Bonnyrigg Living Communities Project

Stage 1

Environment & Construction Management Plan

May 2008

Amendment 1

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COMMERCIAL IN CONFIDENCE

TABLE OF AMENDMENTS

Amendment No.	Section Affected	Description of Amendment
1	**4.24 Water Quality**	**4.24.4 Work Instructions** Additional bullet points in Water Quality Management section under Work Instructions

*Amendments shown in red

1 INTRODUCTION

1.1 PURPOSE

This Environment and Construction Management Plan (ECMP) has been prepared to set out the environmental management requirements for the construction of Stage 1 of the Bonnyrigg Living Communities Project (BLCP). The ECMP forms a practical field guide to the types of measures, timing of implementation, responsibilities of concerned parties and monitoring of the works and control measures.

This ECMP addresses the Environmental Assessment Requirements (EARs) set out by the New South Wales Department of Planning (DoP) in respect to the construction of BLCP.

1.2 AIM OF THE ECMP

The aim of this ECMP is to set out the environmental protection measures and construction requirements to be implemented prior to and during the BLCP construction works in order to avoid or minimise impacts both on-site and off-site. An ECMP detailing the operation and maintenance requirements has also been prepared and should be referenced for post construction issues.

The intended environmental outcomes of the ECMP are to:

I. Avoid environmental impacts, where possible;
II. Minimise those impacts that are unavoidable; and
III. Provide long-term enhancement of the local environment.

The ECMP sets out the environmental goals and range of management measures required throughout the project.

The contractor shall use this ECMP as a critical reference in the preparation of a job-specific Environment and Construction Method Statement for individual activities, (including Project Inspection Test Plan (PITP) and checklists) hereinafter referred to as the Contractor's ECMS (CECMS).

The superintendent shall use the ECMP and CECMS as critical references when inspecting all works, under construction and completed, by the Contractor.

1.3 BACKGROUND AND PROJECT DESCRIPTION

The Bonnyrigg Living Communities Project (BLCP) is a suburban renewal project that will incorporate a redevelopment of the existing Department of Housing area located at Bonnyrigg in Sydney's western suburbs. The project aims to make the Bonnyrigg area a safer and more appealing place to live and will do this by improving services and providing residents with better opportunities within their local community.

The development works of the overall project will include:

- The demolition of structures, including dwellings, roads and services;

- bulk earthworks;
- new streets;
- retention of existing streets;
- stormwater management works and utility services;
- public domain improvements including new parks as part of a network of landscaped public open spaces and street trees; and
- construction of new dwellings in the first stage of a staged master plan.

1.4 SITE DESCRIPTION

The BLCP site occupies an area of approximately 80 hectares and is located 30 km west of the Sydney CBD. The Concept plan study area is bounded by the existing residential suburbs of Edensor Park, St Johns Park, Bonnyrigg Heights and Mt Pritchard. The Concept plan site area is defined as being located between Edensor Road to the north, Elizabeth Drive and Cabramatta Road to the south, Humphries Road to the east and Bonnyrigg Avenue to the west. The existing site comprises of predominantly low-density residential housing, with the majority owned by the State's Department of Housing (DOH). Medium density housing is also found within the subject site.

1.5 LEGAL AND REGULATORY FRAMEWORK

All activities carried out on site must comply with the relevant provisions of all legislation and regulations relating to the proposed works. Since then, new legislation has come into force, which must also be considered. As a result, relevant legislation includes the:

- Protection of the Environment Operations Act, 1997 (POEO Act);
- Local Government Act 1993;
- Environmental Planning Legislation Amendment Act 2006;
- Heritage Act 1977;
- Environmental Protection and Biodiversity Conservation Act 1999;
- Threatened Species Conservation Act 1995 (TSC Act);
- Waste Avoidance and Resource Recovery Act 2001;
- Building Code of Australia (BCA);
- Relevant Australian Standards; and
- Waste Management Act 2000.

1.6 QUALITY ASSURANCE

All tasks undertaken in relation to the project whether they be physical construction activities, office duties or procedural tasks; are to be undertaken in accordance with:

- Suppliers and contractors shall provide assurance of the quality of all goods, materials and services to be provided; and
- All materials and works are to be undertaken to the manufacturers specification or industry standards

1.7 AMENDMENT OF THE ECMP

This ECMP may be updated or amended prior to or during the course of construction, subject to the approval of Bonnyrigg Management.

2 ENVIRONMENTAL OBJECTIVES

2.1 GENERAL OUTCOMES

The general outcomes for the project are:

- That the construction work complies with all relevant legislation; and
- That the works be undertaken such that all environmental and construction objectives are achieved; and
- Compliance with the criteria and safeguards as specified in the various planning and approval documents; and
- The environmental parameters set in the Developments Conditions of Approval, tender documents and regulatory agencies requirements are adhered to.

2.2 ENVIRONMENTAL OBJECTIVES

The objectives for each of the environmental components of the project, relevant to the construction work, are outlined in Table 1. More specific objectives will be provided in each Environmental and Construction Management Plan (see Section 5).

NB: The objectives provided in this section are an overview.

Table 1 Environmental Objectives

Element	Objectives
Access, Egress, and Compound Management	• To minimise the disruption to the local traffic network and allow the safe management of pedestrian and vehicle traffic throughout the duration of the project.
Civil Structures	• To provide infrastructure that facilitates the development of the site
Demolition and Waste Management	• To Minimise environmental impacts and provide for remediation work that will ensure that the site is acceptable for the intended future land use
Dust Management	• To undertake the construction works so that airborne dust is not a nuisance to residents.
Electrical System	• To provide a temporary and permanent electrical supply to maintain power to all privately owned residences throughout the development as shown in the engineering drawings.
Excavation Works	• To provide the regrading of the site in accordance with the development requirements and with minimal disturbance.
Flood Mitigation contingency	• To reduce the potential impacts on the environment and construction processes during flood storm events.
Flora	• To rehabilitate disturbed areas in a manner which sustains the existing species diversity, abundance and distribution of the vegetation communities found in the Bonnyrigg area.
Sewer and Water Management Plan	• To provide protection to Sydney Water's existing and proposed infrastructure.
Hazardous Materials Storage	• To safely store and use various hazardous materials as required for the construction work.

Table 1 Environmental Objectives (Continued)

Noise	• To minimise noise impacts on residents.
Occupational Health and Safety	• To control the construction processes and working environment to reduce Occupational Health & Safety incidents and accidents to employees, contractors and visitors.
Odour Control	• To minimise the potential for odours impacting on residential properties • To undertake the construction works so that air emissions are minimised
Rip rap	• To address scour, aesthetics, flood flows and access for the development.
Saline Soil Management	• To undertake the construction works so that the salinity and erosion potential resulting from exposure due to the earthworks operations is controlled and minimised, if encountered.
Soil & Water Management	• To minimise erosion and the risk of sediment and other pollutants being carried from the site by stormwater run-off.
Soil Contamination	• To ensure that remedial works are undertaken to make sure that the site is acceptable for the indented future land use
Topsoil Management	• To stockpile topsoil separately to enable later re-use of the material.
Traffic Management	• To ensure that road users are able to travel through, past or around work sites safely. • To ensure that workers are protected in the vicinity of road works.
Waste Management	• To minimise disposal of excess material and to remove all waste from site to appropriate facilities.
Water Quality Management	• To monitor throughout the construction the water quality entering and leaving the site

3 PHASING REQUIREMENTS

3.1 PRE-CONSTRUCTION PHASE

Prior to start of construction on-site, licenses and approvals and staff training are required, as set out below.

3.1.1 Approvals / Permits

The specific license or permit requirements for project activities will be the responsibility the Project Manager and the Contractor. The Contractor will abide by all approvals and permits.

3.1.2 Training

Prior to commencing construction activities, all of the Contractor's employees shall attend a project induction workshop carried out by the Contractor. This shall be documented and all participants are to sign an attendance sheet. Typically, the workshop would cover environmental aspects of the project, including the major environmental hazards, environmental management responsibilities (under the *Protection of the Environment Operations Act 1997* and as set out in this CECMS), the main proposed in-site controls and the reporting procedure for any incidents.

3.1.3 Preliminary Construction (Compound Establishment)

The site compound shall be located as far away as practical from any residences and any defined watercourse. The compound area shall be clearly marked out prior to any establishment activities. All necessary erosion and sediment controls for the compound site, in the form of drains and sediment fences, shall be installed prior to site establishment of the compound. Noise attenuation devices, if required shall be installed and protection provided to any existing sewer carriers or service mains, which traverse the site.

3.2 CONSTRUCTION PHASE

The specific details and their mitigation measures are contained within the individual plans and programs of the ECMP in Section 5. The following construction sequence is provided as a guide for implementation during the course of the works.

Allowance must be made for the servicing and access requirement for all of the privately owned dwellings during the staged construction processes.

3.3 POST-CONSTRUCTION PHASE

All temporary measures including erosion control measures shall be removed as directed by the Superintendent.

4 ENVIRONMENTAL AND CONSTRUCTION MANAGEMENT PLANS

This Section of the ECMP lists each relevant plan of construction and discusses how they are to be addressed to obtain the best possible environmental outcome and required construction detail as necessary for this project.

4.1 WORKS METHOD STATEMENT

Due to the complexity of a community renewal project the works have a number of constraints that need to be addressed, namely:

- the retention of live services to existing residents during the demolition and construction process;
- management of access, traffic, drainage and utility services during the staging of works; and
- the control of environmental and engineering risks during the various stages of the project within the existing watercourse in the Central Reserve.

This lists each relevant plan of construction and discusses how they are to be addressed to obtain the best possible environmental, amenity, engineering, economic outcome and required construction detail as necessary for this project.

4.2 ACCESS, EGRESS AND COMPOUND MANAGEMENT

Access and egress management involves the control of the construction, visitor vehicle and pedestrian movements both external and internal of the site.

Where required, the entry / exit to the site is to be protected by a vehicle shaker-pad and ramp together with a wash down area to prevent sediment from being tracked onto public roads.

Compound management relates to the control of work access, vehicle movements, site facilities and amenities and the impact on neighbouring residents.

4.2.1 Environmental Issues

The main concerns with access, egress and movement of vehicles and pedestrians within and around the site are:

- Control of working movements and areas;
- reduction in vandalism; and
- control of noise and dust generation and mud tracking.

4.2.2 Compliance and Best Practice Regulations

The requirements of the access, egress, and compound management are related to statutory requirements and engineering best practices. An outline of issues that are to be addressed include:

- Occupational Health and Safety Act and Regulation (2000);
- Traffic management of vehicles entering and leaving the site in accordance with Australian Standard 1742.3 – Manual of uniform traffic control devices – Traffic control devices for works on roads – (2002);
- site access control;
- dust and noise control;
- erosion prevention;
- removal of sediment from runoff prior to leaving the site;
- provide a designated office and compound area; and
- all works and materials associated with the access gates and fencing shall be undertaken in accordance with the relevant AS 1725. – Chain-link fabric security fencing and gates – (2003).

4.2.3 Environmental Goals

The aim of the access, egress and compound controls is to:

- ensure the safety of on site and off site persons;
- prevent unauthorised access to the site; and
- reduce environmental issues/impact.

4.2.4 Work Instructions

The access, egress and compound management shall allow for:

- The installation of a 1.8 m high man proof fence and associated gates as shown on the engineering plans for the entire perimeter of each stage including the compound area;
- the installation of appropriate signage as detailed in the engineering plans and required under statutory requirements;
- progressively adjust the fence line and compound area as require;
- the perimeter fence is to removed from site upon completion; and
- the compound is to provide the required site facilities in accordance with the OH&S Act, including amenities, facilities and offices.

4.2.5 Responsibility

It is the Contractor's responsibility to ensure that access, egress, compound and other fencing or related Occupation Health and Safety issues are installed and maintained for the entirety of the contract. The fencing is to be checked by the contractor on a daily basis during construction works.

The Contractor is to include traffic management, in accordance with Australian Standard 1742.3. The Contractor shall make use of their own traffic management plan if necessary, to ensure access, signage and traffic management is in accordance with the contractors program.

The Superintendent may order all works to cease or be restricted to certain access and egress points until such time as the fencing and associated signage has been installed to his satisfaction.

4.3 CIVIL STRUCTURES

The construction, testing and maintenance of culverts, pits, retaining walls, gross pollutant traps, and footpaths will be constructed as detailed on engineering plans. The works associated with these structures including the excavation and backfilling, supply of all necessary items, bedding, laying, jointing necessary pipes, junctions, and sundry equipment or activities required for the installation shall be undertaken by the contractor.

4.3.1 Environmental Issues

The structures required as part of this project provide for:

- future development of the site;
- the movement and control of stormwater through and around the site;
- elevating the surface level of the lots above the 100-year ARI flood level;
- pollution control measures; and
- Pedestrian and cycle access through the site.

4.3.2 Compliance and Best Practice Regulations

Below is outline of some of the compliance and best practice requirements of the civil structures associated with the development.

- Suppliers and contractors shall provide assurance of the quality of all goods, materials and services to be provided and installed in accordance with the manufacturers specification or industry standards.
- Suppliers and contractors will require a quality assurance system complying with elements of AS/NZS ISO 9001.
- All works are to be undertaken in accordance with the relevant Australian Standards or Building Code of Australia (BCA).
- The testing or certification of the civil structures shall be undertaken and provided to the superintendent for all structures.

4.3.3 Environmental Goals

The aim of the structures are to provide facilities that permit the development of the site in accordance with the requirements outlined in the conditions of the Development Approval or as required following discussions with regulatory bodies.

4.3.4 Work Instructions

The location, size, levels, grade and details of all structures shall be determined from the details as shown on the engineering plans.

Where structures are proprietary products then the installation, testing and maintenance of the structures shall be in accordance with the industry standards and manufacturer's requirements and specifications.

4.3.5 Responsibility

It is the Contractor's responsibility to ensure that all materials, work practices, finishing and testing are supplied and implemented to provide for the structures as required on the engineering plans. The Superintendent may order all works to cease until such time as any particular structure/s has been constructed or rectified to his/her satisfaction.

4.4 DEMOLITION AND WASTE MANAGEMENT

The demolition of structures from the site involves the demolition, removal and restoration of areas affected by improvements. The removal of waste from the site relates to locating and removing all inert, solid, domestic or building waste from the site. During demolition works only appropriately licensed sub-contractors are to be used to undertake the required work.

4.4.1 Environmental Issues

The aim of demolition and waste management is to:

- provide a site that can be developed in accordance with the intended land use;
- the safe removal of any dwelling building and services in accordance with the relevant best industry practices; and
- Re-cycle any surplus soil, excavated or demolished material wherever practically possible.

4.4.2 Environmental Goals

The aims of the demolition and waste management practices are to:

- ensure that the site is acceptable for the intended future land use;
- provide for remediation work to be carried out for any possible contaminated areas;
- minimise environmental impacts upon adjacent or local residents or neighbours; and
- ensure waste material is sorted and offered for re-cycling.

4.4.3 Work Instructions

The demolition and waste material to be removed include:

- existing structures, houses, sheds and buildings;
- existing improvements, fences, walls;
- existing services and conduit;
- sanitary systems and other pipes located on the site;
- existing waste, inert and solid dumped on the site; and
- existing building, household and vehicle waste dumped on the site.

All waste will be disposed of at appropriate re-cycling facilities and/or a lawful waste disposal facility.

Site inspections for possible contamination following demolition shall be programmed on a daily basis. Plant operators are to be aware of potential contamination sites and to advise of any possible finds.

Where buried material is discovered during the any earthworks during the development the superintendent shall be notified immediately and the material removed within 24 hours notice of the superintendent's approval.

4.4.4 Responsibility

It is the Contractor's responsibility to demolish and remove from the site, any designated improvements and dumped waste. They are to ensure that the finished site contains no deleterious matter that will impact upon the works as required as part of the development. The contractor is required to make an extensive investigation of the site, including potholing if necessary to confirm the possible sources of deleterious or debris material.

The reuse of inert material on the site shall be at the discretion of the superintendent and the principal appointed environmental consultant. The assessment and time costs associated with the reuse of the material on site shall be borne by the contractor.

As described in Soil Contamination the Contractor is to liaise with the principal appointed environmental consultant to ensure a timely approach to the assessment and if need be re-mediation of any contaminated material. The Contractor is also to make allowances in their construction program for reasonable time delays associated with the investigation and re-mediation of soil contamination.

4.5 DUST MANAGEMENT

Dust management involves the control of construction processes and stabilisation to reduce air pollution thus reducing potential nuisances to surrounding properties.

4.5.1 Environmental Issues

The main source of dust generation is likely to result from:

- The excavation of material as part of the construction process;
- construction vehicle emissions and dust;
- transportation of material; and
- vegetation removal.

4.5.2 Compliance and Best Practice Regulations

All construction activities shall be managed in accordance with the POEO Act (1997). Dust emissions from exposed soil areas and stockpiles must comply with the requirements of the Blue Book.
The reduction of source extent and the incorporation of process modifications or adjusted work practices are preventative techniques for the control of fugitive dust emissions and should be reviewed as the project proceeds.

4.5.3 Environmental Goals

The aim of dust management practices is to:

- Reduce potential nuisances to surrounding properties and residents;
- controlling working process;
- controlling plant, contractors and sub-consultants; and
- stabilise disturbed areas as soon as possible following completion of works.

4.5.4 Work Instructions

Dust generation / air pollution shall be minimised by:

- Spraying exposed soil areas with water to suppress dust;
- formalising road routes and ensuring traffic do not deviate from these tracks;
- minimising the area of exposed surfaces where possible;
- ensuring site material is not carried onto public roads by vehicle tyres;
- stabilising the completed earthworks by turfing, seeding and plant establishment;
- using wet suppression on material being handled;
- using wet suppression on stockpiles to achieve a suitable moisture content together with seeding and or covering where necessary;
- ensuring all trucks cover their loads;

- using wet suppression to achieve a suitable moisture content and limiting traffic to 15 km/h speed limits or closing the site on high risk days;
- the seeding of all disturbed areas as soon as practicable;
- limiting the volume of construction machinery working in one area at the same time
- regularly maintaining machinery for maximum efficiency; and
- minimise unnecessary movement of machinery on site.

Excavation, stockpiling and backfilling operations will be programmed on a daily basis. Stockpiled material shall be watered to minimise dust emissions.

Dust generation shall be observed on a daily basis during construction works. The Contractor shall suspend dust-generating activities during periods of high winds.

Dust deposition and concentration shall be continually monitored throughout the construction period by a principal appointed environmental consultant. Feedback from the consultant will include comment on practices being utilised by the contractor, and where practical the contractor will revise their practices.

Consultation with residents will also be required to ensure nuisance to these properties is kept to a minimum.

4.5.5 Responsibility

It is the Contractor's responsibility to ensure that dust mitigation practices are implemented and revised where necessary to reduce the volume of dust generated. Vehicle emissions are the responsibility of the individual machine operator under the direction of the Contractor. The Contractor is to liaise with the environmental consultant.

It is the environmental consultant's responsibility to provide feedback and advice to the Contractor on an ongoing basis to ensure that dust generation does not exceed the predicted volume of the above mentioned dust report.

The Superintendent may order all works to cease until such time as any particular dust nuisance has been controlled to his satisfaction.

4.6 ASBESTOS MANAGEMENT

4.6.1 Environmental Issues

The primary risk related to the management of asbestos contamination on site is the potential exposure of site workers and members of the public to airborne asbestos fibres. Due to the nature of the effects that can be caused by the inhalation of these fibres it is important that precautions are taken to minimise the risk of allowing the possible dispersion of the material.

4.6.2 Compliance and Best Practice Regulations

All asbestos management activities shall be in compliance of the:

- Occupational Health and Safety Act 2000; and
- Occupational Health and Safety Regulation 2001.

The following documentation shall also be observed throughout the process of asbestos related activity:

- Code of Practice for the Safe Removal of Asbestos [NOHSC: 2002 (1998)]; and
- Guide to the Control of Asbestos Hazards in Buildings and Structures.

The Code of Practice and Guide referred to above are known collectively as the Worksafe Code of Practice and Guidance Notes on Asbestos. They are specifically referenced in the Occupational Health and Safety Regulation 2001 and are to be strictly adhered to throughout any remediation works. Under the Regulation, the Worksafe Code of Practice and Guidance Notes on Asbestos are the minimum standards for asbestos removal work.

4.6.3 Environmental Goals

The aim of asbestos management is to reduce the risk of fibrous cement fragments, that potentially contain asbestos, being inhaled by both employees and the general public. Detection strategies shall be implemented to ensure adequate mechanisms and procedures are in place to identify potential asbestos and asbestos containing materials.

If any asbestos products are found on site a licensed asbestos removalist, in accordance with the previously mentioned requirements, must remove them.

4.6.4 Work Instructions

Work instructions regarding the removal of harmful asbestos fibres and products must adhere to the relevant legislation and the following requirements:

- Restricting Access to the work area using a physical barrier around the perimeter;
- The deployment of a decontamination unit;
- Decontamination procedures for personnel; and
- The use of protective clothing and equipment.

During asbestos work the Contractor shall conduct monitoring for airborne asbestos fibres. The results of this monitoring can be used to:

- Identify failures in containment;
- Identify poor work practices; and
- Provide proof of containment for occupiers and regulatory authorities and to provide evidence of good work practices for present and future needs.

4.6.5 Responsibility

It is the Contractor's responsibility to ensure that asbestos detection and removal practices are implemented and revised where necessary to reduce the potential risk of asbestos exposure.

The Superintendent may order all works to cease until such time as any particular asbestos threat has been controlled to his satisfaction.

4.7 ELECTRICAL SYSTEM

The tasks associated with the electrical supply under this section comprises the provision of a temporary and permanent electrical supply from the existing electrical network to the supply points required as part of the renewal process and retained properties.

4.7.1 Environmental Issues

The main issue with the supply of the temporary electrical reticulation is the provision of power to the retained dwellings and site facilities.

4.7.2 Compliance and Best Practice Regulations

The installation of the electrical reticulation associated with the development is to be undertaken in accordance with:

- The relevant Australian Standards;
- Integral Energy's Standards, Specifications and Accredited Service Providers Requirements;
- Integral Energy's General Terms and Conditions; and
- ESSA's Guideline for Design and maintenance of Overhead distribution and Transmission Lines.

4.7.3 Work Instructions

The works associated with the temporary and permanent electrical reticulation include:

- Maintaining electrical service to existing residents;
- removal and disposal of redundant electrical cables and surface fittings;
- installation of light poles;

- provision of undergrounding of existing high voltage transmission currently overhead through the site;
- excavation and backfilling of electrical trenches;
- supply, lay and installation of power cables, conduits within a shared trenching arrangement; and
- connection of the power cables to the existing electrical network.

4.7.4 Responsibility

It is the Electrical Contractor's responsibility to ensure that all works are undertaken in accordance with the requirements and details outlined on the electrical reticulation and asset removal plans.

The Superintendent may order all works to cease until such time as any particular electrical reticulation issues has been addressed to his satisfaction.

4.8 EMERGENCY RESPONSE

Emergency response management involves the control and monitoring of the construction processes and environmental incidents to reduce physical, mental or environmental damage to the Contractor or their staff, Superintendent, Certifier, Principal, consultants, neighbours and any other stakeholder related to the project.

4.8.1 Environmental Issues

The main issues regarding emergencies are:

- Injury or death to persons;
- damage to property, both on the site and external of the site; and
- environmental damage.

4.8.2 Compliance and Best Practice Regulations

- Workcover Guidelines and Regulations
- Occupation Health and Safety Act and Regulations
- DEC Guidelines and Regulations
- Statutory acts and regulations
- Industry standards
- Details contained within the development documents

4.8.3 Environmental Goals

The aim of emergency response practices is to:

- Prevent situations that may increase the risk of damage to people, places or property;

- during or following incidents, reduce damage to the person, property or the environment; and
- assess incidents and accidents to reduce the risk of repeat occurrences.

4.8.4 Work Instructions

Emergency response procedures for project construction and operation shall be implemented generally in accordance with the following framework:

Define the problem:

- The immediate problem is identified in order to facilitate a review of available options for short-term action.

Manage the situation:

- The safety of any persons, either workers or others involved in project construction or operation, is the priority.
- Environmental damage is to be quickly minimised. All emergency action shall occur as soon as possible.

After the event:

- The Superintendent shall be contacted immediately once all people are safe and all possible immediate actions to control damage and manage the situation have been undertaken. The DEC shall also be advised if pollution has occurred.
- An action plan shall be prepared to ensure that similar events do not occur. This shall include recording any changes that are required to existing written procedures.
- A rectification plan shall be developed detailing how any remaining environmental effects shall be remedied.
- A full report of the incident shall be prepared.
- The Superintendent shall review the report and act accordingly.

In the event of a chemical or fuel spill or the leakage of waste water of unacceptable quality, a barrier shall be installed around the affected area. The spill shall then be mopped up with a suitable substance such as sand as quickly as possible. The contaminated material shall be collected for disposal at a waste depot licensed to receive such waste. All site workers shall be trained in emergency response so that action can be taken immediately.

4.8.5 Responsibility

The Contractor shall take all precautions against accident, damage to property and injury or loss arising from any cause whatsoever to persons employed by the Contractor, Principal or otherwise. The cost to the Principal of any such damage, injury or loss may be deducted from any monies due to the Contractor on account of this Contract.

The Contractor is to provide detailed information on the emergency response that will be implemented (Incident Management Plan). The Contractor will be required to establish a 24-hour emergency contact phone number and the Contractor will be the primary contact for any callouts to the site.

If an incident occurs on-site, personnel working on the site shall be responsible for following all procedure, including reporting all incidents. All incidents shall be documented and investigated, with action plans prepared or modified to ensure that the event does not re-occur.

4.9 EXCAVATION WORKS

"Excavation" shall mean excavation in all classes of material and shall include the removal of loose earth, sand, clay, all growth and rippable shale other than rock. Provision should also be made for the removal of concrete, masonry pipes, conduits, made ground and any other obstruction, material, matter or substance. These civil works shall be undertaken in accordance with the current Australian Standards, industry practices and relevant statutory authority's specifications.

Excavation for sewer, water, stormwater drainage, electricity and any other service line trenches will be to the correct lines and levels, with allowance for bedding.

4.9.1 Environmental Issues

Attention is drawn to the contents of the following investigations:

- JBS Environmental Report
- Geotechnical Report

4.9.2 Compliance and Best Practice Regulations

The compliance requirements of the excavation works will be determined as part of the Development Application. Outlines of some of the issues highlighted in the Development Application process are:

- Geotechnical constraints and methods of construction outlined in the reports;
- other environmental considerations like noise, dust and pollution control;
- statutory requirements and regulations;
- development application conditions; and
- industry standards.

4.9.3 Environmental Goals

The aim of excavation management practices is to:

- Protect and restore natural system forms/functions;
- provide for the regrading of the site in accordance with the development requirements;
- minimise disturbance;
- minimise works; and
- increase efficiency.

4.9.4 Work Instructions

Excavation works shall entail:

- Initial topsoil stripping, including the organic and non-organic material (refer to Topsoil);
- Following the stripping of topsoil (as specified in Topsoil), and before any excavation, filling or other works are commenced in any area, all exposed silt and other deleterious material which in the opinion of the Superintendent or geotechnical consultant is unsuitable for use as fill material, shall be removed and disposed of as directed by the Superintendent. Minor pockets of unsound material such as earth disturbed by tree stumps, etc. shall be removed;
- Unsuitable materials are typically defined as those materials that can not be used for their intended purpose. However, a more formal definition to be used for these works is;
    - Ground unsuitable for the purposes of the work, including fill liable to subsidence, ground containing cavities, faults or fissures, ground contaminated by harmful substances and ground which becomes soft, wet or unstable.
- Some materials are unsuitable for forming structural fill and should be either removed to spoil or used in non-critical areas.

  The contractor shall include removal of all materials that is not suitable for inclusion in the works from site and shall obtain all necessary approvals and the like from statutory authorities prior to disposal. Removal of unsuitable material shall be at the direction of the Superintendent and on the recommendation of the environmental or geotechnical consultants.

  Material affected by excessive moisture content will not be considered as "unsuitable" unless it can be also classified as per above. When any material is affected by excessive moisture content the approach to be adopted to allow reuse shall be at the contractor's discretion and expense. Methods to dry the material and/or progress the works that the contractor may consider include:

  i) expose to sun and wind in situ or by spreading to allow the material to dry to a moisture content which will allow compaction and the placement of overlying material, and/or
  ii) scarify the material to a minimum depth of 300mm and work as necessary to accelerate drying of the material. Re-compact as specified and at the specified moisture content, and/or
  iii) excavate moisture affected material and replace with compacted select material.

- The areas that have been specified for regrading shall be finished to the levels, with allowance for the topsoil if required. The area shall be graded as shown on the engineering documents without abrupt changes of slope and/or depressions. The regraded surface, after the specified compaction shall present a good true surface, free from rocks, clods and waste of all description.

- Site regrading work shall be carried out as shown on the Engineering plans by cut and/or fill operations and/or by utilisation of surplus approved spoil material to be transported to the fill areas and blended with topsoil material prior to placement.

- If unsound or unsuitable material is encountered at the specified excavation level or in other than minor pockets, additional excavation and its replacement with compacted

approved material may be ordered in writing by the Superintendent. All unsound or unsuitable material excavated in accordance with the provisions of this paragraph shall be disposed of or removed from the site.

- Excavation works in the vicinity of the existing sewer and water mains on the site shall initially be undertaken with plant that ensures that the existing sewer and water infrastructure is not damaged. From this point, all excavation within the zone of influence of the sewer and water mains shall be undertaken with an excavator working from outside the zone.

- When excavating through existing concrete or asphaltic concrete pavements or public roadways, saw cut the pavement to a depth of at least 50mm and then remove the pavement with pneumatic tools. The relevant authority shall be informed at all times prior to excavating.

- When working outside the property boundary of the site ensure that the relevant authority or owner has been notified of the proposed works and has provided authorisation in writing. This authorisation is to be presented to the Superintendent prior to the commencement of these works. All works are to be restored to the relevant authorities / owners and Superintendents satisfaction.

- Excavation works shall be continually monitored in accordance with engineering plans and geotechnical reports throughout the construction period by a suitably qualified consultant. Feedback from the consultant will include comment on practices being utilised by the contractor, and where practical the contractor will revise their practices.

- All areas not subject to construction works shall be retained free from disturbance or damage. Should these areas become disturbed or damaged they shall be reinstated in accordance with Best Management Practices and the Conditions of Approval.

4.9.5 Responsibility

It is the Contractor's responsibility to ensure that excavation works are undertaken in accordance with the compliance, best practices, regulations and environmental issues.

The Superintendent may order all works to cease until such time as any particular works have been controlled to his satisfaction.

4.10 FLOOD MITIGATION – CONTINGENCY

Flood mitigation management involves the control of the floodwater during the construction processes to reduce the potential impacts on the environment and construction processes.

4.10.1 Environmental Issues

The main source of environmental concerns regarding flood mitigation is likely to result from:

- Pollution of downstream water bodies due to sedimentation;
- delays to works due to inundation;
- access across watercourses; and
- damage to landscaping works.

4.10.2 Compliance and Best Practice Regulations

The compliance requirements of flood mitigation are required under:

- Environmental legislation regarding pollution;
- best management practice; and
- industry standards.

4.10.3 Environmental Goals

The aim of the flood mitigation measures during construction is to:

- control flood waters up to the 2-year Annual Recurrence Interval (ARI) storm event;
- reduce the potential of erosion due storm events from upstream flows;
- ensure that the access across the central swale is re-established as soon as possible during or after storm events; and
- Minimise site disturbance due to inundation from upstream flows.

4.10.4 Work Instructions

The flood damage and potential environment risks shall be minimised by:

- providing controlled access points across the central reserve;
- establishing and maintaining growth of the sterile urban and native seed mix contained within the hydro mulch;
- the effectiveness of the stabilised material and access to be checked daily; and
- maintenance of all erosion control measures adjacent to newly landscaped and mulched areas.

4.10.5 Responsibility

It is the Contractor's responsibility to ensure that flood mitigation practices outlined are implemented and maintained as a minimum. The contractor is to assess the potential risk and provide relevant flood management facilities as he determines necessary.

The Superintendent may order all works to cease until such time as any particular flood mitigation control has been installed or restored to his satisfaction.

4.11 FLORA / TREE MANAGEMENT PLAN

The flora/tree management involves the management and control of the construction processes, within the vicinity of the trees identified for retainment. All flora and tree management must be in accordance with the project arborist report.

4.11.1 Environmental Issues

To ensure long term viability of the trees within the development area the protection of the trees and associated restricted construction activities are required to be implemented prior to the commencement of work and maintained for the duration of the construction works.

Where vegetation removal is required, clearance should be confined to the minimum area needed for construction activities. Rehabilitation of disturbed sites shall occur as soon as possible after construction and shall involve re-vegetation in accordance with the Vegetation Management Plan and implementation of erosion and sediment control measures in accordance with the approved Soil and Water Management Plan.

4.11.2 Compliance and Best Practice Regulations

Compliance and best practice regulations for flora/tree management include:

- The *Environmental Protection and Biodiversity Conservation Act* 2000 (EPBC Act);
- The *Threatened Species Conservation Act* 1995 (TSC Act); and
  Schedule 13 of the *National Parks and Wildlife act* 1974 (New South Wales 1974)

The compliance requirements of the flora/tree management will be determined as part of the Development Application.

All works within the drip line of trees to be retained are to be undertaken under the supervision of a suitably qualified Arborist. In this regard, an arborist is to be contacted and given 24 hours notice of the following:

- earthworks in the vicinity of retained trees; and
- exposure of any root system likely to be adversely impacted upon.

4.11.3 Environmental Goals

The aim of tree management practices is to retain all trees in accordance with the arborist report.

4.11.4 Work Instructions

Protection of the trees and associated restricted construction activities are required to be implemented prior to the commencement of work and maintained for the duration of the

construction works. The works involve the placement and maintenance of a para-webbing fencing around the restricted tree protection areas.

- Vegetation shall be progressively cleared in order to minimise the erosion hazard; and
- vegetation clearance will only occur immediately prior to the construction works, and will be restricted to the nominated areas.

Protect all remaining vegetation by ensuring that:

- Chemicals and construction materials are stored in appropriate bunds;
- machinery access is restricted by barrier fencing erected around “NO GO ZONES”;
- all personnel, whether they be employees, contractors, project members or visitors are to be aware of the tree protection zones and the restricted access within and around these areas;
- the restricted access areas are not to be used for the stockpiling of any material or the parking of plant or vehicles;
- the tree protection measures shall be observed on a daily basis during construction works; and
- limitations on compaction to ensure effective vegetation establishment of disturbed parkland areas.

4.11.5 Responsibility

It is the Contractor’s responsibility to ensure that tree protection measures are installed, maintained and eventually removed upon approval of the superintendent.

4.12 SEWER AND WATER MANAGEMENT PLAN

4.12.1 Environmental Issues

Damage to existing Sydney Water gravity sewers, increases the risk of egress of sewage and odours from those sewers. This would have both health and environmental repercussions on the site and potentially to areas downstream of the site. Protective measures outlined below shall be put in place both prior to and during the renewal process.

4.12.2 Compliance and Best Practice Regulations

Compliance and best practice regulations for gravity sewer management include:

- Sydney Water’s notice of requirements;
- All requirements within any Review of Environmental Factors (REF) report; and
- Sewerage Code of Australia- Sydney Water Edition. WSA 02-2002-2.2

4.12.3 Work Instructions

The Project Manager will protect the existing gravity sewers by ensuring that:

- A dilapidation survey, in the form of a CCTV inspection, is undertaken prior to earthwork activities. Sydney Water shall be informed of any defects detected; and
- submission of an Incident Management Plan and Environmental Management Plan in accordance with Sydney Water's requirements prior to commencing works.

The Contractor will protect the existing gravity sewers and water main by ensuring that:

- The existing sewer carriers and water main traversing the site are protected prior to the commencement of earthworks;
- If Bypass pumping of sewage during sewer protection is required it shall be undertaken in accordance with the pump manufacturer (or supplier) instructions. An acceptable Incident Management Plan and Environmental Management Plan shall be submitted to the Sydney Water Project Manager prior to commencing;
- Existing sewer maintenance holes are identified and marked;
- Sewers traversing the development are to be protected during excavation. Barrier fencing shall be installed at a one to one slope from the sewer(s) and heavy machinery should be excluded from these areas. Heavy machinery, such as long-arm excavators, may excavate material within the fenced area but must be situated outside that area. Light machinery, such as bob-cats and backhoes, may enter, and excavate within the fenced area. Any excavation within the area must be undertaken with care to ensure no damage is done to the existing sewer(s);
- No stockpiling of materials or spoil shall take place within the "Zone of Influence" (a one to one slope) of the existing sewers within the development site;
- Providing an adequate bridging layer, by means of pavement or similar, over the existing sewer carriers to ensure construction machinery do not impact on the sewer; and
- In the event that a sewer is damaged during construction, the incident shall be immediately reported to Sydney Water's Emergency No. 132 090, and the Project Superintendent.

4.12.4 Responsibility

It is the Project Manager's responsibility to undertake a CCTV survey of the existing gravity sewers which traverse the development site and ensure the Contractor has submitted an Incident Management Plan and Environmental Management Plan in accordance with Sydney Water's requirements prior to commencing works.

It is the Contractor's responsibility to:

- Identify and mark the existing sewer maintenance holes (protected by deviating and concrete encasing);
- identify and mark the existing sewer carriers in accordance with construction drawings;
- protect the Carriers which traverse the site from any damage due to construction activity; and
- to ensure that stockpiling is not undertaken with the zone of influence of the sewer(s) and water main within the development site.

4.13 HAZARDOUS MATERIAL MANAGEMENT

Hazardous materials such as fuel, lubricants and chemicals are likely to be stored within the site compound during the construction period. These materials, including all fuels, shall be managed to reduce the potential for contamination of the adjacent watercourse or surrounding ground.

4.13.1 Environmental Issues

The main source of hazardous materials is likely to result from:

- Demolition of existing dwellings, which may contain asbestos based products and/or lead based paints;
- Site storage within the site compound;
- Plant;
- Vehicles; and
- Refuelling incidents

4.13.2 Compliance and Best Practice Regulations

The compliance requirements of the hazardous material management are determined through statutory legislation like:

- Workcover Guidelines and Regulations;
- Occupation Health and Safety Act and Regulations;
- DEC Guidelines and Regulations;
- Code of Practice for the Safe Removal of Asbestos;
- Protection of the Environment Act; and
- Environmentally Hazardous Chemicals Act

4.13.3 Environmental Goals

The aim of hazardous material management practice is to:

- Remove of any asbestos based products in accordance with relevant standards and codes;
- Reduce the potential of spillage from site storage areas;
- Control the use of hazardous materials to within confined areas; and
- Control refuelling of plant and vehicles either on or adjacent to the site

4.13.4 Work Instructions

The environmental risks associated with hazardous material shall be minimised by:

- Removal of any asbestos based products and lead based paints in accordance with relevant standards and codes;

- Implementation of a dust monitoring regime by an independent testing authority during demolition;
- Fuel and chemicals shall be stored in a safe manner to ensure that, in the event of spillage, the spill is contained and immediately cleaned up;
- All machinery shall carry an oil spill kit to minimise risk of any accidental oil spills from machinery contaminating soils and the stormwater system;
- Locating spill response equipment near the storage area;
- Containing any spillage immediately and mopping up with a suitable material such as sand. Contaminated material, including soil, shall be collected for disposal at a waste depot licensed to receive such waste; and
- Hazardous material management and the associated activities shall be observed on a daily basis during construction works.

4.13.5 Responsibility

It is the Contractor's responsibility to ensure that hazardous material management practices are implemented and revised where necessary to reduce the potential of spillage or contamination in accordance with statutory and industry requirements. Full documentation records shall be kept of all removal practices and testing regimes. These are to made available for audit and review.

The Superintendent may order all works to cease until such time as any particular hazard has been controlled to his satisfaction.

4.14 NOISE MANAGEMENT

Noise management involves the control of the construction processes to reduce noise pollution to neighbouring residents. The task associated with noise management under this section comprises the provision of both physical and management noise controls as required by the relevant legislation.

4.14.1 Environmental Issues

Noise and vibration levels shall adhere to all guidelines due to the close proximity of the site to residential educational and recreational areas. The limited extent of construction works at any one time should not allow for excess noise levels.

4.14.2 Compliance and Best Practice Regulations

All construction activities shall be managed in accordance with the POEO Act and Environmental Operation Act. Other requirements include those as specified in the DEC MAO Construction Sites (1995) document and the NSW Environmental Noise Control Manual.

The DEC guidelines for Construction Noise indicates that the noise emission limits are LA10 levels of 65 dBA for up to four weeks and 55 dBA for the remainder of the project, when measured adjacent to any residential dwelling.

4.14.3 Environmental Goals

The aim of noise management practices is to:

- Minimise noise and vibration pollution to neighbouring properties to within the guidelines detailed in the Acoustic report.

4.14.4 Work Instructions

Construction noise and its associated impact shall be minimised by:

- Restricting construction activities outside of the restricted areas, to the hours of 7.00am to 5.00pm Monday to Friday, 8.00am to 1.00pm on Saturday, and no work on Sundays or Public Holidays;
- Provide signage or perimeter indicators for the restrictive construction areas;
- Sound barriers if required;
- The selection of plant and equipment based on acoustic performance;
- Community Liaison will allow occupants of local residences that are in close proximity to the construction woks to plan and organise their week around any noisy activities, including providing contact details for complaints and discussions; and
- A register of complaints shall be maintained.

The noise restricted construction activities shall be observed continually during construction works.

The noise levels shall be continually monitored in accordance with the Acoustic report throughout the construction period by a suitably qualified principal appointed consultant. Feedback from the consultant will include comment on practices being utilised by the contractor, and where practical the contractor will revise their practices.

Consultation with neighbouring residents as required will also be required to ensure that noise created from construction activities to these residents are kept to a minimum.

4.14.5 Responsibility

It is the Contractor's responsibility to ensure that noise mitigation measures and records are implemented and that a Complaints Register is implemented and maintained.

It is the Acoustic Engineer's responsibility to monitor the noise levels during construction and provide feedback to the superintendent and contractor on how to minimise these levels.

The Superintendent may order all works to cease until such time as any particular noise control facility has been installed or undertaken to his satisfaction.

4.15 OCCUPATIONAL HEALTH AND SAFETY

OH & S management involves the control of construction processes and of a safe working environment to reduce incidents and accidents thus reducing potential Occupational Health, Safety and rehabilitation industrial incidents and accidents to employees, contractors and visitors.

4.15.1 Environmental Issues

The OH & S management is required to ensure the following are implemented and maintained monitored and reviewed:

- Risk Management;
- Evacuation;
- Hazardous Substances;
- Work Wear Requirements;
- Work Place Hazards; and
- Site Specific Field Operations.

4.15.2 Compliance and Best Practice Regulations

All construction activities shall be managed in accordance with the *Occupational Health & Safety Act* and the *Occupational Health & Safety Regulations.*

4.15.3 Work Instructions

OH & S monitoring and review operations will be programmed on a daily basis, to minimise work place incidents and accidents.

OH & S issues shall be continually monitored in accordance with relevant Inspection and Testing Plans (ITP's) throughout the construction period by a suitably qualified consultant. Feedback from the consultant will include comment on practices being utilised by the contractor, and where practical the contractor will revise their practices.

Consultation with employees, subcontractors and visitors as required will also be required to ensure OH & S accidents and incidents are kept to a minimum.

4.15.4 Responsibility

It is the Contractor's responsibility to ensure that OH & S practices are implemented and revised where necessary to reduce the occurrence and impact of work place accidents and incidents. An Incident Management Plan is to be developed and implemented.

The Superintendent may order all works to cease until such time as any particular OH & S incidents and or accidents have been controlled to his satisfaction.

4.16 ODOUR CONTROL

Odour management involves the control of the construction processes.

4.16.1 Environmental Issues

To comply with the POEO Act in regards to the management and disposal of any odour generated. Odour levels shall adhere to all guidelines due to the close proximity of the site to residential and recreational areas. The limited extent of construction works at any one time should not allow for excess odour levels.

4.16.2 Compliance and Best Practice Regulations

All construction activities shall be managed in accordance with the relevant Acts and encompass such activities as odour from construction machinery and the possibility of uncovering rotting organic material.

4.16.3 Environmental Goals

The aim of odour mitigation practices is to:

- Minimise odour to statutory requirements; and
- provide for odour mitigation during the management of construction rather than as a reactionary response.

4.16.4 Work Instructions

Odour arising from construction plant and waste material generated from the compound shall be minimised by:

- The erection of the site compound being well away from any adjoining residence.

Odour arising from the excavation of the wetland shall be minimised by:

- When drying out material excavated from potential odorous areas, ensure that the wet material is turned in a location away from nearby residences;
- ensure that odorous materials are not left open and exposed for long periods of time; and
- the disposal of odorous materials of and on site in a timely manner.

4.16.5 Responsibility

It is the Contractor's responsibility to ensure that odour mitigation measures are implemented.

The Superintendent may order all works to cease until such time as any particular odour source has been controlled to his satisfaction.

4.17 STORMWATER ENERGY DISSIPATION (RIP RAP)

The use of stones, gravel and associated materials around the site for rip rap, whether it be for the channel inverts or culvert outlets, are required to be installed to ensure that the other associated elements of the project are adhered too, ie. scour protection, aesthetics, flood flows and access etc.

4.17.1 Environmental Issues

The main issues regarding the use of rip rap throughout the development are:

- The protection of elements like the channel inverts and culvert outlets to scour from high velocity flows.

4.17.2 Compliance and Best Practice Regulations

The minimum best management practices relating to the use of rip rap throughout the site have been detailed in the engineering plans. The supply and placement of the stone shall be installed to the minimum standard detailed within the engineering plans.

4.17.3 Environmental Goals

The aim of rip rap usage around the site is to ensure that:

- No excessive erosion occurs along channel inverts or on the approaches or outlets to the culverts.

4.17.4 Work Instructions

The rip rap used for scour protection shall be of a material that is durable and of a size as indicated on the engineering plans. The gravel shall have consistent grade, colour and composition. A sample of the materials shall be provided to the superintendent for approval prior to any importation of the stones or gravel.

The gravel shall be laid on geo-fabric, placed and pegged with due care and aligned to provide appropriate protection to the structure. The geo-fabric armouring is to be lapped and the installation is to be undertaken to the designer's satisfaction and approved by the superintendent prior to the placement of any covering layer

4.17.5 Responsibility

It is the Contractor's responsibility to ensure that supply and placement of rip rap meets the minimum best practices outlined on the engineering plans and where necessary improved to satisfy the intents outlined.

The Superintendent may order all works to cease until such time as any particular stone, gravel and associated works are being installed not to his satisfaction.

4.18 SALINE SOILS

The management of saline soils during the construction involves the control of the construction, excavation and regrading processes to reduce the potential placing these soil types within area presently not affected by saline soils.

4.18.1 Environmental Issues

Site investigations carried out by JBS Environmental found no direct evidence of salinity across the site, however, information obtained from the Department of Natural Resources shows that there is a possibility of salinity within the swale low point through the site.

The salinity of a soil relates to the content of soluble salts. The salts include sodium chloride as well as sulfate, carbonate and magnesium salts. A high level of salts may lead to corrosion of steel and concrete.

4.18.2 Compliance and Best Practice Regulations

Specific management will limit the impacts of any saline soils on the proposed development. Any saline soils may impact upon the erosion and sediment control, re-vegetation and landscaping both terrestrial and aquatic as well as buildings and other infrastructure. Saline soils should not be used for building foundations. The high soil salinity may lead to the corrosion of steel and concrete including building foundation, underground services and pavements. Sulphate and chloride are regarded as the principle ions responsible for corrosion.

4.18.3 Environmental Goals

The saline management processes aims to ensure that the construction works are controlled to ensure the proper use of any saline soil types.

The excavation and regrading of areas of the site as detailed in the engineering plans deal with the use of only relatively small quantities of material on the site. The tasks associated with the saline soils should consider these details but also the special tasks associated with these soils.

4.18.4 Responsibility

It is the contractor's responsibility to ensure that all Saline mitigation measures are implemented. It is the geotechnical engineer's responsibility to ensure that all saline material is identified during the excavation stage of the contract.

4.19 SOIL & WATER MANAGEMENT

Removing the vegetation cover from an area leaves the underlying soil susceptible to erosion by stormwater run-off. Run-off can convey sediment from the construction site and deposit it into the downstream waterways, resulting in a reduction in water quality.

The earthworks for the Bonnyrigg Renewal development involve land disturbance to approximately 65 Ha of land. To control the expected sediment export from the site erosion and sediment control measures have been prepared and will be enforced during the construction phase of the development.

The work under this part comprises the provision of a complete soil and water management facility to control the erosion and promote sedimentation of any eroded material. The control facilities shall convey all overland flows through the particular control facilities as nominated on the Drawings.

The soil and water management system shall be installed, constructed and maintained in accordance with the NSW Department of Housing's "Managing Urban Stormwater; Soils and Construction." The work shall be undertaken in a manner that the erosion risk is minimised and those disturbed surfaces are progressively stabilised.

Assessment for the extent of the site preparation and erosion control measures required for this development is to be undertaken. All of this work is to be carried out within the development site prior to the commencement of any works that will increase the potential of erosion from the site.

The task associated with rehabilitation under this section comprises the provision of a stabilisation works for areas disturbed during the earthworks.

4.19.1 Environmental Issues

The objectives of the soil water management plan are:

- To control the erosion of soil from disturbed areas on the site;
- To protect downstream water quality and prevent any sediment laden water from Leaving the existing site;
- To provide rehabilitation and re-vegetation for disturbed areas; and
- To establish an ecologically sustainable system of pollution control works during construction.

4.19.2 Compliance and Best Practice Regulations

All site personnel will be required to minimise land disturbance to essential construction areas only with the purpose of reducing the soil erosion hazard on site.

Appropriate erosion and sediment controls are included on the detailed design drawings. Through appropriate implementation of this soil and water management plan, the impact on the natural and physical environment will be minimised. The plan is to be consistent with the objectives as outlined in the NSW Government Publication "Managing Urban Stormwater" March 2004 ("BlueBook").

All soil and water management facilities shall comply with the NSW Government's "Managing Urban Stormwater, Soils and Construction". Where a particular type of facility is required, details are specified on the Drawings.

4.19.3 Work Instructions

The risk of sediment pollution of the waterways shall be minimised in accordance with the requirements of the Blue Book:

Where practical the following principles shall be applied for the control of erosion and sedimentation:

- Stabilisation of denuded areas shall commence as soon as possible but no later than thirty days following the areas being disturbed;
- Stabilisation of disturbed areas shall be hydro mulched with native seed mix (seed mix sourced from others);
- Stabilisation of disturbed areas shall be in accordance with the Specification for Grassing and/or Specification for Landscape Works as outlined in Fairfield City Council's Civil Works Specification;
- All temporary earth diversion channels/banks and sediment basin embankments shall be seeded as soon as possible but within fifteen days of completion of their earthworks;
- Stabilisation of all cut and fill slopes shall be undertaken as soon as possible but within fifteen days of completion of formation;
- All stabilisation measures shall be undertaken prior to issue of the Certificate of Practical Completion; and
- All stabilisation works are to be relocated or decommissioned and removed off site upon instruction by the superintendent.

Sediment basin storage will be provided in the locations as shown on the design plans. Construction and maintenance of the sediment basins will be in accordance with the Blue Book.

If necessary, the settled water will be treated with a flocculation agent to assist in the settlement of fine particles. Flocculation will be undertaken in accordance with the Blue Book. If necessary, additional flocculation and treatment will also be undertaken to reduce the contaminates phosphorous, chlorine and salinity. Before any water is discharged, tests will be undertaken to determine the suitability and acceptability of the waters for release into the downstream drainage system.

A construction sequence shall be implemented to ensure all sediment control measures are in place before the commencement of any significant work practice on site.

The contractor will be required to implement and maintain a self-auditing program in accordance with Chapter 8 of the Blue Book. The Contractor must keep a complete set of the self-audit records on-site and make them available to FCC, NSW DEC, or any other authorised person on request.

Water quality samples will be required at regular intervals at the downstream end of sediment basins or other locations as directed by the superintendent. Samples will be tested by the principal appointed environmental consultant for suspended solids, pH and other tests as directed by the superintendent.

All records will be kept on site and made available to the DEC, Fairfield Council and any other authorised person upon request.

A self-auditing program will be established based upon a checklist sheet. A site inspection using the checklist is required to be undertaken by the contractor's site manager:

- At least weekly;
- Immediately before site closure; and
- Immediately following rainfall events in excess of 5mm.

All sediment detention systems are required to be kept in good working condition. Particular attention will be given to:

- Recent works to ensure that they have not resulted in diversion of sediment laden water;
- Degradable products to ensure they are replaced as required; and
- Sediment removal to ensure the design capacity or less remains in the settling zone.

The location of each soil and water management facility shall be determined from the details on the Drawings, unless otherwise directed by the Superintendent.

Additional erosion and/or sediment control works may be required to be constructed as they become necessary to ensure the desired protection is given to downstream lands and drainage systems.

All sediment and erosion control devices shall be maintained in a satisfactory working order throughout the works or until such earlier time as the area above has been stabilised and the Superintendent directs that the device be removed.

Inspect the devices after all storm events for structural damage or clogging by silt and other debris and make prompt repairs or replacement.

All sediment deposited within the gross pollutant traps shall be periodically removed to a disposal area as directed by the Superintendent.

Gravel or other filter materials shall be cleaned and restacked or replaced when directed by the Superintendent to maintain effective performance.

In the case of the temporary construction exit, the contractor shall undertake daily surface cleaning by drag broom or equivalent, to remove all build up of foreign material to the satisfaction of the Superintendent.

All works are to be contained wholly within the development site. If it becomes necessary to undertake work outside the property boundary of the site the relevant authority or owner shall be notified of the proposed works.

4.19.4 Responsibility

It is the contractor's responsibility to ensure that all sediment and erosion control practices outlined in the engineering plans and the regulatory requirements are implemented and that all reasonable measures are taken to minimise the risk of sediment and other pollutants being carried from the site by stormwater run-off.

Silt settled within sediment basins shall be blended with stockpiled topsoil in accordance with industry best practices and used to topsoil the park or residential areas

At all times, the Contractor shall ensure that the disturbed areas are maintained with an even surface gradient that will enable surface water to drain freely to the sediment fences and discharge points.

In areas subject to prolonged exposure and/or where the nature of the surface is considered highly prone to erosion, the Superintendent may direct that one or more of the following control measures be implemented:

(a) Intercept or divert runoff from exposed areas by constructing diversion channels or bunds in accordance with the NSW Department of Housing's "Managing Urban Stormwater, Soils and Construction."

(b) Establish temporary and permanent vegetation or mulching. Temporary and/or permanent ground cover shall be established on disturbed areas as directed by the Superintendent and in accordance with the Specification for grassing.

(c) Construct and maintain sediment traps at appropriate locations in accordance with the NSW Department of Housing's "Managing Urban Stormwater, Soils and Construction."

All necessary works and materials including excavation, supply, fixing, lay, installation of stakes, ties, silt barriers, straw bales, seeding material and sundry equipment required for the installation of the soil and water control facilities shall be provided.

4.20 SOIL CONTAMINATION

Contamination management involves the assessment of the existing situation and control of the construction processes. These tasks reduce the risk contaminants thus reducing the long-term restrictions on the sites.

4.20.1 Environmental Issues

The sources of contamination are likely to be from:

- Existing structures and associated land uses;
- Existing waste located on the site;
- Existing material from previous land uses;
- Sediment from existing dams or watercourses; and
- Contamination of the site from construction activities.

4.20.2 Compliance and Best Practice Regulations

Compliance and best practice regulations for soil contamination management include:

- DEC Sampling Design Guidelines;
- DEC guideline limits;
- DEC Guidelines for Consultants Reporting on Contaminated Sites;
- DEC Environmental Guidelines: assessment, classification;
- Contaminated Land Management Act 1997;
- ANZECC threshold guidelines;
- SEPP No 55 – Remediation of Land 1998;
- Managing Land Contamination: Planning Guidelines 1998;
- Protection of the Environment Operations Act and regulations;
- DEC Environmental guidelines: Assessment, Classification and Management of Liquid and Non- Liquid Waste;
- DEC Guidelines for the NSW Site Auditor Scheme;
- Contaminated Land Management (Site Auditor) Regulation 1998; and
- And other relevant environmental guidelines, acts and regulations.

4.20.3 Environmental Goals

The aim of the Contamination management practices is to:

- Ensure that the site is acceptable for the intended future land use;
- Remediation work is carried out to any contaminated areas; and
- Minimise environmental impacts upon adjacent or local neighbours.

4.20.4 Work Instructions

Soil contamination management will involve:

- Investigating and re-mediation where necessary;
- Identification of potential soil contamination areas during the initial site establishment / demolition stage of works;
- Arrange for an environmental investigation by the principal appointed environmental consultant of any potential soil contamination sites. The minimum requirements will be for investigations in the vicinity of any demolished buildings or structures and existing dams;
- Controlling construction methods to ensure soil contamination during the construction is minimised;
- Identification of the potential contaminants and likely risks ;
- Site inspections for possible contamination shall be programmed on a daily basis;
- Plant operators are to be aware of potential contamination sites and to advise the contractor and superintendent of any possible finds;
- Undertake re-mediation works in accordance with environmental guidelines and best management methods; and
- Liaison with the environmental consultant and obtain a statement that the site is suitable for its intended use.

4.20.5 Responsibility

It is the Contractor's responsibility to notify the principal appointed environmental consultants of any potential contamination found during earthworks. They are then to liaise with the principal appointed environmental consultant to ensure a timely approach to the assessment and if need be re-mediation of the contaminated material. The contractor is also to make allowances in their construction program for reasonable time delays associated with the investigation and re-mediation of soil contamination.

It is the environmental consultant's responsibility to provide feedback and advice to the contractor on an ongoing basis to ensure that delays and re-mediation works are reasonable.

The Superintendent may order all works to cease until such time as any particular contamination has been controlled to his satisfaction.

4.21 TOPSOIL MANAGEMENT

Topsoil is a valuable resource for the re-vegetation of disturbed areas.

4.21.1 Environmental Issues

The reuse of topsoil sourced during the stripping process is essential to earthwork balance, the riparian re-vegetation and development island stabilisation.

4.21.2 Compliance and Best Practice Regulations

The compliance requirements for the topsoil sourcing and reuse are development driven with the earthworks balance, riparian vegetation and development island topsoil for stabilisation

4.21.3 Environmental Goals

The aim of Topsoil management practices is to:

- Create a balanced cut to fill development that utilises the resources on site for a future benefit;
- Provide a suitable base for medium for planting within the riparian zones; and
- Provide a sufficient topsoil layer to enable the stabilisation of the site's development islands.

4.21.4 Work Instructions

To maintain the integrity of the topsoil on site during the construction period, it will be necessary to undertake the following measures;

- The topsoil from the site stages shall be stripped prior to the main construction works and stockpiled separately from other materials;
- The topsoil shall be stockpiled in approved locations outside areas such as drainage depressions, for later respreading;
- Grass shall be stripped off together with the topsoil;
- Care shall be taken to avoid contamination by any other material;
- Where the topsoil is retained for more than one month, the stockpile shall be covered to minimise erosion potential and degradation by weeds and animals (e.g. birds). Topsoil shall be re-spread as soon as possible;
- Every attempt shall be made to stockpile topsoil on site in depths no greater than 2.0 m. Where this is not possible the superintendent shall be notified;
- Where the topsoil stockpile is greater than 2m in height and is left for periods of time greater then 6 weeks, then the stockpile shall be turned in order to aerate the material and in doing so maintain the topsoil's microbes;
- To minimise soil loss all stockpiles are to be track rolled and where left for more than thirty days, seeded;
- Commencement in placing topsoil on the prepared areas shall not take place until the authority to do so has been obtained from the Superintendent;
- After the Superintendent has authorised the placing of topsoil, works to spread the stockpile to the specified depths: 0.2m within all drainage channels; 0.1m (minimum) with residential and within the voids of rip-rap;
- The topsoil is not to be over compacted within the landscape zones;
- Silt settled within sediment basins shall be blended with stockpiled topsoil in accordance with geotechnical requirements and used to topsoil the residential areas; and
- After spreading the topsoil, it shall then be trimmed so that the finished surface of the topsoil conforms to the design levels and grades unless otherwise specified or directed. Top soiled areas, when finished, shall present smooth surfaces free of stones and lumps of soil and blend into adjoining undisturbed ground.

4.21.5 Responsibility

It is the Contractor's responsibility to ensure that topsoil management addresses the aims and requirements detailed within the engineering plans.

4.22 TRAFFIC MANAGEMENT

The OH & S act makes any employer responsible for the safety of its own workforce, its contractors, visitors and the public at any work site under its control. Traffic control at work sites highlights this responsibility to ensure that road users are able to travel through, past or around work sites in safety. Of equal importance is the obligation to ensure that the workforce is able to work safely in the vicinity of road users and work site plant.

4.22.1 Environmental Issues

As described above the main issue regarding traffic management is the health and safety of workers, visitors and the public as they travel around, or through the development area. There are a large number of private dwellings within the development that will require permanent access.

4.22.2 Compliance and Best Practice Regulations

The compliance requirements of the traffic management are outline on the engineering plans and below. These tasks are not exhaustive and should be supplemented by the contractor with some of the issues highlighted in the Development Application process are viz,

- No work is to commence on site until such time as a person accredited to prepare traffic control plans in accordance with AS1742.3 and the Roads and Traffic Authority's publication "Traffic Control at Worksites" has certified a Traffic Control Plan for the development/site;
- The line marking and signage for the proposed development shall be undertaken in accordance with the relevant Australian Standard;
- Compliance with OH&S legislation, regulations, standards and codes, and the Site Safety Rules; and
- Any works outside the property boundary of the site, ensure that the relevant authority or owner has been notified of the proposed works and has provided authorisation in writing. This authorisation is to be presented to the Superintendent prior to the commencement of these works. All works are to be restored to the relevant authorities / owners and Superintendents satisfaction.

4.22.3 Work Instructions

Prior to the commencement of any work a traffic control plan is to be prepared. The prepared traffic management plans, must be prepared and certified a person accredited to prepare traffic

control plans in accordance with AS1742.3 and the Roads and Traffic Authority's publication "Traffic Control at Worksites".

The Traffic Control Plan shall be implemented during the construction phase of the development and a copy of the plan shall be available on site at all times.

A copy of the Traffic Control Plan shall accompany the Notice of Commencement to be submitted to Council 2 days before any work is to commence on site.
Upon completion of the project the temporary traffic management facilities shall be removed and the areas disturbed restored at least to its pre development standard.

The traffic management facilities shall be observed on a daily basis during construction works. The Contractor shall suspend vehicle or pedestrian use of a certain traffic management facility should evidence of a hazardous or dangerous situation be present.

4.22.4 Responsibility

It is the Contractor's responsibility to ensure the safety of his own workforce, contractors, visitors and the public. They are required to prepare, implement and keep records (Section 6 – RTA, Traffic Control at Work Sites) the Traffic Management Plan that satisfies the requirements of the OH&S Act, Regulations and the Traffic Control at Work Sites manual 1998 RTA.

The Superintendent may order all works to cease until such time as any particular safety issue has been controlled to his satisfaction.

4.23 WASTE MANAGEMENT PLAN

Inert and solid waste is likely to be generated during construction works, consisting of green waste and construction waste. In addition, some waste water laden with fine sediment is likely to be generated from disturbed sites, whilst effluent will be generated within site staff amenities.

4.23.1 Environmental Issues

Litter or waste left to scatter across the site during construction will not only be unsightly but also have the potential to pollute the surrounding streetscapes and neighbourhoods. If it is not prevented from entering the downstream stormwater system the work required to remove it increases substantially.

Also of potential risk is where water has been in contact with dumped waste enters the adjacent watercourse or water table.

The main source of litter is likely to result from:

- Construction activities;
- Dumped waste; and
- Site amenities.

4.23.2 Compliance and Best Practice Regulations

The compliance requirements of litter and debris control are determined from statutory requirements like the POEO Act and other industry standards.

4.23.3 Environmental Goals

The aims of litter and debris management practices are to:

- Minimise loose litter;
- Contain litter or debris to within designated sorting areas; and
- Reduce and control dumped material.

4.23.4 Work Instructions

Litter and debris shall be minimised by:

- To ensure the site is free from litter and dumped waste material during the course of the project regular inspections shall be undertaken on a weekly basis;
- The removal of litter shall be from both sides of the proposed perimeter fence;
- The site shall be fenced in accordance with the engineering plans to prevent any illegal dumping;
- Any discovered dumped waste shall be removed without delay;
- Waste materials shall be recycled where possible or appropriately disposed of off-site in accordance with the requirements of the DEC and Council;
- Two appropriate waste bays shall be provided at the site for the depositing of recyclable waste, litter and other waste to allow the sorting of different waste material. These bins shall be covered at all times when works are not operating on site;
- Trucks shall be cleaned before leaving the site. A truck cleaning facility in the form of a wash down area shall be installed at the exit to the site. This will prevent the deposition of soil and other materials on public roads; and
- Provision of toilet facilities at the rate of one toilet to every 20 persons employed on the site. Each toilet must be a standard flushing toilet connected to a public sewer or where this is not practical, any other sewage management facility approved by council.

4.23.5 Responsibility

The Contractor will have to comply with the POEO Act in regards to the management and disposal of any waste generated. The provision and management of site facilities shall be undertaken in accordance with the OH&S Act

The Superintendent may order all works to cease until such time as any particular waste management issue has been addressed to his satisfaction.

4.24 WATER QUALITY MANAGEMENT

The management of water quality for the site involves the management and control of construction processes to maintain the water quality.

4.24.1 Environmental Issues

Environmental issues associated with water quality include:

- determine baseline and surface water conditions and set suitable benchmark criteria for water quality;
- to minimise impacts on the surface water system from the earthworks process;
- analyse various design options to minimise potential interaction between surface water;
- design a surface water management strategy;
- determine critical triggers for the implementation of a surface water management strategy; and
- design a management plan which will be used to implement mitigation strategies, if required.

4.24.2 Compliance and Best Practice Regulations

The compliance requirements of the water quality management will be determined as part of the Development Application. An outline of some of the issues highlighted in the Development Application process are viz;

- Surface water that is discharged from the site during construction into the downstream drainage system shall meet pre-construction water quality;
- Work is to be in accordance with the engineering plans and water management plan for the site;
- Control of the water quality that discharges from the site (Gross pollutants, Sediment and Nutrients); and
- Contamination.

4.24.3 Environmental Goals

The aims of water quality management practices are to:

- Ensure surface water quality, quantity and levels are not changing significantly during and after construction

4.24.4 Work Instructions

During construction the following measures are required to ensure water quality for the surface water is assessed:

- Establishment of monitoring facilities prior to the commencement of construction at the inlet and outlet of the site (ie Elizabeth Drive and Edensor Road culverts);
- Initial results of the water samples should be utilised to establish base line information and future results provided in a bi-monthly monitoring report;
- Undertake regular self-audit of maintenance requirements and testing using a check sheet, where a weekly site inspection will be made by the site manager;
- Monitoring of erosion and sediment controls; where water fills more than one quarter of the design capacities, water must be flocculated and discharged within 5 days of any storm event capable of these capacities;
- Undertake installation and regular maintenance checks of equipment GPTs and erosion and sedimentation controls.

4.24.5 Responsibility

It is the Contractor's responsibility to ensure that the facilities for the surface water monitoring are available to the specialist consultant. The contractor is also to liaise and provide access to the site for the specialist consultant to undertake the required testing regime.

The Superintendent may order additional works to be undertaken or other works to cease until such time as the testing facilities and access to these facilities are available.

APPENDIX A WASTE MANAGEMENT PLAN

WASTE MANAGEMENT PLAN

Proposal:	*Bonnyrigg Living Communities Project*	
Site Address:	*Edensor Road, Bonnyrigg 2177*	
Applicants Name:	*Bonnyrigg Partnerships*	
Applicant's Address:	*Level 13, 50 Margaret Street, Sydney 2000*	
Applicant's Contact:	*Phone: (02) 8234 1800*	*Fax: (02) 8234 1880*

Buildings and Other Structures Currently on the site:

Existing privately and government owned residential dwellings with roads and service utilities

Brief Description of Proposal:

Retention of privately owned dwellings and the demolition of government owned dwellings. The appropriate service utilities and infrastructure will be retained with the necessary infrastructure reconstruction works. The Stage 1 yield is approximately 112 dwellings on 40 lots.

The details on this form are the intentions for managing waste related to this project

Signature of Applicant:

Date:

SECTION ONE – DEMOLITION/SUBDIVISION STAGE

MATERIALS ON SITE		DESTINATION		
		RE-USE AND RECYCLING		DISPOSAL
Type of Materials	**Estimated Volume (m^3)**	**ON-SITE**	**OFF-SITE**	
Excavation material	3,500m^3	Keep and reuse topsoil for landscaping. Store on site. Stockpile some material for use as fill.	Remainder to M.L. Friend's Earthworks for reuse.	Unsuitable to Brandown, Kemps Creek.
Trees, Vegetation	500m^3	Separated. Some chipped, mulched and stored on site for reuse in landscaping.	To FCC Waste Depot or Ecocycle landscape supplies, Wetherill Park	Nil
Bricks	920m^3	Reuse on-site or off-site.	To FCC Waste Depot or Ecocycle landscape supplies, Wetherill Park	Unsuitable to Brandown, Kemps Creek.
Retaining Walls	300m^3	Nil	To FCC Waste Depot or Ecocycle landscape supplies, Wetherill Park	Nil
Concrete	1,000m^3	Excess material to be used as granular fill, levelling materials and road base.	To FCC Waste Depot or Ecocycle landscape supplies, Wetherill Park	Unsuitable to Brandown, Kemps Creek.
Timber – Structural timber, fencing	220m^3 300m^3	Formwork, bridging, blocking and propping. Timber Roofing and Purlins	To FCC Waste Depot or Ecocycle landscape supplies, Wetherill Park	Nil
Plasterboard	12,500m^2	Nil	To FCC Waste Depot or Ecocycle landscape supplies, Wetherill Park	Unsuitable to Brandown, Kemps Creek.
Metal – window frames, pipework, etc.	100m^3	Nil	Remainder to Barter Town Salvage, Kemps Creek for recycling.	Unsuitable to Brandown, Kemps Creek .

MATERIALS ON SITE		DESTINATION		
		RE-USE AND RECYCLING		DISPOSAL
Type of Materials	**Estimated Volume (m^3)**	**ON-SITE**	**OFF-SITE**	
Road Material	250 m^3	Milled on-site for use as road base and structural fill	To FCC Waste Depot or Ecocycle landscape supplies, Wetherill Park	Unsuitable to Brandown, Kemps Creek .
Roof tiles	6,000m^2	Used as fill material where appropriate	To FCC Waste Depot or Ecocycle landscape supplies, Wetherill Park	Nil
Doors Windows Baths	500m^3	Nil	To FCC Waste Depot or Ecocycle landscape supplies, Wetherill Park	Unsuitable to Brandown, Kemps Creek .
Floor Coverings Carpet Tiles	6,000m^2	Nil	To FCC Waste Depot or Ecocycle landscape supplies, Wetherill Park	Unsuitable to Brandown, Kemps Creek .

SECTION TWO - CONSTRUCTION PHASE

MATERIALS ON SITE		DESTINATION		
		RE-USE AND RECYCLING		DISPOSAL
Expected Waste Materials	**Estimated Volume (m^3)**	**ON-SITE**	**OFF-SITE**	
Excavation material	-	Refer to Section 1; Formwork reused.		
Bricks	-	Refer to Section 1.	To FCC Waste Depot or Ecocycle landscape supplies, Wetherill Park	Unsuitable to Brandown, Kemps Creek.
Concrete	-	Refer to Section 1.	To FCC Waste Depot or Ecocycle landscape supplies, Wetherill Park	Unsuitable to Brandown, Kemps Creek.
Timber – structural timber, formwork, etc.	-	Formwork re-used. Excess chipped for landscaping.	To FCC Waste Depot or Ecocycle landscape supplies, Wetherill Park	Unsuitable to Brandown, Kemps Creek.
Plasterboard	-	Refer to Section 1.	To FCC Waste Depot or Ecocycle landscape supplies, Wetherill Park	Unsuitable to Brandown, Kemps Creek.
Metal – concrete reinforcement, pipework, etc.	-	Refer to Section 1.	Remainder to Barter Town Salvage, Kemps Creek for recycling.	Unsuitable to Brandown, Kemps Creek.

SECTION THREE – USE OF PREMISES

TYPE OF WASTE BEING GENERATED	EXPECTED VOLUME PER WEEK	PROPOSED ON-SITE STORAGE AND TREATMENT FACILITIES	DESTINATION
Please specify. For example: glass, paper, food waste, offcuts, etc.	– **Litres or m3** – **See Appendix 2 of DCP 95 for estimates**	– **For example:** – **Waste storage and recycling area** – **On-site composting** – **Compaction equipment**	– **Recycling** – **Disposal** – **See Council or the Macarthur Waste Board for a list of contacts** – **Specify contractor**

Individual Development Applications will be lodged for dwelling construction upon completion of the subdivision development.

SECTION FOUR – ON-GOING MANAGEMENT

Describe how you intend to ensure on-going management of waste on-site (e.g. lease conditions, caretaker/manager on-site).

Ongoing Management of waste during the subdivision construction will be limited to general waste disposal by the nominated civil contractor. Waste disposal and a recycling facilities requirement will be incorporated into the Construction and Environmental Management Plan to be implemented by the approved contractor.

Bonnyrigg Partnerships will be responsible for the maintenance of existing stock throughout the demolition phase, the construction phase and beyond.