

Clemton Park Construction Management Plan Oct 08



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Project No: 100
Builder: tender
Client: Parkview Sydney Development

Rev Date	Revision Description

Approved _____
Name Matt Crews
Title General Manager

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Section 1 – Project Overview

1.1 Introduction to the Project

This project consists of approx 400 dwellings, Bulky goods centre, retail town centre and childcare centre.

The Development is located on the corner of Harp and Charlotte Streets Clemtown Park.

1.2 Key Personnel and Contact Details

Position / Title	Name	Contact Details
Development Manager	Paul Karantonis	9327 3271
Project Manager	TBC	
Contracts Manager	TBC	
Site Manager	TBC	
OHS Management Rep	TBC	

1.3 Site Accommodation and Amenities

The site office and amenities will be located within the development site, and have an approximate area of 500m² and will remain permanently for the duration of the construction works.

1.4 Hours of Work, Programme and Work Numbers

In accordance with conditions of consent for the hours of construction, including the delivery of materials to and from the site but are expected to be, are as follows:

- a) Between 7am and 6pm - Mondays too Fridays inclusive
- b) Between 7am and 4pm – Saturdays
- c) No work on Sundays and public holidays

Timing of the project is scheduled as follows:

- Commence – June 2009
- Finish – December 2013

The worker numbers will vary according to construction activities and programme. As an estimate, site personnel will be between 50 - 1500.

1.5 Site Identification, Signage and Security

Signage will be erected in prominent locations adjacent to site entry points and within the site. Appropriate signage will include but not be limited to the following:

- Contractor signage to be highly visible to indicate construction access.
- Unauthorised entry of persons to the site prohibited.
- Directions to worker parking.
- Deep excavation.
- Contact Details 24 hours a day.
- Reporting instructions for authorised visitors.
- Location of site office, toilets, lunch sheds, and first aid office.
- Restricted access for persons without appropriate protective equipment.
- Trade specific signs such as – Formwork stripping in progress.

The entire site will have a perimeter fence, with security staff provided at certain points into the site.

Section 2 - Traffic Management Plan

2.1 TRAFFIC & PEDESTRIAN OVERVIEW

Traffic & Pedestrian Management will be accordance with the guidelines listed below, as well as the guidelines established for the entire site as per Contractor requirements.

The contact for site access will be:

Site Foreman: TBC **Phone:**

2.2 INGRESS & EGRESS OF VEHICLES TO THE SITE

Method of site access/egress for all vehicles

All traffic movements associated with the delivery and removal of material will enter/exit the site using Harp Street. Any impact on local vehicular traffic will be minimal due to the low traffic volume currently exhibited by residents and businesses using Harp Street.

Trucks entering and leaving the site.

To allow the arrival and departure of all trucks in a manner which is safe to the public, workers on site and to the drivers.

Procedure

- i) Delivery vehicles must enter and exit the Development via Harp or Charlotte Streets and follow the Contractor Construction signs.
- ii) Truck drivers will then proceed to the designated delivery point outside the Contractor site office and advise the contractor and/or sub-contractors that delivery has arrived.
- iii) Following confirmation of where on site the material is to be unloaded, the delivery driver will proceed to that point and await further instructions.
- iv) Should the delivery driver wish to leave the vehicle whilst on site a fluorescent red or fluorescent yellow vest and a hard hat must be worn. If not having undergone a site induction the driver must remain at the vehicle and not move around the site.

Worker Parking and Transport Arrangements

A dedicated parking area will be provided, for workers using vehicles as their mode of transport, on the site. From their cars there will be dedicated pedestrian walkways for all workers to walk to and from the site.

2.3 LOADING AND UNLOADING, INCL. CONSTRUCTION ZONES

Material deliveries to and from the site will be loaded/unloaded wholly within the development site boundary. This ensures that there will be no standing of any construction vehicles on existing Council infrastructure.

Methods of Loading & Unloading

Mobile Cranes will be typically used. Trucks transporting material will be driven to the closest accessible region of the site where the delivery is to be used. Mobile cranes will lift the materials off the trucks and place immediately into their location or in the designated storage areas.

2.4 TRAFFIC VOLUMES & TRAFFIC TYPES

Truck Numbers at different Stages

The estimate of truck movements is 10 movements per hour. Appropriate traffic control will be supplied at the site ingress/egress during deliveries to facilitate in the safe and controlled movement of traffic at the Harp Street access.

2.5 TRAFFIC ROUTES

Access Routes To and From the development

The major transport route associated with all deliveries will be "State Road – Canterbury Rd" with the majority of the vehicles connecting to the M5 Motorway.

All drivers to be aware of Approved Access Routes & Parking

Site access for material delivery off Harp Street will be a condition of sub-contract agreements. Worker parking and transport arrangement will be discussed as part of the site safety induction program where workers will be shown the worker parking location and be encouraged to use public transport.

2.6 PEDESTRIAN MANAGEMENT

To ensure safe pedestrian movement, the entire site will have a perimeter fence. Pedestrian access will be maintained and keep unobstructed at all times with designated entrances established for construction personnel. Walker staff will ensure that the safe movement of pedestrians/cyclists is maintained.

Section 3 - Noise Management Plan

3.1 NOISE MANAGEMENT OVERVIEW

Construction activity that generates excessive extended periods of noise emission such as excavation hammering through rock where possible will be kept to short periods in lieu of long extended operations. Where possible, consideration will be given to selecting construction methods and equipment based on the level of noise generated.

Temporary acoustic enclosures, barriers or screens may be erected as required either at the source or the receiver during construction activity that has the potential to create excessive noise.

Plant and equipment will be maintained and serviced regularly and fitted with appropriate silencing devices if necessary. Pneumatic hammers and equipment may be used in preference to hydraulic hammers and equipment to limit noise emissions.

3.2 NOISE MANAGEMENT GUIDELINES

Noise emissions associated with site establishment, demolition, land development and construction activities are to be managed to minimise adverse community impacts. The potential impacts include:

- Noise generated from on-site demolition and construction equipment;
- Noise generated from vehicles moving throughout the site; and
- Noise generated from private vehicle movements (to and from site).

The noise impacts will be controlled in accordance with the EPA. Strategies to be adopted to control noise emissions during site establishment, demolition and construction are outlined in the following management plan.

Environmental Policy

Noise emissions from site establishment demolition and construction activities will be controlled to minimise adverse impacts to the adjoining properties.

**Performance
Criteria**

Noise levels from site activities are within EPA INP guidelines.

Construction hours will be restricted to between 7:00am and 6:00pm Monday-Friday and 7:00am and 4:00pm Saturday.

**Mitigation
Strategy**

All equipment will be fitted with appropriate acoustic silencers and enclosures to meet supplier specifications.

All equipment used and operated on site will be monitored to ensure ongoing acoustic compliance and adequate maintenance being undertaken.

Construction hours will be restricted to between 7:00am and 4:00pm Monday-Friday and 7:00am and 4:00pm Saturday. No site activity is to be undertaken on Sunday or public holidays, unless previously discussed and approved by the PM.

Vehicle movements will be restricted to defined access routes. Access routes will be maintained to minimise vehicle body noise.

Specific noise impact assessment plans will be developed and implemented for recognised of identified high noise level generating activities.

Community feedback on noise will be investigated immediately to identify contributing activities.

Monitoring

Attended sensitive receptor and boundary noise monitoring will be undertaken during demolition and construction activities and at monitoring locations identified in the preliminary environmental risk assessment for the project.

Monitoring shall be undertaken in accordance with the EPA INP Guidelines. The frequency of monitoring will be determined by the site activities being undertaken but will be

conducted at least monthly.

Observations of excessive noise generating activities or equipment will be made during daily site inspections by the SM.

Reporting

Any observations of excessive noise generating activities or noisy equipment will be reported immediately to the PM on a daily basis.

Identification of an Incident or Failure to Comply

Observations of excessive noise generating activities.

Community complaints from on-site or off-site receptors.

Excedens of noise limits at boundary locations.

Plant or equipment identified as excessively noisy.

Corrective Action

Following community feedback immediate inspection will be undertaken to identify the likely contributors. An assessment of the effectiveness of implemented noise mitigation controls will be undertaken with action taken as appropriate.

Excessive noise generating activities, operations or equipment will be reviewed and modified as required.

Vehicles accessing the site which are determined to be excessively noisy will be restricted from the site and required to be repaired and reassessed prior to being permitted back on site.

Responsible Person / Resourcing

The PM will ensure the site construction activities comply with the noise emission performance criteria.

The PM will review daily observation reports and monthly noise monitoring reports to ensure compliance.

The EC will receive and respond to community feedback.

Section 4 - Waste Management Plan

4.1 WASTE MANAGEMENT OVERVIEW

On-site waste generation associated with the construction activities is to be managed throughout the entire project.

The solid and liquid wastes generated on-site will include but not be limited to:

- Excess soil or cut material;
- Concrete wastes;
- Drums and containers;
- Wash down water; and
- Waste oils.

Waste management is controlled by the EPA under the Waste Minimisation and Management Act 1995.

The following procedure outlines the waste management strategies to be adopted by WGC during its demolition, site development and construction activities.

4.2 WASTE MANAGEMENT GUIDELINES

Environmental Policy

Wastes generated by site development and construction activities are to be effectively collected, contained, recycled (where possible) and ultimately disposed of.

Performance Criteria

- Potential waste streams are identified and classified in accordance with the EPA requirement for each project.
- Waste generated by the project is monitored and recorded.
- The ultimate disposal location for wastes taken off-site is monitored and recorded.
- Where possible the various waste streams (paper/cardboard, plastics, rock soil, drums etc.) are to be separately stored, recycled and if required disposed

of to landfill.

Mitigation Strategy

Waste Concrete – The disposal of waste concrete excess to specific pour needs shall be conveyed to a contained location (bin or sump) to be ultimately recovered and disposed of off-site to an approved landfill. The disposal of agitation wash water on-site is prohibited.

General site wastes – The general wastes generated by on-site contractor and Contractor employees shall be effectively contained on-site awaiting disposal at an approved landfill. If possible and practical segregation of the various waste streams such as paper/cardboard, plastics, timber, metal, glass etc. should be organised and encouraged.

Drums and Containers – Only empty drums are to be taken off-site for disposal. Drums containing residual products shall be taken off-site by the contractor utilising the material for use on disposal. Empty drums shall be crushed prior to disposal in on-site bins.

Wash Down Water – Wash down waters will be contained on-site in a constructed sump for removal of contained solids. Excess waters will be used on-site for dust suppression or taken off-site for appropriate disposal. The washing out on-site of cement trucks shall normally be prohibited. Cement trucks will be directed to their depot for clean out.

Waste Oils – Shall be removed off-site by the maintenance contractor for appropriate disposal.

Monitoring

A weekly site inspection will be undertaken to ensure all wastes being generated are being sorted and sorted in an appropriate manner in accordance with the waste management plan prepared for construction activities.

Documentation associated with the off-site disposal and reuse of materials will be regularly reviewed. Documentation will

include point of generation, description of waste, quantity of waste and the ultimate disposal fate.

The record of all waste streams and recyclable streams will be maintained.

Reporting

The results of the weekly waste management inspection will be prepared by the SM and reported to the PM.

The record of waste generation rates and recycling rates will be reported to the PM on a monthly basis. The results will be retained on-site for review by relevant Government agencies upon request.

Identification of an Incident or failure to Comply

Evidence of uncontrolled and inappropriate waste generation during site inspections.

Waste storage containers/facilities containing inappropriate and/or mixed wastes.

On-site disposal of wastes, which are required to be taken off-site for disposal.

Generation of water pollution and/or air pollution from on-site waste storage.

Open burning of waste products.

Inappropriate off-site disposal of waste materials.

Corrective Action

Ensure area/activity compliance with the waste management procedure.

Recovery and removal of wastes disposed of on-site to appropriate off-site facility.

Ensure appropriate containment and storage of specific wastes likely to generate secondary pollution.

Recovery and approved disposal of wastes taken off-site and inappropriately disposed of.

Clearly identify the open burning prohibition for all on-site activities.

**Responsible
Person
Resourcing**

/ The PM will ensure appropriate recovery, recycling and disposal of all wastes generated on-site.

The SM will ensure that waste storage and disposal activities comply with site guidelines and are approved by the CSM.

The EC will ensure the waste management inspections are undertaken and reported to the SM with observations and recommendations.

The EC will ensure that the cumulative waste records are maintained and updated.

4.3 DISPOSING OF WASTE AND RECYCLING OF MATERIALS

Excess waste concrete from mobile concrete agitators, concrete pumping equipment or concrete kibbles will not be washed down, spilled or disposed of onto established Council road reserves or into stormwater drainage. The washing of concrete equipment will occur in a designated area of the site. Runoff will be contained within the site sediment basin and not drain into Council stormwater.

Building waste will be placed in bins located around the site and removed by a waste disposal contractor. The waste disposal Contractor will sort steel, concrete, timber, other bulky building waste, cardboard, paper and plastics from general waste and transport to appropriate recycling facilities or land fill sites.

Rubbish skips/bins will be placed at appropriate locations within the site and not on existing council infrastructure. Recyclable or general waste will not be deposited on public areas around the site.

4.4 MATERIAL STORAGE AND STOCKPILES

Due to the cut/fill design approach adopted for the site, it will not be necessary to remove or import excavated material from the site. Excavated material from detailed earthworks will be placed on stockpiles that have been established during the bulk earthworks construction phase.

Material deliveries will be stock piled, in designated areas of the site in close proximity to where they will be used, thus reducing materials handling time.

4.5 HAZARDOUS MATERIALS MANAGEMENT

In the event of an emergency incident, the procedures contained in the Occupational Health and Safety Plan take precedence over this procedure.

Aim:

To prevent environmental impacts arising from the improper management of hazardous materials.

Responsible Person: Environmental Manager

Actions:

1. Minimise chemicals stored on-site.
2. Make staff aware of emergency phone numbers to use in the event of a spill.
3. Keep Material Safety Data Sheets (MSDSs) on site at all times.
4. Keep clearly marked booms and/or absorbent material on-site to contain spills if they occur.
5. All containers of fuel, oil and hazardous chemicals must be stored in covered, bunded areas. Bunded storage areas shall have volumes not less than 120% of the largest container. The floors of bunded areas must be constructed of impervious material and graded to a collection sump. Suitable areas must be erected along bund walls to prevent elevated storage tanks and drums from falling outside of bunded areas.
6. All hazardous chemicals, except flammable liquids, must be stored in a lockable area.
7. All materials are to be used in accordance with relevant MSDSs only.
8. Refueling of vehicles and construction plant shall not be carried out without an operator or driver being in attendance at all times.
9. Contaminated water collected in bunded areas is to be pumped out and disposed of by an EPA licensed hazardous waste disposal contractor.

Performance Outcomes:

The following performance indicators will establish that this procedure is being effectively implemented.

1. Incidences of spills and personal safety risks are avoided.
2. All hazardous materials and dangerous goods are properly stored, handled and disposed of at all times.
3. Staff are aware of emergency procedures.

Reporting, Review and Corrective Actions:

If any of the above performance outcomes are not achieved:

- the specific non conformance or event must be properly investigated and if necessary, these procedures must be revised; and
- the event, investigation and any actions taken must be reported to the Project Manager.

Section 5 - Sediment and Erosion Control

5.1 DUST CONTROL

The primary causes of dust associated with the site will be either from high wind velocities, the filling/tipping of trucks, stockpiling of material, detailed excavation activity, concrete placement, or vehicles driving across exposed earth.

Working areas, access roads, ramps and stockpiles will be kept sufficiently damp by use of water carts to prevent wind blown or traffic generated dust. Vehicle speeds will be kept to 10km/h with access roads sealed or constructed using an all weather surface consisting of road base or similar to minimise vehicle generated dust.

The tailgates of trucks transporting excavated material will be securely fixed prior to unloading and loading, with truckloads covered from immediately after loading until immediately prior to unloading to prevent wind blown emissions and spillage.

Areas where excavation or landscaping is required will be maintained or undisturbed for as long as possible. When exposed, all bare earth areas will be stabilised, built on or landscaped as soon as practical to reduce wind blown dust.

Prevention of Spoil & Dust Entering on Public Roads

The transportation of mud and dirt from the site will be minimised by the use of defined access and haulage routes. All vehicles departing the site will use wash down facilities and exit over cattle grids installed at the site access. The runoff from the washdown facilities will be directed towards sediment basins within the site. Flow paths will be monitored on a regular basis to ensure collection.

5.2 AIR QUALITY MANAGEMENT

Air quality aspects associated with construction activities are to be managed. The potential impacts include:

- Dust generation from construction activities; and
- Emissions from the construction vehicles.

These impacts will be controlled in accordance with the POEO Act 1997 and NEPM Air Quality Standards.

The following procedure outlines the air quality strategies to be adopted during demolition, land development and construction activities associated with WGC.

Environmental Policy

The generation of TSP from on-site land developing activities including site demolition, site development and construction will be minimised through implementing control measures, ensuring that there is no off-site impacts to the community and the surrounding environment.

Performance Criteria

Minimal community complaint relating to dust emissions.

TSP concentrations not to exceed 260 $\mu\text{g}/\text{m}^3$ (24hr average)¹, 90 $\mu\text{g}/\text{m}^3$ (annual average).

Mitigation Strategy

- Site Establishment

Vehicle corridors will be clearly identified and restricted to control vehicle access on site.

- Construction

Construction activities will be staged to control dust generation on-site and to minimise areas of disturbance.

Land stripping (if required) will be staged to minimise exposed areas and dust generation on site.

Stockpiled topsoils and rubble will be restricted to 4 meters high.

Fixed and mobile (water tanker) water sprays will be used to suppress dust emissions from active work areas and transport corridors where required.

Dust generation activities will be limited during moderate to high wind velocity periods (i.e. >5m/s). Water spray usage will increase during these periods.

Vehicles will be maintained in good working order with exhaust directed away from the ground. Vehicle speed on site will be limited to a maximum speed of 40km/h to minimise the potential for dust emissions.

Vehicle corridors will be clearly identified and restricted to control vehicle access on site.

Topsoil for use in landscaping or land rehabilitation will be stockpiled on site for no longer than 4-6 months. Topsoil stockpiled onsite for longer than 2 months will be covered where possible.

All equipment used on site will be effectively maintained to reduce smoke and particulate emissions.

Open abrasive blasting will not be permitted on site. Approval from the SM will be required prior to abrasive blasting on site.

Open spray painting will not be permitted on site. Approval from the SM will be required prior to abrasive blasting on site.

Site areas which have been completed or are not to be disturbed for extended periods will be stabilised with either the ultimate seal (or grass) or have temporary seal coat applied.

No open air burning/pit burning of cleared vegetation is to occur on site.

Vehicle engines will be turned off whilst not in use (no long periods of idling).

Monitoring

Continuous visual monitoring during demolition and construction activities.

Reporting

The effectiveness of construction site dust control measures will be reported to the PM by the SM on a weekly basis. The report will indicate corrective action taken (if required).

Identification of an Incident of Failure to Comply

Visual observations confirm excessive dust emissions.

Monitoring results confirm exceedances of performance criteria.

Community feedback received concerning excessive dust emission or adverse impact on amenity.

Corrective Actions Identification of activities creating excessive dust emission resulting in an operational review, modification of activity, increase in dust suppression activity or cessation of the activity due to adverse impacts.

If monitoring results exceed performance criteria without any control activity being identified, a general overview of the demolition or construction activity will be undertaken to identify major air emission sources and to increase the controls applied to these areas.

Increase water spray suppression of exposed areas particularly during advised weather conditions.

Seal unsealed areas available for access and/or generation of wind blown emissions, as required.

Responsible Person Resources

/ The PM will ensure the site demolition and construction activities comply with the air emission performance criteria.

The PM will view the reports and monitoring reports to ensure compliance.

The SM will ensure all site activities are undertaken in a manner, which will minimise dust emissions.

Where required the EC will ensure the air quality monitoring is undertaken in accordance with EPA guidelines, results are obtained and reviewed in a timely fashion and that appropriate controls are applied.

The EC will receive and respond to community feedback.

5.3 SURFACE WATER MANAGEMENT

The surface water runoff from storm events during construction activities will be managed to avoid erosion sedimentation.

Surface water management is controlled under the POEO Act 1997. The following procedures outlines the strategies to be adopted for the demolition, development and construction activities undertaken by the Contractor.

Environmental Policy

Erosion and sedimentation will be controlled during the demolition, site development and construction activities to minimise on-site and off-site land management impacts.

'Clean' surface waters both on-site and from off-site will be separated from potentially 'dirty' water to minimise contamination of waterways and land.

Performance Criteria

Uncontaminated surface flow from off-site areas will be diverted around the development site.

pH of water leaving the site will be in the range of 6.5-8.5.

Suspended solids in water leaving the site will be less than 50mg/l.

There will be no visible oil and grease discharge from the site.

Mitigation Strategy

Stockpiles of construction materials will be screened and/or banded to prevent soil from being washed off site.

On-site vegetation will be removed only as required.

Exposed areas of the site will be minimised where possible.

Soils will be stockpiled for not greater than 4-6 months during the land development phase, and will be restricted in height to 4 metres.

Revegetation of exposed areas will be undertaken as required.

Temporary drainage systems will be established to divert clean waters around the land development areas as appropriate.

Temporary erosion control and sedimentation devices (haybales etc) will be located down gradient of the water flow pathway as required.

Erosion and sediment control procedures are to be undertaken in accordance with NSW Department of Housing's *Managing Urban Stormwater (1998)*.

Potential contaminant sources (oil, chemicals, diesel fuel) will be separated from surface water flows by appropriate storage and bunding

Monitoring

A daily inspection of the construction site will be undertaken by SM to confirm the operational status of the erosion and sedimentation facilities on site.

An inspection of the erosion and sedimentation facilities on site will be undertaken by the SM immediately following (or during) a 10mm or more rainfall event to confirm operational adequacy of the facilities.

Reporting

The effectiveness of the construction site surface water control facilities will be reported by the SM to the PM on a weekly basis, together with any corrective action taken. The effectiveness of the surface water control facilities during rainfall events will be reported to the PM on the day of the inspection together with any corrective action taken.

Identification of an Incident or Failure to Comply

Visual observations reveal excessive suspended particulate and/or oil and grease within off-site discharge.

Inspections reveal excessive sediment accumulated at on-site control facilities.
Water monitoring results confirm exceedances

of performance criteria.

Inspection of off-site watercourses reveal excessive accumulation of sediments.

Corrective Action Rectification of damaged erosion and sedimentation control facilities.

Removal of accumulated sediments from control facilities.

Review and rectification of bunds and screens.

Installation of additional sedimentation control facilities.

Repair of scouring in drains or dams.

Responsible Person / Resourcing The PM will ensure the site construction activities comply with the site surface water control performance criteria.

The SM will ensure all on-site erosion and sedimentation control facilities are maintained and operational.

5.3.1 Discharging Water

When disposing of rainwater collected in open excavations the preferred method of disposal is irrigation over grassed or other vegetated areas.

Ensure that:

- The water is monitored prior to discharge as set out in the “monitoring” requirements of Section 2.6 – Surface Water Management;
- The discharge does not result to soil erosion; and
- There is no surface run-off to waterways or the stormwater system.

In urban environments the above method of disposal will be unavailable and the usual disposal method will be disposal to stormwater systems in accordance with *Managing Urban Stormwater* (NSW Department of Housing, 1998). In this case appropriate controls must be implemented to ensure only **clean** water is discharged to the stormwater system. Controls include:

- The water is monitored prior to discharge as set out in the “monitoring” requirements of Section 2.6 – Surface Water Management.
- It is recommended that the Environmental Protection Authority be contacted prior to discharge for any site specific advice.
- Attaching a float to the end of the pump suction line to ensure that settled material at the bottom of excavations is not discharged together with clarified water to the stormwater system.
- Filtering pumped discharges through a sediment barrier such as geotextiles fabric. Any sediment entrapped behind such barriers needs to be properly disposed of or put back into the excavation.
- Discharging water through a filtration unit. The construction of a typical unit is detailed below.
- Discharging only the top clarified portion, and tinkering the remainder to a treatment facility. Alternatively, for very dirty water the whole lot can be tinkered away to a treatment facility.
- Leaving bottom slurries in excavations for subsequent covering with sand, or if necessary, removing them in sealed containers to acceptable and proper disposal locations.

- Pre-flocculating before using any of the above methods when dealing with very fine solids such as clay and silt (see Section 2.6.2 – “Flocculation”).
- Wastewaters which are still “dirty” or contaminated should not be discharged to stormwater systems, but instead collected and properly disposed.
 1. Water should not be discharged to the stormwater system if oil is visible on the surface, or if there is reason to suspect that the pit is contaminated with fuel, sewage or other contaminants. In this case the water should be tinkered away to an oil separation facility (such as Lidcombe Liquid Waste Facility); and
 2. Discharges to sewer need to be in accordance with a valid trade waste agreements issued by Sydney Water (or the relevant Water Authority in the area).
- Filtration units (if required) can be constructed from skips appropriate to the pumping rate (usually ~10m³ will be sufficient). Place approximately five alternate layers of geotextile fabric and 75mm blue metal in the skip. The water is pumped in at the top (with flocculation when required) and exits into a tube attached to a hole at the bottom of the skip.

5.3.2 Flocculation

- Excavations containing extremely “dirty” water (or water containing non-settleable solids – very fine soils such as clay or silt) can first be dosed with a flocculating agent to assist with the settlement of particulate matter.
- The use of gypsum as a flocculating agent is preferred because it is environmentally benign.
- Gypsum should be applied at a rate of about two kilograms per 100 cubic metres of water.
- The gypsum is to be applied by spreading it evenly over the surface by hand. A period of at least three hours (preferably 12 hours is usually required) prior to pumping out of dosed waters.
- Mixing improves the performance of the gypsum. For sediment-laden waters, which prove difficulty to flocculate effective mixing of the gypsum can be achieved by dosing

gypsum powder in the pits, pumping the dosed water into a truck-mounted tank with a simple mixing apparatus and then returning the mixed water back to the pits. To ensure effective settling, only the water above the bottom settled material layer should be pumped from the excavations.

5.4 SEDIMENT & EROSION CHECKLIST

The following checklist will be complied with to ensure all sediment and erosion controls are in place:

- Sediment basins to be installed and operated in accordance with the standard design.
- Construction works phased to confine land disturbance to a manageable size.
- Sediment fence erected around the western perimeter of all the sediment basins.
- Diversion banks are to be constructed at the upstream boundary of construction activities to ensure runoff is diverted around exposed areas.
- Catch drains to be constructed at the downstream boundary to ensure sediment laden runoff is contained and diverted to treatment areas and not allowed to flow over undisturbed areas or into existing drainage.
- Devices such as hay bales, silt fences and sandbags are to be provided along catch drains to slow flow, reduce scour and capture sediment from the runoff.
- Stockpiles are to be located on flat or gently sloping land, away from drainage lines.
- All undisturbed areas are to be fenced off to prevent access during construction.
- Diversion pipelines, catch drains and silt fencing are to be installed prior to any upstream surface areas.
- All sediment and erosion control measures are to be inspected on a weekly basis.

- Regular maintenance of all controls and de-silting of any structures as required.