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EXCAVATION MANAGEMENT PLAN

Project:	4 Brookvale Avenue, Brookvale NSW 2100
Client:	Lotus Projects Pty Ltd
Document Number:	PCD-EMP-001
Revision Date:	Upon DA Approval

Rev	Date	Prepared By	Reviewed By	Approved By	Approval Signature
A	9-3-2018	Reece Kilgannon	Frank Lucia		

Table of Contents

1 Spoil Management Plan

1.1 Purpose

The Purpose of this Plan is to:

- Minimise spoil removal and associated impacts on the Community and Environment;
- Maximise the beneficial reuse of spoil material from the project: and
- Address the Project wide objective to provide certainty of delivery by managing spoil in a manner that avoids impacts on construction activities and timing.

1.2 Scope

Spoil is defined and ‘rock’ or ‘other than rock’ resulting from the construction excavation activities.

This Plan addresses and details the following issues:

- Excavation, handling, disposal and reuse methodology, including on-site storage and stockpiling arrangements;
- Processes and procedures that will be used for the management of spoil, including those for Virgin Excavated Natural Material (VENM), Excavated Natural Material (ENM), contaminated and unsuitable material;
- Measures that will be implemented to both reduce spoil quantities and maximize the beneficial reuse of spoil that will be generated during the works;
- Nominated quantities for reuse of spoil within the project and for beneficial reuse of spoil off site;
- Process and procedures for the management of the environmental and social impacts of spoil transfer and reuse.

2 Consistency with Traffic and Access Management Plan (TAMP)

The Spoil Management Plan has been developed and is considered consistent with the standard Traffic and Access Management Plan, to ensure minimal disruptions to neighbours, pedestrians and traffic. The following points will illustrate this consistency:

- Spoil Haulage trucks will utilize the routes presented in the approved TAMP;
- Heavy vehicle haul routes will generally follow main arterial roads, as will be foreshadowed in the approved TAMP.

3 Spoil Production

It is estimated that the project will generate approximately cubic metres of spoil. The majority of spoil will be generated from the main bulk excavation, with minimal spoil coming from the detailed excavation and driveway.

The majority of excavated material will be uncontaminated, crushed sandstone and shale material, classified as Virgin Excavated Natural Material (VENM). Some Excavated Natural Material (ENM) is expected to be generated through the removal of grassed areas and gardens.

The estimated quantities of spoil to be generated at the project site are outlined in the table below.

Location/Job Category of Spoil	Approximate Spoil Production (m3)
Demolition Dirt	
Bulk Excavation	
Grassed/Garden Areas	
Detailed Excavation	
Driveway Excavation	

4 Material Types

Topsoil occurs between 50-300mm of the natural ground surface. Topsoil reuse shall be maximized where feasible on site to minimize the import of external topsoil for revegetation and landscaping purposes.

The material below the topsoil is considered to be spoil and is defined as any earthen material that is surplus to requirements or unsuitable for reuse within the project.

4.1 Classification

Topsoil and Spoil, other than VENM or ENM will be sampled, analyzed and characterised in accordance with the *Waste Classification Guidelines: Part 1 Classifying Waste* (EPA 2014).
Further information regarding the classification of VENM OR ENM are provided below.

4.1.1 VENM

The majority of spoil to be excavated is expected to be classified as VENM and will be classified in accordance with the *Waste Classification Guidelines: Part 1 Classifying Waste* (EPA 2014):

Virgin Excavated Natural Material means natural material (such as clay, gravel, sand, soil or rock fines):

- *That has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities;*
- *That does not contain sulfidic ores or soils, or any other waste.*

And includes excavated natural material that meets the criteria for virgin excavated natural material.

TJM Earthworks, the generator of the VENM will consider the following four questions when classifying material as VENM:

- Are manufactured chemicals or process residues present?
- Are sulfidic ores or soil present?
- Are naturally occurring asbestos soils present?
- Is there any other waste present?

If the material meets the definition of VENM it can be reused on or offsite without prior testing.

4.1.2 ENM

If spoil is unable to be classified as VENM it will be sampled if required, to determine whether it meets the excavated natural material ENM classification criteria.

Excavated Natural Material (ENM) means naturally occurring rock or soil (including but not limited to materials such as sandstone, shale, clay and soil) that has:

- *Been excavated from the ground, and*
- *Contains at least 98% by weight natural material, and*
- *Does not meet the definition of Virgin Excavated Natural Material in the act*

ENM does not include material that has been processed or contains acid sulphate soils or potentially acid sulphate soils.

4.1.3 General Solid Waste

Spoil not classified as either VENM or ENM due to contamination from either construction material or other sources shall be characterised in accordance with the *Waste Classification Guidelines: Part 1 Classifying Waste* (EPA 2014).
This may include classification as General Solid Waste (Non Putrescible) and special waste.

4.1.4 Special Waste

Special Waste is a class of waste that has unique regulatory requirements. The potential environmental impacts of special waste need to be managed to minimize the risk or harm to the environment or human health.

Special Waste means any of the following:

- Clinical and related waste,
- Asbestos waste,
- Waste tyres,
- Anything classified as special waste under an EPA gazettal notice.

5 Spoil Reduction, Reuse and Disposal

Spoil management has been developed to meet the objectives and principles of the *NSW Waste Avoidance and Resource recovery Act 2001* and the *NSW Waste Avoidance and Resource Recovery strategy 2007.*

5.1 NSW Waste Avoidance and Resource Recovery Act 2001

The Act includes the majority of NSW's overarching objectives and guiding principles to encourage beneficial reuse and resource recovery. Implementation of the Act in accordance with the principle of Environmentally Sustainable Development (ESD) is identified as a main objective of the Act, along with objectives to minimize the consumption of natural resources and waste generation. The NSW Environment Protection Authority (EPA) defines ESD as including the following:

- The precautionary principle;
- Inter-generational equity;
- Conservation of biological diversity and ecological integrity; and
- Improved valuation, pricing and incentive mechanisms.

5.2 Spoil Reduction

To reduce spoil quantities, the design of the proposed building has optimized the use of the land and footprint on which it stands, therefore allowing the footprint of the structure to be saw cut to the requirements needed to allow for adequate drainage and waterproofing. This in turn allows for minimal bulk spoil to be removed.

It is unlikely that the spoil volume will be further reduced during the delivery phase of the project; however, if future design or construction methodology development provide any opportunities to reduce spoil generation, such opportunities will be implemented.

5.3 Reuse of Spoil

The target of the project is to reuse 100% of the VENM and ENM waste generated on the project through approved VENM and ENM recycling facilities.

All VENM and ENM will be beneficially reused within the project or on approved reuse sites detailed in Section 7 of this plan.

5.3.1 Monitoring and Reporting

Quantities of material reused will be monitored. To track the performance against our reuse target, quantities will be tracked through the use of air pressure scales found in the haul trucks to be used throughout this project as well as tip dockets.

5.3.2 Reuse within the Project

Given the nature of the construction activities, opportunities to reuse this material on site may be limited by available space. On available storage space within the project, maximum capacity of the VENM or ENM material will be stockpiled for reuse as backfilling and levelling.

5.3.3 Reuse in development works/land restoration

The project Spoil Offsite Reuse Locations details possible reuse locations for development works and land restoration

6 Spoil On-site Management

Spoil from the proposed construction will predominantly be stockpiled at a single location, being on site.
Stockpiles that are not to be moved for a period of more than 5 days will be covered, have siltation barriers around and have a ground water diversion in place above the stockpile location.
Stockpile locations will be positioned in areas were minimal to zero visual and light spill impacts anticipated at the nearest residence and located within the approved project boundary.

6.1 Stockpile Management

Ongoing stockpile management practices for temporary stockpile sites related to the construction works will take into account the following general principles:

- Materials will not be stockpiled within the tree protection zone (in accordance with AS 4970) of trees or native vegetation to be retained, and never pushed around the base of trees. Trees are not to be flooded or soils caused to be waterlogged as a result of stockpile development.
- Contaminated materials will be stockpiled separately to other materials and identified with signage.

- Erosion and Sediment Control Plans (ESCP) will be prepared and implemented in advance of stockpiling.
- The ESCP will detail soil and water management measures to minimize soil erosion and the discharge of sediment and other pollutants to land and/or waters.
- Erosion and sedimentation controls will be erected between the site and any drainage lines or down slope areas.
- A diversion bund will be installed on the uphill side of the stockpile to divert water around the site, unless run on water is 'dirty construction water'. When this occurs the 'dirty' run on water shall be diverted to erosion and sediment controls.
- Erosion and sediment controls shall remain installed and maintained until sufficient stabilization is achieved.
- Controls will be installed around all stockpiles that are in place for more than 5 days in order to prevent wind and water erosion.
- Dust management measures (including for vehicle movements associated with stockpiling activities) will be implemented in accordance with the requirements of the Air Quality Management Plan AQMP

7 Soil Disposal and Reuse Locations

Given the quantity of spoil that will be generated, it is necessary to identify a number of potential spoil reuse and disposal locations.
The Offsite Spoil Locations are DA approved reuse sites for VENM or ENM.
No other materials will be disposed of at these locations.

7.1 Approval of Offsite Reuse Locations

Potential spoil offsite reuse locations will be identified by the construction teams.
If the location is not identified, TJM Earthworks will:

- Check that the appropriate approvals are in place for the receiving site,
- Check that DA or s143 Notice has been completed by the reuse location owner and/or site operator,
- Agree to terms with the site operator and/or owner, and
- Ensure that the relevant environmental, community and traffic impacts are managed under the TAMP for that site, including approved haulage routes.

8 Spoil Transport

Spoil will be transported by registered road trucks. Spoil haulage routes will be identified in the TAMP, and be selected to minimise impacts to sensitive recievers, the travelling public and the local community whilst meeting compliance with road traffic rules.
This project will have all haulage movements well within the standard construction work hours as to be outlined in the DA, therefore minimizing and disturbance to the surrounding community.

8.1 Spoil Tracking

Construction spoil will be weighed by in truck air scales and recorded on the docket or in a daily run sheet.
This will document all spoil leaving site in terms of when, truck registration, characterization and location of disposal.
Fields to be included are as follows:

- Date;
- Docket Number;
- Hauling Company;
- Material;
- Quantity;
- Truck Registration;
- Location of spoil generation;
- Location of spoil receival site.

The tracking system will be implemented when spoil disposal commences.

9 Noise and Vibration Management Plan

9.1Purpose

This Noise and Vibration Management Plan (NVMP) describes how TJM Earthworks and Lotus Projects will minimise and manage noise and vibration impacts during construction.
This NVMP has been prepared to address the requirements of the future DA, Environmental Protection and applicable guidelines and legislation.

9.2 Structure of the NVMP

This NVMP will form part of TJM Earthworks and Lotus Projects environmental framework for the project and is supported by other documents such as SWMS and work procedures. The review and improvement process for this NVMP are described in chapter 26 of this EMP.

9.3 Consultation of the NVMP

Consultation will continue the construction process with relevant stakeholders and contractors. Where relevant, the outcomes of this consultation will be documented in subsequent revisions of the NVMP

10 Other Requirements

10.1 Legislation

Legislation relevant to noise and vibration management includes:

- *Protection of the Environment Operations Act 1997*

- *Protection of the Environment Operations Regulation 2008.*

10.2 Guidelines and Standards

The main guidelines, standards and policy documents relevant to this NVMP include:

- Environmental Noise Management Assessing Vibration: a Technical Guideline (DEC,2006)
- AS2436-2010 Guide to Noise and Vibration Control on Construction, Demolition and Maintainence Sites

11Existing Environment

This project is located within the Northern Beaches Council district.
Surrounding this project is various dense residential areas. Residences, businesses and other community facilities are located at varying distances from the project and may be impacted from noise and vibration.

12 Noise and Vibration Criteria

12.1 Construction Noise Criteria

All feasible and reasonable noise mitigation measures will be implemented with the aim of achieving the NML's. However, predicted noises levels during construction may exceed these NML's.

The *Interim Construction Noise Guideline* (the Guideline) sets out ways to deal with the impacts of construction noise on residences and other sensitive land uses. It does this by presenting assessment approaches that are tailored to the scale of construction projects and indicate how work practices can be modified to minimise noise. The Guideline provides detailed advice on the range of work practices and regulatory approaches to manage construction noise.

The Guideline takes into account comments made during community consultation on the draft guideline in late 2008.

The Guideline is primarily aimed at managing noise impacts from construction works regulated by the Department of Environment and Climate Change NSW (DECC). It will be used to assist DECC in setting statutory conditions in licences or other regulatory instruments for construction noise. The Guideline may also be of assistance to local councils in guiding their decision-making on construction projects they regulate.

'Construction' is defined in the Guideline to include the erection, installation, alteration, repair, maintenance, cleaning, painting, renewal, removal, excavation, dismantling or demolition of, or addition to, any building or structure, or any work in connection with any of these activities, that is done at or adjacent to the place where the building or structure is located. The Guideline takes into account that construction noise has only a temporary impact.

12.2 Vibration Criteria

Frequency-dependent limits have the capacity to precisely deal with the hazards presented by ground vibration and are seen as the basis for best practice blasting. The particular frequency-dependent criteria should be reported with the measurements. All the limits given in this section are peak component particle velocities, as used in overseas standards and guidelines.
The classification of type of structure may be difficult; when in doubt, a more conservative limit from the nearest description in the structural damage table should be applied.

Currently there exists no Australian Standard for assessment of building damage caused by vibrational energy. This section summarises the most relevant available standards from the United Kingdom, the United States and Germany. Frequency-independent and frequency-dependent guide levels are described in both British Standard BS 7385–2: 1993 Evaluation and measurement for vibration in buildings.

Guide to damage levels from ground borne vibration and the United States Bureau of Mines (USBM) RI 8507 Impacts to structures. The levels specified are peak component particle velocities, and the methods used for assessing the frequencies are similar in both documents.

Research suggests that the guide values and assessment methods given in BS 7385–2 and (USBM) RI 8507 are applicable to Australian conditions. The estimation of the frequency of each vibration component to be used in structural damage assessment is complex. Simple approaches suggested within the BS 7385–2 and (USBM) RI 8507 include:

- frequency of the maximum peak particle velocity amplitude peak
- dominant frequency of the component vibration time history
- zero crossing frequency of the peak particle velocity amplitude peak.

German Standard DIN 4150–3:1999–02 Vibration in buildings—Part 3: effects on structures provides recommended maximum levels of vibration that reduce the likelihood of building damage caused by vibration. These levels are 'safe limits', up to which no damage due to vibration effects have been observed for the particular class of building. 'Damage' is defined by DIN 4150 to include even minor non-

structural effects such as superficial cracking in cement render, the enlargement of cracks already present, and the separation of partitions or intermediate walls from load bearing walls. If such damage is observed without vibration exceeding the 'safe limits' it can be attributed to other causes. DIN 4150 also states that when vibrations higher than the 'safe limits' are present, it does not necessarily follow that damage will occur.

12.2.1 Heritage Structures

The German Standard DIN 4150: *Part 3 – 1999 Effects of Vibration on Structure (DIN 1999)* guideline values for peak particle velocity (mm/s) criteria at heritage structures are summarized in appendix.

12.2.2 Other Buildings and Structures

British Standard BS 7385: *Part 2: 1993 'Evaluation and Measurement for Vibration in Buildings Part 2 Guide to damage levels from ground borne vibration'* gives guidance on the levels of vibration above which building structures could be damaged.
These values apply to buildings other than heritage buildings, including residential, industrial and commercial buildings surrounding the project.

For the purposes of BS 7385 damage is classified as cosmetic (formation of hairline cracks) or major (damage to structural elements).
Guideline values given in the standard are associated with the threshold of cosmetic damage only, usually in wall and/or ceiling lining materials. The BS 7385 values for vibration limits above which cosmetic damage could occur are provided in appendix.

12.2.3 Human Exposure

Vibration criteria relating to human comfort is sourced from *Assessing Vibration – A Technical Guide (DEC, 2006)* and include:

- Continuous vibration from uninterrupted sources;
- Impulsive vibration – up to three instances of sudden impact eg. Dropping heavy items, per monitoring period; and
- Intermittent vibration such as from drilling, rock hammering, compacting or activities that would result in continuous vibration if operated continuously.

Appendix identifies the relevant human exposure criteria for the project.

13 Compliance Management

13.1 Roles and Responsibilities

TJM Earthworks and Lotus Projects have an organized structure, overall roles and responsibilities to ensure that all construction works are kept well within the requirements as outlined in the DA

13.2 Training

All employees, subcontractors and staff working onsite will undergo site induction training that includes construction noise and vibration management issues, including:

- Existence and requirements of the EMP
- Relevant legislation
- Construction hours
- Locations of Vibration monitoring
- Complaints reporting and public enquiries
- Specific responsibilities to minimise impacts on the community and built environment from un-necessary noise and vibrations associated with the works.

13.3 Monitoring and Inspections

Regular monitoring and inspections will be undertaken during construction in accordance with the requirements outlined in the DA.

Where monitoring indicates that levels consistently exceed the predicted and mandatory maximum levels, mitigation measures and/or redesign will be applied in order to meet the requirements.

Vibration monitoring locations will be selected onsite and monitored by the chosen Geotech.
Please note that these locations are subject to ease of access throughout the project and acceptance from the resident of the neighbouring property that monitoring can occur on or at the boundary of their property.
If a resident does not wish monitoring to occur on their boundary, an equivalent location will then be selected.

13.4 Non-conformances

Non-conformances will be dealt with by the project manager or their delegate and recorded in accordance with regulations.

13.5 Community Notification and Complaints Management

Noise and Vibration complaints will be recorded and addressed in accordance with the DA requirements. The key steps in this process will include:

- Respond to and manage all complaints made,
- Record any contact, complaint or enquiry,
- All calls and enquiries will be responded to immediately,
- All complaints will be responded to immediately

13.6 Audits

Internal audits will be undertaken to assess the effectiveness on all controls outlined in this EMP.

14 Air Quality Management Plan

14.1 Purpose

This Air Quality Management Plan (AQMP) describes how TJM Earthworks and Lotus Projects will minimise and manage Air Quality impacts during construction. This AQMP has been prepared to address the requirements of the future DA, Environmental Protection and applicable guidelines and legislation.

14.2 Structure of the AQMP

This AQMP will form part of TJM Earthworks and Lotus Projects environmental framework for the project and is supported by other documents such as SWMS and work procedures. The review and improvement process for this AQMP are described in chapter 26 of this EMP.

14.3 Consultation of the AQMP

Consultation will continue the construction process with relevant stakeholders and contractors. Where relevant, the outcomes of this consultation will be documented in subsequent revisions of the AQMP.

15 Other Requirements

15.1 Legislation

Legislation relevant to air quality management for the project includes:

- *Environmental Planning and Assessment Act 1979 (EPA&A Act);*
- *Protection of the Environment Operations Act, 1997 (POEO Act); and*
- *Protection of the Environment Operations (Clean Air) Regulation 2010*

15.2 Guidelines and Standards

The main guidelines, standards and policy documents relevant to this AQMP include:

- Guidance on the assessment of dust from demolition and construction (IAQM 2014). This provides guidance on how to assess the sensitivity of receptors and the risk of impact on those receptors due to the various components of the project construction,
- NSW EPA Local Government Air Quality toolkit, Visual Guide: Dust from Urban construction sites

16 Existing Environment

16.1 Construction Activities

TJM Earthworks construction activities have potential to impact on air quality. The construction aspects identified that have the potential to impact on air quality are:

- Demolition: any activity that involves the removal of existing structures. This may be referred to as deconstruction, specifically when a building is to be removed a small part at a time;
- Earthworks: the process of soil stripping, ground levelling, excavation and landscaping. Earthworks will primarily involve excavating material, haulage, tipping and stockpiling;
- Construction: any activity that involves the provision of new structured, modification or refurbishment. A structure will include a residential dwelling, office building, retail outlet, road, etc.; and
- Track-out: the transport of dust and dirt by heavy vehicles and/or machinery from the construction/demolition site onto the public road network, where it may be deposited and the re-suspended by the vehicles using the network.

Gaseous Emissions:

- Mobile construction plant and equipment: fuel combustion;
- Transport of materials, spoil and waste to/from site: fuel combustion;
- Transport of project vehicles: fuel combustion;
- Vegetation clearance: removal of planted trees and screening vegetation
- Construction materials: concrete, cement, structural steel, reinforcing steel, steel rock bolts, aggregate, asphalt, copper, plastic and mains water; and
- Waste: construction and demolition waste.

16.2 Construction Impacts

The dominant air quality impacts and amenity issues as a consequence of the identified construction aspect are:

- Dust deposition and visible dust plumes;
- Temporary elevation of Particulate matter (PM_{10}) concentrations due to dust generating activities;
- Exhaust emissions from equipment; and
- Dust and odour complaints from the public.

It is difficult to quantify dust emissions from construction activities, since it is not possible to predict the weather conditions that will prevail during the specific construction activities needed for this project.
As work areas will generally be opened up and stabilised in a relatively short period of time, the effects of local dust levels will be very temporary and short lived. These dust levels will be adequately suppressed utilising water methods.

17 Compliance Management

17.1 Roles and Responsibilities

TJM Earthworks and Lotus Projects have an organized structure, overall roles and responsibilities to ensure that all construction works are kept well within the requirements as outlined in the DA

17.2 Training

All employees, subcontractors and staff working onsite will undergo site induction training that includes construction noise and vibration management issues, including:

- Existence and requirements of the EMP
- Relevant legislation
- Construction hours
- Complaints reporting and public enquiries
- Specific responsibilities to minimise impacts on the community and built environment from un-necessary air pollution associated with the works.

17.3 Monitoring and Inspections

Regular monitoring and inspections will be undertaken during construction in accordance with the requirements outlined in the DA.

Where monitoring indicates that levels consistently exceed the predicted and mandatory maximum levels, mitigation measures and/or redesign will be applied in order to meet the requirements.

Item	Frequency	Standards	Reporting	Responsibility
Inspections				
Site	Daily	No visible dust emissions from site	N/A	All
Site	Daily	No mud tracking offsite, check entry and exit to site Dust controls	Site Diary	All
Site	Weekly	No visible dust emissions from site	Site Diary/Checklist	All

Site	Weekly	Entry and exit to be maintained	Site Diary	All
Site	Fortnightly	Regular dust soiling checks on surrounding cars and window sills	Site Diary	All
Plant/Equipment inspections including maintainance and emissions	Prior to use Daily	As per daily pre start	Pre starts	Operators
Visual surveillance	Continual during activities with high potential to produce dust	No visible dust emissions from site	Site Diary	All
Monitoring				
Weather	Daily	Extreme weather Winds >25km/h	Site Diary	Supervisor
Rainfall	Daily	As per BOM	Site Diary	Supervisor

17.4 Non-conformances

Non-conformances will be dealt with by the project manager or their delegate and recorded in accordance with regulations.

17.5 Community Notification and Complaints Management

Air Quality complaints will be recorded and addressed in accordance with the DA requirements. The key steps in this process will include:

- Respond to and manage all complaints made,
- Record any contact, complaint or enquiry,
- All calls and enquiries will be responded to immediately,
- All complaints will be responded to immediately

17.6 Audits

Internal audits will be undertaken to assess the effectiveness on all controls outlined in this EMP.

18 Construction Environmental Management Plan

18.1 Purpose

This Construction Environmental Management Plan (CEMP) describes how TJM Earthworks and Lotus Projects will minimise and manage noise and vibration impacts during construction.
This CEMP has been prepared to address the requirements of the future DA, Environmental Protection and applicable guidelines and legislation.

18.2 Structure of the CEMP

This CEMP will form part of TJM Earthworks and Lotus Projects environmental framework for the project and is supported by other documents such as SWMS and work procedures. The review and improvement process for this CEMP are described in chapter 26 of this EMP.

18.3 Consultation of the CEMP

Consultation will continue the construction process with relevant stakeholders and contractors. Where relevant, the outcomes of this consultation will be documented in subsequent revisions of the CEMP.

19 Project Overview

19.1 Project Description

Construction of a multi storey residential sole occupancy unit block, with 2 levels for parking onsite.

19.2 Location and Management of Stockpiles

Temporary stockpiles will be required during construction to store materials for construction or materials generated from within the construction site including:

- Recycled Road base;
- Stripped topsoils;
- Excavated Materials;
- Excess concrete, pavement, rock, steel and other materials stored for either future use in the project or prior to removal from site.

Please refer to Section 6 of this EMP for Management of Stockpiles.

20 Planning

20.1 Environmental Obligations

All construction personnel working on the project will have the following environmental obligations:

- Minimise pollution of land, air and water;
- Use pollution control;
- Preservation of the natural environment;
- Immediately notify the relevant authorities of any heritage discovery;
- Minimise the occurrence of offensive noise;
- Be a good neighbour to surrounding neighbours;
- Use equipment correctly and ensure it is properly maintained;
- Attend project toolbox talks and pre start meetings to discuss personal thoughts and implements for the project and surrounding environment; and
- Conduct works in compliance with SWMS and this EMP.

20.2 Other Requirements

- *Environmental Planning and Assessment Act 1979*
- *Water Management Act 2000*
- *Protection of the Environment Operations Act 1997*
- *Protection of the Environment Operations (Noise Control) Regulation 2008*
- *Noxious Weeds Act 1993*
- *National Parks and Wildlife Act 1974*
- *Native Vegetation Act 2003*
- *Environment Protection and Biodiversity Act 1999*
- *Protection of the Environment Operations (Waste) Regulation 2014*
- *Heritage Act 1977*

20.3 Approvals and Permits

Other than the DA, no other approvals or permits will be required for commencing construction works.

20.4 Environmental Policy

The environmental policy is to be issued to the Project Manager of the site by all relevant subcontractors prior to commencing works.

21 Contractor Roles

The environmental responsibilities of the following roles include:

Project Manager:

- Ensure all works comply with relevant regulatory and project requirements;
- Ensure all requirements of this EMP are fully implemented where applicable;
- Participate and provide guidance in the regular review of this EMP;
- Ensure all personnel receive adequate inductions and requirements of this EMP
- Ensure that all complaints are investigated and issues raised are resolved in due time;
- Direct that works be stopped immediately where there is an actual risk that the construction will harm the environment.

Foreman/Leading Hand:

- Undertake environmental duties as defined by Project Manager;
- Control construction works and implement/maintain effective environmental controls;
- Undertake required environmental risk assessments;
- Ensure all site activities and workers comply with this EMP.

21.1 Subcontractor Management

Subcontractors environmental requirements and responsibilities will be addressed by the site project Manager prior to the subcontractor commencing work.

All subcontractors are required to have an environmental management policy in place prior to commencing works and work in accordance with this EMP.

All subcontractors are required to attend inductions and toolbox talks. These toolbox talks are held at regular intervals as stated by the Project Manager

A standard monitoring system will be developed to assess and ensure the:

- Subcontractors general work practices;
- Effectiveness of the subcontractors environmental protection measures;
- Subcontractors compliance with the requirements of this EMP; and
- Maintainenece of environmental measures.

22 Competence, Training and Awareness

The Project Manager has overall responsibility for ensuring the requirements of this EMP are fully implemented.

22.1 Environmental Induction

All personnel, including subcontractors, are required to attend a compulsory site induction prior to commencement of works.
The site induction must and will include environmental requirements for all personnel on site as outlined in this EMP

22.2 Toolbox Talks and Awareness

Toolbox Talks will be used to raise awareness and educate personnel on construction related issues as well as environmental issues and performance.
Toolbox Talks will be tailored to specific issues on site, when and if they need to be raised at that particular time.
Toolbox Talks will always consist of any environmental issues, performance and/or maintenance.

Toolbox attendance is mandatory for those on site and personnel are required to sign an attendance register.

22.3 Pre-Start Meetings

Pre-starts are a tool used to inform all personnel of the days/weeks work activities, deliveries, haulage, operation, safe work practices and environmental protection practices.

The foreman or other appropriate staff member, will conduct pre start meetings at intervals of the discretion of the project manager.

These meeting much like toolbox talks are mandatory to attend and must be signed off.

23 Communication

23.1 Internal Communication

Clear communication throughout all levels and functions, is key to minimising environmental impacts and achieving continual improvements in environmental performance.

Information relating to communication in meetings can be found in Section 22 of this EMP.

24 Incidents and Emergencies

All environmental incidents and emergencies will be managed in accordance with the DA requirements and the contractors environmental policy.

The relevant authorities to be notified in an emergency are:

- The EPA;
- SafeWork NSW;
- Northern Beaches Council; and
- Fire and Rescue NSW

25 Compliance Management

25.1 Roles and Responsibilities

TJM Earthworks and Lotus Projects have an organized structure, overall roles and responsibilities to ensure that all construction works are kept well within the requirements as outlined in the DA

25.2 Training

All employees, subcontractors and staff working onsite will undergo site induction training that includes construction noise and vibration management issues, including:

- Existence and requirements of the EMP
- Relevant legislation
- Construction hours
- Locations of Vibration monitoring
- Complaints reporting and public enquiries
- Specific responsibilities to minimise impacts on the community and built environment from un-necessary noise and vibrations associated with the works.

25.3 Monitoring and Inspections

Regular monitoring and inspections will be undertaken during construction in accordance with the requirements outlined in the DA.

Where monitoring indicates that levels consistently exceed the predicted and mandatory maximum levels, mitigation measures and/or redesign will be applied in order to meet the requirements.

Item	Frequency	Standards	Reporting	Responsibility
Inspections				
Site	Daily	No visible dirty water/dust emissions from site	N/A	All
Site	Daily	No mud tracking offsite, check entry and exit to site Dust controls	Site Diary	All
Site	Weekly	No visible dirty water/dust emissions from site	Site Diary/Checklist	All
Site	Weekly	Entry and exit to be maintained	Site Diary	All
Site	Fortnightly	Regular dust soiling checks on surrounding cars and window sills Regular checks of drains	Site Diary	All
Plant/Equipment inspections including maintainance and emissions	Prior to use Daily	As per daily pre start	Pre starts	Operators
Visual surveillance	Continual during activities with high potential to produce dust	No visible dust emissions from site No pollution on street or in assets	Site Diary	All
Monitoring				
Weather	Daily	Extreme weather Winds >25km/h	Site Diary	Supervisor

Rainfall	Daily	As per BOM	Site Diary	Supervisor

25.4 Non-conformances

Non-conformances will be dealt with by the project manager or their delegate and recorded in accordance with regulations.

25.5 Community Notification and Complaints Management

Environmental complaints will be recorded and addressed in accordance with the DA requirements. The key steps in this process will include:

- Respond to and manage all complaints made,
- Record any contact, complaint or enquiry,
- All calls and enquiries will be responded to immediately,
- All complaints will be responded to immediately

25.6 Audits

Internal audits will be undertaken to assess the effectiveness on all controls outlined in this EMP.

26 Review and Improvement

Continuous improvement of this Excavation Management Plan will be achieved by the ongoing evaluation of all requirements and standards, policies, performance, objectives and targets.

Reviews will take place every 6-12 months or as required.
Revision Numbers will be recorded on the cover page of this EMP along with the creator, reviewer and approver.

Appendix