10 hours | 258          | 2,160                     | 0                      | -1,902        |
| 12 hours | 275          | 2,592                     | 0                      | -2,317        |
| 24 hours | 348          | 5,184                     | 0                      | -4,836        |
| 48 hours | 429          | 10,368                    | 0                      | -9,939        |
| 60 hours | 453          | 12,960                    | 0                      | -12,507       |
| 72 hours | 471          | 15,552                    | 0                      | -15,081       |

# SUMP/SWALE VOLUME CALCULATOR

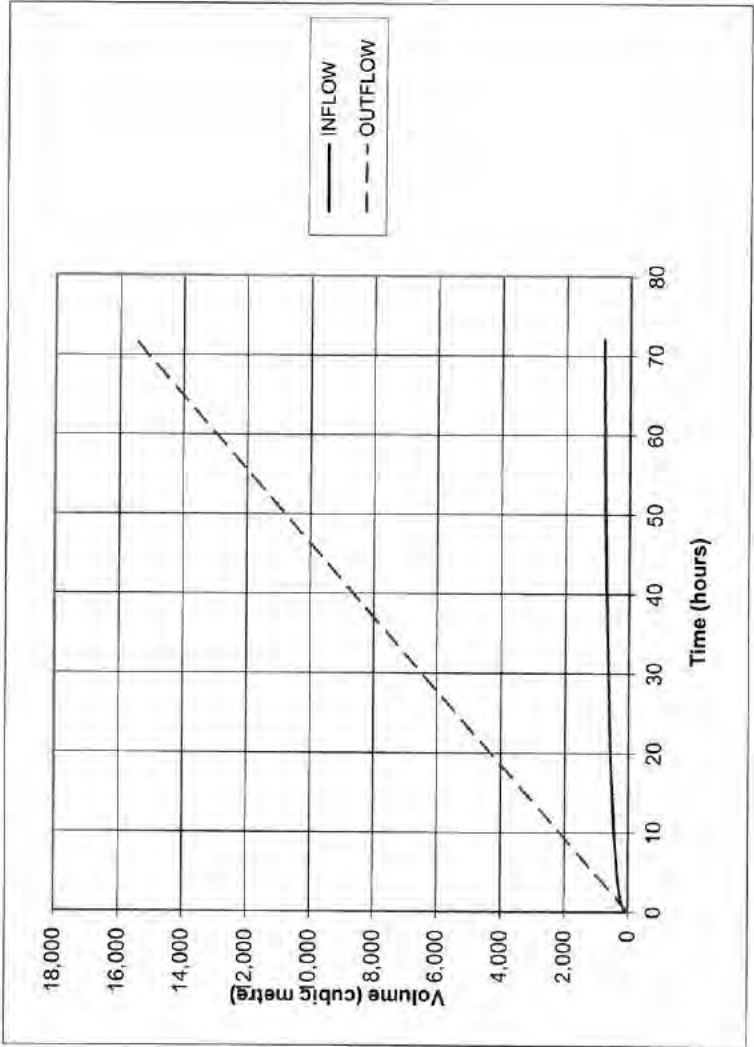
Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

|  |  |   |  |
|--|--|---|--|
| <b>Location</b> :  : CHITTERING :  |  | <b>Storm Duration</b> :  : 24 hours :     |  |
| <b>Storm Event</b> :  : 10 year :  |  | <b>Design Intensity</b> :  : 3.5 mm/hr :  |  |
| Outflow Details  |  |   |  |
| <b>Catchment Details</b>   |  | <b>Soil Characteristics</b>   |  |
| <b>Catchment Area</b> : 9,028 m <sup>2</sup>   |  | <b>Infiltration Rate</b> : 0.0001 m/s → 0.06 m <sup>3</sup> /s (Total Soakage)  |  |
| <b>Run-off Coefficient</b> : 0.80  |  | <b>Additional Outlet</b> : 0.000 m <sup>3</sup> /s  |  |
| <b>Flow Rate</b> : 7.1 L/s   |  |   |  |
| Storage Details  |  |   |  |
| <b>Volume Required at 15 minutes</b> : 65 m <sup>3</sup>   |  | <b>Freeboard</b> : 0 mm   |  |
| <b>Total Surface Area no freeboard</b> : 628 m <sup>2</sup>  |  | <b>Batter/Slope</b> : 1 in 3  |  |
| <b>Total Base Area</b> : 600 m <sup>2</sup>  |  | <b>Depth</b> : 0.106 m  |  |

PERITAS CIVIL PTY LTD







| TIME     | INFLOW<br>m³ | OUTFLOW                      |                           | STORAGE<br>m³ |
|----------|--------------|------------------------------|---------------------------|---------------|
|          |              | Ground<br>Infiltration<br>m³ | Allowable<br>Outlet<br>m³ |               |
| 6 min.   | 75           | 22                           | 0                         | 54            |
| 9 min.   | 93           | 32                           | 0                         | 61            |
| 12 min.  | 107          | 43                           | 0                         | 64            |
| 15 min.  | 119          | 54                           | 0                         | 65            |
| 20 min.  | 134          | 72                           | 0                         | 62            |
| 30 min.  | 157          | 108                          | 0                         | 49            |
| 45 min.  | 181          | 162                          | 0                         | 19            |
| 1 hour   | 198          | 216                          | 0                         | -18           |
| 2 hours  | 256          | 432                          | 0                         | -176          |
| 3 hours  | 296          | 648                          | 0                         | -352          |
| 6 hours  | 379          | 1,296                        | 0                         | -917          |
| 10 hours | 456          | 2,160                        | 0                         | -1,704        |
| 12 hours | 486          | 2,592                        | 0                         | -2,106        |
| 24 hours | 615          | 5,184                        | 0                         | -4,569        |
| 48 hours | 758          | 10,368                       | 0                         | -9,610        |
| 60 hours | 801          | 12,960                       | 0                         | -12,159       |
| 72 hours | 832          | 15,552                       | 0                         | -14,720       |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

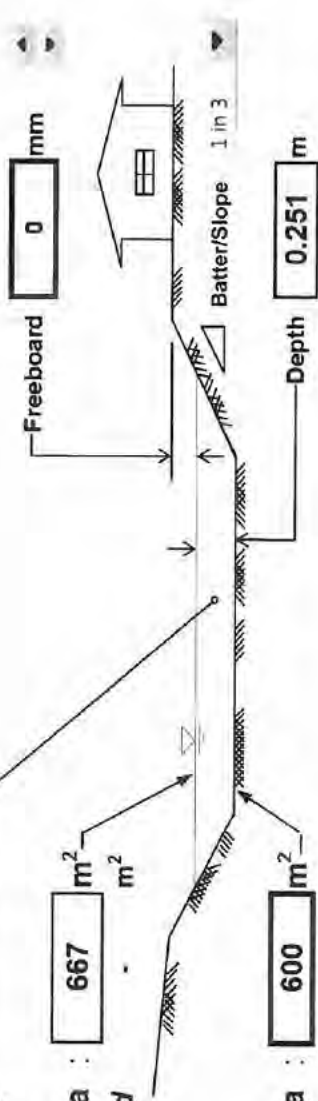
Design Rainfall Intensity

|   |  |                                     |  |
|---|--|-------------------------------------|--|
| <b>Location</b> :  : CHITTING    |  | <b>Storm Duration</b> : 24 hours    |  |
| <b>Storm Event</b> :  : 100 year |  | <b>Design Intensity</b> : 5.6 mm/hr |  |

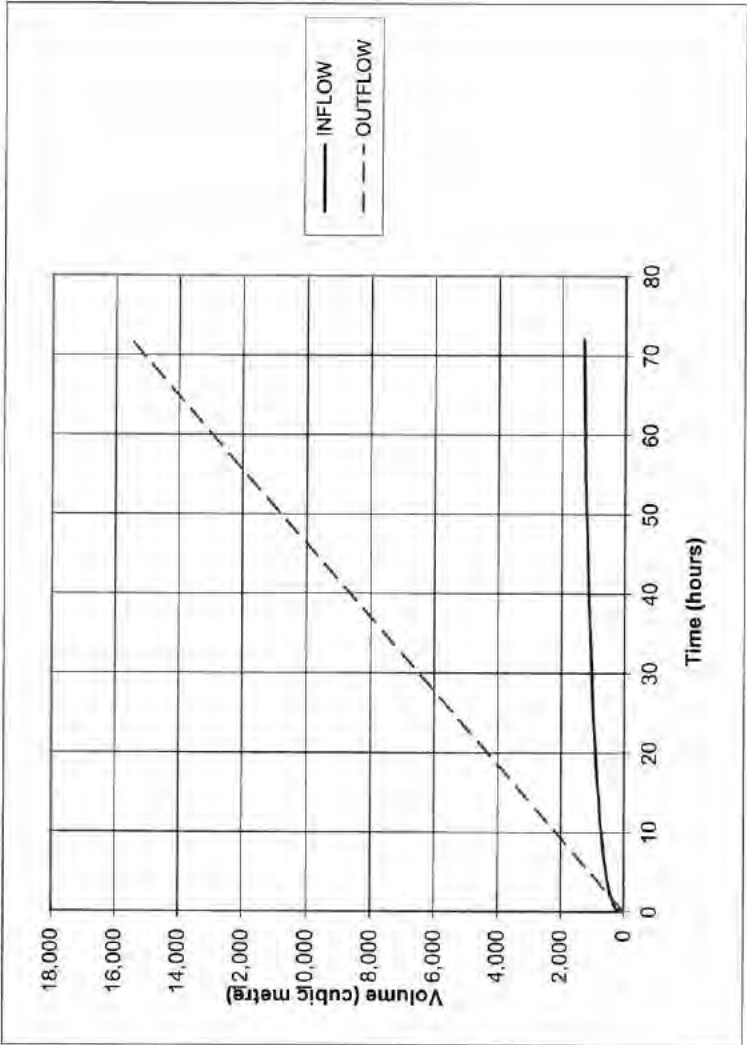
  

|  |                                   |  |  |
|--|-----------------------------------|--|--|
| <b>Catchment Details</b>                     |                                   | <b>Soil Characteristics</b> : Fine Sand            |  |
| <b>Catchment Area</b> : 9,028 m <sup>2</sup> | <b>Run-off Coefficient</b> : 0.80 | <b>Infiltration Rate</b> : 0.0001 m/s →            | <b>0.06 m<sup>3</sup>/s</b><br>(Total Soakage) |
| <b>Flow Rate</b> : 11.2 L/s                  |                                   | <b>Additional Outlet</b> : 0.000 m <sup>3</sup> /s |  |

|   |  |
|---|--|
| <b>Storage Details</b>                                      |  |
| <b>Volume Required at 24 minutes</b> : 159 m <sup>3</sup>   |  |
| <b>Total Surface Area no freeboard</b> : 667 m <sup>2</sup> |  |
| <b>Total Base Area</b> : 600 m <sup>2</sup>                 |  |

PERITAS CIVIL PTY LTD







| TIME     | INFLOW<br>m³ | OUTFLOW                   |                        | STORAGE<br>m³ |
|----------|--------------|---------------------------|------------------------|---------------|
|          |              | Ground Infiltration<br>m³ | Allowable Outlet<br>m³ |               |
| 6 min.   | 133          | 22                        | 0                      | 111           |
| 9 min.   | 163          | 32                        | 0                      | 131           |
| 12 min.  | 187          | 43                        | 0                      | 143           |
| 15 min.  | 205          | 54                        | 0                      | 151           |
| 20 min.  | 230          | 72                        | 0                      | 158           |
| 30 min.  | 265          | 108                       | 0                      | 157           |
| 45 min.  | 301          | 162                       | 0                      | 139           |
| 1 hour   | 326          | 216                       | 0                      | 110           |
| 2 hours  | 417          | 432                       | 0                      | -15           |
| 3 hours  | 478          | 648                       | 0                      | -170          |
| 6 hours  | 604          | 1,296                     | 0                      | -692          |
| 10 hours | 718          | 2,160                     | 0                      | -1,442        |
| 12 hours | 764          | 2,592                     | 0                      | -1,828        |
| 24 hours | 968          | 5,184                     | 0                      | -4,216        |
| 48 hours | 1,193        | 10,368                    | 0                      | -9,175        |
| 60 hours | 1,260        | 12,960                    | 0                      | -11,700       |
| 72 hours | 1,310        | 15,552                    | 0                      | -14,242       |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

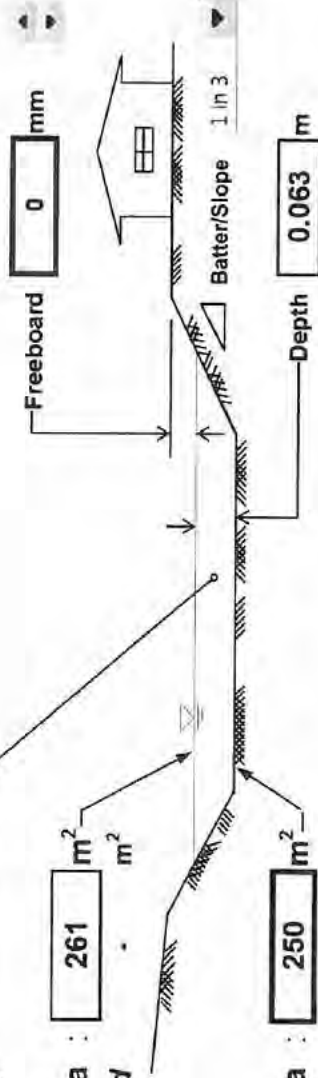
Design Rainfall Intensity

|  |  |
|--|--|
| <b>Location</b><br> : CHITTING  | <b>Storm Duration</b><br> : 24 hours    |
| <b>Storm Event</b><br> : 1 year | <b>Design Intensity</b><br> : 2.0 mm/hr |

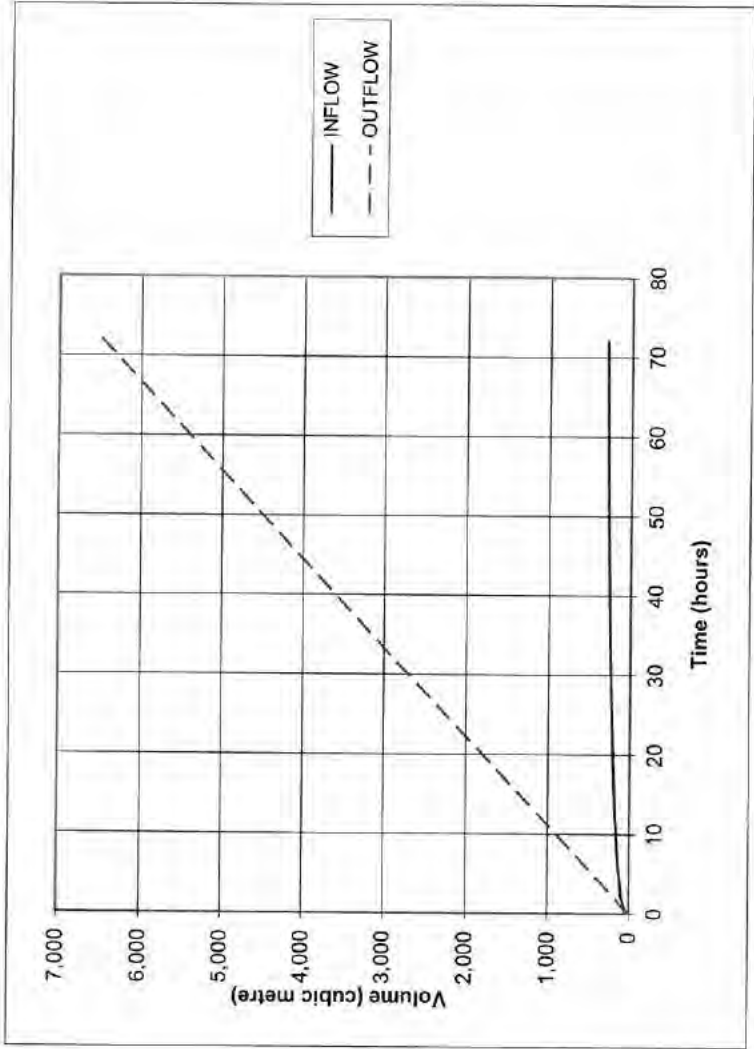
|  |   |
|--|---|
| <b>Catchment Details</b><br>Catchment Area : 5,737 m <sup>2</sup><br>Run-off Coefficient : 0.80<br>Flow Rate : 2.6 L/s | <b>Outflow Details</b><br>Soil Characteristics : Fine Sand<br>Infiltration Rate : 0.0001 m/s → 0.025 m <sup>3</sup> /s (Total Soakage)<br>Additional Outlet : 0.000 m <sup>3</sup> /s |
|--|---|

|  |  |
|--|--|
| <b>Storage Details</b><br>Volume Required at 11 minutes : 16 m <sup>3</sup><br>Total Surface Area : 261 m <sup>2</sup><br>no freeboard<br>Total Base Area : 250 m <sup>2</sup> |  |
|--|--|

PERITAS CIVIL PTY LTD









| TIME     | INFLOW<br>m³ | OUTFLOW                   |                        | STORAGE<br>m³ |
|----------|--------------|---------------------------|------------------------|---------------|
|          |              | Ground Infiltration<br>m³ | Allowable Outlet<br>m³ |               |
| 6 min.   | 23           | 9                         | 0                      | 14            |
| 9 min.   | 29           | 14                        | 0                      | 16            |
| 12 min.  | 34           | 18                        | 0                      | 16            |
| 15 min.  | 38           | 23                        | 0                      | 16            |
| 20 min.  | 44           | 30                        | 0                      | 14            |
| 30 min.  | 52           | 45                        | 0                      | 7             |
| 45 min.  | 61           | 68                        | 0                      | -7            |
| 1 hour   | 67           | 90                        | 0                      | -23           |
| 2 hours  | 88           | 180                       | 0                      | -92           |
| 3 hours  | 103          | 270                       | 0                      | -167          |
| 6 hours  | 134          | 540                       | 0                      | -406          |
| 10 hours | 164          | 900                       | 0                      | -736          |
| 12 hours | 175          | 1,080                     | 0                      | -905          |
| 24 hours | 221          | 2,160                     | 0                      | -1,939        |
| 48 hours | 272          | 4,320                     | 0                      | -4,048        |
| 60 hours | 288          | 5,400                     | 0                      | -5,112        |
| 72 hours | 299          | 6,480                     | 0                      | -6,181        |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

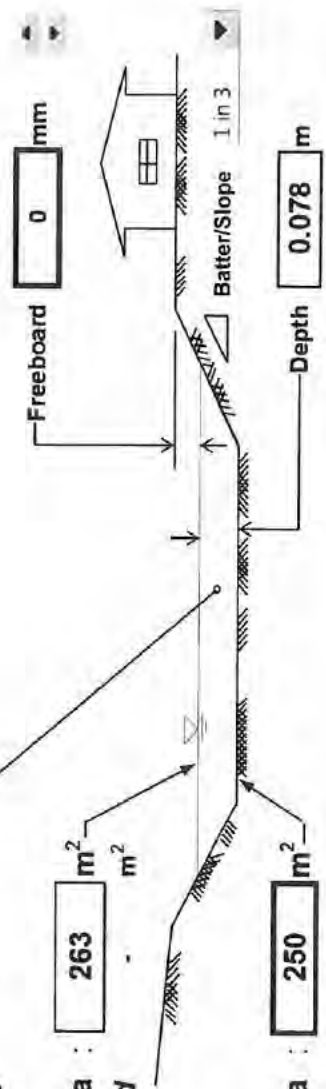
Design Rainfall Intensity

|   |  |
|---|--|
| <b>Location</b><br> CHITTERING   | <b>Storm Duration</b><br> : 24 hours    |
| <b>Storm Event</b><br> : 10 year | <b>Design Intensity</b><br> : 3.5 mm/hr |

|  |   |
|--|---|
| <b>Catchment Details</b><br>Catchment Area : 3,187 m <sup>2</sup><br>Run-off Coefficient : 0.80<br>Flow Rate : 2.5 L/s | <b>Outflow Details</b><br>Soil Characteristics : Fine Sand<br>Infiltration Rate : 0.0001 m/s → 0.025 m <sup>3</sup> /s (Total Soakage)<br>Additional Outlet : 0.000 m <sup>3</sup> /s |
|--|---|

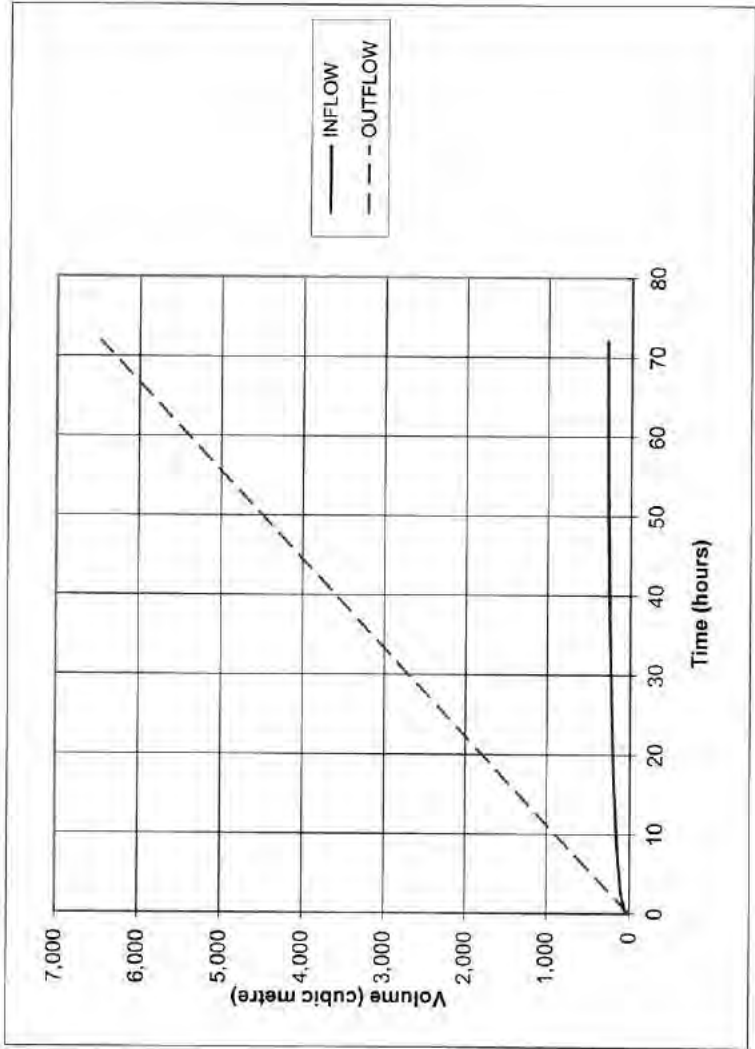
  

|  |  |
|--|--|
| <b>Storage Details</b><br>Volume Required at 12 minutes : 20 m <sup>3</sup><br>Total Surface Area : 263 m <sup>2</sup><br>no freeboard<br>Total Base Area : 250 m <sup>2</sup> |  |
|--|--|

PERITAS CIVIL PTY LTD

PRINT DATE: 11/03/2016









| TIME     | INFLOW<br>m³ | OUTFLOW                      |                           | STORAGE<br>m³ |
|----------|--------------|------------------------------|---------------------------|---------------|
|          |              | Ground<br>Infiltration<br>m³ | Allowable<br>Outlet<br>m³ |               |
| 6 min.   | 27           | 9                            | 0                         | 18            |
| 9 min.   | 33           | 14                           | 0                         | 19            |
| 12 min.  | 38           | 18                           | 0                         | 20            |
| 15 min.  | 42           | 23                           | 0                         | 19            |
| 20 min.  | 47           | 30                           | 0                         | 17            |
| 30 min.  | 55           | 45                           | 0                         | 10            |
| 45 min.  | 64           | 68                           | 0                         | -4            |
| 1 hour   | 70           | 90                           | 0                         | -20           |
| 2 hours  | 90           | 180                          | 0                         | -90           |
| 3 hours  | 105          | 270                          | 0                         | -165          |
| 6 hours  | 134          | 540                          | 0                         | -406          |
| 10 hours | 161          | 900                          | 0                         | -739          |
| 12 hours | 171          | 1,080                        | 0                         | -909          |
| 24 hours | 217          | 2,160                        | 0                         | -1,943        |
| 48 hours | 268          | 4,320                        | 0                         | -4,052        |
| 60 hours | 283          | 5,400                        | 0                         | -5,117        |
| 72 hours | 294          | 6,480                        | 0                         | -6,186        |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

|  |  |
|--|--|
| <b>Location</b><br> : CHITTING    | <b>Storm Duration</b><br> : 24 hours    |
| <b>Storm Event</b><br> : 100 year | <b>Design Intensity</b><br> : 5.6 mm/hr |

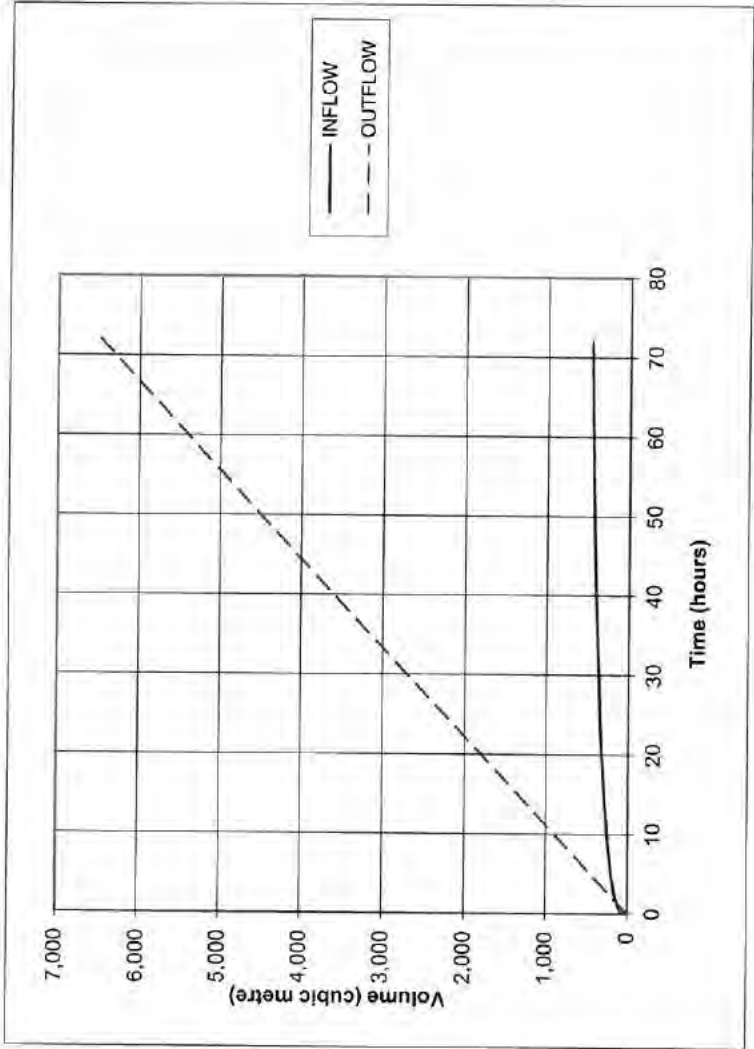
  

|  |   |
|--|---|
| <b>Catchment Details</b>   | <b>Soil Characteristics</b>   |
| Catchment Area : 3,187 m <sup>2</sup><br>Run-off Coefficient : 0.80<br>Flow Rate : 4.0 L/s | Infiltration Rate : 0.0001 m/s → 0.025 m <sup>3</sup> /s (Total Soakage)<br>Additional Outlet : 0.000 m <sup>3</sup> /s |

|   |  |
|---|--|
| <b>Storage Details</b>  | <b>Outflow Details</b>                                       |
| Volume Required at 21 minutes : 51 m <sup>3</sup><br>Total Surface Area : 283 m <sup>2</sup> no freeboard<br>Total Base Area : 250 m <sup>2</sup> | Freeboard : 0 mm<br>Batter/Slope : 1 in 3<br>Depth : 0.192 m |

PERITAS CIVIL PTY LTD







| TIME     | INFLOW<br>m³ | OUTFLOW                      |                           | STORAGE<br>m³ |
|----------|--------------|------------------------------|---------------------------|---------------|
|          |              | Ground<br>Infiltration<br>m³ | Allowable<br>Outlet<br>m³ |               |
| 6 min.   | 47           | 9                            | 0                         | 38            |
| 9 min.   | 58           | 14                           | 0                         | 44            |
| 12 min.  | 66           | 18                           | 0                         | 48            |
| 15 min.  | 72           | 23                           | 0                         | 50            |
| 20 min.  | 81           | 30                           | 0                         | 51            |
| 30 min.  | 94           | 45                           | 0                         | 49            |
| 45 min.  | 106          | 68                           | 0                         | 39            |
| 1 hour   | 115          | 90                           | 0                         | 25            |
| 2 hours  | 147          | 180                          | 0                         | -33           |
| 3 hours  | 169          | 270                          | 0                         | -101          |
| 6 hours  | 213          | 540                          | 0                         | -327          |
| 10 hours | 253          | 900                          | 0                         | -647          |
| 12 hours | 270          | 1,080                        | 0                         | -810          |
| 24 hours | 342          | 2,160                        | 0                         | -1,818        |
| 48 hours | 421          | 4,320                        | 0                         | -3,899        |
| 60 hours | 445          | 5,400                        | 0                         | -4,955        |
| 72 hours | 463          | 6,480                        | 0                         | -6,017        |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

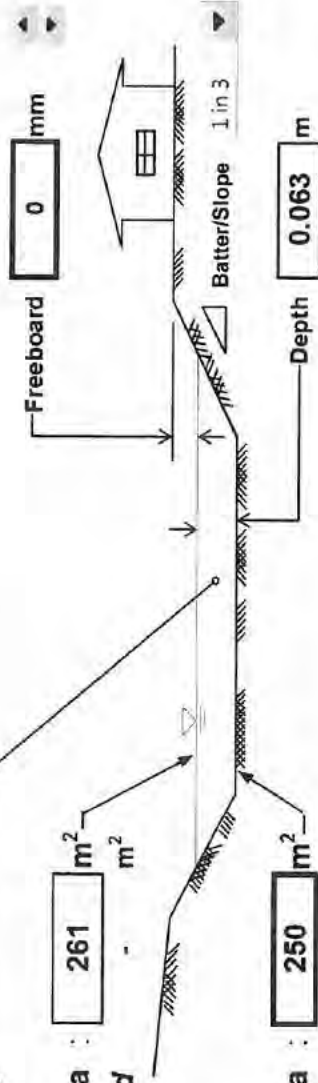
Design Rainfall Intensity

|   |  |
|---|--|
| <b>Location</b><br> CHITTERING | <b>Storm Duration</b><br> 24 hours    |
| <b>Storm Event</b><br> 1 year  | <b>Design Intensity</b><br> 2.0 mm/hr |

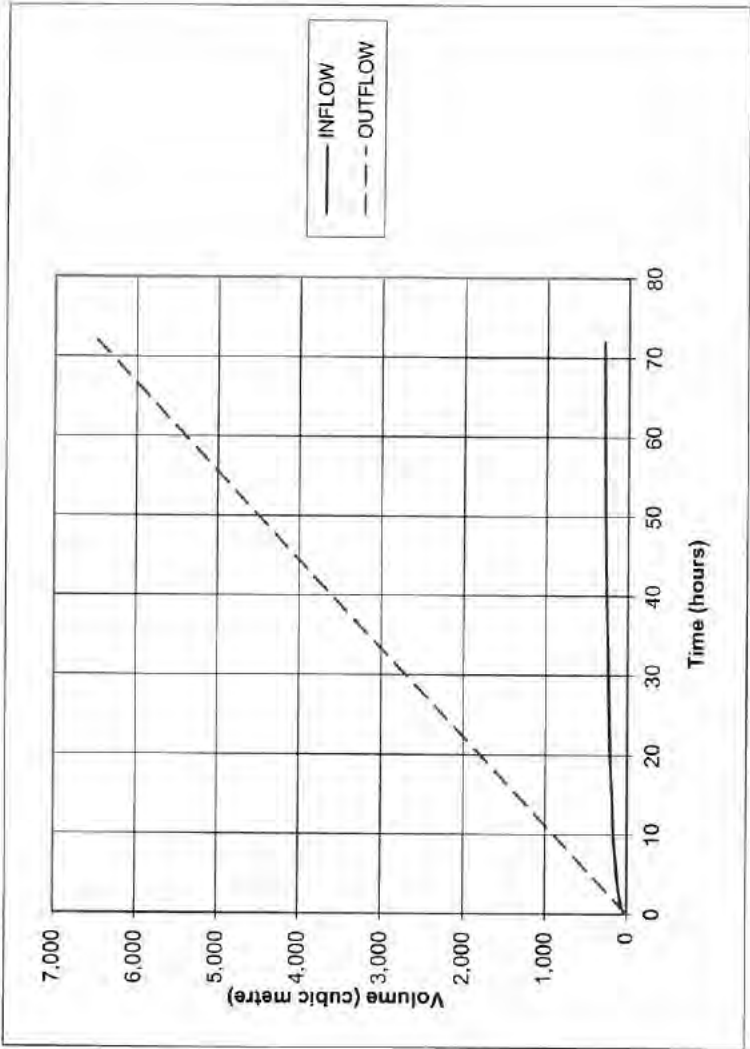
|  |   |
|--|---|
| <b>Catchment Details</b><br>Catchment Area : 5,737 m <sup>2</sup><br>Run-off Coefficient : 0.80<br>Flow Rate : 2.6 L/s | <b>Outflow Details</b><br>Soil Characteristics : Fine Sand<br>Infiltration Rate : 0.0001 m/s → 0.025 m <sup>3</sup> /s (Total Soakage)<br>Additional Outlet : 0.000 m <sup>3</sup> /s |
|--|---|

|  |  |
|--|--|
| <b>Storage Details</b><br>Volume Required at 11 minutes : 16 m <sup>3</sup><br>Total Surface Area : 261 m <sup>2</sup><br>no freeboard<br>Total Base Area : 250 m <sup>2</sup> |  |
|--|--|

PERITAS CIVIL PTY LTD







| TIME     | INFLOW<br>m³ | OUTFLOW                   |                        | STORAGE<br>m³ |
|----------|--------------|---------------------------|------------------------|---------------|
|          |              | Ground Infiltration<br>m³ | Allowable Outlet<br>m³ |               |
| 6 min.   | 23           | 9                         | 0                      | 14            |
| 9 min.   | 29           | 14                        | 0                      | 16            |
| 12 min.  | 34           | 18                        | 0                      | 16            |
| 15 min.  | 38           | 23                        | 0                      | 16            |
| 20 min.  | 44           | 30                        | 0                      | 14            |
| 30 min.  | 52           | 45                        | 0                      | 7             |
| 45 min.  | 61           | 68                        | 0                      | -7            |
| 1 hour   | 67           | 90                        | 0                      | -23           |
| 2 hours  | 88           | 180                       | 0                      | -92           |
| 3 hours  | 103          | 270                       | 0                      | -167          |
| 6 hours  | 134          | 540                       | 0                      | -406          |
| 10 hours | 164          | 900                       | 0                      | -736          |
| 12 hours | 175          | 1,080                     | 0                      | -905          |
| 24 hours | 221          | 2,160                     | 0                      | -1,939        |
| 48 hours | 272          | 4,320                     | 0                      | -4,048        |
| 60 hours | 288          | 5,400                     | 0                      | -5,112        |
| 72 hours | 299          | 6,480                     | 0                      | -6,181        |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

|  |  |                                     |  |
|--|--|-------------------------------------|--|
| <b>Location</b> :  : CHITTING   |  | <b>Storm Duration</b> : 24 hours    |  |
| <b>Storm Event</b> :  : 10 year |  | <b>Design Intensity</b> : 3.5 mm/hr |  |

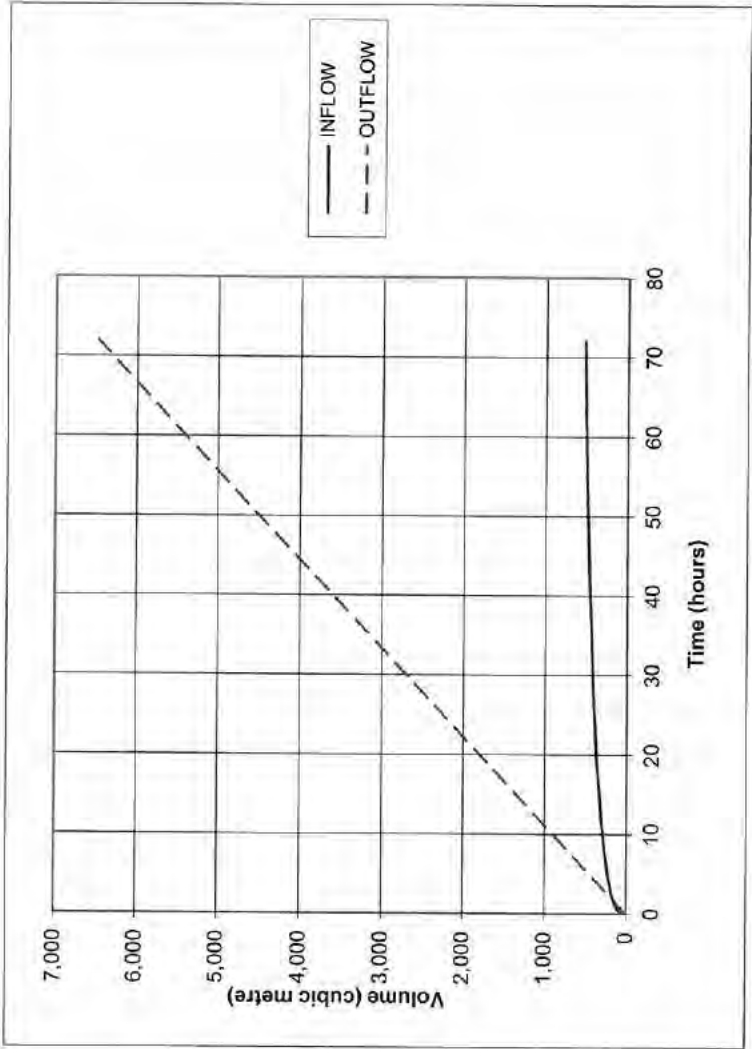
|  |                                   |  |   |
|--|-----------------------------------|--|---|
| <b>Catchment Details</b>                     |                                   | <b>Outflow Details</b>                             |   |
| <b>Catchment Area</b> : 5,737 m <sup>2</sup> | <b>Run-off Coefficient</b> : 0.80 | <b>Soil Characteristics</b> : Fine Sand            | <b>Infiltration Rate</b> : 0.0001 m/s → 0.025 m <sup>3</sup> /s (Total Soakage) |
| <b>Flow Rate</b> : 4.5 L/s                   |                                   | <b>Additional Outlet</b> : 0.000 m <sup>3</sup> /s |   |

|   |                              |
|---|------------------------------|
| <b>Storage Details</b>                                      |                              |
| <b>Volume Required at 24 minutes</b> : 56 m <sup>3</sup>    | <b>Freeboard</b> : 0 mm      |
| <b>Total Surface Area no freeboard</b> : 286 m <sup>2</sup> | <b>Batter/Slope</b> : 1 in 3 |
| <b>Total Base Area</b> : 250 m <sup>2</sup>                 | <b>Depth</b> : 0.208 m       |

PERITAS CIVIL PTY LTD





| TIME     | INFLOW<br>m³ | OUTFLOW                   |                        | STORAGE<br>m³ |
|----------|--------------|---------------------------|------------------------|---------------|
|          |              | Ground Infiltration<br>m³ | Allowable Outlet<br>m³ |               |
| 6 min.   | 48           | 9                         | 0                      | 39            |
| 9 min.   | 59           | 14                        | 0                      | 46            |
| 12 min.  | 68           | 18                        | 0                      | 50            |
| 15 min.  | 76           | 23                        | 0                      | 53            |
| 20 min.  | 85           | 30                        | 0                      | 55            |
| 30 min.  | 100          | 45                        | 0                      | 55            |
| 45 min.  | 115          | 68                        | 0                      | 47            |
| 1 hour   | 126          | 90                        | 0                      | 36            |
| 2 hours  | 163          | 180                       | 0                      | -17           |
| 3 hours  | 188          | 270                       | 0                      | -82           |
| 6 hours  | 241          | 540                       | 0                      | -299          |
| 10 hours | 290          | 900                       | 0                      | -610          |
| 12 hours | 309          | 1,080                     | 0                      | -771          |
| 24 hours | 391          | 2,160                     | 0                      | -1,769        |
| 48 hours | 482          | 4,320                     | 0                      | -3,838        |
| 60 hours | 509          | 5,400                     | 0                      | -4,891        |
| 72 hours | 529          | 6,480                     | 0                      | -5,951        |

# SUMP/SWALE VOLUME CALCULATOR

Based on Rational Method - 2001 Australian Rainfall and Runoff

Design Rainfall Intensity

|                               |  |                                     |  |
|-------------------------------|--|-------------------------------------|--|
| <b>Location</b> : CHITTERING  |  | <b>Storm Duration</b> : 24 hours    |  |
| <b>Storm Event</b> : 100 year |  | <b>Design Intensity</b> : 5.6 mm/hr |  |

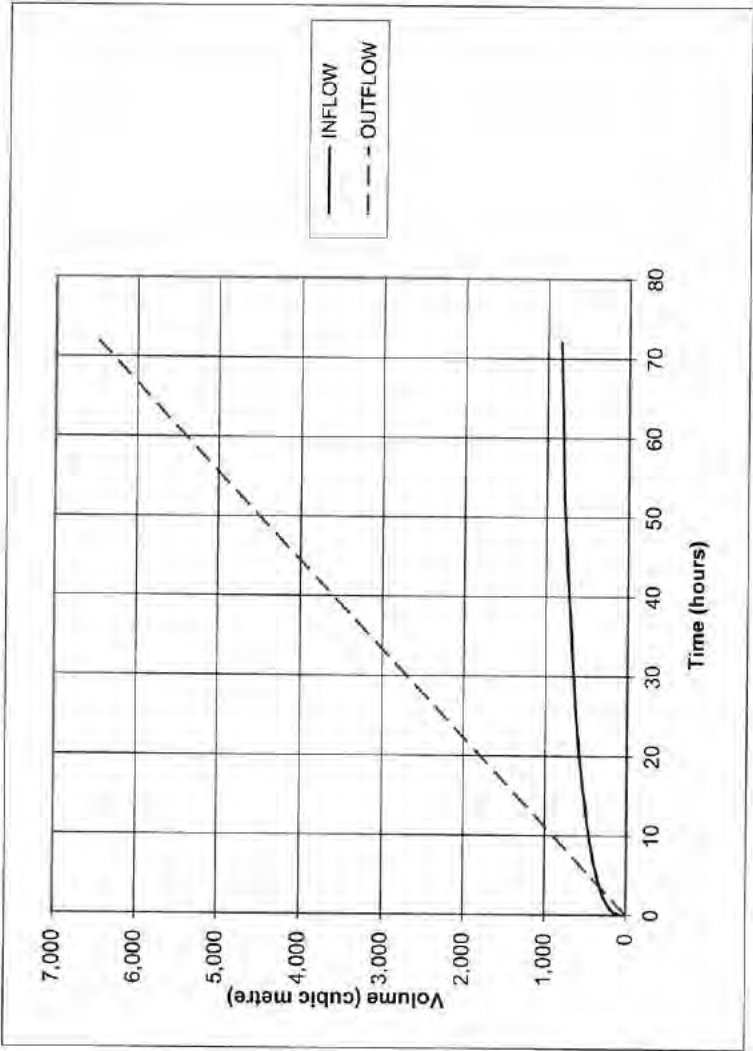
|  |                                   |  |   |
|--|-----------------------------------|--|---|
| <b>Catchment Details</b>                     |                                   | <b>Soil Characteristics</b> : Fine Sand            |   |
| <b>Catchment Area</b> : 5,737 m <sup>2</sup> | <b>Run-off Coefficient</b> : 0.80 | <b>Infiltration Rate</b> : 0.0001 m/s →            | <b>0.025 m<sup>3</sup>/s</b><br>(Total Soakage) |
| <b>Flow Rate</b> : 7.1 L/s                   |                                   | <b>Additional Outlet</b> : 0.000 m <sup>3</sup> /s |   |

|   |                              |
|---|------------------------------|
| <b>Storage Details</b>                                      |                              |
| <b>Volume Required at 37 minutes</b> : 125 m <sup>3</sup>   | <b>Freeboard</b> : 0 mm      |
| <b>Total Surface Area no freeboard</b> : 328 m <sup>2</sup> | <b>Batter/Slope</b> : 1 in 3 |
| <b>Total Base Area</b> : 250 m <sup>2</sup>                 | <b>Depth</b> : 0.431 m       |




PERITAS CIVIL PTY LTD

| TIME     | INFLOW         | OUTFLOW             |                  | STORAGE        |
|----------|----------------|---------------------|------------------|----------------|
|          |                | Ground Infiltration | Allowable Outlet |                |
|          | m <sup>3</sup> | m <sup>3</sup>      | m <sup>3</sup>   | m <sup>3</sup> |
| 6 min.   | 84             | 9                   | 0                | 75             |
| 9 min.   | 104            | 14                  | 0                | 90             |
| 12 min.  | 119            | 18                  | 0                | 101            |
| 15 min.  | 130            | 23                  | 0                | 108            |
| 20 min.  | 146            | 30                  | 0                | 116            |
| 30 min.  | 168            | 45                  | 0                | 123            |
| 45 min.  | 191            | 68                  | 0                | 124            |
| 1 hour   | 207            | 90                  | 0                | 117            |
| 2 hours  | 265            | 180                 | 0                | 85             |
| 3 hours  | 304            | 270                 | 0                | 34             |
| 6 hours  | 384            | 540                 | 0                | -156           |
| 10 hours | 456            | 900                 | 0                | -444           |
| 12 hours | 486            | 1,080               | 0                | -594           |
| 24 hours | 615            | 2,160               | 0                | -1,545         |
| 48 hours | 758            | 4,320               | 0                | -3,562         |
| 60 hours | 801            | 5,400               | 0                | -4,599         |
| 72 hours | 833            | 6,480               | 0                | -5,647         |






Appendix 3 – Photos

The following pages contain photos taken on site during our inspection on the 25 September 2015.




|  |                            |
|--|----------------------------|
|    | <p><u>Photograph 1</u></p> |
|   | <p><u>Photograph 2</u></p> |
|  | <p><u>Photograph 3</u></p> |






|   |                            |
|---|----------------------------|
|   | <p><u>Photograph 4</u></p> |
|  | <p><u>Photograph 5</u></p> |
|  | <p><u>Photograph 6</u></p> |




|  |                            |
|--|----------------------------|
|    | <p><u>Photograph 7</u></p> |
|   | <p><u>Photograph 8</u></p> |
|  | <p><u>Photograph 9</u></p> |



|  |                             |
|--|-----------------------------|
|    | <p><u>Photograph 10</u></p> |
|   | <p><u>Photograph 11</u></p> |
|  | <p><u>Photograph 12</u></p> |

|  |                             |
|--|-----------------------------|
|    | <p><u>Photograph 13</u></p> |
|   | <p><u>Photograph 14</u></p> |
|  | <p><u>Photograph 15</u></p> |






|  |                             |
|--|-----------------------------|
|    | <p><u>Photograph 16</u></p> |
|   | <p><u>Photograph 17</u></p> |
|  | <p><u>Photograph 18</u></p> |

|  |                             |
|--|-----------------------------|
|    | <p><u>Photograph 19</u></p> |
|   | <p><u>Photograph 20</u></p> |
|  | <p><u>Photograph 21</u></p> |

|  |                             |
|--|-----------------------------|
|    | <p><u>Photograph 22</u></p> |
|   | <p><u>Photograph 23</u></p> |
|  | <p><u>Photograph 24</u></p> |



|  |                             |
|--|-----------------------------|
|    | <p><u>Photograph 25</u></p> |
|   | <p><u>Photograph 26</u></p> |
|  | <p><u>Photograph 27</u></p> |



|  |                             |
|--|-----------------------------|
|    | <p><u>Photograph 28</u></p> |
|   | <p><u>Photograph 29</u></p> |
|  | <p><u>Photograph 30</u></p> |



*Keeping the Balance*

OUR REF: DL: HL: 10.9.10 12/00

**Enquiries to: David Lawn, Shire Planner**

8 June, 2000

The Manager  
Milne Feeds Pty Ltd  
103 -105 Welshpool Road  
WELSHPOOL W A 6106

Attention: Andrew Forbes-Prior

Dear Sir

**LOT 6 BRAND HIGHWAY, MUCHEA  
PLANNING CONSENT APPLICATION – HAY PRESSING**

I wish to advise that Council resolved to approve your application for Planning Consent to establish a hay pressing business on Lot 6 Brand Highway.

In granting approval Council has applied the following conditions: -

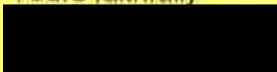
1. **Noise and dust levels are within the criteria as required by the EPA.**
2. **Appropriate measures being taken by the applicant to contain surplus hay (and other grass seeds) from entering neighbouring properties.**
3. **If the development, the subject of the approval, is not substantially commenced within a period of 12 months from the date of the approval, the approval shall lapse. Where an approval has lapsed, no further development shall be carried out without the further approval of Council having first been first sought and obtained.**
4. **The applicant develop a Fire Management Plan for the site in conjunction with the Chief Bush Fire Control Officer and Muchea Volunteer Bush Fire Brigade.**
5. **No discharges either into the air or onto the land from the operation.**
6. **Electricity is used to power the presses."**

A copy of Council's resolution is attached.

Once Council has received a copy of your Fire Management Plan appropriately endorsed by the Chief Fire Control Officer and the Muchea Volunteer Bush Fire Brigade, Council will issue you with your Planning Consent Approval Schedule.

If you require further information please contact Council's Planning Department by email on [helen@chittering.wa.gov.au](mailto:helen@chittering.wa.gov.au) or telephone 08 95761044.

Yours faithfully

A black rectangular box redacting the signature of Ray Hooper.

**Ray Hooper**  
**CHIEF EXECUTIVE OFFICER**

Enc: Council Report



## 6.4.6 Planning Consent Application - Hay Processing (10.9.10 12/00)

|                         |                                 |
|-------------------------|---------------------------------|
| DATE:                   | 23 May 2000                     |
| LOCATION/ADDRESS:       | Lot 6 Brand Highway Muchea      |
| APPLICANT:              | Milne Feeds Pty Ltd             |
| OWNER:                  | Black Granite Pty Ltd           |
| AUTHOR:                 | David Lawn, Shire Planner       |
| DISCLOSURE OF INTEREST: | No                              |
| APPENDICES:             | Letter from Applicant and Owner |
| DOCUMENTS TABLED:       | Nil                             |

**PRECIS:**

Application to operate a Hay Processing Plant Lot 6 Brand Highway Muchea.

**Comment/Background:**

*The applicant, Milne Feeds Pty Ltd, has made arrangement with Black Granite Pty Ltd, to seek approval for a hay processing plant on the premises. A lease will be formalised upon Black Granite obtaining consent for this use.*

**Zoning Compliance**

The land is zoned Rural-General Farming Zone which allows rural industry as a Planning Consent. The hay processing operation fits into this category.

The consent of the rural industry does not affect the existing Special Use for Australian International Carbon.

**Details:**

|                       |                              |
|-----------------------|------------------------------|
| Zoning:               | Rural 2 General Farming Zone |
| Policy Area:          | Ellen Brook Catchment        |
| Land Use:             | Rural Industry               |
| Lot Size:             | NA                           |
| Area:                 | NA                           |
| Use Class:            | Rural                        |
| No. of lots Proposed: | NA                           |

**Statutory Environment:**

Scheme compliant.

**Policy Implication:**

Compliant.

**Strategic Implications:**

Fits well with Ellen Brook Management Plan.

**Financial Implications:**

Standard Planning Consent Fee \$50.00

**STAFF RECOMMENDATION**

*"That the application for Planning Consent for the Hay Processing Plant, by Milne Feeds Pty Ltd, on Lot 6 Brand Highway Muchea be approved with the following conditions:*

- 1. Noise levels are within the criteria as required by the EPA.*
- 2. Appropriate measures being taken by the applicant to contain surplus hay (and other grass seeds) from entering neighbouring properties.*
- 3. If the development, the subject of the approval, is not substantially commenced within a period of 12 months from the date of the approval, the approval shall lapse. Where an approval has lapsed, no further development shall be carried out without the further approval of Council having first been first sought and obtained."*

180600

Moved Cr Bush/Seconded Cr Douglas

*"That the application for Planning Consent for the Hay Processing Plant, by Milne Feeds Pty Ltd, on Lot 6 Brand Highway Muchea be approved as a hay pressing plant only with the following conditions:*

- 1. Noise and dust levels are within the criteria as required by the EPA.*
- 2. Appropriate measures being taken by the applicant to contain surplus hay (and other grass seeds) from entering neighbouring properties.*
- 3. If the development, the subject of the approval, is not substantially commenced within a period of 12 months from the date of the approval, the approval shall lapse. Where an approval has lapsed, no further development shall be carried out without the further approval of Council having first been first sought and obtained.*
- 4. The applicant develop a Fire Management Plan for the site in conjunction with the Chief Bush Fire Control Officer and Muchea Volunteer Bush Fire Brigade.*
- 5. No discharges either into the air or onto the land from the operation.*
- 6. Electricity is used to power the presses."*

CARRIED [6 – 0]

ABSOLUTE MAJORITY REQUIRED: No

The resolution varied from the staff recommendation to ensure the application was only for a hay 'pressing' plant not hay 'processing' plant and to ensure that appropriate conditions were in place for the plant operations.



## Appendix 6.4.6

**BLACK GRANITE PTY LTD**

ACN 009 144 816

Ref: 3378

11 May 2000

Shire of Chittering  
PO Box 70  
Bin-Joon WA 6502

Attention: Mr. David Lawn

Dear Sir,

Re: Lot 6 Brand Highway, Muchea.

We confirm that we have negotiated with Milne Feeds Pty Ltd, to lease to them part of the above property.

This negotiation is subject to a number of conditions, foremost of which is the Shire of Chittering approving of the proposed use.

The land is currently zoned Rural, with an approved Special Use of Industry-Carbon Products processing and associated uses.

Prior to 1999 the special use was Industry-Masonry Preparation.

Milne Feed's proposed use will still be industrial in nature but will involve the processing of hay and other agricultural products.

As the registered proprietor of the land, we hereby support Milne Feeds application for a change in use to "Industry-Hay Processing and associated uses".

Yours faithfully,

  
MJ. Oosterhof  
Director

Suite 2, Majestic Rise, Cnr Kintail Road & Moreau Mews, Applecross, Western Australia  
PO BOX 1065, Canning Bridge, Western Australia 6153  
Telephone (08) 9316 1000 - Facsimile (08) 9316 0999

|                       |
|-----------------------|
| SHIRE OF CHITTERING   |
| RECEIVED              |
| 11 MAY 2000           |
| Officer DL            |
| File 10-9-10 12/00    |
| Presented to Council: |
| Date                  |
| Signature             |



FAX TRANSMITTAL FORM

Date: 14 February 2000  
 To: Mr David Lawn  
 Company: Shire of Chittering  
 Fax Number: 08 9576 1250  
 From: Andrew J. Forbes-Pryer  
 Subject: Hay Operations  
 No of Pages: Two (Including This Page)

Time: 11:36am/pm  
 18 MAY 2000  
 DL  
 10 910

Dear David,

Thankyou for your time today, as discussed please find below an operational overview our Hay pressing operation.

The operation has been certified as compliant with the SQF2000 quality system and is constantly Independently audited to ensure compliance.

The majority of our exports go to Japan, with developing markets in Korea, Malaysia and the middle east. Annual tonnage is approximately 35,000 tones of oaten hay.

The Hay plant employs a manager, clerk, engineer and twelve process workers. The process workers are all skilled to various levels.

Operational flow.

1. Hay is contracted under the supervision of our management who assists the farmer with crop selection planting times etc.
2. Crops are constantly monitored; cutting and baling is carried under our supervision to ensure that the highest quality standards are achieved.
3. Baled hay is core sampled by paddock number and scientifically tested for moisture, rye grass toxicity, and a range of other tests to determine its final grading.
4. Oaten hay is then graded; there are three grades with traditionally over 80% of our final purchases being premium grade. This can change depending on climatic conditions.
5. The majority of our Japanese customers travel to Australia to select their hay which is then reserved for their exclusive use.

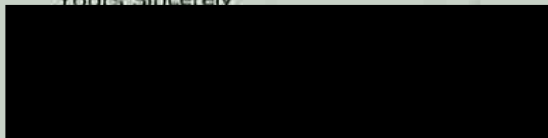
6. Depending on our customer requirements, the hay is then shipped to our pressing facility when it is again tested for moisture, any tests that exceed 12% result in the hay being rejected and returned to the farmer.
7. The Hay is stored in a shed to prevent any rain damage.
8. The baling operation does not use any additives or chemicals; it is simply a compressing operation where the 600kg bales are pressed into 40Kg cubes which are then loaded directly into 40 ft containers. The average tonnage per container is 25.76 tonnes.
9. The pressing operation generates a small amount of surplus hay. This hay is accumulated and collected by various horticultural organizations (Soils ain't Soils etc) where it is used to manufacture mulches
10. There are no discharges either into the air or onto the land from the operation.
11. There is no use of water in the pressing operation.
12. Electricity is used to power the presses.

David as I have explained the operation is inherently a simple one with no dangerous side effects or threats to the environment. WE envisage that the operation will continue to grow with the strong possibility that we will install another press in the future to handle a growing demand for larger bales which are used as raw materials in fibre deficient countries such as the middle east.

Should you require any amplification on the operational points outlined above please do not hesitate to contact me.

I look forward to a long association with the "Shire of Chittering" to our mutual benefit.

Yours Sincerely,



Andrew J Forbes-Pryer,

---

**MILNE FEEDS PTY LTD**  
A.C.N. 006 919 579

**9.1.3 Proposed Change of Use (Transport Depot) – Lot 6 (RN 290) Brand Highway, Muchea\***

|                            |   |
|----------------------------|---|
| <b>Applicant</b>           | Brand Highway Pty Ltd                               |
| <b>File ref</b>            | A3028   |
| <b>Prepared by</b>         | Scott Penfold, Planning Officer                     |
| <b>Supervised by</b>       | Azhar Awang, Executive Manager Development Services |
| <b>Voting requirements</b> | Simple Majority                                     |
| <b>Documents tabled</b>    | Nil   |

|                    |  |
|--------------------|--|
| <b>Attachments</b> | 1. Locality Plan                       |
|                    | 2. Site Plan and Applicants Submission |
|                    | 3. Site Photographs                    |
|                    | 4. Schedule of Submissions             |

**COUNCIL RESOLUTION - 050712**

**Moved Cr Hawes / Seconded Cr Norton**

**That Council:**

1. support the proposed transport depot at Lot 6 (RN 290) Brand Highway, Muchea, subject to the following condition:
  - (a) Approval being sought from Main Roads Western Australia and the Public Transport Authority for the proposed access to the Transport Depot and evidence of these approvals being provided to the Shire of Chittering.
2. upon completion of the above, delegates authority to the Chief Executive Officer to issue Planning Approval for the proposed transport depot at Lot 6 (RN290) Brand Highway, Muchea, subject to the following conditions and providing the following advice notes:
  - (a) The proposed railway crossing and intersection with Brand Highway to be designed and constructed in accordance with the engineering specifications of Main Roads Western Australia and the Public Transport Authority.
  - (b) Railway Road being constructed to the engineering specifications of the Shire of Chittering and the satisfaction of the Chief Executive Officer.
  - (c) A Traffic Management Plan, incorporating the potential number of vehicles and including hours of operation, being prepared, approved and implemented for the site by the Applicant to the satisfaction of the Chief Executive Officer.
  - (d) Short Term Laydown Zone and Transport Depot areas to be adequately filled, sealed and drained to minimise the impact dust on the surrounding properties be bunded and drained to catch hydrocarbons, to the satisfaction of the Chief Executive Officer.
  - (e) Short Term Laydown Zone and Transport Depot areas are to be setback 30m from lot boundaries and 100m from Brand Highway.
  - (f) The Applicant must obtain appropriate permits from Main Roads Western Australia for heavy haulage vehicle usage on all of the proposed access roads in the Restricted Access Vehicles network. The Applicant must apply in writing to the Shire of Chittering if they require use of Shire roads not on the Restricted Access Vehicle network.
  - (g) Evidence is provided to Council to the satisfaction of the Chief Executive Officer that the Transport Depot is located a minimum distance of 200m from all surrounding residences and sensitive land uses.

- (h) Provision of satisfactory screening along the property boundaries to the satisfaction of the Chief Executive Officer within a period of twelve (12) months.
- (i) Satisfactory screening is implemented within the Railway Road, road reserve to provide screening for the existing Hay Australia use on the subject site to Brand Highway.
- (j) The proposed Landscaped Stormwater Runoff Purification Swale to include a Hydrocarbon Separator and a Nutrient Stripping Pond and to be constructed to the engineering requirements of the Shire of Chittering.
- (k) The provision of bunded wash down facilities, with stormwater and hard-stand water to be directed to a revegetated swale drain, to minimise the impact of any spills resulting from on-site servicing of vehicles and equipment.
- (l) The development shall comply with the *Environmental Protection (Noise) Regulations 1997*.
- (m) Off-vehicle storage of any products being transported is not permitted anywhere on site.
- (n) Any servicing of plant and equipment shall be carried out within a confined concrete floor area such as a shed, and such area shall have sufficient bunding and spill trays to minimise the impact from any spills as a result of onsite servicing.
- (o) Any further developments on site shall be the subject of subsequent planning applications/approvals.
- (p) If the development (the subject of this approval) is not substantially commenced within a period of two (2) years, or such other period as specified in the approval after the date of the determination, the approval shall lapse and be of no further effect.
- (q) Where an approval has so lapsed, no development shall be carried out without the further approval of the local government having first been sought and obtained.

**Advice Notes**

1. With regard to Conditions 2(c), (d), (e), (g), (k) and (l), the Applicant should contact the Shire's Engineering Department to obtain specifications and standards required for this site.
2. With regard to Conditions 2(i), (j), vegetation is to be maintained for a period of two summers from the implementation of the approval.
3. With regard to Conditions 2(i), (j), the Applicant is to liaise with Chittering Landcare regarding the species and distribution of planting.
4. This approval does not include the proposed Truck Maintenance Workshop, Warehouse or Administration Office shown on the Overall Site Plan, nor any other buildings on the site. A separate Application for Planning Approval will be required for any proposed buildings or additional land uses.
5. The Applicant has a right of review to the State Administrative Tribunal should the applicant be aggrieved by Council's decision. Such a review should be lodged to the State Administrative Tribunal Office within twenty-eight (28) days of Council's decision.

**THE SUBSTANTIVE MOTION WAS PUT AND DECLARED CARRIED 5/0**



**OFFICER RECOMMENDATION**

Moved Cr Hawes / Seconded Cr Norton

That Council:

1. support the proposed transport depot at Lot 6 (RN 290) Brand Highway, Muchea, subject to the following condition:
  - (a) Approval being sought from Main Roads Western Australia and the Public Transport Authority for the proposed access to the Transport Depot and evidence of these approvals being provided to the Shire of Chittering.
2. upon completion of the above, delegates authority to the Chief Executive Officer to issue Planning Approval for the proposed transport depot at Lot 6 (RN290) Brand Highway, Muchea, subject to the following conditions and providing the following advice notes:
  - (a) The proposed railway crossing and intersection with Brand Highway to be designed and constructed in accordance with the engineering specifications of Main Roads Western Australia and the Public Transport Authority.
  - (b) Railway Road being constructed to the engineering specifications of the Shire of Chittering and the satisfaction of the Chief Executive Officer.
  - (c) A Traffic Management Plan being prepared, approved and implemented for the site by the Applicant to the satisfaction of the Chief Executive Officer.
  - (d) Short Term Laydown Zone and Transport Depot areas to be adequately filled, sealed and drained to minimise the impact dust on the surrounding properties to the satisfaction of the Chief Executive Officer.
  - (e) Short Term Laydown Zone and Transport Depot areas are to be setback 30m from lot boundaries and 100m from Brand Highway.
  - (f) The Applicant must obtain appropriate permits from Main Roads Western Australia for heavy haulage vehicle usage on all of the proposed access roads in the Restricted Access Vehicles network. The Applicant must apply in writing to the Shire of Chittering if they require use of Shire roads not on the Restricted Access Vehicle network.
  - (g) Evidence is provided to Council to the satisfaction of the Chief Executive Officer that the Transport Depot is located a minimum distance of 200m from all surrounding residences and sensitive land uses.
  - (h) Provision of satisfactory screening to a width of 30m along the property boundaries to the satisfaction of the Chief Executive Officer.
  - (i) Satisfactory screening is implemented within the Railway Road, road reserve to provide screening for the existing Hay Australia use on the subject site to Brand Highway.
  - (j) The proposed Landscaped Stormwater Runoff Purification Swale to include a Hydrocarbon/Nutrient Stripping Pond and to be constructed to the engineering requirements of the Shire of Chittering.
  - (k) The provision of wash down facilities, with stormwater and hard-stand water to be directed to a revegetated swale drain, to minimise the impact of any spills resulting from on-site servicing of vehicles and equipment.
  - (l) The development shall comply with the *Environmental Protection (Noise) Regulations 1997*.
  - (m) Storage of any products being transported is not permitted anywhere on site.
  - (n) Any servicing of plant and equipment shall be carried out within a confined concrete floor area such as a shed, and such area shall have sufficient bunding and spill trays to minimise the impact from any spills as a result of onsite servicing.
  - (o) Any further developments on site shall be the subject of subsequent planning applications/approvals.
  - (p) If the development (the subject of this approval) is not substantially commenced within a period of two (2) years, or such other period as specified in the approval after the date of the determination, the approval shall lapse and be of no further effect.



- (q) Where an approval has so lapsed, no development shall be carried out without the further approval of the local government having first been sought and obtained.

Advice Notes

1. With regard to Conditions 2(c), (d), (e), (g), (k) and (l), the Applicant should contact the Shire's Engineering Department to obtain specifications and standards required for this site.
2. With regard to Conditions 2(i), (j), vegetation is to be maintained for a period of two summers from the implementation of the approval.
3. With regard to Conditions 2(i), (j), the Applicant is to liaise with Chittering Landcare regarding the species and distribution of planting.
4. This approval does not include the proposed Truck Maintenance Workshop, Warehouse or Administration Office shown on the Overall Site Plan, nor any other buildings on the site. A separate Application for Planning Approval will be required for any proposed buildings or additional land uses.
5. The Applicant has a right of review to the State Administrative Tribunal should the applicant be aggrieved by Council's decision. Such a review should be lodged to the State Administrative Tribunal Office within twenty-eight (28) days of Council's decision.

**AMENDMENT**

**Moved Cr Norton / seconded Cr Mackie**

**That condition (j) be amended by separating the words '*Hydrocarbon/Nutrient*' so that it reads '*Hydrocarbon Separator and a Nutrient Stripping Pond*'.**

**THE AMENDMENT WAS PUT AND DECLARED CARRIED 5/0  
AND FORMED PART OF THE SUBSTANTIVE MOTION**

**AMENDMENT**

**Moved Cr Norton / seconded Cr Rossouw**

**That condition (k) be amended by adding the word '*bunded*' before the words '*wash down*'.**

**THE AMENDMENT WAS PUT AND DECLARED CARRIED 5/0  
AND FORMED PART OF THE SUBSTANTIVE MOTION**

**AMENDMENT**

**Moved Cr Norton / seconded Cr Mackie**

**That condition (d) be amended by including the words '*be bunded and drained to catch hydrocarbons,*' after the words '*surrounding properties*'.**

**THE AMENDMENT WAS PUT AND DECLARED CARRIED 5/0  
AND FORMED PART OF THE SUBSTANTIVE MOTION**

**AMENDMENT**

Moved Cr Rossouw / seconded Cr Mackie

That condition (h) be amended to read as follows:

*“Provision of satisfactory screening along the property boundaries to the satisfaction of the Chief Executive Officer within a period of twelve (12) months.”*

**THE AMENDMENT WAS PUT AND DECLARED CARRIED 5/0  
AND FORMED PART OF THE SUBSTANTIVE MOTION**

**AMENDMENT**

Moved Cr Hawes / seconded Cr Douglas

That condition (c) be amended by including the words *‘incorporating the potential number of vehicles and including hours of operation,’* after the words *‘Traffic Management Plan’*.

**THE AMENDMENT WAS PUT AND DECLARED CARRIED 5/0  
AND FORMED PART OF THE SUBSTANTIVE MOTION**

**AMENDMENT**

Moved Cr Norton / seconded Cr Rossouw

That condition (m) be amended by including the words *‘Off-vehicle’* at the beginning of the condition.

**THE AMENDMENT WAS PUT AND DECLARED CARRIED 5/0  
AND FORMED PART OF THE SUBSTANTIVE MOTION**

**Background**

Council has received an application for planning approval with regards to a proposed Transport Depot submitted by Brand Highway Pty Ltd.

A previous approval exists for a Rural Industry (hay pressing). The approval was granted on 8 June 2000. This approval applies to approximately 3ha of the site and is located in the north western corner and used by Hay Australia Pty Ltd. A number of other approvals relate to the site and the slow expansion of the hay pressing business.

The application provides limited details as to the operations, including the types of trucks using the transport depot, hours of operation proposed and the upgrades (if any) needed to the existing access situation.

**Consultation**

As part of the advertisement process required under *Town Planning Scheme No 6*, clause 9.4, letters were sent to all adjoining owners requesting feedback regarding the proposal. No feedback was received from the surrounding landowners.

The proposal was also forwarded to the following referral agencies for comment:

- Main Roads Western Australia (MRWA)
- Brookfield Rail (being the lessee/operator of the railway line neighbouring the property)
- Ellen/Brockman Integrated Catchment Group.

Following the submission of Brookfield Rail and further liaison with the applicant, the proposal was also forwarded to the Public Transport Authority for its comment, as it is the approval authority for railway crossings, whilst Brookfield Rail is the lessee of its assets.

Details of the submission responses can be found in the Schedule of Submissions attached to this report. A short summary is provided below:

MRWA commented:

- Stacking on the railway crossing is to meet the requirements of MRWA.
- The existing access is designed and upgraded to the standards of MRWA at the applicants cost.
- The approval of the West Australian rail authority is sought for the proposal.

Brookfield Rail commented:

- The existing crossing used for access to Hay Australia is a private crossing.
- A Level Crossing Agreement does not exist for the private crossing, nor would one likely be supported.
- The close proximity of the level crossing and current issues with short-stacking to Brand Highway would preclude any extended/expanded use.
- It proposed the use of Railway Road, which is an unconstructed road reserve connecting to Edwards Place, Muchea, for access to both the proposed Transport Depot and Hay Australia as a resolution to the issues with the existing access.

The Public Transport Authority commented:

- It supported Brookfield Rail's submission.
- A Level Crossing Agreement was not in place and the crossing was not included in the level crossings register of the Public Transport Authority, hence may be an unapproved private crossing.

**Statutory Environment**

Local: *Shire of Chittering Town Planning Scheme No.6*

The zoning of the land is '**Agricultural Resource**'. The objectives of the zone are:

- *To preserve productive land suitable for grazing, cropping and intensive horticulture and other compatible productive rural uses in a sustainable manner.*
- *To protect the landform and landscape values of the district against despoliation and land degradation.*
- *To encourage intensive agriculture and associated tourist facilities, where appropriate.*
- *To allow for the extraction of basic raw materials where it is environmentally and socially acceptable.*

The proposed land use definition under scheme is listed as Transport Depot, which under the scheme has a definition of:

*"means premises used for the garaging of two (2) or more motor vehicles, used or intended to be used for carrying of goods or persons for hire or reward, or for the transfer of goods or persons, and includes maintenance and repair of the vehicles, used but not for other vehicles"*

This particular use is an "A" use under the scheme which means that the use is not permitted unless the local government has exercised its discretion by granting planning approval after giving special notice in accordance with clause 9.4.

The proposal is also identified within the Water Prone Special Control Area of the Scheme. Clause 6.3.3 outlines the Planning Requirements as outlined below:

*“The Local Government will impose conditions on any Planning Approval relating to-*

- a) the construction and occupation of any dwelling or outbuilding;*
- b) the type of effluent disposal system used in this area shall be high performance with bacterial or nutrient stripping capability to the specifications of Council and the Health Department and shall be located in a position determined by Council;*
- c) minimum floor levels for any building above the highest known water levels;*
- d) any land use that may contribute to the degradation of the surface or sub-surface water quality;*
- e) no development other than for conservation purposes will be permitted within 30 metres of any natural water body;*
- f) damming, draining or other development which may alter the natural flow of surface water will not be permitted unless such works are part of an approved Catchment Management Plan.”*

Clause 10.2 of the Scheme outlines the matters to be considered by the local government when considering an application for planning approval. Those relevant to the current application include:

- (e) any relevant policy or strategy of the Commission and any relevant policy adopted by the Government of the State;*
- (j) the compatibility of a use or development within its setting taking into consideration any Special Control Area;*
- (m) the likely effect of the proposal on the natural environment and any means that are proposed to protect or to mitigate impacts on the natural environment;*
- (o) the preservation of the amenity of the locality;*
- (p) the relationship of the proposal to development on adjoining land or on other land in the locality including but not limited to, the likely effect of the height, bulk, scale, orientation and appearance of the proposal;*
- (q) where the proposed means of access to and egress from the site are adequate and whether adequate provision has been made for the loading, unloading, manoeuvring and parking of vehicles;*
- (r) the amount of traffic likely to be generated by the proposal, particularly in relation to the capacity of the road system in the locality and the probable effect on traffic flow and safety;*
- (w) whether adequate provision has been made for the landscaping of the land to which the application relates and whether any trees or other vegetation on the land should be preserved; and*
- (aa) any relevant submission received from any authority consulted under Clause 10.1.1.*

An outline of how the proposal addresses/does not address the above is included within the comments section of this report.

### **Policy Implications**

Local: *Local Planning Policy 18 – Setbacks*

*Local Planning Policy No.18* outlines the required minimum setbacks for development in the Shire of Chittering. Outlined in Section 5.7 (a) of the Policy are the setbacks applicable to buildings, dams and water tanks applicable in the ‘**Agricultural Resource**’ zone:

*Highway – 100m*  
*Major Road – 50m*  
*Other Road – 30m*  
*Rear – 30m*  
*Side – 30m*

State: *Environmental Protection Authority Guidance Statement No.3 – Separation Distance Between Industrial and Sensitive Land Uses*

The above document outlines the minimum separation distances required for industrial type land uses and other land uses considered sensitive, an example being residences. The document stipulates a minimum separation distance of 200metres for a Transport Vehicles Depot.

### **Financial Implications**

Nil

### **Strategic Implications**

The proposed Transport Depot is not specifically identified within the *Shire of Chittering Local Planning Strategy*.

The site is not identified within the *Muchea Employment Node Structure Plan 2011*. However, the proposed Loop Road of the Structure Plan will be located adjacent to the northern boundary of the site. Whilst the site currently has good transport connectivity, this is likely to improve as a result of the construction of the Perth-Darwin National Highway.

### **Site Inspection**

Site inspection undertaken: Yes

### **Triple Bottom Line Assessment**

#### Economic Implications

If approved, the proposal has the ability to generate employment for local residents and support local businesses with transport needs.

#### Social Implications

Given the type of proposal, there may be on-going complaints regarding noise from the residents of Muchea Village. It is suggested that this be monitored and any complaints received as a result of the approval of the application be acted upon directly with the applicant.

#### Environmental Implications

There are no known significant environmental implications associated with this proposal.

### **Comment**

This application was originally submitted for a change of land use, with the Overall Site Plan submitted at a later date as requested by the officer. With regard to the buildings shown on the Overall Site Plan, it is recommended that Council does not offer its Planning Approval for these buildings. The Applicant has advised that these buildings are indicative only and has not provided details on size, colouring or other matters to be considered by Council. These buildings are able to be approved at a later stage should Council be supportive of the change of land use proposed.

#### Shire of Chittering Town Planning Scheme No.6

The proposed transport depot is zoned '**Agricultural Resource**' where Transport Depot is an "A" use. Council has the ability to determine the application based on its merit and in consideration of the submissions received during the advertising period.

With regard to the matters to be considered by the Local Government, outlined in the Scheme, the following comments which correspond to Clause 10.2 of the Scheme (outlined previously):

- (e) A review was undertaken of State and Local Government Policies. Those applicable have been outlined in the planning context of this item.



- (j) The proposal lies within the Water Prone Special Control Area of the Scheme. As such it is subject to the planning considerations within the Special Control Area. As shown on the Overall Site Plan, the applicant proposes a Landscaped Stormwater Runoff Purification Swale to be located to the eastern, northern and southern lot boundaries. It was commented by the Ellen/Brockman Integrated Catchment Group that a Hydrocarbon/Nutrient Stripping Pond is implemented to treat drainage prior to entering a swale. It is recommended that Council require this two stage approach to treating run-off to ensure groundwater is not impacted by run-off.
- (m) As previously mentioned, it is recommended that Council require the applicant to integrate the two-stage drainage treatment system recommended by Ellen/Brockman Integrated Catchment Group.
- (o) The Overall Site Plan shows landscaping/screening being implemented along the northern, southern and eastern boundaries of the proposed Transport Depot. It was recommended by Ellen/Brockman Integrated Catchment Group that replanting occur to a width of 30m. It is recommended that Council require this replanting to occur in consultation with the Ellen/Brockman Integrated Catchment Group.

Although not shown on the Site Plan, liaison with the Applicant regarding the lack of screening on the frontage of Railway Road has occurred. The Applicant has advised that this was an oversight when the plans were being prepared and is supportive of this officer recommending the planting of screening vegetation in this location. This portion of the site is visible from Brand Highway (as shown in Attachment 3).

Upon site inspection, this officer also notes that the construction of Railway Road will remove a portion of remnant vegetation screening the Hay Australia Pty Ltd (hay pressing business) from Brand Highway. It is recommended that Council require vegetation to be replanted and maintained in road verge so that screening can be restored and the visual amenity of the locality is maintained.

- (p) As outlined previously, it is not recommended that Council offer its approval for the buildings shown on the Overall Site Plan. In regard to the size/scale of the proposed Transport Depot, whilst the proposal represents a significant size, there are no guidelines or restrictions in the Scheme or from State policy that limit this. The use of Transport Depot has been permitted to be established on '**Agricultural Resource**' zoned land throughout the Shire, although not at such a large scale.
- (q) Access represents the most important issues in regards to this application. Brookfield Rail has advised that it has no record of a Level Crossing Agreement being in place for access to the property. Given that, it does not support the extended/expanded use on the property, a position that is supported by the Public Transport Authority. Furthermore, the suggestion of the use of Railway Road for access via Edwards Place is not desirable, as based on the following:
  - Railway Road is unconstructed and would require construction and clearing by the applicant for 350metres for access to the proposal;
  - The intersection of Edwards Place and Brand Highway is located in close proximity to the Muchea Level Crossing. Brookfield Rail has advised this officer verbally that if this option was to be supported, it would be required for an ALCAM (Australian Level Crossing Assessment Model) to be applied. This would determine the safety of the crossing, any upgrades required and if the intersection is a safe distance to ensure safe precautions can be applied;

- The use of Edwards Place is not supported as this is a residential road servicing a small number of properties. There is likely to be complaints arising from noise, dust and hours of operation should this road be used for access; and
- The primary reason for the location of the proposed transport depot on Brand Highway would be to support heavy haulage vehicles serving the northern regions of the state. This could be used for oversized loads, long vehicles and other vehicles not considered appropriate on such a minor road.

Mains Roads Western Australia recommended that the proposed intersection is to its specifications and commented that the West Australian Rail Authority provides its approval for the use of the level crossing.

Based on the above, it is recommended that Council require the Applicant to gain the approval of Main Roads Western Australia and the Public Transport Authority (being the West Australian Rail Authority) as a condition of Planning Approval. If this is not forthcoming, the applicant will have to find a suitable alternative access to the satisfaction of the Shire of Chittering and other authorities or the proposed Transport Depot will be unable to proceed.

Comment was sought from the Engineering Department regarding the construction of Railway Road. Based on preliminary assessment, this does not seem to be an issue, provided it is constructed to the engineering specifications of the Shire of Chittering. It was also recommended that the applicant get the required permits from Main Roads Western Australia to use Railway Road for heavy haulage vehicles, which has been included as a condition of planning approval in the officer's recommendation.

It is recommended that Council require the submission of the Traffic Management Plan for the proposal, given that details regarding the access and egress from the site are not included in the proposal.

- (r) Details regarding the likely traffic flow from proposal have not been provided by the Applicant. However, it should be noted by Council that the approval of Main Roads Western Australia and the Public Transport Authority will require these details when considering the proposed access to the site. It will also be required that this is specified by the Applicant in the preparation of the Traffic Management Plan.
- (w) The Applicant has outlined in the Schedule of Submissions that landscaping/screening will be implemented as per the recommendations of the Ellen/Brockman Integrated Catchment Group.
- (aa) As per the above, submissions were received from the Ellen/Brockman Integrated Catchment Group, Main Roads Western Australia, Brookfield Rail and the Public Transport Authority (refer to the Schedule of Submissions in Attachment 4).

Local Planning Policy No 18 – Setbacks (LPP 18)

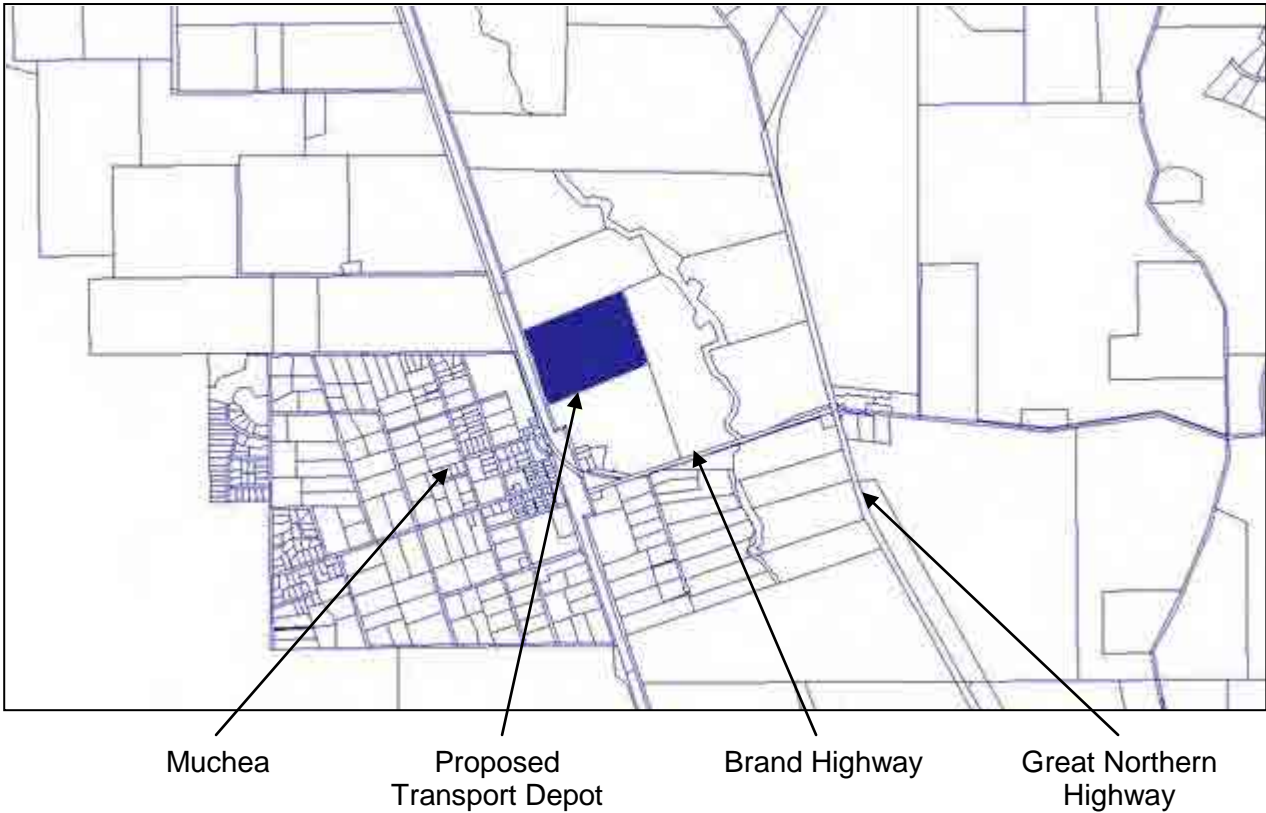
As outlined above, it is not recommended that Council issue its approval to the buildings outlined on the Overall Development Plan. LPP 18 relates specifically to the construction of buildings, dams and water tanks. However, in this case, it is recommended that Council impose similar setbacks, the number and size of vehicles possibly using the proposed Transport Depot is likely to merit increased setbacks.

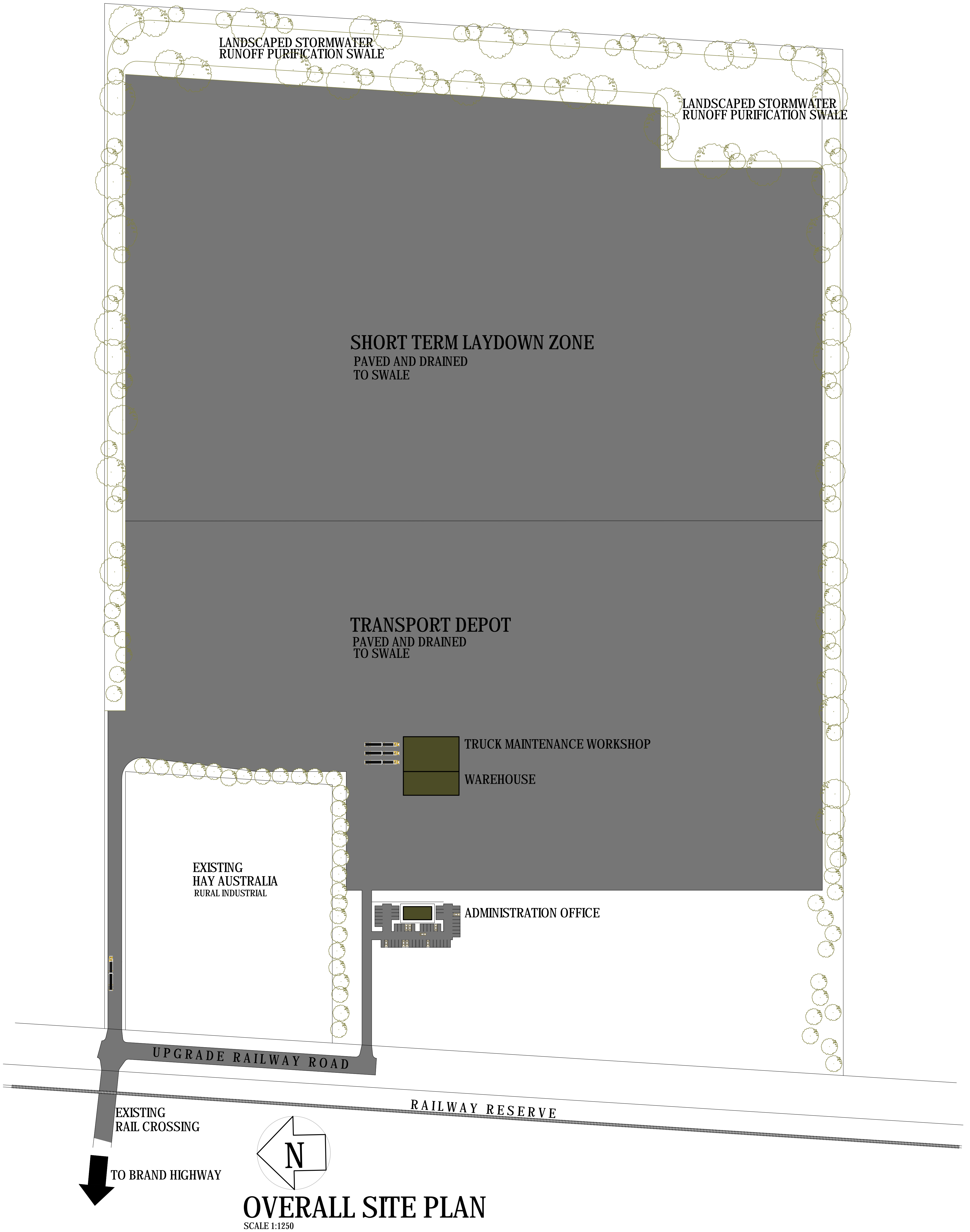
Environmental Protection Authority Guidance Statement No 3

Guidance Statement No 3 recommends a setback of 200metres to Transport Vehicles Depots from sensitive land uses. A review has been undertaken of the surrounding lots and it does not seem that sensitive land uses are located closer than 200metres. It is recommended that Council require the applicant to submit a plan showing nearby sensitive land uses and demonstrate that these are not within 200metres.

Attachment 1 – Locality Plan

Lot 6 (RN 290) Brand Highway, Muchea





TRANSPORT DEPOT- LAYDOWN FACILITY  
RAILWAY ROAD  
MUCHEA WA

SCALE: 1:250



© copyright 2012



# BRAND HWY PTY LTD

A.B.N. 009 144 816

Ref: 120329BCSHIRECHITT

29<sup>th</sup> March 2012

**Mr Brendan Jeans**

Shire of Chittering

P.O Box 70

Bindoon W.A 6052

Dear Brendan,

## **Lot 6 Brand Highway Muchea**

### **Application for Planning Approval to Allow "Transport Depot" (portion only)**

Brand Highway Pty Ltd are the owners of Lot 6 Brand Highway Muchea and we seek Planning approval to enable a portion of the site to be used as "Transport Depot".

### **Property Description**

Lot 6 comprises a 39ha parcel of rural land situated at the northern end of the Muchea Town site. More specifically, the property is located on the eastern side of Railway Road (unmade) approximately 1 kilometre north of the intersection of Brand Highway and Great Northern Highway. The property is accessed from Brand Highway across the rail line which runs parallel to the western boundary.

### **Existing Site Uses**

We currently lease approximately 3ha of land in the northwest corner of the property to Hay Australia Pty Ltd. The land is improved with various buildings used in connection with a hay pressing business. Our current application for Transport Depot does not include this portion of the property.

The balance of the property comprises level to very gently sloping, cleared grazing land.

### **Zoning and Existing Approvals**

The property is zoned "Agricultural Resource" under Town Planning Scheme No 6.

Planning approval to establish a hay pressing business ("Rural Industry") for portion of the site was obtained 8<sup>th</sup> June 2000.

We now seek approval for the balance of the property to be used as "Transport Depot". We understand that "Transport Depot" is an "A" classification under the Shire of Chittering Town Planning Scheme No 6 which requires local government discretion after giving special notice in accordance with the scheme.

Suite 2, Majestic Rise, 16 Moreau Mews, Applecross. Western Australia  
PO Box 1065, Canning Bridge. Western Australia  
Telephone (08) 9316 1000 - Facsimile (08) 9316 0999

### **Proposed Transport Depot Use**

There are a number of reasons why we believe our site should be given planning support for use as a Transport Depot:

- 1) Situated on Brand Highway and in close proximity to the Great Northern Highway being major arterial linkages and freight routes to the north of Western Australia.
- 2) The site is adjacent to the proposed Industrial Loop Road which is proposed to link the Brand Hwy through to the Great Northern Highway and the Perth to Darwin Highway
- 3) The site is adjacent to the Midland Geraldton railway line
- 4) The site is adjacent to the Muchea Employment Node
- 5) Muchea is in close proximity to Perth's extended highway network providing an opportunity to capitalise on the limited number of transport depot facilities currently available to be leased in the established industrial precincts.

### **Possible Inter-Modal Facility**

It may be worth considering that, in time, the Midland Geraldton railway line could provide access via an inter-modal facility in the vicinity of the subject lot that could link this precinct to port facilities at Oakagee and Fremantle/Cockburn and the general freight rail network. A transport depot in this location could take advantage of local demand for transport services including that of the Muchea Employment Node, demand for transport of large equipment to the Mid West and North West regions, demand from the surrounding agricultural area and further cater for spill-over from the metropolitan region.

### **Access**

The property has an existing crossover to Railway Road in the northwest corner of the site which in turn links to Brand Highway across the railway line. It is proposed that this access be maintained as the primary point of ingress/egress.

### **Landscaping & Services**

The land is relatively flat and can be suitably screened from Brand Highway through the planting of a vegetation strip along the front boundary. We understand that the north eastern end of the subject lot is situated in close proximity to a vegetation protection area however we are of the view that the proposed use would reduce the potential for nutrient runoff in comparison to the existing agricultural use. All storm water from the proposed use would be contained on site.

The site is already serviced by telephone and mains power.

### **Appendices**

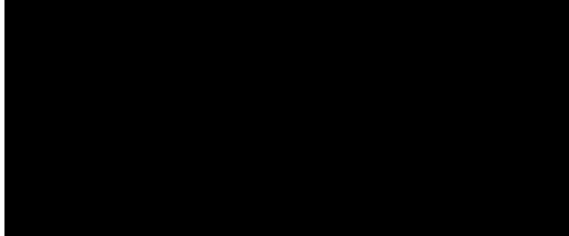
In support of our application we have included 3 copies each of the following:

- 1) Certificate of Title
- 2) Repeg and Contour Survey of the subject lot indicating the area proposed as "Transport Depot".
- 3) Extract from the Muchea Employment Node Structure Plan showing the proximity of the property to the proposed local distributor/industrial Loop Road.
- 4) Extract from the Shire of Chittering TPS 6 confirming "Transport depot" as an "A" classification under the Agricultural Resource zoning.
- 5) Extract from Schedule 1 of TPS 6 confirming the definition of "Transport Depot".
- 6) Landgate search showing the whole of the subject lot in relation to Railway Road.
- 7) Schedule 7 Form - application for planning approval.

Suite 2, Majestic Rise, 16 Moreau Mews, Applecross. Western Australia  
PO Box 1065, Canning Bridge. Western Australia  
Telephone (08) 9316 1000 - Facsimile (08) 9316 0999

**Summary**

We seek support from Shire of Chittering to this planning application allowing portion of Lot 6 Brand Highway Muchea to be used as "Transport Depot". We would welcome the opportunity to meet and discuss any aspects of our application should you have any queries.



Suite 2, Majestic Rise, 16 Moreau Mews, Applecross. Western Australia  
PO Box 1065, Canning Bridge. Western Australia  
Telephone (08) 9316 1000 - Facsimile (08) 9316 0999

132F

WESTERN



AUSTRALIA

|                                    |  |
|------------------------------------|--|
| REGISTER NUMBER<br><b>6/P13866</b> |  |
| DUPLICATE EDITION<br><b>1</b>      | DATE DUPLICATE ISSUED<br><b>2/5/2011</b> |

**RECORD OF CERTIFICATE OF TITLE**  
UNDER THE TRANSFER OF LAND ACT 1893

VOLUME **1651** FOLIO **436**

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

[Redacted Signature]  
REGISTRAR OF TITLES



**LAND DESCRIPTION:**

LOT 6 ON PLAN 13866

**REGISTERED PROPRIETOR:**  
(FIRST SCHEDULE)

BRAND HWY PTY LTD OF SUITE 2, MAJESTIC RISE, 16 MOREAU MEWS, APPECROSS  
(AN L582056 ) REGISTERED 22 MARCH 2011

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**  
(SECOND SCHEDULE)

1. EXCEPT AND RESERVING METALS, MINERALS, GEMS AND MINERAL OIL SPECIFIED IN TRANSFER 6923/1933. AS TO THE SAID LOCATION 1352 ONLY SKETCH ON VOL 1651 FOL 436.
2. H070859 MORTGAGE TO AUSTRALIA & NEW ZEALAND BANKING GROUP LTD REGISTERED 1.4.1999.
3. H632804 LEASE TO MILNE FEEDS PTY LTD OF 103-105 WELSHPOOL ROAD, WELSHPOOL EXPIRES: SEE LEASE. AS TO PORTION ONLY. REGISTERED 27.12.2000.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.  
\* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.  
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1651-436 (6/P13866).  
PREVIOUS TITLE: 1651-430.  
PROPERTY STREET ADDRESS: LOT 6 BRAND HWY, MUCHEA.  
LOCAL GOVERNMENT AREA: SHIRE OF CHITTERING.

*NOT HAVE ORIGINAL*

Attachment 3 – Site Photographs



Figure 1: View of driveway and level crossing from opposite on Brand Highway.



Figure 2: View of driveway from northern side on Brand Highway.





Figure 3: View of Hay Australia Pty Ltd from driveway.



Figure 4: View of proposed Transport Depot site from Brand Highway (south of Hay Australia).

| Name                          | Submission Comments  | Applicant Response Comments   | Officer Response Comments  |
|-------------------------------|--|---|--|
| Mains Roads Western Australia | <ul style="list-style-type: none"> <li>Stacking on the railway crossing is to meet the MRWA requirements for the types of vehicle using the access and that the level of protection at the rail crossing complies with MRWA policy;</li> <li>The existing access is designed and upgraded to be suitable for the purpose to the specification of MRWA at the applicants cost; and</li> <li>That the approval of the West Australian rail authority is sought for the proposal.</li> </ul>  | <p>The property has an existing approved point of access from Brand Highway.</p> <p>The comments of Main Roads are noted. The applicant will consult with Main Roads regarding vehicle movements and access to the site.</p> <p>The Applicant will liaise with the West Australian Rail Authority regarding the existing rail crossing.</p>   | <p>Noted. It is included in the officer recommendation to Council to require all road upgrades and the railway crossing to be approved by Main Roads Western Australia and for the approval of the</p>   |
| Brookfield Rail               | <ul style="list-style-type: none"> <li>The lot fronts a gazetted road reserve (Railway Road), and use this road as its primary access yet it has a private level crossing across to Brand Highway. Brookfield Rail does not understand how this came to be and there does not appear to be a level Crossing Agreement in place for this.</li> <li>The crossing at 29.6km is a private crossing giving access to “Hay Australia”.</li> <li>It would seem that the new Railway Road could serve both Hay Australia and the propose new Transport Depot, thus allowing the closure of the existing crossing. The existing flashlight controlled crossing at 26.765km may need additional controls (hatching, etc.), or be upgraded to Boom Gates if the Railway Road links up with Brand Highway near the service station. There is a potential for vehicles to queue across the FL crossing while turning onto Railway Road.</li> <li>There are current problems with short-stacking at the 29.60km due to the close proximity of the crossing to Brand Highway. This will preclude any extended/expanded use.</li> <li>Given the intended use of the proposed facility (transport Depot), using a current crossing unsuitable for vehicles over 30m does not auger well for the road/rail interface.</li> </ul> | <p>The Applicant notes that Brookfield Rail does not object to the planning proposal.</p> <p>With regard the alternative crossing located suggested by Brookfield Rail (incorporating access from Edward Place) the Applicant believes this to be unreasonable. The property has an existing approved point of access from Brand Highway and planning approval.</p> <p>The Certificate of Title describes the property as Lot 6 Brand Highway Muchea and the Lot has enjoyed direct access to Brand Highway for many years.</p> <p>The applicant has a pre-existing use right to cross the railway line at the point shown on the application plan. That crossing has been sign posted by relevant public authorities and has been in use for many years. The proposal in question does not fetter that right.</p> <p>It must be noted that land in rail lines are owned by the Crown and not by Brookfield Rail. By virtue of the Rail Freight System Act 2000, control of land in the rail system is vested in the CEO of the Public Transport Authority (PTA) under powers delegated by the Minister. In our opinion, Brookfield Rail are not in the position to legitimately raise an objection to an upgrade of a rail crossing if the rail corridor (i.e. the use and enjoyment thereof) is wholly unaffected by an upgrade of that crossing. It comes down to a question of traffic management on the roads with due regard to the existence of the rail and the traffic flows on the Highway in the design process. For that reason, the position of the MRWA (which is a public authority under the same Minister as the PTA) should be preferred to that of Brookfield Rail (i.e. the application should not result in a refusal but rather, appropriate conditions should attach).</p> | <p>It would be unreasonable and undesirable to require construction of Railway Road for access to this proposal, connecting to Edwards Place, Muchea. This intersection would likely be unsafe, due to close location to the existing level crossing at Muchea.</p> <p>Frontage of the property is to Brand Highway as Railway Road is unconstructed.</p> <p>Although the proposal does not fetter the right to use the crossing for Hay Australia, this proposal does significantly expand the use of the site, hence upgrades are likely to be required and the approvals of the necessary agencies to support the continued use.</p> <p>The proposal was referred to the Public Transport Authority (PTA), who are the vestee of the asset and hence have the final decision over crossings of it. The crossing is not listed in it register of level crossing, nor is a Level Crossing Agreement in place as advise by Brookfield. It is included in the officer recommendation to Council to require the approval of the PTA prior to allowing the use on the land and that all upgrades of the level crossing and intersection with Brand Highway to be to the specifications of the PTA and Main Roads Western Australia.</p> |



|                                 |           |  |   |  |
|---------------------------------|-----------|--|---|--|
| Public Authority                | Transport | The Public Transport Authority (PTA) supports and agrees to the submission prepared by Brookfield Rail. It is noted that a Level Crossing Agreement is not in place and the level crossing is not listed in the PTA's level crossing register. Hence, the PTA is of the opinion that it may not be an approved crossing.   | See above.  | See above.   |
| Ellen/Brockman Integrated Group | Catchment | <p>Following comments:</p> <ul style="list-style-type: none"> <li>The proposal is within the palusplain of the Ellen Brook (Special Control Area);</li> <li>Town Planning Scheme 6 – 6.3.3 – states that the local government will impose conditions on any planning approval within the special control area which may contribute to the degradation of the surface or sub surface water quality;</li> <li>The Landcare Centre recommends that any area used as a transport depot should be sealed or hardstand with a slope to a hydrocarbon/nutrient stripping pond which drains to a swale. The Landcare Centre would recommend a defined site be established and when that is addressed the Landcare Centre would make further comment. The Landcare Centre would prefer the defined site was established as far to the west as is practicable to avoid impact on the Ellen Brook. Currently, with the whole area (39 hectares) designated as transport depot it is impossible to make informed comment.</li> <li>Revegetation of the eastern, northern and southern boundaries of the block to a width of 30 metres and a density of 10,000 stems per hectare is recommended if this proposal is approved. Further advice can be obtained from the Chittering Landcare Centre.</li> <li>There are no proposed buildings on site. If any toilet facilities are to be established on site they should have alternative septic systems such as eco max or biocycle wastewater treatment systems.</li> <li>There is no made road to the south of the hay plant. Road trains or trucks entering will have to negotiate a right angle bend after the railway when accessing the site – at present the proposal does not designate an entrance;</li> <li>Possible Intermodal facility – the proponent is advised that a strategic document from the WAPC Economic and Employment Lands Strategy recommends an intermodal facility be established at the Great Northern Gateway Industrial area in Bullsbrook;</li> <li>The Landcare Centre recommends that a defined area be established before approval is granted for this proposal.</li> </ul> | <p>A site plan submitted in conjunction with this response sets out in broad terms the proposed location of nutrient stripping swales and ponds.</p> <p>Further engineering detail specifying hardstand surface treatment, swale slope, contour, pond detail, imported nutrient stripping soil quantities, species lists and quantities will be provided as part of the building licence submission.</p> <p>Revegetation generally in accordance with the Ellen/Brockman Integrated Catchment Group recommendation has been incorporated within the new site plan.</p> <p>Eco max or Biocycle wastewater treatment systems will be incorporated into the building licence submission where necessary.</p> <p>With regards the access query, the Applicant has revised the site plan to incorporate direct access over the northern side of the “Hay Australia” tenancy.</p> | <p>Noted. As per the recommendation, a defined area was established for the Transport Depot by the applicant.</p> <p>The officer recommendation includes the following conditions relating to the implementation of the submission from the Ellen/Brockman Integrated Catchment Group: Conditions 9 – 12 requiring revegetation and appropriate drainage.</p> <p>With regards to the use of toilets, this proposal relates to land use and not buildings on the site. Assessment of effluent disposal systems will occur as part of future applications.</p> <p>With regards to the proposed access, the officer recommendation includes conditions requiring access to be to the satisfaction of the Shire of Chittering, Public Transport Authority and Main Roads Western Australia. The preparation and implementation of a Traffic Management Plan has also been recommended.</p> |



## SHIRE OF CHITTERING

GREAT NORTHERN HIGHWAY, BINDOON, WESTERN AUSTRALIA 6502  
P.O. BOX 70, BINDOON, W.A. 6502  
TELEPHONE (09) 576 1044 FACSIMILE (09) 576 1250

OUR REF:DL:NIF: 10.9.10 - 8/96  
YOUR REF: OOS/MUC  
ENQUIRES TO: *David Lawn, Planning Consultant*

22 November 1996

The Manager  
Roberts Day Group  
P.O Box 1498  
WEST PERTH W.A 6000

**Attention: Mike Day**

Dear Mike,

### BLACK GRANITE - PROPOSED REZONING

I regret to advise that Council did not support the proposal to rezone lot 6 Brand Highway Muchea to Light Industrial zone as requested.

Council felt that the creation of an industrial area adjacent to Muchea Townsite is not acceptable. There was concern over the presentation of an industrial area along Brand Highway detracting from the overall ambience of the locality.

Yours faithfully,

Ray Hooper  
CHIEF EXECUTIVE OFFICER


| Agency Submissions                                       |   |   |   |
|--|---|---|---|
| Submitter  | Comment   | Proponent Response  | Shire Officer Response  |
| Department of Water                                      | Assessed – no comments provided   | Noted   | Noted.  |
| Ellen Brockman Integrated Catchment Group (submission 1) | <p>The Ellen Brockman Integrated Catchment Group in collaboration with Chittering Landcare Group makes the following comments regarding this proposal.</p> <ol style="list-style-type: none"> <li>1. Comment was made on a previous proposal for a transport depot dated 23rd May 2012 on this property. At that time the proponent was Hat Australia.</li> <li>2. The site is situated on the Palusplain of the Ellen Brook (Special Control Area). This is characterised by high water table and flooding. Any extension of the hardstand area will need to take this into consideration.</li> <li>3. Town Planning Scheme 6 - 6.3.3 - states that "the local government will impose conditions on any planning approval in the special control area which may contribute to the degradation of the surface or sub surface water quality."</li> </ol> | <p>Comments 1 to 3:</p> <p>The previous proposal for a transport depot dated 23<sup>rd</sup> May 2012 (prepared by a former operator or owner) comprised a total area of 30ha for the transport depot use. The current proposal occupies only a fraction of that area and is proposed to occupy the existing 3ha developed hardstand area plus an additional 1ha hardstand area for future expansion potential.</p> <p>Importantly, the current transport depot site is already developed with hardstand throughout the site and contains internal and external concrete hardstand areas capable of capturing hydrocarbons.</p> <p>In the site inspections undertaken during their preparation of the Stormwater Drainage Management Strategy, the Peritas Group noted that there was no evidence of flooding of the hardstand areas.</p> | <p>Noted. Whilst the retrospective transport depot does occupy a small portion of the property comparatively to the previously approved transport depot (which was not acted upon and has expired), the types of vehicles associated with the applicants retrospective transport depot are considerably large and may sit idle whilst not being utilised due to the downturn in the construction and mining industries. The probability of leakage and the unsealed nature of the gravel hardstand may indeed have some impact on the Ellen Brook Palusplain which has previously not been monitored on the site.</p> <p>Whilst the applicants representatives may not have seen evidence of flooding of the hardstand areas, the pervious nature of a large portion of the hardstand area (i.e unsealed) and the fact that the property is within an identified 'Water Prone' Special Control Area backs up the need for the extension to take into consideration this environmental aspect and appropriately plan for potential high rainfall events which may shift hydrocarbons not captured on the concreted surfaces.</p> |



| Agency Submissions |   |  |   |
|--------------------|---|--|---|
| Submitter          | Comment   | Proponent Response   | Shire Officer Response  |
|                    | <p>4. Any area used as a transport depot should be sealed with all stormwater directed to a hydrocarbon separation trap. Other hardstand construction should be sloped to ensure stormwater and contaminants from the site flow to a hydrocarbon/nutrient stripping pond which drains to a vegetated swale.</p> | <p>Comment 4:</p> <p>As noted in the Stormwater Drainage Management Strategy, all areas of the site report to a swale (in some cases already vegetated and in others to be constructed and vegetated as noted on the plans). The requirements of Comment 4 will be capable of being satisfied with the existing and proposed works recommended in the Stormwater Drainage Management Strategy.</p> <p>For clarity, Section 5.2 of Planning Application Report also notes that no servicing occurs in hardstand area to east of main shed. In addition, Section 5.2 notes that mechanical servicing or structural repair of crane equipment occurs within the main building with adequate spill response equipment readily available should spills occur (per Spill Management Plan included at Annexure 7 of the Planning Application Report). Any work conducted within the external concrete storage area to the western side of the main storage building will be subject to the same hydrocarbon and chemical management processes (see Section 5.8.1 of Planning Application Report) to those internally within the main building.</p> <p>Lampson would agree to a condition requiring that all servicing occur on concrete hardstand</p> | <p>Noted and agreed with the referral agency.</p> <p>Noted and agreed with the referral agency.</p> |

| Agency Submissions |   |  |  |
|--------------------|---|--|--|
| Submitter          | Comment   | Proponent Response   | Shire Officer Response   |
|                    | <p>5. While the toilet facilities are already established on site with a septic system it should have alternative septic systems such as eco max or biocycle wastewater treatment systems. Any extension to the toilets or ablution block will need to be an alternative treatment unit.</p> <p>6. An aerial image taken in 21st November 2015 indicates two areas of concern that should be checked and possible remediation undertaken. These areas are indicated on the attached aerial. They appear to be areas of hydrocarbon spill and according to the EMS supplied, all spills are to be cleaned up and disposed of in the correct manner and recorded. We suggest that the Shire take steps to inspect these areas to ensure compliance.</p> | <p>within the shed and on the concrete hardstand to the west of the main shed as required for larger items.</p> <p>Comment 5:</p> <p>No toilets are proposed as part of this development application. As such, any conditions relating to the upgrading of toilet facilities would not reasonably relate to the proposal.</p> <p>Comment 6:</p> <p>The area to the west (Area 1) of the site is a blackened area of concrete which remains from the fire from 2012 (refer historic aerial photos contained within Annexure 2 of the Planning Application Report). This has not been created by the Lampson operations and is not hydrocarbon staining.</p> <p>The area to the east (Area 2) of the site boundary is a low drainage point on the site (as evidenced by the green growth surrounding it). This drainage point has been reflected in the Stormwater Drainage Management Strategy.</p> | <p>Noted and acknowledged. Whilst this may be the case, follow-up with the Shire's Principal Environmental Health Officer will need to be undertaken as, due to the property being operated as a commercial premises then the need for appropriate waste management is need to be addressed and compliant with the requirements of the Department of Health/Shire of Chittering Health Local Laws.</p> <p>Noted.</p> |

| Agency Submissions |   |  |  |
|--------------------|---|--|--|
| Submitter          | Comment   | Proponent Response   | Shire Officer Response                                       |
|                    | <p>7. Any hydrocarbon spillage will enter the groundwater and flow towards the Ellen Brook creating a plume. A piezometer on the eastern boundary near the southern boundary needs to be installed and groundwater tested annually in spring to ensure that there is no hydrocarbon plume extending beyond the property boundary. All results to be forwarded to the Shire for compliance checking.</p> | <p>Comment 7:</p> <p>No hydrocarbon spillages have been reported by Lampson. The main workshop where mechanical servicing occurs has trapped grated drains that report to an external tank that can be pumped out as required. Refer to Section 4.5 (Hydrocarbon Containment Management) of the Stormwater Drainage Management Strategy.</p> | <p>Noted.</p>  |
|                    | <p>8. The proposed extension area should be vegetated around the perimeter to protect it from stormwater flow and erosion of the hardstand if gravel or limestone is to be used for this purpose.</p>   | <p>Comment 8:</p> <p>Lampson agree to provide vegetation in accordance with the Stormwater Drainage Management Strategy which recommends that swales within catchments C5, C7 and C8 are vegetated.</p> <p>It is also noted that the Peritas Group have confirmed that, based on their observations,</p>                                     | <p>Noted. Agreed with the referral authorities comments.</p> |

| Agency Submissions |  |  |   |
|--------------------|--|--|---|
| Submitter          | Comment  | Proponent Response   | Shire Officer Response  |
|                    | <p>9. Approval should not be given without the provision of a suitable surface water and stormwater management plan. This is yet to be completed as stated (Paragraph 5.8.2) as it was not attached to the documents supplied. No surface water flows from the hardstand areas are allowed flow into existing drainage lines on the property that drain directly into the Ellen Brook.</p> | <p>adequate scour protection exists around the hardstand area. In addition, no erosion any consequence was observed during their site inspections.</p> <p>Comment 9:</p> <p>Provided and addressed in Stormwater Drainage Management Strategy.</p> | <p>Noted. Refer to applicant's response. The referral authority was provided with the Stormwater Management Plan after they had initially made their submission. The Shire requested they revise their referral response as detailed below.</p> |
|                    |    |  |   |

| Agency Submissions  |  |  |   |
|---|--|--|---|
| Submitter   | Comment  | Proponent Response   | Shire Officer Response  |
|   | Areas marked for inspection as possible hydrocarbon contamination.   |  |   |
| <b>Ellen Brockman Integrated Catchment Group (submission 2)</b> | <p>1. The site is situated on the Palusplain of the Ellen Brook on the part of the block mapped as Yanga 14x soils. It is in Special Control Area of the Ellen Brook floodplain and, therefore, the site requires a formal geotechnical report to understand the permeability and lateral movement of water from the bioretention basins proposed.</p> <p>2. There is no comparison with known DOW monitoring bores in the area (GN21 Muchea).</p> | <p>Comment 1:</p> <p>The bioretention basins have been assessed by a qualified engineer (Peritas Group) and the recommendations are contained within the Stormwater Drainage Management Strategy. The Strategy did not recommend a geotechnical investigation to be undertaken.</p> <p>Comment 2:</p> <p>A review of the Department of Water's Water Information Reporting database provided no results of current or active monitoring bores in the locality surrounding the subject site which would provide an accurate reading of groundwater levels.</p> <p>However, the Peritas Group note that observations made at this and sites to the west of the subject site indicate that groundwater is approximately 1m below the hardstand areas.</p> | <p>Noted.</p> <p>Noted. The importance of the comparison between existing monitoring bores and monitoring of the groundwater surrounding the development itself should be considered as a high priority due to the groundwater being 1m below the hardstand area.</p> <p>The unsealed nature of the hardstands and the potential for hydrocarbon spillage consolidates the importance that ongoing monitoring and reporting should be undertaken by the applicant to ensure that no adverse impacts from the land use occur and impact the Ellen Brook flood plain.</p> |



| Agency Submissions |  |  |   |
|--------------------|--|--|---|
| Submitter          | Comment  | Proponent Response   | Shire Officer Response  |
|                    | <p>3. Storage of hydrocarbons and other chemicals requires bunded storage areas. This application is for a transport depot rather than a storage depot and this requires that such structure be in place in maintenance and storage areas.</p> <p>4. No design information is provided for the bioretention areas.</p> | <p>Comment 3:</p> <p>Refer to Section 5.8.1 (Hydrocarbon and Chemical Management) of the Planning Application Report and Section 4.5 (Hydrocarbon Contamination Management) of the Stormwater Drainage Management Strategy. It has been confirmed that a containerised storage system is in place for storage of hydrocarbons and other chemicals.</p> <p>Comment 4:</p> <p>The proposed swales and bioretention areas were assessed as adequate within the Stormwater Drainage Management Strategy. Should the Shire require further design detail.</p> <p>For clarity, the Peritas Group have explained that the bioretention areas are assessed and based on providing a minimum bioretention area of 2% of the impermeable area served by that structure. In the majority of cases the bioretention areas provided are in excess of 5-7% of the impermeable areas.</p> <p>Comment 5:</p> | <p>Noted.</p> <p>Noted and agreed with the referral authority's response.</p> |

| Agency Submissions |  |   |  |
|--------------------|--|---|--|
| Submitter          | Comment  | Proponent Response  | Shire Officer Response   |
|                    | <p>5. The monitoring bore is required in the south east corner of the transport storage and maintenance area and monitoring of this bore is required for hydrocarbons, depth to water table and nutrients. This should be sampled and analysed at least once a year to check for plumes. While contaminant plumes may be a low risk at present it will be a transport depot that could have changed circumstances in the future.</p> | <p>Based on the conclusions of the Stormwater Drainage Management Strategy, water quality monitoring for surface water and stormwater entering and leaving the site is not necessary for the current operations.</p> <p>It is unreasonable from a planning perspective to require conditions to address any future unconfirmed change of circumstances. Apart from the proposed hardstand extension, which will provide Lampson with a small area of extended storage for the continued operation of the current activities, there are no changes to the nature of the Lampson operations anticipated in the future. The proposal is for retrospective approval for a transport depot which comprises the distribution and storage of crane elements, rigging and jacking equipment.</p> <p>No refuelling occurs on-site and all servicing occurs in locations where adequate hydrocarbon management infrastructure is located. Any monitoring is therefore unnecessary in this instance.</p> | <p>Noted and agreed with referral authorities response. Whilst the applicant contends that this is unreasonable from a planning perspective, it is the Shire's role to ensure that no adverse environmental impacts are as a result of applications from which they are responsible for approving. Furthermore, the applicant has been undertaking an activity without the appropriate approvals in place and therefore requirements for them to undertake it.</p> |

| Agency Submissions   |   |  |   |
|----------------------|---|--|---|
| Submitter            | Comment   | Proponent Response   | Shire Officer Response  |
| <b>Main Roads WA</b> | <p>Thank you for consulting Main Roads on the retrospective use and development of a Transport Depot at Lot 6 Brand Highway, Muchea.</p> <p>Main Roads has concerns that the road or edge of the seal could be damaged, and dirt and debris being tracking onto Brand Highway from the existing gravel crossover. As Main Roads considers that the current proposal would generate a high number of light vehicle and a low number of heavy vehicle turning movements in and out of the site. As information provided by the Shire of Chittering noted that there would be:</p> <ul style="list-style-type: none"> <li>10 staff employed at the transport depot, meaning there could be a total minimum of 20 staff car movements in and out of the site daily; and</li> <li>In association with the incoming and outgoing of deliveries of equipment there would be 1 truck and trailer pocket road train per month; 1 truck and 40 trailer per month; and 2 truck and trailers per week.</li> </ul> <p>Additionally, the change in land use from hay bailing to transport depot represents a land</p> | <p>As noted in the Traffic Management Plan included at Annexure 5 of the Planning Application Report, the vehicle movements generated by the proposal include:</p> <ul style="list-style-type: none"> <li>10 Staff vehicles (20 movements per day);</li> <li>1 rubbish removal per week (=0.14 per day);</li> <li>1 water delivery per month (=0.033 per day);</li> <li>1 truck/trailer pocket road train (28m) per month (=0.033 per day);</li> <li>1 truck/trailer (25m) per month (=0.033 per day);</li> <li>2 truck/tailer (21m) per week (=0.28 per day). (this equates to combined total of 20.5 movements per day)</li> </ul> <p>The Roads and Traffic Authority NSW 'Guide to Traffic Generating Developments' does not provide a specific guideline for a transport depot land use, however by way of comparison, the guide suggests 4 daily vehicle trips per 100m2 gross floor area for warehouses. Based on the total floor area of approximately 1,933m2 across the two large sheds, the warehouse trip generation would result in approximately 77 trips per day. Therefore, whilst only a guide, this suggests that the proposal represents a low traffic generating development.</p> | <p>Noted and acknowledged.</p> <p>Whilst acknowledged the utilisation of the Roads and Traffic Authority NSW 'Guide to Traffic Generating Developments' is a comparative tool to ascertain the relatively low number of movements, as it is a guide in applications based in NSW and not WA then it should be dismissed.</p> <p>Main Roads have been provided with the relevant information pertaining to the application and as such have provided comment on that basis which the Shire, whom as the referral authority and 'experts' in this field with any conditions considered relevant and suggested by Main Roads as being included if the application were to be</p> |

| Agency Submissions |   |  |                        |
|--------------------|---|--|------------------------|
| Submitter          | Comment   | Proponent Response   | Shire Officer Response |
|                    | use intensification for the site, as hay bailing operates seasonally, while the transport depot would operate annually. | <p>It is also considered that the former feed delivery operation that previously operated from this site may have generated greater year round traffic than the current land use. This is due to the infrequent nature of deliveries conducted from the site. When Nearmap aerial imagery of the crossover is observed between the years of 2009 and 2015, it is evident that there is greater discolouration of Brand Highway during use under the previous hay bailing operation than from the current transport depot use.</p> <p>On this basis, the contention from Main Roads that the land use generates a high number of light vehicle movements is, with respect, considered incorrect and based on an assumption of the former use, not a factual understanding.</p> <p>In addition, we have attached the Main Roads plan and timeline for the North-West Link project (Attachment 1). It is noted that the Muchea section of this project will divert Brand Highway to the north of the subject site. The timeline shows that this project will be completed by mid 2019. This suggests that the traffic numbers (and potentially the classification) of the section of Brand Highway adjacent to the subject site is likely to be reduced on the basis that the majority of traffic volume this road currently carries will be diverted to the north within the next 3 years. As a result of these changes, the control of this</p> | approved.              |

| Agency Submissions |   |   |                        |
|--------------------|---|---|------------------------|
| Submitter          | Comment   | Proponent Response  | Shire Officer Response |
|                    | <p>Accordingly, Main Roads has no objection to the retrospective development and use, subject to the imposition of the following conditions or similarly worded conditions:</p> <ol style="list-style-type: none"> <li>1. Prior to the Local Government issuing planning approval, at the cost of the landowner(s) the existing crossover onto Brand Highway shall be designed and upgraded in accordance with the standards and specifications of Main Roads WA.</li> <li>2. Approval being sought from the Public Transport Authority for the design and upgrades to the existing crossover onto Brand Highway.</li> <li>3. All maintenance of the existing crossover, including its surface and culvert shall be the responsibility of the landowner(s).</li> </ol> <p>In relation to condition 1 Main Roads advises</p> | <p>road may also ultimately be given back to the Shire.</p> <p>As the Shire is the ultimate decision maker, with Main Roads providing recommendations, the Shire has discretion to the extent to which conditions are imposed. On this basis, we request that the Shire takes the future intent of this section of Brand Highway into account when preparing its recommendation. We also request the Shire to consider the low traffic generating nature of the current operation when considering conditions so that any requirement fairly and reasonably relates to the use.</p> <p>It is therefore requested that the Shire considers removing the requirement for the upgrading of the existing crossover, or alternatively considers a condition which enables the operator to upgrade the crossover to a rural standard (or standard to the Shire's satisfaction) but ensures that the management of gravel on Brand Highway is addressed.</p> |                        |



| Agency Submissions |  |                    |                        |
|--------------------|--|--------------------|------------------------|
| Submitter          | Comment  | Proponent Response | Shire Officer Response |
|                    | <p>the landowner and the Shire of Chittering that:</p> <ul style="list-style-type: none"> <li>• We expect the crossover upgrades to be completed within a timeframe of 4 to 6 months from the date of this letter.</li> <li>• Crossover upgrade works should at a minimum involve clearing the culvert of debris and sealing the crossover up to the railway line crossing; and</li> <li>• Prior to the crossover not being upgraded the following statements apply; <ul style="list-style-type: none"> <li>• Main Roads accepts no immediate liability should there be any incident in relation to the crossover works not being completed. This includes additional gravel being deposited on the road due to increased traffic using the crossover.</li> <li>• Should the edge of the road be damaged Main Roads may charge the landowner for any maintenance works.</li> </ul> </li> </ul> |                    |                        |

| Agency Submissions |  |  |                             |
|--------------------|--|--|-----------------------------|
| Submitter          | Comment  | Proponent Response   | Shire Officer Response      |
|                    | <p>Independent of Main Roads comments, we will be shortly contacting the applicant and landowner to raise Main Roads concerns, as gravel being tracked onto Brand Highway has safety implications on the operation of Main Roads network and its users.</p> <p>Additionally, Main Roads notes that the current road to rail separation would support the use of vehicles up to 27.5m in length that is a Restricted Access Vehicle (RAV) 3 or 4 network combination. The proposed heavy vehicles used to deliver equipment to and from the site range from a RAV 1 to a RAV 4 network combination. From the information submitted, these vehicles would travel along Muchea South Road is not a part of the RAV network, and therefore 'As of Right' vehicles are only permitted to travel along Muchea South Road. For heavy vehicles travelling to and from the site seeking to use Neaves Road, alternate access can be sought from Rutland Road.</p> |  |                             |
| Public Submissions |  |  |                             |
| <b>Public A</b>    | <p><b>Lot 6 (290 Brand Highway) site</b></p> <p>a) Fencing to 1.8m height to rail corridor boundary must be installed</p> <p>b) No water run off – storm water</p>   | <p>The site is currently secured by a 2m high electrified fence around the boundary of the development area. No further fencing is considered necessary.</p> <p>All stormwater will be retained on site to reflect pre-development flows. The Stormwater</p> | <p>Noted.</p> <p>Noted.</p> |

| Agency Submissions |   |  |                        |
|--------------------|---|--|------------------------|
| Submitter          | Comment   | Proponent Response   | Shire Officer Response |
|                    | <p>(drainage) to be contained within development site</p> <p><b>Level Crossing</b><br/>From a level crossing point of view there are no issues in terms of sighting distances or level of protection.</p> <p>The traffic management plan submitted states that all road traffic will stop at the stop sign, there is no higher control we could fit to an installation such as this as the traffic number simply do not justify the upgrade to active protection.</p> <p>[submitter's name, removed] specifies however that no vehicles in excess of 28m in length are to cross the crossing as there is insufficient standing room on the west side of the crossing to accommodate larger vehicles. The planning submission and traffic management plan specify vehicles no larger than 28m in length; however the business must comply with this.</p> <p>Lampson are required to enter into a Commercial Level Crossing Licence and an Interface Agreement. This is in accordance</p> | <p>Drainage Management Strategy provides further details on drainage throughout the site.</p> <p>No vehicles of more than 28m in length are proposed to access the site.</p> | <p>Noted.</p>          |

| Agency Submissions |  |                    |                        |
|--------------------|--|--------------------|------------------------|
| Submitter          | Comment  | Proponent Response | Shire Officer Response |
|                    | with the Rail Safety National Law 2015 and the fact that the crossing will require ongoing maintenance which Lampson are required to fund. |                    |                        |

\*Note: Comments are as per original submission received by the Shire. Submission comments have not been edited unless for the purposes of confidentiality where necessary.

Images from site visit

Lot 6 Brand Highway, Muchea





**INDUSTRIAL DEVELOPMENT (FIGURE 10)****Description/Location**

The primary heavy industrial activity is restricted to Tiwest. The most immediate prospects for catalysts to promote industrial development are the State Livestock Centre at Muchea and the endeavours of the shire to develop a light industrial area.

The State Livestock Centre relocated from Midland will attract associated stock industry business and provide additional employment opportunities.

Two sites are designated for industrial/light industrial development:

- 1 Chittering – Great Northern Highway (light industrial)
- 2 Bindoon – Bindoon-Dewars Pool Road (light industrial)

**Note:** The Muchea Employment Node is designated as an Investigation Area only. The boundaries depicted on Figure 10 and the LPS map, are indicative only and subject to change following detailed investigation of all constraints.

**Note:** The Muchea Employment Node, as depicted on the North Eastern Corridor Extension Strategy and on Figure 10 and the LPS map, is subject to detailed assessment prior to any scheme amendment being supported by Council.

Council in supporting a scheme amendment, shall consult with all relevant government authorities and community groups.

Council may adopt a Development Plan outlining the various permissible land uses and environmental considerations, road access and traffic management of the precinct and clearly state on that plan the considerations and conditions for development.

**Aims**

- *To provide for local centres of service and employment*
- *Actively encourage the relocation of businesses to the light industrial area*
- *To ensure that all industrial/light industrial activities conform to best practice in environmental terms.*

Council shall require confirmation of the ability of the land to be properly serviced with water and electricity, prior to supporting any applications for rezoning, subdivision and development.

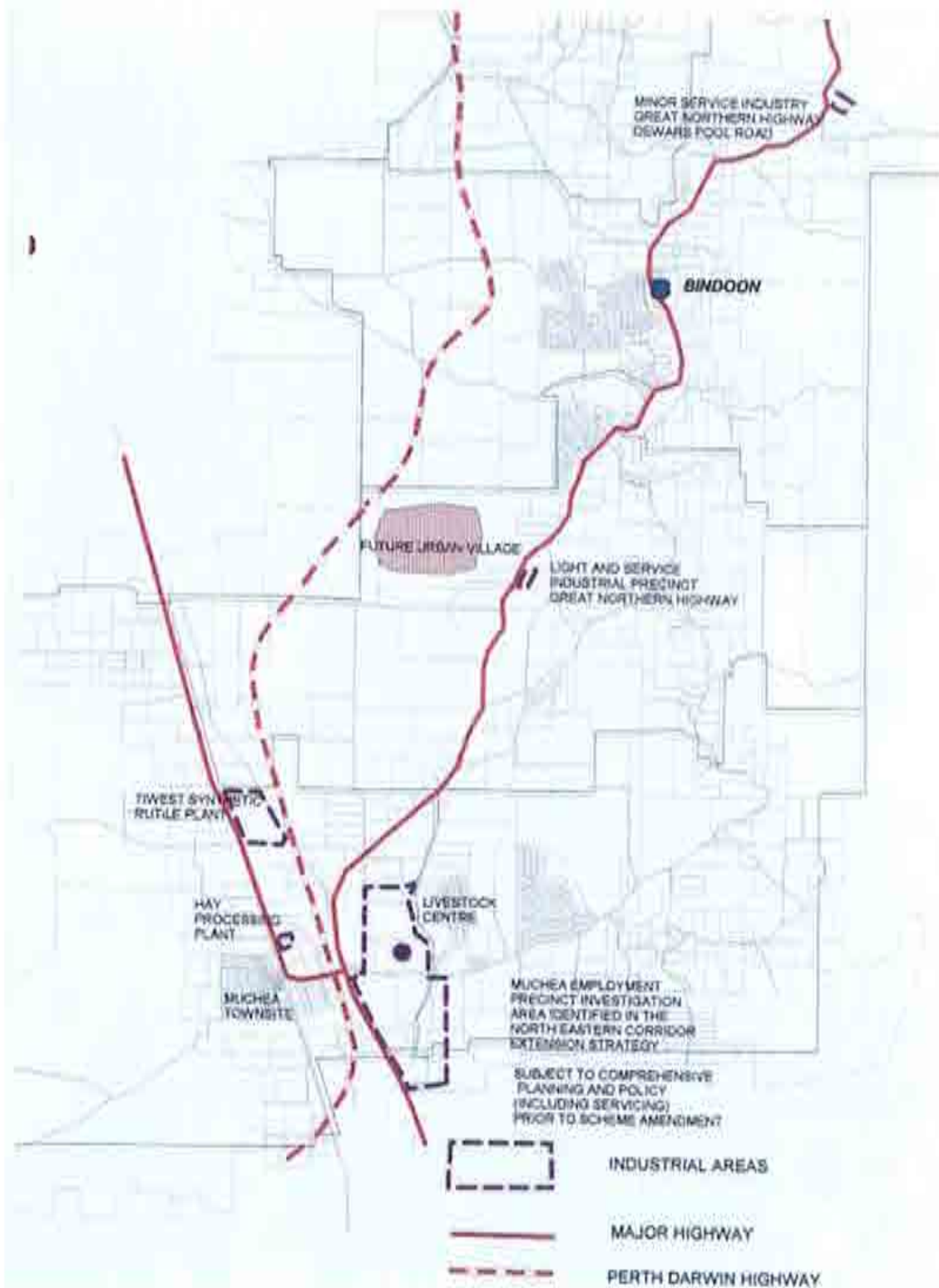
**Note:** The Muchea Employment Node is designated as an Investigation Area only. The boundaries depicted on Figure 10 and the LPS map, are indicative only and subject to change following detailed investigation of all constraints.

**Note:** The Muchea Employment Node, as depicted on the North Eastern Corridor Extension Strategy and on Figure 10 and the LPS map, is subject to detailed assessment prior to any scheme amendment being supported by Council.

Council in supporting a scheme amendment, shall consult with all relevant government authorities and community groups.

Council may adopt a Development Plan outlining the various land uses and environmental considerations, road access and traffic management of the precinct and clearly state on that plan the considerations and conditions of development.

Figure 10 – Industrial Employment Nodes



1 September 2016

Our Ref: LAM BRD DA



Chief Executive Officer  
Shire of Chittering  
6177 Great Northern Highway  
BINDOON WA 6502

**Attention: Shire President and Councillors**

Dear Elected Members,

**RE: PROPOSED TRANSPORT DEPOT USE - LOT 2 (290) BRAND HIGHWAY, MUCHEA**

Thank you for meeting with us recently at Lot 2 (290) Brand Highway, Muchea (the subject site) to discuss the Lampson operations. As a consequence of that meeting, the following further information is provided in response to those discussions. Our client has also already initiated a number of modifications to their operations as a result of some of the matters that were discussed in that recent meeting. These can be summarised as follows;

1. The visibility of the boom cranes will now be reduced by agreement of the landowner to ensure that all booms are kept in the lowered position when not in use;
2. The large hydraulic mechanical cranes will be stored on the concrete pad on the western side of the main shed to ensure any minor spills are captured;
3. We confirm that the central gully pit located in the main shed, observed at the recent site visit, connects to a triple cell (oil) interceptor that captures and separates oil waste for off site disposal;
4. In addition, Lampson have identified a dedicated oil storage area on the plans and separately installed new localised bunding within the main shed within this area;
5. Engineering confirmation has been received that the vegetated swales identified in the eastern boundary of the site have been designed to fully retain all stormwater on site to a 1:100 year storm event. Therefore, whilst the arrows on the Drainage Plan implied an overflow, in practice and design it is intended to fully retain all stormwater on site for the conservative standard of a 1:100 year event.

---

**Visibility of Cranes from Brand Highway and Surrounding Properties**

Concern was raised with regard to the visibility of cranes from areas outside of the subject site. To address this issue, Lampson has agreed to ensure that all crane boom sections are lowered when not in use and then stored in the lowered position outside of business hours. This will assist to reduce the visual impact of these crane elements and ensure that the operations are effectively screened behind the existing vegetation within the Brand Highway road reserve and along the southern boundary of the operation area.

**Storage of Mechanical Cranes**

During the recent site visit, two large hydraulic cranes were observed parked to the east of the main shed. These cranes will be stored on the concrete hardstand area to the west of the main shed and have now been relocated accordingly. Any residual oils present at the location east of the main shed have now been removed. The hydraulic cranes are capable of being serviced and maintained inside the main shed with mobile storage units used at all times and placed under work areas when oils are being handled. Lampson staff have been instructed as to the required parking location of the hydraulic cranes when on site between projects.

**Storage of Oils and Hydrocarbons**

Consideration of the storage of hydrocarbons was discussed on site.

The issue of hydrocarbon containment management was considered in the planning and design of the development at 290 Brand Highway and outlined in our previous Stormwater Strategy. This included a range of factors from diesel spills, accidental droplets of oil and greases from vehicles under maintenance (inside the storage sheds) and in storage on the open hardstand.

The first and most important safety and management measure is storage. We confirm that inside the main shed, where vehicle servicing occurs, the gully pit observed at our recent site inspection forms part of the containerised storage system with a capture tank adjacent to the main storage shed. This includes a triple cell oil interceptor and pump-out facility should there be a spill. Figure 11 on the Site Plan indicates the location of the external below ground containment tank, noted as "Oil Trap".

The storage shed has a concrete floor that incorporates sealing and a drain point to the observed gully traps with connection to an external treatment tank adjacent to the workshops as described above. Workshop spills will also be limited as handling and containment measures will include mobile storage units that will be placed under works areas when oils are being handled and will be limited to specified areas within the shed/workshop and service area facility. However, as noted above, the first response to any spills within the main shed will be dealt with by direct application of the Spill Management Measures contained within the Spill Response and Reporting Plan.



Should minor spills occur outside of the sheds, the gravel will be removed to an approved disposable facility if the quantity of spillage (unlikely to occur) justifies this action. However, as discussed earlier, all large hydraulic cranes will now be relocated and stored on the concrete hardstand when not in use.

As an additional measure, Lampson has identified a dedicated storage area for oils in the south west corner of the main shed that will of itself incorporate localised bunding, in addition to the existing containerised storage system within the main storage building. The bunding will also be designed with sufficient volume to accommodate the largest storage vessel within the containerised area. This bunded area measures 4.0m in width and 12.0m in length and comprising a perimeter of plastic "Duro-bund" bunding with an apex height of 35mm and a width of 200mm. The bunding is silicone sealed to the concrete surface.

The site plan has been amended to identify the location of this localised storage area and the Spill Response and Reporting Plan has also been updated to reflect this treatment.

### **Stormwater Drainage**

A question was raised during the site visit in relation to the capacity of the existing drainage and swale network within the operations area to contain stormwater, based on the engineering plans depicting overflow arrows to the adjoining eastern portion of the property.

Specifically, concern was raised in relation to the soak area centrally located on the eastern boundary of the operations area ("catchment C6") and the ability of this drainage feature to contain all stormwater in a large storm event.

Upon further confirmation with our Engineers, Section 4.7.1 of the Stormwater Strategy confirms that the drainage modelling undertaken for the site has demonstrated that all storm flows up to and including 1 in 100 year storm **will be fully contained on site** and directed to either the existing soakage basins and/or proposed upgraded swales located throughout the site. This means that with the minor additions to the identified swales and soaks in Table 5.6 of the Stormwater Strategy, the site is and currently will be fully capable of containing all stormwater up to that conservative 1:100 year event.

The client's hydrological engineer has also confirmed that the blue arrows shown on the catchment plans included at Figure 13 and Appendix 1 of the Stormwater Strategy depict the direction of water leaving the site would only apply in the case of a storm event greater than 1 in 100 years. Because of the conservative planning of swales to accommodate a 1:100 year event and retain stormwater on site, the arrows are redundant in practice and have been removed.

Notwithstanding the capacity of the existing drainage network to fully accommodate stormwater within the site, the client's hydrological engineer has investigated potential engineering solutions for increasing the capacity of the swale and soak within catchment



C5 and C6. Currently, Table 5.6 of the Stormwater Strategy notes as follows in relation to catchment areas C5 and C6:

- **Operations Area sub-catchment C5 (north east corner of operations area)** – “Existing soakage area to be expanded to provide required volume as noted in Table 5.7 below. Area to be vegetated.”
- **Operations Area sub-catchment C6 (centrally located on the eastern edge of the operations area)** – “Existing swale adequately sized and operating efficiently.”

Attached is the supplementary information for on-site stormwater collection and management that has been prepared by the hydrological engineer which details the capability of the existing stormwater network to contain stormwater on-site.

Should Council consider that the increased capacity is necessary to safeguard against runoff in a storm event exceeding 1:100 year event, it is possible for Council to require this as a condition and the engineers have verified that it is possible to accommodate increased capacity. However, because the allocation of a 1:100 year event is already a conservative provision, we do not consider that is necessary, and nor does the Engineering advice received.

#### **Engineering Detail for Dome Shade**

The Shire has sought further information with regard to the engineering design of the dome shade. Attached is the dome shelter specifications for the Shire’s records.

We would like to extend an invitation to Elected Members and Shire staff to meet on-site ahead of the upcoming Council Meeting to discuss the changes that have been implemented to the Lampson operations as result of these recent discussions. They will enable Councillor’s to view changes and discuss any last minute considerations to be addressed prior to the Council Meeting. We will be in contact with you in due course to arrange a suitable time.

Please do not hesitate to contact our office should you require any further information.

Yours sincerely

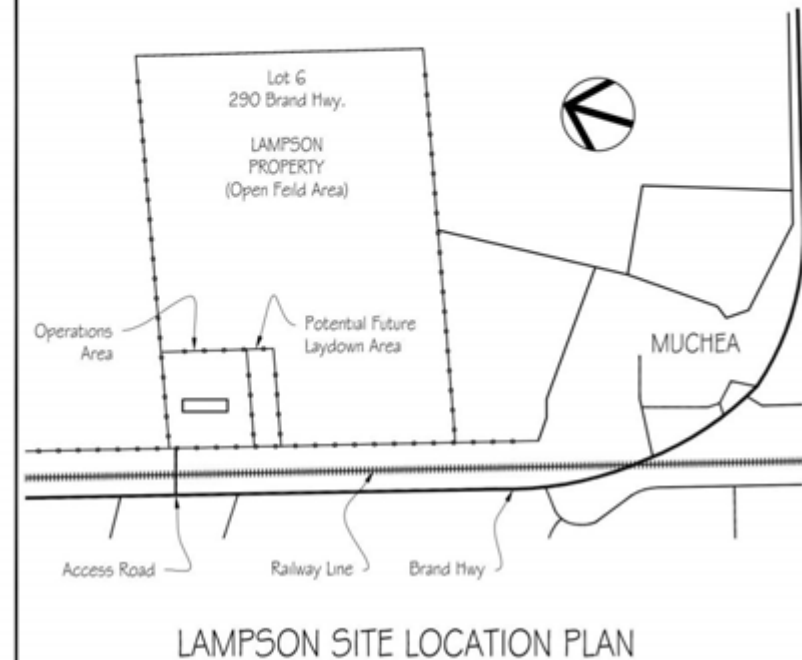
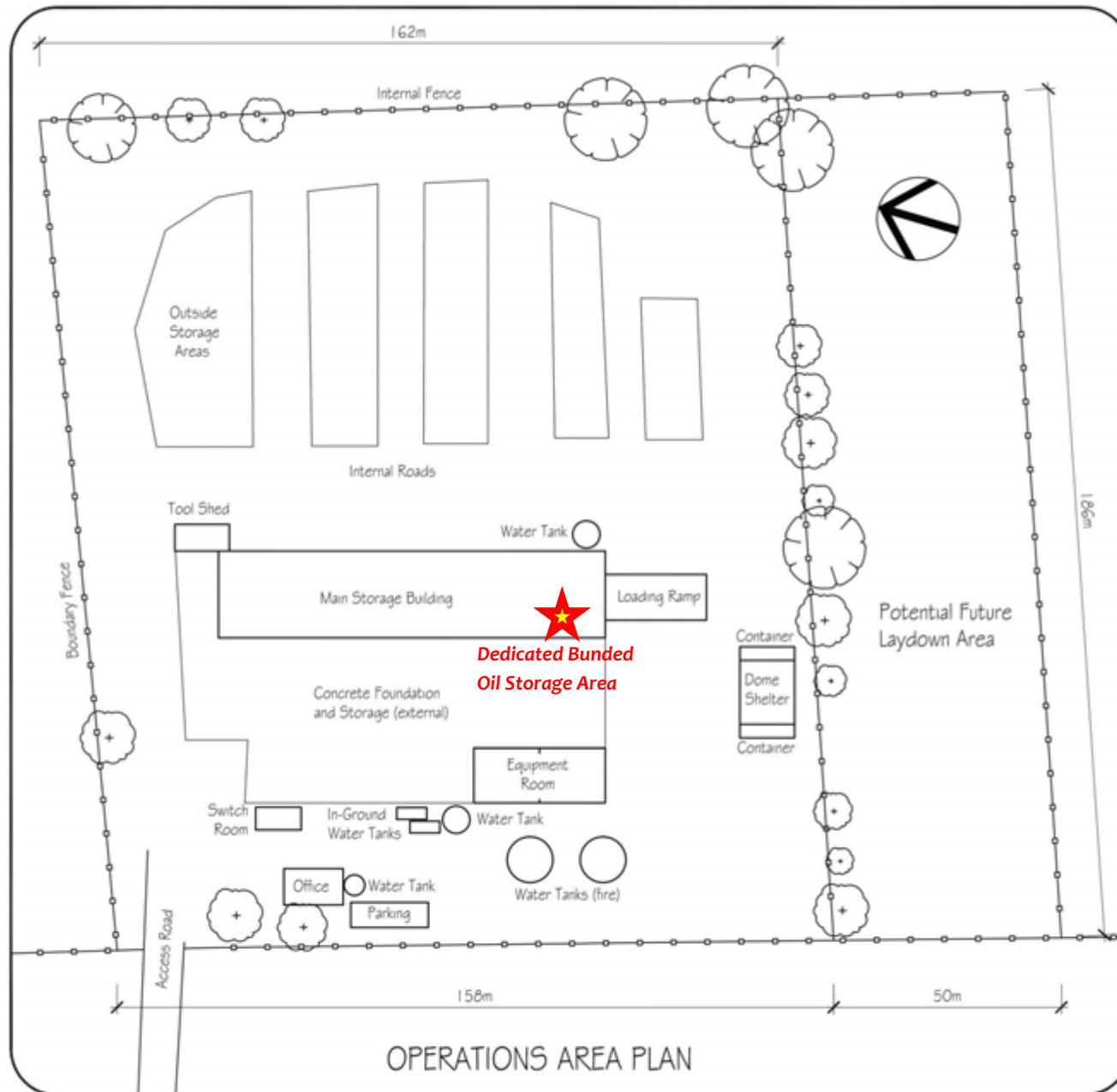
**ALLERDING AND ASSOCIATES**



**STEVE ALLERDING**  
**DIRECTOR**

cc. Client

Encl. Updated Site Plan  
Spill Response and Reporting Plan  
Supplementary information for on-site stormwater collection and management  
Dome shelter specifications



|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |    |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | </ |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----|



## Spill Response and Reporting

### General spill response guidelines

Lampson see that all oil / chemical spills, regardless of size, must be contained and cleaned up in a safe and effective manner.

This Spill Response and Reporting Guideline shall be read in conjunction with Section 4.5 of the 'Property Stormwater Drainage Management Strategy' Revision 1, dated 8 March 2016, prepared by Peritas Group. Additional measures for hydrocarbon management are outlined on Page 3 of this Guideline.

### Oil spill response

Incidental spills are generally those where:

- The spill is small (e.g. less than 20 L)
- The spill can be easily contained and cleaned up
- The spill is unlikely to reach a waterway or storm water drain.
- Clean up procedures do not pose a health or safety hazard
- Proper response equipment is available for a safe clean up (e.g.

All spills must be report to the Site Manager and Supervisor. Site Manager to decide the appropriate response to incidental spills. Always fill out incident report after the clean-up.

Non-Incidental Spills are generally those where:

- The spill is large enough to spread beyond the immediate area
- The spill cannot be contained
- The spill may reach a waterway or storm drain
- The spill requires special equipment or training to clean up
- The spill poses a hazard to human health or the environment
- There is a danger of fire or explosion.

Report the spill immediately to the Site Manager and Supervisor. Site Manager or Supervisor to evacuate the site (if applicable) and to call emergency services if necessary.

Most spills in general will be clean up by Lampson employees. For all other spills where Lampson employees are unable to control or contain a spill release, emergency services will be called.



## **Oil spill response steps**

### **Incidental spills**

1. Secure the area
2. Control and contain the spill
3. Clean up the spill
4. Notify the Site Manager
5. Complete an incident form

### **Non-Incidental**

1. Secure the area
2. Control and contain the spill
3. Notify the Site Manager
4. Contact emergency service and evacuate the site if necessary.
5. Site clean up
6. Complete an incident form

## **Spill Notification procedure**

Site Manager must make contact with the Managing director for all spills so any additional notifications can be made as required.



## Hydrocarbon Management

The following measures for hydrocarbon management shall be implemented by Lampson in addition to the spill response and reporting procedures:

- Spills will be directed to the bunded containerised storage system with capture tank adjacent to the main storage building with triple cell interceptor and pump-out facility.
- Servicing of equipment to be completed on the concreted areas such that collection and disposal of any material is completed without the need to excavate soil and remove from the working area.
- Unsealed hardstand areas shall be constructed with a thick layer of gravel (200-250mm) to absorb accidental spills and confine the leakage to the gravel layer itself. Should spills occur, the gravel will be removed to an approved disposal facility if the quantity of spillage justifies this action.
- Mobile storage units shall be used at all times and placed under works areas when oils are being handled. Oil handling is limited to specified areas within the main storage building/workshop and service area facility.
- Storage of equipment and machinery and operations stock items (steel, timber miscellaneous equipment) shall be on a base that captures all internal catchment runoff and directs it to a treatment area prior to discharging to the existing outfalls on the property to ensure that surface water is collected to containment ponds for soakage disposal (refer to Property Stormwater Drainage Management Strategy for detail of water flow and collection).
- Vegetated swales shall be established and/or enhanced within the operations areas to naturally reduce the pollutants to 'safe' compounds.
- The availability of spill kits in the main storage building that include 'kitty litter' or pads for absorption of any spilt liquid, as well as shovels and bins to remove such liquid laden material from the ground.
- Liquid waste that has been absorbed and cleared from the spill site is stored in sealed containers within the main storage shed and then removed on an 'as required' basis by the waste removal contractor.
- Spills of more than 100 litres (including fuels, oils, radiator coolants, hydraulic fluid, brake fluid and other fluids) shall be reported to the pollution section of the Department of Environment Regulation.
- Vehicles entering the property or stored in unsealed areas shall be inspected weekly for leakage. Should leakage be present, Lampson staff shall follow the Oil Spill Response Steps on Page 2.
- All hydrocarbons will be stored within the main storage building which contains the bunded containerised storage system.
- All oils to be contained in a dedicated and localised area of the main storage building with localised bunding of a sufficient capacity to accommodate the largest storage vessel.



30/08/2016

Allerding Associates  
 125 Hammersley Road  
 SUBIACO WA 2008

Attention: Mt Steve Allerding

Dear Steve,

**RE: STORMWATER DRAINAGE MANAGEMENT STRATEGY  
 290 BRAND HIGHWAY MUCHEA**

Peritas Civil was commissioned by Allerding Associates on behalf of Lampson (Australia) Pty Ltd (**Lampson**), the landowners of Lot 6 (No. 290) Brand Highway, Muchea (**subject site**) to prepare a Stormwater Drainage Management Strategy in support of a retrospective application for planning approval to allow the continued operation of the 'Transport Depot' land use associated with the Lampson operations.

Further to our report dated 8/03/2016 we understand that during on-site discussions with council members, there were concerns raised about the capacity of the stormwater system for the development area.

**As noted in the report in some detail, the development site (area within which storage depot activities are being maintained) is already capable of retaining the pre and post development flows up to 1:100 year events.**

The existing stormwater regime plan (Figure 6 from the 8/03/2016 report) shows the existing watersheds from the site and this indicates that above the 1:100-year event, overflow from the developed area will join the property watersheds and continue eastwards.

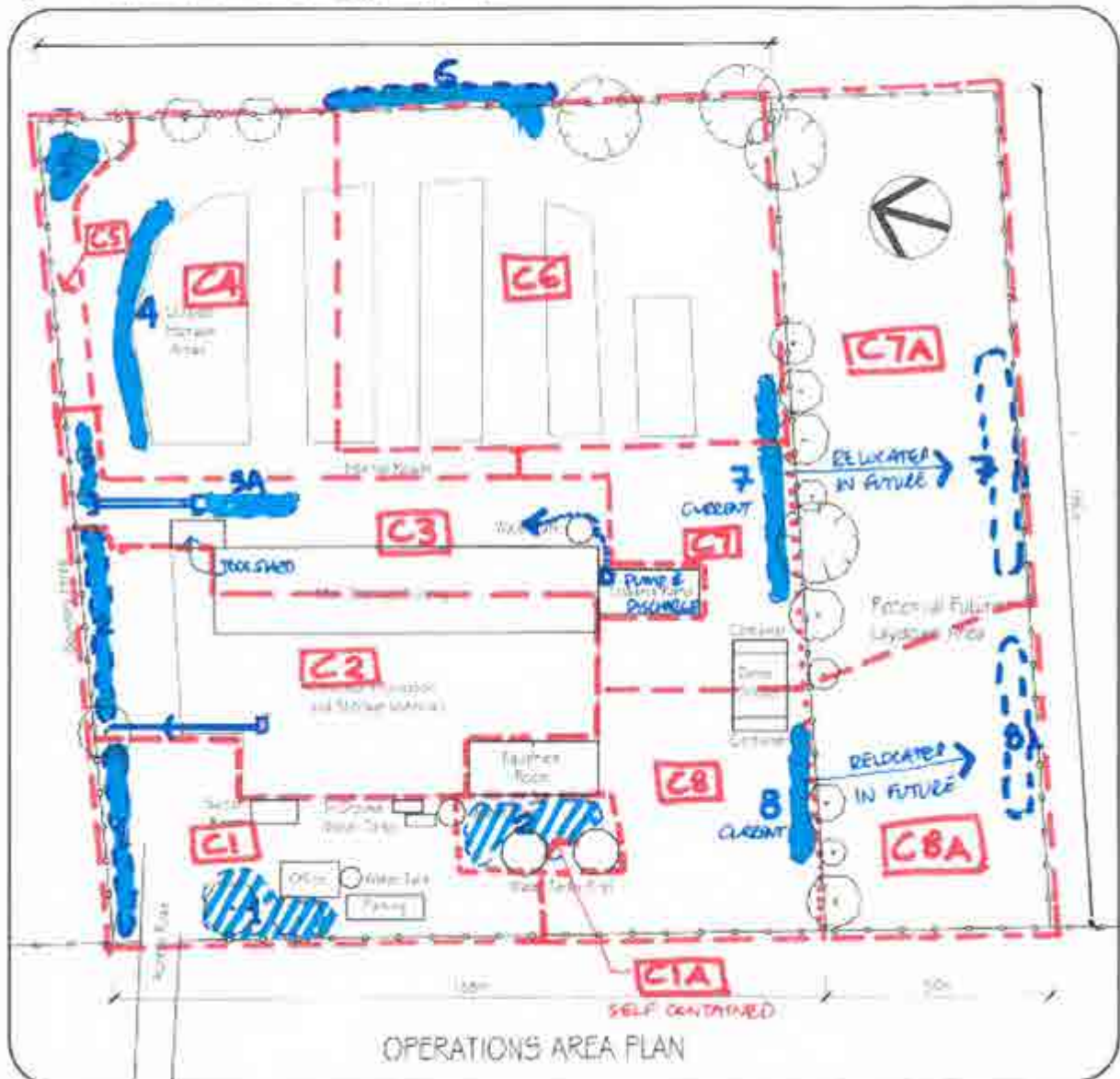
What was not shown in detail are the additional storage zones within the property than would increase the retention of stormwater events on site to above the 1:100-year capacity. It was felt unnecessary at the time of writing the main report, to highlight this as these storages would be in excess of the normal council requirements for stormwater retention and disposal. The additional locations where natural storage occurs is shown highlighted in red borders below.

It would also be possible to increase the size of swales 5 & 6 to accommodate additional storage closer to the development, however, having achieved the 1 in 100-year storage requirements, we feel any request by council to impose additional storage beyond this would be excessive and unnecessary.

Figure 13 from our report below – Operations Area Subcatchment Plan includes swale 5 & 6 sized as follows:

| Catchment Number                   | Catchm't Gross Area (m2) | Swale Area (m2) | ARI    | TWL (mAHD) | Storage Volume (m³) | Surface Area at TWL (m²) | Swale / Soakage Area Details |                                   |
|------------------------------------|--------------------------|-----------------|--------|------------|---------------------|--------------------------|------------------------------|-----------------------------------|
|                                    |                          |                 |        |            |                     |                          | Base Level (m AHD)           | Side Slope (v:h)                  |
| Operations area Catchment C5 Swale | 642                      | 450             | 1-yr   | N/A        | N/A                 | N/A                      | RL51.00                      | 1:3 with 4 to 4.5m wide base min. |
|                                    |                          |                 | 10-yr  | N/A        | N/A                 | N/A                      |                              |                                   |
|                                    |                          |                 | 100-yr | N/A        | N/A                 | N/A                      |                              |                                   |
| Operations area Catchment C6 Swale | 8,092                    | 300             | 1-yr   | RL 51.09   | 27.0                | 316                      | RL51.00                      | 1:3 with 5.0m wide base min.      |
|                                    |                          |                 | 10-yr  | RL 51.27   | 87.0                | 351                      |                              |                                   |
|                                    |                          |                 | 100-yr | RL 51.53   | 188.0               | 406                      |                              |                                   |

Figure 13 - Operations Area Subcatchment Plan



The base of the bio retention pockets within the swales would be provided with High PRI soils (Gin Gin Soils or similar) capable of nutrient stripping in conjunction with the planting proposals. Generally, wetland planting would consist of tube-stock planting of the following varieties:

- 50% of the plantings to be effective at nutrient removal
- Balance plantings would be local, native, ephemeral species (e.g. *Ficinia Nodosa*)
- 8-12 plants per m<sup>2</sup> planting frequency would be satisfactory



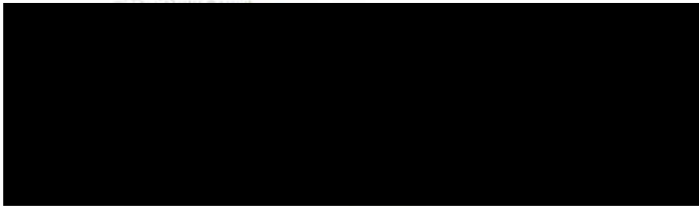
#### Oil & Hydrocarbon Storage on site

A second issue raised on site was storage of materials and effect on environment in case of spillage. We understand, however, that the storage volume of materials proposed will be kept to below accepted volume limits that would not necessitate licensing or bunded storage.

We understand that the client has already provided a bunded area within the storage shed that would comply with the Dangerous Goods Safety and storage guidelines even though the quantity being stored would be exempt from formal licensing.

We trust that this information is adequate for your present purposes and would be pleased to provide any additional information if required.

Yours sincerely



**ENZO BIAGIONI-FROUDIST**  
B.Eng, FIE Aust, NPER  
Director  
Peritas Civil Pty Ltd



THE DESIGN AND DRAWINGS SHOWN HERE ON ARE COPYRIGHT AND SHALL NOT BE COPIED, REPRODUCED, SCANNED, STORED IN ANY ELECTRONIC DATABASE, RE-TRANSMITTED, DISCLOSED, DISTRIBUTED, OR COMMERCIALISED WITHOUT THE WRITTEN CONSENT OF ALLSHELTER. THIS DRAWING AND INFORMATION REMAINS THE PROPERTY OF ALLSHELTER AND MAY NOT BE USED FOR ANY OTHER PURPOSE THAN THAT FOR WHICH IT IS SUPPLIED. ALLSHELTER WILL NOT HESITATE TO TAKE APPROPRIATE LEGAL ACTION IF ITS RIGHTS IN THIS RESPECT ARE INFRINGED.

GENERAL:

- G2. DIMENSIONS SHALL NOT BE OBTAINED BY SCALING THE DRAWINGS.
- G3. ALL LEVELS AND SETTING OUT DIMENSIONS SHOWN ON THE DRAWINGS SHALL BE VERIFIED ON SITE BEFORE CONSTRUCTION.
- G4. DURING CONSTRUCTION THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERSTRESSED.
- G5. DESIGN LOADS.

COMBINATION LOADS (AS/NZS 1170.0:2002) SECTION 4

WIND LOAD (AS/NZS 1170.2:2011)

V<sub>DES</sub> = 41.0m/s REG. A\*, T.C.2

V<sub>DES</sub> = 51.9m/s REG. B\*, T.C.2

V<sub>DES</sub> = 63.1m/s REG. C\*, T.C.2

V<sub>DES</sub> = 80.1m/s REG. D\*, T.C.2

\* REFERS TO WIND REGION SPECIFIED IN THE TITLE BLOCK SHELTER CODE BELOW.

SNOW LOAD NIL ALLOWED – REFER TO ENGINEER FOR RE-DESIGN IF IN SNOW AREA.

STRUCTURAL IMPORTANCE LEVEL – 2
- NOTE: 1. ULTIMATE DESIGN WIND SPEED V<sub>DES</sub> INCLUDES A FACTOR FOR BUILDING HEIGHT, BUT NOT FOR LOCAL TOPOGRAPHIC EFFECTS SUCH AS HILLS & ESCARPMENTS. THESE DRAWINGS ARE NOT VALID IF THESE EFFECTS OCCUR ON SIGHT. CONTACT COOK AND ROE FOR A REVISED DESIGN IN THESE CIRCUMSTANCES.
2. STRUCTURAL ASSESSMENT & SUITABILITY OF CONTAINERS FOR RESISTING ARCH FORCES BY OTHERS

STRUCTURAL STEEL WORK:

- S1. FABRICATION AND ERECTION TO BE IN ACCORDANCE WITH AS4100 SECTIONS 14 & 15 AND AS/NZS1554 EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS. STRUCTURAL STEEL SHALL COMPLY WITH AS/NZS1163, AS/NZS3678 AND AS/NZS3679.1.

STRUCTURAL STEEL SHALL BE CONSTRUCTED FROM THE FOLLOWING GRADES:

ROLLED SECTIONS GRADE 300 plus

RECTANGULAR HOLLOW SECTION GRADE 350/450 AS NOTED ON PLAN

CIRCULAR HOLLOW SECTIONS GRADE 250/350 AS NOTED ON PLAN

PLATE GRADE 250

A CERTIFICATE BY THE STRUCTURAL STEEL SUPPLIER SHALL BE PROVIDED TO DEMONSTRATE COMPLIANCE WITH THE ABOVE REQUIREMENTS.
- S2. STRUCTURAL STEELWORK SHALL BE OF THE FOLLOWING GRADES U.N.O.

| SECTION                   | GRADE                                  |
|---------------------------|--|
| FLATS, PLATES, ROUNDS     | AS/NZS3678 - 300<br>AS/NZS3679.1 - 250 |
| COLD-FORMED SHS, RHS, CHS | AS/NZS1163 - C450<br>- C350            |
- S3. ALL DIMENSIONS GIVEN FOR MATERIALS ARE GROSS DIMENSIONS WITH NO REDUCTION FOR WELD PREPARATION.
- S4. BOLTS DESIGNATED 4.6/S SHALL BE COMMERCIAL GRADE BOLTS TO AS AS1111 & NUTS TO AS TO AS1112 (GRADE 4.6) TIGHTENED TO A SNUG FIT. BOLTS DESIGNATED 8.8/S SHALL BE HIGH STRENGTH BOLTS TO AS/NZS1252 TIGHTENED TO A SNUG FIT.
- S7. ALL WASHERS FOR HIGH STRENGTH BOLTS SHALL BE HARDENED STEEL TO AS/NZS1252 EXCEPT FOR SNUG-TIGHT JOINTS WHERE BLACK STEEL WASHERS TO AS1237 MAY BE USED.
- S8. A FLAT WASHER IS TO BE FITTED UNDER THE ROTATING COMPONENT OF EACH BOLT.
- S14. ALL BOLTS, NUTS AND WASHERS SHALL BE HOT DIPPED GALVANIZED BY THE MANUFACTURER.
- S15. THE CONTRACTOR SHALL PROVIDE ALL CLEATS AND DRILL ALL HOLES NECESSARY FOR FIXING STEEL TO STEEL, WHETHER OR NOT DETAILED IN THE DRAWING.
- S17. WELDS SHALL BE 6mm CONTINUOUS FILLET, ELECTRODES E48XX, BOLTS

FOUNDATIONS:

- F1. FOOTINGS HAVE BEEN DESIGNED FOR ALL ALLOWABLE BEARING PRESSURE OF 150 kPa AND ALLOWABLE SHAFT ADHESION OF 15 kPa.
- F4. FOUNDATION MATERIAL SHALL BE INSPECTED AND APPROVED BY A QUALIFIED GEOTECHNICAL ENGINEER FOR THE ABOVE SAFE BEARING PRESSURE BEFORE PLACING CONCRETE.

REINFORCED CONCRETE:

- C1. ALL WORKMANSHIP SHALL BE IN ACCORDANCE WITH AS3600.

STEEL REINFORCING FOR CONCRETE SHALL COMPLY WITH AS/NZS4671.

REINFORCEMENT SHALL SATISFY THE FOLLOWING GRADE REQUIREMENTS:

N- DENOTES GRADE 500 NORMAL DUCTILITY DEFORMED BAR TO AS4671

R- DENOTES GRADE 250 NORMAL DUCTILITY PLAIN ROUND BAR TO AS4671

SL- DENOTES GRADE 500 LOW DUCTILITY WELD SQUARE MESH TO AS4671

A CERTIFICATE BY THE REINFORCING STEEL SUPPLIER SHALL BE PROVIDED TO DEMONSTRATE COMPLIANCE WITH THE ABOVE REQUIREMENTS.
- C2.

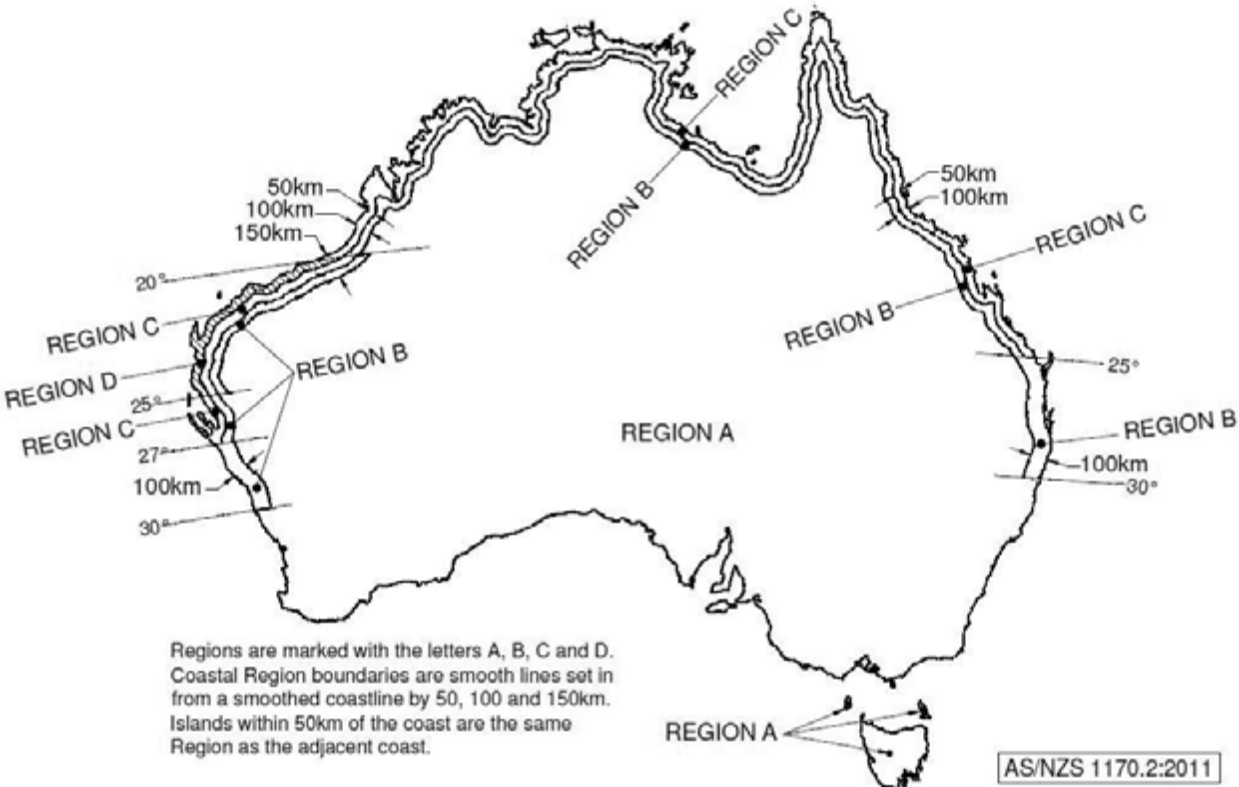
| ELEMENT        | SLUMP mm | MAX SIZE AGG mm | CONCRETE GRADE |
|----------------|----------|-----------------|----------------|
| FOOTINGS       | 80±15    | 20              | N25            |
| SLAB ON GROUND | 80±15    | 20              | N32            |
- C3. MINIMUM CLEAR CONCRETE COVER TO REINFORCEMENT INCLUDING TIES AND STIRRUPS SHALL BE AS FOLLOWS UNLESS OTHERWISE SHOWN.

| ELEMENT        | COVER mm |
|----------------|----------|
| FOOTINGS       | 50       |
| SLAB ON GROUND | 40       |

- C5. ALL CONCRETE SHALL BE COMPACTED WITH MECHANICAL VIBRATORS. VIBRATORS SHALL NOT BE USED TO SPREAD CONCRETE.
- C6. SPLICE IN REINFORCEMENT SHALL NOT BE MADE WITHOUT THE APPROVAL OF COOK & ROE.
- C7. WELDING OF REINFORCEMENT IS NOT PERMITTED.

COMPACTED FILLING

- CF.1 BEFORE PLACING ANY FILL, ALL ORGANIC MATERIAL & TOP SOIL ARE TO BE REMOVED & THE AREA PROOF ROLLED TO IDENTIFY ANY LOW STRENGTH AREAS. IF NECESSARY, LOW STRENGTH MATERIAL IS TO BE EXCAVATED TO OBTAIN A UNIFORM STRENGTH BASE PRIOR TO PLACEMENT OF FILL MATERIAL.
- CF.2 WHERE FILL IS REQUIRED, A SUITABLE FILL MATERIAL CERTIFIED BY A QUALIFIED GEOTECHNICAL ENGINEER SHALL BE PLACED IN 150mm LAYERS & COMPACTED TO A DENSITY RATIO NOT LESS THAN 98% STANDARD DENSITY IN ACCORDANCE WITH AS.3798-2007 "GUIDELINES ON EARTHWORKS FOR COMMERCIAL & RESIDENTIAL DEVELOPMENTS". FURTHERMORE, THE SUBGRADE SHOULD BE COMPACTED TO ACHIEVE TO MEET THE SAME COMPACTION REQUIREMENTS NOTED ABOVE PRIOR TO PLACEMENT OF FILL.



NOTE:

- 1) THESE DRAWINGS ARE DESIGNED FOR USE BY A QUALIFIED BUILDER EXPERIENCED IN THE USE OF ALL FORMS OF CONSTRUCTION TO BE USED IN THIS PROJECT.
- 2) THE SHIPPING CONTAINERS USED TO SUPPORT THE ROOF STRUCTURE HAVE NOT BEEN CHECKED AS PART OF THE STRUCTURAL DESIGN OF THE SHELTER. IT IS THE RESPONSIBILITY OF THE CLIENT TO ENSURE THAT ALL CONTAINERS WILL BE IN GOOD CONDITION AND ARE SUITABLE TO WITHSTAND THE ARCH FORCES FROM THE ROOF STRUCTURE.
- 3) IT IS THE OWNERS RESPONSIBILITY TO ENSURE THAT THE FABRIC REMAINS TIGHT. FLOGGING OF THE FABRIC WILL OVERLOAD THE STEEL FRAME. COOK & ROE CANNOT GUARANTEE THE DESIGN SUITABILITY IF FLOGGING OCCURS.



Ph.1800 08 2244 Ph.+612 6898 2244  
Email:sales@allshelter.com.au

|     |          |                      |          |
|-----|----------|----------------------|----------|
| E   | -        | -                    |          |
| D   | -        | -                    |          |
| C   | -        | -                    |          |
| B   | -        | -                    |          |
| A   | 09/05/14 | RELEASE FOR APPROVAL |          |
| REV | DATE     | DETAILS              | APPROVED |

JOB NUMBER:

DRAWN: williamp

DATE: 7/05/2014

SCALE: NTS

PAGE:

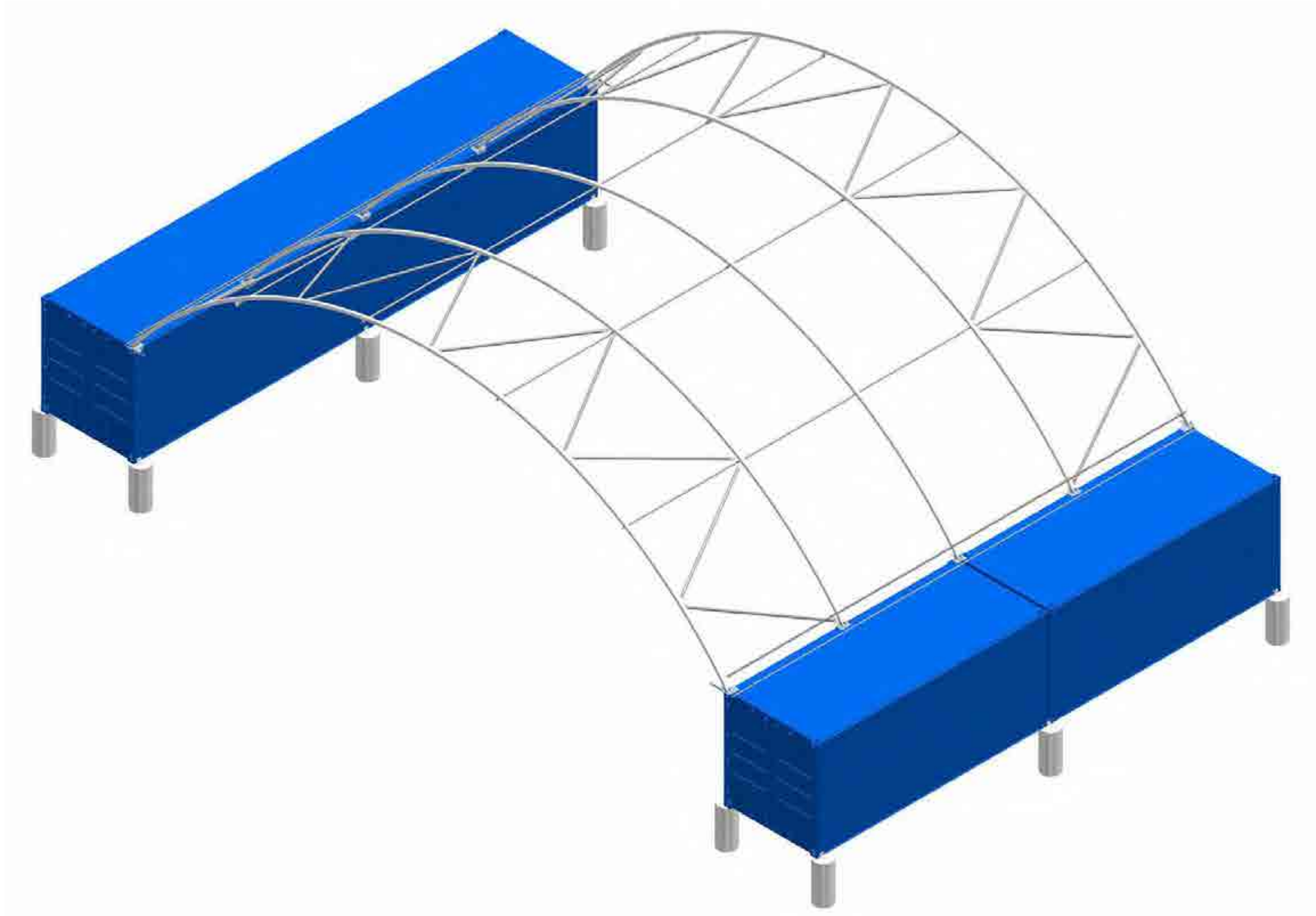
TITLE:

SHELTER ASSEMBLY

SHELTER CODE:

CASA1512AIM

THE DESIGN AND DRAWINGS SHOWN HERE ON ARE COPYRIGHT AND SHALL NOT BE COPIED, REPRODUCED, SCANNED, STORED IN ANY ELECTRONIC DATABASE, RE-TRANSMITTED, DISCLOSED, DISTRIBUTED, OR COMMERCIALISED WITHOUT THE WRITTEN CONSENT OF ALLSHELTER.  
THIS DRAWING AND INFORMATION REMAINS THE PROPERTY OF ALLSHELTER AND MAY NOT BE USED FOR ANY OTHER PURPOSE THAN THAT FOR WHICH IT IS SUPPLIED. ALLSHELTER WILL NOT HESITATE TO TAKE APPROPRIATE LEGAL ACTION IF ITS RIGHTS IN THIS RESPECT ARE INFRINGED.



Ph.1800 08 2244 Ph.+612 6898 2244  
Email:sales@allshelter.com.au

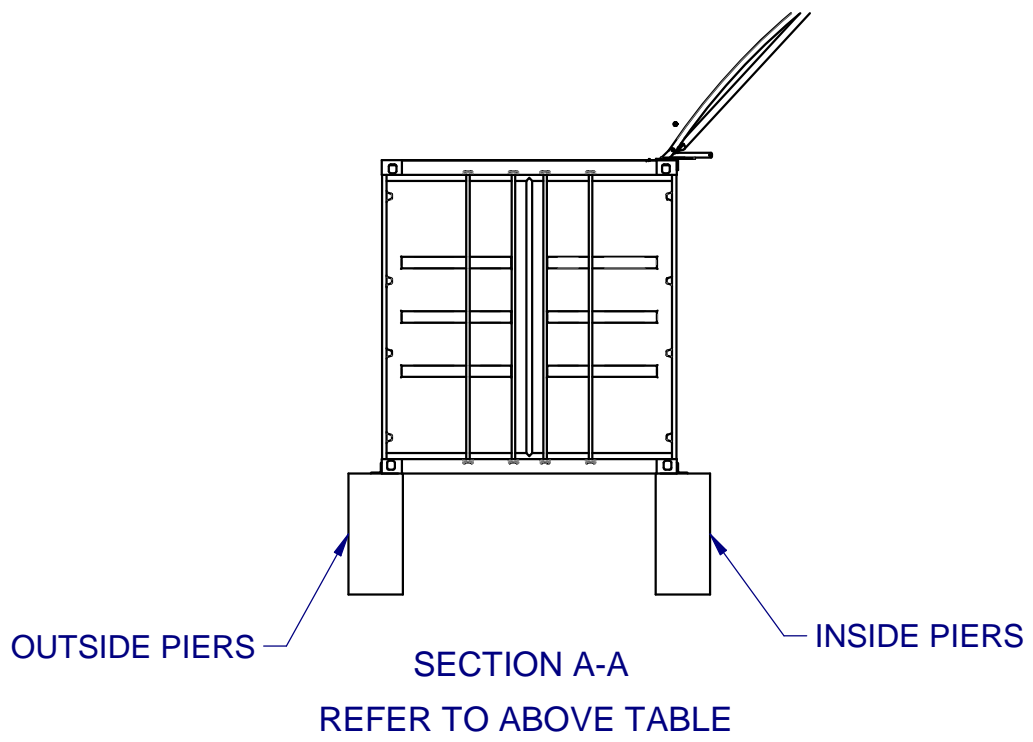
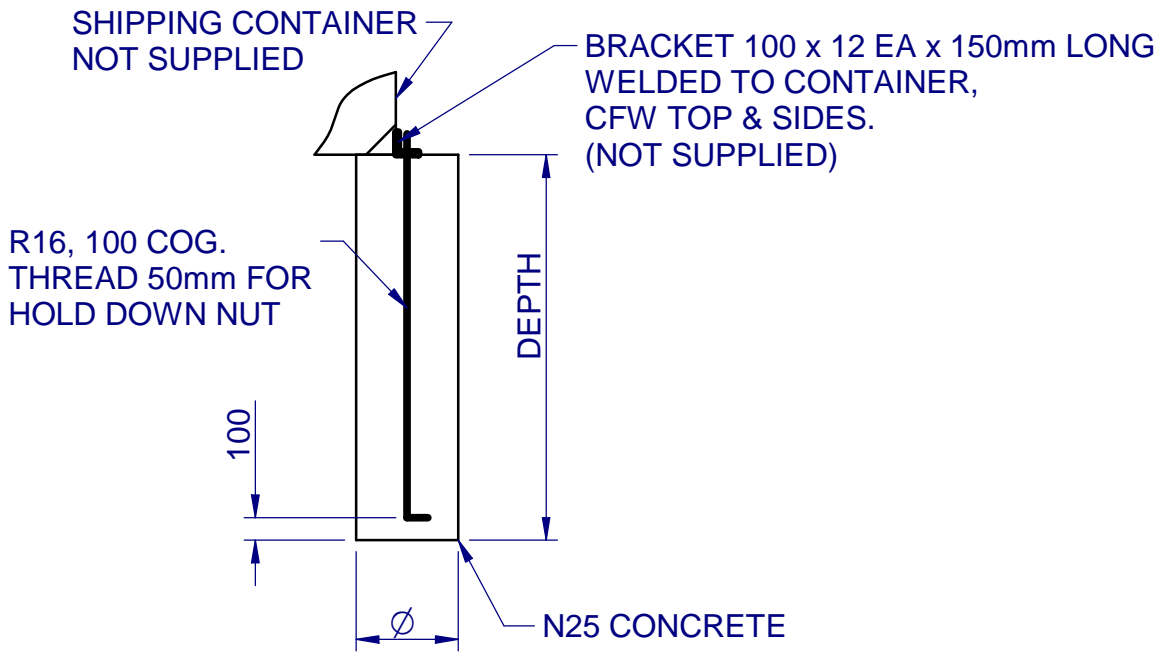
|     |          |                      |          |
|-----|----------|----------------------|----------|
| E   | -        | -                    |          |
| D   | -        | -                    |          |
| C   | -        | -                    |          |
| B   | -        | -                    |          |
| A   | 09/05/14 | RELEASE FOR APPROVAL |          |
| REV | DATE     | DETAILS              | APPROVED |

|             |           |        |       |
|-------------|-----------|--------|-------|
| JOB NUMBER: |           |        |       |
| DRAWN:      | DATE:     | SCALE: | PAGE: |
| williamp    | 7/05/2014 | NTS    |       |

|               |                  |
|---------------|------------------|
| TITLE:        | SHELTER ASSEMBLY |
| SHELTER CODE: | CASA1512AIM      |

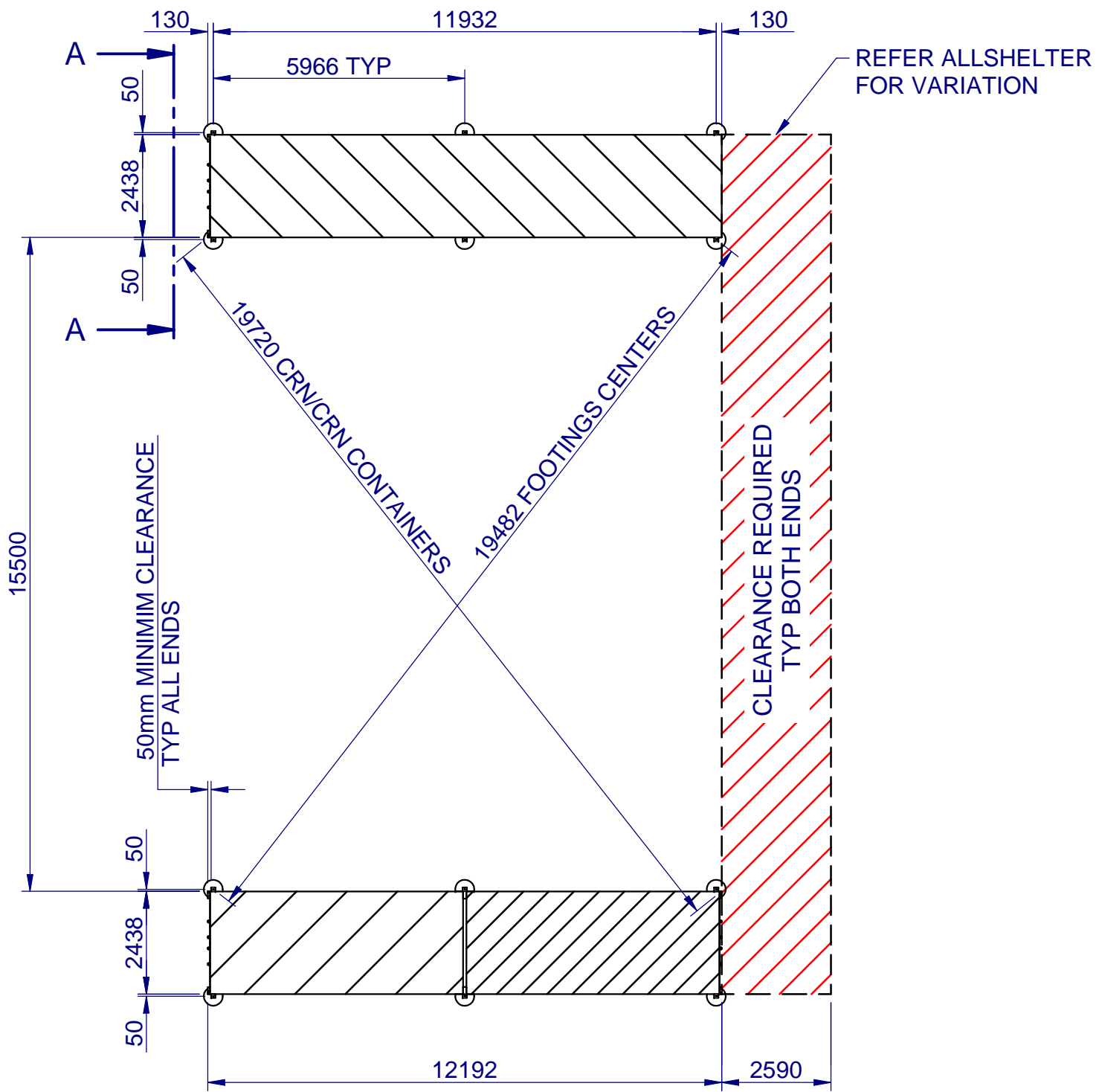


THE DESIGN AND DRAWINGS SHOWN HERE ON ARE COPYRIGHT AND SHALL NOT BE COPIED, REPRODUCED, SCANNED, STORED IN ANY ELECTRONIC DATABASE, RE-TRANSMITTED, DISCLOSED, DISTRIBUTED, OR COMMERCIALISED WITHOUT THE WRITTEN CONSENT OF ALLSHELTER. THIS DRAWING AND INFORMATION REMAINS THE PROPERTY OF ALLSHELTER AND MAY NOT BE USED FOR ANY OTHER PURPOSE THAN THAT FOR WHICH IT IS SUPPLIED. ALLSHELTER WILL NOT HESITATE TO TAKE APPROPRIATE LEGAL ACTION IF ITS RIGHTS IN THIS RESPECT ARE INFRINGED.



| FOOTING / BALLAST DETAILS |                |      |                 |      |
|---------------------------|----------------|------|-----------------|------|
|                           | INSIDE FOOTING |      | OUTSIDE FOOTING |      |
| CONTAINER HEIGHT          | 2590           |      | 2890            |      |
| Ø                         | 450            |      | 450             |      |
| DEPTH                     | 1000           | 1400 | 1000            | 1500 |
| NUMBER                    | 3              | 3    | 3               | 3    |
| UPLIFT FORCE PER PIER     |                |      |                 |      |
| DIMENSION                 | 5966           | 5966 | 5966            | 5966 |
| BALLAST OPTION (kg/m)     | 685            |      | 800             |      |

NOTE: BALLAST OPTION TO BE USED INSTEAD OF CONCRETE PIERS & PLACED ALONG THE ENTIRE LENGTH OF CONTAINER. BALLAST REQUIREMENTS ASSUMES A MINIMUM SHIPPING CONTAINER TARE WEIGHT OF 2,200kg.



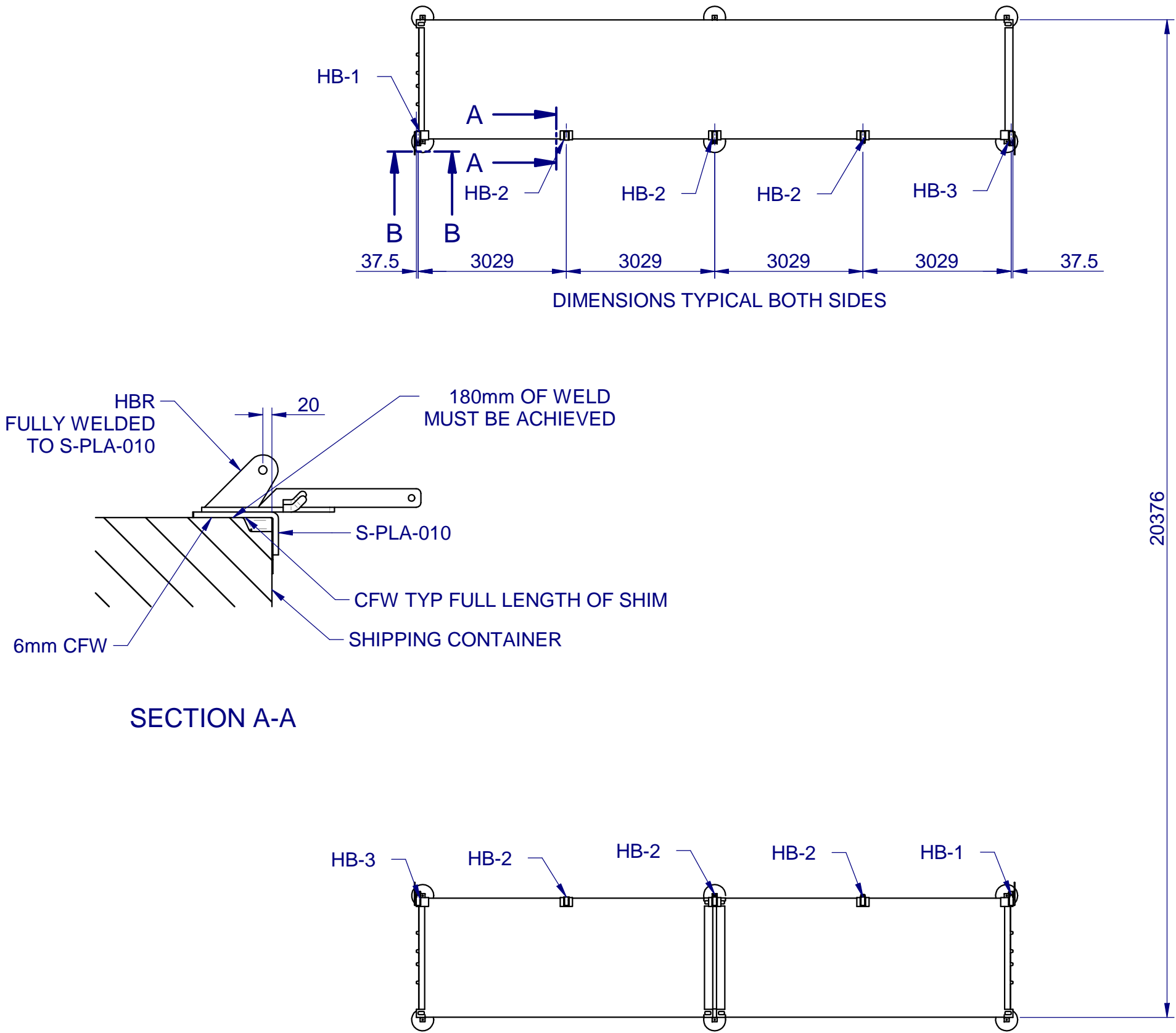
Ph.1800 08 2244 Ph.+612 6898 2244  
Email:sales@allshelter.com.au

|     |          |                      |          |
|-----|----------|----------------------|----------|
| E   | -        | -                    |          |
| D   | -        | -                    |          |
| C   | -        | -                    |          |
| B   | -        | -                    |          |
| A   | 09/05/14 | RELEASE FOR APPROVAL |          |
| REV | DATE     | DETAILS              | APPROVED |

|             |           |        |       |
|-------------|-----------|--------|-------|
| JOB NUMBER: |           |        |       |
| DRAWN:      | DATE:     | SCALE: | PAGE: |
| williamp    | 7/05/2014 | NTS    |       |

|               |  |                  |  |
|---------------|--|------------------|--|
| TITLE:        |  | SHELTER ASSEMBLY |  |
| SHELTER CODE: |  | CASA1512AIM      |  |

THE DESIGN AND DRAWINGS SHOWN HERE ON ARE COPYRIGHT AND SHALL NOT BE COPIED, REPRODUCED, SCANNED, STORED IN ANY ELECTRONIC DATABASE, RE-TRANSMITTED, DISCLOSED, DISTRIBUTED, OR COMMERCIALISED WITHOUT THE WRITTEN CONSENT OF ALLSHELTER. THIS DRAWING AND INFORMATION REMAINS THE PROPERTY OF ALLSHELTER AND MAY NOT BE USED FOR ANY OTHER PURPOSE THAN THAT FOR WHICH IT IS SUPPLIED. ALLSHELTER WILL NOT HESITATE TO TAKE APPROPRIATE LEGAL ACTION IF ITS RIGHTS IN THIS RESPECT ARE INFRINGED.



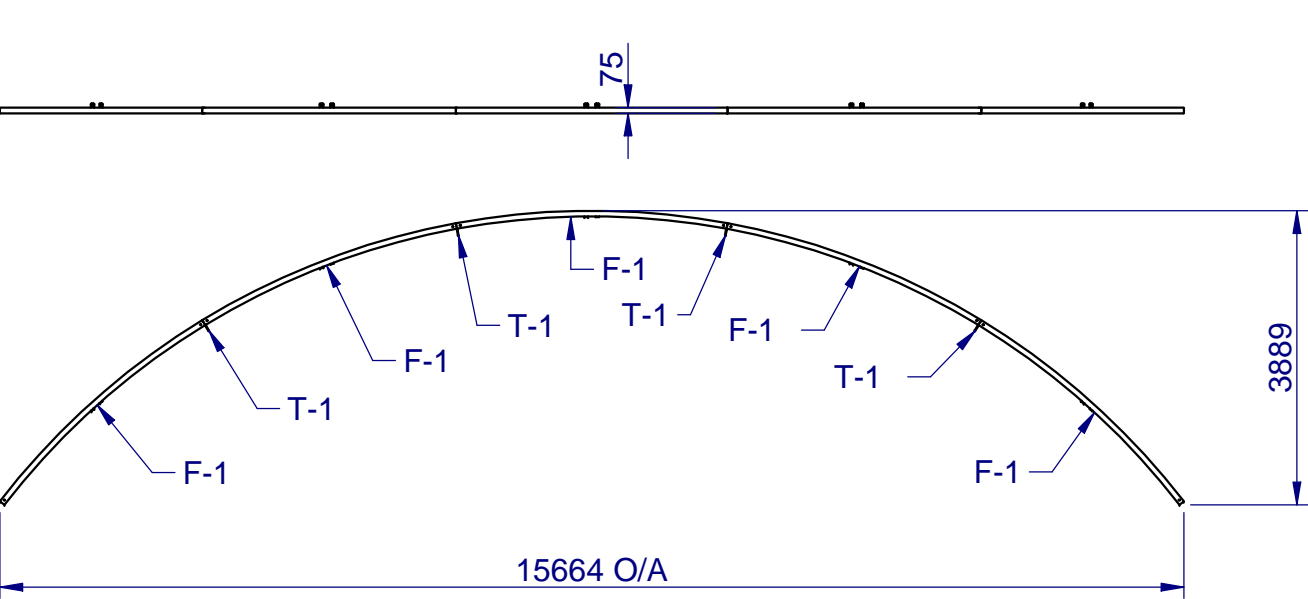
Ph.1800 08 2244 Ph.+612 6898 2244  
Email:sales@allshelter.com.au

|     |          |                      |          |
|-----|----------|----------------------|----------|
| E   | -        | -                    | -        |
| D   | -        | -                    | -        |
| C   | -        | -                    | -        |
| B   | -        | -                    | -        |
| A   | 09/05/14 | RELEASE FOR APPROVAL | -        |
| REV | DATE     | DETAILS              | APPROVED |

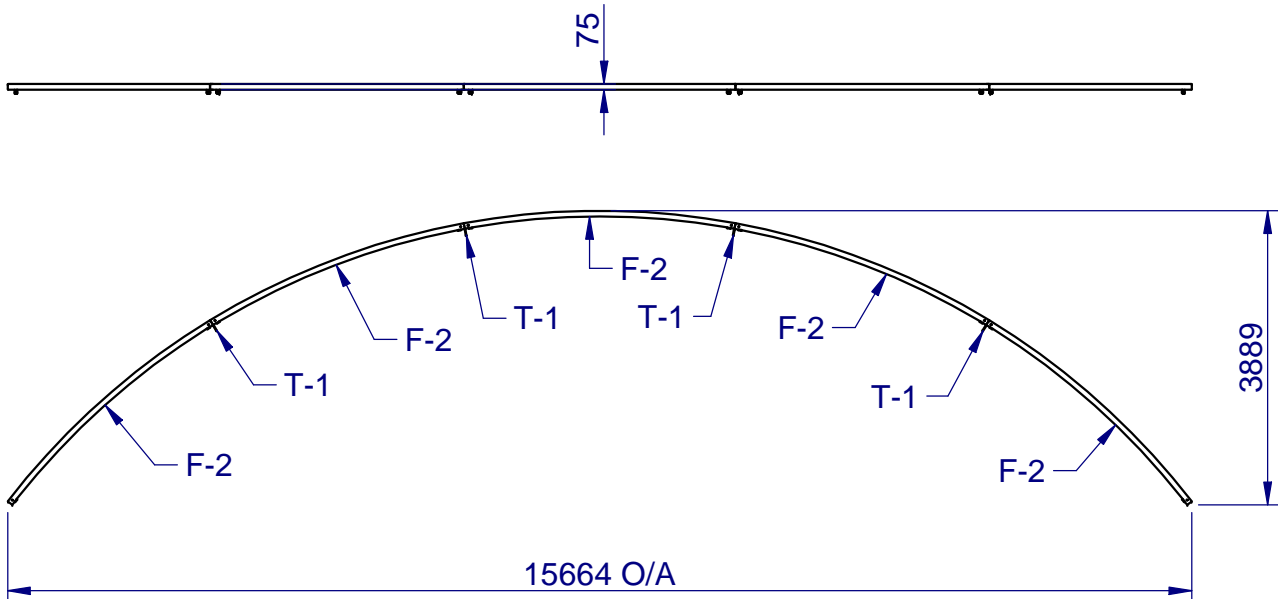
|             |           |        |       |
|-------------|-----------|--------|-------|
| JOB NUMBER: |           |        |       |
| DRAWN:      | DATE:     | SCALE: | PAGE: |
| williamp    | 7/05/2014 | NTS    | -     |

|               |                  |
|---------------|------------------|
| TITLE:        | SHELTER ASSEMBLY |
| SHELTER CODE: | CASA1512AIM      |

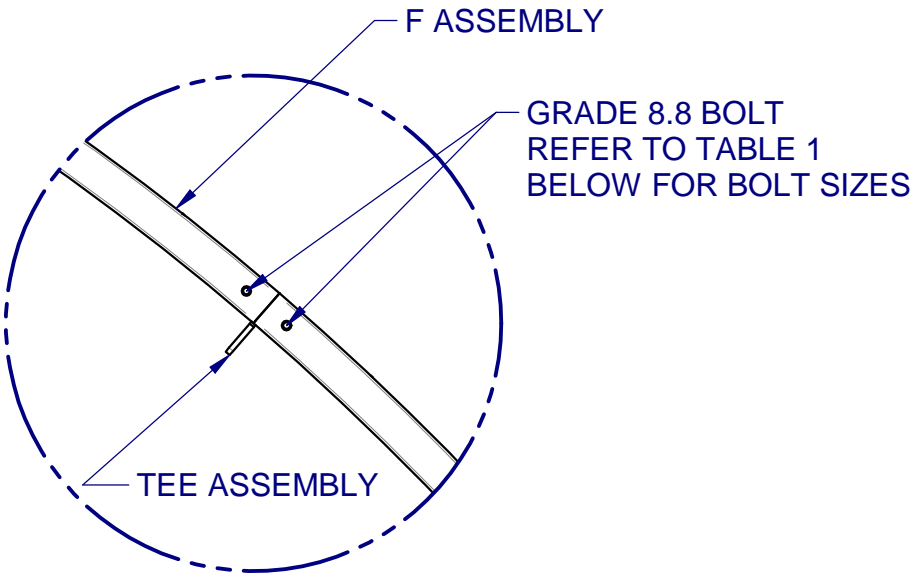
THE DESIGN AND DRAWINGS SHOWN HERE ON ARE COPYRIGHT AND SHALL NOT BE COPIED, REPRODUCED, SCANNED, STORED IN ANY ELECTRONIC DATABASE, RE-TRANSMITTED, DISCLOSED, DISTRIBUTED, OR COMMERCIALISED WITHOUT THE WRITTEN CONSENT OF ALLSHELTER. THIS DRAWING AND INFORMATION REMAINS THE PROPERTY OF ALLSHELTER AND MAY NOT BE USED FOR ANY OTHER PURPOSE THAN THAT FOR WHICH IT IS SUPPLIED. ALLSHELTER WILL NOT HESITATE TO TAKE APPROPRIATE LEGAL ACTION IF ITS RIGHTS IN THIS RESPECT ARE INFRINGED.



ARC-1 QTY: 2

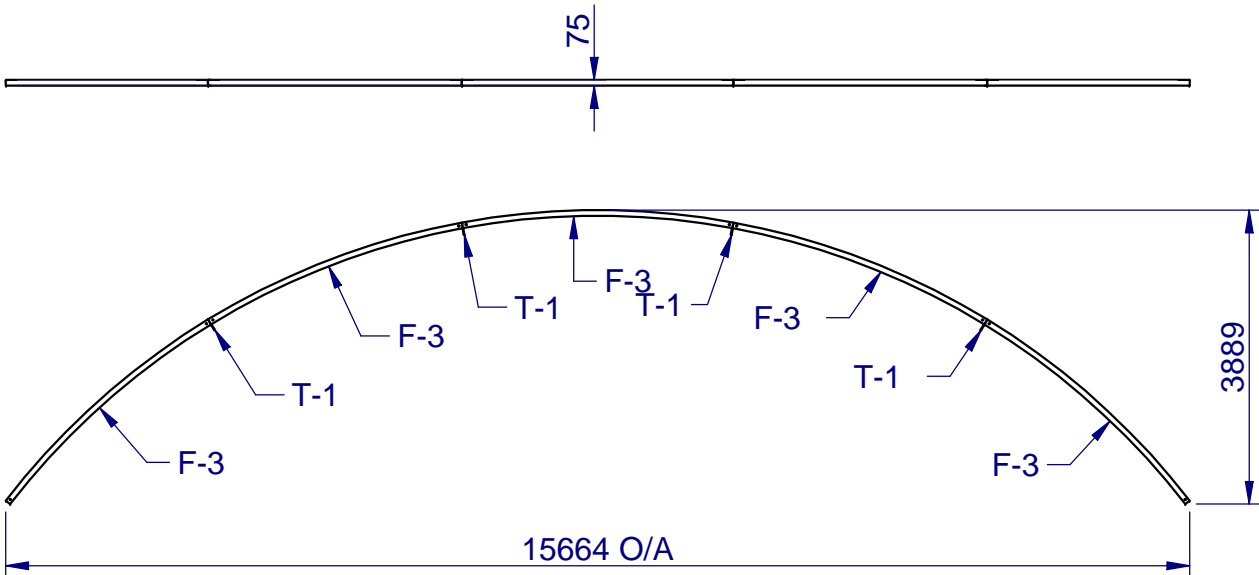


ARC-2 QTY: 2



| FRAME SIZE | BOLT Ø |
|------------|--------|
| SHS 50x4   | M12    |
| SHS 75x4   | M16    |
| SHS 100x4  | M16    |

TABLE 1



ARC-3 QTY: 1



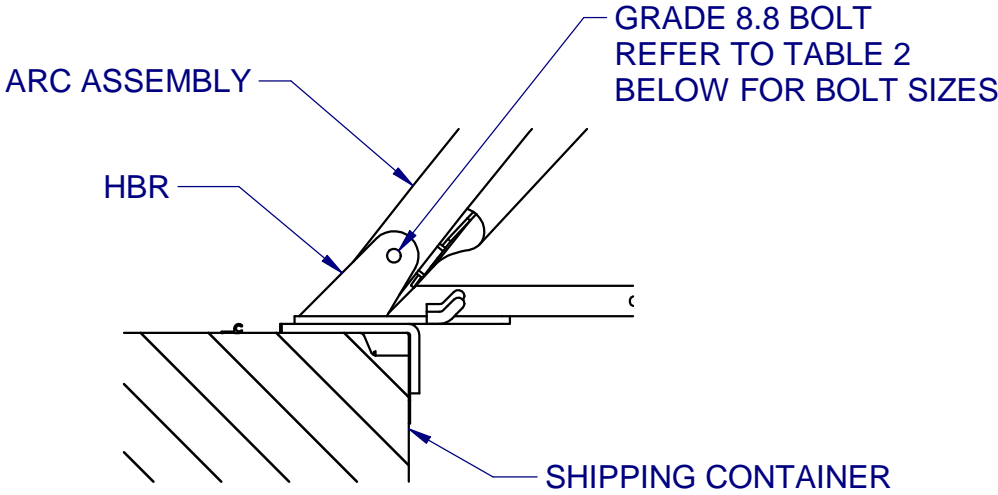
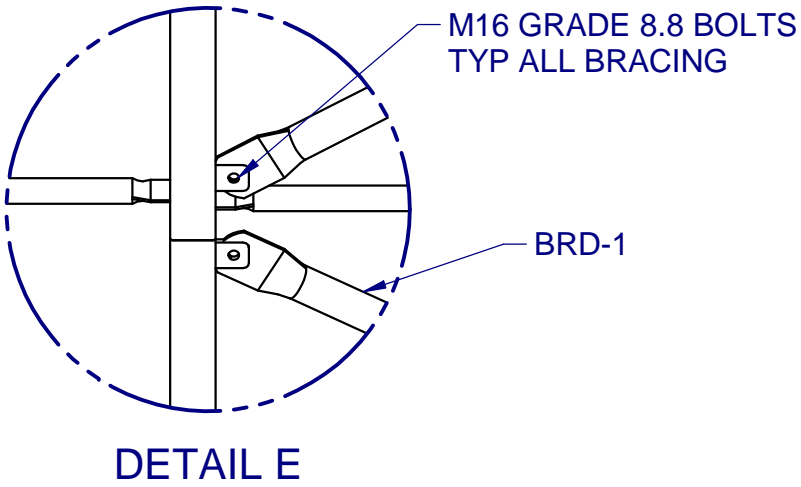
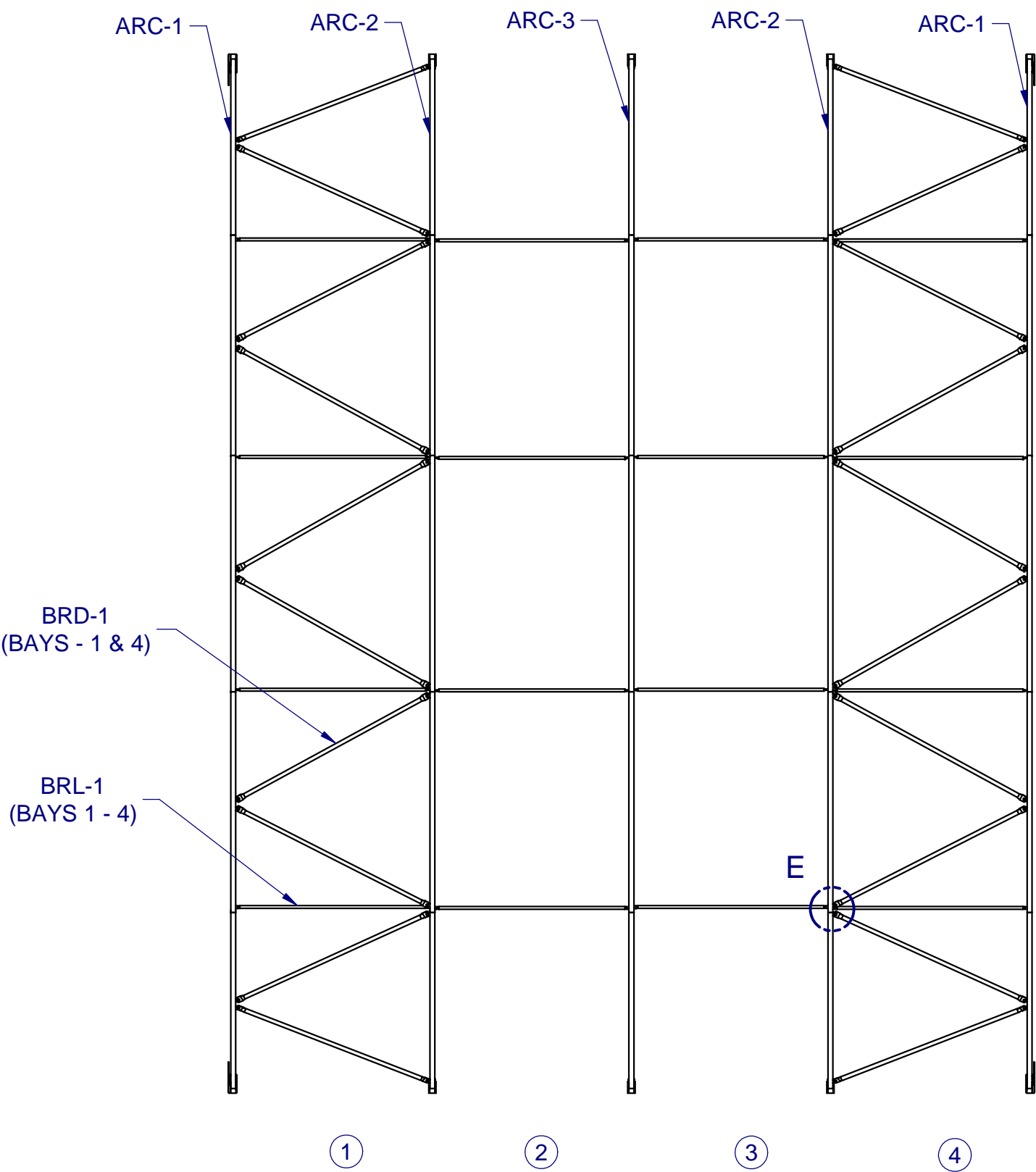
Ph.1800 08 2244 Ph.+612 6898 2244  
Email:sales@allshelter.com.au

|     |          |                      |          |
|-----|----------|----------------------|----------|
| E   | -        | -                    | -        |
| D   | -        | -                    | -        |
| C   | -        | -                    | -        |
| B   | -        | -                    | -        |
| A   | 09/05/14 | RELEASE FOR APPROVAL | -        |
| REV | DATE     | DETAILS              | APPROVED |

|             |           |        |       |
|-------------|-----------|--------|-------|
| JOB NUMBER: |           |        |       |
| DRAWN:      | DATE:     | SCALE: | PAGE: |
| williamp    | 7/05/2014 | NTS    | -     |

|               |                  |
|---------------|------------------|
| TITLE:        | SHELTER ASSEMBLY |
| SHELTER CODE: | CASA1512AIM      |

THE DESIGN AND DRAWINGS SHOWN HERE ON ARE COPYRIGHT AND SHALL NOT BE COPIED, REPRODUCED, SCANNED, STORED IN ANY ELECTRONIC DATABASE, RE-TRANSMITTED, DISCLOSED, DISTRIBUTED, OR COMMERCIALISED WITHOUT THE WRITTEN CONSENT OF ALLSHELTER. THIS DRAWING AND INFORMATION REMAINS THE PROPERTY OF ALLSHELTER AND MAY NOT BE USED FOR ANY OTHER PURPOSE THAN THAT FOR WHICH IT IS SUPPLIED. ALLSHELTER WILL NOT HESITATE TO TAKE APPROPRIATE LEGAL ACTION IF ITS RIGHTS IN THIS RESPECT ARE INFRINGED.



| FRAME SIZE | BOLT Ø |
|------------|--------|
| SHS 50x4   | M12    |
| SHS 75x4   | M16    |
| SHS 100x4  | M16    |

TABLE 2

ARC AND BRACE LAYOUT



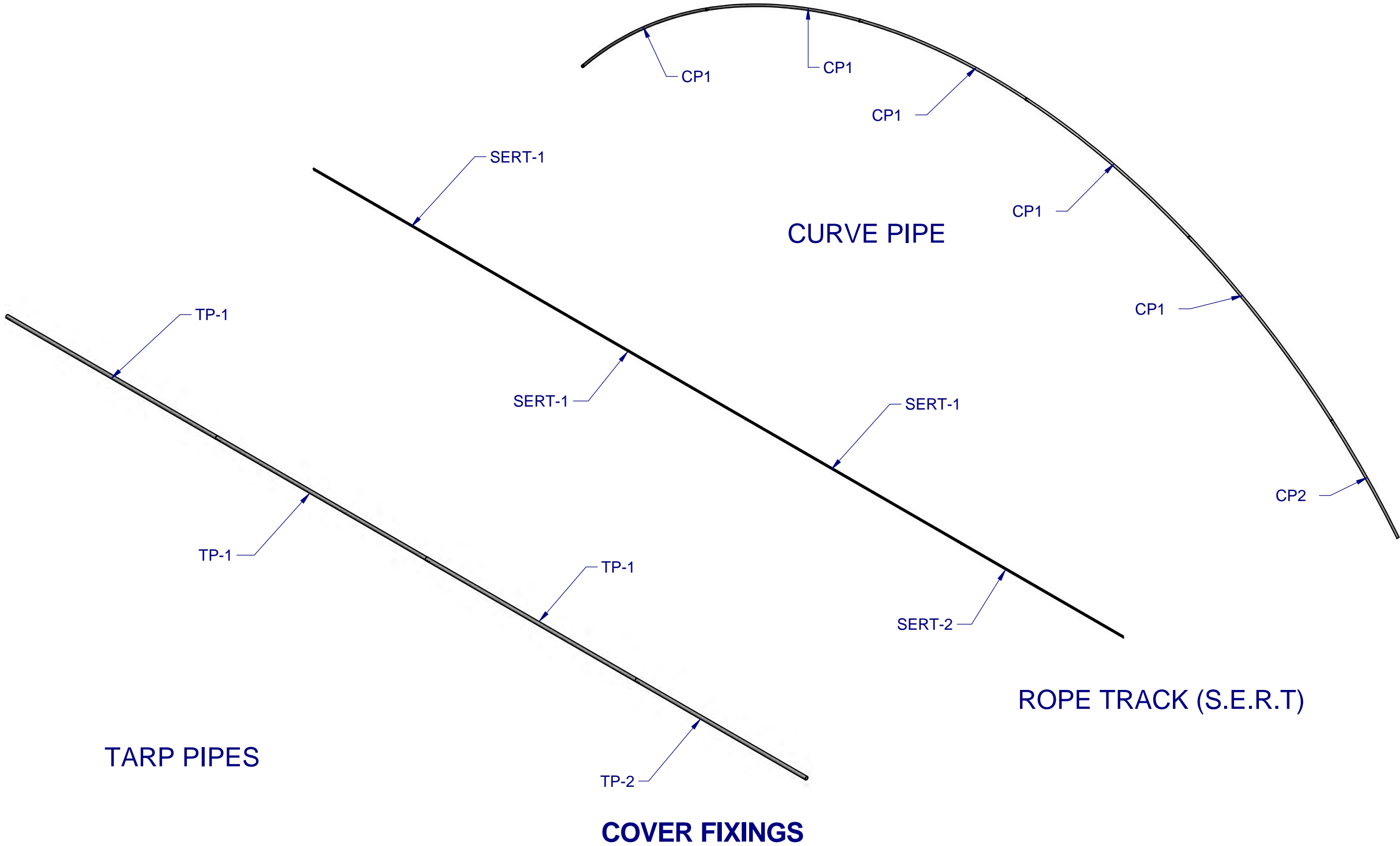
Ph.1800 08 2244 Ph.+612 6898 2244  
Email:sales@allshelter.com.au


|     |          |                      |          |
|-----|----------|----------------------|----------|
| E   | -        | -                    |          |
| D   | -        | -                    |          |
| C   | -        | -                    |          |
| B   | -        | -                    |          |
| A   | 09/05/14 | RELEASE FOR APPROVAL |          |
| REV | DATE     | DETAILS              | APPROVED |

|             |           |        |       |
|-------------|-----------|--------|-------|
| JOB NUMBER: |           |        |       |
| DRAWN:      | DATE:     | SCALE: | PAGE: |
| williamp    | 7/05/2014 | NTS    |       |

|               |                  |
|---------------|------------------|
| TITLE:        | SHELTER ASSEMBLY |
| SHELTER CODE: | CASA1512AIM      |

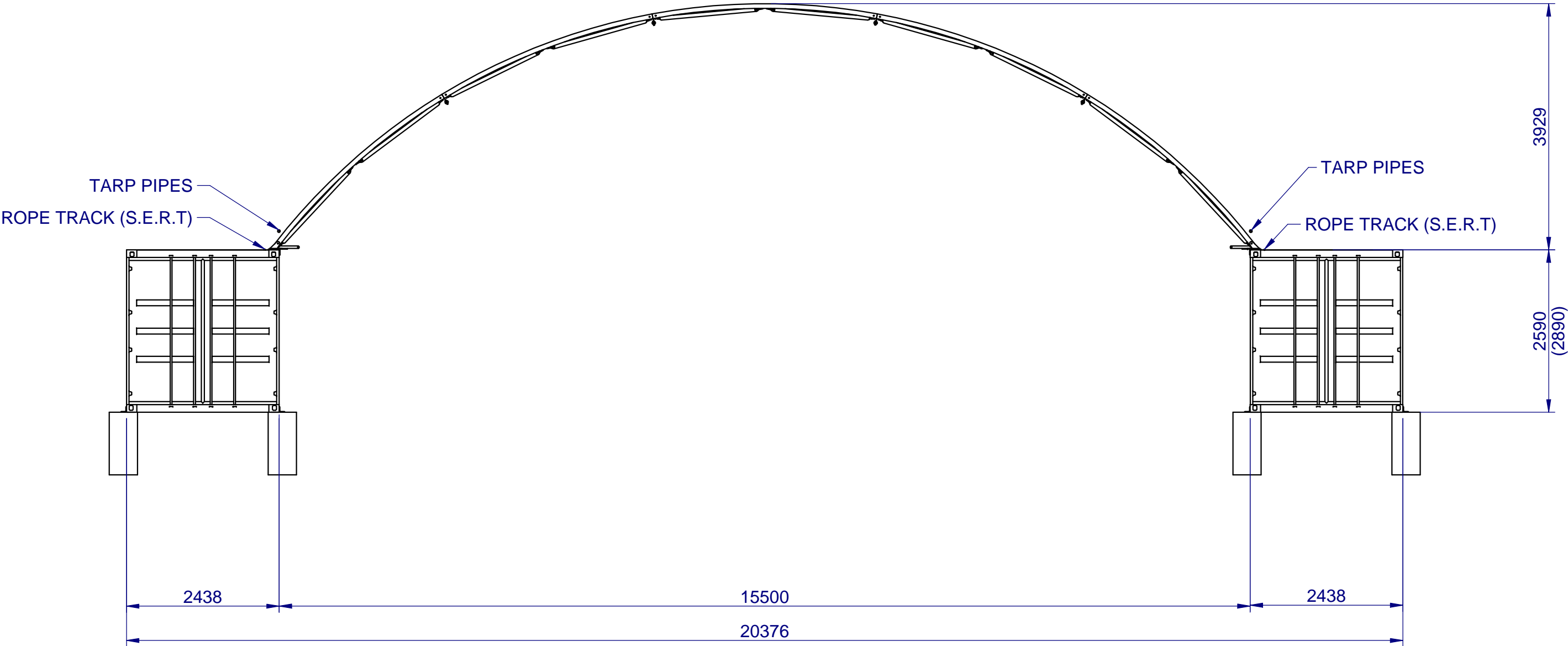
THE DESIGN AND DRAWINGS SHOWN HERE ON ARE COPYRIGHT AND SHALL NOT BE COPIED, REPRODUCED, SCANNED, STORED IN ANY ELECTRONIC DATABASE, RE-TRANSMITTED, DISCLOSED, DISTRIBUTED, OR COMMERCIALISED WITHOUT THE WRITTEN CONSENT OF ALLSHELTER. THIS DRAWING AND INFORMATION REMAINS THE PROPERTY OF ALLSHELTER AND MAY NOT BE USED FOR ANY OTHER PURPOSE THAN THAT FOR WHICH IT IS SUPPLIED. ALLSHELTER WILL NOT HESITATE TO TAKE APPROPRIATE LEGAL ACTION IF ITS RIGHTS IN THIS RESPECT ARE INFRINGED.



|   |      |          |                      |             |          |  |           |        |       |                  |
|---|------|----------|----------------------|-------------|----------|--|-----------|--------|-------|------------------|
| <br>Ph.1800 08 2244 Ph.+612 6898 2244<br>Email:sales@allshelter.com.au | E    | -        | -                    | JOB NUMBER: |          |  |           | TITLE: |       | SHELTER ASSEMBLY |
|   | D    | -        | -                    |             |          |  |           |        |       |                  |
|   | C    | -        | -                    |             |          |  |           |        |       |                  |
|   | B    | -        | -                    |             |          |  |           |        |       |                  |
|   | A    | 09/05/14 | RELEASE FOR APPROVAL |             | DRAWN:   |  | DATE:     | SCALE: | PAGE: | CASA1512AIM      |
| REV   | DATE | DETAILS  | APPROVED             |             | williamp |  | 7/05/2014 | NTS    |       |                  |



THE DESIGN AND DRAWINGS SHOWN HERE ON ARE COPYRIGHT AND SHALL NOT BE COPIED, REPRODUCED, SCANNED, STORED IN ANY ELECTRONIC DATABASE, RE-TRANSMITTED, DISCLOSED, DISTRIBUTED, OR COMMERCIALISED WITHOUT THE WRITTEN CONSENT OF ALLSHELTER.  
THIS DRAWING AND INFORMATION REMAINS THE PROPERTY OF ALLSHELTER AND MAY NOT BE USED FOR ANY OTHER PURPOSE THAN THAT FOR WHICH IT IS SUPPLIED. ALLSHELTER WILL NOT HESITATE TO TAKE APPROPRIATE LEGAL ACTION IF ITS RIGHTS IN THIS RESPECT ARE INFRINGED.



Ph.1800 08 2244 Ph.+612 6898 2244  
Email:sales@allshelter.com.au

|     |          |                      |          |
|-----|----------|----------------------|----------|
| E   | -        | -                    | -        |
| D   | -        | -                    | -        |
| C   | -        | -                    | -        |
| B   | -        | -                    | -        |
| A   | 09/05/14 | RELEASE FOR APPROVAL | -        |
| REV | DATE     | DETAILS              | APPROVED |

|             |           |        |       |
|-------------|-----------|--------|-------|
| JOB NUMBER: |           |        |       |
| DRAWN:      | DATE:     | SCALE: | PAGE: |
| williamp    | 7/05/2014 | NTS    |       |

|               |                  |
|---------------|------------------|
| TITLE:        | SHELTER ASSEMBLY |
| SHELTER CODE: | CASA1512AIM      |

**LOCALITY PLAN**

**LOT 1009 BINDOON – DEWAR'S POOL ROAD, BINDOON**





Superlight Aircraft Club of WA (inc)  
c/- 28 Walter Rd East  
Eden Hill WA 6054

16 June 2016

Mr Alan Sheridan,  
CEO, Chittering Shire  
Binda Place  
Bindoon  
WA 6502

Subject: Proposed master plan of improvements to Bindoon Airfield

Dear Sir,

I am pleased to inform you that the Superlight Aircraft club of WA (Inc), (herein after the club), has recently purchased the Bindoon airfield and immediate surrounds in accordance with the attached plan on 24 May 2016.

The club has existed and operated from the airfield under an agreement with the Catholic Agricultural College for approximately 35 years, and has grown to become a substantial club with over 115 members from the local area and Perth.

During this time, club members have constructed 32 hangar and equipment sheds, predominantly commercially manufactured to house their recreational and sport aircraft. The club has also invested in firefighting vehicles, firefighting equipment and water storage tanks with a capacity of over 250,000 litres.

From our initial decision to purchase the airfield till now has taken approximately 3 years, and during that time no new structures have been constructed, as the members awaited for the purchase to be finalised. Now that settlement has been achieved, we have many members that wish to build new hangars and the club wishes to improve the infrastructure and services available to the membership.

And so to the reason of this letter.

We attach a forward looking overview of the plans the club has to improve the airfield, with a view to advising Chittering Shire of the longer term direction the club is taking, and to facilitate a streamlined process where members can approach the Shire for building approvals and/or permits for new hangar structures.



Our proposed improvements are as follows:

1. Allocation of 31 allotments of varying sizes to existing hangar owners that contributed funds to the club for the express purpose of purchasing the airfield. Please note that the club owns a commercially manufactured and erected equipment storage shed near allotment 18.
2. Allocation of 23 new allotments, each being approx. 20m x 20m in size for members that contributed funds to the club for the express purpose of purchasing the airfield and who desire to build new hangars. These members will secure the appropriate permissions and permits from the shire on a case by case basis. Three of these new allotments are within a lightly treed area and will only require removal of a couple of diseased (nearly dead) gum trees. An area has also been identified for possible future hangars or public open space or perhaps a club room, but the committee has not yet made any decisions on this area or its longer term plans. To ensure bio diversity is retained the club intends to plant more trees inside the property, and along the Bindoon - Dewars Pool Rd.
3. At the end of each new hangar row, additional water storage for firefighting will be added, increasing site capacity to approx. 500,000 litres. All tanks including existing are / will be suitable for DFES to take water direct from the tank couplings.
4. The club intends to build a new communal toilet block for both men and women, with one stall being suitable for disabled people's access, and the club will submit documentation for planning permission in the near future.
5. The club intends to link all new hangars with taxi ways to the current runway and add a diagonal (NW / SE) taxi way for aircraft which might be useable as an alternative runway for our lightest aircraft should winds strengthen beyond the recommended cross wind component of either the pilot or their aircraft, thus increasing safety. This would not be used as a runway for routine operations as we wish to maintain our fly neighbourly policy with our neighbours on the southern boundary.
6. The club will designate a visitor carpark on the northern side of the hangar precinct.
7. Access to the airfield will be from the eastern crossover, with emergency exits at the western / central / eastern portions of the airfield.
8. The property will be fenced and a permanent 5m wide gravel firebreak established which will double as a fence perimeter track.
9. A sufficiently dense green zone with new trees planted to screen the new hangars area from direct view from Bindoon – Dewars Pool Rd, so as to keep the rural feel to visitors and passing motorists.
10. It is the desire of the club to attach DFES locks to all gates so that in the event of a fire, DFES will be able to access the water storage on site. We have had discussion with DFES regards their fire management plans and access to our water for firefighting is seen as a significant benefit in lowering fire risk to the airfield assets and surrounds.

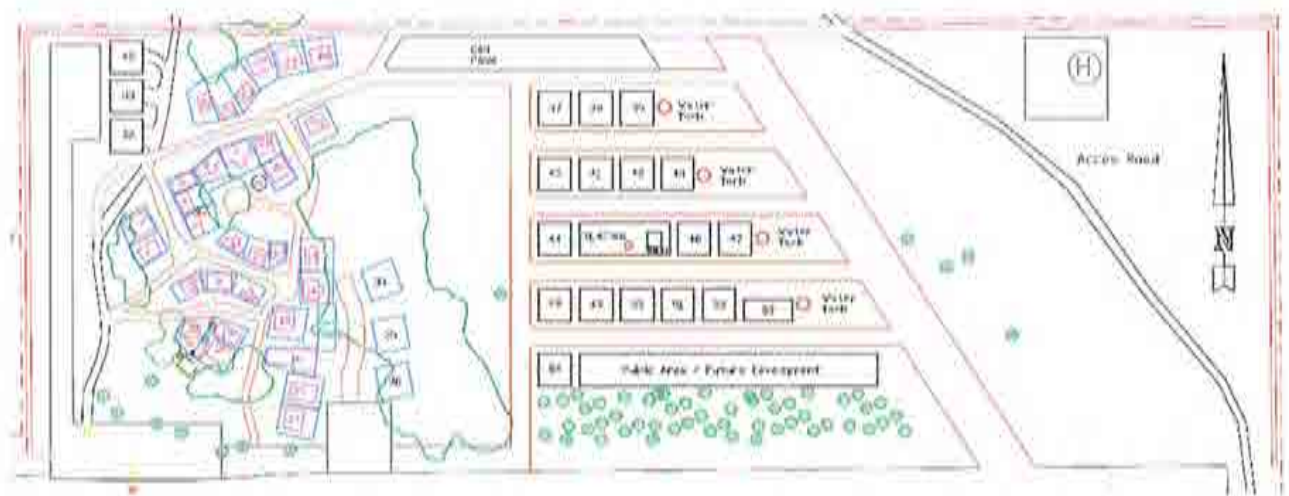
To assist councillors with understanding the existing infrastructure, and the proposed improvements I will now provide some greater detail of the proposed improvements.

The existing hangar area is shown in the diagram below.

1. Hangars are identified 1 – 31. The boundaries around each hangar (in blue), will be the area allocated to each hangar owner member for their personal aviation use.
2. The treed areas will be retained wherever possible with the exception of the required firebreaks.
3. The clubs equipment shed is adjacent to hangars 18 and 30.
4. There are currently 4 water storage tanks on site with a capacity of approx. 250,000 litres.



Our proposed improvements will improve the airfield as follows:





1. The new hangar area has been kept as compact as possible to retain an open feel to the majority of the property. The allotments shown are the areas available to members to build their new hangars, not the size of the actual hangar as these will vary depending on individual requirements. New hangars will be built on plots numbered 32 – 54 over the next few years.
2. Four additional water storage tanks for firefighting and a separate tank for the toilets.
3. The aircraft apron will be expanded to allow for visitor aircraft parking should we have an open day or fly in.
4. Vehicle access will be relocated to the eastern access track to prevent cars crossing an active runway further enhancing safety.
5. Visitor carpark well away from aircraft activity.
6. The new hangar area will be screened by a green zone of trees to keep a rural feel to passers-by.
7. A communal toilet facility will be built between plots 44 and 46. Separate planning permissions will be sought for this item in the near future.

As all of these planned improvements have been chosen with the guidance of the Shire's Planning Department, we trust that the above meets with the approval of the Shire, and that the Shire will then look favourably on the hangar building applications from our membership and expedite them through the approval process.

If there are any specific changes required, the club will most certainly comply with all Shire requirements and will work with the appropriate departments to achieve a positive outcome for all.

Yours sincerely,

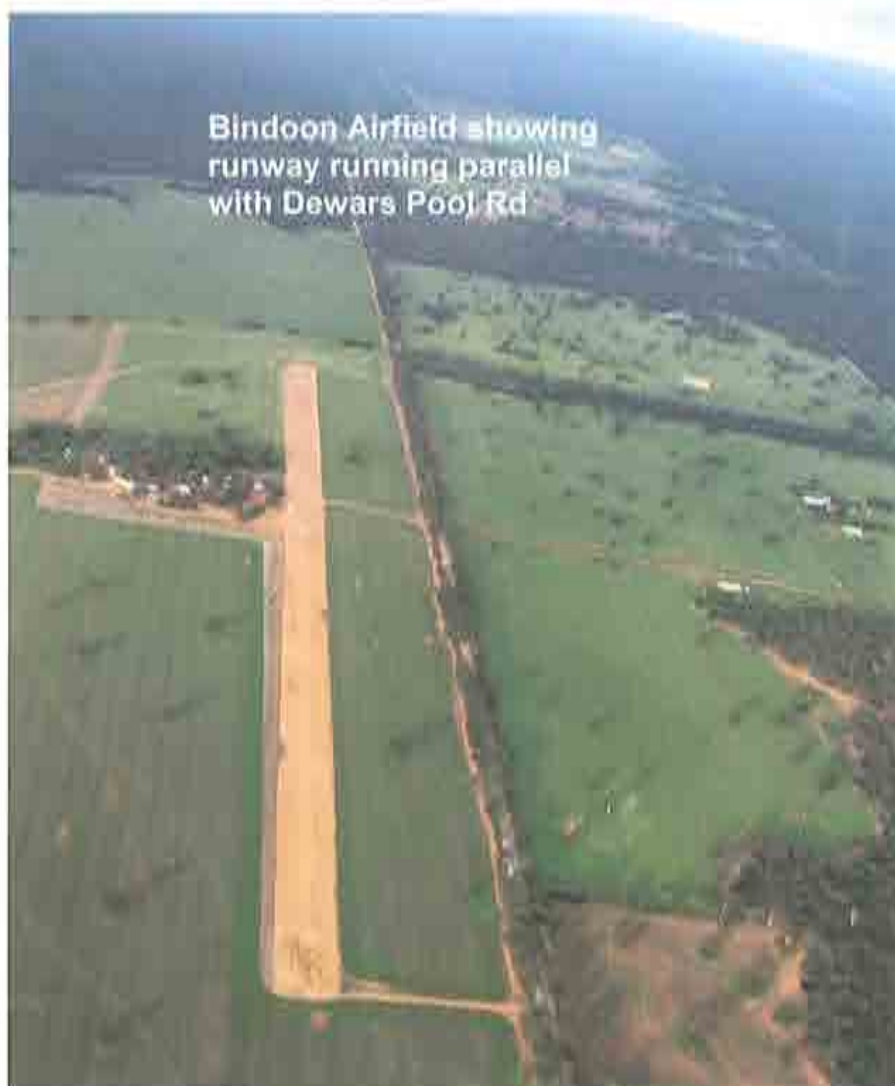


Jack Donsen  
President  
Superlight Aircraft Club of WA (Inc)

Addendums:

Landgate Record of title and site plan.  
Current property survey with land contours shown.  
Proposed plans with improvements shown.  
Photo of current hangar area from Bindoon – Dewars Pool Rd.  
List of members allocated a new hangar allotment.

Photos of existing airfield and infrastructure.





Members List of new hangar plots as allocated, and whom will be applying to the Shire for building approvals.

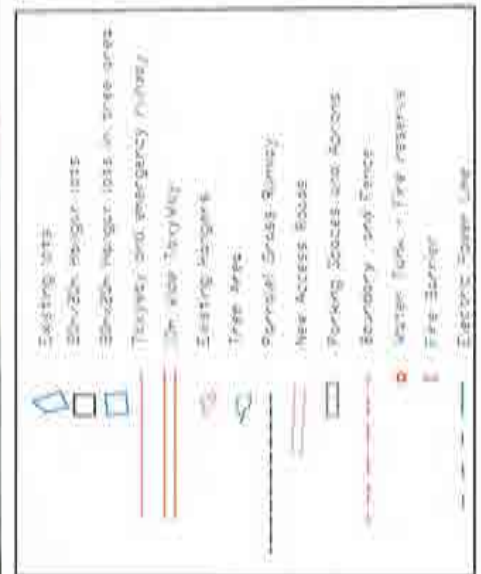
| Lot No. | Name.                    |
|---------|--------------------------|
| 32.     | Christopher Mills        |
| 33.     | Shane Curgenvin          |
| 34.     | Paul Brocklehurst        |
| 35.     | Paul Brocklehurst        |
| 36.     | Wayne Fowler             |
| 37.     | Paul Pearson             |
| 38.     | Brad Cole/Michael Donsen |
| 39.     | Anton Kepinski           |
| 40.     | Stuart Wood              |
| 41.     | Dean Wood                |
| 42.     | Stuart Wood              |
| 43.     | Dean Wood                |
| 44.     | Joseph Kennedy           |
| 45.     | G Whiteside              |
| 46.     | Stuart Wood              |
| 47.     | Ehud Ravikovitch         |
| 48.     | Andrew Murray            |
| 49.     | Tony Watters             |
| 50.     | Matt Robinson            |
| 51.     | Rob Hanbury              |
| 52.     | Peter Newnes             |
| 53.     | Stuart Wood              |
| 54.     | Razvan Puiu              |

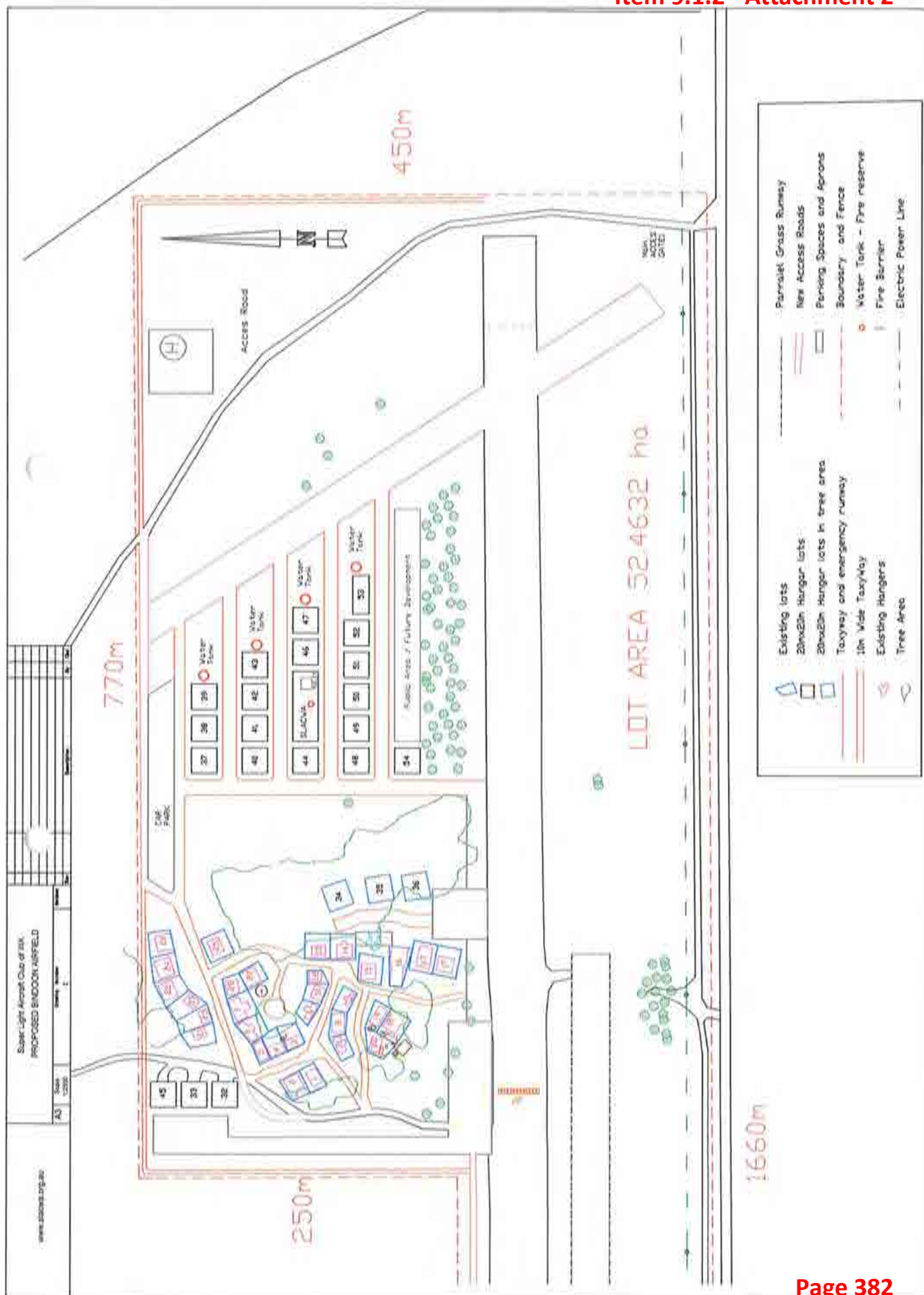


|  |                         |   |                                  |
|--|-------------------------|---|----------------------------------|
| PREPARED BY: <b>MR. P. J. O'NEILL</b><br>DRAWING NO: <b>100-000000-0000</b><br>DATE: <b>10/10/2014</b><br>SCALE: <b>AS SHOWN</b> |                         | CLIENT: <b>MATTHEW CLUB BINGOON</b><br>PROJECT: <b>FEATURE SURVEY</b><br>LOT 500 BINGOON AREA |                                  |
| SHEET NO: <b>1</b><br>TOTAL SHEETS: <b>1</b>   | DATE: <b>10/10/2014</b> | DRAWN BY: <b>P. J. O'NEILL</b>  | CHECKED BY: <b>P. J. O'NEILL</b> |









99A

WESTERN



AUSTRALIA

|  |   |
|--|---|
| REGISTER NUMBER<br><b>1009/DP73248</b> |   |
| DUPLICATE EDITION<br><b>1</b>          | DATE DUPLICATE ISSUED<br><b>29/4/2016</b> |

**RECORD OF CERTIFICATE OF TITLE**  
UNDER THE TRANSFER OF LAND ACT 1893

VOLUME 2901 FOLIO 211

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.



REGISTRAR OF TITLES

**LAND DESCRIPTION:**

LOT 1009 ON DEPOSITED PLAN 73248

**REGISTERED PROPRIETOR:**  
(FIRST SCHEDULE)

SUPERLIGHT AIRCRAFT CLUB OF WA INC OF 28 WALTER ROAD EAST EDEN HILL  
(T N334899 ) REGISTERED 24 MAY 2016

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**  
(SECOND SCHEDULE)

1. \*N236968 NOTIFICATION SECTION 165 PLANNING & DEVELOPMENT ACT 2005 LODGED 28.1.2016.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.  
\* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.  
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP73248.  
PREVIOUS TITLE: 2898-798.  
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.  
LOCAL GOVERNMENT AREA: SHIRE OF CHITTERING.

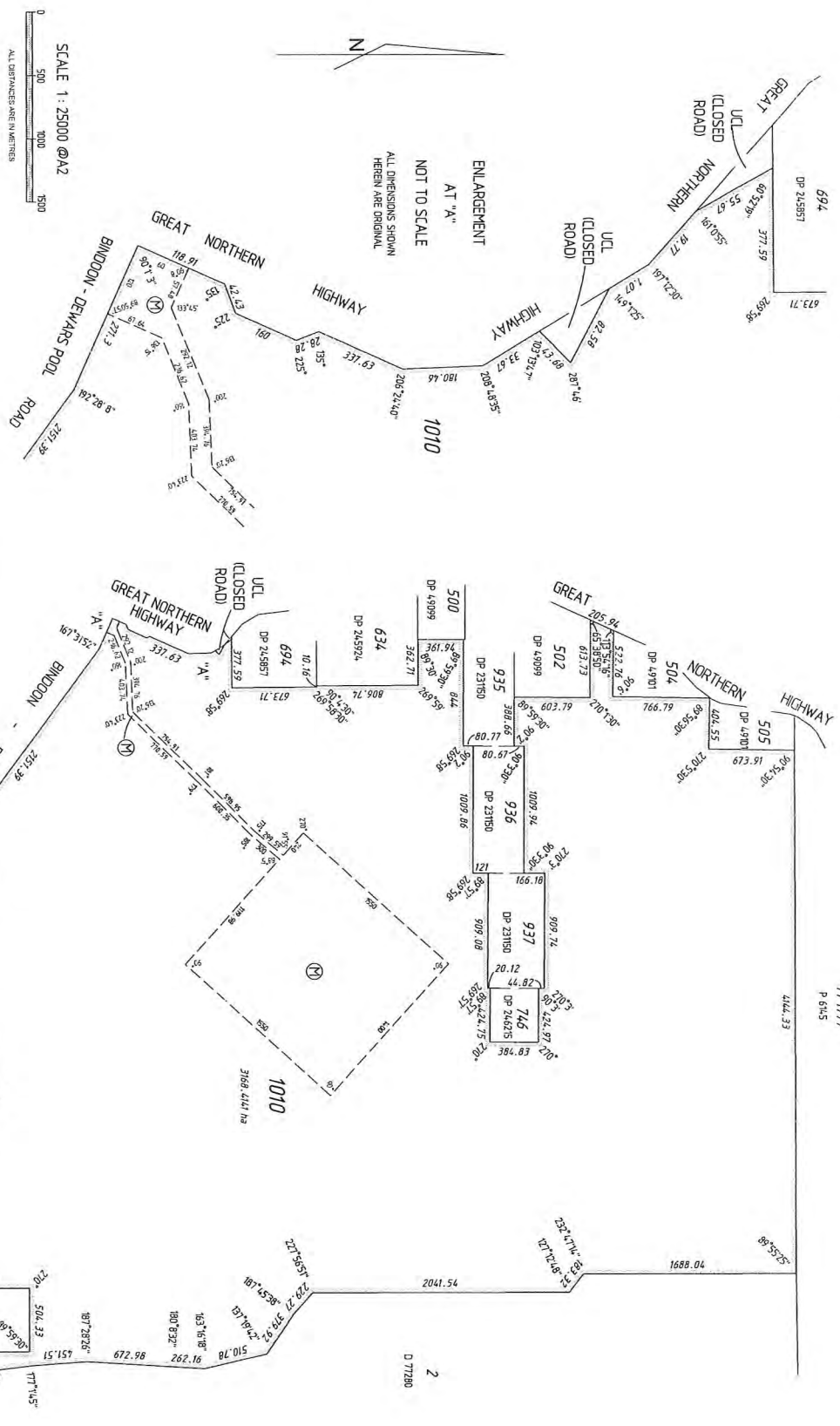
NOTE 1: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING N334899



| VER. | AMENDMENT | AUTHORISED BY | DATE |
|------|-----------|---------------|------|
|------|-----------|---------------|------|

HELD BY LANDGATE IN DIGITAL FORMAT ONLY

M 1777  
P 645

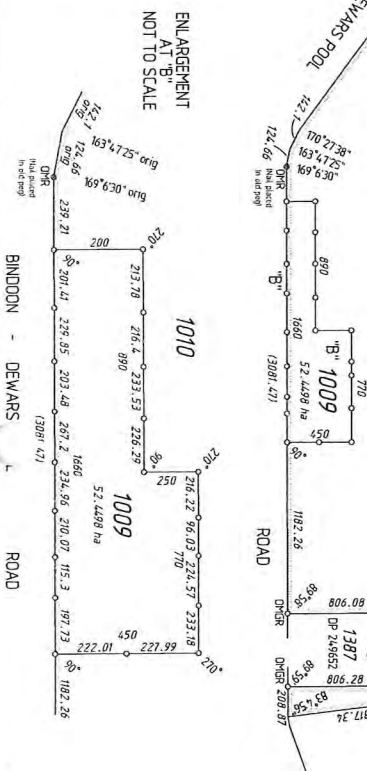


NOTE:  
ALL DIMENSIONS SHOWN CLOCKWISE  
FROM ⊗ TO ⊙ ARE ORIGINAL

**JOHN HIGHAM**  
CONSULTING SURVEYORS  
P.O. BOX 317  
WILLETTON WA 6955  
T 08 9354 9666 F 08 9354 9677

INTERESTS AND NOTIFICATIONS

| SUBJECT      | PURPOSE                | STATUTORY REFERENCE                           | ORIGIN            | LAND BURDENED | BENEFIT TO | COMMENTS   |
|--------------|------------------------|---|-------------------|---------------|------------|--|
| Ⓢ            | REPORAL                | SECTION 56 (1) OF THE HERITAGE OF WA ACT 1990 | DOC H408244       | LOT 1010      |            | HERITAGE COUNCIL OF W.A.   |
| NOTIFICATION | SEC 145 OF THE PEO ACT | DOC   | LOT'S 1009 & 1010 |               |            | SUBJECT AND ADJACENT LOTS HAVE BEEN ADJACENT LOTS TO FUTURE PLANNING |



|         |                    |               |
|---------|--------------------|---------------|
| TYPE    | FREEHOLD           | S.S.A. YES/NO |
| PURPOSE | SUBDIVISION        |               |
| PLAN OF | LOTS 1009 AND 1010 |               |

|                 |                     |             |
|-----------------|---------------------|-------------|
| FORMER TENURE   | LOT 503 ON DP 49700 | CT 2229/780 |
| LOCAL AUTHORITY | SHIRE OF CHITTERING |             |
| LOCALITY        | BINDOON             |             |
| D.O.L. FILE     |                     |             |

|  |        |
|--|--------|
| FIELD RECORD   | 126577 |
| SURVEYOR'S CERTIFICATE - REG 54  |        |
| I, J. A. HIGHAM  |        |
| herewith certify that this plan is accurate and is a correct representation of the -                                   |        |
| (a) survey, and/or   |        |
| (b) calculations from measurements recorded in the field records.  |        |
| I declare (if applicable)  |        |
| that the purpose of this plan and that it complies with the relevant written law(s) in relation to which it is lodged. |        |
| LICENSED SURVEYOR  |        |
| LOGGED   |        |
| DATE   |        |
| FEE PAID   |        |
| ASSESS No.   |        |
| I.S.C.   |        |
| EXAMINED   |        |
| DATE   |        |
| WESTERN AUSTRALIAN PLANNING COMMISSION   |        |
| FILE 151777  |        |
| Delegated under s.16 PEO Act 2005  |        |
| DATE   |        |
| SUBJECT TO   |        |
| IN ORDER FOR DEALINGS  |        |

|                                    |      |
|------------------------------------|------|
| FOR INSPECTOR OF PLANS AND SURVEYS | DATE |
| APPROVED                           |      |
| INSPECTOR OF PLANS AND SURVEYS     | DATE |
| (S.18 Licensed Surveyors Act 1909) |      |



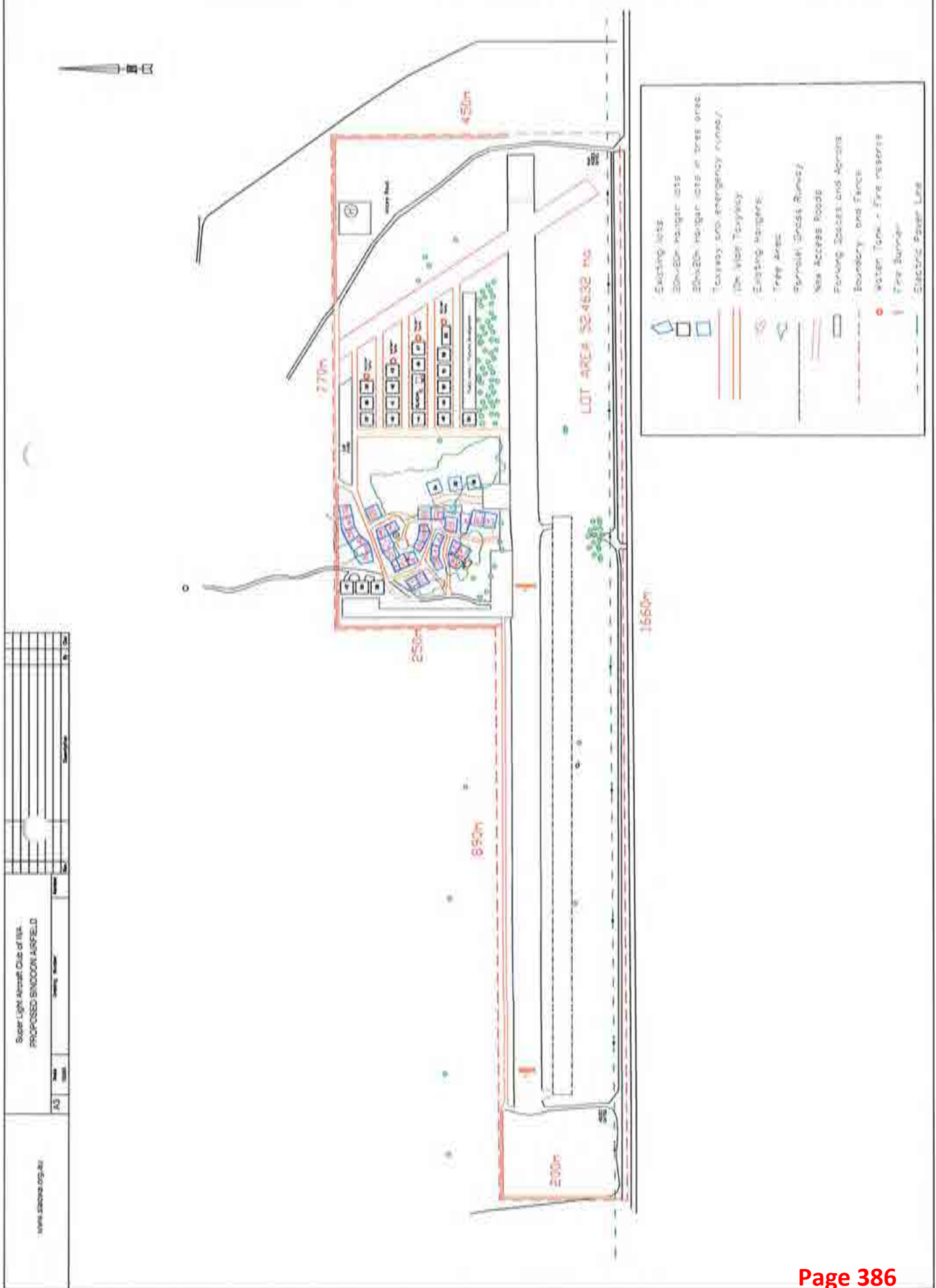
DEPOSITED PLAN

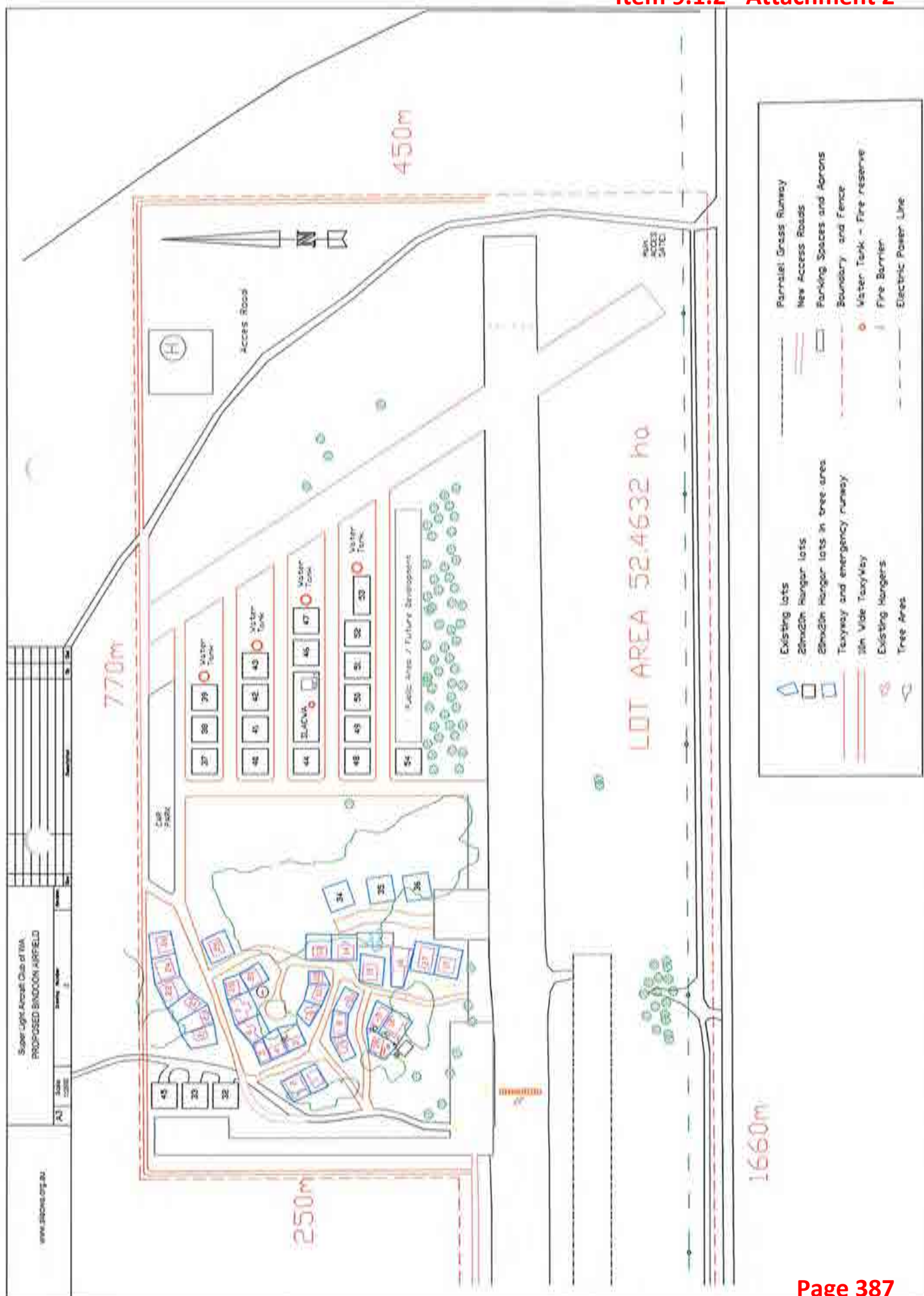
73248

SHEET 1 OF 1 SHEET  
VERSION 1











[illegible]



Existing lots  
20mx20m Hangar lots  
20mx20m Hangar lots in tree area  
Taxiway and emergency runway  
10m Wide Taxiway  
Existing Hangars  
Tree Area  
Parallel Grass Runway  
New Access Roads  
Parking Spaces and Aprons  
Boundary and Fence  
Water Tank - Fire reserve  
Fire Barrier  
Electric Power Line

APPROVED UNDER THE RELATED AUTHORITY  
SUBJECT TO THE UNDERSTANDING WHICH APPLICANT HAS  
WITH THE CONDITIONS OF APPROVAL OF COMPLAINT  
OF \_\_\_\_\_

APPLICATION No. P065/16

SIGNED \_\_\_\_\_ DATE 18/8/16

NOTES: THIS APPROVAL DOES NOT CONSTITUTE  
A RECOMMENDATION  
REFER TO A GUIDE TO THE PROCEEDINGS





### 9.1.5 Reconsideration of Scheme Amendment No. 54: Rezoning of Lot 300 Settlement Road, Bindoon\*

|                            |  |
|----------------------------|--|
| <b>Report Date</b>         | 28 October 2015  |
| <b>Applicant</b>           | Land Insights  |
| <b>File ref</b>            | 18/02/25; 18/07/11; A1463  |
| <b>Prepared by</b>         | Brendan Jeans, Senior Planning Officer   |
| <b>Supervised by</b>       | Bronwyn Southee, Executive Manager Development Services  |
| <b>Voting requirements</b> | Simple Majority  |
| <b>Documents tabled</b>    | Nil  |
| <b>Attachments</b>         | 1. Scheme Amendment documents dated Nov 2014<br>2. Request letter and revised draft Structure Plan |

#### Background

Council originally considered and refused the initiation of the Scheme Amendment for rezoning Lot 300 Settlement Road, Bindoon at its 18 February 2015 Ordinary Council Meeting. The reasons for refusing the initiation to rezone the property from 'Agricultural Resource' to 'Rural Smallholdings' were:

- To preserve agricultural resource; and
- Battleaxe designs are not supported.

Since the refusal of the initiation the Applicant has liaised with Shire Officers to discuss and assess any options the client may have for reconsideration. The Shire's advice for any reconsideration to be entertained is for the proposal to address Council's reasons for refusal.

The Applicant has finalised a request for reconsideration. The proposed zoning has not altered, due to being consistent with the Local Planning Strategy, however the draft Structure Plan has been revised (Attachment 2).

The proposed lot layout aims to shift away from the battleaxe design. The Applicant has widened the previous access leg for the rear lot and have aimed to provide water supply from existing bores to both proposed lots to allow for agricultural production.

Council's reconsideration of the proposed Scheme Amendment to rezone Lot 300 Settlement Road, Bindoon to 'Rural Smallholdings' is requested.

#### Consultation

Consultation of the Scheme Amendment shall occur in accordance with the *Town Planning Regulations 1967* should Council determine to initiate the scheme amendment. This requires the scheme amendment to be referred to the Environmental Protection Authority for consent to advertise for a period of forty two (42) days. The Structure Plan will be advertised in conjunction with the Scheme Amendment.





### Statutory Environment

State: *Planning and Development Act 2005*  
*Town Planning Regulations 1967*

Local: *Shire of Chittering Town Planning Scheme No. 6*

The subject land is zoned 'Agricultural Resource'. The objectives of this zone are:

- *To preserve productive land suitable for grazing, cropping and intensive horticulture and other compatible productive rural uses in a sustainable manner;*
- *To protect the landform and landscape values of the district against despoliation and land degradation;*
- *To encourage intensive agriculture and associated tourist facilities, where appropriate;*
- *To allow for the extraction of basic raw materials where it is environmentally and socially acceptable.*

The objectives of the 'Rural Smallholdings' zone are:

- *To preserve productive land suitable for intensive horticulture and other compatible productive rural uses in a sustainable manner;*
- *To protect the landform and landscape values of the district against despoliation and land degradation.*
- *To provide lots with a minimum size of 5ha.*

The subject land is located within the 'Landscape Protection Special Control Area' which sets out planning considerations of retaining native vegetation, preventing deterioration of quality land and protecting landscape values.

The Applicant has submitted a draft Structure Plan, regulated by Clause 5.19 of the Scheme, to support the Scheme Amendment.

### Policy Implications

State: *Planning for Bushfire Guidelines 2010*

The Applicant has provided a bushfire hazard assessment, which identified low to moderate fire risk over the site. This risk is acceptable to allow development as per the guiding principles of the Guidelines.

Local: *Local Planning Policy No 32 Development Plans*

The Applicant submitted a draft Structure Plan with the Scheme Amendment for initiation for the 18 February 2015 Ordinary Council Meeting. As of June 2015 following the gazettal of Scheme Amendment 52, it is now referred to as a Structure Plan. The level of detail in the draft Structure Plan for the purposes of the Scheme Amendment is considered to be acceptable.

### Financial Implications

The proposed Scheme Amendment is not considered to create any financial implications on Council.



### Strategic Implications

Local: Shire of Chittering Local Planning Strategy 2001-2015

The subject land is identified for 'Rural Smallholdings' development. The aims of Rural Smallholdings development in the Shire include:

#### Aims

- *To maximise the productive capacity of good soils*
- *To allow for rural environment around nominated service centres*
- *To include stringent conditions for protection and reparation of watercourses and wetlands*
- *To provide a working rural living presentation around the centres*
- *To allow for eco-tourism and agro tourism and special developments appropriate to rural production*
- *To allow for a range of lot sizes befitting the landform constraints with an average minimum lot size of 10 hectares and an absolute minimum lot area of 5 hectares*
- *All subdivision and development shall complement land capability analysis, protection of natural streamlines and remnant vegetation and clearly demonstrate the availability of water*
- *To minimise vehicular access to highways or regional roads*
- *Prior to rezoning of land for Small Rural Holdings the following matters shall be addressed:*
  - *Access to Great Northern Highway and the management of increased traffic*
  - *The potential conflict between agricultural production and Rural Smallholdings*
  - *The 'Linear Valley Greenway' in the Avon Arc Sub-Regional strategy, the general presumption against closer rural subdivision in this vicinity and the need to consider protection of land along the river if subdivision is supported*
  - *Land capability and water availability to sustain intensive agriculture on Rural Smallholdings.*

The land is located within the 'Chittering Valley Geographical Unit' which aims at protecting productive land for broad acre farming, supporting intensification where water is available, preventing land degradation and preserving landscape values.

### Site Inspection

Site inspection undertaken: Yes

### Triple Bottom Line Assessment

#### Economic implications

There are no known economic implications as a result of this proposal.

#### Social implications

There are no known social implications that would arise as a result of this proposal.

#### Environmental implications

There are no known environmental implications as a result of this proposal. No clearing of remnant vegetation is required and the Applicant has attempted to retain existing agricultural activities in the best interest of the landowner to continue operations.



## Comment

### Town Planning Scheme No 6

The proposed rezoning and draft Structure Plan is consistent with the objectives of the 'Rural Smallholdings' zone as the revised proposed lot layout aims to preserve the continuation of the existing agricultural activities, does not result in land degradation and meets the minimum lot size set by the Scheme.

### Local Planning Strategy

Lot 300 is identified in the Shire's Local Planning Strategy for 'Rural Smallholdings' development and is maintained in the Shire's draft Local Planning Strategy (2013). The strategies of the geographical location and zone precinct supports the intensification of agricultural uses where land capability and water availability permits. It is considered the proposed zone facilitates these objectives.

### Structure Plan

The Structure Plan (previously Development Plan) meets the standard set out by the Shire's Local Planning Policy No 32. The lot layout has been amended from when Council considered the initiation of the scheme amendment at the 18 February 2015 OCM with providing bore water supply/infrastructure to both lots as a priority. It is considered the advertisement of the Structure Plan to relevant agencies will provide further detail for Council's consideration.

### Access

Settlement Road is mostly constructed of gravel with the exception of approximately 300m from the Great Northern Highway entrance which is bitumen sealed. The proposed zoning does not result in additional access requirements.

### Fire management

The Applicant has provided a Bush Fire Hazard Assessment for the site which indicates some remnant vegetation of moderate hazard. The only non-compliant aspect is the distance of Settlement Road exceeding the desired maximum 600m. The distance to Great Northern Highway is 890m. The Applicant proposes to address this by requiring dwellings to be constructed to a higher standard than the BAL Assessment of the site. This proposed solution will be further assessed in advertising and considering the adoption of the Structure Plan.

### Concluding comments

It is the Officer's recommendation that Council reconsider the proposed rezoning favourably. The reasons that Council refused the initiation of the rezoning have been addressed and the rezoning should be supported for the following reasons:

1. The proposed Rural Smallholdings zone is consistent with the Shire's Local Planning Strategy.
2. The proposed zone allows for the continuation and intensification of the existing agricultural activities being undertaken on the land.
3. The draft Structure Plan has been modified to:
  - a. Provide bore water supply to the rear lot;
  - b. Maintain sufficient bore water supply for the front lot with existing orchards; and
  - c. Shift away from the 'skinny' access leg originally proposed.

It is recommended that Council support the proposed Scheme Amendment to rezone the land to Rural Smallholdings given the above comments and due to Council's reasons of refusal relating to the Structure Plan and not the proposed zone. The Structure Plan would be advertised concurrently with the Amendment. The consideration of the Structure Plan and report to Council will then factor in community



MINUTES FOR ORDINARY MEETING OF COUNCIL  
WEDNESDAY, 28 OCTOBER 2015

and public comments/advice in regards to the proposal and allow for a more informed determination of its suitability.

**9.1.5 OFFICER RECOMMENDATION / COUNCIL RESOLUTION 071015**

**Moved Cr Gibson / Seconded Cr Vallance**

**That Council:**

1. In pursuance of Section 75 of the *Planning and Development Act 2005*, support the initiation of the amending of the *Shire of Chittering Town Planning Scheme No 6* by:
  - a. Rezoning Lot 300 Settlement Road, Bindoon from 'Agricultural Resource' to 'Rural Smallholdings'; and
  - b. Amend the Scheme Map accordingly.
2. Numbers the proposed amendment as 'Amendment No 54' of the *Shire of Chittering Town Planning Scheme No. 6* and forwards to the Environmental Protection Authority for assessment in accordance with Section 81 of the *Planning and Development Act 2005*, prior to advertising in accordance with the *Town Planning Regulations 1967*.

**THE MOTION WAS PUT AND DECLARED CARRIED 4/3**

# Outline Development Plan

Lot 300 Settlement Road, Bindoon

Prepared for Thomas James

*Prepared by:*

**Land Insights**  
**PO Box 289**  
**Mount Lawley WA 6936**

**Phone: (08) 9271 8506**  
**Email: [admin@landinsights.com.au](mailto:admin@landinsights.com.au)**  
**Web: [www.landinsights.com.au](http://www.landinsights.com.au)**



## **Document details:**

File: 972  
Revision: 1  
Date: November 2014  
Author: MT/SR  
Approved: MT

### **Important Note:**

"The information contained in this report has been prepared with care by the author(s), or it has been supplied to the author(s) by apparently reliable sources. In either case, the author(s) have no reason to doubt its completeness or accuracy. However, neither the author(s) company nor its employees guarantee the information, nor does it or is it intended to form part of any contract. Accordingly, all interested parties should make their own inquiries to verify the information, as well as any additional or supporting information supplied, and it is the responsibility of interested parties to satisfy themselves in all respects.

This report is for the use only of the party to whom it is addressed. Land Insights disclaims responsibility to any third party acting upon or using the whole or part of its contents."



## Executive summary

|                              |   |
|------------------------------|---|
| <b>APPLICANT:</b>            | Land Insights<br>PO Box 289<br>Mount Lawley WA 6929<br>Ph: 9271 8506<br>Fx: 9370 5786<br>Email: admin@landinsights.com.au |
| <b>CLIENT:</b>               | Thomas James  |
| <b>LOCATION:</b>             | Lot 300 Settlement Road, Bindoon  |
| <b>CERTIFICATE OF TITLE:</b> | Lot 300 on D74951<br>Volume: 1852, Folio: 778   |
| <b>LOCAL GOVERNMENT:</b>     | Shire of Chittering   |
| <b>SITE AREA:</b>            | 19.9 hectares   |
| <b>DATE:</b>                 | November 2014   |

Land Insights act on behalf of Thomas James and lodge this Outline Development Plan on their behalf. The Outline Development Plan is seeking to subdivide Lot 300 Settlement Road, Bindoon ('the site') into 2 Rural Small Holding lots.

It is requested that the Shire of Chittering approve this Outline Development Plan.

## ***Table of Contents***

|   |           |
|---|-----------|
| <b>EXECUTIVE SUMMARY .....</b>                            | <b>1</b>  |
| <b>1 INTRODUCTION .....</b>                               | <b>1</b>  |
| 1.1 BACKGROUND .....                                      | 1         |
| 1.2 SITE LOCATION .....                                   | 1         |
| 1.3 OWNERSHIP .....                                       | 2         |
| <b>2 POLICY AND STATUTORY FRAMEWORK.....</b>              | <b>3</b>  |
| 2.1 SHIRE OF CHITTERING TOWN PLANNING SCHEME No. 6.....   | 3         |
| 2.2 SHIRE OF CHITTERING LOCAL PLANNING STRATEGY .....     | 5         |
| 2.3 SHIRE OF CHITTERING LOCAL BIODIVERSITY STRATEGY ..... | 6         |
| <b>3 SITE CONTEXT.....</b>                                | <b>7</b>  |
| 3.1 CURRENT LAND USE .....                                | 7         |
| 3.2 SURROUNDING LAND USE.....                             | 7         |
| <b>4 SITE ANALYSIS.....</b>                               | <b>8</b>  |
| 4.1 TOPOGRAPHY AND LANDFORM .....                         | 8         |
| 4.2 VEGETATION .....                                      | 8         |
| 4.3 SITE CONTAMINATION .....                              | 10        |
| 4.4 SOIL TYPES.....                                       | 10        |
| 4.5 HYDROLOGY .....                                       | 12        |
| 4.6 ACCESS .....  | 17        |
| 4.7 HERITAGE .....  | 17        |
| 4.8 ENVIRONMENTAL IMPACT ASSESSMENT AND MANAGEMENT .....  | 17        |
| <b>5 OUTLINE DEVELOPMENT PLAN.....</b>                    | <b>19</b> |
| 5.1 PROPOSED LAND USE .....                               | 19        |
| 5.2 LOT SIZES AND BUILDING ENVELOPES .....                | 19        |
| 5.3 PUBLIC OPEN SPACE.....                                | 19        |
| 5.4 BUSHFIRE HAZARD .....                                 | 19        |
| 5.5 ENVIRONMENTAL PROTECTION .....                        | 19        |
| 5.6 RELATIONSHIP TO SURROUNDING LOCALITY .....            | 19        |
| 5.7 ROADS AND ACCESS .....                                | 20        |
| 5.8 INFRASTRUCTURE AND SERVICES .....                     | 20        |
| 5.9 LOT LAYOUT RATIONALE .....                            | 22        |
| 5.10 DEVELOPMENT PROVISIONS .....                         | 22        |
| 5.11 IMPLEMENTATION .....                                 | 23        |
| <b>6 CONCLUSION.....</b>                                  | <b>25</b> |

## ***Appendices***

APPENDIX A – PLANS

APPENDIX B – CERTIFICATE OF TITLE

APPENDIX C – WATERCOURSE FORESHORE ASSESSMENT FORM

APPENDIX D – ABORIGINAL HERITAGE DATABASE SEARCH

APPENDIX E – BUSHFIRE HAZARD ASSESSMENT

APPENDIX F – AMENDMENT DOCUMENTATION

## 1.1 Background

The proposed subdivision will consolidate the existing orchard operation onto one lot and will create an additional lot for rural living.

## 1.2 Site location

[illegible]

### 1.3 Ownership

Lot 300 is owned by Thomas James and Annie James. A copy of the Certificate of Title is attached at Appendix B. Details are as follows:

- Volume: 1852
- Folio: 778
- Diagram: D74951



## 2 Policy and Statutory Framework

### 2.1 Shire of Chittering Town Planning Scheme No. 6

The Shire of Chittering Town Planning Scheme No. 6 indicates that the site is zoned *Agricultural Resource*.



It is proposed that the site is rezoned to the *Rural Small Holdings* zone. The objectives of the *Rural Small Holding* zone are addressed in the following table.

| OBJECTIVE   | COMMENT   |
|---|---|
| <i>To preserve productive land suitable for intensive horticulture and other compatible productive rural uses in a sustainable manner</i> | <b>Complies:</b> The purpose of rezoning is to facilitate future subdivision of the site into 2 lots. One lot will consolidate the existing orchard and another lot will be created for a potential intensive horticulture operation. |
| <i>To protect the landform and landscape values of the district against despoliation and land degradation</i>                             | <b>Complies:</b> The proposed rezoning and subdivision will not lead to degradation of landscape and landform values.   |

This ODP has been prepared in accordance with Clause 5.8.1 of the TPS which provides a list of the details to be addressed in the plan.

Under Clause 5.8.1, the TPS states that an ODP shall address the following:

- *Lot sizes, dimensions and identification of building envelopes or building exclusion areas*
- *Areas to be set aside for public open space, pedestrian accessways, horse trails, community facilities, etc, as may be considered appropriate*
- *Strategic firebreaks*
- *Any Catchment Management Plan recommendations*
- *Any part of the natural environment which is required to be protected from degradation or required for landscape protection*
- *An assessment of the presence and impacts of Dieback in consultation with Council and the appropriate State government environmental agency and the ability of the subdivision design and works to mitigate against the spread and effect of Dieback*
- *Any facilities which the purchasers of the lots will be required to provide (eg. their own potable water supply, liquid or solid waste disposal, etc)*
- *Areas where conventional septic tanks may not be suitable*
- *The description of adjoining land(s) and their uses*
- *Remnant vegetation and any land affected by rare and endangered flora and fauna*
- *Location of watercourses, drainage lines and areas of inundation and the distance of any infrastructure from these*
- *Identify the area/s that need to comply with an approved Environmental Management Plan.*

Where relevant, in the context of this particular site, the ODP shows all of the above features.

## 2.2 Shire of Chittering Local Planning Strategy

The Shire of Chittering draft Local Planning Strategy (LPS) shows that the site is located within the *Rural Small Holding* zone. It is located within the 'North Bindoon' Rural Small Holding precinct. The Rural Small Holding precincts are described as areas located around the Bindoon townsite where there are appropriate soil types for productive hobby farms and opportunities for conservation, along important streamlines and wetlands.



The strategies and actions for the Rural Small Holding zone are addressed in the table below.

| OBJECTIVE   | COMMENT   |
|---|---|
| To maximise the productive capacity of good soils.  | The proposed rezoning and subdivision will consolidate the existing orchard on one lot and will create an additional lot which will have the potential to be used for productive rural use.   |
| To allow for rural environment around nominated service centres.                            | The proposed lots can continue to be used for agriculture and the site is located approximately 1km from the Bindoon town site.   |
| To include stringent conditions for protection and reparation of watercourses and wetlands. | A seasonal watercourse is located on the property. It flows from north-west to south-east and flows during storm events. The watercourse has been degraded from past agricultural use, however it will be fenced and managed appropriately and will be rehabilitated over time. |

| OBJECTIVE  | COMMENT  |
|--|--|
| To provide a working rural living presentation around centres.   | The site will be developed as rural small holding including rural living and some farming in close proximity to Bindoon.   |
| To allow for eco-tourism and agro tourism and special developments appropriate to rural production.  | No tourism is proposed as part of the development, but the subdivision will provide some opportunity.  |
| To allow for a range of lot sizes befitting the landform constraints with an absolute minimum lot area of 4ha.   | The proposed lot sizes are well above 4ha in size and have been designed according to the landscape.   |
| All subdivision and development shall compliment land capability analysis, protection of natural streamlines and remnant vegetation and clearly demonstrate the availability of water. | The site has been assessed by a qualified environmental consultant and natural features have been identified and mapped. The proposed subdivision has been designed to complement the natural features of the site. Water availability is addressed below. |
| To minimise vehicular access to highways and regional roads.   | Access will be onto Settlement Road which is a rural road.   |
| To promote and investigate the provision of potable water supply.  | Adequate water for domestic use can be collected in rainwater tanks, however the potential to provide potable water will be investigated.  |
| To promote consolidation of existing Rural Small Holdings  | The site is located within the North Bindoon Rural Small Holding precinct as identified in the Strategy and therefore is part of a larger rural small holding area.  |
| To require developer contributions in accordance with an adopted developer contributions scheme.   | Developer contributions will be determined at a later stage.   |

The draft Strategy indicates that the site is located within the Chittering Valley geographical unit. This unit is described as arable land which is mainly used for grazing and horticulture with large areas of steep gradients remaining covered by remnant vegetation.

### 2.3 Shire of Chittering Local Biodiversity Strategy

No Local Natural Areas are identified across the site. The site is not located within a high conservation value area.

The site is within the Bindoon Precinct. The objective of this precinct is to '*maintain a local centre attuned to dispersed settlement pattern.*

### 3 Site Context

#### 3.1 Current land use

The land is currently used for rural purposes and an orchard exists across the eastern and central parts of the property. It has been largely cleared of native vegetation to facilitate farming, some small areas of remnant vegetation exist at the western part of the site. Improvements on the site include two sheds, one at the eastern side near the entrance to the property and another older shed in the centre of the property. A house is located at the south-west corner. A water tank and small dam are located at the northern boundary.



*The property is used for horticulture including orange orchards.*

#### 3.2 Surrounding land use

All properties directly adjoining the site are currently zoned *Agricultural Resource* and are used for rural purposes. The Brockman River runs a short distance to the east of the property. The Bindoon townsite is located approximately 1km south.



## 4 Site Analysis

### 4.1 Topography and Landform

The site gently slopes from east to west with the lowest point being 130m AHD at the eastern boundary. The land rises gently at first and more steeply at the western side where it reaches approximately 170m AHD.

### 4.2 Vegetation

Vegetation across the site has been historically cleared to facilitate rural use. It comprises a few small remnants of regrowth on the hills, fringing vegetation along the watercourse and windbreaks. Native vegetation on the western hills comprise of jarrah, marri and wandoo woodland. The windbreaks were planted many years ago and comprise of she oaks. The vegetation along the watercourse was historically cleared and existing vegetation was planted many years ago. The vegetation comprises a mixture of native and exotic species. Bluegum eucalypts were planted along the northern side of the watercourse many years ago. The watercourse is overgrown with grass in most locations.



*Woodland area at the western side of the property.*

Vegetation condition across the majority of the site is classified as *Completely Degraded* due to the cleared and disturbed nature of the site. The patches of native vegetation remaining at the western and southern portions of the site are classified as *Good* condition (according to the Keighery B J (1994) vegetation scale in Bush Forever, Volume 2 (WAPC, 2000)) which shows signs of multiples disturbances such as clearing, stock grazing and weeds.

There might be some clearing required around the existing residence at the south-west corner for fire management, however the level of clearing is not extensive and will largely be restricted to parkland cleared trees. The proposed subdivision is not expected to have a significant impact on vegetation or habitat for native fauna. The outcomes of the bushfire hazard assessment (Appendix E) indicate that the site has a low bushfire attack level (BAL) and low fire risk across a majority of the site which means that clearing of vegetation is not necessary to mitigate fire risk.



*Rows of Bluegum Eucalyptus trees along the watercourse.*



*Sheoak windbreaks are located throughout the orchard.*

### 4.3 Site Contamination

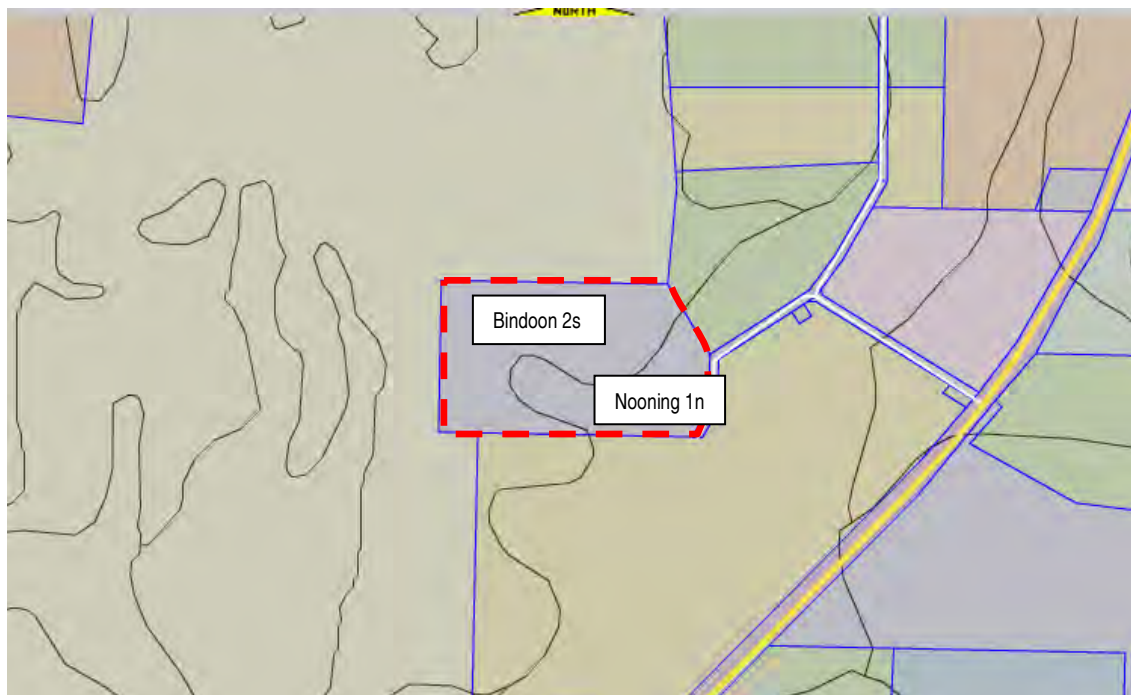
The ODP area is not known to have contained any notifiable activities that would cause the site to be included within the Contaminated Land Register.

### 4.4 Soil Types

The soil types have been mapped at a broad scale by the Department of Agriculture and Food (DAFWA) and can be found on their online mapping system at [http://spatial.agric.wa.gov.au/slip/products\\_view.asp](http://spatial.agric.wa.gov.au/slip/products_view.asp).

The soil-landscape units mapped across the site include:

- Bindoon 2s Phase – western portion of the site
- Nooning 1n Phase – eastern portion of the site



The descriptions and soil types for these soil-landscape units are described in the table below.

| Soil landscape unit | Description  | Dominant soil types   |
|---------------------|--|---|
| Bindoon 2s Phase    | Mixed red and yellow duplex soils with some uniform fine and medium textured, structured soils | <ul style="list-style-type: none"> <li>Red shallow loamy duplex</li> <li>Stony soil</li> <li>Red deep loamy duplex</li> </ul> |
| Nooning 1n Phase    | Salt affected yellow, brown and grey gradational and duplex soils                              | <ul style="list-style-type: none"> <li>Yellow/brown shallow loamy duplex</li> </ul>   |

The soil qualities of the above soil-landscape units are described in the table below. It includes hazard risk for flooding, waterlogging, phosphorus export, water erosion and wind erosion.

| Soil landscape unit | Flood Risk                      | Waterlogging                         | P export                      | Water Erosion                   | Wind erosion                   |
|---------------------|---------------------------------|--------------------------------------|-------------------------------|---------------------------------|--------------------------------|
| Bindoon 2s Phase    | 3-10% has moderate to high risk | 3-10% has moderate to very high risk | >70% has high to extreme risk | >70% has high to extreme risk   | 3-10% has high to extreme risk |
| Nooning 1n Phase    | >70% has moderate to high risk  | >70% has moderate to very high risk  | >70% has high to extreme risk | 10-30% has high to extreme risk | 3-10% has high to extreme risk |
| <b>Overall</b>      | <b>Low to high risk</b>         | <b>Low to high risk</b>              | <b>High risk</b>              | <b>High to Moderate risk</b>    | <b>Low risk</b>                |

The land degradation qualities reflect the soil types found across the site. The soil on the lower elevated section across the eastern portion of the site has a higher risk of flooding, waterlogging and Phosphorus export and a low water and wind erosion risk. The more elevated western side has a lower flooding and waterlogging risk but high Phosphorus export risk and water erosion risk.

The high phosphorus export risk across the site might require the need for Alternative Treatment Units for effluent waste disposal.

The land capability has also been mapped by DAFWA and is based on the qualities of the soil types. The land capability for annual and perennial horticulture, dryland cropping and grazing is shown in the table below.

| Soil landscape unit | Annual horticulture     | Perennial horticulture    | Dryland cropping        | Grazing                              |
|---------------------|-------------------------|---------------------------|-------------------------|--------------------------------------|
| Bindoon 2s Phase    | >70% has low capability | 50-70% has low capability | >70% has low capability | >70% has moderate to high capability |
| Nooning 1n Phase    | >70% has low capability | >70% has low capability   | >70% has low capability | >70% has low capability              |
| <b>Overall</b>      | <b>Low capability</b>   | <b>Low capability</b>     | <b>Low capability</b>   | <b>Low to moderate capability</b>    |

The site has low land capability for all four agricultural land use categories.

## 4.5 Hydrology

### Surface water

A seasonal watercourse dissects through the centre of the property and flows from north-west to south east. The watercourse flows during storm events only and is in degraded condition from past disturbances associated with rural use of the property. Some attempts have been made to revegetate along the watercourse and a fence is located along the northern edge to keep stock out. A watercourse assessment in accordance with the Department of Water's River Restoration Manual has been undertaken for the watercourse and the outcomes are presented below.

The Brockman River runs to the south-east of the site. This area is classified as a *Conservation* Category Wetland in the Geomorphic Wetlands Dataset of the Swan Coastal Plain. The floodplain area is classified as a *Multiple Use* category wetland. This area extends up to the south-east boundary of the site.

No Public Drinking Water Source Areas (PDWSAs) are located onsite or in close proximity.

The site is located within a *Rights in Water and Irrigation Act 1914* Proclaimed Groundwater Area and within a Proclaimed Surface Water Area (the Swan River System).

### Watercourse assessment

A watercourse foreshore assessment has been conducted to determine the existing condition and appropriate management in accordance with the Department of Water's River Restoration Manual. The biophysical assessment was carried out using *River Restoration Manual RR3* as a guide. The following characteristics were assessed:

- Bank stability
- Foreshore vegetation
- Stream cover



- Habitat diversity

The biophysical characteristics of the watercourse have been assessed based on the *Foreshore Condition Assessment* methodology in *River Restoration RR3 Foreshore Condition Assessment in Farming Areas*. The *Foreshore Condition Assessment Form* was completed for the watercourse. The form gives a score for each feature of the watercourse and, when combined together, provides an overall condition rating. The features are categorised into bank stability, foreshore vegetation, stream cover and habitat diversity. A copy of the form is at Appendix C.

#### *Foreshore condition*

The foreshore is rated *C Eroding or Erosion Prone* due to the existence of high levels of erosion, subsidence in some sections and the steep banks (very steep in most locations). This is described in the River Restoration Manual as:

*Trees remain, and possibly some large shrubs or tree grasses, but the understorey consists entirely of weeds, mainly annual grasses. The trees are generally resilient or long lived species but there is little or no evidence of regeneration. The shallow-rooted weedy understorey provides no support to the soil, and only a small increase in physical disturbance will expose the soil and make the river embankments and floodway vulnerable to erosion.*



*The typical foreshore condition along the watercourse.*

#### *Fencing*

The northern side of the watercourse is fenced, the southern side is not fenced.

#### *Bank stability and erosion*

The soil cohesion is *good* as the soil mainly comprises loamy soils. The general bank steepness is *very steep* in most sections where erosion is most severe and *steep* in sections where grass cover has provided some bank stability.

#### *Floodway and Bank Vegetation*

The watercourse has been cleared in the past and most of the vegetation is regrowth or has been planted by the landowner. Most of the floodway is still cleared and is covered in exotic grass. The vegetation is mostly located on the northern side of the watercourse (consisting of she oaks and exotic Bluegum Eucalypts), with some limited vegetation on the southern side. It has been rated as *moderate* due to the mixture of exotic and native species and the amount of past disturbance and clearing.

#### *Verge vegetation*

The verge vegetation is rated as *moderate* due to a mix of native vegetation and exotic species. A majority of the verge vegetation is grass cover with limited understorey species. The southern side of the watercourse is mostly cleared and covered in exotic grass. The verge vegetation is also relatively narrow, ranging from a few meters to less than 10 meters along the length of the watercourse through the property.



*Verge and fringing vegetation along the watercourse, largely consists of Bluegum Eucalypts, sheoaks and exotic grasses.*



*Stream cover*

The stream cover is rated as *good* along a majority of the watercourse due to the existence of the Bluegum Eucalypts along the northern side, natural regeneration of plants along the verge and the grass cover throughout which provides abundant shade and stream cover.



*A typical example of the amount of stream cover along the watercourse.*



*Habitat diversity*

The length of the watercourse through the property doesn't allow for too many habitat types to be located through the property. Only a few habitat types exist along the watercourse including seasonal water in the watercourse, some small cascades and some pools of water. The habitat is rated as *moderate* due to the occurrence of a few seasonal habitat types.



*Habitat areas include pools of water and seasonally flowing water.*



#### *Overall environmental rating*

The overall environmental rating is calculated as *moderate*. This is reflective of the past disturbances to the watercourse from historical farming uses and the regeneration and rehabilitation which has been undertaken by the landowner in recent decades.

### 4.6 Access

The site is currently accessed via Settlement Road which runs along the eastern boundary of the site. Settlement Road extends off Great Northern Highway.

### 4.7 Heritage

A search was conducted on the Department of Aboriginal Affairs Aboriginal Heritage Enquiry System database for identified Aboriginal sites. The results found that there are no sites currently identified on or directly surrounding the site (Appendix D).

A search was also conducted on the Heritage Council WA Heritage Places Database. No places of heritage value are identified on the database on the subject site.

There are no known sites of heritage value on the subject site to protect. Therefore, no heritage protection provisions are considered necessary.

### 4.8 Environmental impact assessment and management

The environmental impact assessment reviews the environmental features of the site and how the proposed subdivision will impact on environmental values.

Environmental management aims to reduce, minimise and avoid environmental impact and proposes was to improve environmental features where possible. Management is directly related to the environmental impacts of the proposed development.

The result of the environmental assessment and management actions are described in the following table.



| FEATURE                | COMMENT AND MANGEMENT  |
|------------------------|--|
| Vegetation and habitat | <p>The property has been historically cleared to facilitate agricultural use and only small patches of degraded woodland exist on elevated areas at the southern and western side of the site. These woodland areas will be located on the new proposed lot which will be created for rural living purposes. Although some clearing may be required around the existing residence at the south-west corner of the property, extensive clearing is not proposed and these woodland areas will be retained.</p> <p>The vegetation along the watercourse will be retained and further protected through the propose subdivision by the installation of fencing to keep stock out and further revegetation.</p> <p>These areas of remaining vegetation can provide habitat for native fauna in the area.</p> |
| Watercourses           | <p>The watercourse naturally divides the property in half and as such, the proposed boundary will be placed along the northern side of the watercourse so it will remain within the southern lot. Retaining the watercourse on one lot will assist with future management.</p> <p>A watercourse foreshore assessment has been undertaken as part of this application and the overall condition rating has been identified as <i>moderate</i>. The proposed subdivision will facilitate better management of the watercourse through fencing along both sides and revegetation of the fringing vegetation.</p>  |
| Soils and land quality | <p>The soil and land quality information indicates that the more productive soils are located across the eastern portion of the site. This area is currently used for agriculture and orchards exist over most of this area. The western part of the site has poorer quality soils and as such has not been used for farming for many years. This area is more suited to rural living than farming and it is proposed that the subdivision to create a separate lot for rural living over this portion of the site will assist in better land management more suited to the qualities of this lot.</p>   |

It is concluded that the proposed subdivision will result in an overall environmental benefit through better management of vegetation, land qualities and the watercourse.

## 5 Outline Development Plan

### 5.1 Proposed land use

The proposed subdivision will divide the western side of the lot to facilitate rural living use and the remainder of the property will continue as a functioning orchard.

### 5.2 Lot sizes and building envelopes

The proposed lot sizes will be 6.72 hectares and 13.2 hectares.

A dwelling is already located at the south-west corner of the proposed lot. A new dwelling can be established on eastern lot.

### 5.3 Public Open Space

No public open space is provided as part of this development.

### 5.4 Bushfire Hazard

A Bushfire Hazard Assessment was undertaken by Bushfire Prone and is included at Appendix E. The assessment shows a *low* bushfire hazard across a majority of the site, with *moderate* risk to the areas of vegetation at the western end of the property. No areas of *extreme* bushfire hazard risk are located on or directly surrounding the property. The site is located greater than 100m from the nearest *extreme* hazard risk area.

The assessment also concluded that the Bushfire Attack Levels (BALs) across the site are *low*. The report suggests that as an alternative solution, any future dwellings on the proposed lots are to be constructed to a BAL 12.5 standard, thus ensuring enhanced occupant protection from the impact of bushfire.

### 5.5 Environmental Protection

The site has been designed to reduce and minimise environmental disturbance and to avoid degradation where possible. Environmental protection measures have been proposed such as fencing areas of remnant vegetation and watercourses to reduce future disturbance and to promote natural restoration. Environmental protection and management is discussed in more detail in Section 4.11 above.

### 5.6 Relationship to surrounding locality

The surrounding properties are also used as operating farms, many of which include orchards and some grazing. The land use will not change significantly as a result of the subdivision (the new lot will largely be for rural living purposes) and therefore will have minimal impact on the neighbours.

## 5.7 Roads and Access

Access for both lots will be from Settlement Road which leads from Great Northern Highway. Settlement Road is bitumen sealed approximately half way and gravel the remainder of the length. Access to proposed Lot 3001 is via Settlement Road, 707m west of the Great Northern Highway intersection. Proposed Lot 3002 will be accessed via a battleaxe located 888m along Settlement Road from the Great Northern Highway. The length of Settlement Road does not comply with the Performance Criteria as it is greater than 600m. The Bushfire Hazard Assessment proposes that buildings are constructed to a higher standard as an acceptable solution to the non-compliant site access distance. Further information is provided in the Bushfire Hazard Assessment report at Appendix E.

A battleaxe will run along the southern boundary to provide access to the new rear lot (proposed lot 3002). It will be 344m in length which is below the maximum length of 600m and complies with the Planning for Bushfire Protection Guidelines.

## 5.8 Infrastructure and services

### Water supply

Reticulated water is currently not available to the site. It is proposed that each lot will be supplied with potable water from a 120,000L tank (of which 10,000L is to be kept for firefighting purposes).

The collection area required to supply an appropriate volume of water for each dwelling has been calculated based on the formula in the Rural Planning Guidelines (WAPC, 2014):

*Collection area (m<sup>2</sup>) = average household water consumption (L) divided by (0.85 x (local rainfall – 24mm))*

The Water Corporation Perth Residential Water Use Study 2008-2009 specifies that the average household water consumption is 106,000L (including outdoor and indoor use) per person. The average household size in WA (as determined by the Australian Bureau of Statistics) is 2.6 people for each dwelling. Therefore, the average water use for each household is 275,600L.

Out of the 106,000L total, approximately 56,000L is used internally. For an average household size of 2.6 people this is 145,600L per annum.

The local average rainfall was obtained from the Bureau of Meteorology website. The Marbling station was chosen because it had a relatively good historic record and was largely complete ([http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p\\_nccObsCode=139&p\\_display\\_type=dataFile&p\\_startYear=&p\\_c=&p\\_stn\\_num=009024](http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=139&p_display_type=dataFile&p_startYear=&p_c=&p_stn_num=009024)). The average rainfall for Bindoon station is 665.8mm.

The collection area for each person is calculated as follows:

$$\text{Collection area} = \frac{56,000\text{L/person/year}}{0.85 \times (665.8 - 24)}$$

$$\text{Collection area} = \frac{56,000\text{L}}{545.53\text{mm}}$$

This equals a collection area of 102.6m<sup>2</sup> per person. For an average family of 2.6 people this is 267m<sup>2</sup> and for 4 people this equals a collection area of 410.6m<sup>2</sup>.

A roof space area of 410m<sup>2</sup> is considered reasonable for a family home.

If total water consumption is considered in the collection area calculation (including outside use) the average household water consumption is 106,000L per person per year. The collection area is calculated as follows:

$$\text{Collection area} = \frac{106,000\text{L/person/year}}{0.85 \times (665.8 - 24)}$$

$$\text{Collection area} = \frac{106,000\text{L}}{545.53\text{mm}}$$

This equals a collection area of 194.3m<sup>2</sup> per person. For an average family of 2.6 people this is 505.2m<sup>2</sup> and for 4 people this equals a collection area of 777.22m<sup>2</sup>.

The collection area can include outbuildings such as sheds, garages, verandas and outdoor living areas.

### **Wastewater**

On-site effluent disposal units need to be installed to treat wastewater. The soil types across the majority of the site have high phosphorus export risk so it might be necessary to use Alternative Treatment Units (ATUs). The Outline Development Plan provisions require the installation of ATUs across the entire site unless a future land owner wishes to undertake further on-site geotechnical and capability assessment at the time of seeking Council approval for the installation of a wastewater system. All effluent disposal systems will be located at least 100 metres away from any watercourse on the site.

### **Power**

Western Power connection is available in the area and will be required to connect the site once subdivision occurs.

## 5.9 Lot Layout Rationale

The rear lot will be subdivided as this land has low productivity for horticulture and is better suited as a rural living property. The watercourse through the centre of the property naturally divides the site. The new lot boundary has been placed along the western side of the watercourse so that it will retain on the existing horticulture property. The new lot boundary also aims to retain good quality soils on the horticulture lot and leaves unproductive soils on the new rural living lot.

## 5.10 Development Provisions

The following development provisions apply.

### 1. Development Plan:

This Development Plan has been endorsed by the Shire Council. Subdivision and development should generally be in accordance with this Plan.

### 2. Development Requirements and Lot Sizes:

In considering development and subdivision of the land, the requirements of the Shire of Chittering Town Planning Scheme No. 6 for the Rural Small Holding Zone apply.

### 3. Building Envelopes:

Buildings, water tanks, waste disposal and a building protection zone for fire management are to be contained within a cleared area not to exceed a maximum of 2000m<sup>2</sup> without the prior approval of Council; prior to confirming a building clearing area a vegetation survey is to be undertaken to ensure no rare or endangered flora is present; buildings are to have setbacks in accordance Local Planning Policy No. 18 Setbacks, with minimum setbacks from cadastral boundaries as follows:

|       |           |
|-------|-----------|
| Road  | 20 metres |
| Rear  | 20 metres |
| Sides | 15 metres |

### 4. Fencing:

In accordance with Local Planning Policy No. 22 - Fences, the construction of a fence is permitted within the building clearing area, any previously cleared area and adjoining an authorised fire break.

### 5. Crossovers:

The construction of a crossover to each lot is to be in accordance with Council's specifications.

### 6. Potable Water:

Each dwelling is to have a water supply from roof catchment of a minimum of 120,000 litres, of which 10,000 litres is to be kept in reserve for fire-fighting purposes and fitted with a standard Camlock valve.

### 7. Land Management:

The maintenance of any watercourse and fire breaks on private property is the responsibility of the



owner/occupier.

**8. Bores, Dams and Water Courses:**

The sinking of bores, construction of dams and extraction of surface water is not permitted without the approval of the Council and relevant State Government department.

**9. Fire Control:**

A Fire Management Plan will be prepared and endorsed by the Shire of Chittering. Development shall accord to the requirements of the Fire Management Plan.

**10. Permitted Uses:**

A single house and associated outbuildings are the only permitted uses. Other uses specified in the Town Planning Scheme may be approved at the discretion of the Council. Approval is required for a home business but not for a home office. For any use that may result in degradation of land or water resources or nuisance to neighbours, a management plan may be required as a condition of development approval.

**11. Stocking Restrictions:**

Stock shall be restricted to previously cleared areas. The prior approval of Council is required for the keeping of any grazing animal on a lot. If, in the opinion of Council, any lot is overgrazed or constitutes land degradation, it may order the removal of any or all stock, either temporarily or permanently until the remedial works are carried out by the landowner to render the land stable.

**12. Poultry:**

The keeping of poultry for domestic purposes is permitted, in accordance with the Shire's Health Local Law.

**13. Non-reflective Materials:**

All buildings shall be constructed with roofs of non-reflective materials.

**14. Effluent Disposal:**

Alternative Treatment Units (ATUs) with nutrient retention capability are required on all lots unless proven otherwise by the developer / landowner in accordance with the soil capability for the site.

**15. Vendor Responsibility:**

The developer/vendor shall inform prospective purchasers of the lots, in writing, of the provisions of the Council's Town Planning Scheme relating to the management of the land, as specified in the Development Plan and Fire Management Plan.

## 5.11 Implementation

This ODP will be considered and endorsed by both the Shire of Chittering and the Western Australian Planning Commission.

Following endorsement, a separate Subdivision Application will be lodged for subdivision.

The process for implementation will require the following:

- This Outline Development Plan to be approved by the Shire of Chittering and the Western Australian Planning Commission.
- Subdivision application to be approved by the Western Australian Planning Commission.

## 6 Conclusion

This proposal report accompanies a proposed Outline Development Plan over Lot 300 Settlement Road, Bindoon to develop the site for Rural Small Holding. As demonstrated by the assessment contained within this report and attached documents, the proposed development achieves compliance with the Shire's planning policies and is an acceptable land use for this site.

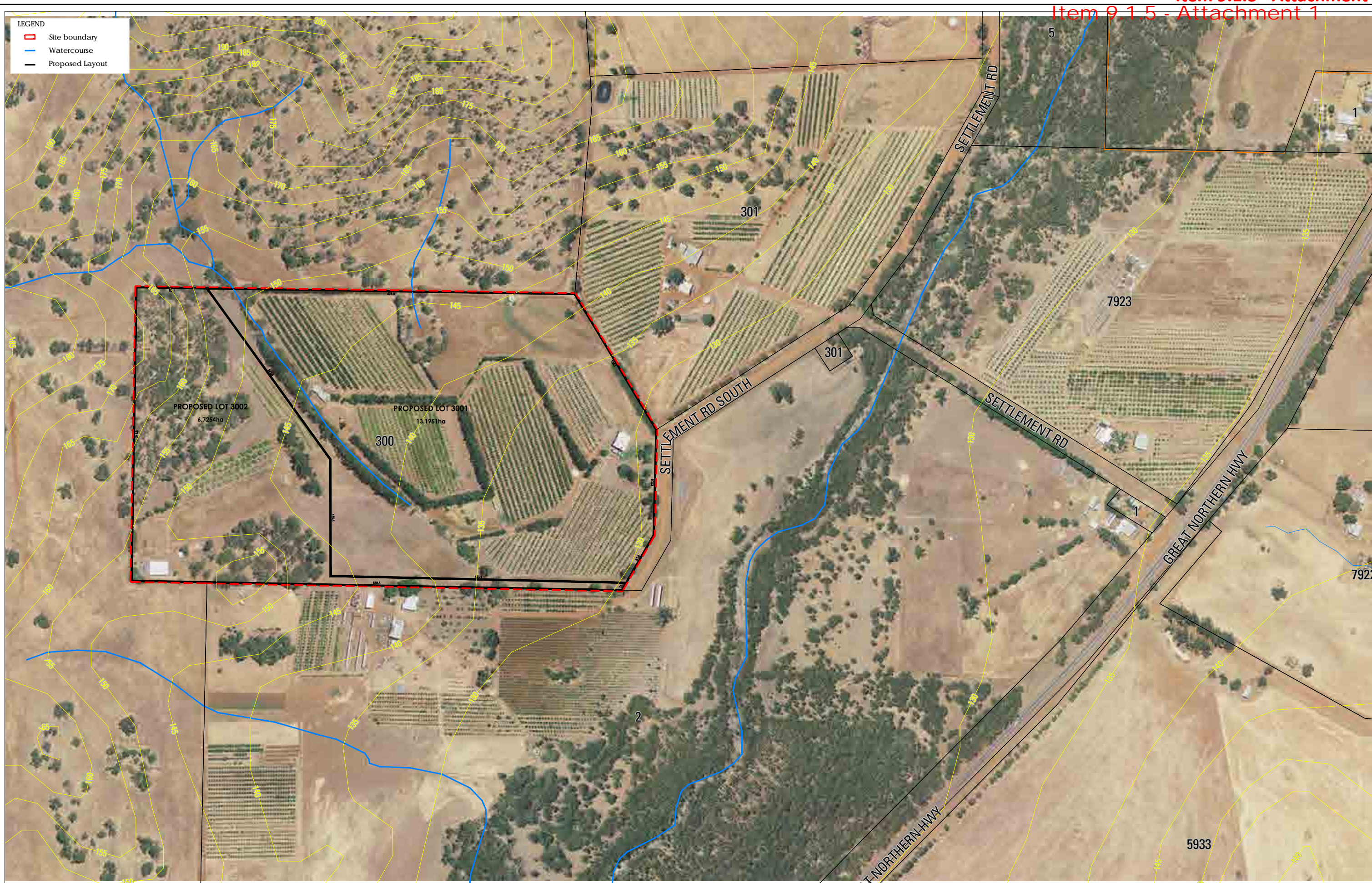
We therefore recommend that Council and the WAPC favourably consider and endorse the proposed Outline Development Plan as the basis for the future use and development of the site.

# APPENDIX A

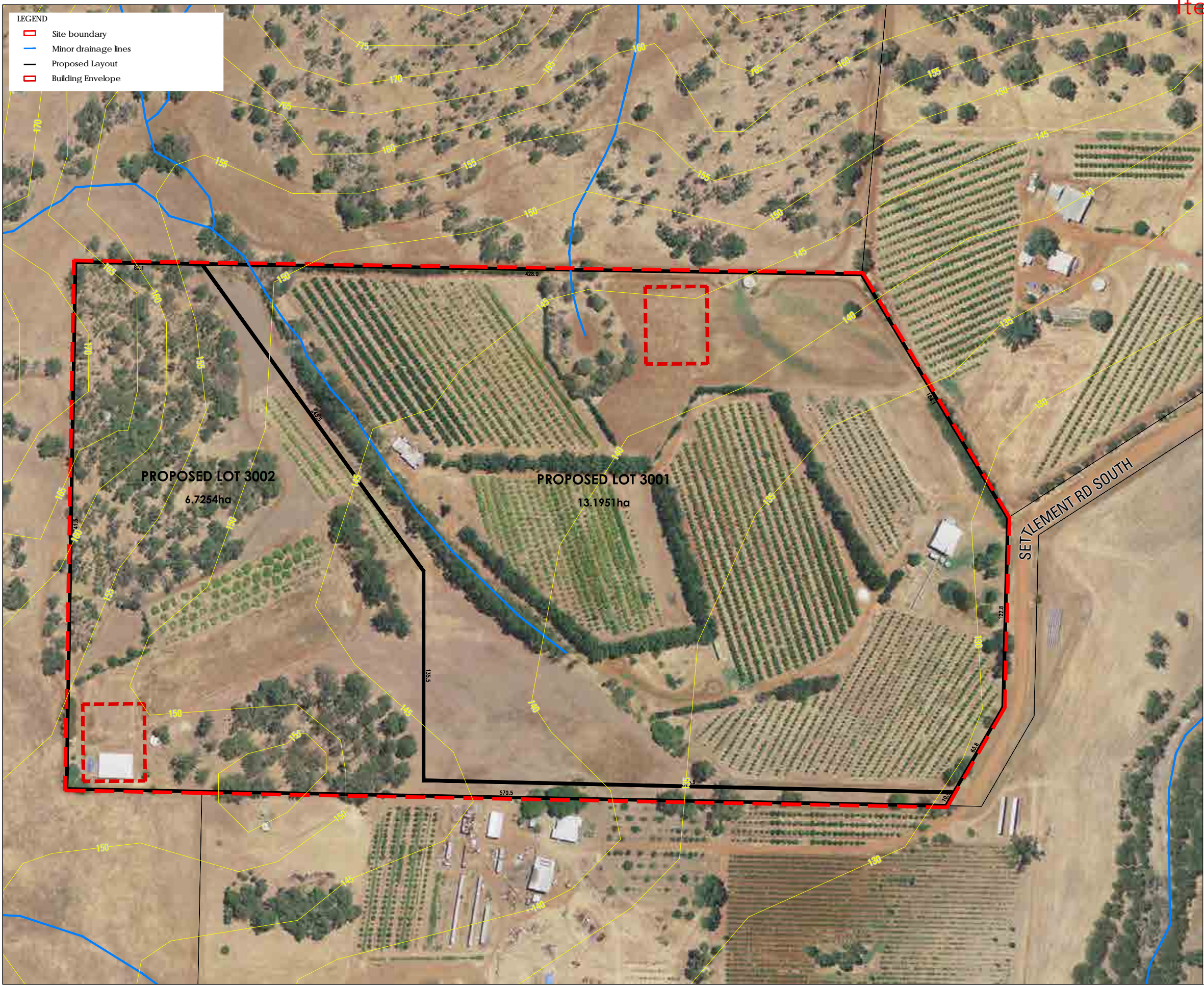
---

## Plans









**DEVELOPMENT PROVISIONS**

The following development provisions apply.

**1.Development Plan:**

This Development Plan has been endorsed by the Shire Council. Subdivision and development should generally be in accordance with this Plan.

**2.Development Requirements and Lot Sizes:**

In considering development and subdivision of the land, the requirements of the Shire of Chittering Town Planning Scheme No. 6 for the Rural Residential Zone apply.

**3.Building Envelopes:**

Buildings, water tanks, waste disposal and a building protection zone for fire management are to be contained within a cleared area not to exceed a maximum of 2000m<sup>2</sup> without the prior approval of Council; prior to confirming a building clearing area a vegetation survey is to be undertaken to ensure no rare or endangered flora is present; buildings are to have setbacks in accordance Local Planning Policy No. 18 Setbacks, with minimum setbacks from cadastral boundaries as follows:

|       |           |
|-------|-----------|
| Road  | 20 metres |
| Rear  | 20 metres |
| Sides | 15 metres |

**4.Fencing:**

In accordance with Local Planning Policy No. 22 - Fences, the construction of a fence is permitted within the building clearing area, any previously cleared area and adjoining an authorised fire break. Where natural vegetation adjoins a road reserve, no fence is to be constructed between the road reserve and the building clearing area. Elsewhere, no boundary fences are permitted without planning consent of the Council. Where a fence crosses a strategic fire break a gate of approved design is to be provided.

**5.Crossovers:**

The construction of a crossover to each lot is to be in accordance with Council's specifications.

**6.Potable Water:**

Each dwelling is to have a water supply from roof catchment of a minimum of 120,000 litres, of which 10,000 litres is to be kept in reserve for fire-fighting purposes and fitted with a standard Camlock valve.

**7.Land Management:**

The maintenance of any drainage swales, easements, fire breaks and vegetation on private property is the responsibility of the owner/occupier.

**8.Bores, Dams and Water Courses:**

The sinking of bores, construction of dams and extraction of surface water is not permitted without the approval of the Council and relevant State Government department.

**9.Bushfire Management:**

A Bush Fire Management Plan in accordance with the Western Australian Planning Commission's relevant Bush Fire Risk Management policies, is to be prepared to accompany any future subdivision application, to the satisfaction of the Local Government and relevant State Authority for Fire and Emergency Services.

Land subject of this Development Plan is designated bushfire-prone for the purpose of triggering the Building Code of Australia's bushfire construction requirements. Any buildings to be erected pursuant to this Development Plan shall comply with the requirements of Australian Standard 3959 (as amended).

**10. Permitted Uses:**

A single house and associated outbuildings are the only permitted uses. Other uses specified in the Town Planning Scheme may be approved at the discretion of the Council. Approval is required for a home business but not for a home office. For any use that may result in degradation of land or water resources or nuisance to neighbours, a management plan may be required as a condition of development approval.

**11. Stocking Restrictions:**

Stock shall be restricted to previously cleared areas. The prior approval of Council is required for the keeping of any grazing animal on a lot. If, in the opinion of Council, any lot is overgrazed or constitutes land degradation, it may order the removal of any or all stock, either temporarily or permanently until the remedial works are carried out by the landowner to render the land stable.

**12. Poultry:**

The keeping of poultry for domestic purposes is permitted, in accordance with the Shire's Health Local Law.

**13. Non-reflective Materials:**

All buildings shall be constructed with roofs of non-reflective materials.

**14. Effluent Disposal:**

Aerobic Treatment Units (ATUs) with nutrient retention capability are required on all lots unless proven otherwise by the developer / landowner in accordance with the soil capability for the site.

**15. Vendor Responsibility:**

The developer/vendor shall inform prospective purchasers of the lots, in writing, of the provisions of the Council's Town Planning Scheme relating to the management of the land, as specified in the Development Plan and Fire Management Plan.



## APPENDIX B

---

### Certificate of Title

WESTERN



AUSTRALIA

|                                      |                                     |
|--------------------------------------|-------------------------------------|
| REGISTER NUMBER<br><b>300/D74951</b> |                                     |
| DUPLICATE EDITION<br><b>N/A</b>      | DATE DUPLICATE ISSUED<br><b>N/A</b> |

**RECORD OF CERTIFICATE OF TITLE**  
UNDER THE TRANSFER OF LAND ACT 1893

VOLUME  
**1852**

FOLIO  
**778**

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

  
REGISTRAR OF TITLES



**LAND DESCRIPTION:**

LOT 300 ON DIAGRAM 74951

**REGISTERED PROPRIETOR:**  
(FIRST SCHEDULE)

THOMAS JAMES  
ANNIE JAMES  
BOTH OF 3 DUNVEGAN ROAD, APPLECROSS  
AS JOINT TENANTS

(T K249408 ) REGISTERED 29 JUNE 2007

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**  
(SECOND SCHEDULE)

1. \*K249409 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA REGISTERED 29.6.2007.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.  
\* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.  
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: 1852-778 (300/D74951).  
PREVIOUS TITLE: 1659-679.  
PROPERTY STREET ADDRESS: 45 SETTLEMENT RD, MOOLIABEENEE.  
LOCAL GOVERNMENT AREA: SHIRE OF CHITTERING.

NOTE 1: DUPLICATE CERTIFICATE OF TITLE NOT ISSUED AS REQUESTED BY DEALING K249409

## APPENDIX C

---

### Watercourse Foreshore Assessment Form

# Foreshore Condition Assessment Form: for paddock scale surveys

## General details

Name: \_\_\_\_\_  
 Address: 45 Settlement  
Road, Bindoon  
 Ph no: \_\_\_\_\_  
 Date: October 2014  
 Farm name: \_\_\_\_\_  
 Farm address: \_\_\_\_\_  
 Nearest road intersection Settlement  
Rd and Great Western Hwy  
 Catchment Swan River / Brockton River  
 Stream name: N/A  
 Location: N/A  
 Lot no.: Lot 300  
 Owner/manager assent obtained  
 Yes ☒ No ☐

## Site diagram

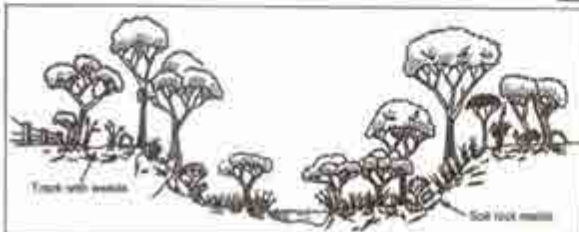
See attached plan

## Foreshore assessed

One side ☐ Both sides ☒

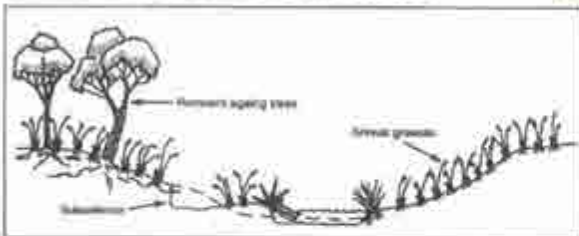
## Foreshore Condition

### A. PRISTINE - FEW WEEDS ☐



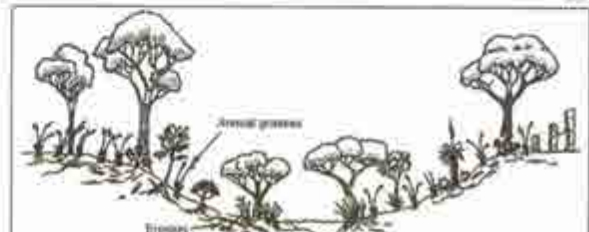
- A1 Pristine: no weeds ☐  
 A2 Near pristine: some weeds ☐  
 A3 Slightly disturbed: local weed infestations ☐

### C. ERODING OR EROSION PRONE ☒



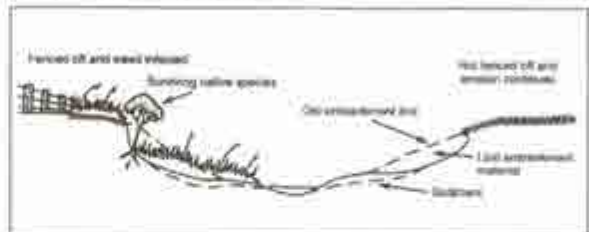
- C1 Erosion prone: understorey weeds only ☐  
 C2 Surface erosion: soil exposed ☐  
 C3 Erosion and subsidence present ☐

### B. DEGRADED - WEED INFESTED ☐



- B1 Weed infested: understorey mainly natives ☐  
 B2 Heavily weed infested: natives = weeds ☐  
 B3 Degraded: understorey weed dominated ☐

### D. DITCH OR DRAIN ☐



- D1 Eroding: extensive erosion and siltation ☐  
 D2 Freely eroding (ditch); erosion / siltation out of control ☐  
 D3 Weed infested (drain): highly eroded ☐



### Fencing Status

Fenced off: Yes ☐ No ☐ Partly - northern side





Stock access to foreshore: Yes ☐ No ☐ Partly

Crossing point present: Yes ☒ No ☐

Comments: \_\_\_\_\_

### Additional Information

#### General bank steepness

- ☒ > 60°  Very Steep  
☐ > 45-60°  Steep  
☐ > 10-45°  Moderate  
☐ > 0-10°  Slight

#### Major erosion/siltation

- ☐ None  
☒ Points of cutting/undercutting  
☐ Major undercutting  
☐ Firebreak/track washouts  
☐ Bank subsidence  
☐ Large deposits

#### Vegetation health

- ☒ Looks healthy  
☐ Some sick trees  
☐ Many sick and/or dying trees  
☐ Many dead trees  
☐ Mainly long dead trees  
 Tree seedlings and saplings present  
 Yes ☒ No ☐

#### General soil cohesion

- ☐ Excellent - rock, stone ☒ Good - clay, clayey loam ☐ Poor - sand, loose loam

Comments: \_\_\_\_\_

### Overall stream environmental rating

| Rating    | Floodway & Bank vegetation | Verge vegetation | Stream cover | Bank stability & sediment | Habitat diversity |
|-----------|----------------------------|------------------|--------------|---------------------------|-------------------|
| Excellent | (15)                       | (8)              | (8)          | (8)                       | (6)               |
| Good      | (12)                       | (6)              | (6)          | (6)                       | (4)               |
| Moderate  | (6)                        | (4)              | (4)          | (4)                       | (2)               |
| Poor      | (3)                        | (2)              | (2)          | (2)                       | (1)               |
| Very poor | (0)                        | (0)              | (0)          | (0)                       | (0)               |

#### Surrounding landuse:

- ☐ Conservation reserve (8) ☐ Rural residential (4) ☒ Agriculture (2)  
☐ Remnant bush (6) ☐ Urban (2) ☐ Commercial/industrial (1)

TOTAL SCORE =

ENVIRONMENTAL RATING = 24

| Score  | 40-55     | 30-39 | 20-29    | 10-19 | 0-9       |
|--------|-----------|-------|----------|-------|-----------|
| Rating | Excellent | Good  | Moderate | Poor  | Very poor |



Table 1. Living streams survey: information to determine stream health ratings

|                  | Floodway and Bank Vegetation  | Verge Vegetation  | Stream Cover   | Bank Stability and Erosion   | Habitat Diversity   |
|------------------|---|---|--|--|---|
| <b>Excellent</b> | <ul style="list-style-type: none"> <li>• Healthy undisturbed native vegetation.</li> <li>• No weeds.</li> </ul> <p>(15 points)</p>  | <ul style="list-style-type: none"> <li>• Healthy undisturbed native vegetation.</li> <li>• Verges more than 20 metres wide.</li> </ul> <p>(8 points)</p>                    | <ul style="list-style-type: none"> <li>• Abundant cover, shade, overhanging vegetation.</li> <li>• Snags, leaf litter, rocks and/or aquatic vegetation in stream.</li> </ul> <p>(8 points)</p> | <ul style="list-style-type: none"> <li>• No erosion or subsidence or sediment deposits.</li> <li>• Dense vegetation cover on banks and verge.</li> <li>• No disturbance.</li> </ul> <p>(8 points)</p>  | <ul style="list-style-type: none"> <li>• Three or more habitat type.</li> <li>• Some permanent water.</li> </ul> <p>(6 points)</p>  |
| <b>Good</b>      | <ul style="list-style-type: none"> <li>• Mainly healthy undisturbed native vegetation.</li> <li>• Some weeds.</li> <li>• No recent disturbances.</li> </ul> <p>(12 points)</p>                                | <ul style="list-style-type: none"> <li>• Mainly healthy undisturbed native vegetation.</li> <li>• Verges less than 20 metres wide.</li> </ul> <p>(6 points)</p>             | <ul style="list-style-type: none"> <li>• Abundant shade and overhanging vegetation.</li> <li>• Some cover in the stream.</li> </ul> <p>(6 points)</p>  | <ul style="list-style-type: none"> <li>• No significant erosion, subsidence or sediment deposits in floodway or on lower banks.</li> <li>• May be some soil exposure and vegetation thinning on upper bank and verge.</li> </ul> <p>(6 points)</p> | <ul style="list-style-type: none"> <li>• Two habitat type.</li> <li>• Some permanent water.</li> </ul> <p>(4 points)</p>  |
| <b>Moderate</b>  | <ul style="list-style-type: none"> <li>• Good vegetation cover, but a mixture of native and exotic species.</li> <li>• Localised clearing.</li> <li>• Little recent disturbance.</li> </ul> <p>(6 points)</p> | <ul style="list-style-type: none"> <li>• Good vegetation cover, but mixture of exotic and native species.</li> <li>• Verges 20 m wide or more.</li> </ul> <p>(4 points)</p> | <ul style="list-style-type: none"> <li>• Some permanent shade and overhanging vegetation.</li> <li>• Some instream cover.</li> </ul> <p>(4 points)</p>   | <ul style="list-style-type: none"> <li>• Good vegetation cover.</li> <li>• Only localised erosion, bank collapse and sediment heaps.</li> <li>• Verges may have sparse vegetation cover.</li> </ul> <p>(4 points)</p>                              | <ul style="list-style-type: none"> <li>• Mainly one habitat type with permanent water, or a range of habitats with no permanent water.</li> </ul> <p>(2 points)</p>                   |
| <b>Poor</b>      | <ul style="list-style-type: none"> <li>• Mainly exotic ground cover.</li> <li>• Obvious site disturbance.</li> </ul> <p>(3 points)</p>  | <ul style="list-style-type: none"> <li>• Narrow verges only (&lt; 20 m wide).</li> <li>• Mainly exotic vegetation.</li> </ul> <p>(2 points)</p>                             | <ul style="list-style-type: none"> <li>• Channel mainly clear.</li> <li>• Little permanent shade or instream cover.</li> </ul> <p>(2 points)</p>   | <ul style="list-style-type: none"> <li>• Extensive active erosion and sediment heaps.</li> <li>• Bare banks and verges common.</li> <li>• Banks may be collapsing.</li> </ul> <p>(2 points)</p>  | <ul style="list-style-type: none"> <li>• Mainly one habitat type with no permanent water.</li> </ul> <p>(1 points)</p>  |
| <b>Very Poor</b> | <ul style="list-style-type: none"> <li>• Mostly bare ground or exotic ground cover (i.e. pasture gardens or weeds but no trees).</li> </ul> <p>(0 points)</p>   | <ul style="list-style-type: none"> <li>• Mostly bare ground or exotic ground cover (i.e. pasture gardens or weeds but no trees).</li> </ul> <p>(0 points)</p>               | <ul style="list-style-type: none"> <li>• Virtually no shade or instream cover.</li> </ul> <p>(0 points)</p>  | <ul style="list-style-type: none"> <li>• Almost continuous erosion.</li> <li>• Over 50% of banks collapsing.</li> <li>• Sediment heaps line or fill much of the floodway.</li> <li>• Little or no vegetation cover.</li> </ul> <p>(0 points)</p>   | <ul style="list-style-type: none"> <li>• Stream channelised.</li> <li>• No pools, riffles or meanders.</li> <li>• The stream forms a continuous channel.</li> </ul> <p>(0 points)</p> |

## APPENDIX D

---

### Aboriginal Heritage Database Search



### Search Criteria

0 Registered Aboriginal Sites in Custom search area; 413729.96mE, 6529691.95mN (zone 50) : 414689.04mE, 6530346.99mN (zone 50)

### Disclaimer

The *Aboriginal Heritage Act 1972* preserves all Aboriginal sites in Western Australia whether or not they are registered. Aboriginal sites exist that are not recorded on the Register of Aboriginal Sites, and some registered sites may no longer exist.

The information provided is made available in good faith and is predominately based on the information provided to the Department of Aboriginal Affairs by third parties. The information is provided solely on the basis that readers will be responsible for making their own assessment as to the accuracy of the information. If you find any errors or omissions in our records, including our maps, it would be appreciated if you email the details to the Department at [HeritageEnquiries@daa.wa.gov.au](mailto:HeritageEnquiries@daa.wa.gov.au) and we will make every effort to rectify it as soon as possible.

### Copyright

Copyright in the information contained herein is and shall remain the property of the State of Western Australia. All rights reserved.

### Coordinate Accuracy

Accuracy is shown as a code in brackets following the coordinates.



### Terminology (NB that some terminology has varied over the life of the legislation)

**Place ID/Site ID:** This is a unique ID assigned by the Department of Aboriginal Affairs to the place

**Status:**

- o **Registered Site:** The place has been assessed as meeting Section 5 of the *Aboriginal Heritage Act 1972*
- o **Other Heritage Place which includes:**
  - **Stored Data / Not a Site:** The place has been assessed as not meeting Section 5 of the *Aboriginal Heritage Act 1972*
  - **Lodged:** Information has been received in relation to the place, but an assessment has not been completed at this stage to determine if it meets Section 5 of the *Aboriginal Heritage Act 1972*

**Access and Restrictions:**

- o **File Restricted = No:** Availability of information (other than boundary) that the Department of Aboriginal Affairs holds in relation to the place is not restricted in any way.
- o **File Restricted = Yes:** Some of the information that the Department of Aboriginal Affairs holds in relation to the place is restricted if it is considered culturally sensitive. This information will only be made available if the Department of Aboriginal Affairs receives written approval from the informants who provided the information. Download the [Request to Access Restricted Information](#) letter and form.
- o **Boundary Restricted = No:** place location is shown as accurately as the information lodged with the Registrar allows.
- o **Boundary Restricted = Yes:** To preserve confidentiality the exact location and extent of the place is not displayed on the map. However, the shaded region (generally with an area of at least 4km<sup>2</sup>) provides a general indication of where the place is located. If you are a landowner and wish to find out more about the exact location of the place, please contact DAA.
- o **Restrictions:**
  - **No Restrictions:** Anyone can view the information.
  - **Male Access Only:** Only males can view restricted information.
  - **Female Access Only:** Only females can view restricted information

**Legacy ID:** This is the former unique number that the former Department of Aboriginal Sites assigned to the place. This has been replaced by the Place ID / Site ID.





### List of Registered Aboriginal Sites with Map

No Results



## Legend

### Selected Heritage Sites

-  Registered Sites
-  Aboriginal Community Occupied
-  Aboriginal Community Unoccupied
-  Town
-  Search Area

Copyright for base map information shall at all times remain the property of the Commonwealth of Australia, Geoscience Australia - National Mapping Division. All rights reserved.

Cadastre, Local Government Authority, Native Title boundary, Roads data copyright © Western Australian Land Information Authority trading as Landgate (2014).

Geothermal Application, Geothermal Title, Mining Tenement, Petroleum Application, Petroleum Title boundary data copyright © the State of Western Australia (DMP) (2014.10)

For further important information on using this information please see the Department of Aboriginal Affairs' Terms of Use statement at <http://www.daa.wa.gov.au/Terms-Of-Use/>

## APPENDIX E

---

### Bushfire Hazard Assessment



# **BUSHFIRE HAZARD ASSESSMENT – MAPPING AND REPORT**

**LOT 300 (45) SETTLEMENT ROAD  
BINDOON**

**Project No: 14208  
Report Date: November 2014**



## Document Control Record

|                                    |  |
|------------------------------------|--|
| <b>Site Details:</b>               | Lot 300 Settlement Road, Bindoon   |
| <b>Client:</b>                     | Mr M Taylforth / Landsights  |
| <b>Assessment Type:</b>            | Bushfire Hazard Assessment (BHA)   |
| <b>Prepared By:</b>                | <b>Bushfire Prone Planning (BPP Pty Ltd)</b><br>ABN: 39 166 551 784<br>M: 0438 946 285 / 0459 558 986<br>Email: <a href="mailto:enquiries@bushfireprone.com.au">enquiries@bushfireprone.com.au</a> |
| <b>Reference:</b>                  | 14208  |
| <b>Document Status &amp; Date:</b> | Final November 2014  |



|                        |                                  |
|------------------------|----------------------------------|
| <b>Prepared by:</b>    | <b>Reviewed and approved by:</b> |
| <b>David Carroll</b>   | <b>Kathy Nastov</b>              |
| <b>Date:</b> 20-Nov-14 | <b>Date:</b> 20-Nov-14           |

| Amendment number: | Details of Amendment: | Date: | Approved by: |
|-------------------|-----------------------|-------|--------------|
|                   |                       |       |              |
|                   |                       |       |              |
|                   |                       |       |              |

*Disclaimer: The measures contained in this Bushfire Management Plan are considered to be minimum standards and they do not guarantee that a building will not be damaged in a bushfire. All surveys, forecasts, projections and recommendations made in this report associated with the project are made in good faith on the basis of information available to Bushfire Prone Planning at the time; and achievement of the level of implementation of bushfire precautions will depend among other things on the actions of the landowners or occupiers over which Bushfire Prone Planning has no control. Notwithstanding anything contained therein, Bushfire Prone Planning will not, except as the law may require, be liable for any loss or other consequences (whether or not due to the negligence of the consultants, their servants or agents) arising out of the services provided by the consultants.*





## Contents

---

|          |   |           |
|----------|---|-----------|
| <b>1</b> | <b>Introduction and Purpose .....</b>                 | <b>4</b>  |
| <b>2</b> | <b>Site Details.....</b>                              | <b>5</b>  |
| 2.1      | Residential Development Proposal; .....               | 7         |
| 2.2      | Vegetation .....                                      | 7         |
| 2.3      | Topography.....                                       | 7         |
| <b>3</b> | <b>Statutory Conditions.....</b>                      | <b>8</b>  |
| <b>4</b> | <b>Bushfire Hazard Assessment .....</b>               | <b>9</b>  |
| 4.1      | Method of Assessment .....                            | 9         |
| 4.2      | Hazard Assessment – Strategic Level .....             | 9         |
| 4.3      | Bushfire Attack Level (BAL) .....                     | 11        |
| 4.4      | Bushfire Hazard Management .....                      | 13        |
| <b>5</b> | <b>Bushfire Protection Performance Criteria .....</b> | <b>15</b> |
| 5.1      | Location (P1).....                                    | 15        |
| 5.2      | Vehicular Access (P2) .....                           | 16        |
| 5.3      | Water (P3).....                                       | 20        |
| 5.4      | Siting of Development (P4) .....                      | 21        |
| 5.5      | Design of Development (P5) .....                      | 24        |
| <b>6</b> | <b>Fire Fighting Service.....</b>                     | <b>25</b> |
| <b>7</b> | <b>Implementation and Responsibilities.....</b>       | <b>26</b> |
| <b>8</b> | <b>References.....</b>                                | <b>29</b> |



# 1 Introduction and Purpose

---

Mr M Taylforth of Landinsights Design commissioned Bushfire Prone Planning to develop a Bushfire Hazard Assessment for a subdivision application for the subdivision of Lot 300 Settlement Road, Bindoon, located within the Shire of Chittering. The subdivision application is for the subdivision of existing Lot 300 Settlement Road into 2 Lots. This Plan relates to bushfire protection measures recommended for consideration for the individual building envelopes and proposed buildings on each Lot.

The purpose of this plan is to provide guidance on how to plan for and manage the potential bushfire threat of the specified area. The Plan identifies the bushfire risk and addresses requirements of local government and the responsibilities for both the developers and property owners. This Bushfire Hazard Assessment has been prepared to determine the suitability of the site for subdivision in order to comply with the requirements of a condition of development by the Shire of Chittering. The Plan details the specific bushfire management requirements that will be implemented within the development and design.

The objectives of this Plan are to:

- Define areas where values are located
- Define and rank bushfire hazard areas
- Define management responsibilities
- Define bushfire management responsibilities
- Provide performance criteria and acceptable solutions (non-construction).

## 2 Site Details

The site is Lot 300 Settlement Road, Bindoon located within the Shire of Chittering (Figure 1) and is situated on the west side of Settlement Road sitting within an Agricultural Resource Zone (Shire of Chittering Town Planning Scheme Number 6 Local Planning Policy Number 32). Lot 300 is 19.9205 hectares in size with the proposed subdivision being the western Lot 3002 - 6.7254 hectares and eastern Lot 3001 - 13.1951 hectares in size (Figure 2).







**Figure 1:** Lot 300 Settlement Road, Bindoon with Proposed Subdivision (Source: Landinsights).



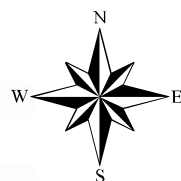
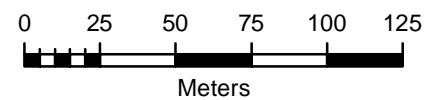
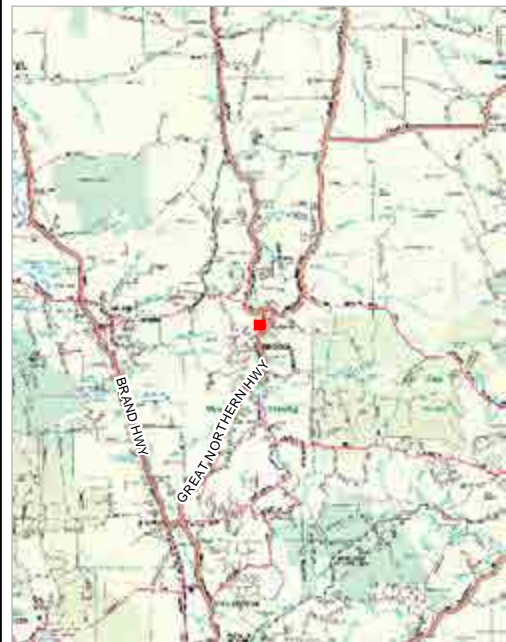
**Figure 2.**  
**Proposed Subdivision**

Lot 300 Settlement Rd,  
Mooliabeenee

**LEGEND**

-  Lot 300
-  Proposed Subdivision
-  Battleaxe Access
-  Blocks

**LOCALITY**



Date: 5/11/2014





## 2.1 Residential Development Proposal;

Lot 300 Settlement Road is proposed for subdivision into two lots being Lot 3001 and Lot 3002.

## 2.2 Vegetation

The subject site vegetation is comprised of orchards, cultivated gardens, managed grassland and remnant bushland on the upper western slope. Neighbouring property consists of orchards managed grassland and remnant bushland. (Figure 3 & 4).



**Figure 3:** Orchards



**Figure 4:** Managed Grassland

## 2.3 Topography

The topography of the subject site is undulating with a general 4° south easterly aspect.





### 3 Statutory Conditions

---

This Bushfire Hazard Assessment Report has been prepared to accompany a subdivision application to the Shire of Chittering.

This Bushfire Management Plan is aligned to the following policies and guidelines:

- Planning for Bushfire Protection Guidelines, Department for Planning and Infrastructure and Department of Fire and Emergency Services
- Australian Standards (AS) 3959-2009 Construction of buildings in bushfire prone- areas, Standards Australia
- Shire of Chittering Fire Break Notice
- Shire of Chittering Town Planning Scheme No 6
- Bush Fires Act 1954 (as amended).



## 4 Bushfire Hazard Assessment

---

### 4.1 Method of Assessment

There are two processes for determining the bushfire hazard level of an area. The first assessment is a broad assessment intended to be used at strategic level planning to identify the suitability of an area for the intensification of land use and to determine if the area is bushfire prone. Hazard levels are based on the prominent vegetation at the location and are identified as being either Low, Moderate or Extreme bushfire risk. The method for determining the bushfire hazard at the strategic level is aligned to the Western Australian Planning for Bushfire Protection Guidelines, 2010.

The second assessment, the Bushfire Attack Level (BAL) is a more detailed assessment of the site that is applied after the bushfire hazard and land capability assessment has been conducted. The BAL is required at the development stage to determine the potential level of construction standard as specified in *AS 3959-2009 Construction of buildings in bushfire prone areas*. Within this Plan the BAL assessment is an overview for the purpose of the Development Application and a more specific assessment prior to the construction of any buildings may be required.

### 4.2 Hazard Assessment – Strategic Level

The assessment of bushfire risk takes into consideration existing site conditions, which include:

- Topography with particular reference to ground slopes and accessibility;
- Vegetation cover – both remnant and likely re-vegetation;
- Relationship to surrounding development.






Based on these considerations the strategic Bushfire Hazard Assessment for Lot 300 Settlement Road is Low to Moderate. The hazard ratings for the adjoining properties are a combination of hazard ratings being Low to Moderate (Figure 5).



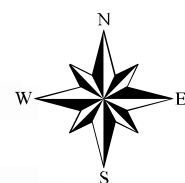
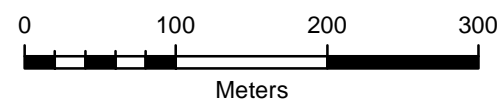
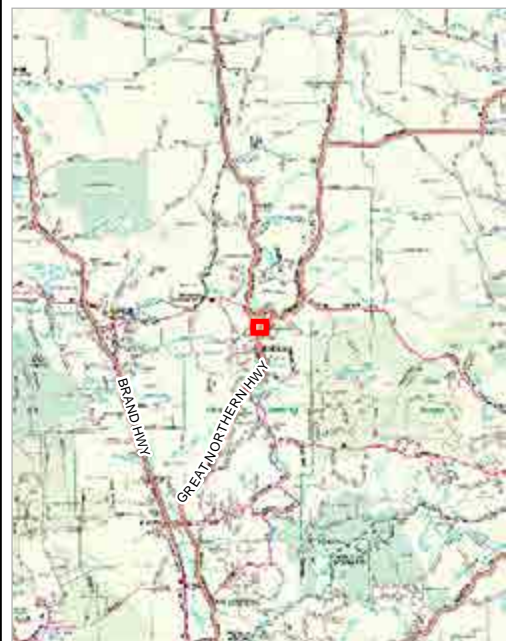
**Figure 6.**  
**Bushfire Hazard Mapping -**  
**Strategic**

Lot 300 Settlement Rd,  
Mooliabeenee

**LEGEND**

-  Lot 300
-  Blocks
-  Low Bushfire Hazard
-  Moderate Bushfire Hazard
-  Extreme Bushfire Hazard

**LOCALITY**



Date: 5/11/2014

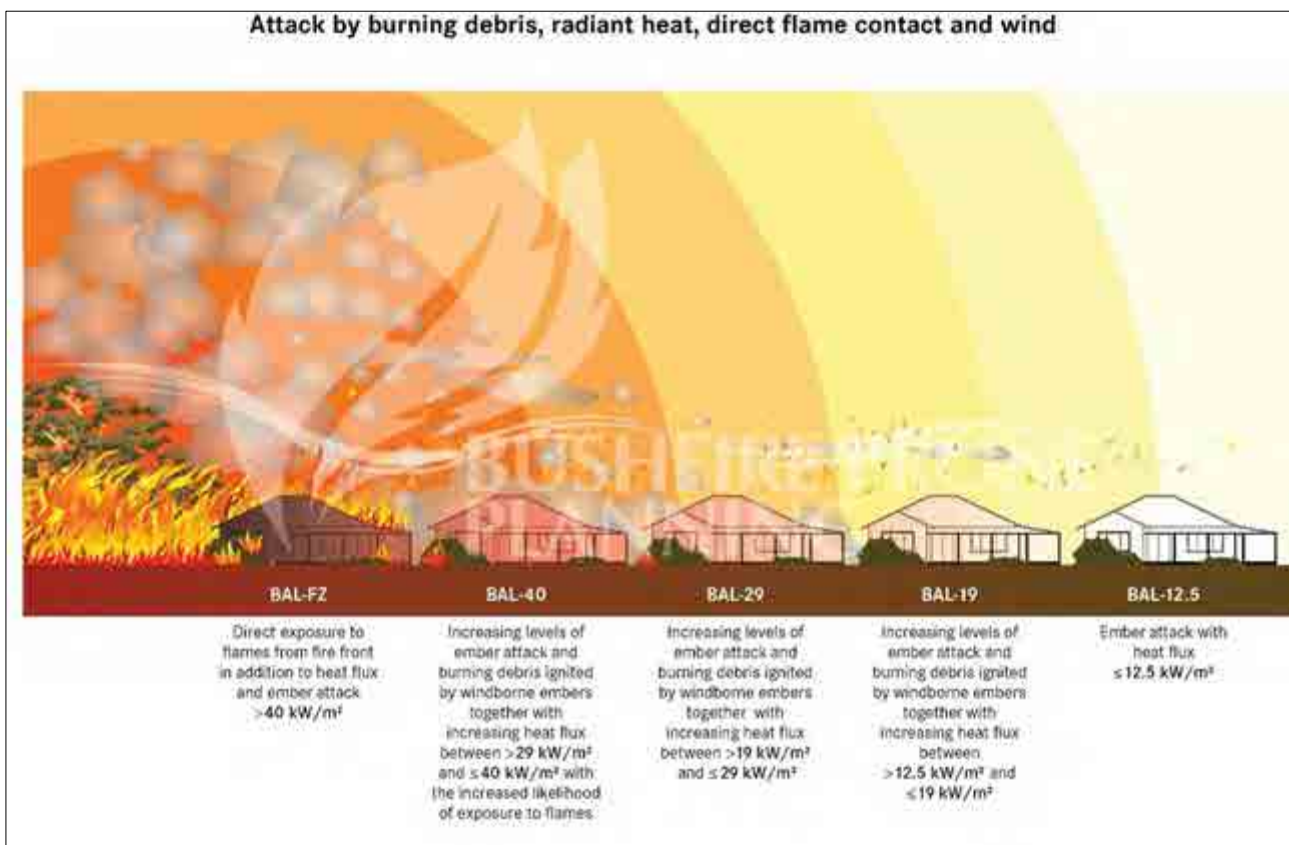




### 4.3 Bushfire Attack Level (BAL)

The methodology rates bushfire attack using a combination of vegetation type, slope and distance from the building or building envelope to the predominant vegetation. In Western Australia it assumes a Forest Fire Danger Index (FFDI) of 80. The BAL assessment involves the following process in accordance with the Australian Standard- *Construction of Buildings in Bush Fire Prone Areas (AS 3959 – 2009)* (Method 1);

- Determination of the area to be assessed
- Identification of vegetation type and class
- Determination of distance of the site from classified vegetation
- Determination of average slope (under the classified vegetation)
- Determination of a BAL
- Determination of construction standards



AS 3959 – 2009 has six categories of BAL. These categories are based on heat flux exposure thresholds and are summarised in Table 1.



**Table 1: Bushfire Attack Levels and Corresponding Sections for Specific Construction Requirements (AS 3959-2009).**

| <b>Bushfire Attack Level (BAL)</b> | <b>Classified vegetation within 100 m of the site and heat flux exposure thresholds</b> | <b>Description of predicted bushfire attack and levels of exposure</b>  | <b>AS 3959:2009 Construction Section</b> |
|------------------------------------|---|---|--|
| BAL- LOW                           | See Clause 2.2.3.2  | There is insufficient risk to warrant specific construction requirements  | 4  |
| BAL- 12.5                          | $\leq 12.5 \text{ kW/m}^2$  | Ember attack  | 3 and 5                                  |
| BAL- 19                            | $>12.5 \text{ kW/m}^2 - \leq 19 \text{ kW/m}^2$   | Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux   | 3 and 6                                  |
| BAL- 29                            | $>19 \text{ kW/m}^2 - \leq 29 \text{ kW/m}^2$   | Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux   | 3 and 7                                  |
| BAL- 40                            | $>29 \text{ kW/m}^2 - \leq 40 \text{ kW/m}^2$   | Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing heat flux with the increased likelihood of exposure to flames | 3 and 8                                  |
| BAL- FZ                            | $>40 \text{ kW/m}^2$  | Direct exposure to flames from fire front in addition to heat flux and ember attack   | 3 and 9                                  |





The BAL assessment using methodology from AS 3959-2009 (Section 2.2.1, 2.2.3.2 and Table 2.4.3 of the Standards) for the proposed development area is provided in Tables 2 and 3 below.

Where there is a risk of ember attack, the lowest BAL will be 12.5.





**Table 2: BAL Assessment Proposed Lot 3002, Existing Western Dwelling**

| Lot 3002 - VEGETATION ASSESSMENT WITHIN 100m RADIUS OF EXISTING DWELLING |   |   |  |   |
|--|---|---|--|---|
| Sector   | North   | East  | South  | West  |
| Distance (metres)  | 90.8  | >100  | >100   | >100  |
| Slope (degrees)  | 0   | 0   | 4.1  | 0   |
| Vegetation Classification  | Woodland  | Managed Grassland   | Managed Grassland  | Managed Grassland   |
| Site pictures From Existing Dwelling                                     |  |  |  |  |
| BAL Determination for Sector   | 12.5  | LOW   | LOW  | LOW   |
| BAL dermination (highest BAL) <b>BAL 12.5</b>                            |   |   |  |   |

To reduce the heat flux on the proposed subdivided Lots, the following Section (4.4 Bushfire Hazard Management) contains recommendations for the development planning and design. It is recommended that a revised BAL assessment is undertaken for any proposed new building once a location has been defined.

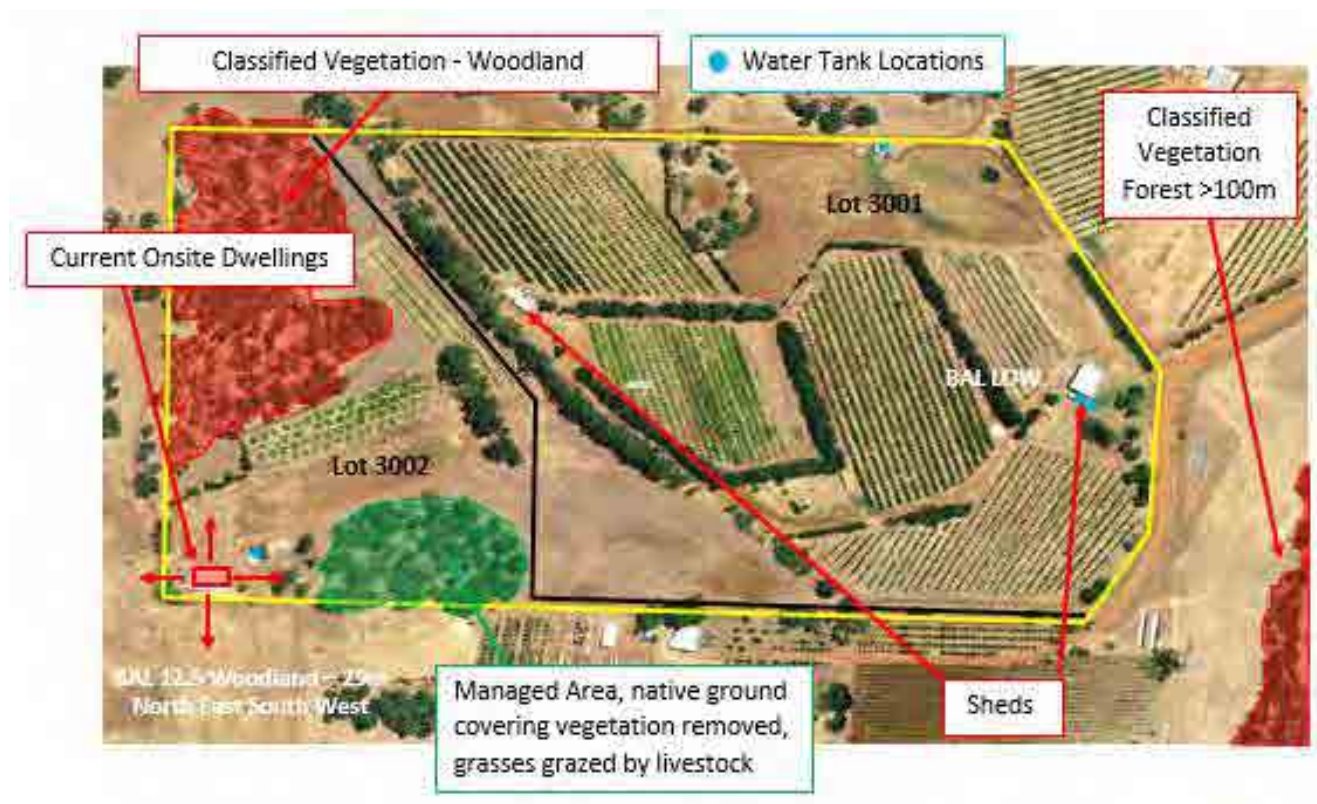
#### 4.4 Bushfire Hazard Management

Bushfire Attack Level determinations are based on the ongoing management of grassland fuels to low levels by slashing or grazing by livestock and adherence to the Shire of Chittering Firebreak Notice. Neighbouring property grass fuels are currently being grazed by more than 1000 head of livestock (Figure 6).

Future dwellings are to be located in areas with the appropriate BAL and to minimize the impact on the environment. The minimum BAL will be 12.5 and the maximum BAL allowable will be BAL 29. Where the minimum BAL setback is less than 20 metres, the BPZ shall be a minimum of 20m.

Bushfire Attack Level – BAL LOW is based on insufficient bushfire risk to warrant increased bushfire resistant construction standards and a BAL LOW is achievable within the proposed subdivision. **However as an Alternative Solution, any future dwellings on the proposed Lots are to be constructed to a BAL 12.5, thus ensuring enhanced occupant protection from the impact of a bushfire. The increased level in structure are mandatory to achieve the Alternative Solution**

allowing for length of Settlement Road not meeting the Planning for Bushfire Guidelines performance Criteria.



**Figure 6:** Subject Site Relationship to Classified Vegetation and BAL 12.5 set back distances.



## 5 Bushfire Protection Performance Criteria

---

The site will be required to meet the Performance Criteria for Extreme Hazard, taking into consideration the following as per the Planning for Bushfire Protection Guidelines, 2010;

- Location (P1)
- Vehicular access (P2)
- Water (P3)
- Siting of development (P4)
- Design of development (P5)

### 5.1 Location (P1)

*The subdivision is located in an area where the bushfire hazard level is manageable.*

#### 5.1.1 Development Location

The site sits within an Agricultural Resource Zone. The proposed lots are located in a Low to Moderate bushfire hazard. Any future construction on the site will be required to comply with the construction requirements as detailed in Table 1 and vegetation setbacks appropriate to classified vegetation within 100 metres of the proposed dwelling site.

## 5.2 Vehicular Access (P2)

*The internal layout, design and construction of public and private vehicular access in the subdivision allows emergency and other vehicles to move through it safely at all times.*

### 5.2.1 Two Access Routes

Site access (proposed lot 3001) is via Settlement Road 707 metres west of Great Northern Highway. Proposed lot 3002 Battle-axe Driveway will be 888 metres along Settlement Road from Great Northern Highway. Settlement Road is a formed bitumen and gravel road having a 7.5 metre wide trafficable surface between guide posts. There is provision for carrying out a three point turn at the Settlement Road termination and access to neighbouring properties.



**Figure 7:** Settlement Road looking south west toward the subject site

### 5.2.2 Public Roads

Not Applicable.

### 5.2.3 Cul-de-sacs

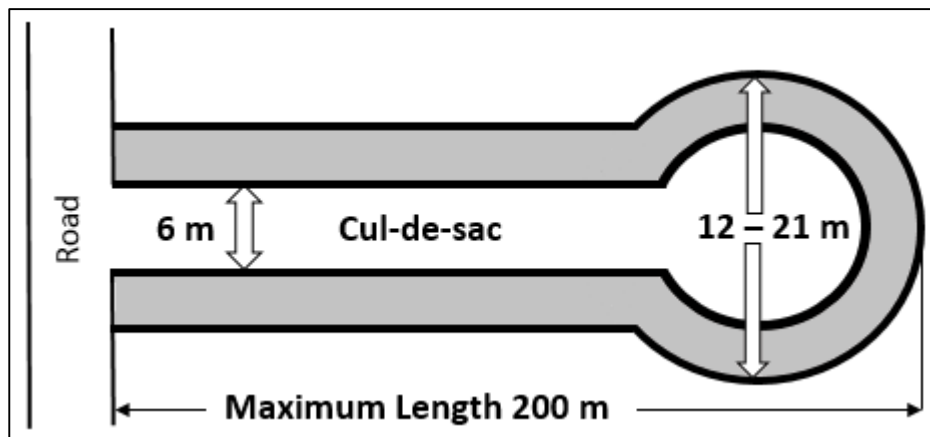
Settlement Road terminates 888.56 metres west of Great Northern Highway and does not comply with the Performance Criteria due to road length (refer Table 3 below).

An increased Bushfire Attack Level building construction standard is recommended for future onsite buildings as an **Acceptable Solution** to the non-compliant site access distance (Settlement Road). Settlement Road has a two way egress on Great Northern Highway. Settlement Road meets minimum public road requirements and with road side vegetation density and type being of a low threat nature, this also contributes to a lower bushfire threat and ease of egress in an emergency.

The construction of a cul-de-sac turnaround area as detailed in Figure 1 must meet, as a minimum, the requirements set out below. (Table 3).

**Table 3:** Minimum Standard for Cul-de-sacs

| Standard                    | Public Road   |
|-----------------------------|---|
| Maximum length              | 200 meters (if emergency access is provided between cul-de-sac heads maximum length can be increased to 600 meters provided no more than 8 lots are serviced) |
| Minimum trafficable surface | 6 metres  |
| Horizontal clearance        | 6 metres  |
| Maximum grades              | 1 in 8  |
| Maximum grade over <50m     | 1 in 5  |
| Maximum average grade       | 1 in 7  |
| Minimum weight capacity     | 15 tonnes   |
| Maximum crossfall           | 1 in 33   |
| Curves minimum inner radius | 12 metres   |
| Turnaround areas            | As per turn around area requirements – including 21 metre diameter head. To accommodate 3.4 fire appliance and enable them to turn around safely.             |



**Figure 8:** Cul-de-sac construction widths





#### 5.2.4 Battle Axes

Battle axe block construction standards for the provision of access to the Lot 3002 from Settlement Road are listed in table 4 below. The battle axe will be 344 metres in length.

**Table 4:** Minimum Standard for Battle axe access.

| Standard                    | Battle Axes |
|-----------------------------|-------------|
| Maximum length              | 600 metres  |
| Minimum width               | 6 metres    |
| Minimum trafficable surface | 4 metres    |
| Horizontal clearance        | 6 metres    |
| Vertical clearance          | 4 metres    |
| Maximum grades              | 1 in 8      |
| Maximum grade over <50m     | 1 in 5      |
| Maximum average grade       | 1 in 7      |
| Minimum weight capacity     | 15 tonnes   |
| Maximum crossfall           | 1 in 33     |
| Curves minimum inner radius | 12 metres   |

#### 5.2.5 Private Driveways

The Proposed lots 3001 and 3002 will comply with the minimum standard is detailed in Table 5.



**Table 5:** Minimum Standard for Private Driveway.

| Standard                    | Private Driveway   |
|-----------------------------|--|
| Minimum trafficable surface | 4 metres   |
| Horizontal clearance        | 6 metres   |
| Vertical clearance          | 4 metres   |
| Maximum grades              | 1 in 8   |
| Maximum grade over <50m     | 1 in 5   |
| Maximum average grade       | 1 in 7   |
| Minimum weight capacity     | 15 tonnes  |
| Maximum crossfall           | 1 in 33  |
| Curves minimum inner radius | 12 metres  |
| Turnaround areas:           | To accommodate safe turnaround of a 3.4 firefighting appliance |



### 5.2.6 Emergency Access Ways

Not applicable.

### 5.2.7 Fire Service Access Routes

Not applicable.

### 5.2.8 Gates

Not applicable.

### 5.2.9 Firebreak Widths

Proposed Lots 3001 and 3002 must comply with the Shire of Chittering Firebreak Notice.

### 5.2.10 Signs

Not applicable.

## 5.3 Water (P3)

*The development is provided with a permanent and secure water supply that is sufficient for fire fighting purposes.*

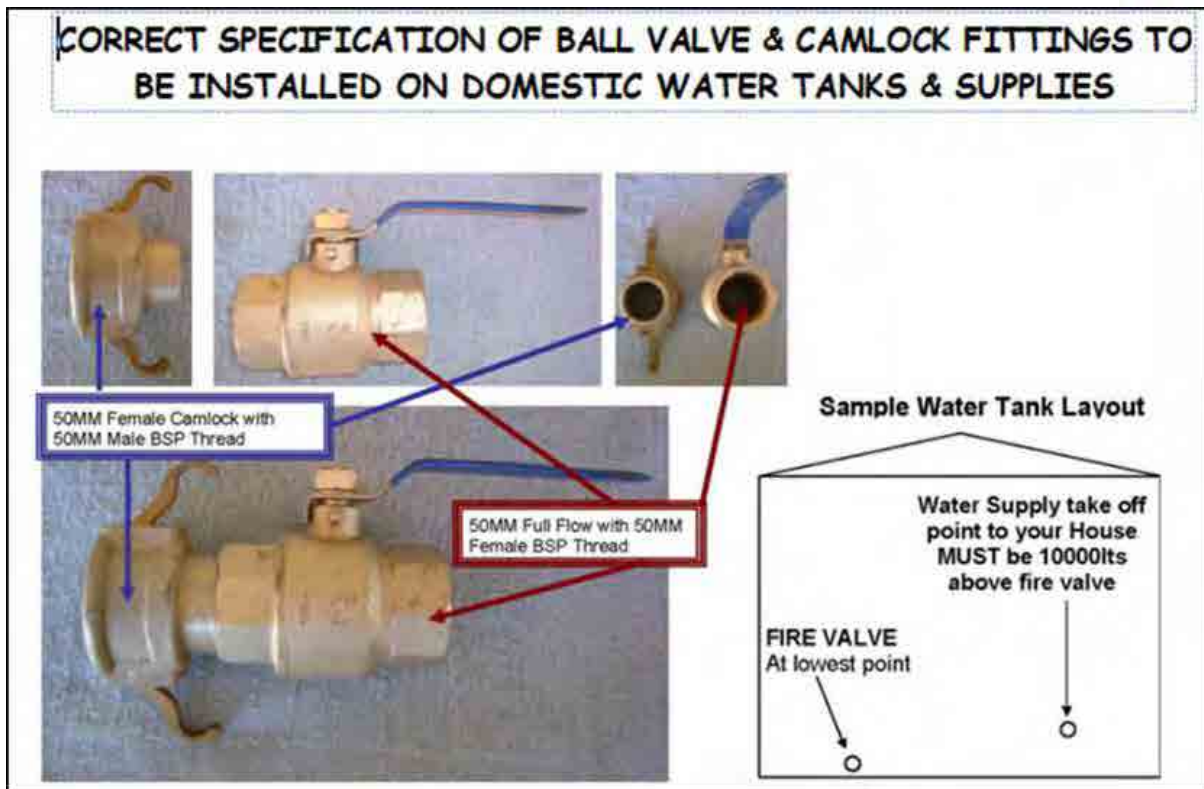
### 5.3.1 Reticulated Areas

A reticulated water supply is not available in the area of the subject site.

### 5.3.2 Non-Reticulated Areas

As a minimum proposed Lots 3001 and 3002 will require 10,000 litres of storage water per Lot including standard hose couplings for firefighting purposes and will be readily accessible and provide adequate water supply to fire services (Figure 9). A hardstand and turn around area suitable for a 3.4 fire appliance is required at the tank.

Proposed Lot 3001 has two 25,000 litre water tanks adjacent to the dwelling and an 80,000 litre water tank 227 metres north west from the dwelling, on the property eastern boundary. Proposed Lot 3002 has a 120,000 litre water tank adjacent to the dwelling and a 140,000 litre water tank to the north in the central bushland area.



**Figure 9.** Tank and Fitting Specifications

### 5.3.3 Non-Reticulated Areas- Dams

Not applicable.

## 5.4 Siting of Development (P4)

*The siting (including paths and landscaping) of the development minimises the bushfire risk to life and property.*

### 5.4.1 Hazard Separation-Moderate to Extreme Bushfire Hazard Level

Refer to Section 4.4 for acceptable solution.

### 5.4.2 Hazard Separation-Low Bushfire Hazard Level

Refer to Section 4.4 for acceptable solution.

### 5.4.3 Building Protection Zone (BPZ)

A Building Protection Zone (BPZ) shall be incorporated into the design to reduce bushfire intensity close to dwellings, therefore minimising the likelihood of flame contact and radiant heat onto buildings. The BPZ standards that are recommended to be incorporated into the overall design are

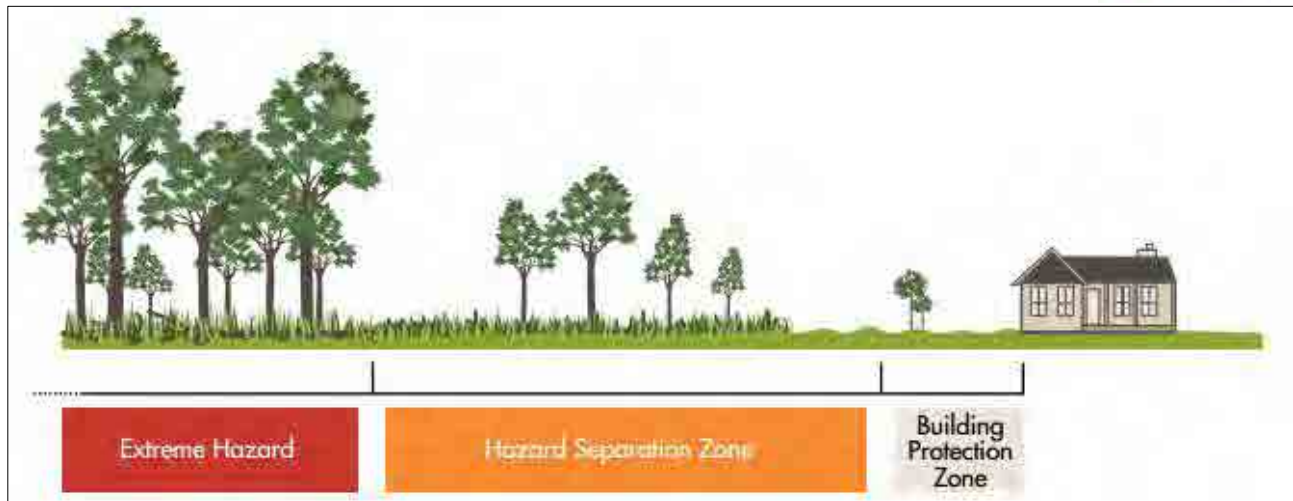


provided below (and shown in Figure 10). Barriers such as driveways, lawns, ovals, orchards and pathways surrounding dwellings can form part of a BPZ.

As a minimum, the BPZ must comply with the *Planning for Bushfire Protection Guidelines*, however it is recommended that any future development comply with a BPZ as detailed below and set out in Section 4.4. In accordance with AS 3959-2009, as the distance from the vegetation is reduced, the construction standard must be increased. Table 2.4.3 of AS 3959-2009 sets out this relationship between separation distances and construction standards (refer to Section 4.4 of this Plan for explanation):

- Width: The BPZ for all sub division Lots is 20 metres measured from the external walls of the building or proposed buildings (see Section 4.4).
- Fuel Load: reduced to and maintained at 2 tonnes per hectare.
- The crowns of trees are to be separated where possible to create a clear separation distance between adjoining or nearby tree crowns. The separation distance between tree crowns is not required to exceed 10 metres
- No tall shrub or tree is located within 2 metres of a building (including windows).
- There are no tree crowns overhanging the building.
- Fences and sheds within the Building Protection Zone are constructed using non-combustible materials (eg: Colorbond, iron, brick, limestone) or within 6 metres of the main structure comply with AS 3959: 2009.
- Shrubs in the Building Protection Zone are cleared of dead material within the plant.
- Tall shrubs in the Building Protection Zone are not arranged in clumps, close to buildings (ie: within 3 metres).
- Trees in the Building Protection Zone have no dead material within the plant's crown or bole, and;
- Maintain debris accumulation in areas against, under or within the buildings structure.





**Figure 10.** Diagram showing Hazard Separation Zones and Building Protection Zone Requirements.

#### 5.4.4 Hazard Separation Zone (HSZ)

In line with the *Western Australian Planning for Bush fire Protection Guidelines* the following landscape design measures are recommended to provide sufficient protection to the building from radiant heat and flame contact and to reduce the likelihood of ember attack by approximately 85 percent (Leonard, 2005), to reduce the overall vulnerability of a subdivision and related development from bushfire and also assist with fire control operations. They must be provided between extreme bushfire hazards and buildings within a subdivision to create a minimum separation distance of 100 metres between the buildings and the hazard in order to provide protection from burning debris (spotting and airborne embers), radiant heat and direct flame contact. Where bushfire hazards exist within a subdivision, a separation zone should be created between these hazards and the buildings.

It is recommended that the Hazard Separation Zone (HSZ) should comply with Section A4.4 of the *Planning for Bushfire Protection Guidelines* (outlined in Figure 10). Every building and its contiguous Building Protection Zone is surrounded by a HSZ that is required to meet the following:

- Minimum width: inclusive of BPZ is 100 metres or to the boundary of the Lot from the buildings in the case of vegetation classified under Table 1, *Planning for Bushfire Protection Guidelines* and incorporating the Building Protection Zone
- Fuel load: reduced to and maintained at between 5 and 8 tonnes per hectare (jarrah/marri dominated forest)
- Trees crowns have clear separation
- Trees have no dead material within the plant's crown or on the bole



Where buildings are constructed to a Bush Fire Attack Level construction standard the Building Protection and Hazard Separation Zones may be included in the BAL setback distance as long as the BAL setback distance is equal to or greater than 20 metres.

#### **5.4.5 Reduction in Bushfire Attack Level Due to Shielding**

Not Applicable.

### **5.5 Design of Development (P5)**

*The design of the development is appropriate to the level of bush fire hazard that applies to the development site.*

#### **5.5.1 Compliant Development**

It is recommended the development comply with the requirements set out in Section 5.4 to include appropriate Hazard Separation Zones and Building Protection Zones that are maintained to the requirements set out in this Section. This will ensure the bushfire hazard level is kept as low as feasible on existing and future dwellings on the site.

#### **5.5.2 Non-Compliant Development**

Not applicable.



## 6 Fire Fighting Service

---

The Shire of Chittering Fire Service supports 5 Volunteer Bushfire Brigades. The development site is within 7.5 Kilometres / 20 minute average turn out response zone from the Bindoon Volunteer Bush Fire Brigade fire station.

Fire fighter safety during fire suppression activities is taken into consideration and the BPZ and HSZ shall be maintained around surrounding buildings in respect of this.



## 7 Implementation and Responsibilities

---

The proposed development for lot 300 Settlement Road, Bindoon will be required to meet the minimum criteria as per the Western Australian Planning for Bushfire Protection guidelines, AS 3959-2009, Shire of Chittering Town Planning Scheme No 6, Shire of Chittering Firebreak Notice and other requirements as included in a full and comprehensive Bushfire Management Plan.

The design of structures and the modification to vegetation are such that with implementation of a comprehensive Bushfire Management Plan, the bushfire threat to persons and property within the development is reduced. This is subject to the owners and occupiers of the proposed development complying with their responsibilities as described in a detailed Bushfire Management Plan.



## Appendix 1. Compliance Checklist for Performance Criteria and Acceptable Solutions

| Element 1: Location  | Compliance |
|--|------------|
| Does the proposal comply with the performance criteria by applying acceptable solution A1.1? | Yes        |

| Element 2: Vehicular Access   | Compliance  |
|---|---|
| Does the proposal comply with the performance criteria by applying acceptable solution A2.1?  | Yes - Via Great Northern Highway<br>Refer - 5.2.3 Cul-de-sac  |
| Does the proposal comply with the performance criteria by applying acceptable solution A2.2?  | N/a   |
| Does the proposal comply with the performance criteria by applying acceptable solution A2.3?  | Yes – Cul de sac will meet requirements (refer Section 5.2.3) |
| Does the proposal comply with the performance criteria by applying acceptable solution A2.4?  | Yes – proposed battle axe driveway will meet requirements     |
| Does the proposal comply with the performance criteria by applying acceptable solution A2.5?  | Yes, refer 5.2.5 driveway requirements                        |
| Does the proposal comply with the performance criteria by applying acceptable solution A2.6?  | N/a   |
| Does the proposal comply with the performance criteria by applying acceptable solution A2.7?  | N/a   |
| Does the proposal comply with the performance criteria by applying acceptable solution A2.8?  | N/a   |
| Does the proposal comply with the performance criteria by applying acceptable solution A2.9?  | Yes, compliance with Shire of Chittering Firebreak Notice     |
| Does the proposal comply with the performance criteria by applying acceptable solution A2.10? | N/a   |

| Element 3: Water   | Compliance |
|--|------------|
| Does the proposal comply with the performance criteria by applying acceptable solution A3.1? | N/a        |
| Does the proposal comply with the performance criteria by applying acceptable solution A3.2? | Yes        |
| Does the proposal comply with the performance criteria by applying acceptable solution A3.3? | N/a        |

| Element 4: Siting of Development   | Compliance   |
|--|--|
| Does the proposal comply with the performance criteria by applying acceptable solution A4.1? | Yes - Refer Section 5.4.1 & 4.4.                                     |
| Does the proposal comply with the performance criteria by applying acceptable solution A4.2? | Yes – on site vegetation will be managed.                            |
| Does the proposal comply with the performance criteria by applying acceptable solution A4.3? | Yes – Where achievable on site (BPZ) - refer to Section 5.4.3.       |
| Does the proposal comply with the performance criteria by applying acceptable solution A4.4? | Yes – Where achievable on site - refer to Section 5.4.4.             |
| Does the proposal comply with the performance criteria by applying acceptable solution A4.5? | N/a - Existing and future developments may be assessed if requested. |





| Element 5: Design of Development   | Compliance   |
|--|--|
| Does the proposal comply with the performance criteria by applying acceptable solution A5.1? | Yes – Vegetation modification will be carried out to achieve compliance.   |
| Does the proposal comply with the performance criteria by applying acceptable solution A5.2? | Yes - Building construction standards will be increased to comply with AS 3959-2009, and appropriate on site setbacks provided where possible. |



## 8 References

---

- Muller, C 2008. *Report on a Bushfire Threat Analysis for Western Australia*.
- Western Australian Planning Commission & Fire and Emergency Services Authority 2010, *Planning for bushfire protection guidelines*, edition 2, State of Western Australia.
- Shire of Chittering *Local Planning Scheme 6*
- Shire of Chittering - *Firebreak Notice 2013/14*
- Standards Australia 2009, *Australian Standard, Construction of buildings in bushfire prone areas*, AS 3959-2009 (incorporating Amendment No 1, 2 and 3), NSW Australia.

## APPENDIX F

---

### Amendment Documentation

SHIRE OF CHITTERING

Town Planning Scheme No. 6

Amendment No. XX

Lot 300 Settlement Road, Bindoon

November 2014

**PLANNING AND DEVELOPMENT ACT 2005**  
**RESOLUTION DECIDING TO AMEND A TOWN PLANNING SCHEME**  
**SHIRE OF CHITTERING**  
**TOWN PLANNING SCHEME NO. 6 – AMENDMENT NO. XX**

**RESOLVED** that the Council, pursuant to Section 7 of the Planning and Development Act 2005 initiate an Amendment to Town Planning Scheme No.6 for Lot 300 Settlement Road, Bindoon by:-

1. Rezoning Lot 300 Settlement Road, Bindoon from *Agricultural Resource* to *Rural Smallholdings*.
2. Amending the Scheme Map accordingly.

Dated this \_\_\_\_\_ day of \_\_\_\_\_ 2014.

\_\_\_\_\_  
Chief Executive Officer of the Shire of Chittering



## Scheme Amendment Report

---

|   |   |
|---|---|
| <b>Local Government:</b>                    | Shire of Chittering   |
| <b>Description of Town Planning Scheme:</b> | Town Planning Scheme No. 6  |
| <b>Type of Scheme:</b>                      | District Zoning Scheme  |
| <b>Amendment No.:</b>                       | XX  |
| <b>Proposal:</b>                            | Rezone Lot 300 Settlement Road, Bindoon from<br><i>Agricultural Resource to Rural Smallholdings</i> |

---

### **Please refer to the attached Development Plan report.**

The Development Provisions are as follows:

#### **1. Development Plan:**

This Development Plan has been endorsed by the Shire Council. Subdivision and development should generally be in accordance with this Plan.

#### **2. Development Requirements and Lot Sizes:**

In considering development and subdivision of the land, the requirements of the Shire of Chittering Town Planning Scheme No. 6 for the Rural Smallholdings Zone apply.

#### **3. Building Envelopes:**

Buildings, water tanks, waste disposal and a building protection zone for fire management are to be contained within a cleared area not to exceed a maximum of 2000m<sup>2</sup> without the prior approval of Council; prior to confirming a building clearing area a vegetation survey is to be undertaken to ensure no rare or endangered flora is present; buildings are to have setbacks in accordance Local Planning Policy No. 18 Setbacks, with minimum setbacks from cadastral boundaries as follows:

Road    20 metres  
Rear    20 metres  
Sides   15 metres

#### **4. Fencing:**

In accordance with Local Planning Policy No. 22 - Fences, the construction of a fence is permitted within the building clearing area, any previously cleared area and adjoining an authorised fire break.

**5. Crossovers:**

The construction of a crossover to each lot is to be in accordance with Council's specifications.

**6. Potable Water:**

Each dwelling is to have a water supply from roof catchment of a minimum of 120,000 litres, of which 10,000 litres is to be kept in reserve for fire-fighting purposes and fitted with a standard Camlock valve.

**7. Land Management:**

The maintenance of any watercourse and fire breaks on private property is the responsibility of the owner/occupier.

**8. Bores, Dams and Water Courses:**

The sinking of bores, construction of dams and extraction of surface water is not permitted without the approval of the Council and relevant State Government department.

**9. Fire Control:**

A Fire Management Plan will be prepared and endorsed by the Shire of Chittering. Development shall accord to the requirements of the Fire Management Plan.

**10. Permitted Uses:**

A single house and associated outbuildings are the only permitted uses. Other uses specified in the Town Planning Scheme may be approved at the discretion of the Council. Approval is required for a home business but not for a home office. For any use that may result in degradation of land or water resources or nuisance to neighbours, a management plan may be required as a condition of development approval.

**11. Stocking Restrictions:**

Stock shall be restricted to previously cleared areas. The prior approval of Council is required for the keeping of any grazing animal on a lot. If, in the opinion of Council, any lot is overgrazed or constitutes land degradation, it may order the removal of any or all stock, either temporarily or permanently until the remedial works are carried out by the landowner to render the land stable.

**12. Poultry:**

The keeping of poultry for domestic purposes is permitted, in accordance with the Shire's Health Local Law.

**13. Non-reflective Materials:**

All buildings shall be constructed with roofs of non-reflective materials.

**14. Effluent Disposal:**

Alternative Treatment Units (ATUs) with nutrient retention capability are required on all lots unless proven otherwise by the developer / landowner in accordance with the soil capability for the site.

**15. Vendor Responsibility:**

The developer/vendor shall inform prospective purchasers of the lots, in writing, of the provisions of the Council's Town Planning Scheme relating to the management of the land, as specified in the Development Plan and Fire Management Plan.

**PLANNING AND DEVELOPMENT ACT 2005**  
**RESOLUTION DECIDING TO AMEND A TOWN PLANNING SCHEME**  
**SHIRE OF CHITTERING**  
**TOWN PLANNING SCHEME NO. 6 - AMENDMENT NO. XX**

The Shire of Chittering, under and by virtue of the powers conferred upon it in that behalf by the Planning and Development Act 2005, hereby amends the above Town Planning Scheme by:

1. Rezoning Lot 300 Settlement Road, Bindoon from *Agricultural Resource* to *Rural Smallholdings*.
2. Amending the Scheme Map accordingly.

## **ADOPTION**

Adoption by resolution of the Shire of Chittering at the Ordinary Meeting of Council held on the 2014.

\_\_\_\_\_  
President of the Shire of Chittering

\_\_\_\_\_  
Chief Executive Officer of the Shire of Chittering

## **FINAL APPROVAL**

Adopted for final approval by the resolution of the Shire of Chittering at the Ordinary Meeting of Council held on the \_\_\_\_\_ day of \_\_\_\_\_ 2014.

The common seal of the Shire of Chittering was here unto affixed by authority of a resolution of council in the presence of:

\_\_\_\_\_  
President of the Shire of Chittering

\_\_\_\_\_  
Chief Executive Officer of the Shire of Chittering

Recommended/Submitted for Final Approval

\_\_\_\_\_  
Chairperson of the Western Australian Planning Commission  
or as delegated under s16 of the *Planning and Development Act 2005*

\_\_\_\_\_  
Date

Final Approval Granted

\_\_\_\_\_  
Minister of Planning

\_\_\_\_\_  
Date





PO Box 289  
Mount Lawley WA 6029

Ph: 08 9412 7100  
info@landinsights.com.au  
admin@landinsights.com.au

Your ref:  
Our ref: 972

Chief Executive Officer  
Shire of Chittering  
PO Box 70  
BINDOON WA 6502

Dear Sir/Madam

**Scheme Amendment Initiation Request and Outline Development Plan  
*Lot 300 Settlement Road, Bindoon***

I refer to the Council decision dated 18<sup>th</sup> February 2015 in relation to the Scheme Amendment Initiation Request and Development Plan for Lot 300 Settlement Road, Bindoon ("the site") and subsequent discussions with Shire Planners over the last 6 months. We respectfully ask the Council to reconsider the request in light of the revised Development Plan attached to this letter.

The officer recommendation put forward to Council supported the initiation of the amendment and adopting the Development Plan, however the motion was lost because of the following reasons:

1. Council wishes to preserve agricultural resource
2. Battleaxe designs are not supported.

The revised plan has been prepared in conjunction with Shire Planners to address the concerns of Council. The details of the plan are described further below.

**Agricultural Resource**

The proposed subdivision will not result in the loss of agricultural land. The intention of the design is to retain a majority of the existing orchards on one lot to have the least amount of disruption to existing operations and to create an additional lot with the remainder of the property. The new lot will include a portion of the active and productive orchard as well as some additional productive land which can be used for agricultural production including citrus trees or grapes. The remainder of the property can be used for cattle or sheep grazing. Under the current operation the cleared portions on Proposed Lot 3002 are going to waste as there are currently no plans to plant these areas. Creating one lot with a majority of the existing

orchard and another has the potential of increasing agricultural productivity as the new lot could be used for productive agricultural purposes.

Water is available to both proposed lots. The existing house on proposed Lot 3002 uses water captured from a rainwater tank. Should a dwelling be constructed on proposed Lot 3001 a rainwater tank should be installed for domestic water consumption. A rainwater tank is located at the northern boundary of proposed Lot 3001 which is used for irrigation. A number of groundwater bores and solar pump wells are located at the eastern side of the property which can be used for irrigation purposes. Proposed Lot 3001 will include a number of groundwater bores and Proposed Lot 3002 will also include a new groundwater well.

The site has been strategically identified for *Rural Smallholding* and subdivision. The site is located within the 'North Bindoon' Rural Small Holding precinct and is identified as *Rural Smallholding* in the Local Planning Strategy. This Local Planning Strategy precinct is described as areas located around the Bindoon townsite where there are appropriate soil types for productive hobby farms and opportunities for conservation, along important streamlines and wetlands. It is consistent with the surrounding area which is also identified for *Rural Smallholding* to the east, south-west and north. The proposed rezoning and subdivision complies with the strategies and actions of the *Rural Smallholding* zone from the LPS as demonstrated in the following table.

| OBJECTIVE   | COMMENT  |
|---|--|
| To maximise the productive capacity of good soils.  | The proposed rezoning and subdivision will consolidate a majority of the existing orchard on one lot and will create an additional lot which will contain an active orchard and have the potential to be used for additional agricultural purposes.  |
| To allow for rural environment around nominated service centres.                                    | The proposed lots promote rural use and the site is located approximately 1km from the Bindoon town site.  |
| To include stringent conditions for protection and reparation of watercourses and wetlands.         | A seasonal watercourse is located on the property. The watercourse has been degraded from past agricultural use, however the proposed subdivision provides a mechanism for protection and management of the watercourse, including fencing and rehabilitation. A watercourse assessment has been undertaken and is included in the ODP report. |
| To provide a working rural living presentation around centres.                                      | The site will be developed as rural small holding including rural living and some farming in close proximity to Bindoon.   |
| To allow for eco-tourism and agro tourism and special developments appropriate to rural production. | No tourism is proposed as part of the development, but the subdivision will provide some opportunity.  |

| OBJECTIVE  | COMMENT   |
|--|---|
| To allow for a range of lot sizes befitting the landform constraints with an absolute minimum lot area of 4ha.   | The proposed lot sizes are well above 4ha in size and have been designed according to the landscape.  |
| All subdivision and development shall compliment land capability analysis, protection of natural streamlines and remnant vegetation and clearly demonstrate the availability of water. | The site has been assessed by a qualified environmental consultant and natural features have been identified and mapped. The proposed subdivision has been designed to complement the natural features of the site. Water availability was addressed in the ODP report. |
| To minimise vehicular access to highways and regional roads.   | Access will be onto Settlement Road which is a rural road.  |
| To promote and investigate the provision of potable water supply.  | Adequate water for domestic use can be collected in rainwater tanks, however the potential to provide potable water can be investigated.  |
| To promote consolidation of existing Rural Small Holdings  | The site is located within the <i>North Bindoon Rural Small Holding</i> precinct as identified in the Local Planning Strategy and is already part of a larger rural small holding area.   |
| To require developer contributions in accordance with an adopted developer contributions scheme  | Developer contributions will be determined at a later stage.  |

The proposed amendment and Development Plan will also comply with the objectives of the *Rural Small Holdings* zone in the Town Planning Scheme as is shown in the table below:

| OBJECTIVE   | COMMENT  |
|---|--|
| <i>To preserve productive land suitable for intensive horticulture and other compatible productive rural uses in a sustainable manner</i> | <b>Complies:</b> The purpose of rezoning is to facilitate future subdivision of the site into 2 lots. One lot will consolidate the existing orchard and another lot will create an opportunity to be used for further agricultural production. |
| <i>To protect the landform and landscape values of the district against despoliation and land degradation</i>                             | <b>Complies:</b> The proposed rezoning and subdivision will not lead to degradation of landscape and landform values.  |

### Battleaxe and Access

The previous subdivision design included a 10m wide battleaxe and the revised plan (attached) has eliminated this. The revised lot layout removes the battleaxe altogether. Proposed Lot 3002 now has street frontage of 50m onto Settlement Road. This design also

places a portion of the existing orchard on Proposed Lot 3002 which provides opportunity for agricultural use on the new lot.

We would appreciate the opportunity to discuss the application with the Council if required so we can explain the lot design rationale in more detail and Council's concerns and queries. Please don't hesitate to contact the undersigned should you have any queries or require any further information.

Yours sincerely,

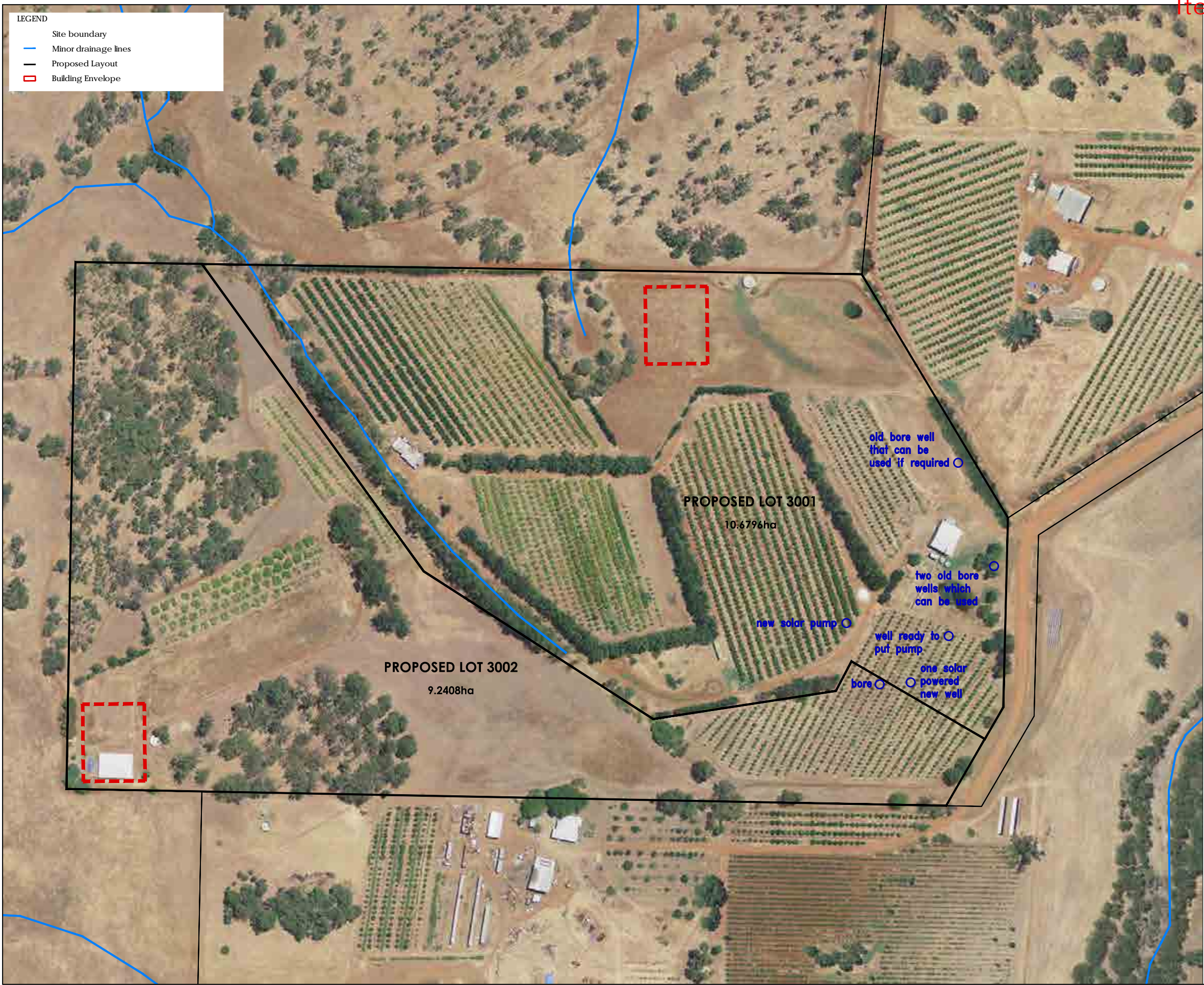
A black rectangular box redacting the signature of Sharee Rasmussen.

Sharee Rasmussen  
**Land Insights**  
*Planning – Design – Environment*

2<sup>nd</sup> October 2015

Enc: Revised Outline Development Plan





- DEVELOPMENT PROVISIONS**  
The following development provisions apply.
- 1. Development Plan:**  
This Development Plan has been endorsed by the Shire Council. Subdivision and development should generally be in accordance with this Plan.
  - 2. Development Requirements and Lot Sizes:**  
In considering development and subdivision of the land, the requirements of the Shire of Chittering Town Planning Scheme No. 6 for the Rural Residential Zone apply.
  - 3. Building Envelopes:**  
Buildings, water tanks, waste disposal and a building protection zone for fire management are to be contained within a cleared area not to exceed a maximum of 2000m<sup>2</sup> without the prior approval of Council; prior to confirming a building clearing area a vegetation survey is to be undertaken to ensure no rare or endangered flora is present; buildings are to have setbacks in accordance Local Planning Policy No. 18 Setbacks, with minimum setbacks from cadastral boundaries as follows:

|       |           |
|-------|-----------|
| Road  | 20 metres |
| Rear  | 20 metres |
| Sides | 15 metres |
  - 4. Fencing:**  
In accordance with Local Planning Policy No. 22 - Fences, the construction of a fence is permitted within the building clearing area, any previously cleared area and adjoining an authorised fire break. Where natural vegetation adjoins a road reserve, no fence is to be constructed between the road reserve and the building clearing area. Elsewhere, no boundary fences are permitted without planning consent of the Council. Where a fence crosses a strategic fire break a gate of approved design is to be provided.
  - 5. Crossovers:**  
The construction of a crossover to each lot is to be in accordance with Council's specifications.
  - 6. Potable Water:**  
Each dwelling is to have a water supply from roof catchment of a minimum of 120,000 litres, of which 10,000 litres is to be kept in reserve for fire-fighting purposes and fitted with a standard Camlock valve.
  - 7. Land Management:**  
The maintenance of any drainage swales, easements, fire breaks and vegetation on private property is the responsibility of the owner/occupier.
  - 8. Bores, Dams and Water Courses:**  
The sinking of bores, construction of dams and extraction of surface water is not permitted without the approval of the Council and relevant State Government department.
  - 9. Bushfire Management:**  
A Bush Fire Management Plan in accordance with the Western Australian Planning Commission's relevant Bush Fire Risk Management policies, is to be prepared to accompany any future subdivision application, to the satisfaction of the Local Government and relevant State Authority for Fire and Emergency Services. Land subject of this Development Plan is designated bushfire-prone for the purpose of triggering the Building Code of Australia's bushfire construction requirements. Any buildings to be erected pursuant to this Development Plan shall comply with the requirements of Australian Standard 3959 (as amended).
  - 10. Permitted Uses:**  
A single house and associated outbuildings are the only permitted uses. Other uses specified in the Town Planning Scheme may be approved at the discretion of the Council. Approval is required for a home business but not for a home office. For any use that may result in degradation of land or water resources or nuisance to neighbours, a management plan may be required as a condition of development approval.
  - 11. Stocking Restrictions:**  
Stock shall be restricted to previously cleared areas. The prior approval of Council is required for the keeping of any grazing animal on a lot. If, in the opinion of Council, any lot is overgrazed or constitutes land degradation, it may order the removal of any or all stock, either temporarily or permanently until the remedial works are carried out by the landowner to render the land stable.
  - 12. Poultry:**  
The keeping of poultry for domestic purposes is permitted, in accordance with the Shire's Health Local Law.
  - 13. Non-reflective Materials:**  
All buildings shall be constructed with roofs of non-reflective materials.
  - 14. Effluent Disposal:**  
Aerobic Treatment Units (ATUs) with nutrient retention capability are required on all lots unless proven otherwise by the developer / landowner in accordance with the soil capability for the site.
  - 15. Vendor Responsibility:**  
The developer/vendor shall inform prospective purchasers of the lots, in writing, of the provisions of the Council's Town Planning Scheme relating to the management of the land, as specified in the Development Plan and Fire Management Plan.



| Agency Submissions               |   |   |  |
|----------------------------------|---|---|--|
| Submitter                        | Comment   | Proponent Response  | Shire Officer Response   |
| Chittering Landcare              | <p>The Chittering Valley Land Conservation District Committee has reviewed the above proposed scheme amendments and has no objections but would strongly advise that compliance with the Local Planning Strategy is necessary.</p> <p>The aims of the Shire of Chittering Local Planning Strategy for Rural Small Holdings states:</p> <p><i>“To include stringent conditions for protection and reparation of watercourses and wetlands,”</i></p> <p>The presence of a degraded seasonal watercourse through the property provides an opportunity for reparation of the watercourse. This could be a condition of planning approval as it has not been suggested in this proposal. The landholder may wish to contact the Chittering Landcare Centre for advice and assistance in establishing species such as rushes and sedge which will help to hold soil when the stream does flow.</p> <p>Rural Small Holdings are intended for intensive agricultural use in keeping with local land uses and if keeping of animals is proposed, protection of the remnant (albeit degraded) woodland at the south west corner of the property would be required to prevent animals from rubbing against or chewing on the trees. This could be achieved by fencing the vegetation and allowing only very occasional (3 or four weeks of the year) grazing to keep the weed burden under control. The proponent has stated that the reasoning behind the subdivision will be to allow intensive horticultural use on the blocks but keeping of animals is a permitted use within the zone and this recommendation will ensure the protection of remnant vegetation, another aim of the zoning which is noted.</p> <p>It is also difficult to tell the outline of the proposal – one diagram (in the Bush Fire Hazard report) has a cul de sac to access a lot and the other Revised Lot Layout Proposed Lot 3002 has a frontage of approximately 50 metres to Settlement Road.</p> <p>Thank you for the opportunity to comment on this proposal. The advice from this group is that the watercourse should be protected and rehabilitated and that the south west corner vegetation should be fenced if keeping of animals is proposed, to comply with the Local Rural Strategy.</p> | <p>The applicant was given an opportunity to respond however no reply was received.</p> | <p>Comment noted.</p> <p>The applicant originally submitted a battle-axe lot configuration proposal for Lot 3002. As the Shire does not support battle-axe lots the applicant was asked to revise their proposal and subsequently submitted the diagram illustrating a larger frontage to Settlement Road. Notwithstanding, approval of the subdivision is not a matter to be considered as part of this application process.</p> <p>Advice noted. Such conditions are only able to be placed on subdivision applications and not applications for rezoning.</p> <p>The Shire will contact the DAA for referral if any application is made for development or subdivision.</p> |
| Department of Aboriginal Affairs | <p>Thank you for your information regarding the Proposed Scheme Amendment No. 54 (Amendment) received by the Department of Aboriginal Affairs (DAA) on 5 July 2016.</p> <p>DAA understands that the Amendment is for the rezoning of Lot 300 Settlement Road from Agricultural to Rural Small Holdings.</p> <p>A review of the Register of Aboriginal Places and Objects as well as the DAA Aboriginal Heritage Database concludes that there is one heritage place within Lot 300 Settlement Road. The relevant DAA record is:</p> <p>DAA 3422 – Bindoon Hill</p> <p>Information regarding DAA 3422 – Bindoon Hill states that it contains burial and skeletal material and is currently lodged with DAA. The lodged status means that on the information available to the Aboriginal Cultural Material Committee (ACMC) at the time an assessment under the Aboriginal Heritage Act 1972 (AHA) could not be determined by the ACMC.</p> <p>Therefore based on the information regarding DAA 3422 – Bindoon Hill DAA suggests that prior to any development occurring within Lot 300 Settlement Road that contact been made with DAA as to whether any proposed development will require an approval under the Aboriginal Heritage Act 1972 (AHA).</p> <p>DAA also recommends that for any future works DAA that the Developments refer to the State’s Aboriginal Heritage Due Diligence Guidelines (Guideline). The Guidelines can be found the DAA website at the following link:</p>  |   |  |

|   |  |  |   |  |
|---|--|--|---|--|
|   | <a href="http://www.daa.wa.gov.au/heritage/land-use">http://www.daa.wa.gov.au/heritage/land-use</a>  |  |   |  |
| Main Roads WA                             | <p>The Guidelines allow developers to undertake their own risk assessment regarding any proposal's potential to impact Aboriginal Heritage.</p> <p>Further to your correspondence of the 30 June 2016 with attached details, Main Road WA (MRWA) has determined from the information provided that the proposed development will not have an adverse impact on the MRWA network and therefore advises no objection to the proposal.</p>  |  | Comment noted.  |  |
| Department of Agriculture and Food        | <p>Thank you for the opportunity to comment on the above application for rezoning. As the site is currently located within a Small Rural Holding Precinct under the Shire of Chittering's Local Planning Scheme, the Department of Agriculture and Food (DAFWA) has no objection to the proposed rezoning provided the development includes buffers to adjacent rural land surrounding the site to avoid potential land use conflicts. This planning should be guided by the 2012 Department of Health guidelines, Guidelines for Separation of Agricultural and Residential Land Uses – Establishment of Buffer Areas, which place the onus on new residential areas to accommodate buffers and not impose them on established agricultural areas.</p> <p>The proposed site's capability is summarised in the accompanying report Table 6 – Soils and Landform, stating that rural living rather than agricultural production would be more suited to this site. DAFWA believes that smaller lots limit versatility for agricultural activities and constrain the ability to adapt to changing environmental and market conditions.</p> <p>DAFWA is providing these comments as advice to the Shire and the Shire is not lawfully obliged to incorporate these comments. DAFWA does not have any independent statutory approval or licence to grant and do not require any conditions on approval that require monitoring or enforcement.</p>   |  | <p>The proposal does not alter the use of the land. Rather, it is intended to preserve the agricultural nature of the property, in accordance with the general objectives of the proposed zone.</p> <p>As mentioned above, the agricultural use of the land is not intended to alter with the rezoning.</p> <p>Noted.</p> |  |
| Department of Fire and Emergency Services | <p>I refer to your email dated 22 June 2016 for the above scheme amendment application. The Department of Fire and Emergency Services (DFES) provide the following comments with regard to <i>State Planning Policy 3.7 Planning in Bushfire Prone Areas</i> (Guidelines):</p> <p><b>Considerations for the Department of Planning</b></p> <p><b>1. General Observations</b></p> <p>i. The subject site is designated as bushfire prone on the <i>Map of Bush Fire Prone Areas</i>, and therefore SPP 3.7 applies to the proposal. The submitted Bushfire Management Plan does not apply SPP 3.7 and the Guidelines. The proposal needs to demonstrate to the fullest extent possible how the bushfire protection criteria have been addressed according to the current methodology.</p> <p><b>2. Policy Objectives and Measures</b></p> <p>i. Policy Measure 6.4 of SPP 3.7 applies, and states:</p> <p>ii. "Any subdivision application to which policy measure 6.2 applies is to be accompanied by the following information in accordance with the Guidelines:</p> <p>a) a BAL Contour Map to determine the indicative acceptable BAL ratings across the subject site, in accordance with the Guidelines. BAL Contour Maps should be prepared by an accredited Bushfire Planning Practitioner;</p> <p>b) the identification of any bushfire hazard issues arising from the BAL Contour Map; and</p> <p>c) an assessment against the bushfire protection criteria requirements contained within the Guidelines demonstrating compliance within the boundary of subdivision site.</p> <p><i>This information can be provided in the form of a Bushfire Management Plan or an amended Bushfire Management Plan where one has been previously endorsed.</i></p> <p>The submitted BMP from Bushfire Prone Planning is dated November 2014 and cannot be validated as it does not apply the current methodology. Therefore compliance to this policy measure as not been demonstrated.</p> <p><b>Recommendation</b></p> <p>DFES advice is to seek a revised BMP pursuant to Policy Measure 6.4 of SPP 3.7 and the Guidelines for the proposed scheme</p> |  | <p>The Shire is not able to refuse the application based on the submitted Bushfire Management Plan (BMP) due to the nature of the application being to rezone the property and not to subdivide. The Shire may request that an updated BMP demonstrating compliance with current methodology.</p>                         |  |

|                                      |  |  |  |  |  |
|--------------------------------------|--|--|--|--|--|
|                                      | amendment.   |  |  |  |  |
| Department of Parks and Wildlife     | The Department of Parks and Wildlife Swan Region has no objection to this proposal. It is considered that any potential environmental impacts will be appropriately addressed through the existing planning framework.   |  |  |  | Comment noted.   |
| Department of Health                 | <p>Thank you for your letter, dated 24 June 2016, requesting comment from the Department of Health (DOH) on the above proposal.</p> <p>The DOH provides the following comment:</p> <p><b>1. <i>Water Supply and Wastewater Disposal</i></b></p> <p>The proposed development is required to connect to scheme water and reticulated sewerage in accordance with the draft <i>Country Sewerage Policy</i>.</p> <p>Further developments are required to have access to suitable supply of potable water which complies with the <i>Australian Drinking Water Quality Guidelines 2004</i>.</p> <p>The proponents are to be advised that approval is required from the DOH for any on-site waste water treatment process. The necessary requirements may be referenced and downloaded from <a href="http://www.public.health.wa.gov.au/3/572/2/wastewater_legislation_and_guidelines_.pm">http://www.public.health.wa.gov.au/3/572/2/wastewater_legislation_and_guidelines_.pm</a></p> <p><b>2. <i>Toxicology Programs and Services</i></b></p> <p>The proponent should undertake soil and groundwater investigations prior to these lands being released for the creation of 2 rural residential lots as these lands were previously used for orchards/ or vineyards.</p> <p>As there is a high potential for pesticides residues to be present, this may compromise the quality and future availability to use groundwater for irrigation or drinking water, and may also pose a risk to those who may come into direct contact with any contaminated soils.</p> <p>The property at Lot 200 Settlement Road is surrounded by lands that are currently used for vineyards/ orchards. The proposed development should take account of the DOH <i>Guidelines for separation of agricultural and residential land uses</i>.</p> <p>A copy is attached or it may be accessed from the Public Health website:<br/><a href="http://www.public.health.wa.gov.au/cproot/4913/2/Guidelines%20for%20Agricultural%20and%20Residential%20Buffer.pdf">http://www.public.health.wa.gov.au/cproot/4913/2/Guidelines%20for%20Agricultural%20and%20Residential%20Buffer.pdf</a></p> |  |  | <p>1. Comment noted. This will be assessed in the development stage.</p> <p>Comment noted.</p> <p>Noted, as mentioned above, this will be assessed in the development stage.</p> <p>2. If an application for subdivision is received, the Shire may place conditions that soil and groundwater investigations are to take place prior to any planning determination.</p> <p>Comment noted.</p> |  |
| Department of Environment Regulation | <p>I refer to your later dated 30 June 2016, regarding the proposed scheme amendment to support the rezoning of Lot 300 Settlement Road, Bindoon (the site).</p> <p>As of 18 August 2016, the site has not been reported to DER as a known or suspected contaminated site and DER holds no information in relation to the contamination status of the site. However, in relation to the proposed rezoning of the site, DER provides the following comment.</p> <p>DER notes that the site is currently used for intensive agricultural (orchard). This is a land use which has the potential to cause contamination as specified in the guideline ‘Assessment and management of contaminated sites’ (DER, 2014). Additionally, it is considered that the proposed rezoning represents a change in the sensitivity of the land use, i.e. moving to a more sensitive land use which may include rural/residential uses.</p> <p>Therefore, if technical advice is subsequently sought from DER for any proposed developments at this site which represent a change to a more sensitive use, DER is likely to recommend that a contamination condition and advice be included in any such approval consistent with conditions EN9 and advice ENa2 published in ‘Model Subdivision Conditions Schedule’ (Department of Planning and WAPC, October 2012).</p>  |  |  |  | <p>Comment noted. This will be addressed in the development stage.</p> |



|                    |   |  |  |
|--------------------|---|--|--|
|                    | <p>In relation to your specific questions, I provide the following advice:</p> <ol style="list-style-type: none"><li>1. DER is unable to provide the Shire of Chittering (the Shire) with legal advice with regard to its obligations under the <i>Contaminated Sites Act 2003</i> (the CS Act), other relevant legislation or the planning approval process.</li><li>2. See response for 1.</li><li>3. See response for 1.</li></ol>   |  | <p>Noted.</p> <p>Noted.</p> <p>Noted.</p>  |
| Public Submissions |   |  |  |
| <b>PUBLIC A</b>    | <p>In reference to your correspondence dated 30<sup>th</sup> June 2016, thank you for the chance to respond to the proposed planning changes in our area.</p> <p>While generally pro development, see the following points below in response to the <b>Proposed Scheme Amendment</b>:</p> <ul style="list-style-type: none"><li>• We fear increased traffic in the area would adversely affect our current quality of life / leisure at 47 Settlement Rd due to increased noise, dust and a greater security risk that comes with higher density development.</li><li>• If this plan is to proceed, we believe the same planning concession should be afforded to all property owners on Settlement Rd, so as to preserve equality and provide each with an equal opportunity to see economic gain. In this regard, I believe development should be restricted to all or nothing, that is, open to all on Settlement Rd, or none.</li></ul> |  | <p>As the land use will remain the same, it is not considered to have a substantial impact the level of noise, dust or security.</p> <p>Comment noted.</p> |
| <b>PUBLIC B</b>    | <p>We, [REMOVED FOR PRIVACY] wish to advice that we do not object to the proposed rezoning of Lot 300 Settlement Road, Bindoon from “Agricultural Resource” to “Rural Smallholdings” and subsequently amending the Scheme Map accordingly.</p> <ul style="list-style-type: none"><li>•</li><li>•</li><li>•</li></ul>  |  | <p>Noted</p>   |
|                    |   |  |  |
|                    |   |  |  |

\*Note: Comments are as per original submission received by the Shire. Submission comments have not been edited unless for the purposes of confidentiality where necessary.

Locality Plan  
Scottalian Bindoon Hotel  
Lot 4 Great Northern Highway, Bindoon





| Agency Submissions               |  |  |  |
|----------------------------------|--|--|--|
| Submitter                        | Comment  | Proponent Response   | Shire Officer Response   |
| Department of Aboriginal Affairs | <p>I am writing in response to the letter from Ms Bronwyn Southee to the Department of Aboriginal Affairs (DAA) dated 9 June 2016. Thank you for providing the opportunity to comment on the above proposed Scheme Amendment (the Proposal).</p> <p>DAA has reviewed the relevant information and can confirm that there are currently no Aboriginal heritage places known to DAA within the area subject of the Proposal. There are therefore no known heritage implications to the Proposal proceeding.</p> <p>DAA has released Aboriginal Heritage Due Diligence Guidelines (the Guidelines) to assist developers with planning and considering Aboriginal heritage during proposed works. It is recommended that the land owner be made aware of the Guidelines. A copy of the Guidelines can be found on the DAA website <a href="http://www.daa.wa.gov.au/heritage/land-use">http://www.daa.wa.gov.au/heritage/land-use</a>.</p> | Comments noted   | Noted.   |
| Western Power                    | <p>I refer to your correspondence dated 9<sup>th</sup> June 2016 requesting comment from Western Power in respect to the aforementioned Scheme Amendment. Western Power provides the following comments on the proposed amendment:</p> <p><u>Comments:</u></p> <ul style="list-style-type: none"> <li>Western Power recommends that the Proponent consider the relocation or undergrounding of the existing Western Powder distribution feeder.</li> <li>Any proposed development or subdivision application interfacing with network assets shall be referred to Western Power for comment.</li> </ul>  | Comments noted. However, the proponent does not consider it to be practical or necessary to relocate or underground the existing Western Power distribution line to accommodate the future development of the site. The Concept Development Plan has been prepared having regard to the location of overhead Western Power infrastructure and new buildings can achieve suitable clearance from these assets. In any event, this is a matter that could be examined further at development application stage and would not affect the proposed Scheme Amendment from being progressed. | Noted. These comments relate to additional processes for the applicant – it does not reflect the current proposal. |

Scheme Amendment No. 59 – Lot 4 Great Northern Highway, Bindoon

|                      |   |   |  |
|----------------------|---|---|--|
|                      | <ul style="list-style-type: none"> <li>Detailed assessment will be required at the subdivision / development stage application stage in accordance with Western Power's standard processes to determine distribution augmentation requirements for future development.</li> </ul>   |   |  |
| Department of Health | <p>Thank you for your letter, dated 9 June 2016, requesting comment from the Department of Health (DOH) on the above rezoning:</p> <p><b>1. Water Supply and On-site Wastewater Disposal</b><br/> The development is to have access to a sufficient supply of potable water that is of the quality specified under the <i>Australian Drinking Water Quality Guidelines 2004</i>. The proponents should develop (if not already completed) a <i>Drinking Water Quality Plan</i> including a drinking water quality monitoring program for chemical and microbiological analysis.</p> <p>The proponents are advised that approval is required for any on-site waste water treatment process. This amendment needs to reflect this regulatory requirement and reference DOH publications as appropriate. The necessary requirements may be referenced and downloaded from:<br/> <a href="http://www.public.health.wa.gov.au/3/672/2/wastewater_legislation_and_guidelines_.pm">http://www.public.health.wa.gov.au/3/672/2/wastewater legislation and guidelines .pm</a></p> <p><b>2. Food Act Requirements</b><br/> All food related aspects to comply with the provisions of the <i>Food Act 2008</i> and related code, regulations and guidelines.</p> | <p>Comments noted. Preparation of a Drinking Water Quality Plan could be required as a condition of Development Approval.</p> <p>Comments noted.</p> <p>Comments noted.</p> | <p>Noted. The Shire will address this matter in the development stage.</p> <p>Noted.</p> <p>Noted.</p> |

|                                    |   |   |        |
|------------------------------------|---|---|--------|
|                                    | <b>3. Health Act Requirements</b><br>All public access areas (function rooms, etc.) are to comply with the provisions of the <i>Health Act 1911</i> , related regulations and guidelines and in particular Part IV – Public Buildings.  | Comments noted.   | Noted. |
| Department of Water                | Assessed – no comments  | Noted.  | Noted. |
| Department of Agriculture and Food | <p>Thank you for the opportunity to comment on the above application for rezoning Lot 4 Great Northern Highway; from 'Agricultural Resource' to 'Special Use – Tourist Development'.</p> <p>As the location currently contains the heritage listed 'Scottalian Hotel' and is not used for agricultural production, the Department of Agriculture and Food (DAFWA) has no objection to the proposed rezoning provided the development includes buffers to adjacent rural zoned land to avoid potential land use conflicts. This planning should be guided by the 2012 Department of Health guidelines, Guidelines for Separation of Agricultural and Residential Land Uses – Establishment of Buffer Areas, which place the onus on new residential areas to accommodate buffers and not impose them on established agricultural areas.</p> <p>DAFWA would also like to provide the following information for your consideration:</p> <p>In Section 4.3.3 of the main report by Harley Dykstra, it is stated that both the septic tanks and leach drains are physically capable of being provided on the site to service the accommodation units. The environmental assessment report in Appendix C suggests there are</p> | <p>Comments noted. With regard to the capability of the site for effluent disposal, the environmental investigations demonstrate via conceptual design that a suitable system can be installed to service the future development of the site. Detailed design of an effluent disposal system in accordance with the recommendations of the Environmental Assessment could be required as a condition of Development Approval.</p> <p>The applicant's response in this instance is sufficient. Technical details relating to the upgrade or expansion of an additional tourism use can be addressed at the development application stage.</p> <p>Comment noted. The Shire will assess these concerns during the development stage.</p> |        |

|   |   |  |  |
|---|---|--|--|
|   | <p>some qualifications to the statement, as outlined in the page 10 summary of that report. DAFWA's concerns are based on the physical constraints of the site, including the dept to weathered bedrock at approximately 1-2m below ground level and a watertable encountered at 1.8m at site BT1. These measurements are combined with the soil permeability tests showing a result of 0.5m/day which translates to approximately 21mm/hr.</p> <p>DAFWA's land evaluation standards suggest that these factors combine to have a low to moderate rating for microbial purification capability at this site. As the Mortlock River is nearly 500m to the west of the site, DAFWA supports the environmental report's findings to emphasise careful planning for the septic tanks and leach drains to reduce the risk of contamination from surface and subsurface flow.</p> <p>DAFWA is providing these comments as advice to the Shire and the Shire is not lawfully obliged to incorporate these comments. DAFWA does not have any independent statutory approval or licence to grant and do not require any conditions on approval that require monitoring or enforcement.</p> |  |  |
| Department of Fire and Emergency Services | <p>I refer to your letter dated 9 June 2016 regarding the submission of a BAL Contour Assessment v1.2 dated 29 January 2016 and a BHL Assessment v1.1 dated 29 January 2016 completed by RUIC Fire, for the above scheme amendment application.</p> <p>The Department of Fire and Emergency Services (DFES) provide the following comments with regard to <i>State Planning Policy 3.7 Planning in Bushfire Prone Areas</i> (SPP</p>  | <p>Comments noted. With respect to preparation of a Bushfire Management Plan (BMP) it is considered this further detailed work could be undertaken at Development Application stage and that the assessment of bushfire hazards within the BAL Contour Assessment and Bushfire Hazard Level Assessment demonstrate bushfire risk can be appropriately managed. Therefore, for the purposes of the proposed Scheme Amendment, the proponent is of the view the requirements of SPP 3.7 have been addressed.</p> | <p>The Shire is not able to refuse the rezoning based on the absence of a Bushfire Management Plan (BMS). The Shire may request the applicant submit a BMS as a condition of planning determination.</p> |

|  |   |  |
|--|---|--|
|  | <p>3.7) and the <i>Guidelines for Planning in Bushfire Prone Areas</i> (Guidelines):</p> <p><b>Considerations for the decision maker:</b></p> <p><b>1. General Observations</b></p> <p>i. The subject site is designated as bushfire prone on the <i>Map of Bush Fire Prone Areas</i>, and therefore SPP 3.7 applies to the proposal. The proposal needs to demonstrate to the fullest extent possible how the bushfire protection criteria have been addressed.</p> <p>ii. The rezoning of the subject site to ‘Special Use – Tourist Development’ is considered a vulnerable land use and policy measure 6.6.1 should be applied. An emergency evacuation plan will be required for the site.</p> <p><b>2. Policy Objective and Measures</b></p> <p>i. Policy Measure 6.2 applies as the development will on completion have BAL-12.5 to BAL-29.</p> <p>ii. Policy Measure 6.3 of SPP 3.7 states: “any <i>strategic planning proposal to which policy measure 3.2 applies is to be accompanied by the following information</i>”:</p> <p>b) the identification of any bushfire hazard issues arising from the relevant assessment; and</p> <p>c) clear demonstration that compliance with the bushfire protection criteria in the Guidelines can be achieved in subsequent planning stages.</p> |  |
|--|---|--|



## Scheme Amendment No. 59 – Lot 4 Great Northern Highway, Bindoon

|                                  |  |                 |        |
|----------------------------------|--|-----------------|--------|
|                                  | <p><b>Recommendation</b></p> <p>DFES is satisfied that Bushfire Hazard Level assessment and BAL Contour assessment have identified the bushfire hazard and indicative BAL ratings across the site.</p> <p>However, in line with the above policy measures DFES advice is to seek the submission of a BMP for the proposed scheme amendment. The BMP needs to demonstrate how the bushfire protection criteria will be addressed.</p>   |                 |        |
| Department of Parks and Wildlife | <p>The Department of Parks and Wildlife Swan Region has no objection to this proposal.</p> <p>It is considered that any potential environmental impacts will be appropriately addressed through the existing planning framework.</p>   | Comments noted. | Noted. |
| State Heritage Office            | <p>Thank you for your correspondence received on 21 June 2016 regarding proposed Scheme Amendment No. 59 to rezone Lot 4 Great Northern Highway from 'Agricultural Resource' to Special Use – Tourist Development'. The following comments are made on behalf of the State Heritage Office:</p> <ol style="list-style-type: none"> <li>1. Our records indicate the subject site contains the Bindoon Country Inn (Place Number 14095), which is included in the Shire's Municipal Heritage Inventory.</li> <li>2. The rezoning of this site to from 'Agricultural Resource' to Special Use – Tourist Development' is supported, as this will allow for the continued use of the Inn as a hotel, and provide for a range of appropriate tourist uses on the remainder of site.</li> </ol> | Comments noted. | Noted. |

|                             |   |  |                              |
|-----------------------------|---|--|------------------------------|
|                             | <p>3. In relation to the additional questions raised in your letter, we can advise of the following:</p> <ul style="list-style-type: none"> <li>a. Section 79 of the <i>Planning and Development Act, 2005</i> requires the local government to have due regard to the advice of the Heritage Council.</li> <li>b. Our Agency does not have any independent statutory approval or licence to grant in respect of this proposal.</li> <li>c. We are not recommending any conditions of approval.</li> </ul> <p>The comments made in this letter are provided in response to the referral of a scheme amendment as set out under Section 79 of the <i>Planning and Development Act, 2005</i>.</p> |  |                              |
| <b>Public Submissions</b>   |   |  |                              |
| <b>Public 1<br/>SUPPORT</b> | <p>We support the rezoning of the above property "AGRICULTURAL RESOURCE" to "SPECIAL USE – TOURIST DEVELOPMENT".</p> <p>This reflects both the current and historical use of this land.</p> <p>It also allows a successful local business to grow and supply much needed accommodation in the Bindoon area.</p> <p>Short term accommodation in Bindoon is limited to B&amp;B and farmstay type operations, with little suitable for seasonal workers or travelling sales staff, consultants, etc. And at peak season there is not enough</p>  |  | The submission is supported. |

|  |  |  |  |
|--|--|--|--|
|  | accommodation to cater for demand.<br><br>The addition of caravan bays provide a more traditional option than parking behind the Visitor Centre. |  |  |
|--|--|--|--|

\*Note: Comments are as per original submission received by the Shire. Submission comments have not been edited unless for the purposes of confidentiality where necessary.