FRASERS PROPERTY INDUSTRIAL CONSTRUCTIONS PTY LTD

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

Two Staged Speculative Warehouse/Industrial Facility

PROPOSED LOT 3 IN Lot 5 DP1212087

Burilda Close, Wetherill Park

CORNER OF HORSLEY DRIVE & COWPASTURE ROAD, HORSLEY PARK NSW

10TH of October 2016 Rev.1

1. INTRODUCTION

1.1 Objective of the Construction Environmental Management Plan

The objective of this Construction Environmental Management Plan is to minimize the adverse impact of construction activities on the environment.

This objective will be achieved by identifying possible environmental risks, setting up systems to reduce the risk, and managing and maintaining the systems throughout the project to ensure correct function of the Control Systems.

The Site location is on Lot 3, Burilda Close within the Horsley Drive Business Park, located at the corner of Horsley Drive & Cowpasture Road, Horsley Park NSW

Position	Name	Signature	Date
Project Manager	Naiem Teghlobi		
Contract Administrator	Jacob Aboutaka		
Site Manager	John Simmons		
Foreman	N/A		
Foreman	N/A		
Leading Hand	Jack Lambert		
Leading Hand	N/A		
Construction Worker	N/A		
Safety Representative	Mitchell Watts		

1.2 Responsibility for Implementation

Frasers Property Industrial Constructions Pty Ltd as the builder will be responsible to implement the Control systems and procedures outlined in this Construction Environmental Management Plan.

All other subcontractors will be briefed on the plan and will be required to adhere to the systems and procedures outlined. If a section of work does not comply with this plan, rectification of that area will be made a priority until such time as it complies with systems and procedures of this plan.

1.3 Site Contact Details and responsibilities within CEMP

Frasers Property Industrial Constructions as the builder are the principal contractor.

The Project Manager is Naiem Teghlobi & he can be contacted on 0417 665 167.

The Site Manager is John Simmons and he can be contacted on 0414 829 518.

We are currently awaiting confirmation of telecommunication line connection for our site amenities, phone and fax services. We will forward details to your department once arranged.

The procedure in an emergency is as follows:

For any emergencies requiring ambulance, fire or police please contact 000.

Other staff can be contacted after notifying the emergency services.

Other contacts include:
Frasers Property HSE Manager: Gary Windred - 0407 481 843
Frasers Property Construction Manager: Greg Donaghey - 0438 255 348

2. DESCRIPTION OF CONSTRUCTION WORKS

2.1 Location and Type of Construction

The Site location is on Lot 3, Burilda Close within the Horsley Drive Business Park, located at the corner of Horsley Drive & Cowpasture Road, Horsley Park NSW

The proposed development includes two (2) warehouses including a total of two (2) offices, loading docks and car parking. The specified approximate areas for the proposal are as follows:

- Warehouse 1 – 13,695sqm GFA;
  Office – 500sqm GFA;
  Ground Floor Entry – 40sqm;
- Warehouse 2 – 8,680sqm GFA;
  Office – 500sqm;
  Ground Floor Entry – 40sqm;
  Total Building Area = 23,455sqm.
  The majority of materials used in the construction of the building are prefabricated steel and concrete elements.

2.2 Key Activities of the Construction Works

Following is a list of key activities undertaken in the construction of the proposed development.

- Initial site set-up.
- Site works / bulk earthworks
- Footings
- Underground services (drainage, fire service, sewer, water, electricity, telephone, data)
- Concrete hard stand
- Structural steel
- Roof and wall cladding
- Reinforced concrete ground slabs and external paving
- Mechanical, electrical and hydraulic services
- Finishes and fixtures to the office and warehouse
- Landscaping

2.3 Staging of Construction Works

Stage 1 – 12 week duration

- Foundations
- Structural Steel
- Precast
- Roofing
- Office Suspended Slab
- External Wall Cladding

Stage 2 – 12 week duration

- Services Rough In
- PIR Walls & Ceilings
- Office Fit out

Stage 3 – 12 week duration

- Office fit out
- External pavement & carpark prep
- Internal concrete slab
- Plantroom fit out
- Services
- Equipment installation such as dock levellers, solar, water heaters etc.

Stage 4 – 12 week duration

- Office furniture & joinery
- External concrete works
- Carpark construction
- Landscaping
- Services fit out
- Services commissioning

Stage 5 – 8 week duration

- Defects
- Handover

2.4 Responsibility

All of the above works will be carried out under the supervision and instruction of Frasers Property Industrial Constructions Pty Ltd acting as Head Contractor. The works will be staged and generally in the order of the key activities as outlined above.

The Head Contractor will be responsible for the implementation and maintenance of all environmental management controls. Monitoring of individual tasks will be conducted by the Project Manager or the Site Manager as listed in the Risk Matrix. They can occur on a daily to monthly basis, depending on the item.

2.5 Extent of Works

The site is approximately 43,976 m^2.
Building and external paving will cover approximately 34,301 m^2.

The works include stabilisation to all the batters as part of the landscaping.

2.6 Site Operation Times

The site will operate through a six day week.
Operating times are as follows:
Monday to Friday: 7.00 am – 6.00 pm
Saturday: 8.00 am – 1.00 pm

Note that the site will open earlier and close later than dates listed above where required.

3. REGULATORY REQUIREMENTS

Refer to Table 1, appended to this Construction Environmental Management Plan. Following is a list of the documents that apply to this Construction Environmental Management Plan:

- Protection of the Environment Operations Act 1997 (POEO Act)
- AS/NZS ISO 14001:2004
- AS/NZS ISO 14004:2004
- EPBC Act 1999 Environment Protection Biodiversity & Conservation 1999
- State Environment Protection Act 1970 and Regulations
- NSW Environmental Management System Guidelines, 2009.

Ground Water

- NSW Ground water quality protection policy

Ambient Air Quality

- Protection of the Environment Operations Act 1997 (POEO Act)
- Protection of the environment operations (Clean Air) Regulation 2010

Noise

- POEO (Noise Control) Regulation 2008

Vehicle Air and Noise Emissions

- POEO (Noise Control) Regulation 2008 & Interim Construction Noise Guidelines

Impacts on the Ozone Layer

- Ozone Protection Act 1989

National Pollutant Inventory

- Protection of the environment operations (general) regulation 2009

Trade Waste (Discharge to Sewer)

- NSW Liquid Trade waste regulations 2009

Occupational Health and Safety

- National Work Health & Safety Act & Regulation 2011
- Storage & Handling of Dangerous goods, Industry Code of Practice
- Environmentally Hazardous Chemicals Act 1985
- Work Cover, Managing Risks of Hazardous Chemicals in the Workplace code of practice

Pesticides

- Pesticides Act 1999

Threatened Species (in conjunction with commonwealth EPBC Act)

- Threatened Species Conservation Act 1995

Indigenous Heritage

- Heritage Act 1997

4. ASSESSMENT OF ENVIRONMENTAL RISK

4.1 Potential of Environmental Impact

The following is a list of activities that have the potential to impact upon the environment.

- Site works comprising of:
  - Site strip and stockpiling of topsoil
  - Cut to fill earthworks
  - Creation of batters within and adjacent to the site
- Installation of underground services including:
  - Storm water drainage
  - Sewerage system
- De-watering of the worksite
- Water runoff from disturbed ground
- Noise and vibration / fumes from machinery
- Creation of dust
- Storage of fuel, oil and other chemicals
- Mud and dirt on road
- Rubbish / litter
- Laying of concrete and concrete cutting

Table 1 - Consequence Table

Consequence	Environment
Catastrophic	Irreversible or long term changes (recovery 5 years +)
Major	Major impact (recovery 1-5 years)
Moderate	Moderate impact (recovery up to one year)
Minor	Minor impact (no detectable change to communities)
Insignificant	No detectable harm (within natural variability)

Table 2 - Likelihood Table

Likelihood	Descriptor
High	Greater than 70% Probability
Medium	40-70% Probability
Low	20-40% Probability
Very Low	Less than 20% Probability

Table 3 - Ratings Matrix

High (grade 3) (Greater than 70 % probability)	**M**	**S**	**H**	**H**	**H**
Medium (grade 2) (40%-70% probability)	**M**	**M**	**S**	**H**	**H**
Low (grade 1) (20%-40% probability)	**M**	**M**	**S**	**S**	**H**
Very Low (grade 0.5) (less than 20% probability)	L	**M**	M	**S**	**S**
(12 month) Potential *Incidence* Rate[1] / **Consequence**	**Insignificant (grade 1)**	**Minor (grade 2)**	**Moderate (grade 3)**	**Major (grade 4)**	**Catastrophic (grade 5)**

Significance

L = Low Significance = 5

M = Moderate Significance = 4

S = Significant Effect = 3

H = High Significance = 2

C = Critical Significance = 1

Refer to letters for Table 3 ratings Matrix

Refer to numbers for 4.2 Evaluation of Environmental Risks

Assessment based on experienced site staff judgement

4.2 Evaluation of Environmental Risks

Activity	Aspect	Impact	Risk Level*	Objectives	Targets	Environmental Control (ref to procedures/ guidelines)	Applicable Legislation
Initial site set-up	Dust Noise and Vibration Emissions	Noise and Vibration emissions released	5	To minimise the impact of noise and Vibration	Use machinery within hours described in DA	Erect and maintain construction site signage Implementation of traffic management plan	Protection of the Environment Operations Act 1997 (POEO Act) AS/NZS ISO 14001:2004 AS/NZS ISO 14004:2004
		Dust released to adjoining properties	5	Have boundary fences clad with shade cloth or similar product to		Display construction site signage	EPBC Act 1999 Environment Protection Biodiversity & Conservation 1999
	Air Quality,	Lower air quality	3	suppress dust from escaping the site.	Ensure all dust minimisation is in place before clearing takes place	Maintain temporary fence All machinery will be required to be serviced and maintained in accordance with manufacturer's requirements.	State Environment Protection Act 1970 and Regulations NSW Environmental Management System Guidelines, 2009.
	Surface Water Discharge,	Contaminants released to land, stormwater	5	Instigate Dust suppression activities, eg Water carts Install silt fencing and hay bales for containment of sediment	Install sediment containment prior to any works taking place	Any machine producing excessive fumes will be required to be replaced or repaired. Machinery that be used on site will be required to have log books detailing servicing intervals, hours of use.	<u>Noise</u> POEO (Noise Control) Regulation 2008 <u>Vehicle Air and Noise Emissions</u> POEO (Noise Control) Regulation 2008 & Interim Construction Noise Guidelines
	Fauna and Flora,	Damaged to protected vegetation, and wildlife	3	Ensure that vegetation to be removed is identified by suitable qualified person	Only those tree and shrubs identified, are to be removed	Any machine that has not been serviced and maintained correctly will not be permitted to work on the site.	<u>Trade Waste (Discharge to Sewer)</u> NSW Liquid Trade waste regulations 2009 <u>Threatened Species (in conjunction with commonwealth EPBC Act)</u>
	Waste Management	Track the recyclability of all waste materials	3	Waste management	Ensure documented evidence of recycled	Immediate isolation of area of unidentified find	Threatened Species Conservation Act 1995

Activity	Aspect	Impact	Risk Level*	Objectives	Targets	Environmental Control (ref to procedures/ guidelines)	Applicable Legislation
				contractor to supply a detailed report on all materials recycled	materials is gathered monthly		
Civil works	Dust Noise and Vibration Emissions Air Quality, Surface Water Discharge, Fauna and Flora, Waste Management	Noise and Vibration emissions released Dust released to adjoining properties Lower air quality Contaminant land, stormwater Damaged to protected vegetation, and wildlife	5 5 3 5 3	To minimise the impact of noise and Vibration Have boundary fences clad with shade cloth or similar product to suppress dust from escaping the site. Instigate Dust suppression activities, eg Water carts Install silt fencing and hay bales for containment of sediment Ensure that vegetation to be removed is identified by suitable	Use machinery within hours described in DA Ensure all dust minimisation is in place before clearing takes place Install sediment containment prior to any works taking place Only those tree and shrubs identified, are to be removed	Erect and maintain construction site signage Implementation of traffic management plan Display construction site signage Maintain temporary fence All machinery will be required to be serviced and maintained in accordance with manufacturer's requirements. Any machine producing excessive fumes will be required to be replaced or repaired. Machinery that be used on site will be required to have log books detailing servicing intervals, hours of use. Any machine that has not been serviced and maintained correctly will not be permitted to work on the site.	Protection of the Environment Operations Act 1997 (POEO Act) AS/NZS ISO 14001:2004 AS/NZS ISO 14004:2004 EPBC Act 1999 Environment Protection Biodiversity & Conservation 1999 State Environment Protection Act 1970 and Regulations NSW Environmental Management System Guidelines, 2009. <u>Noise</u> POEO (Noise Control) Regulation 2008 <u>Vehicle Air and Noise Emissions</u> POEO (Noise Control) Regulation 2008 & Interim Construction Noise Guidelines <u>Trade Waste (Discharge to Sewer)</u> NSW Liquid Trade waste regulations 2009

Activity	Aspect	Impact	Risk Level*	Objectives	Targets	Environmental Control (ref to procedures/ guidelines)	Applicable Legislation
		Track the recyclability of all waste materials		qualified person Waste management contractor to supply a detailed report on all materials recycled	Ensure documented evidence of recycled materials is gathered monthly	Immediate isolation of area of unidentified find	Threatened Species (in conjunction with commonwealth EPBC Act) Threatened Species Conservation Act 1995
Footings	Dust Noise and Vibration Emissions Air Quality, Surface Water Discharge, Fauna and Flora,	Noise and Vibration emissions released Dust released to adjoining properties Lower air quality Contaminants released to land, stormwater	5 5 3 5 3	To minimise the impact of noise and Vibration Have boundary fences clad with shade cloth or similar product to suppress dust from escaping the site. Instigate Dust suppression activities, eg Water carts Install silt fencing and hay bales for containment of sediment	Use machinery within hours described in DA Ensure all dust minimisation is in place before clearing takes place Install sediment containment prior to any works taking place Only those tree and shrubs	Erect and maintain construction site signage Implementation of traffic management plan Display construction site signage Maintain temporary fence All machinery will be required to be serviced and maintained in accordance with manufacturer's requirements. Any machine producing excessive fumes will be required to be replaced or repaired. Machinery that be used on site will be required to have log books detailing servicing intervals, hours of use.	Protection of the Environment Operations Act 1997 (POEO Act) AS/NZS ISO 14001:2004 AS/NZS ISO 14004:2004 EPBC Act 1999 Environment Protection Biodiversity & Conservation 1999 State Environment Protection Act 1970 and Regulations NSW Environmental Management System Guidelines, 2009. Noise POEO (Noise Control) Regulation 2008 Vehicle Air and Noise Emissions POEO (Noise Control) Regulation 2008 & Interim Construction Noise Guidelines Trade Waste (Discharge to Sewer)

Activity	Aspect	Impact	Risk Level*	Objectives	Targets	Environmental Control (ref to procedures/ guidelines)	Applicable Legislation
	Waste Management	Damaged to protected vegetation, and wildlife Track the recyclability of all waste materials		Ensure that vegetation to be removed is identified by suitable qualified person Waste management contractor to supply a detailed report on all materials recycled	identified, are to be removed Ensure documented evidence of recycled materials is gathered monthly	Any machine that has not been serviced and maintained correctly will not be permitted to work on the site. Immediate isolation of area of unidentified find	NSW Liquid Trade waste regulations 2009 Threatened Species (in conjunction with commonwealth EPBC Act) Threatened Species Conservation Act 1995
Underground services (drainage, fire service, sewer, water, electricity, telephone, data)	Dust Noise and Vibration Emissions Air Quality, Surface Water Discharge, Fauna and Flora,	Noise and Vibration emissions released Dust released to adjoining properties Lower air quality	5 5 3 5 3	To minimise the impact of noise and Vibration Have boundary fences clad with shade cloth or similar product to suppress dust from escaping the site. Instigate Dust suppression activities, eg Water carts Install silt fencing and	Use machinery within hours described in DA Ensure all dust minimisation is in place before clearing takes place Install sediment containment prior to any	Erect and maintain construction site signage Implementation of traffic management plan Display construction site signage Maintain temporary fence All machinery will be required to be serviced and maintained in accordance with manufacturer's requirements. Any machine producing excessive fumes will be required to be replaced or repaired.	Protection of the Environment Operations Act 1997 (POEO Act) AS/NZS ISO 14001:2004 AS/NZS ISO 14004:2004 EPBC Act 1999 Environment Protection Biodiversity & Conservation 1999 State Environment Protection Act 1970 and Regulations NSW Environmental Management System Guidelines, 2009. Noise POEO (Noise Control) Regulation 2008 Vehicle Air and Noise Emissions

Activity	Aspect	Impact	Risk Level*	Objectives	Targets	Environmental Control (ref to procedures/ guidelines)	Applicable Legislation
	Waste Management	Contaminants released to land, stormwater Damaged to protected vegetation, and wildlife Track the recyclability of all waste materials		hay bales for containment of sediment Ensure that vegetation to be removed is identified by suitable qualified person Waste management contractor to supply a detailed report on all materials recycled	works taking place Only those tree and shrubs identified, are to be removed Ensure documented evidence of recycled materials is gathered monthly	Machinery that be used on site will be required to have log books detailing servicing intervals, hours of use. Any machine that has not been serviced and maintained correctly will not be permitted to work on the site. Immediate isolation of area of unidentified find	POEO (Noise Control) Regulation 2008 & Interim Construction Noise Guidelines Trade Waste (Discharge to Sewer) NSW Liquid Trade waste regulations 2009 Threatened Species (in conjunction with commonwealth EPBC Act) Threatened Species Conservation Act 1995
Structural steel	Dust Noise and Vibration, Emissions Paint and special finish applications	Noise and Vibration emissions released Track the recyclability of all waste materials Sewer or storm water	5 5 3 5	To minimise the environmental impact of all the structural steel instillation works of the site. Wash out of utensils and work product	Use machinery within hours described in DA Ensure documented evidence of recycled materials is gathered monthly Ensure all paint and special finishers are disposed of as per the material	Erect and maintain construction site signage Implementation of traffic management plan Display construction site signage All machinery will be required to be serviced and maintained in accordance with manufacturer's requirements. Any machine producing excessive fumes will be	Protection of the Environment Operations Act 1997 (POEO Act) AS/NZS ISO 14001:2004 AS/NZS ISO 14004:2004 EPBC Act 1999 Environment Protection Biodiversity & Conservation 1999 State Environment Protection Act 1970 and Regulations NSW Environmental Management System Guidelines, 2009. Noise

Activity	Aspect	Impact	Risk Level*	Objectives	Targets	Environmental Control (ref to procedures/ guidelines)	Applicable Legislation
		system contamination		in separate catchment bin and dispose of sediment in approved waste container.	safety data sheet for the substance used.	required to be replaced or repaired. Machinery that is to be used on site will be required to have log books detailing servicing intervals, hours of use. Any machine that has not been serviced and maintained correctly will not be permitted to work on the site.	POEO (Noise Control) Regulation 2008 Vehicle Air and Noise Emissions POEO (Noise Control) Regulation 2008 & Interim Construction Noise Guidelines Trade Waste (Discharge to Sewer) NSW Liquid Trade waste regulations 2009 Threatened Species (in conjunction with commonwealth EPBC Act) Threatened Species Conservation Act 1995
Roof and wall cladding	Dust Noise and Vibration, Emissions Paint and special finish applications	Noise and Vibration emissions released Track the recyclability of all waste materials Sewer or storm water system	5 5 3 5	To minimise the environmental impact of all the structural steel instillation works of the site. Wash out of utensils and work product in separate	Use machinery within hours described in DA Ensure documented evidence of recycled materials is gathered monthly Ensure all paint and special finishers are disposed of as per the material safety data	Erect and maintain construction site signage Implementation of traffic management plan Display construction site signage All machinery will be required to be serviced and maintained in accordance with manufacturer's requirements. Any machine producing excessive fumes will be	Protection of the Environment Operations Act 1997 (POEO Act) AS/NZS ISO 14001:2004 AS/NZS ISO 14004:2004 EPBC Act 1999 Environment Protection Biodiversity & Conservation 1999 State Environment Protection Act 1970 and Regulations NSW Environmental Management System Guidelines, 2009. Noise

Activity	Aspect	Impact	Risk Level*	Objectives	Targets	Environmental Control (ref to procedures/ guidelines)	Applicable Legislation
		contamination		catchment bin and dispose of sediment in approved waste container.	sheet for the substance used.	required to be replaced or repaired. Machinery that is to be used on site will be required to have log books detailing servicing intervals, hours of use. Any machine that has not been serviced and maintained correctly will not be permitted to work on the site.	POEO (Noise Control) Regulation 2008 Trade Waste (Discharge to Sewer) NSW Liquid Trade waste regulations 2009
Reinforced concrete ground slabs and external paving	Dust Noise and Vibration, Emissions Slurry discharge	Stormwater, sewer contamination Soil contamination	3 3	Designated area for washing of concrete trucks and capture of slurry. Soiled material removed off site in bins.	Ensure all Concrete and slurry from washing of concrete tools and equipment / trucks is contained, dried out and disposed in bins provided.	• Designated area for washing of concrete trucks and capture of slurry. Soiled material to be placed in location to dry out then removed off site in bins.	Protection of the Environment Operations Act 1997 (POEO Act) AS/NZS ISO 14001:2004 AS/NZS ISO 14004:2004 EPBC Act 1999 Environment Protection Biodiversity & Conservation 1999 State Environment Protection Act 1970 and Regulations NSW Environmental Management System Guidelines, 2009. Noise POEO (Noise Control) Regulation 2008 Vehicle Air and Noise Emissions

Activity	Aspect	Impact	Risk Level*	Objectives	Targets	Environmental Control (ref to procedures/ guidelines)	Applicable Legislation
							POEO (Noise Control) Regulation 2008 & Interim Construction Noise Guidelines
Sprinkler, mechanical, electrical and hydraulic services	Dust Noise and Vibration, Emissions Paint and special finish applications	Noise and Vibration emissions released Track the recyclability of all waste materials Sewer or storm water system contaminati on	5 5 3 5	To minimise the environmental impact of all the structural steel instillation works of the site. Wash out of utensils and work product in separate catchment bin and dispose of sediment in approved waste container.	Use machinery within hours described in DA Ensure documented evidence of recycled materials is gathered monthly Ensure all paint and special finishers are disposed of as per the material safety data sheet for the substance used.	Erect and maintain construction site signage Implementation of traffic management plan Display construction site signage All machinery will be required to be serviced and maintained in accordance with manufacturer's requirements. Any machine producing excessive fumes will be required to be replaced or repaired. Machinery that is to be used on site will be required to have log books detailing servicing intervals, hours of use. Any machine that has not been serviced and maintained correctly will not be permitted to work on the site.	Protection of the Environment Operations Act 1997 (POEO Act) AS/NZS ISO 14001:2004 AS/NZS ISO 14004:2004 EPBC Act 1999 Environment Protection Biodiversity & Conservation 1999 State Environment Protection Act 1970 and Regulations NSW Environmental Management System Guidelines, 2009. <u>Noise</u> POEO (Noise Control) Regulation 2008 <u>Trade Waste (Discharge to Sewer)</u> NSW Liquid Trade waste regulations 2009
Finishes and fixtures to	Paint and special finish applications	Sewer or storm water system	5	Wash out of utensils and work product	Ensure all paint and special finishers are	Wash out of utensils and work product in separate catchment bin and dispose	Protection of the Environment Operations Act 1997 (POEO Act)

Activity	Aspect	Impact	Risk Level*	Objectives	Targets	Environmental Control (ref to procedures/ guidelines)	Applicable Legislation
the offices and warehouse		contamination		in separate catchment bin and dispose of sediment in approved waste container.	disposed of as per the material safety data sheet for the substance used.	of sediment in approved waste container. All waste to be placed in bins provided.	AS/NZS ISO 14001:2004 AS/NZS ISO 14004:2004 EPBC Act 1999 Environment Protection Biodiversity & Conservation 1999 State Environment Protection Act 1970 and Regulations NSW Environmental Management System Guidelines, 2009. <u>Noise</u> POEO (Noise Control) Regulation 2008 <u>Trade Waste (Discharge to Sewer)</u> NSW Liquid Trade waste regulations 2009
Landscaping	Dust Noise and Vibration Emissions Air Quality,	Noise and Vibration emissions released Dust released to adjoining properties	5 5 3 5 3	To minimise the impact of noise and Vibration Have boundary fences clad with shade cloth or similar product to suppress dust from escaping the site.	Use machinery within hours described in DA Ensure all dust minimisation is in place before clearing takes place	Erect and maintain construction site signage Implementation of traffic management plan Display construction site signage Maintain temporary fence All machinery will be required to be serviced and maintained in accordance with manufacturer's requirements.	Protection of the Environment Operations Act 1997 (POEO Act) AS/NZS ISO 14001:2004 AS/NZS ISO 14004:2004 EPBC Act 1999 Environment Protection Biodiversity & Conservation 1999 State Environment Protection Act 1970 and Regulations NSW Environmental Management System Guidelines, 2009.

Activity	Aspect	Impact	Risk Level*	Objectives	Targets	Environmental Control (ref to procedures/ guidelines)	Applicable Legislation
	Surface Water Discharge, Fauna and Flora, Waste Management	Lower air quality Contaminants released to land, stormwater Damaged to protected vegetation, and wildlife Track the recyclability of all waste materials		Instigate Dust suppression activities, eg Water carts Install silt fencing and hay bales for containment of sediment Ensure that vegetation to be removed is identified by suitable qualified person Waste management contractor to supply a detailed report on all materials recycled	Install sediment containment prior to any works taking place Only those tree and shrubs identified, are to be removed Ensure documented evidence of recycled materials is gathered monthly	Any machine producing excessive fumes will be required to be replaced or repaired. Machinery that be used on site will be required to have log books detailing servicing intervals, hours of use. Any machine that has not been serviced and maintained correctly will not be permitted to work on the site. Immediate isolation of area of unidentified find	Noise POEO (Noise Control) Regulation 2008 Trade Waste (Discharge to Sewer) NSW Liquid Trade waste regulations 2009 Ambient Air Quality Protection of the Environment Operations Act 1997 (POEO Act) Protection of the environment operations (Clean Air) Regulation 2010 Threatened Species (in conjunction with commonwealth EPBC Act) Threatened Species Conservation Act 1995

5. ENVIRONMENTAL MANAGEMENT PROGRAM

5.1 Treatment methods and inspection schedules

5.1.1 Method and Frequency of Inspections

Visual inspections will be undertaken by the personnel referenced in Environment Management Plan Inspection Report at the following frequencies:

All Items: Daily

In wet weather: Protection at drainage pits three times per day. On day start up after overnight rain.

In windy weather: Continual monitoring for dust and air-borne materials.

5.1.2 Records

All initial records which define both the location and types of Environmental Management methods in place, as well as data on initial establishment and inspection dates are contained in the Environment Management Plan Inspection Report Section.

5.2 Control Method Specifications

5.2.1 Diversion Drains / Banks

Earth diversion banks will be used to intercept and divert water away from the sites to stable locations.

Earth diversion banks will be constructed by pushing soil downhill into a long mound or by pushing soil uphill.

To avoid diversion bank channels becoming eroded, gradients will be constructed no steeper than 5%.

To prevent soil slippage, the diversion banks and channels will be constructed with stable side gradients, typically no steeper than 1:1 (horizontal: vertical).

Surface vegetation and at least 50mm of topsoil will be stripped from below diversion bank areas, exposed soil furrowed and the bank compacted in thin layers.

5.2.2 Recycle of Waste.

Frasers Property will contract to Hello Bin Hire Pty Ltd for all recycle and waste management processes from site produce waste.

Their recycle depot, which is fundamentally, a manual operation, operating in an enclosed facility, which provides for an efficiency and unrestricted capability for recycling purposes.

Their recycle depot sorts, consolidates stores and transport a variety of waste, namely:

- Bricks & Pavers
- Building Timber
- Concrete & Concrete products
- Plaster
- Soil
- Paper, Cardboard & Plastics
- Ferrous & Non Ferrous Metals

A minimum of 80% of construction waste will be reused or recycled during the project. A monthly report will be provided that will include the percentage of total construction waste that has been reused/recycled.

5.2.3 Table Drains

Table drains will be used to collect water at the base of batters and divert the water away from the sites to a stable location.

The drain will be formed in a spoon drain style and at a grade. Table drains will be dressed. Methods of best practice will be used to protect the storm water drains.

5.2.4 Dust Management & Sediment Control Barriers

Dust generation from construction activities will be mitigated by regularly using water carts along the earth in order to reduce the amount of dust generated from construction activity and wind driven dust, this will be specifically implemented daily during hot & dry periods. All public & private road ways will be street swept as required in order to remove dust from the road ways and mitigate any risk of dust entering the storm water systems. In addition dust cloth will be added to the site boundary in order to capture and reduce the impact of dust on the surrounding roadways. A street sweeper will be present on site at all times.

All construction access road ways within the site will be proof rolled and compacted in order to reduce the amount of dust generated from construction site vehicles coming in and out of the site regularly.

Sediment Control Barriers will be constructed using straw bales staked to the ground in the invert and batters of drains forming a dam. Water will slowly filter through the straw bale, which will remove a reasonable amount of suspended contaminants. GEO fabric may be used over the face of the bales to help the filtration.

Bales will be replaced after heavy rains or when contaminated.

An inspection to be conducted by the site foreman after heavy rains to ensure pooling of water does not occur.

5.2.5 Velocity Controls

Velocity of water will be controlled by:

i) In drains a straw bale or large rock will be placed in the base of the drain to slow the water to prevent erosion of the drain.

ii) On batters, furrows will be placed across the batter to slow the water velocity or prevent erosion of the batter.

5.2.6 Stockpiles

Spoil on the site will be temporarily stockpiled in three distinct piles, topsoil, clay, spoil and rock.

(Temporary stockpiling refers to a short amount of period during construction).

All stockpiles are to be removed from site prior to project completion.

The quantity of spoil to be stockpiled will be minimal as all subcontractors will be required to remove all spoil from the site.

The stockpiles will be located on a flat section of land adjacent to the site.

The stockpile will be constructed with a slope no greater than 1:1 (horizontal: vertical).

The stockpiles are temporary and will be 'dressed' as smooth as possible to minimise dust and erosion. The stockpiles will be watered with non-potable water if dusting occurs.

If required and practicable, a sediment control barrier will be constructed around the base and stockpiles will be covered.

If excess spoil is required, the origin of soil certificates for all soil brought onto the Martin Brower site will be approved prior to the soil arriving.

5.2.7 De-watering of Site

To remove water from the work area, the pump intake will be kept as close to the surface of pool as possible. Care will be taken to avoid pumping from the bottom of pools and constant supervision will be provided during pumping operations to ensure this does not happen.

Contaminated water taken off the land and disposed of at an EPA licensed facility. .

5.2.8 Noise / Vibration / Fumes

All machinery that enters the site will conform to Occupational Health and Safety requirements.

These regulations require all machinery to have a log book outlining service intervals, hours of use and maintenance carried out.

All machines will be checked regularly to conform with all manufacturers requirements.

If any machine is to be found to be producing excessive noise / vibration / fumes, it will be serviced immediately to resolve the problem.

5.2.9 Storage of Fuels, Oils and Chemicals

Storage of fuels, oils and chemicals on the site will be kept to a minimum.

Any fuel, oils or chemicals that will be kept on site will be stored in the onsite container which is locked at all times and stored in accordance with regulatory requirements where applicable.

Any bulk fuel required to refill machinery will be by mini-tankers within a designated and bounded area

A spill response kit will be located at this facility. The kit will consist of large quantities of absorbing materials such as saw dust, recycled shredder paper, cement dust and were applicable to a particular chemical, if required on site, an absorption product recommended by that particular supplier.

Should a major spill of a large quantity of product occur, then a machine would be used to create a holding basin in the affected immediate area. An appropriate qualified contractor will be employed to remove the spillage to an approved disposal location.

Should a spill over 5L occur site management will be notified immediately and the spill will be contained using the mobile spill kit. If Site Management is not able to contain the spill with the mobile spill kit and the spill is unable to be controlled the site manager shall declare an environmental emergency. In the case of an environmental emergency 000 will be notified immediately. Site evacuation procedure is to be implemented and all site personal are to assemble at the designated safe assembly points and await direction from site management.

Spills in excess of 5L will be immediately reported to.

Frasers Property will submit a report of the incident within 48hrs of the occurrence.

5.2.10 Shaker Grids

A shaker grid will be installed at the entry / exit point of the site prior to the commencement of earthworks.

Excessive amounts of mud will be removed first, after which the vehicle will drive over the shaker grid.

In the event the road does become dirty, a road sweeper will be employed to clean the road to the satisfaction of Council.

5.2.11 Rubbish Bins and Waste Skips

Ample rubbish bins and waste skips will be provided around the site and the amenities. Appropriate lids or covers will be placed on rubbish bins and waste skips, all of which will be closed at all times.

Bins will not be allowed to be overfilled to prevent rubbish in a bin being blown away.

A regular site inspection will be made and any loose rubbish will be picked up immediately.

As part of the induction process, all workers will be required to clean up their own rubbish as they progress.

5.2.12 Asbestos Removal

If Asbestos is found on site it will be determined by an Environmental Report to be supplied.

However in the case that asbestos is found, the appropriate and licensed contractor will be employed to remove any contaminated areas.

5.2.13 Management of Ozone Depleting Substances

Minimal ozone depleting substances will be produced during construction. Control measures include quantifying the amount of substance produced, eliminating the source and providing alternative means for the action in question.

5.3 Training of Personnel

All personnel on site are required to be inducted. As part of this induction, reference will be made to this document and an explanation of the environmental issues will be provided. Once inducted, personnel are required to sign a form stating they understand all issues discussed and will comply with all requirements before they start work on the site.

Further, all personnel, management and workers on site will be provided with a copy of this report, and the associated reference material. Frasers Property staff is trained on spill response prior to commencement of the project.

5.4 Contingency Plans

In the unlikely occurrence of a failure of any of the control measures, a contingency plan will be devised, approved and implemented promptly. Remedial action will be undertaken immediately to make the existing control measures operate until the contingency plan is able to be implemented fully.

The contingency plan will be devised through consultation with Frasers Property Industrial Constructions Pty Ltd.

5.5 Reporting of Environmental Incidents and Emergencies

Environmental incidents are to be reported by our site manager to the relevant authority including the Department of Planning.

See spill procedure in section 5.2.10.

5.6 Maintenance, Audit and Inspection Program

Refer to Evaluation of Environmental Risks and individual site inspection reports for information on inspection program and maintenance.

A copy of all reports will be kept on site and available for review at any time.

Any non-conforming results during our site monitoring will be reported by our Project Manager within 24hrs of the inspection.

5.7 Cultural Heritage and Contaminated Soil

Where artefacts of cultural significance or contaminated soil are found on the site, works will be ceased and the Site Manager will immediately contact Frasers Property management.

5.8 Landscaping

Due to the undeveloped nature of the property, there are no significant trees or shrubs indicated to be retained.

The finalised landscaping plan will be issued to local council for approval and will designed to meet the council Planting Guidelines.

All imported new top soil will be classified under the appropriate Australian standard as clean fill suitable for its intended use.

Garden top soil will only contain approved fertilizer.

5.9 Community Consultation & Complaints Handling

Frasers Property Australia have consulted with affected businesses within the community and local authorities, refer below;

- Top Tyres – 133 – 139 Cowpasture Rd, Wetherill park NSW 2164
- Austral Wright Metals – 133 – 139 Cowpasture Rd, Wetherill park NSW 2164
- AWJ Civil on behalf of Frasers Property Australia have contacted all emergency services, Police, Fire, Ambulance & SES, whom have all responded with no objections.

All evidence of community consultation is evident in the site specific construction traffic management plant Version 1.4

All complaints handling will directed to Frasers Property Australia, specifically by the specific project team and all complaints will be dealt with on an as required basis and all reasonable measures will be undertaken to address the specifics of the complaint.

All complaints will be formally expressed by the community via post to Frasers Property Australia Head Office or Site Office and a formal response by Frasers Property Australia will be issued outlining measures undertaken to address the specifics of the complaint.

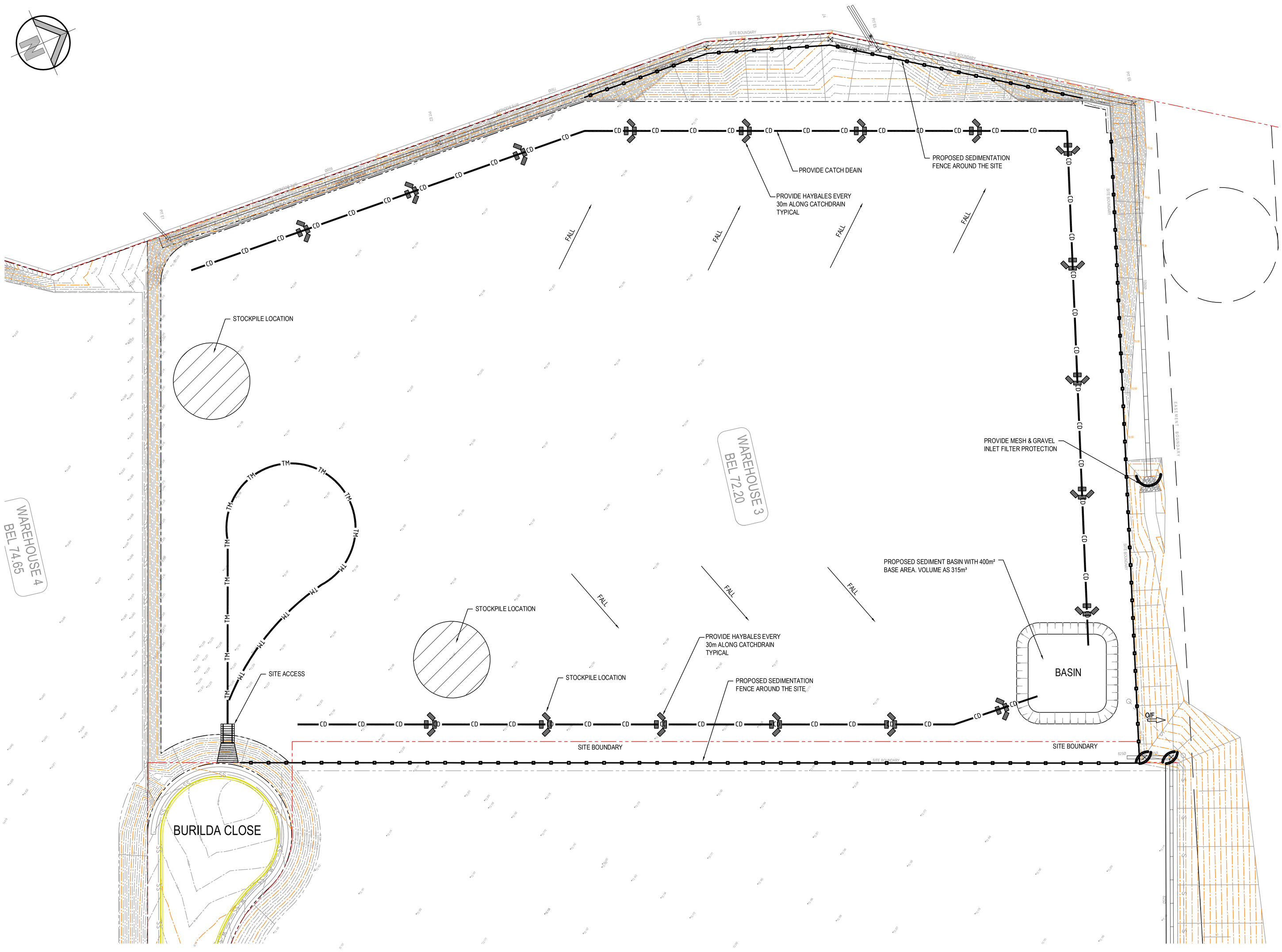
FRASERS PROPERTY	Site Managers Weekly Review	Form: MABP 405 3rd October 2012
Site Managers Name:		**Date:**
Site Managers Signature:		

No	Safety Items	☑ N/A	Specify exact location & item.	Action (Date)
1	Have all employees been site inducted?			
2	Have employees been inducted into their SWMS?			
3	Have SWMS been reviewed?			
4	Have SWMS Observations been conducted?			
5	Have items of plant been site inducted?			
6	Are the site boundaries fenced & secure?			
7	Is PPE & Construction Signage in place?			
8	Are all Excavations barricaded or protected?			
9	Has the Site Services Plan been up dated?			
10	Are the Site Amenities clean & compliant?			
11	Are tested & tagged Fire Extinguishers in place?			
12	Is there a Haz Subs container on site?			
13	Has the Emergency Assembly Point been defined?			
14	Has the Emergency Evacuation siren been tested?			
15	Is the First Aid Kit fully stocked?			
16	Is the Defib unit operational?			
17	Are First Aid Injuries being recorded & reported?			
18	Is the First Aiders Certificate current & displayed?			
19	Has Electrical equipment been tested & tagged?			
20	Have the site sheds been tested & tagged?			
21	Are electric leads off the ground?			
22	Have Scaffold Inspections been completed?			
23	Are Mobile Scaffolds assembled correctly?			
24	Are Access Ladders tied off & secure.			
25	Are Platform ladders being used in a safe manner?			
26	Have any Stepladder Task approvals been granted?			
27	Is suitable handrail in place & is it in good condition?			
28	Are appropriate warning signs in place?			
29	Are all penetrations covered to prevent falls?			
30	Is adequate Access & Egress in place?			
31	Is adequate task & access lighting in place?			
32	Is site housekeeping of a high standard?			
33	Are materials stacked safely & securely?			
34	Is Personal Protective Equipment in use?			
35	Have Plant Log Books been completed.			
36	Is mobile plant being used correctly?			
37	Has the Precast Panel Checklist been completed?			
38	Has the Structural Steel Checklist been completed?			
39	Has the Roof Permit been completed?			
40	Have Permits to Dig been completed?			

FRASERS PROPERTY	Site Managers Weekly Review	Form: MABP 405 3rd October 2012

No	Environment Items	☑ N/A	Specify exact location & item.	Action (Date)
1	Is the EMP current & on site?			
2	Are silt fences in place & in good condition?			
3	Are storm water drains clean & protected?			
4	Are sedimentation basins constructed correctly?			
5	Is all water draining into the sedimentation basins?			
6	Is the water in the basin being regularly monitored?			
7	Have silt fences been installed?			
8	Are silt fences being maintained?			
9	Is dewatering being carried out in accordance with regulatory requirements?			
10	Does the site contain contaminates?			
11	Are contaminates being controlled?			
12	Are waste disposal containers are place?			
13	Have separate food waste bins been provided?			
14	Are there lids or covers on all bins?			
15	Is there a paint wash-out system in place?			
16	Has a concrete wash out area been established?			
17	Has a refuelling area been established?			
18	Refuelling area is not near drains or gutters?			
19	Have spill kits been established & maintained?			
20	Are Haz Subs being stored correctly?			
21	Are MSDS available for all substances on site?			
22	Is dust suppression in place (e.g. water cart)?			
23	Is mobile plant fitted with appropriate noise control?			
24	Is work being conducted in authorised hours?			
25	Are site contact details displayed?			
26	Are Emergency Contact details displayed?			
27	Has a traffic management plan been developed?			
28	Is the traffic management plan on site?			
29	Are traffic control measures in place?			
30	Are rumble grids in place?			
31	Is ballast rock in place on site access roads?			
32	Are adjacent public roads clean?			
34	Are spoil stockpiles sorted according to type i.e. • Topsoil • Clay • Rock			
35	Are spoil stockpiles being controlled to minimise: • Dust generation • Erosion			

Appendix 1 – Erosion & Sediment Control Plan



SEDIMENT & EROSION CONTROL PLAN

SCALE: 1:500

0 10 20 30 40 50m

10 8 6 4 2

SCALE 1:500

GENERAL INSTRUCTIONS

1. THIS SEDIMENT AND EROSION CONTROL WORKS FOR THE SITE SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION, 4TH EDITION (2004)" BY LANDCOM.
2. AS REQUIRED BY BLACKTOWN CITY COUNCIL SEDIMENT CONTROL MEASURES WILL BE REQUIRED DURING THE CONSTRUCTION OF ALL DEVELOPMENTS/BUILDING WORKS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY THAT THE WORKS ARE CARRIED OUT IN ACCORDANCE WITH THE SEDIMENT AND EROSION CONTROL PLAN AND COUNCIL'S REQUIREMENTS.
3. THE CONTRACTOR SHALL ENSURE THAT ALL SUBCONTRACTORS ARE INFORMED OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSLOPE AREAS.
4. THE NON-DISTURBED PORTION OF THE CATCHMENT OUTSIDE OF OPERATING AREA IS TO BYPASS THE BASINS BY MEANS OF LINED CATCH DRAINS.
5. WHERE PRACTICABLE, THE SOIL EROSION HAZARD SHALL BE KEPT AS LOW AS POSSIBLE. LIMITATIONS TO ACCESS ARE TO BE VIA THE SEALED ACCESS ROAD OFF CAPTAIN COOK DRIVE UNLESS OTHERWISE APPROVED BY COUNCIL
6. ENSURE THAT ALL DRAINS ARE OPERATING EFFECTIVELY AND SHALL MAKE ANY NECESSARY REPAIRS. REMOVE TRAPPED SEDIMENT WHERE THE CAPACITY OF THE TRAPPING DEVICE FALLS BELOW 60%.
7. CONSTRUCT ADDITIONAL EROSION OR SEDIMENT CONTROL WORKS AS MAY BE APPROPRIATE TO ENSURE THE PROTECTION OF DOWNSLOPE LANDS AND WATERWAYS.
8. MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES IN A FULLY FUNCTIONING CONDITION AT ALL TIMES UNTIL THE SITE IS REHABILITATED.
9. REMOVE TEMPORARY SOIL CONSERVATION STRUCTURES AS THE LAST ACTIVITY IN THE REHABILITATION PROGRAM.

EROSION CONTROL REQUIREMENTS

1. CLEARLY VISIBLE BARRIER FENCING SHALL BE INSTALLED AT THE DISCRETION OF THE SITE SUPERINTENDENT TO ENSURE TRAFFIC CONTROL AND PROHIBIT UNNECESSARY SITE DISTURBANCE. VEHICULAR ACCESS TO THE SITE SHALL BE LIMITED TO ONLY THAT ESSENTIAL FOR CONSTRUCTION WORK AND SHALL ENTER THE SITE ONLY THROUGH THE STABILISED ACCESS POINT.
2. SOIL MATERIALS SHALL BE REPLACED IN THE SAME LAYERS THEY ARE REMOVED FROM THE GROUND i.e. ALL SUBSOILS ARE TO BE BURIED AND TOPSOIL IS TO BE RESPREAD ON THE SURFACE AT THE COMPLETION OF WORKS.
3. ALL DISTURBED AREAS ARE TO BE STABILISED WITHIN SEVEN WORKING DAYS OF THE COMPLETION OF LAND SHAPING. ALL DISTURBED AREAS ARE TO BE PROTECTED SO THAT THE LAND IS PERMANENTLY STABILISED WITHIN SIX MONTHS. TOPSOIL SHALL BE RESPREAD OVER THE SITE, OTHER THAN LOT RE-GRADING AREAS, TO A MINIMUM DEPTH OF 100mm ON BARE BUT TYNED SOIL SURFACES AND THE SITE SHALL BE REVEGETATED IN ACCORDANCE WITH THE FOLLOWING:

CONSTRUCTION SEQUENCE

WORKS SHALL BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:

1. INSTALL SEDIMENT FENCING AND CUT DRAINS TO MEET THE REQUIREMENTS OF THE SEDIMENT AND EROSION CONTROL PLAN. WASTE COLLECTION BINS SHALL BE INSTALLED ADJACENT TO SITE OFFICE.
2. CONSTRUCT STABILISED SITE ACCESS IN ACCORDANCE WITH INVERELL SHIRE **COUNCIL'S** REQUIREMENTS.
3. REDIRECT CLEAN WATER AROUND THE CONSTRUCTION SITE.
4. INSTALL SEDIMENT CONTROL PROTECTION MEASURES AT ALL NATURAL AND MAN-MADE DRAINAGE STRUCTURES. MAINTAIN UNTIL ALL THE DISTURBED AREAS ARE STABILISED.
5. CLEAR AND STRIP THE WORK AREAS. MINIMISE THE DAMAGE TO THE GRASS AND LOW GROUND COVER OF NON-DISTURBED AREAS.
6. ANY DISTURBED AREAS, OTHER THAN BUILDING PAD AREAS, SHALL IMMEDIATELY BE COVERED WITH SITE TOPSOIL WITHIN 7 DAYS OF CLEARING. BUILDING PAD AREAS SHALL BE COVERED WITH BITUMEN EMULSION AS SPECIFIED.
7. APPLY PERMANENT STABILISATION TO SITE (LANDSCAPING).

LEGEND

- CD — CD — CATCH DIVERSION DRAIN
- TM — TM — TRAFFIC MANOEUVRING
- O/F — OVERLAND FLOW PATH
- PROPOSED SEDIMENTATION FENCE
- PROPOSED VEHICLE SHAKER GRID AND STABILISED SITE ACCESS
- PROPOSED STOCKPILE LOCATION
- PROPOSED HAYBALE FILTER
- PROPOSED MESH & GRAVEL INLET FILTER

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY CRAIG & RHODES
DATUM: AHD
ORIGIN OF LEVELS: PM31592 RL3.621

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR DEVELOPMENT APPLICATION	JL	TC	04/10/2016

Client: FRASERS PROPERTY
Architect: FRASERS PROPERTY

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79 Victoria Avenue
Chatswood NSW 2067

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Web www.henryandhymas.com.au

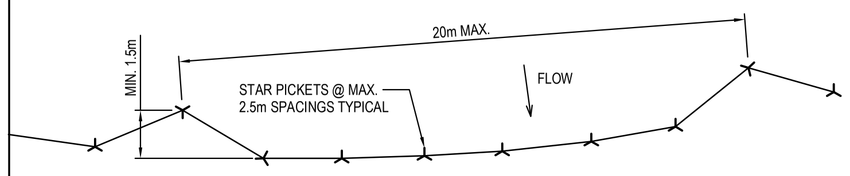
henry&hymas

Project: LOT 3 IN LOT 5 DP1212087, BURILDA CLOSE, WETHERILL PARK
TWO STAGED SPECULATIVE WAREHOUSE/INDUSTRIAL FACILITY

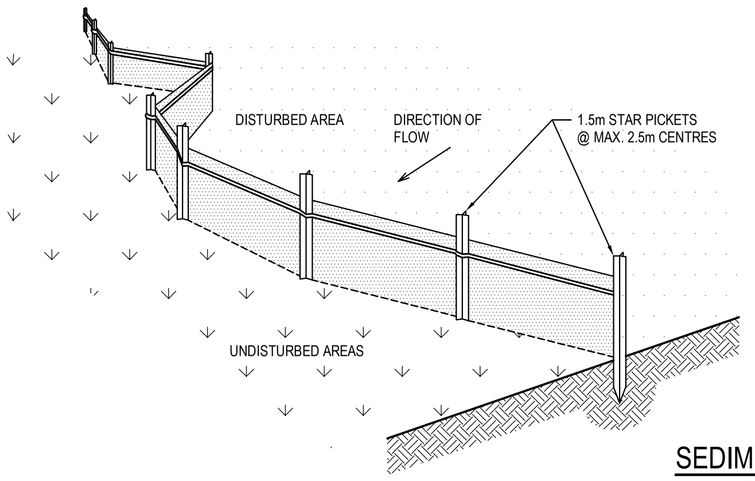
Title: SEDIMENT & EROSION CONTROL PLAN

Drawn	Designed	Date
J.Liu	T.Chan	SEP 2016
Checked	Approved	Scale
T.Dempsey	A.Francis	1:500 @ A1

Drawing number: 16875_DA_SE01
Revision: 01



PLAN

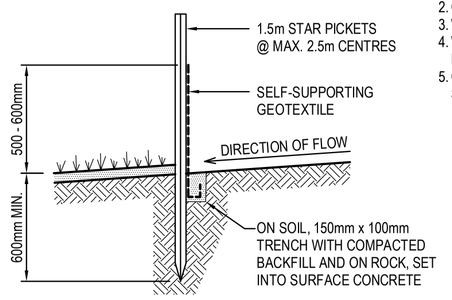


SEDIMENT FENCE

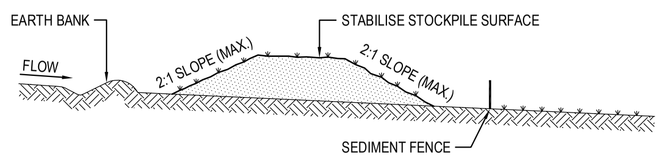
SCALE N.T.S.

SEDIMENT FENCE CONSTRUCTION NOTES:

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5m LONG STAR PICKETS INTO GROUND @ 2.5m INTERVALS (MAX.) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.



SECTION DETAIL

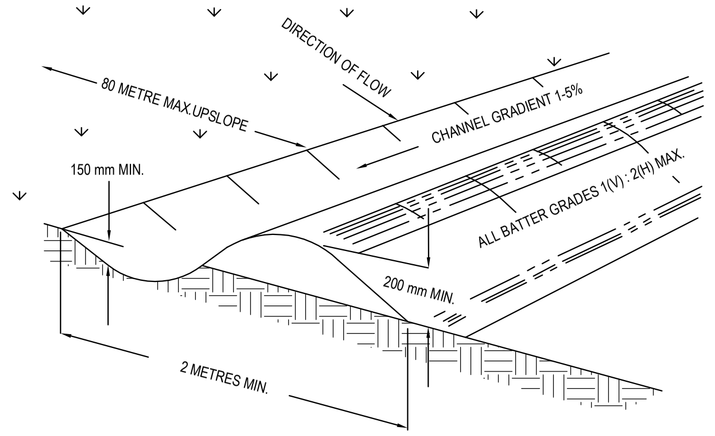


STOCKPILE CONSTRUCTION NOTES:

1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. WHERE THEY ARE TO BE PLACED FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED E.S.C.P. OR S.W.M.P. TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES 1 TO 2 METRES DOWNSLOPE.

STOCKPILES

SCALE N.T.S.



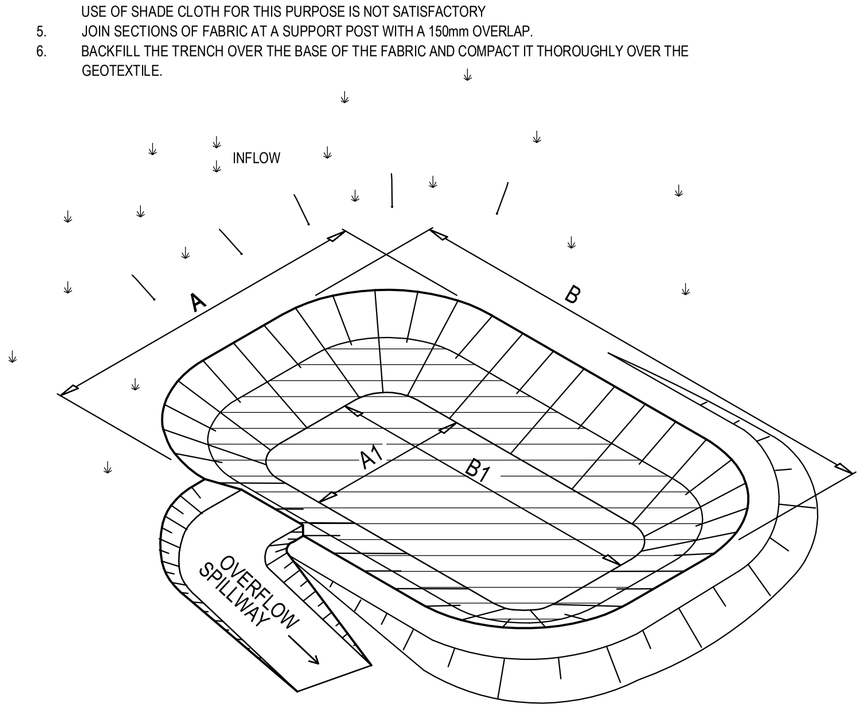
NOTE: ONLY TO BE USED AS TEMPORARY BANK WHERE MAC.UPSLOPE LENGTH IS 80 METERS.

CATCH DRAIN CONSTRUCTION NOTES:

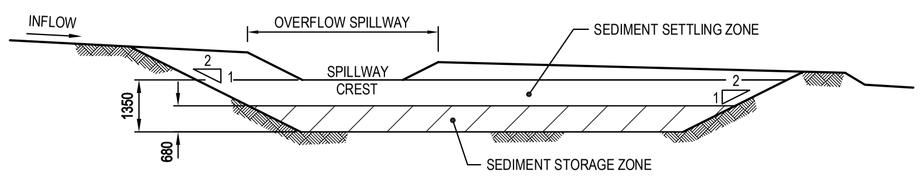
1. CONSTRUCT ALONG GRADIENT AS SPECIFIED.
2. MAXIMUM SPACING BETWEEN BANKS SHALL BE 80 METRES.
3. DRAINS TO BE OF PARABOLIC OR TRAPEZOIDAL CROSS SECTION NOT V-SHAPED.
4. EARTH BANKS TO BE ADEQUATELY COMPACTED IN ORDER TO PREVENT FAILURE.
5. CONSTRUCTION IS OF A TEMPRORARY NATURE AND SHALL BE COMPACTED AT THE END A DAYS WORK OR IMMEDIATELY PRIOR RAIN.
6. ALL OUTLETS FROM DISTURBED LANDS ARE TO FEED INTO SEDIMENT BASIN OR SIMILAR.
7. DISCHARGE RUNOFF COLLECTED FROM UNDISTURBED LANDS ONTO EITHER A STABILISED OR AN UNDISTURBED DISPOSAL AISTE WITHIN THE SAME SUBCATCHMENT AREA FROM WHICH THE WATER ORIGINATED.
8. COMPACT WITH A SUITABLE IMPLEMENT IN SITUATIONS WHERE THEY ARE REQUIRED TO FUNCTION FOR MORE THAN FIVE DAYS.
9. EARTH BANKS TO BE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT WILL IMPEDE NORMAL FLOW.

CATCH DRAINS SD 5-8

SCALE N.T.S.



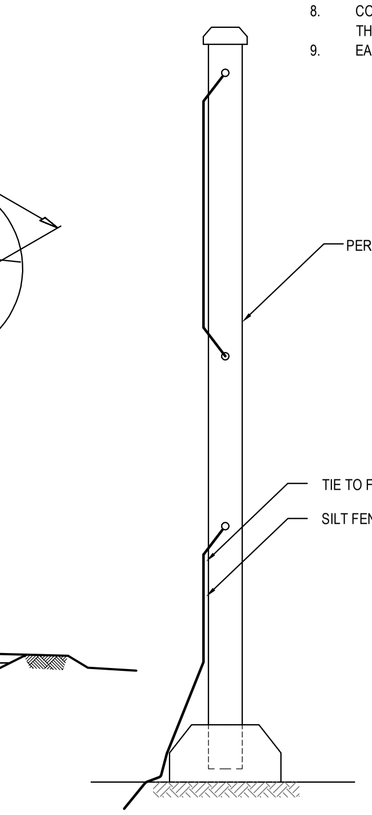
PERSPECTIVE VIEW



TYPICAL SECTION

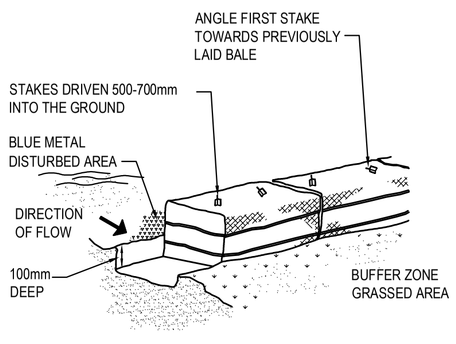
TYPE 'D' & 'F' SEDIMENTATION BASIN

N.T.S.



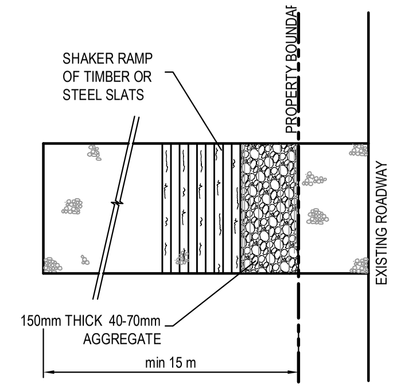
PERIMETER SECURITY FENCE WITH WIND BARRIER & SILT FENCE

N.T.S.



HAYBALE BARRIERS

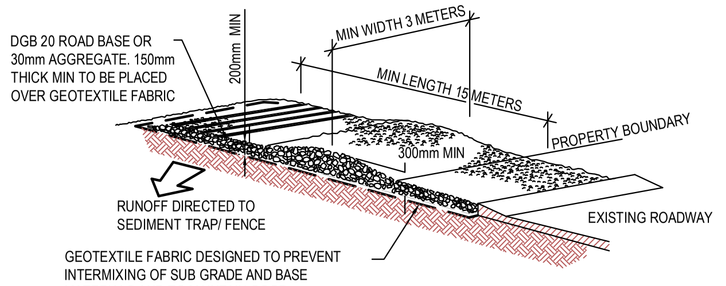
N.T.S.



PLAN
STABILISED SITE ACCESS WITH SHAKER RAMP

N.T.S.

CONSTRUCTION SITE

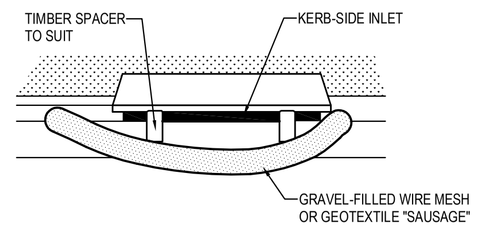


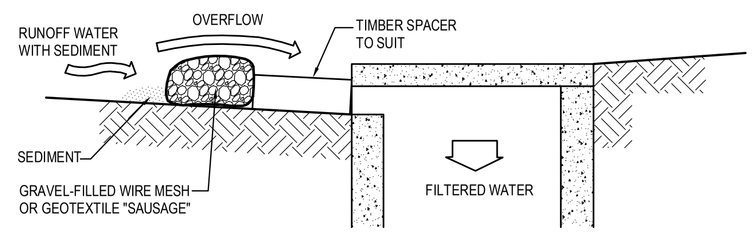
STABILISED SITE ACCESS WITH SHAKER RAMP

N.T.S.

NOTES:

1. THIS DEVICE IS TO BE LOCATED AT ALL EXITS FROM CONSTRUCTION SITE.
2. THIS DEVICE IS TO BE REGULARLY CLEANED OF DEPOSITED MATERIAL SO AS TO MAINTAIN A 50mm DEEP SPACE BETWEEN PLANKS.
3. ANY UNSEALED ROAD BETWEEN THIS DEVICE AND NEAREST ROADWAY IS TO BE TOPPED WITH 100mm THICK 40-70mm SIZE AGGREGATE.
4. ALTERNATIVELY, THREE(3) PRECAST CONCRETE CATTLE GRIDS (AS MANUFACTURED BY "HUMES CONCRETE MAY BE USED. 1, 2 & 3 ABOVE ALSO APPLY.





MESH & GRAVEL INLET FILTER CONSTRUCTION NOTES:

1. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
2. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
3. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
4. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
5. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY CAN FIRMLY ABUT EACH OTHER AND SEDIMENT / LADEN WATERS CANNOT PASS BETWEEN.

MESH & GRAVEL INLET FILTER

SCALE N.T.S.

SEDIMENT BASIN SIZING

1. THE SEDIMENT BASIN SHALL BE CONSTRUCTED ON A RATE PER HECTARE BASIS AND HAS BEEN IN ACCORDANCE WITH THE REQUIREMENTS OF THE LANDCOM MANUAL "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION", FOR SEDIMENTATION **TYPE D** SOILS. THE DISTURBED AREA WITHIN THIS CATCHMENT AT ANY ONE TIME SHOULD BE LIMITED TO AN AREA FOR WHICH EACH SEDIMENT BASIN CAN HANDLE. EACH BASIN SHALL BE SIZED IN ACCORDANCE WITH THE TABLE BELOW.

SEDIMENT BASIN SIZING TYPE D SOILS	
VOLUMETRIC RUNOFF COEFFICIENT, CV	0.25 (APPENDIX F - TABLE F2)
75TH PERCENTILE 5 DAY TOTAL RAINFALL DEPTH, R	19.0 mm
CATCHMENT AREA, A	1 Ha (UNIT AREA)
SETTLING ZONE VOLUME (PER HECTARE) 10 CV A R	47.5 m³
DISTURBED CATCHMENT AREA	1 Ha (UNIT AREA)
R K LS P C	110.87m³
SEDIMENT ZONE VOLUME (0.17 A (R K LS P C)/1.3	14.5m³ < 50% SETTLING VOL
TOTAL SEDIMENT BASIN VOLUME REQUIRED :	71.25 m³/Ha

* (LANDCOM MANAGING URBAN STORMWATER MANUAL REFERENCE)

2. THE FOLLOWING DESIGN PARAMETERS HAVE BEEN ASSESSED FOR THE SITE:

CONSTRAINT	VALUE	(SOURCE)*
RAINFALL EROSIVITY (R-FACTOR)	2350	APPENDIX B
LENGTH/SLOPE GRADIENT FACTOR, LS	0.955	APPENDIX A - TABLE A1
SOIL ERODIBILITY (K-FACTOR)	0.038	(TABLE C20 - BLACKTOWN)
EROSION CONTROL PRACTICE FACTOR (P-FACTOR)	1.3 (COMPACTED)	APPENDIX A - TABLE A2
COVER FACTOR (C-FACTOR)	1.0 (DURING EARTHWORKS)	APPENDIX A - FIGURE A5
CALCULATED SOIL LOSS, A (RUSLE EQUATION)	110.87t/Ha/YR	A = R K LS P C
SOIL HYDROLOGIC GROUP	GROUP C	APPENDIX C TABLE 20
SEDIMENT TYPE	TYPE D	APPENDIX C TABLE 4
75TH PERCENTILE 5-DAY RAINFALL EVENT	19.0mm (BLACKTOWN)	TABLE 6.3A

* (LANDCOM MANAGING URBAN STORMWATER MANUAL REFERENCE)

BASIN MANAGEMENT

1. THE CAPTURED STORMWATER IN THE SETTLING ZONE SHOULD BE DRAINED TO MEET THE MINIMUM STORAGE CAPACITY REQUIRED WITHIN A FIVE (5) DAY PERIOD FOLLOWING RAINFALL, PROVIDED THE ACCEPTABLE WATER QUALITY (NFR) AND TURBIDITY HAVE BEEN ACHIEVED.
2. CHEMICAL FLOCCULENT SUCH AS GYPSUM MAY BE DOSED TO AID SETTLING WITHIN 24 HOURS OF CONCLUSION OF EACH STORM. THE APPLIED DOSING RATES SHOULD ACHIEVE THE TARGET QUALITY WITHIN 36 TO 72 HOURS OF THE STORM EVENT.
3. INSPECT THE SEDIMENT BASINS AFTER EACH RAINFALL EVENT AND/OR WEEKLY. ENSURE THAT ALL SEDIMENT IS REMOVED ONCE THE SEDIMENT STORAGE ZONE IS FULL (REFER TO PEGS INSTALLED IN BASINS IN ACCORDANCE WITH THE SWMP). ENSURE THAT OUTLET AND EMERGENCY SPILLWAY WORKS ARE MAINTAINED IN A FULLY OPERATIONAL CONDITION AT ALL TIMES.

SOWING SEASON	SEED MIX
AUTUMN/WINTER	OATS@40KG/Ha + JAPANESE MILLET@10kg/Ha
SPRING/SUMMER	OATS@20kg/Ha + JAPANESE MILLET@20kg/Ha

NOTE : THESE PLANT SPECIES ARE FOR TEMPORARY REVEGETATION ONLY. THEY WILL ONLY PROVIDE PROTECTION FROM EROSION FOR SIX MONTHS. WHERE THE LOTS ARE TO BE LEFT UNDEVELOPED FOR A LONGER PERIOD, THE CONTRACTOR SHALL SEEK ADVICE FROM THE SITE SUPERINTENDENT AS TO MORE APPROPRIATE REVEGETATION METHODS.

REVEGETATION IN ACCORDANCE WITH THE ABOVE TABLE WILL BE ENHANCED BY ADDING LIME AT A RATE OF 4kg/TONNE OF TOPSOIL AND 7.5kg/TONNE OF SUBSOIL.

4. THE LONG TERM GROUND COVER FACTORS FOR THE CONSTRUCTION WORKS IS NOT TO EXCEED THE FOLLOWING LIMITS:

LAND	MAXIMUM C-FACTOR	REMARKS
WATERWAYS AND OTHER AREAS OF CONCENTRATED FLOWS, POST CONSTRUCTION	0.05	APPLIES AFTER TEN WORKING DAYS OF COMPLETION OF FORMATION AND BEFORE CONCENTRATED FLOWS ARE APPLIED. FOOT AND VEHICULAR TRAFFIC IS PROHIBITED IN THIS AREA AND 70% GROUND COVER IS REQUIRED.
STOCKPILES, POST CONSTRUCTION	0.10	APPLIES AFTER TEN WORKING DAYS FROM COMPLETION OF FORMATION. 60% GROUND COVER IS REQUIRED.
ALL LANDS, INCLUDING WATERWAYS AND STOCKPILES, DURING CONSTRUCTION.	0.15	APPLIES AFTER 20 DAYS OF INACTIVITY, EVEN THOUGH WORKS MAY BE INCOMPLETE. 50% GROUND COVER IS REQUIRED.

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY CRAIG & RHODES
DATUM: AHD
ORIGIN OF LEVELS: PM31592 RL3.621

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR DEVELOPMENT APPLICATION	JL	TC	04/10/2016

Client: FRASERS PROPERTY
Architect: FRASERS PROPERTY

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Project: LOT 3 IN LOT 5 DP1212087, BURILDA CLOSE, WETHERILL PARK
TWO STAGED SPECULATIVE WAREHOUSE/INDUSTRIAL FACILITY

Title: SEDIMENT & EROSION CONTROL DETAILS AND TYPICAL SECTIONS

Drawn	Designed	Date
J.Liu	T.Chan	SEP 2016
Checked	Approved	Scale
T.Dempsey	A.Francis	N.T.S.

Drawing number: 16875_DA_SE02
Revision: 01