

Construction Environmental Management Plan

Managing FDC's Safety, Quality and Environmental requirements



Project Details

Project Name: IC3 WEST

Project Number: 250177

Project Location: 17-23 Talavera Road, North Ryde

Client: Macquarie Telecom

Commencement date: April 2024

Estimated completion date: September 2026

Name of principal contractor: FDC Construction (NSW) Pty Ltd

Company address: 22-24 Junction Street, Forest Lodge 2037

ABN: 72 608 609 427

Reviewed/Approved
Signature



Matt Hezlett

Project Manager

Approved
Signature



Sean Gibbeson

General Manager

Acknowledgement of Country

This project is being undertaken on Darug land.



FDC are proud to acknowledge the Traditional Custodians of the land on which this project is located, and their connections to land, sea and community.

We pay our respects to their elders past and present and extend that respect to all Aboriginal and Torres Strait Islander people and all Aboriginal and Torres Strait Islander workers on this project.

FDC Commitment

“FDC are committed to a reconciled, just and equitable Australia”
(FDC Reconciliation Action Plan)

By these acknowledgements and other actions, FDC will continue to do all we can to contribute to improving the lives and communities of our First Nations People.

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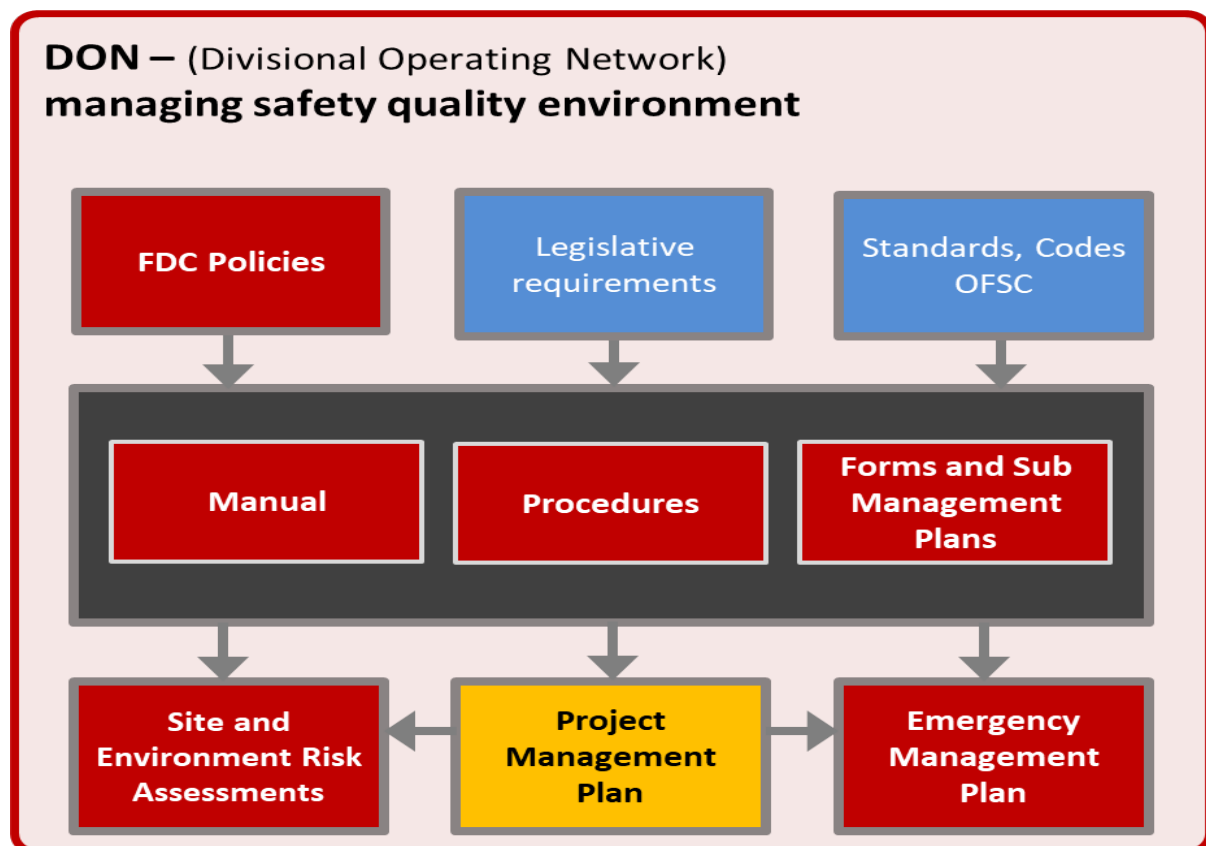
INTRODUCTION

1.1 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

This Construction Environment Management Plan (CEMP) has been developed in accordance with FDC's integrated management system and establishes project responsibilities to achieve project specific health, safety, quality, and environmental requirements. The CEMP enables the project team to deliver the project in accordance with client requirements and without safety or environmental incidents to employees, environment, or the community.

The CEMP links with the Site Risk Assessment and Environmental Risk Assessment to identify potential hazards and aspects at the workplace and develop appropriate control measures to eliminate or reduce potential risks. The documents referenced throughout the CEMP are available for FDC workers on the Vault > Manage My Project. Downloading and storage of templates on project directories for repeat use is not permitted as only new or revised templates uploaded to the Vault. Changes to system documents shall be communicated through alerts to Divisional HSEQ representatives and project teams.

The CEMP addresses FDC's management system that has third party certification to ISO9001, ISO14001, and ISO45001 and is accredited with the OFSC Accreditation Scheme. FDC's Divisional Operating Network (DON) integrates FDC's health, safety, quality and environmental requirements and external requirements as illustrated below:



1.2 DPE CONDITIONS

The CEMP required under conditions C1, C2, C3 of the SSDA determination (2429970), addresses the following requirements;

Conditions	Comments / Sections Addressed in the Document
C1. Management plans (CEMP) required under this consent must be prepared in accordance with relevant guidelines, and include:	This document
(a) a condition compliance table;	
(b) details of:	
(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);	Refer to Sections 1.3 & 4.2 (4.2.1)
(ii) any relevant limits or performance measures and criteria; and	Refer to Section 4.6
(iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation	Refer to Section 1.10
(c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	Refer to Sections 1.8, 1.9 & Section 4.6
(d) a program to monitor and report on the:	
(i) impacts and environmental performance of the development; and	Refer to Sections 1.8, 1.7 & Section 2.15 (2.15.1.1 & 2.15.2.1) & Section 4.6
(ii) effectiveness of the management measures set out pursuant to condition C1(c) above;	
(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Refer to Sections 1.8 & 1.9, Sections 4.1 & 4.6
(f) a program to investigate and implement ways to improve the environmental performance of the development over time;	Refer to Sections 1.8 & 2.13 (2.13.1.1 & 2.13.3)
(g) a protocol for managing and reporting any:	
(i) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria);	Refer to Section 2.13 (2.13.1.1 & 2.13.3) Refer to Section 2.16
(ii) complaint;	
(iii) failure to comply with statutory requirements; and	Refer to Sections 4.6 & 2.17
(h) a protocol for periodic review of the plan.	Refer to Sections 1.3 & 1.9

C3. As part of the CEMP (see condition C2), included in the following:	
(a) details of the community consultation and complaints handling procedure to be implemented during construction;	Refer to Sections 1.11, 2.17 (Section 2.17.1) and Appendix K - Community Consultation Letter
(b) erosion and sediment control plan(s); and	Refer to Appendix E
(c) a copy of the development's:	
(i) Construction Noise and Vibration Management Plan (see condition B4);	Refer to Appendix D
(ii) Construction Traffic Management Plan (see condition B25); and	Refer to Appendix C
(iii) Unexpected Contamination Finds Procedure (see condition B45).	Refer to Appendix G

1.3 PLAN REVIEW, LICENSING REQUIREMENTS AND APPROVAL

The CEMP shall be reviewed by the Project Manager for General Manager approval prior to issue and subsequent revision. The Project Manager shall be responsible for inducting the project team into the requirements of the CEMP. Team members with assigned responsibilities and accountabilities shall initial the organisation chart thereby acknowledging they have read, understood, and accepted the CEMP requirements and are committed to complying with these.

At least one CEMP hard copy shall be available and accessible on site in addition to the electronic copy retained in the Project drive and provided to stakeholder where requested. The CEMP shall also be issued to subcontractors, together with the Site Risk Assessment, prior to them commencing work on site.

The ongoing suitability of the CEMP shall be reviewed during the monthly site audit. Changes due to reviews, meetings, site-specific outcomes and recommendations through inspections, reports, audits etc. shall be reviewed in consultation with Divisional HSEQ representatives and approved as above prior to re-issue.

The revision table in Appendix B shall record CEMP revisions and the Project Manager shall be responsible for communicating changes to holders of copies and other stakeholders as required and recorded through project correspondence.

Project Approval – The project has been approved in accordance with the NSW Environmental Planning and Assessment Act 1979, An Environmental Assessment has been prepared for the project which contains conditions to which the project must comply. Requirements of the following planning documents have been incorporated within the CEMP.

Legislation – Legislation applicable to the construction of the project has been incorporated in the development of the CEMP.

Permits and Licenses – Permits and licenses relevant to the project will be acquired as necessary in accordance with the requirements for the works. A copy of these permits will be kept in the project folders.

Client Specifications, Standards and Guidelines – Client specifications including industry best management practice standards and guidelines have been incorporated in the development of the CEMP.

1.4 POLICIES

FDC's WHS, Quality and Environmental policies communicate FDC's commitment to delivering this project safely, without impact to the environment and in accordance with client requirements. These policies are included in Appendix A and available on site. Additional policies are available on the Vault and include:

- Code of Conduct and Ethics
- Equal Employment Opportunity
- Unexpected Finds Protocol
- Subcontractor Payment Administration
- Aboriginal Participation Policy
- Drug and Alcohol Policy
- Fatigue Policy
- Hot and Cold Policy
- Industrial Relations
- Return to Work Policy
- Young, Inexperienced Workers Policy
- Training Management Policy
- Travel Policy
- FDC Group Motor Vehicle Policy
- Whistleblower Policy
- Modern Slavery

1.5 ROLES AND RESPONSIBILITIES

General roles and responsibilities for employees are outlined in individual position descriptions. This project PMP assigns project specific roles and responsibilities in accordance with the DON and the Training and Experience Register as applicable. When reading the PMP, the following definitions explain Responsibility and Accountability:

Responsibility – the person with overall responsibility for ensuring the specific task is completed. Only one person can be responsible.

Accountability – the person, or persons, with delegated authority to complete the task. There can be more than one person accountable for a task.

FDC's Project Manager has executive responsibility for safety, quality, and the environment and responsible for implementation of the CEMP requirements. It remains the responsibility of the Project Manager and the project team to ensure the CEMP requirements are complied with.

1.6 PROJECT SCOPE

Macquarie Data Centres is now commencing the development of the second stage of IC3 being the western portion (IC3 Super West or IC3w), involving the construction and operation

of:

- a seven-storey building, with total of approx. 9,930m² of data halls,
- 47MW total IT load,
- ancillary office space and staff amenities,
- Tier III level electrical and mechanical systems,
- associated infrastructure, car parking, loading docks and landscaping.

IC3w will be constructed on the land immediately adjacent to MDC's existing IC2 and IC3e data centres. Works to IC3w will be phased, with Phase 1 to be designed & constructed first and consisting of the shell and core, along with associated site works, plant, and services, and an initial deployment of 6MW IT load. Increased IT load capacity and fit out of data halls shall be designed to be progressively deployed in subsequent phases over time subject to business demand.

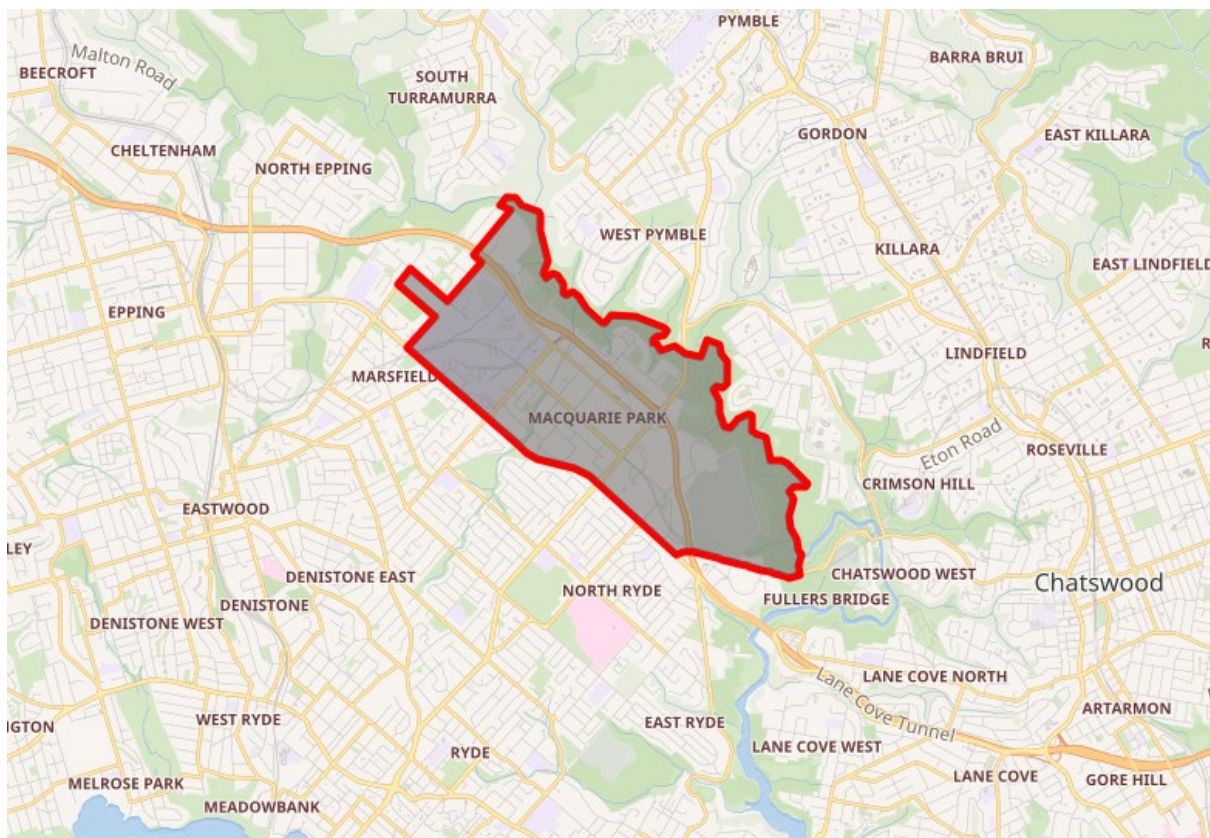
The facility is operational 365 days per year, 24 hours per day and is built as a 'Mission Critical Facility' meeting the requirements of a Tier 3 data centre, as defined by the Uptime Institute and in the ANSI/EIA/TIA-942 standard.

Staging of Construction (Condition A17)

The Stormwater diversion works for site formed part of the previous CEMP prepared by Ardee Civil which was approved by the planning department on 15/02/2024.

This CEMP covers all remaining works for the project. Inclusive of All in ground elements, groundworks, substructure and services, superstructure, above ground services and internal fit out.

Project Location



Macquarie Park is a suburb in the Northern Sydney region of Sydney, New South Wales, Australia. Macquarie Park is located 13 kilometres north-west of the Sydney central business district in the local government area of the City of Ryde.

Macquarie Park was part of the suburb of North Ryde until it was gazetted as a suburb in its own right on 5 February 1999, and many businesses still use North Ryde as the address. Both suburbs share the 2113 postcode but Macquarie University, which is located at the northern part of the suburb, has its own postcode of 2109.

The Surrounding Community - The site is generally surrounded by commercial, industrial facilities, including shopping centres (Macquarie Centre is a major shopping centre located opposite Macquarie University and next to Macquarie University Station. There are also two smaller shopping centres nearby, Lachlan's Square Village located in the Lachlan's Line precinct and strip mall on Lane Cove Road known as Eden Park Centre) and a University (Macquarie University) and Metro stations with residential properties located near Lane Cove National Park.

Works Hours

Monday to Friday 7:00 am - 7:00 pm

Saturdays 8:00 am - 3:00 pm

Sundays and public holidays NO WORK

Works outside these hours can only be undertaken:

- If delivery of oversized plant or structures is required, and where Police or other relevant authorities have determined that such deliveries require special arrangements to avoid impacting other road users.
- If emergency work is required to avoid loss of lives, property or avoid environmental harm.
- As approved by variation of the conditions of consent.

Where permission is received from representatives of the potentially affected community.

Site Establishment – Site establishment will involve the installation of signage, sediment controls, hoarding, walkways and temporary accommodation along with the disconnection of existing power, water and communications.

Demolition – The demolition stage will commence under a Construction Certificate with the removal of existing asphalt, concrete & topsoil. Material generated will be tested in line with environmental requirements and disposed in accordance with statutory requirements & regulations to an accredited facility.

Excavation & Substructure – Main construction will commence under a State Significant Development consent (SSD). There is an estimated total of 3,200m³ of material to be exported. Insitu piles will be installed followed by footings, pits, retaining walls and shear walls. In-ground drainage and lead-in conduits will also be installed for sewer, stormwater, electrical and communications.

Structure – A post-tensioned slab on ground will be progressively completed in separate pours followed by the construction of concrete columns and post-tensioned suspended slabs to make up

level's 1 - 5 and roof deck for the main building. Precast concrete panels and structure steel will be installed sequentially as progress advances on the structure.

Facade – Following completion of the concrete structure and advancement of structural steel, façade framing and cladding will be progressively installed to the building perimeter. Access will be via perimeter scaffold and also boom lift. Roof sheeting will be installed as areas become available in order to make the building watertight as soon as possible.

Services / Fitout – Once the internal building structure has been completed, fit-out of internal walls and services will commence as floor slabs are progressively stripped. Final finishes will be installed once the building has been made watertight.

Other Environmental Impacts - This section provides detail regarding the additional potential environmental impacts identified by FDC beyond those described in the Environmental Report, and the overall mitigation strategies FDC will implement to address each.

Water System Pollution

Stormwater catchment area per appended civil document (C04.51) Appendix J. The majority of the area of works drains into the OSD through existing carpark stormwater pits & lines. Sediment and erosion controls will be implemented as identified in the Erosion & Sediment Control Plan contained in Appendix E. Additionally, FDC will implement control measures to mitigate against chemical pollution including nominating designated chemical storage areas; providing / enforcing provision of spill kits for each potential pollutant; identifying refuelling areas, and the like.

Bushfire Prevention

FDC will implement strategies to minimise the risk of bushfire ignition including storage of flammable / combustible materials in secured locations, positioning of fire extinguishers across the site, and protocols for use of spark-generating machinery (including requirement for fire extinguisher and restricted work periods e.g. no hot works on days with a Fire Danger Index of High or above or use of spotters).

Hazardous Building Materials

Prior to commencement of demolition / removal of the existing facilities, a thorough Hazardous Materials Inspection will be undertaken by a qualified Environmental Consultant to identify any hazardous materials required to be removed prior to demolition. These items will be removed by a licensed subcontractor, and the demolition works will proceed only after the issue of a Clearance Certificate by the qualified Environmental Consultant.

Waste Minimisation

Consistent with all FDC projects, FDC will implement strategies to minimise waste on site.

Multiple bins will be provided on site for the continuous separation of both trade and personal waste where possible. Material waste will be reduced as far as possible through intelligent design and manufacturing, and residual waste and offcuts are to be recycled where possible in convenient and well-marked bins. Dockets will be retained for reporting purposes. FDC's current goal is to increase recycled waste docketing to over 90%. Contamination of waste streams will be inspected and audited on a regular basis, and actions implemented to address any deficiencies.

Avoidance of damage will be a key focus to minimise waste and unnecessary additional works. Protective materials will be used to cover potentially at-risk finishes / surfaces and subsequently minimise damage and waste.

Contaminated, chemical and/or hazardous waste will be separated from general building waste and disposed of in accordance with relevant legislation.

FDC will focus on procurement of suppliers / subcontractors which implement good environmental and waste management strategies for their own works, and will encourage suppliers to use reduced, reusable (e.g. board, blankets, boxes or recyclable packaging where possible to minimise waste).

FDC will reuse materials where possible on the Project including excavated materials, demolition waste and vegetation required to be cleared for works (e.g. as mulch).

Ongoing Risk Assessment - Environmental risk assessment will be on-going throughout project delivery. Emphasis will be placed on any changes to construction methodology, changes in materials used, and works within or adjacent to sensitive receiving environments. The Project Engineer will be responsible for management of risk identification and assessment in consultation with the project team.

Environmental risks associated with the Project shall be monitored and tracked through the Environmental Risk Assessment (Risk Register). This includes all risks identified for the project management processes to reduce or eliminate the risk and identified staff responsible for each risk.

Forums for facilitation of risk identification include:

- Project meetings;
- Environmental Site Inspections;
- Toolbox meetings;
- Informal site discussions; and
- Work Method Statements.

Management Schedules - The Management Schedules that are relevant to the capturing of site environmental activities are listed as follows,

- Site Inspection Checklist
- Non-Conformance Report
- Non-Conformance & Corrective Actions Register
- Environmental Incident Report
- Environmental Training Register
- Waste Register

Environmental Awareness

Where there are significant environmental issues identified for the project, these must be incorporated into the site-specific induction. These include but shall not necessarily be limited to:

- Minimising disturbance and confining it to as small an area as possible (e.g. being flexible with excavations and other works to enable tree retention where possible).
- Potential contaminated subsoils and the need to separately stockpile them and backfill them before topsoil.

- Noise emissions and limits for neighbours.
- Limiting and reducing dust emissions.
- The majority of the area of works drains into the OSD through existing carpark stormwater pits & lines. Sediment and erosion controls will be implemented as identified in the Erosion & Sediment Control Plan. Additionally, FDC will implement control measures to mitigate against chemical pollution including nominating designated chemical storage areas; providing / enforcing provision of spill kits for each potential pollutant; identifying refuelling areas, and the like.
- Handling and storage of harmful substances used in construction (e.g. fuels, solvents, concrete wash-out etc.), especially important to prevent from entering drainage systems.
- Throughout the footprint of the proposed construction site there are fuel lines and a fuel tank used to help power the existing diesel generators. The likelihood of any risk regarding contamination is low due to the following control measures:
 - a. All lines have been identified and documented on plan using GPR (Ground penetrating Radar).
 - b. It is included within subcontractor inductions to make themselves individually aware of in-ground services within areas they are working.
 - c. Any works being completed in close proximity to a fuel line will be only started once an additional test (using GPR) has been completed to validate the location.
 - d. Non-destructive digging methods to be used where there is any excavation near fuel lines (i.e. sucker truck).

NOTE: Prior to relocation of the existing tank, the entire fuel system will be drained, ensuring there is no risk of contamination.
- General site tidiness and order with no litter on a daily basis.

Subcontractors

Subcontractors will be responsible for ensuring that the controls specified in this Plan and FDC's Risk Register are adopted when developing their system(s) for work and implemented throughout the course of the works.

Subcontractors shall be responsible for consulting with and educating workers under their management, in the agreed environmental system(s). Evidence of appropriate training shall be made available by the subcontractor to FDC upon request by an FDC nominated representative.

1.7 INCIDENT RESPONSE AND EMERGENCY CONTACTS

Incident Response

An environmental incident may, amongst other things, include:

- A fuel or hazardous material spillage or leakage;
- Failure of a pollution control device such as sediment controls;
- Major noise and/or vibration affecting neighbours; and
- Disturbance to a protected area or item.

Any Environmental Incidents shall be immediately reported to the Project Manager or Site Manager who will report the incident to the Contract Administrator as per project requirements. The first priority is to ensure that the situation is controlled as soon as possible, and to avoid further pollution or other adverse environmental consequences. Reporting of the incident should not delay any immediate responses to the incident.

In the event of serious or material environmental harm, FDC will notify the relevant regulatory authorities as per State / Commonwealth. Where necessary, FDC will also notify the respective property owners or occupiers within 1 hour of the incident occurring. An incident will be reported if any of the following scenarios occur or have the potential to occur:

- Serious environmental harm;
- Material environmental harm;
- Prosecution by a Regulatory Authority;

Environmental approval condition breach; or

- Environmental monitoring parameter breach.

Incidents shall be reported both verbally and in writing. Verbal notification shall be provided immediately (within 1 hour of the incident occurring) to EPA, verbal and written notification will be provided to Macquarie Data Centres (MDC) within 1 hour of the incident occurring. A written incident notification addressing the requirements must be submitted to the Planning Secretary via the Major Projects website within seven days of an incident. All incidents shall be recorded in an appropriate Incident & Accident Database.

All environmental incidents that cause, or could potentially cause environmental harm are to be investigated, and corrective actions implemented following the investigation. Depending on the seriousness of the incident, key site personnel, the HSEQ Manager, witnesses and the like shall be consulted on the investigation and in determining appropriate corrective or preventive actions.

Emergency Contacts

In the event of an environmental emergency, the following person can be contacted 24 hours per day, seven days per week:

Name:	Matthew Hezlett (FDC)
Position / Responsibility:	Project Manager
Contact Number:	0478 403 455

Emergency services contact details are as follows:

Emergency Hotline	000
Ambulance	000
NSW Fire Service	000

Police	000
SES	132 500
WIRES (injured wildlife)	1300 094 737
EPA Environment Line	131 555
Aboriginal Heritage Office	(02) 8495 5616

All on-site information relating to hazardous materials, including Material Safety Data Sheets and spill containment materials will be kept at the Site Office.

1.8 MONITORING AND REPORTING

Site Inspections

Environmental Site Inspections will be undertaken by various project personnel to monitor and report on the adequacy and effectiveness of environmental controls. These inspections will address the following as a minimum:

1. High risk activities and processes;
2. Work in environmentally sensitive areas; and
3. Site preparation for adverse weather conditions.

Responsibilities for Environmental Site Inspections on the project are summarised below:

- Site supervisory staff (e.g. the Site Manager, Foremen) will conduct daily observations of areas under their supervision, including assessment of environmental controls and issues. Daily inspections will be documented in Daily Site Diaries, and any corrective actions entered into the Non-Conformance & Corrective Actions Register.
- Site supervisory staff and/or the Project Engineer will conduct weekly inspections and complete the Weekly Environmental Checklist. Environmental issues arising from these inspections will be immediately reported to the HSEQ Manager and relevant project personnel for rectification. Where necessary, issues may be entered into the Non-Conformance & Corrective Actions Register.
- Any FDC staff member or subcontractor may raise an environmental issue through the Safe Behaviour Observation process.
- Safety, Environment and Quality Audits will be performed by the Construction Regional Management Systems / Divisional HSEQ Team on a regular basis.

Inspection Checklist

The majority of monitoring that will occur on site will be by Site Inspection or observation. The following is a summary of the checklist provided below for environmental aspects typically reviewed during a Site Inspection. The checklist will be completed during the inspection and results logged within reporting systems (including corrective actions).

Inspection Checklist Summary

Aspect	Observations	Corrective Actions
Heritage	Are heritage areas protected with fencing? Are workers avoiding these areas where possible?	If deficiencies are observed, corrective action is noted, with a location
Vegetation	Are sensitive vegetation areas fenced off and no access has been gained? Are trees fenced off, is material being stored under them? Is tree protection installed and in good condition?	
Bushfire prevention	Are fire extinguishers located across the site? Are combustible materials stored in secure locations? Are hot works restricted on high fire danger days?	
Emergency preparedness	Are spill kits available? Are MSDSs available? Are erosion and sediment control materials available?	
Disturbance	Are people and vehicles causing impacts outside the designated construction and access areas?	
Traffic management	Are construction vehicles adhering to agreed access routes? Is access being maintained for occupants of nearby facilities? Are vehicle wheels being cleaned before exiting the site (via cattle grid, wheel-wash etc.)?	
Site services	Is water and sewer connected with no leakage? Is light spilling that could affect aircraft or neighbours? Is soil or mud on access roads?	

Sediment control measures	Are control measures (e.g. silt fencing, drain protection, swale protection) in place and adequate? Are they installed properly? Is any sediment escaping? Is captured sediment being removed?	
Site runoff	Is runoff passing through at least one filter barrier before leaving the site, e.g. sediment fence, check dam? Is the runoff clean – sediment / cloudy / coloured / oil or grease sheens, etc.? Is pollution-generating activity controlled with wastewater being collected and treated prior to discharge (e.g. concrete washout)? Are runoff depressions obstructed and does drainage work effectively across the site?	
Dust and emissions	Is dust escaping from site? Are wind breaks installed for dust minimisation? Are water carts or sprays used for controlling dust when required? Are stockpiles covered to prevent dust generation? Are vehicles emitting smoky exhausts?	
Odours	Are any odours detectable?	
Noise and vibration	Is very noisy or vibration-producing activity occurring? Is it confined to daylight hours? Is it occurring with time limitations?	
Waste management	Is the site free of litter and debris? Are recycling facilities provided on site and utilised / adequate? Are waste dockets available? Is a waste register being maintained? Are general waste bins covered with lids? Are contaminated materials separated from general waste?	
Hazardous substances	Are they stored in a safe manner? Are they being used in a safe manner? Where is paint wash-out occurring?	

	Where is waste material being placed? Are there spill-kits on site? Are there designated areas for refuelling and use of chemicals?	
Hazardous materials	Has a Clearance Certificate been obtained prior to demolition of existing facilities (if applicable)?	
Contaminated soils	Are they being stored separately from other soils (with physical barriers)? Are adequate covers provided to prevent wind-born particles?	
Water consumption	Are low-flow fixtures / equipment being used? Check hosing down surfaces is not occurring	
Complaints	Have any been recorded and what action taken?	

Additional Monitoring

Weather Monitoring

While it is not a specific requirement of the contract, it is good practice to be aware of weather forecasts on the day of work, and a few days ahead.

The intent is to assess the potential for any of the following:

- Rain events – allowing site clean-ups, checking the working order of sediment controls and sediment clean-out to occur prior.
- Wind – allowing the checking of wind fencing (if required), and stockpiles covered etc.

The weather should be monitored and recorded every day, which shall inform preparations in advance of adverse conditions.

These aspects should be maintained on a regular basis to ensure the site is prepared for any weather that is not forecast.

1.9 AUDITING

Audits of the CEMP will be conducted to ensure that the plan is suitable for the works and site. As part of the audit program, audits will also be undertaken on the project site for compliance with, and implementation of, the requirements of the CEMP. Audits may be undertaken internally by the Divisional HSEQ Team, or by independent experienced auditors. The need for the latter will be determined by the HSEQ Manager based on the environmental performance of the project.

Audits will occur on a six-monthly basis in conjunction with the six-monthly review of the CEMP. These may be undertaken as an integrated audit in conjunction with the Project Work Health & Safety Management Plan and Project Quality Plan. High risk activities or those that performed poorly at the initial audit may be audited at a higher frequency. The HSEQ Manager is responsible for coordinating project audits.

In order to optimize the value of CEMP audits, the following analysis will be conducted by the HSEQ Manager.

- Lag indicators:

- Number of environmental incidents;
- Number and type of non-conformances;
- Number of Penalty Infringement Notices (PINs) or clean-up notices; and
- Number of community complaints.
- Lead Indicators:
 - Number of Site Inductions (environment);
 - Number of toolbox talks (environmental issues);
 - Number of audits of subcontractor environmental performance;
 - Number of environmental inspections undertaken; and
 - Waste and recycling volumes (initially to set benchmark, then track improvement).

A concluding environmental compliance audit will be undertaken upon completion of the works. It will include the following:

- Site surveillance / inspection;
- Full review of environmental records;
- Identification of any environmental protection measures and operational controls that have not yet been implemented to the levels identified in the associated plans;
- Recording of the condition of existing environmental protection controls; and
- Identification of any environmental protection measures which require rectification and ongoing management.

Corrective Actions

Following routine Site Inspections, Audits or general site observations, any deficiencies identified with environmental systems will be logged in the Non-Conformance & Corrective Action Register. This will provide details of the deficiency, with the required action and responsibility allocation, and a due date if not rectified immediately (during the inspection).

The issue will be raised with the responsible staff or subcontractor for rectification before the due date. If the issue is not addressed in this timeframe, a Non-Conformance Report will be issued. If the deficiency is considered to be major, or a minor deficiency is identified as recurring, a Non-Conformance Report will be issued.

Deficiencies that arise across the site may be raised in toolbox talks, subcontractor meetings and/or Site Inductions so that all subcontractors are aware of, and implement, best practices.

1.10 OBJECTIVES AND TARGETS

The following project objectives and targets reflect FDC targets and objectives that are established, reported, monitored, and reviewed annually for suitability and adequacy in accordance with the HSEQ Strategic Framework and company policies. The Project Manager shall be responsible for measuring performance against these targets and reporting to Divisional management monthly through the Project Monthly HSEQ Report (F090). Project targets and objectives specified in the contract shall be included as appropriate.

- Environmental

Aspect	Objective
Waste	Minimise waste going to landfill and meet Greenstar objectives.
Sediment and Erosion Control	Prevent sediment from entering waterways or the stormwater system.
Water Quality	Prevent contamination of water ways including the adjacent Alexandra Canal.
Noise and Vibration	Minimise noise and vibration including parameters associated with Alexandra Canal.
Dust	To limit dust and impacts on neighbouring businesses.
Asbestos	Manage existing asbestos and petroleum contaminated fill soils in accordance with best practice.

Work health and safety

Lead Indicator	Target	Responsibility
Project Managers Audit	1 per month	Project Manager
Weekly Site Inspections	1 per week	Site Manager / Safety Advisor
EHSQ Leadership Walk p/week – approx. 1 hr duration	1 per week	PC construction of Operational Person in attendance (Site Manager/ Project Manager)
EHSQ Observations p/week – approx. 15mins duration (p/observation)	4 per week	Safety Advisor/ Foreman
FDC Toolbox meetings	1 per week	Site Manager
Senior Management Site Inspection	1 per month	Senior Management
Daily Activity Briefing (DAB)	1 per day	Site Manager
Lag Indicator	Target	Responsibility
Recording of Medical Treatment Injury (MTI*)	MTI = 0	Project Manager
Recording of Lost Time Injury (LTI)*	LTI = 0	Project Manager

* Notes

In accordance with AS1885:

- A Medical Treatment Injury (MTI) is as an injury, which results in a journey to a medical facility where a medical practitioner provides treatment;
- A lost time injury / disease (LTI) is defined as a workplace injury where the injured person is not able to work for at least one full day/shift at any time after the day the injury occurred.

1.11 COMPLAINTS RESPONSE & HANDLING PROCEDURE

The Project Manager is responsible for ensuring that the appropriate management response and handling procedures are instigated and carried through in the event of a complaint. The project specific site induction will be used to ensure all site employees are aware of and understand their obligations for complaints response.

All employees who take receipt of a complaint, either verbal or written, are to immediately notify the Project Manager.

Complaints Register will be maintained by the Project Team with the following records for all complaints and enquiries:

- Date and time of complaint;
- The method by which the complaint was made (telephone, letter, meeting, etc.);
- Name, address, contact telephone number of complainant (if no such details were provided, a note to that effect);
- Nature of complaint;
- Action taken in response to the complaint, including follow up contact with the complainant;
- Any monitoring to confirm that the complaint has been satisfactorily resolved; and
- If no action was taken, the reasons why no action was taken.

Any complaints received via Macquarie Data Centres will also be included in the Complaints Register, responded to and closed out.

This process enables the management of the receipt and response to issues and reports.

All project staff will be advised of the procedures to be followed on receipt of a complaint during the project Site Induction.

FDC will notify Macquarie Data Centres immediately upon receipt of a complaint, and provide a final report within 5 working days detailing the action taken to remedy the situation and any proposed measures to prevent recurrence.

Upon becoming aware of a complaint, the protocol outlined below will be followed;

1. Record and Acknowledge

Any employee who takes receipt of a complaint, either verbal or written, is to immediately notify the Project Manager and/or the Site Manager.

The complainant's name and contact details, along with the nature of the complaint, will be recorded in the complaints register.

2. Assess and Prioritise

FDC will prioritise all complaints by considering the seriousness of the complaint including risk to health and safety and will attempt to provide a timely response via phone or email.

3. Investigate

A field investigation will be initiated in an attempt to confirm details relevant to the complaint and the cause of the problem.

If the complaint is due to an incident, the notification requirements and handling procedures outlined in this CEMP will be followed.

4. Action or Rectify

Once the cause of the complaint has been established, every possible effort will be made to undertake appropriate action to rectify the cause of the complaint and mitigate any further impact. The Project Manager will assess whether the complaint is founded or unfounded and delegate the remediation, as required.

5. Respond to Complainant

FDC will respond to the complainant once the issue has been resolved. The complainant will be provided with a follow up verbal response on what action is proposed within a timely manner. Where a complaint cannot be resolved by the initial or follow-up verbal response a written response will be provided to the complainant.

6. Record

It is imperative that an assessment of the situation is carried out and documented in order to minimise the potential for similar complaints in the future. On this basis, every complaint received is to be recorded in the Complaints Register.

7. Preventative Action

Once the complaint has been suitably handled, appropriate measures will be identified and implemented to negate the possibility of re-occurrence. The Complaints Register is not finalised until the preventative or completion actions are recorded on the register.

Communication, Coordination and Collaboration

FDC's project team will be led by the Project Manager (Contractor's Representative), who will be the primary point of contact between FDC and Macquarie Data Centres. The Project Manager will be supported by FDC's Project Engineer and the Divisional HSEQ team in the ongoing development of this CEMP and monitoring of the outcomes against the pre-determined targets.

The Project Manager is responsible for engaging MDC regarding project matters, as may be directed from time to time by the MDC Project Director.

The Project Manager and Project Engineer will maintain communication lines with MDC to ensure collaborative consultation.

FDC understands the importance of regular communication of all project information with MDC. FDC will keep MDC informed regularly and accurately with environmental management-related data.

FDC will establish an Excel-based reporting tool to be populated by the FDC Project Team and issued to MDC on a monthly basis throughout the works. This tool will include as a minimum the following data:

- Man-hours on site.
- Number of personnel inducted to site.
- Number of positive environmental interactions undertaken (inductions, tool-box talks, inspections, audits etc.).
- Number of environmental incidents.
- Number of environmental near-misses.

The monthly update of all pertinent Construction Environmental Management Plan data will be included in the FDC PCG Report, submitted to Macquarie Data Centres.

Ongoing Communication

Essential information relating to project environmental management will be communicated through regular tool-box talks and Site Inductions.

Environmental alerts will be periodically prepared and posted on notice boards.

Key changes to environmental legislation or policy will be issued by the Divisional HSEQ Team via email to all Project Managers and Site Managers for review and dissemination on site.

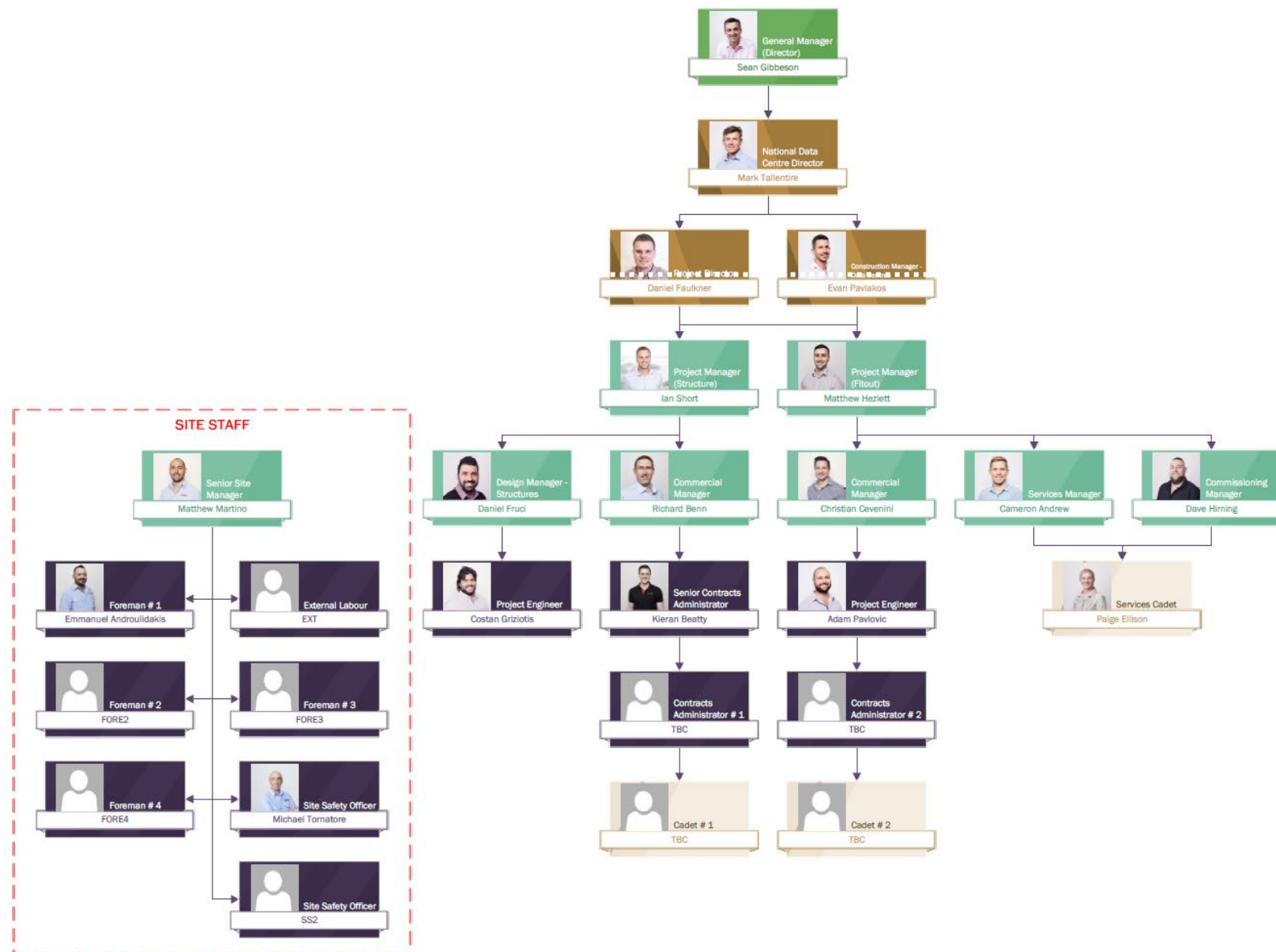
Communication with Authorities

All communication with Regulatory Authorities and the like shall be through the Project Manager.

Communication with the Media

Under no circumstances are project staff, subcontractors, or any other personnel involved in the Project to engage with the media.

1.12 PROJECT ORGANISATION CHART



QUALITY

2.1 LEGAL AND OTHER REQUIREMENTS

Section	Requirements	Responsibility	Accountability	Tools
2.1.1	The legal and other requirements (including Legislation, Australian Standards, Codes of Practice and guidelines) are identified in the Legal Register (G11) in accordance with Cor-4.2-003 Legal and Other Requirements. The Legal Register shall be made project specific taking into consideration customer and local government requirements and associated licenses and permits. To make site specific – delete tabs/legislation/standards/codes and other requirements that do not apply. Add any legal and other requirements that are contract specific. The register shall assist determine appropriate controls for potential hazards in accordance with site safety and environmental risk assessments. Request for access to legal requirements shall be made to FDC site management.	Project Manager	Project Manager	Legal Register (G11)
2.1.2	Changes to the legal register, or the management system, due to legal changes shall be communicated to project teams. Project teams shall be responsible for communicating changes on site using prestart / toolbox meetings, Subcontractor Meetings, or other correspondence. Review of project plans, risk assessments, SWMS and other documents shall be conducted to determine if changes are required due to legal changes.	Project Manager	Project Manager	Legal Register (G11)
2.1.3	Potential system changes resulting from legal changes shall be documented via Systems Change Request and assessed by the National HSEQ Systems Manager.	Divisional HSEQ Representative	Project Manager	Systems Change Request (F056).
2.1.4	FDC and its sub-contractors shall comply with the requirements of the New South Wales Industrial Relations Guidelines: Building and Construction Procurement 2017. The CCU are responsible for monitoring the implementation of the Guidelines and may visit site to confirm and assist implementation.	Project Manager	Site Manager	DON > FDC Guidance

2.2 DOCUMENT CONTROL AND RECORDS MANAGEMENT

Section	Requirements	Responsibility	Accountability	Tools
2.2.1	Controlled documents Controlled documents shall be controlled via transmittals and may include: • Project Management Plan; • Drawings; • Programme; • Specifications; and • Shop drawings. A transmittal shall be issued with the documents, when controlled documents are issued to third parties. Superseded documentation shall be marked “Superseded”. Project collaboration tools used on this project to assist plan implementation include PROJECT SIMPEL & Aconex	Project Manager	Project Manager	Transmittal – Collaboration Tool (Simpel & Aconex)

2.2.2	Project Correspondence Received by FDC The Project Manager shall be responsible for control of incoming correspondence. The Project Manager shall control amendments to the specification and shall ensure that variations are received in writing, filed and the appropriate personnel advised.	Project Manager	Project Manager	Cor-4.2-001 Document Control
2.2.3	Project Documentation Received by FDC Project documentation received by FDC shall be controlled via a Document Transmittal or Register. Superseded documentation shall be marked "Superseded". Copies shall be issued to the relevant parties together with a Document Transmittal.	Project Manager	Project Manager	Cor-4.2-001 Document Control
2.2.4	Handwritten Changes Handwritten changes to project documentation are allowed provided that all copies are initialled and dated by the Project Manager.	Project Manager	Project Manager	Cor-4.2-001 Document Control
2.2.5	Filing Structure Electronic records shall be filed in accordance with Project Filing Guides located at The DON > DON Policy and Procedures > 6 – Guidance . Hardcopy files shall follow the same structure.	Project Manager	Project Manager	Project Filing Guides.
2.2.6	Archiving Records generated throughout the project, including records resulting from the PMP implementation shall be maintained in either electronic or hardcopy version. Upon project completion hard copy site records shall be collected for archiving and be kept for a minimum of 10 years unless otherwise noted. Electronic records are backed up daily and archived upon projects completion with the IT Department.	Project Manager	Contracts Administrator	Cor-4.2-002 Records

2.3 TRAINING

2.3.1 Training and Experience Register

Section	Requirements	Responsibility	Accountability	Tools
2.3.1.1	Training and Experience Register identifies minimum training requirements for positions and provides a record of individual's internal training and external qualifications. Training requirements are reviewed throughout the project when there's a change in project resources, where a skill gap has been identified, or as required by the Project Manager. The register shall be made available through Divisional Management. Additional training for workers shall be arranged with Divisional management where there's a change in project resources, promotion, where a skill gap has been identified, or where unforeseen or special training skills have been identified (e.g. High risk licence, Confined Space, Working at Heights etc.), to ensure appropriate training and qualifications are gained. Copies of training documentation (certificates, statements of attainment and induction record forms) shall be held in the Personnel files.	Project Manager	Project Manager	Training and Experience Register F024

2.3.2 Site Specific Induction

Section	Requirements	Responsibility	Accountability	Tools
2.3.2.1	Nominated FDC site management shall use the Site Induction to induct workers into site specific requirements and site rules. FDC shall ensure officials, delegates, or other representatives of a building association do not undertake or administer site inductions.	Site Manager	Foreman	Training and Experience Register F024
2.3.2.2	Workers shall complete the site specific induction before commencing work on site. To be inducted workers must provide photographic proof of identity and evidence that they have completed the Construction Industry Induction Card (e.g. White Card/Blue card). A register of all inducted workers shall be maintained. Task specific training and qualifications (e.g. high risk licences etc.) required to perform tasks or operate plant/equipment shall be recorded at the site induction. Where it is not possible to obtain copies of the required certification the person conducting the inductions is to sight the documentation and make note on the induction form that documentation has been sighted and record the required details.	Project Manager	Project Manager	Site Induction-Site Rules F018; Site Induction Register-Construction Large Project F022; Site Induction Register F023.
2.3.2.3	Workers from a non-English speaking background, or having difficulty understanding English, shall have their employer provide a translator to interpret the induction content to the person being inducted.	Project Manager	Sub-contractor	Site Induction-Site Rules F018
2.3.2.4	Visitors to site that are not performing construction work shall sign in, be advised of emergency procedures, and be accompanied at all times by a person who has completed the site induction.	Site Manager	Foreman	Site Sign In Register F005
2.3.2.5	FDC shall ensure completed site inductions are secured in a lockable cabinet or site office to prevent misuse, interference or loss, and unauthorised access, modification, or disclosure.	Site Manager	Foreman	Site Induction-Site Rules F018

2.3.3 Work Activity Training

Section	Requirements	Responsibility	Accountability	Tools
2.3.3.1	Workers shall undertake work activity training prior to commencing work on site. This includes being inducted into and signing Safe Work Method Statements (SWMS) or other relevant safe operating procedures covering relevant high risk construction work. The work activity training may be in a form of toolbox talks, development and/or review of a SWMS) / safe operating procedures/ instructions or training provided by a company, individual or a combination of these.	Site Manager	Foreman	SWMS; Toolbox Site Induction-Site Rules F018.

2.3.4 High Risk Work Licences

Section	Requirements	Responsibility	Accountability	Tools
2.3.4.1	Workers performing high risk work including scaffolding, dogging, rigging, operating cranes, hoists reach stackers, forklifts and pressure equipment must have a high risk work licence. Licences for works in these categories must be verified and recorded during the site induction process. Further guidance on tickets and licences is available through G012 Plant and Equipment Competency and Inspection Schedule.	Site Manager	Foreman	Site Induction-Site Rules F018. SWMS; Plant and Equipment

				Competency and Inspection Schedule G012
2.3.5 Young, Inexperienced Workers				
Section	Requirements	Responsibility	Accountability	Tools
2.3.5.1	FDC is committed to ensuring that FDC's young workers and workers new to the industry are given the required training, instruction, and supervision to be able to identify hazards which may affect their health and safety whilst at work. Any training provided to young and/or inexperienced personnel must be recorded. - A young worker is an apprentice or construction worker under 24. - An inexperienced worker is a construction worker with less than two years in the construction industry.	Site Manager	Foreman	Young Worker Policy
2.3.5.2	The site induction process identifies the presence of young and inexperienced workers on site. The induction process shall assess the competency of workers, supervision and training requirements with the nominated supervisor and an FDC representative. Consideration shall be given to suitably identifying the young worker on site (eg issued with an alternative vest, hard hat or similar) where appropriate. The Young / Inexperienced Work Management Plan shall be completed for workers that are not deemed competent.	Project Manager	Site Manager	Site Induction – Site Rule F018; Young / Inexperienced Workers Management Plan F025
2.4 CONTRACT REQUIREMENTS				
Section	Requirements	Responsibility	Accountability	Tools
2.4.1	Specific Contractual and Trade Requirements The Project Manager shall prepare a list of trade requirements such as submissions, hold and witness points, test, and warranties.	Project Manager	Project Manager	Con-7.4-001 Procurement
2.4.2	Programme The project programme may be amended, and the latest revision will be controlled by the Project Manager	Project Manager	Project Manager	Programme
2.4.3	Principal Certifying Authority The Project Manager shall contact the Principal Certifying Authority as soon as possible after FDC has been awarded the project to determine objectives and project timetable and to agree on mandatory inspections and timing. A copy of the Construction Certificate / Building Permit and the approved plans shall be kept on site. Prior to taking over a site where the client has carried out preliminary works such as site clearing, demolition, excavation, etc., ensure that all required inspections have been carried and that the Principal Certifying Authority will be able to issue an Occupation Certificate or Final Inspection upon completion.	Project Manager	Project Manager	Con-7.5-001 Project Start-up

2.4.4	Practical Completion / Occupation Certificate Checklist During the early stages of the project, the Project Manager shall prepare a Practical Completion / Occupation Certificate Checklist (F099) which will schedule all items and requirements necessary for the achievement of practical completion, and for the achievement of an Occupation Certificate.	Project Manager	Project Manager	Practical Completion / Occupation Certificate Checklist (F099)
2.5 PROJECT ADMINISTRATION				
Section	Requirements	Responsibility	Accountability	Tools
2.5.1	Site Diary Record daily events and activities using the Site Diary. Each week a copy of the Site Diary shall be forwarded to the Project Manager for review. The Site Diary shall be reviewed to identify Extensions of Time Claims and other potential claims under the contract etc.	Project Manager	Site Manager	Site Diary
2.5.2	Sample Control Samples shall be uniquely identified and logged in the Sample Submission Register. Approval of samples shall be via meetings with the client or client representative or via email / collaboration tool (e.g. Aconex) and any such approval shall be minuted.	Project Manager	Project Manager	Sample Submission Register F085
2.5.3	Technical Submission Technical submissions shall include: • Samples; • Product technical and performance information; • Work Shop Drawings; and • Builder supplied sketches. Submissions shall be uniquely identified and registered showing a summary of the submission, date, and approval status. Submissions approvals shall be recorded via meetings with the client or client representative or via email / fax / memo. Any such approval shall be updated on the register.	Project Manager	Project Manager	Submission register
2.5.4	Dilapidation Report A Dilapidation Report shall be produced for the building at project start-up to avoid litigation at the end of the project. The report should be conducted for structures in or adjacent to the project, for example, existing roads, adjacent buildings to the site etc. and a copy forwarded to the client. At the end of the project another Dilapidation Report shall be conducted and any discrepancies between the two reports shall be reported to the client to decide on the action to be taken.	Project Manager	Project Manager	Dilapidation Report
2.5.5	Inspection and Test Plans (ITPs) Inspection and testing requirements shall be determined at project commencement in accordance with project requirements by identifying key areas, trades and/or stages. For each of these determine the level of inspection required and decide: • What should be inspected; • How it should be inspected;	Project Manager	Site Manager	Refer to DON > DON Policy and Procedures > 6 – Guidance for ITP templates

	- When it should be inspected; - What is the risk (exposure to FDC); - The standards against which inspections and tests will be conducted; - The competencies required by the persons conducting the inspection or test. Project specifications, drawings and contract requirements shall be reviewed to determine the key control points, the level of control required and the risk to FDC associated with project activities. ITPs shall be developed using the ITP form to identify witness points, hold points, sign off points, samples or prototypes, tests, submissions, calibration records, etc. ITPs should only include those items or processes that require control through inspection or testing. ITPs should allow for WHS risks involved and consider: - The timing and nature of high risk work; - Identified work site hazards including risks and controls; - The likelihood of unforeseen hazards or risks emerging between inspections; - Instructions provided by designers, manufacturers or suppliers of product or equipment; - Any regulatory requirements. ITPs shall be registered in the ITP Register. ITPs shall be reviewed and approved by the Project Manager. ITPs shall be completed as the job progresses and activities should be signed off as they are completed. ITPs shall be maintained on project files when completed.			
2.5.6	Documentation Accepted by the Client's Representative Where required by contract, ITP's shall be submitted to the client's representative prior to commencing the activity. The ITP shall include all witness and hold points that require attendance by the client's representative as nominated in the specification. Additional witness and hold points may be inserted, and activities not required may be deleted from the ITP.	Project Manager	Project Manager	Refer to DON > DON Policy and Procedures > 6 – Guidance Inspection & Test Plan Register G006.1
2.5.7	Subcontractor Inspection and Test Plans (ITPs) Subcontractors shall submit their ITPs to FDC for review to ensure they are adequate and identify witness and hold points. ITPs submitted by subcontractors should reflect the project and identify critical control points including control of WHS risks. Changes to the ITPs shall be communicated to the subcontractor. FDC shall verify that the subcontractor has completed ITPs correctly during the project and that supporting documentation is available.	Project Manager	Foreman	Refer to DON > DON Policy and Procedures > 6 – Guidance for ITP templates
2.5.8	Concrete Pours The location of each concrete pour shall be recorded on a site drawing by the Site Manager or Site Foreman.	Site Manager	Foreman	Concrete supply register F126
2.6 Requests for Information				
Section	Requirements	Responsibility	Accountability	Tools

2.6.1	Requests for Information (RFI) RFI's shall be raised by FDC whenever a response is required from a consultant, the client, or the client's representative that requires tracking. RFI's shall be registered and distributed to the relevant parties and a copy filed in the RFI file.	Project Manager	Project Manager	RFI's Register F130
2.6.2	Receiving Requests for Information (RFI) Subcontractor submitted RFI's shall be addressed by FDC and the RFI answer shall be filed in the appropriate subcontractor file with the date of the answer recorded on the RFI to enable cross referencing.	Project Manager	Project Manager	RFI's Register F130
2.6.3	Client Instructions / Architect's Instructions / Site Instructions FDC will receive instructions in the form of Client Instructions / Architects Instructions and/or Instructions to Contractor (ITC). Instructions shall be registered together with details of the actions taken, or to be taken, to carry out the instruction. FDC shall issue any instructions to consultants, suppliers and/or subcontractors to comply with the client's instruction.	Project Manager	Contracts Administrator	Site Instruction Register or Collaboration tool.
2.6.4	Site Instructions - Subcontractors A Site Instruction is raised to: - Formally advise a subcontractor to take some action; - Advise of changes in scope; - Highlight poor subcontractor performance; and - Request pricing details, etc.	Project Manager	Site Manager	Site Instruction Register or Collaboration tool.
2.6.5	Contra Charges Contra Charges occur when a subcontractor creates damage, uses materials purchased by FDC, where FDC cleans up after a subcontractor, or a subcontractor is unable to complete the work it is contracted to do and another subcontractor or supplementary labour is used to complete the work. Contra charges shall be recorded in the Site Diary or Site Instruction. The subcontractor shall be advised in writing of the impending contra charge and a copy of the quotation to rectify the issue shall be attached to the instruction (where available). Contra charges shall be processed with the next claim from the subcontractor.	Site Manager	Site Manager	Site Diary Template F007
2.6.6	Extensions of Time Records of delay shall be documented in the Site Diary, and communicated to the Project Manager. Details of the Extension of Time shall be recorded in the EOT Register by the Contracts Administrator. Where the contract provides for FDC to claim for extensions of time, the Project Manager shall prepare the claim using the Notification of Delay Advice / EOT claim forms and forwarded to the client/superintendent	Project Manager	Contracts Administrator	EOT F135 Head Contract Administration procedure 7.5-004
2.7 Variations				
Section	Requirements	Responsibility	Accountability	Tools
2.7.1	By Subcontractors Variation requests shall be passed on to the Contracts Administrator for actioning in accordance with Subcontract Administration procedure 7.5-005.	Project Manager	Contracts Admin	Head Contract Administration procedure 7.5-004.

2.7.2	By FDC Variations against the Head Contract shall be assessed and passed onto the Contracts Administrator for actioning. Where required prices from subcontractors to price the variation may be required. Details of the variation added to the Variation Register (F133) and a Variation Quote/Claim (F132) shall be raised detailing the variation and cost. Copies of subcontractor quotations shall be attached to the Quote/claim as required and submitted to the client for approval. The Variation Register shall be updated with the status (approved/not approved) of the variation claim.	Project Manager	Contracts Admin	Variation Register (F133); Variation Quote/Claim (F132)
2.7.3	By Client Variations issued to FDC shall be communicated to the Project Manager for pricing. Where required prices from subcontractors to price the variation may be required. Variation details shall be added to the Variation Register.	Project Manager	Contracts Admin	Variation Register (F133);
2.7.4	Subcontractor Progress Claim Claims shall be dated stamped upon receipt by FDC and claim checked in accordance with the Subcontract Administration procedure 7.5-005.	Project Manager	Contract Admin	Subcontract Administration procedure 7.5-005.
2.7.5	Claims under the Security of Payments Act Any disputed amounts shall be identified, and the subcontractor advised within 10 business days of receipt of the claim.	Project Manager	Project Manager	Subcontract Administration procedure 7.5-005.
2.7.6	Product and Service Non Conformances Non-Conformance Report (F039) shall be raised where non-conforming products and services work are identified and shall be added to the monthly project report. Non-Conforming product or materials shall be quarantined and either returned to the supplier, disposed of or used with client approval. Records of any action taken will be maintained including emails, minutes of meetings, memos, non-conformance reports etc. Non-conformance relating to safety and environmental issues shall be managed in accordance with the NON-CONFORMANCE section of this PMP. Defects shall be managed in accordance with the Defects Management section of this PMP.	Project Manager	Contract Admin	Non-Conformance Report F039 Project Monthly HSEQ Report F090
2.7.7	Materials Purchases shall be made using FDC Purchase Order and approved by the Project Manager and contain the following: ▪ Description of goods or services required; ▪ Delivery address requirements; ▪ Delivery date; ▪ Project details such as name and/or job number, and trade and/or cost reference; ▪ Agreed or estimated price; ▪ Reference to drawings etc. (number and revision); ▪ WHS requirements, including Safety Data Sheets (SDS), labelling, handling, and storage. The Purchase Order shall be sent to the supplier including relevant FDC terms and conditions.	Project Manager	Project Manager	Vista Purchase Order
2.7.8	Receipt of Goods on Site Deliveries to site shall be compared against the supplier's Delivery Docket and the Purchase Order. Where goods meet requirements, the Delivery Docket shall be signed and filed.	Site Manager	Foreman	Non-Conformance Report F039

	Where goods do not meet requirements, the receiver shall record the discrepancies / issues (e.g. incorrect goods, incorrect quantity, damaged or faulty goods, etc.) on the Delivery Docket. Non-conforming goods shall be segregated from conforming goods and identified that they have been quarantined / put on hold. Any issues should be followed up with the supplier and/or Project Manager and resolved with appropriate actions. The marked up / signed Delivery Docket shall be forwarded to the Contracts Administrator to reconcile and process the purchase order, delivery docket and invoice and pass to accounts department.			
2.7.9	Client Supplied Product and Services Product supplied by the client shall be identified and be subject to the same levels of inspection, risk assessment etc. as purchased product or services.	Project Manager	Site Manager	Procurement Procedure 7.5-001
2.7.10	Storage of Materials and Equipment Materials and equipment shall be adequately identified and stored on site in a suitable and safe manner to ensure: - Security; - Protection from damage or deterioration; and that - Damaged or non-conforming goods shall be quarantined and identified as such.	Site Manager	Foreman	Logistic Plan
2.7.11	Calibration FDC equipment requiring calibration (e.g. dumpy level, noise / gas meters) shall be calibrated and maintained in accordance with manufacturers requirements. Subcontractor's equipment shall be checked for calibration and equipment shall be registered in the Calibration Register F080 and ITP's used to monitor use and calibration of equipment.	Project Manager	Site Manager	ITPs Calibration Register F080
2.7.12	Defect Management A Defect / Incomplete Works Register shall be established during the project for FDC and clients to identify the type of defect, the party responsible for rectifying the defect, the date the defect was detected and the date when the defect was rectified. Defects shall be identified, prioritised and the completion of all defects will be confirmed. This measure will ensure that the cause of defects are identified and prioritised at an early stage and will educate the responsible subcontractor to prevent recurrence. Progressive defect inspections shall be conducted in conjunction with Monthly Project Team Meetings. Where monthly review is not practicable, i.e. for projects of short duration, defect inspections shall be carried out weekly during weekly site inspections. Defects will be progressively reviewed and prioritised for resolution as early as possible and closed out progressively in order of priority to ensure: - Defects are sorted by trade / applicable subcontractor and then distributed to the relevant subcontractors by email; - Subcontractors shall be responsible for actioning each item on the Defects List; and - subcontractor is required to sign off and close out all identified defects once completed. The status of the defect will be changed on the Defect / Incomplete Works Register from "open" to "closed". Defects requiring immediate attention shall be given priority.	Project Manager	Site Manager	Defects Register or collaboration tool

	Client Involvement - The involvement of the client or their representative is paramount to the success of defect reduction. The client's representative will be required to attend, review, and critique all built-in prototypes to ensure that the standard set for implementation throughout the project is acceptable.			
2.7.13	Project Handover Inspections Implementation of the defects process aims to result in fewer defects at the time of project handover. Areas shall be cleaned, and a final defects list prepared for the area prior to areas being handed over to the client. This list shall be presented to the Client's representative for review and concurrence. The General Manager or nominee shall attend handover inspections. Any further defects identified by the Client's representative shall be added to the list. Once the final list has been compiled, FDC shall endeavour to close out the identified defects as soon as practicable (ideally within two weeks). Update reports will be issued to relevant parties every week until all items are closed out. Once all defects have been closed off, a copy of the completed Defects Lists shall be forwarded to the client for verification/sign-off.	General Manager	Project Manager	Defects List
2.7.14	Practical Completion Approximately 8 weeks prior to handover a Practical Completion / Occupation Certificate Checklist shall be developed based on the Head Contract. The checklist shall be updated as actions are progressively completed by trades prior to the final inspection occurring. Maintenance manuals, certificates and as FDC drawings will be compiled progressively. The Project Completion form shall be completed within 3 weeks of practical completion. This form ensures our work is documented and can be searched and shared.	Project Manager	Project Manager	Practical Completion / Occupation Certificate Checklist (F099); Project Completion
2.7.15	Bank Guarantee/Cash Retentions A letter requesting the release of the Bank Guarantee or Cash Retention shall be forwarded to the client.	Project Manager	Project Manager	Head Contract Administration procedure 7.5-004

2.8 PROCUREMENT – SUBCONTRACTORS AND SUPPLIERS

Section	Requirements	Responsibility	Accountability	Tools
2.8.1	Procurement of subcontractors and suppliers shall be managed in accordance with Procurement 7.4-001 and the Tender Analysis Sheet. Successful tenders shall undergo the Subcontractors Pre Start Checklist (F003) prior to subcontractors starting on site and address any risks to HSEQ raised through the tender analysis.	Project Manager	Estimator	Tender Analysis Sheet F115; Subcontractors Pre-Start Checklist F003
2.8.2	Details of subcontractor insurances and workers compensation shall be recorded and monitored to ensure they remain valid during the project.	Site Manager	Foreman	Subcontractor Insurances F014
2.8.3	Subcontractor performance shall be monitored to ensure contract requirements are being fulfilled, including compliance with the PMP, Site Risk Assessment (F001) and Environmental Risk Assessment (F010).	Project Manager	Site Manager	Refer Monitoring section.
2.8.4	In addition to the above procurement activities, purchased goods and services shall be subject to a risk assessment through activities that include:	Project Manager	Site Manager	SWMS;

	- Design Management (where applicable) - Hazardous Chemicals; - Risk Management; - Safe Work Method Statements; and - Environmental Aspects and Impacts.			Safety in Design Risk Assessment (F008). Hazardous Chemical Register (F086). SWMS Checklist (F029). Environmental Risk Assessment (F010)
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2.9 DESIGN MANAGEMENT

2.9.1 No FDC design input

Section	Requirements	Responsibility	Accountability	Tools
2.9.1.1	FDC shall request a Safety in Design Risk Assessment (F008) (or similar) from the client or consultant. If available, FDC shall review the document to identify design related buildability hazards and determine opportunities to eliminate design hazards prior to, during, and post construction. A RFI shall be communicated to the client or consultant for consideration. Where an assessment is not available FDC shall complete a Safety in Design Risk Assessment (F008) in consultation with relevant stakeholders to identify design related buildability hazards and determine opportunities to eliminate design hazards prior to, during, and post construction. The hierarchy of control and applicable legislation, codes of practice and Australian standards shall be used to reduce the potential risk so far as reasonably practicable where hazards are unable to be eliminated. Hazards that cannot be eliminated shall be transferred to the Site Risk Assessment (F001) for control during construction.	Project Manager	Design Manager	Safety in Design Risk Assessment (F008); Site Risk Assessment (F001). RFI

2.9.2 Design and Construct Projects

Section	Requirements	Responsibility	Accountability	Tools
2.9.2.1	A project specific Design Management Plan addressing design requirements in accordance with procedure Con7.3-001 Design Construct shall be developed where required by contract or at the discretion of Divisional management. Where a Design Management Plan is not required, the following requirements shall be applied in accordance with procedure Con7.3-001 Design Construct.	Project Manager	Project Manager	Design Management Plan
2.9.2.2	FDC shall request a Safety in Design Risk Assessment (F008) or similar from the client or consultant. In the absence of this FDC shall complete a Safety in Design Risk Assessment (F008) in consultation with relevant stakeholders to identify design related buildability hazards and determine opportunities to eliminate design hazards prior to, during, and post construction. The hierarchy of control and applicable legislation, codes of practice and Australian standards shall be used to reduce the potential risk so far as reasonably practicable where hazards are unable to be eliminated. Potential hazards in the design phase shall remain Open until Closed or Transferred. Hazards that cannot be eliminated (or 'Closed') shall be transferred to the Site Risk Assessment (F001) for control during construction.	Project Manager	Design Manager	Safety in Design Risk Assessment (F008); Site Risk Assessment (F001)

2.9.3 Communicating Design Risk				
Section	Requirements	Responsibility	Accountability	Tools
2.9.3.1	The Safety in Design Risk Assessment (F008) shall identify the method for communicating construction related risks. Methodologies include marked up drawings, amended Site Risk Assessment (F001), toolbox/prestart talks, Site Instructions etc.	Project Manager	Design Manager	Safety in Design Risk Assessment F008. Toolbox Talk (F050).
2.9.3.2	Potential hazards identified through the Safety in Design Risk Assessment (F008) that remain after construction shall be communicated to end users of the building by inclusion in the handover documentation/manuals.	Project Manager	Project Manager	Operations Manuals; handover documentation
2.9.4 Design Changes				
Section	Requirements	Responsibility	Accountability	Tools
2.9.4.1	Changes to approved "For Construction" issued drawings/specification shall be identified, documented, and approved prior to use. Changes shall assess impacts in terms of safety against the Safety in Design Risk Assessment to determine new hazards or changes to existing hazard controls.	Project Manager	Design Manager	Correspondence Safety in Design Risk Assessment (F008). Drawing/Design Change Register
2.9.4.2	Changes that introduce new hazards or involve changes to existing hazard controls shall be communicated to workers through toolbox/prestart meetings or correspondence so that safety documentation can be reviewed and updated as required.	Project Manager	Design Manager	Toolbox / Prestart / Meeting Minutes; Correspondence
2.10 SITE ESTABLISHMENT				
Section	Requirements	Responsibility	Accountability	Tools
2.10.1	The Site Establishment Checklist (F002) shall be used to assist site established, including site amenities, in accordance with legal requirements prior to commencement of work in accordance with Con-7.5-001 Project Start-up.	Project Manager	Site Manager	Site Establishment Checklist (F002); Amenities Checklist (F006)
2.10.2	The perimeter fencing, security and amenities shall be installed and inspected through the Weekly Site Inspection, if damage has occurred, or where risk assessment which indicates additional inspections are required.	Site Manager	Foreman	Weekly Site Inspection (F049).
2.10.3	Details of inspections of overhead protection / hoardings shall be recorded. An Engineer's Certificate is required for installation and inspection of overhead protection and shall be kept on site.	Site Manager	Foreman	Hoarding Inspection Checklist (F081).
2.10.4	Signage shall be displayed as required by legislation or as directed by FDC and for any work activity where signage is noted in safety documentation. Signs that seek to vilify or harass employees who participate, or do not participate, in industrial activities shall not be displayed on FDC sites.	Site Manager	Foreman	Site Establishment Checklist (F002)

	Building association logos, mottos or indicia shall not applied to clothing, property or equipment supplied by FDC. Conduct which implies that membership of a building association is anything other than an individual choice for each employee is not permitted.			
2.10.5	To assist in potential emergency situations workers and visitors shall record their site attendance and departure.	Site Manager	Foreman	Site Sign In Register (F005).
2.10.6	In accordance with the Site Risk Assessment, a search of potential services (e.g. gas, electricity, fire, water, sewer, telecommunications, etc.) shall be conducted to prevent a breach of service. Services searches, including walls and slabs, shall be conducted by engaging relevant contractors to complete investigations including: ▪ Electrical Contractors to investigate and complete Electrical Survey and Protection Plan (F069); ▪ Contact Dial Before You Dig (DBYD); ▪ Scans; and ▪ Requesting information from client and relevant stakeholders. This information, including location of temporary lighting, shall be transferred to drawings, be displayed on site, and updated throughout the project. Workers shall be notified of these services through inductions, toolbox/prestart meetings or by other means of communication. This information can be used in completion of permits including the Termination of Services Permit (F070), All Services Isolation Permit (F071), Excavation Works Permit (F066) and Concrete Cutting and Coring permit (F068).	Site Manager	Foreman	Electrical Survey and Protection Plan (F069); DBYD; Scans; other available information; Site Risk Assessment (F001).

2.11 EMERGENCY PREPAREDNESS AND RESPONSE

Section	Requirements	Responsibility	Accountability	Tools
2.11.1	Complete the First Aid, Emergency and Health Surveillance Risk Assessment (F009) to prepare a site specific Emergency Management Plan addressing potential emergency situations and controls specific to the project.	Project Manager	Chief Warden	First Aid, Emergency and Health Surveillance Risk Assessment (F009) Emergency Management Plan

2.12 MEETINGS

Section	Requirements	Responsibility	Accountability	Tools
2.12.1	Client Meetings These monthly meetings are normally initiated by the client and involve the Project Manager to deal with project specific issues. The client is normally responsible for minuting the meeting. Minutes are distributed by the client to the Project Manager. Where FDC is required to take action, it is the Project Manager's responsibility to allocate tasks and to ensure the action has been completed in a timely manner. Evidence that the task has been completed should be noted on the minutes and reported to the client.	Project Manager	Project Manager	Meeting Minutes

2.12.2	Project Control Group The monthly Project Control Group (PCG) involves major stakeholders in the project and are run by the client. The Project Manager shall prepare a Project Report for submission to the PCG meeting and attend meetings on behalf of FDC.	Project Manager	Project Manager	Meeting Minutes
2.12.3	Subcontractor Meetings The monthly meeting involves the Project Manager, Site Manager or Site Foreman, and subcontractors with the meeting agenda including: ▪ Safety; ▪ Quality; ▪ Environment; ▪ Industrial Relations; ▪ Programme; ▪ General business; and ▪ Actionable items from the other meetings. The meeting shall be minuted to identify action items and be distributed to all attendees.	Project Manager	Project Manager	Meeting Minutes
2.12.4	Services Coordination Meetings The weekly meeting involves the Project Manager, Site Manager or Site Foreman, Service Coordinator, and services consultants. The meeting covers issues regarding the coordination of drawings and installation of services. The meeting shall be minuted by the Project Manager, identify action items, and be distributed to all attendees.	Project Manager	Project Manager	Meeting Minutes
2.12.5	Site Coordination Meetings The weekly meeting involves the Site Manager or Site Foreman and Leading Hand to discuss site issues and to plan the day's / week's activities. The meeting action items are recorded.	Project Manager	Project Manager	Meeting Minutes
2.12.6	Project Team Meetings The meeting involves the Project Manager, Site Manager or Site Foreman, Site Safety Representative and Leading Hand and held at least monthly . The meeting is held to discuss project, safety, and environmental issues and to plan the project activities. The meeting shall be minuted and agenda shall include: ▪ Review of Project Management Plan; ▪ Review of Site Safety Rules; ▪ Review of Site Risk Assessment and its effectiveness; ▪ Review of Environmental Risk Assessment; ▪ Project training requirements; ▪ Non-conformances; ▪ Subcontractors performance – safety, environmental, quality; ▪ Incidents; and ▪ Audit and site inspection results.	Project Manager	Project Manager	Meeting Minutes

2.13 MONITORING

2.13.1 Weekly Site Inspection

Section	Requirements	Responsibility	Accountability	Tools
2.13.1.1	Site inspections shall be undertaken to monitor implementation of work practices and identify areas for improvements. These shall be conducted weekly, independent of consultation arrangements, with workers invited to attend. Actions arising from these inspections shall be communicated and addressed by FDC and subcontractors to ensure items are suitably addressed in a timely manner. Hazards identified shall be made safe where practical and details of rectification, or actions required recorded. The Weekly Site Inspection 'SWSM Activity Review' section shall focus on activities rated "High" in the Site Risk Assessment that require additional monitoring.	Site Manager	Foreman	Weekly Site Inspection (F049)
2.13.1.2	The Site Supervisor Weekly Checklist (F004) can be used to assist in the implementation of the PMP and management system requirements.	Project Manager	Site Supervisor	Site Supervisor Weekly Checklist (F004).

2.13.2 Task Observations

Section	Requirements	Responsibility	Accountability	Tools
2.13.2.1	A Task Observation (F053) shall be used at weekly intervals to evaluate and confirm SWMS for high risk construction works are being complied with, are effective and aligned with current work activities. In addition, the observation shall determine if hazard controls measures are adequate, and that the SWMS addresses identified hazards. Observations of activities not involving high risk work may be conducted at the team's discretion.	Site Manager	Foreman	Task Observation (F053)

2.13.3 Monthly Site Audit

Section	Requirements	Responsibility	Accountability	Tools
2.13.3.1	Monthly site audits shall be conducted and be attached to the Monthly Project Report and forwarded to the General Manager. The audit addresses the physical site as well reviewing the ongoing suitability of key documents including this PMP, Site Risk Assessment and Environmental Risk Assessment. If changes are required, the updated documents will be distributed to key stakeholders. Additional audits and assessments may be conducted in accordance with the Audit procedure COR 8.2-001 by the HSEQ team. The audits shall verify implementation of the PMP and applicable elements of the integrated management system and identify opportunities for improvement.	Project Manager	Site Manager	Monthly Site Audit (F054)

2.13.4 Senior Management Inspections

Section	Requirements	Responsibility	Accountability	Tools
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2.13.4.1	Senior management, including the General Manager, Construction / Operations Managers, Project Directors / Senior Project Managers, HSEQ Managers as relevant shall attend site at maximum three monthly intervals to discuss WHS and other relevant matters with the project team. The inspections shall be documented through a weekly site inspection, observation, monthly site audit, HSEQ assessment, project team meeting and or toolbox.	Divisional HSEQ Representative	Nominated Senior Managers	Task Observation (F053), Weekly Site Inspection (F049)
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2.14 NON-CONFORMANCE

Section	Requirements	Responsibility	Accountability	Tools
2.14.1	Where a non-conformance with planned requirements (including PMP, SWMS, contract, legal requirements or repeat issues/offences, products and materials) has been identified a Non-Conformance Report (F039) shall be issued and actions agreed, monitored and closed out in consultation with the non-conformance recipient. Non-Conforming product or materials shall be quarantined and either returned to the supplier, disposed of, or used with client approval. Non-conformance can be identified through Weekly Site Inspection, Work Observations, Monthly Site Audit, internal/external audits, or general observations. Non-Conformances reports shall be included in Project Monthly HSEQ Report (F090). Where non-conformance has the potential to impact FDC's integrated management system these shall be communicated with the Division HSEQ representative for consultation with the National HSEQ Systems Manager.	Project Manager	Site Manager	Non-conformance Report (F039). Project Monthly HSEQ Report (F090).

2.15 REPORTING

2.15.1 Internal Monthly Report

Section	Requirements	Responsibility	Accountability	Tools
2.15.1.1	The Monthly Report, including the Cost to Complete and Project Monthly HSEQ Report (F090) is submitted to Divisional management for review. The monthly meeting between the team and management shall address the report and determine actions that are minuted, to assist successful project delivery.	Project Manager	Project Manager	Internal Monthly Report F191 or division equivalent (eg Divisional PowerPoint Template); Project Monthly HSEQ Report(F090)

2.15.2 Project Monthly HSEQ Report

Section	Requirements	Responsibility	Accountability	Tools
2.15.2.1	Project HSEQ performance shall be reported monthly via the Project Monthly HSEQ Report (F090) to the Divisional HSEQ representative on the 1 st working day of the following month. The report summarises the month's activities including:	Project Manager	Project Manager	Project Monthly HSEQ Report (F090)

	- Incidents / LTI / MTI /First aids reports; - Regulatory / statutory / union notices; and - Non-conformance reports. These reports are collated into a Divisional Monthly HSEQ Report and the summary is distributed within Divisions in the interest of keeping employees informed and consulted. The summary forms part of the Divisional Monthly HSEQ Report and reviewed by the General Manager at Senior Managers Meetings Cor-5.6-002.			
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2.15.3 Hazard Reporting

Section	Requirements	Responsibility	Accountability	Tools
2.15.3.1	Physical Hazard Reporting - Notify a supervisor, manager and FDC site management when hazards are identified on this site. Workers have a responsibility to ensure the health and safety of others. WHS dispute resolution may be required through section 3.4 as applicable. Psychosocial Hazards shall be managed through section 3.27 of the plan.	Project Manager	Site Manager	Non-Conformance Report

2.16 INCIDENT MANAGEMENT

Section	Requirements	Responsibility	Accountability	Tools
2.16.1	Incident Notification - Incidents shall be managed at the time of the occurrence in accordance with the Incident Notification Flowchart (G014). Incidents shall be verbally notified immediately per the Incident Notification Flowchart to offsite management when: - Emergency services, unions or the media attend site; or - A notifiable incident (eg serious Injury / illness or fatality or dangerous incident) is likely. For any EHS incidents involving contractors engaged by a Principal Contractor (other than MDC), or Subcontractors engaged by MDC. The Principal Contractor or Subcontractor must: Notify MDC of an incident within <u>1 hour</u> of the incident occurring Lead the incident investigation Engage the MDC EHS Manager in early investigation findings Ensure a copy of the incident and investigation report is made available to MDC within <u>8 business days</u> from the date of the incident Close out all actions associated to the incident within <u>28 days</u> of the incident occurring	Project Manager	Site Manager	Incident Notification Flowchart G014

	For environmental incidents, a written incident notification addressing the requirements set out below must be submitted to the Planning Secretary via the Major Projects website within seven days after the Applicant becomes aware of an incident. Written notification of an incident must: (a) identify the development and application number; (b) provide details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident); (c) identify how the incident was detected; (d) identify when the applicant became aware of the incident; (e) identify any actual or potential non-compliance with conditions of consent; (f) describe what immediate steps were taken in relation to the incident; (g) identify further action(s) that will be taken in relation to the incident; and (h) identify a project contact for further communication regarding the incident. Within 30 days of the date on which the incident occurred or as otherwise agreed to by the Planning Secretary, the Applicant must provide the Planning Secretary and any relevant public authorities (as determined by the Planning Secretary) with a detailed report on the incident addressing all requirements. The Incident Report must include: (a) a summary of the incident; (b) outcomes of an incident investigation, including identification of the cause of the incident; (c) details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence; and (d) details of any communication with other stakeholders regarding the incident.			
2.16.2	Critical Incidents – Class 1 incidents shall be managed in accordance with the Incident Notification Flowchart (G014) and Emergency Management Plan that addresses critical incident protocols for trauma counselling, legal privilege and media management and require senior management involvement.	HSEQ Manager	Site Manager	Incident Notification Flowchart G014; Emergency Management Plan
2.16.3	Non-disturbance – Where incidents are notifiable to the regulator the incident location shall remain unaltered until an inspection/investigation or direction has been provided by the Regulator. Work shall cease in the immediate area and appropriate barricades and signage displayed to prevent unauthorised entry and having the scene altered and/or contaminated. The non-disturbance provision does not prevent such actions as helping or removing trapped or injured persons or actions directed by the Regulator. •	Project Manager	Site Manager	Nil.
2.16.4	Regulatory notices (e.g. Prohibition, Improvement etc.) shall be addressed in consultation with Divisional HSEQ representatives and the regulator to determine and implement suitable actions. Work related to the incident shall not recommence until the notice has been closed as advised by the regulator. Notices shall be copied to the General Manager, Division HSEQ and National HSEQ Systems Manager.	Project Manager	Site Manager	Regulatory notices

2.16.5	Incident Investigation - HSEQ Managers, trained in FDC incident management requirements, shall be responsible for incident notification, investigation and reporting and involving the project team and senior management as required to identify causes, contributing factors and actions for improvement. Incident investigations shall be completed for Notifiable Incident or where an incident occurs due to an absence of safe works procedures or physical controls. Investigations, including site attendance where practical, shall include relevant project team, subcontractor members and offsite FDC senior managers. FDC senior managers must be involved in Notifiable and Class 1 incident investigations. Incident Reports shall be completed to assist FDC understand how the incident occurred and identify contributing factors that lead to the incident. HSEQ Manager to review report and work with project teams to close out actions. Incidents shall be communicated through monthly project, division, and group HSEQ reports and monthly HSEQ meetings and HSEQ management reports. This enables FDC to take suitable projects/system actions, including lessons learned as relevant, to prevent incident recurrence. Incident Reports shall not be distributed externally without approval from the General Manager or a Director.	HSEQ Manager	HSEQ Manager	Cor-8.5-001 Incident Management
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2.17 STAKEHOLDER COMMUNICATION

Section	Requirements	Responsibility	Accountability	Tools
2.17.1	The planning and conduct of works shall be carefully considered to minimise interference with the local community and the environment. The Communication and Stakeholder Plan may be developed in accordance with contract or Divisional requirements. In the absence of a Communication and Stakeholder Plan the relevant details shall be provided to clients, community representative and other interested parties regarding project duration, peak periods of construction, hours of operations, specific environmental management issues, complaints management procedures and project contact details, night work, change in work hours, and disruption to services. Communication pathways, including open forums and/or letterbox drops shall be conducted to inform the residents of the works being undertaken.	Project Manager	Project Manager	Communication and Stakeholder Plan
2.17.2	External complaints from the community, client and stakeholders shall be reported to the Project Manager for assessment of appropriate action. Where a complaint is found to be an outcome of site activities, a Nonconformance Report shall be issued to the party responsible and actioned as soon as practicable. Information to be included shall address complaint details, action taken to correct the problem and further action recommended to prevent recurrence. Where the complainant leaves contact details, a response shall be communicated regarding the above outcomes.	Project Manager	Site Manager	Non-conformance Report (F039). Correspondence
2.17.3	Where complaints have the potential to impact the management system the Nonconformance report shall be communicated with Divisional HSEQ representatives for consultation with the National HSEQ Systems Manager for action.	Project Manager	Divisional HSEQ Representative	Non-conformance Report (F039).

WORK, HEALTH & SAFETY

3.1 RISK MANAGEMENT

Section	Requirements	Responsibility	Accountability	Tools
3.1.1	The Site Risk Assessment (F001) shall be used to inform FDC, Subcontractors and other interested parties of the potential hazards and FDC's minimum controls. The risk assessment identifies high risk construction work activities and minimum requirements that shall be addressed through safety documentation SWMS, Permits or other documented safety procedures relevant to the specific tasks.	Project Manager	Project Manager	Site Risk Assessment (F001)
3.1.2	The Site Risk Assessment (F001) shall be established prior to construction work commencing and be communicated with the project team to confirm potential hazards and control requirements during the project. The Site Risk Assessment shall be: - prepared by employees trained in FDC risk management procedures; - approved by the Project Manager; - approved by the Division HSEQ Manager; and - issued to subcontractors prior to them commencing work and where revisions are made during the project. The ongoing suitability of the Site Risk Assessment shall be reviewed at the Monthly Site Audit and changes prepared, approved and reissued as above.	Project Manager	Site Manager	Site Risk Assessment (F001)
3.1.3	Only employees trained in FDC risk management procedures addressing the Hazard Identification Risk Assessment and Control (HIRAC) process, including the use of the Site Risk Assessment (F001), shall be responsible for managing HIRAC activities.	Divisional HSEQ Representative	Project Manager	See HSEQ / Division Admin for Training and Experience Register (F024)
3.1.4	The effectiveness of the HIRAC process shall be evaluated after class 1 incidents to determine its effectiveness in managing risks. Proposed changes shall be raised with the National HSEQ Systems Manager in accordance with the Change Management Procedure.	Divisional HSEQ Manager	Divisional HSEQ Manager	Incident Report (F035)

3.2 SAFE WORK METHODS STATEMENTS (SWMS)

Section	Requirements	Responsibility	Accountability	Tools
3.2.1	SWMS shall be developed for high risk construction work activities in consultation with workers. SWMS and relevant safe operating procedures shall be reviewed and accepted by FDC using the SWMS Checklist (F029) in accordance with the Site Risk Assessment prior to works commencing on site. High risk construction works are identified on page 2 of the Safe Work Method Statement Checklist (F029) in accordance with legislative requirements.	Site Manager	Site Manager	FDC SWMS Template (F030) SWMS Checklist (F029)
3.2.2	SWMS and/or safe operating procedures shall be reviewed and revised if necessary, whenever construction work changes or if there is reason to believe that risk control measures are not adequate to control the level of risk. All persons affected by the amendment must be advised of the change and retrained.	Site Manager	Foreman	Toolbox Talk F050. Pre-Start Meeting (F051).

3.2.3	A Task Observation (F053) shall be used at maximum monthly intervals to confirm SWMS for high risk construction works are being complied with. In addition, the observation shall determine if hazard controls measures are adequate, and that the SWMS addresses identified hazards. Unsafe activity shall be immediately reported to FDC and a stop work process initiated until the SWMS and/or activity is rectified.	Site Manager	Foreman	Task Observation (F053) Non-Conformance Reports (F039)
3.3 CONSULTATION				
Section	Requirements	Responsibility	Accountability	Tools
3.3.1	Consultation involves the sharing of WHS information with the workforce and providing the workforce an opportunity to contribute to the improvement and resolution of WHS issues including: • Work policies, systems, procedures and consultative arrangements; • Risk assessments and control measures; • Work premises, work environment, plant, equipment or substances used for work; • Incidents, illnesses (including mental health), or injuries (in a way that protects the confidentiality of personal information); • Reporting procedures; and • WHS and welfare with workers. Consultation occurs when: • changes to premises, work environment, work methods, plant, and substances that may affect health, safety or welfare are proposed; • risks to health and safety arising from work are assessed or when the assessment of those risks is reviewed; • decisions are made about the measures to be taken to eliminate or control hazards; • When introducing or altering the procedures for monitoring hazards. The Site Manager shall facilitate a toolbox meeting with workers at project commencement to establish the consultation arrangements. Consultative arrangements may include a Health & Safety Representative, a Health & Safety Committee, or any other agreed arrangements in accordance with the legislation and documented on the Consultation Statement. The statement shall be displayed on site and referenced at site inductions. Changes to the established consultation arrangements shall be made in writing to FDC site management and any WHS disputes shall be managed per section 3.4 Dispute Resolution. • In accordance with the following consultation arrangements, weekly inspections shall monitor the workplace and related activities (eg plant and equipment, substances, access and egress) using the Weekly Site Inspection. The inspection shall be made available and communicated to workers to enable issues to be rectified and information shared. Raised issues shall be actioned, closed out and a copy of the completed report shall be filed.	Project Manager	Site Manager	Toolbox Talk F050; Consultation Statement (F047); Weekly Site Inspection (F049). FDC Vault Resources: - Mental Health. - FDC Employee Assistance Program (EAP) - Mates in Construction

3.3.2	Health and Safety Representatives - A worker may request the election of a health and safety representative to represent them on work health and safety matters. If a worker makes this request, work groups must be established to facilitate the election. Health & Safety Representatives shall be elected by members of the work group unless the number of nominations equals the number of vacancies whereby the Site Manager shall facilitate the election if requested to do so by the work group. - Negotiations shall commence within 14 days after a worker makes the request and may involve a worker's representative (such as a union official) if requested. Workers shall be notified of the outcome of the negotiations and of any work groups determined by agreement as soon as practicable after negotiations are complete. - Management and workers shall agree on the formation of work groups including: - The number of health and safety representatives and deputy health and safety representatives (if any) to be elected; - The workplace or workplaces to which the work groups will apply, and - The businesses or undertakings to which the work groups will apply. The elected Health & Safety Representatives shall hold their position whilst on the project, but no longer than 3 years, unless they leave employment, are removed from office by the members of the work group or are disqualified from holding the position as per the WHS Act. Health & Safety Representatives shall: - Confirm the consultation statement; - represent the work group in matters relating to work health and safety, - monitor the measures taken by the person conducting the relevant business or undertaking or that person's representative in compliance with this act in relation to workers in the work group, - investigate complaints from the work group relating to work health and safety, and - inquire into potential risks to the health or safety of the work group arising from the conduct of the business or undertaking. - Not be entitled to have access to personal or medical information concerning a worker without the worker's consent, unless the information is in a form that does not identify the worker, and could not reasonably be expected to lead to the identification of the worker; - Attend prescribed training to be eligible to be a Health & Safety Representatives; and - Conduct a site inspection with work group representatives to identify areas for improvement.	Project Manager	Health and Safety Representatives	Toolbox Talk (F050); Consultation Statement (F047); Weekly Site Inspection (F049).
3.3.3	Health and Safety Committee	Site Manager	Committee	Weekly Site Inspection (F049).

	- A Health & Safety Committee must be established within two months after being requested to do so by 5 or more workers or by a Health & Safety Representative. If agreement about the Health & Safety Committee cannot be reached in a reasonable time, either party can request the regulator to appoint an inspector to decide on the make-up of the Health & Safety Committee, or whether it should be established at all. - Health & Safety Representatives are eligible to be on the Committee and nominations shall be held for the remaining positions. At least half of the members of the committee shall be workers not nominated by management. If there are more nominations than positions, then an election shall be held, and results published. - Health and Safety Committees shall meet weekly, but not exceed 3 monthly intervals, with meeting minutes published. The first meeting of the Health & Safety Committee should establish the constitution for that committee with the constitution displayed on site and referenced in the site induction. Committee members shall have appropriate prescribed training to be eligible to participate as a Health & Safety Committee member. The functions of the Health & Safety Committee are to: - facilitate cooperation between FDC and workers in instigating, developing, and carrying out measures designed to ensure the workers' health and safety at work; - assist in developing standards, rules and procedures relating to health and safety that are to be followed or complied with at the workplace, - address other functions prescribed by the regulations or agreed between FDC and the committee; and - Conduct a site inspection to identify areas for improvement.			Toolbox Talk (F050).
3.3.4	Agreed Arrangements - Any other arrangements for consultation shall be established to suit workers and workplace situations ensuring these are consistent with the requirements of the WHS Act. Agreed arrangements shall be determined by the workers at a meeting, records made, and Consultation Statement confirmed. The statement shall be displayed on site and referenced at site inductions. The agreed arrangements for this project shall be managed by Site Manager [Matthew Martino] and include: - Site toolbox talk conducted Monday mornings; and - Site inspection conducted weekly on Wednesday, with members of the workforce - all welcome. If there are WHS issues for FDC to address, these shall be communicated at the above inspection/toolbox or directly with FDC site management. Additional toolbox talks/prestarts may be held at any time in support of worker / project	Site Manager	Site Manager	Weekly Site Inspection (F049). Toolbox Talk (F050).

	needs or as directed by FDC. Where directed by FDC, evidence of subcontract toolbox talks shall be collected and maintained by FDC.			
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3.4 DISPUTE RESOLUTION

Section	Requirements	Responsibility	Accountability	Tools
3.4.1	WHS Disputes: Where WHS issues cannot be resolved, the disputed issue shall be resolved in accordance with local legislation where the dispute has been raised. The agreed procedure to resolving WHS disputes includes: - Notifying the FDC Supervisor in charge of the area of the issue. The FDC Supervisor shall, where possible, organise to have the matter rectified immediately. If this is not possible the FDC Supervisor shall inform affected parties of the issue and arrange for workers affected by the issue to be relocated until rectified if necessary; - An inspection shall be then undertaken of the disputed area by the Site Manager per the project consultation arrangements with the FDC Supervisor and affected parties where practical. Where the dispute involves a subcontractor their Site Supervisor and HSR (where nominated) may also be present. - Where the dispute cannot be resolved, the matter may be determined through the local regulatory authority. Records of the issue and agreed action shall be maintained.	Project Manager	Site Manager	Toolbox Talk F050; Correspondence
3.4.2	Industrial Disputes: Potential disputes shall be notified to FDC site management. Resolution is to be sought through consultation between affected parties and in accordance with applicable regulatory and industrial instruments. Escalation of disputes beyond the directly affected parties, should not occur unless all other possible remedies and negotiations have been exhausted. Records of the issue and agreed action shall be maintained.	Project Manager	Site Manager	Toolbox Talk F050 Consultation Regulatory and/or Industrial Instrument

3.5 INJURY MANAGEMENT

Section	Requirements	Responsibility	Accountability	Tools
3.5.1	Conduct a First Aid, Emergency and Health Surveillance Risk Assessment using the First Aid, Emergency and Health Surveillance Risk Assessment (F009) to identify site first aid equipment and requirements in accordance with relevant legislation, codes of practice and Australian standards. This shall be completed prior to commencement to ensure adequate first aiders, first aid equipment and facilities are supplied. This assessment shall be completed by a qualified first aider. First aid equipment shall be listed on the FDC First Aid and Emergency Equipment Register to assist the ongoing inspection, test and maintenance of equipment on site.	Site Manager	First Aider	First Aid, Emergency and Health Surveillance Risk Assessment (F009); Training and Experience Register F024; FDC First Aid and Emergency Equipment Register (F060)
3.5.2	Locations of first aid equipment and facilities, and names of First Aiders, shall be communicated at site induction and displayed on site. First aid equipment and facilities shall be inspected weekly and maintained in compliance with manufacturers and/or legal requirements.	Site Manager	Foreman	First Aid Restock Request (F037). Weekly Site Inspection (F049).

3.5.3	First Aiders shall provide first aid and coordinate additional medical assistance / emergency services as required. The FDC Register of Injury (F036) shall be completed when first aid has been provided through designated First Aiders. Injuries, and provision of first aid, must be notified to FDC on the day of the occurrence to be reported. Late notifications of injuries, without FDC first aid treatment, shall only be noted in the site diary. First aid injuries shall be verbally notified immediately per the Incident Notification Flowchart to offsite management when: - Emergency services, unions, or the media attend site; or - A notifiable incident (eg serious Injury / illness or fatality) is likely.	Site Manager	First Aiders	Incident Notification Flowchart G014; FDC Register of Injury (F036)
3.5.4	For FDC employees – Where an injured worker seeks additional offsite medical assistance the FDC Register of Injuries shall be copied to Divisional HSEQ to assist the injured worker with the completion of workers compensation paperwork. For all other injured parties - The FDC Register of Injuries (F036) shall be copied to the supervisor of injured workers seeking additional offsite medical assistance. Where a Medical Practitioner prescribes time off work due to reported work related injuries, a clearance certificate from a Medical Practitioner must be provided prior to returning to work.	Site Manager	First Aiders	FDC Register of Injury (F036).
3.5.5	Return to work and rehabilitation activities shall be managed in consultation with the Divisional HSEQ representative in accordance with Cor8.5-002 Injury Management.	Divisional HSEQ Representative	Site Manager	FDC Register of Injury (F036); Workers compensation forms

3.6 HAZARDOUS CHEMICALS

Section	Requirements	Responsibility	Accountability	Tools
3.6.1	Where Safety Data Sheets (SDS) identify chemicals to be hazardous or dangerous these shall be recorded, and risk assessed for use in accordance with the Hazardous Chemical Register. Suitable safety documentation (eg SWMS, standard operating procedures as appropriate) are developed prior to works commencing for the safe use, handling, and storing of chemicals. Current SDS shall be identified and readily accessible in either hard copy or electronic format.	Site Manager	Foreman	Hazardous Chemical Register (F086)
3.6.2	Hazardous chemicals and dangerous goods shall be stored and separated as required by the Dangerous Goods Regulation.	Site Manager	Foreman	Hazardous Chemical Register (F086)
3.6.3	The use of hazardous chemicals requiring health surveillance, as defined by legalisation, shall be managed in accordance with the Site Risk Assessment and the Health Surveillance section of this PMP.	Site Manager	Foreman	Site Risk Assessment (F001)

3.7 MANUAL HANDLING AND HOT AND COLD WORK ENVIRONMENTS				
Section	Requirements	Responsibility	Accountability	Tools
3.7.1	Workers and subcontractors are encouraged to take sufficient time to assess risks before they perform manual handling tasks in accordance with the national Code of Practice for Manual Handling. Where possible, and after completion of training in the use of equipment, mechanical aids should be used for manual handling in accordance with the Site Risk Assessment. Examples of manual handling tasks include: • Heavy / awkward materials, plaster board sheet, products, packages, cement bags; • Moving plant, equipment and scaffolding; • Using wheelbarrows and trolleys to transport materials; and • Reaching and stretching tasks.	Site Manager	Foreman	Evidence of training; Toolbox Talk F050; SWMS
3.7.2	HOT AND COLD WORK ENVIRONMENTS Where work is conducted in extreme temperatures these require hazard identification, risk, and control through the Site Risk Assessment in accordance with the Hot and Cold Work Environment Policy.	Site Manager	Foreman	Site Risk Assessment F001; Hot and Cold Work Environment Policy.
3.8 CONCRETE CUTTING – CORE HOLES				
Section	Requirements	Responsibility	Accountability	Tools
3.8.1	A Concrete Cutting and Coring Permit shall be completed and issued for coring works or penetrating concrete slabs.	Site Manager	Foreman	Concrete Cutting and Coring Permit (F068)
3.9 HOT WORKS				
Section	Requirements	Responsibility	Accountability	Tools
3.9.1	Work including oxy/acetylene welding/brazing and cutting, electric welding and cutting, grinding, works that involve the use of a naked flame or other heat-producing or spark-producing source in a hazardous environment require a Hot Works Permit. The permit shall be completed in accordance with the Site Risk Assessment when any one of the following conditions apply: • hot work is being completed within a client or user occupied area (e.g. breaking through into an occupied or completed area such as an extension to the building services / involve retro fitting in a completed area / post occupancy work); and/or • hot work in a high risk zone. A high risk zone is an area containing readily flammable material below, or within 10m of works, that cannot be removed (i.e. carpet and furnishings, cardboard, paper and packaging, dry grass,	Site Manager	Foreman	Hot Works Permit F062

	straw and litter, stored flammable gas or liquids, glues, cleaners, lubricants, oils, paper, insulation, PVC plastic etc.); and/or hot work is likely to trigger thermal (heat) detectors or activate sprinklers and/or smoke detectors. A permit is not required where the above conditions do not apply. In such cases, the hot works shall be managed through safe systems of work including SWMS, standard operating procedures, ensuring first attack firefighting equipment is readily available.			
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3.10 HIGH RISK CONSTRUCTION WORK

Section	Requirements	Responsibility	Accountability	Tools
3.10.1	The following high risk construction work activities establish FDC minimum requirements and shall be managed in accordance with the Site Risk Assessment. Potential hazards shall be controlled through safety documentation including SWMS, safe operating procedures, permits, other documented safety procedures or a combination of these relevant to the specific tasks. Emergency procedures and safe systems of work, including SWMS, safe work/operating procedures, permits etc. shall be established by person's trained in and conducting high risk construction work activities.	Project Manager	Site Manager	Site Risk Assessment F001

3.11 Asbestos

Section	Requirements	Responsibility	Accountability	Tools
3.11.1	Where the removal of asbestos is required an Occupational Hygienist shall provide an Asbestos Management Plan including types of asbestos, locations, and exposure monitoring standards.	Site Manager	Foreman	Asbestos Management Plan
3.11.2	Removal of asbestos shall be in accordance with the Asbestos Management Plan by licenced asbestos removal contractors in accordance with their Asbestos Control Plan and safety documentation including SWMS. Records of worker qualifications/ training and evidence that health surveillance medicals have been conducted shall be made available. The intended removal of asbestos shall be notified to the Regulator by the subcontractor prior to works commencing. Liaison with stakeholders potentially affected by removal activities shall be managed by FDC.	Site Manager	Foreman	Asbestos Control Plan; SWMS; Regulator and stakeholder notification
3.11.3	Air monitoring and sampling activities shall be conducted by an Occupational Hygienist that is independent of the licensed asbestos removal contractor. Clearance certificates shall be obtained from the Hygienist on completion of any asbestos removal work.	Site Manager	Foreman	Clearance certificates
3.11.4	Waste disposal receipts for removed asbestos products shall be obtained from the asbestos removal contractor.	Site Manager	Foreman	Waste removal receipts

3.12 Confined Space

Section	Requirements	Responsibility	Accountability	Tools
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3.12.1	The Confined Space Criteria and Entry Permit (F063) shall be used to determine the presence of confined spaces. Inadvertent access to confined spaces shall be prevented by securing the confined space, installing confined space signage, and ensuring access is only by workers with a permit and training as follows.	Site Manager	Foreman	Confined Space Criteria and Entry Permit F063
3.12.2	Persons entering the confined space, and standby persons, shall hold Nationally Recognised Training in Confined Space and have SWMS for the proposed activities. Where a harness is required for access a Harness Permit shall be required.	Site Manager	Foreman	Training/qualification; SWMS; Harness Permit (F064).
3.12.3	When confined space requirements including qualifications, PPE, emergency procedures, equipment maintenance and calibration, isolations, signage, barricading, hot works, and air monitoring have been met a Confined Space Criteria and Entry Permit for the duration of the activity shall be issued. The permit shall be closed out on completion of the activity.	Site Manager	Foreman	Confined Space Criteria and Entry Permit F063;

3.13 Demolition

Section	Requirements	Responsibility	Accountability	Tools
3.13.1	An Occupational Hygienists shall determine the presence of hazardous substances, including review of available asbestos registers, which may be hazardous to the health of the site personnel or the public if disturbed by the stripping or demolition. The nature, location, and proposed methods to control the hazards shall be recorded and provided to FDC and the demolition contractor prior to demolition activities. Where required by contract or Divisional requirements a Hazardous Material Management Plan may be used.	Site Manager	Foreman	Asbestos Register; Hazardous Material Management Plan
3.13.2	Notice of demolition work shall be issued by the Subcontractors to the relevant authority prior to commencement of demolition work if the demolition involves: • demolition of a structure, or a part of a structure that is load-bearing or otherwise related to the physical integrity of the structure, that is at least 6m in height; • demolition work involving load-shifting machinery on a suspended floor; • demolition work involving explosives.	Site Manager	Foreman	Notice of demolition work
3.13.3	Demolition contractors shall provide FDC with SWMS and a Demolition Work Plan addressing Hazardous Material Management Plan, the building structure, including adjacent structures and materials prior to commencing works. Safe systems of work, including SWMS, shall address requirements for working at heights and protecting persons from falling objects.	Site Manager	Foreman	Demolition Work Plan; SWMS
3.13.4	Prior to commencing demolition work Dial Before You Dig requests, Electrical Safety Survey, All Services Isolation Permit or Termination of Services Permit and/or specific client, contractor or utilities permit requirements shall be completed.	Site Manager	Foreman	Electrical Safety Survey and Protection Plan (F069).

				All Services Isolation Permit (F071). Termination of Services Permit F070; Dial Before You Dig
3.13.5	Where demolition consists of non-structural strip out the Electrical Safety Survey, All Services Isolation Permit or Termination of Services Permit and or specific client, contractor or utilities permit requirements shall be completed. Safe systems of work, including SWMS, shall address requirements for working at heights and protecting persons from falling objects.	Site Manager	Foreman	Electrical Safety Survey and Protection Plan (F069). All Services Isolation Permit (F071). Termination of Services Permit (F070). SWMS
3.14 Electrical				
Section	Requirements	Responsibility	Accountability	Tools
3.14.1	A Licensed Electrical Contractor shall be responsible for developing safe systems of work, including SWMS and safe work procedures for work on electrical installations (e.g. construction wiring, high voltage power, switchboards, and isolation). The Licensed Electrical Contractor shall ensure workers are licensed and trained in safe systems of work involving the installation, modification, testing and certification of electrical installations. Evidence of licensing and qualifications shall be reviewed during site induction. The Licensed Electrical Contractor shall be responsible for the training and supervision of unlicensed workers (e.g. apprentices, trade qualified workers) whilst on site.	Site Manager	Foreman	Qualifications
3.14.2	The Electrical Safety Survey and All Services Isolation Permit (for de-energising and re-energising) or Termination of Services Permit shall be completed for works involving: - isolation, de-energisation and re-energising activities; - lockout and tag out of electrical isolations; and - working near energised parts. Work on, or testing of, energised electrical equipment shall only be conducted by a Licensed Electrical Contractor in accordance with task specific procedures and legislative requirements. The permits shall only be issued to a Licensed Electrical Contractor when safe systems of work, including SWMS, have been developed for these specific works. The Site Manager must visually check that tags, lockouts etc. have been applied as required.	Site Manager	Foreman	Electrical Safety Survey & Protection Plan (F069). All Services Isolation Permit (F071). Termination of Services Permit (F070). SWMS

3.14.3	The Licensed Electrical Contractor shall ensure electrical work, including switchboards, distribution boards, temporary and permanent wiring has been installed, inspected prior to use, and conforms with relevant legislation, codes of practice and Australian standards (AS3000, AS3012, AS3760) by a qualified electrician. Construction wiring shall be adequately secured, protected, and clearly marked accordingly with "Construction Wiring" sticker and not be tied, bundled, or grouped with permanent wiring.	Site Manager	Foreman	Regulatory Compliance Certificates
3.14.4	Testing and tagging of electrical equipment shall be completed at maximum 3 month intervals by a qualified electrician, or competent person with an industry recognised test and tag training course (e.g. UEENEEPO26A) in accordance with relevant legislation, codes of practice and Australian standards (AS3760). Records of testing and inspection activity, including Electrical registers and Compliance Certificates, shall be maintained. FDCs Electrical Test and Tag Register may be used in the absence of similar register supplied by a Licensed Electrical Contractor.	Site Manager	Foreman	Electrical Test and Tag Register F073
3.14.5	RCD protection is required for portable generators, construction wiring and electrical systems to protect workers from electrical contact. RCD's shall be tested by a Licensed Electrical Contractor at maximum 3 monthly intervals and results recorded.	Site Manager	Foreman	Electrical Test and Tag Register F073
3.14.6	The Licensed Electrical Contractor shall develop safe systems of work to prevent workers from coming into contact with energised cables. Safe systems of work to ensure electrical cable ends are terminated safely shall consider taping the ends of the cables, installing a j-box, twisting and/or taping the cables during rough-in, or altering existing electrical cabling to prevent the cables from becoming live. First Energisation Process 1. Energisation requests to include the following as per FDC Energisation & Isolation Plan: - Energisation/Connection permit to be completed and signed by a licensed tradesperson. - ITP/C's to be attached showing all test results (once equipment is energised, final tests are to be completed and ITP/C's updated and submitted). - A drawing attached of the equipment/plant to be energised - A site plan showing the location of equipment/plant to be energised - A site plan detailing the energisation path e.g. on cable tray, in slab, underground (including depth of cover), surface conduit/duct. - A single line diagram (SLD) highlighting the energisation path. - Confirmation that any required mechanical protection is in place e.g. suitable protection surrounding cable trays containing energised cables, conduits, top hats. - Photos to be provided of all required labels/signage (laminated) in place including; - details of where the equipment is fed from, what breaker, cable sizes (where required), - contact details of the licensed electrician responsible for the equipment, and; "live power" signage placed on the equipment and all cable pathways. - A notice period of 20 days is preferred and will assist in energisation being approved. - A lock out/tag out procedure including those responsible for its implementation. Calibration certificates for test equipment.	Site Manager	Foreman / Site Safety Manager / Commissioning Manager / Services Manager	SWMS, Safe operating procedures All Services Isolation Permit (F071). Termination of Services Permit (F070). FDC Energisation Procedure FDC Energisation Permit Master Energisation Tracker

	2. Informing the Site Team. a. The FDC Services Team will provide energisation forms to the Site Management Team. b. A site wide energised areas plan will be attached to the FDC site notice board and induction room. The site will be tool boxed on the approved energisation. 3. Controlled access to energised electrical rooms (switch rooms, risers, electrical enclosures). If these measures are not followed, re-inductions will take place. a. Doors to electrical rooms/risers to be locked at all times. NO CHOCKING OPEN OF DOORS. b. Services trades requiring access to electrical rooms to be managed by the FDC Services Team; - A risk assessment to be undertaken prior to authorisation being provided for EACH TASK/WORKPLACE. c. Construction trades requiring access to an electrical room to be managed by the Construction Team in consultation with the Services Team; A risk assessment to be undertaken prior to authorisation being provided for EACH TASK/WORKPLACE. d. Once authorisation is approved, personnel accessing electrical rooms are to sign on/off each day on the supplied register (located on the door). 4. Energisation Process. a. Issue the completed energisation request to the FDC Services Team. b. FDC Services Team to issue to relevant contractor and the Site Management Team. c. A marked up site plan will be issued for reference on site. d. The site will be tool boxed on the approved energisation prior to energisation taking place. FDC's will maintain a Master Energisation Tracker (excel spread sheet) which tracks the energisation process from requests for energisations to the approval and the completion of the process. Service trade energisation include a backout procedure in the event of an emergency.			
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3.15 Excavation

Section	Requirements	Responsibility	Accountability	Tools
3.15.1	The Site Risk Assessment shall be used to develop safe systems of work to manage excavation activities including: - Impacts to adjacent building structures, materials and foundations; - Excavation near above ground and underground services (including liasing with asset owners); - Mobile plant working in or around an excavation; - Potential falls into the excavation; and - emergencies related to excavations. Safe systems of work include the development of Permits, SWMS, drawings/plans, engineering reports or a combination of these in accordance with the below requirements.	Site Manager	Foreman	Site Risk Assessment; SWMS, permits, drawings/plans; haz mat, Geotech / dilapidation reports

3.15.2	Identification and location of services by contacting Dial Before You Dig (DBYD) by telephone 1100 or visit their website www.1100.com.au. Allow at least three days from enquiry submission to receive all your DBYD information. Print DBYD plans including your Enquiry Confirmation Sheet that contains the DBYD Confirmation Number. Printed plans shall be maintained on site for the duration of the excavation activity. DBYD plans have an expiry date that can be found on the Enquiry Confirmation Sheet. A new DBYD enquiry shall be made when excavation activities exceed the expiry date. Relevant asset owners shall be contacted to determine potential impacts of above ground and underground services on excavation activities. Asset owner requirements shall be documented and permits, training needs and encroachment distances complied with. Termination of Services F070 and the All Services Isolation Permit F071 may be required. Where drawings show services within 2 (two) metres of the proposed excavation/penetration, the actual location of those services must be confirmed by either a locating device or by hand excavation.	Site Manager	Foreman	DBYD; Drawings/plans; SWMS; Termination of Services F070; All Services Isolation Permit F071; Excavation Works Permit F066;
3.15.3	An Excavation Works Permit (F066) shall be completed for excavations prior to commencing works and issued to a supervisor / foreman responsible for the activity. The permit and associated safety documentation shall address the nature of the works and note methods to prevent ground collapse. Drawings / plans / permits / reports relevant to the excavation activity shall be attached to the Excavation Works Permit (F066). Inspection of the excavation and control measures shall be conducted by a supervisor / foreman each day the excavation is accessed and recorded on the Excavation Works Permit (F066). Note - Excavation Works Permits are not required for Aqua Vac exploratory excavation, potholing for services, other hand tool excavations including driving of star pickets. For these activities instructions (e.g. equipment maximum nozzle pressures) from asset owners and DBYD must be available on site for reference and implemented.	Site Manager	Foreman	Excavation Works Permit F066; drawings/plans; Geotech reports; SWMS
3.15.4	Excavation support systems including hydraulic shoring, sheet piling, steel shoring/trench lining, sheeting and ground anchors shall be: - designed by a qualified Geotechnical or Structural Engineer; - detailed on current drawings; - installed and verified by persons trained and instructed in the support system being installed in accordance with documented designs/drawings; and - authorised by a qualified Geotechnical Engineer or Structural Engineer where changes to the design or installed system are made.	Site Manager	Foreman	Drawings / designs / Geotech reports
3.15.5	Safe systems of work shall ensure:	Site Manager	Foreman	SWMS; Vehicle movement plan

	• Safe access at all times. Where a ladder is used, it must be sufficient to extend 1 (one) metre past the landing place and be secured at the top and bottom to prevent slipping; • Excavations deeper than 1.5m shall be properly benched, battered or shored, or a combination of these. Where the ground is unstable, advice from a Geotechnical Engineer or Structural Engineer may be required; • Excavations shall not be left exposed if unattended. Flagging, para webbing and/or barricading must be erected at a minimum of 1m from the edge and warning signs posted to protect persons from falling into the excavation; • Sufficient controls (eg signage, flagging/para webbing/barricading) are implemented where mobile plant is working in and around excavations in accordance with the Vehicle Movement Plan.			
3.15.6	Inspection of the excavation and control measures shall be conducted each day the excavation is accessed and recorded on the Excavation Works Permit (F066) in accordance with safety systems of work. For excavations less than 1.5m the person competent to conduct the inspection holds either of the following: ▪ Conduct Civil Construction Operations Course (RIIMPO32F or similar); or ▪ Certificate in Plumbing and Draining; or ▪ Certificate in Drainage; and ▪ Asbestos Awareness Training (where required by regulation). For excavations greater than 1.5m: ▪ In addition to the inspection for less than 1.5m by the defined competent person above, inspections shall also be conducted by Geotechnical Engineer or Civil Engineer, and a Structural Engineer where shoring systems are used.	Site Manager	Foreman	Excavation Works Permit F066; Geotech reports;
3.16 Formwork				
Section	Requirements	Responsibility	Accountability	Tools
3.16.1	Subcontractors shall provide the following documentation must be available for inspection on site: • Certification of the maximum loads from stacked materials that the formwork assembly can withstand; • Specifications for the concrete and when formwork can be removed; • Back-propping details (plans and elevations including tying in); and • Drawings for the formwork design. The drawings must be signed by a professional engineer or formwork designer or be accompanied by a certification letter that lists the drawing numbers and drawing revision numbers.	Site Manager	Foreman	Designs, Engineers Certificate; drawings
3.16.2	A structural/geotechnical engineer shall assess building structures/materials/foundations and identify controls required prior to commencing formwork. Subcontractors shall be responsible for developing safe systems of work for the:	Site Manager	Foreman	SWMS

	- erection, use and stripping of formwork; - prevention of persons falling and the management of falling objects, including exclusion zones; - management of penetrations (Open penetrations such as stairwells shall include handrails, mesh, and plywood covers. Slab shall include cast in mesh to be secured prior to pouring concrete. Penetrations on poured slabs shall be covered with formplay and secured in place to prevent inadvertent removal); and - correct installation of systems/structures, including the ongoing monitoring/inspections of the effectiveness of the systems/structures in accordance with legislative and manufactures requirements and applicable drawings or plans; - review and approve design variations that deviate in the erection from the plan or that fall outside the design parameters; and - approve modifications to formwork, outside specified design parameters.			
3.16.3	An Engineer with experience in structural design shall inspect and certify that the completed formwork meets the design specifications, manufacturers' instructions and relevant legislation, codes of practice, Australian standards and applicable drawings/plans and is structurally sound before it is loaded.	Site Manager	Foreman	Engineers Certificate
3.16.4	An Engineer with experience in structural design shall inspect and certify that the completed formwork meets the design specifications, manufacturers' instructions and relevant legislation, codes of practice, Australian standards and applicable drawings/plans and is structurally sound prior to concrete pours.	Site Manager	Foreman	Engineers Certificate
3.17 Exposure Monitoring				
Section	Requirements	Responsibility	Accountability	Tools
3.17.1	The Site Establishment Checklist prompts the completion of site investigations. The Asbestos Registers and Hazardous material/substances survey shall be completed by an Occupational Hygienist to identify potential hazards including biological and chemical/atmospheric contaminants and products identified in legislation that require health surveillance activities to: - determine workplace exposure standards and exposure levels; and - consider potential health hazards when developing safe systems of work for project specific activities in accordance with the Site Risk Assessment. Potential physical hazards, including dust, noise and vibration shall be managed in accordance with the Work Environment section of the Site Risk Assessment. Workplace/Worker exposure monitoring activities for work areas potentially affected by health hazards shall be developed in consultation with Divisional HSEQ representatives and Occupational Hygienists. Safe systems of work including Site Risk Assessment, SWMS, Permits or a combination of these shall address the following activities: - Method and frequency of monitoring; - Sampling and analytical method (including exposure standards);	Site Manager	Foreman	Site Establishment Checklist; Hygienist Report; Site Risk Assessment F001; SWMS; Permits

	• Interpretation and consultation of results; • Nomination and maintenance of control measures; and • The need for individual health surveillance. When monitoring activities identify that exposure to potential health hazards are approaching accepted exposure standards, the suitability of nominated control measures shall be reviewed in consultation with site management and the Occupational hygienist to determine appropriate actions where appropriate.			
3.17.2	The inspection, measuring and test equipment related to health and safety monitoring shall be managed in accordance with manufacturer's specifications and legal requirements with records of calibration maintained. In the absence of registers or calibration certificates from the subcontractor, FDC shall maintain a register of project specific on the Calibration Register.	Site Manager	Foreman	Calibration Register F080
3.17.3	A review of monitoring activities and nominated control measures shall be undertaken when: • a failure of nominated control measures is suspected; • accepted exposure limits are exceeded; or • when individuals are unexpectedly exposed to hazardous substances that weren't previously known to be present on-site. Where potential exposure to hazardous substances has occurred, work shall cease immediately, and the area evacuated and secured. Further work activities shall be assessed in consultation with site management, Divisional HSEQ representative and the Occupational Hygienist to determine improvements to work methods and control measures. Access to closed secured areas due to potential health hazards shall not be permitted until certification is received from the Occupational Hygienist and the suitability of monitoring requirements and nominated control measures have been assessed, recorded, and improved as necessary. The HSEQ Manager shall be notified when individuals have potentially been exposed to health hazards due to absent controls or safe systems of work.	Site Manager	Foreman	Nil.
3.17.4	General information on health surveillance, exposure monitoring and control measures is communicated as appropriate through inductions, toolbox talks, noticeboard etc. Records of health surveillance and exposure monitoring activities however contain personal information and shall remain confidential.	Site Manager	Foreman	Site Induction-Site Rules F018.Toolbox Talks F050. First Aid, Emergency & Health Surveillance Risk Assessment (F009)
3.18 Health Surveillance				
Section	Requirements	Responsibility	Accountability	Tools
3.18.1	Individuals potentially exposed to hazardous substances shall be directed to seek medical treatment with a medical practitioner to assess exposure and any requirement for ongoing health surveillance.	Site Manager	Foreman	First Aid, Emergency & Health Surveillance Risk Assessment (F009)

	Where Medical Practitioners identify/advise that health surveillance is required, a review of monitoring activities and nominated control measures, including any recommendations by the registered Medical Practitioner, shall be undertaken in consultation with site management, Divisional HSEQ representatives and Occupational Hygienist to determine appropriate actions. The HSEQ Manager shall be notified when individuals have potentially been exposed to health hazards due to absent controls or safe systems of work.			
3.18.2	Records of surveillance data shall be maintained and actions arising from assessment recorded. Records shall include monitoring equipment calibration records whenever the monitoring is conducted directly by FDC. Ongoing individual health surveillance shall be provided in accordance with the recommendations of registered medical practitioners. Health surveillance requirements shall be communicated to relevant employees in consultation with Divisional management and shall remain confidential.	Site Manager	Foreman	Surveillance Data First Aid, Emergency & Health Surveillance Risk Assessment (F009) Calibration Register F080.

3.19 Mobile Plant

Section	Requirements	Responsibility	Accountability	Tools
3.19.1	The Mobile Plant Induction (F077) shall be completed for mobile plant prior to commencing works on site. The induction shall ensure, as a minimum, a plant risk assessment specific to the plant model, maintenance records, log books and original equipment manufacturers manuals are available. Plant risk assessments shall focus on higher order controls including plant specific warning devices, ROPs/FOPs, guarding, edge protection etc. Operator controls are considered lower order controls and on their own are not acceptable as a plant risk assessment. The mobile plant induction process aims to establish safe systems of work addressing original equipment manufacturers requirements, plant risk assessment outcomes and controls, and the need for ROP's and FOP's. Site specific requirements shall be established through SWMS, vehicle movement plans and permits related to activities.	Site Manager	Foreman	Mobile Plant Induction F077
3.19.2	Upon successful induction the plant shall receive a plant identification sticker and be registered on the Plant Register. Registered items shall be randomly selected, and records verified through Weekly Site Inspections and Monthly Site Audits. The Plant and Equipment Competency and Inspection Schedule is available as guidance regarding plant inspection requirements. The Plant Register shall record plant inspections and maintenance specific to the needs of each type of plant. Inspections shall be in accordance with regulatory inspections, registrations, and manufacturers requirements, including pre-start inspections and/or commissioning prior to commencing on site. The Plant Register shall be used to manage ongoing maintenance requirements.	Site Manager	Foreman	Plant Register F079; Plant and Equipment Competency and Inspection Schedule G012

3.19.3	Where a mobile crane or boom pump is required, the Mobile Crane / Boom Pump Setup form shall be completed. This is required for each new location that a Mobile Crane / Boom Pump is set up for operation. The set-up location shall be communicated to relevant parties. The subcontractor shall develop safe system of work, including SWMS, in addition to the above documentation.	Site Manager	Foreman	Mobile Crane/Boom Pump Setup F078
3.19.4	Lifting procedures for Tower Cranes – the subcontractor shall provide lifting procedures/lift plan when working outside the Original Equipment Manufacturers requirements and when multiple cranes are involved in a lift. Procedures shall include crane type / capacity, weight of lift, load charts, rigging/lifting equipment, lifting methods and sequence etc.	Site Manager	Foreman	Lifting procedures / lift plan; SWMS
3.19.5	Lifting procedures for Mobile Cranes - Documented lifting procedures shall be provided by persons responsible for mobile cranes, in addition to safe work method statements, for work associated with cranes in the following situations: ▪ tilt-up panel jobs ▪ multiple crane lifts - where more than one crane is used to lift a load at any one time ▪ lifting of workboxes with persons in the boxes ▪ installation of bridge beams during bridge installation work ▪ working near live overhead powerlines ▪ lifting large pressure vessels or tanks ▪ the use of mobile cranes on barges ▪ erection of tower cranes or heavy lifts where the load is 50 tonnes or more.	Site Manager	Foreman	Lifting procedures / lift plan; SWMS
3.19.6	The mobile cranes lifting procedures for the above situations shall include:	Site Manager	Foreman	Lifting procedures / lift plan; SWMS

	- maximum load radius to be used for the cranes - where spotter duties are required (e.g. for preventing collision or contact with powerlines), what the duty is and who is responsible for performing the duty - position of the load to be lifted and the final position to which it is to be lifted, where practicable - diagram that shows a plan view of the site may assist - maximum wind speed where the load has a large surface area - verification of the maximum allowable ground bearing pressure (this must be carried out for heavy lifts including tilt up panels and loads of 50 tonnes or more.) - allowance for any factors that may require de-rating of the crane (e.g. for multiple crane lifts, additional radius caused by tilting of tilt-up panels) - rigging requirements of the job.			
3.19.7	Work boxes - Subcontractors shall develop safe systems of work in accordance with relevant legislation, standards, and codes of practice for using crane lifted work boxes, including crane lifted first aid work boxes. Safe Work Australia has an information sheet including reference to AS 1418.17 and AS 2550.1 crane use, design and construction requirements. The safe systems of work shall address requirements for the use of work boxes and cranes.	Site Manager	Foreman	Lifting procedures / lift plan; SWMS
3.19.8	Operator licensing, qualifications or competency requirements shall be identified through the Mobile Plant Induction. These documents shall be verified at worker site inductions. Further guidance on competency/qualifications is available through the Plant and Equipment Competency and Inspection Schedule to assist this process. NOTE: a letter signed by an employer or supervisor claiming that the worker is competent is not acceptable.	Site Manager	Foreman	Site Induction-Site Rules F018; Mobile Plant Induction F077; Plant and Equipment Competency and Inspection Schedule G012
3.19.9	To manage the interaction between people and mobile plant a vehicle movement plan shall be maintained that illustrates work areas and pedestrian access. These plans shall be displayed and communicated through toolbox/prestart meetings and updated as necessary to reflect site activities. Plans shall take into consideration site characteristics, barricading, exclusion zones, warning devices and plant/vehicle/worker interactions.	Site Manager	Foreman	Vehicle Movement Plan
3.20 Scaffold				
Section	Requirements	Responsibility	Accountability	Tools

3.20.1	FDC shall ensure where a person or object could fall greater than 4m that scaffold is designed by a qualified person, documented on drawings/plans and installed as per the plan, and changes to the design or installed system are authorised by a qualified person. FDC shall conduct a workshop with subcontractors to confirm scaffold requirements for high risk scaffolds, including where an object or person could fall greater than 4 metres. Attendees shall include FDC Site Manager, Subcontract Supervisor as a minimum.	Project Manager	Foreman	Scaffold Workshop F045
3.20.2	Scaffold where a person or object could fall greater than 4m shall be designed by a qualified structural engineer who shall: • provide a scaffold design/plan that includes a site layout, engineer sketch plan, engineer approved as-built or standard drawings for scaffolds; • provide documented design parameters provided by the scaffold manufacturer. These should be located on the scaffold drawings or associated documents; • provide designs and drawings that reflect interactions between multiple scaffold systems where applicable; • review design variations that deviate in the erection from the plan or that fall outside the design parameters and ensure designs/drawings are updated and approved; and • review modifications to erected scaffold, outside specified design parameters and ensure designs/drawings are updated and approved. A structural/geotechnical engineer shall provide written confirmation of the assessment of building structures/materials/foundations and identify controls required prior to commencing scaffolding.	Site Manager	Foreman	Scaffold Workshop F012; Design/drawings; qualifications
3.20.3	Scaffold where a person or object could fall greater than 4m shall be erected by a person holding a High Risk Work Licence (Basic, Intermediate or Advanced Scaffolder) in accordance with the guidance in G012 Plant and Equipment Competency and Inspection Schedule.	Site Manager	Foreman	G012 Plant and Equipment Competency and Inspection Schedule
3.20.4	Scaffold where a person or object could fall greater than 4m shall not be used or accessed unless a written inspection certificate from the scaffold inspector (HRWL Intermediate or Advanced Scaffolder), has been obtained for the scaffold, or its relevant portion, and is complete, and verified as installed in accordance with the manufacturers' instructions and relevant legislation, codes of practice and Australian standards and applicable drawings/plans. Scaffold inspections shall be conducted: • prior to initial use; • after repairs and alterations;	Site Manager	Foreman	Scaffold Inspections

	- before scaffold is used after an incident (eg heavy weather events, unplanned impact to scaffold) that may affect the stability of the scaffold; and - at least every 30 days. The inspections shall include methods to check base plates and sole boards are correctly installed per design and supported on solid ground. Inspection records by the scaffold inspector shall be in accordance with AS 4576:1995 and include the: - individual identification number or mark of the scaffold; - design, drawing, specification, or manufacturers reference; - location of the scaffold; - purpose for which the scaffold is provided; - date and time of each inspection; and the - name and signature of the person conducting the inspection. Written inspections shall be maintained in site files. Where scaff tags (or similar are used), the above records of inspection are still required. The Safe Work Australia – Guide to scaffold inspection and maintenance can be used by FDC team to monitor scaffold suitability.			
3.20.5	The assembly, dismantling and re-assembly of fixed or mobile scaffolds where a risk of fall of a person or object is less than 4m shall be by competent persons including: - a person holding a High Risk Work Licence (Basic, Intermediate or Advanced Scaffolder) and SWMS; or - persons trained in the use of the scaffold components in accordance with manufacturers requirements and SWMS. These scaffolds shall be inspected to monitor the effectiveness of the system / structure in accordance with specified requirements through the Weekly Site Inspection. The Task Observation may also be used as applicable to observe the scaffold in use for a specific task. Where inspections are also conducted by competent persons records shall be maintained. Work platforms with no assembly requirements (e.g. Snappy Scaffold) are exempt from this process.	Site Manager	Foreman	Evidence of training; SWMS, Weekly Site Inspection (F049). Task Observation (F053)
3.20.6	Swinging stages shall only be erected and operated by persons holding the relevant High Risk Work Licence in accordance with the Plant and Equipment Competency and Inspection Schedule.	Site Manager	Foreman	G012 Plant and Equipment Competency and Inspection Schedule

3.21 Structural Steel

Section	Requirements	Responsibility	Accountability	Tools
3.21.1	Consultation with workers for the planning and erection of structural steel shall be initiated through the Structural Steel workshop. Consultation shall address potential hazards, risks and control measures, fabrication, transportation, and erection and include structural design engineer, fabricator, and erector on: - the structural design of the building; - plant and equipment to be used; - erections sequence; - training and qualification of workers and engineers; - emergency management; and - access to the structure. Information from consultation activities shall be available to parties involved and reviewed and updated as required to enable for the safe erection and handover. The workshop shall address hazards associated to the proposed works including working at heights, falling materials, electrical and plant management. Attendees shall include FDC Site Manager, Subcontract Supervisor as a minimum.	Project Manager	Site Manager	Structural Steel Workshop F046, Site Risk Assessment
3.21.2	Design and planning by the structural design engineer shall consider: - the effect of the erection sequence on the stability of the structure; - safe access and working places including anchorage points for fall prevention/arrest systems; - the ease of connections for components such as landing cleats; - safe handling storing and transport of components including providing details of lifting points, and - all materials, for example grades of steel and welding comply with standards specified in the design; and - ensure shop drawings comply with the structural design before steel members are fabrication. The erection sequence shall be documented and supplied to FDC and parties involved in the fabrication and erection of the steelwork. Structural steel shop drawings shall be reviewed by the Permanent Works Engineer, and Temporary Works Engineer where applicable, prior to fabrication and erection respectively.	Project Manager	Site Manager	Design Plan / Design Drawings; Shop drawings
3.21.3	Persons responsible for structural steel fabrication shall:	Project Manager	Site Manager	Shop drawings

	- Ensures the accurate detailing and manufacture of the steelwork according to the shop drawings; - Ensures steel members are identifiable for the sequence of erection and fit together correctly; - Structural steel shall be supported and tied to prevent movement during loading or unloading and transport; and - Logistics for site delivery have been coordinated.			
3.21.4	Persons responsible for structural steel erection shall ensure site specific safe systems of work are developed and: - Obtain the approved erection sequence documentation; - Prepares the method of erection according to the drawings; - Provide a site plan with detailed information on the location and coverage of cranes and lift plans where required, workers, unloading points and storage areas, and exclusion zones; - Consider the stability requirements of all items of the structure, including temporary works; and - Consider the suitability of ground conditions for the safe movement of mobile plant. If the erection process is split into shifts, a defined process for beginning of a shift, and ending of a shift shall be determined by the persons responsible for structural steel erection.	Project Manager	Site Manager	SWMS, Mobile Plant, Mobile Crane Setup, Lift plans
3.21.5	Persons responsible for structural steel erection shall provide written confirmation that the structural steel erection meets design requirements in accordance with the structural steel high risk workshop.	Project Manager	Site Manager	Handover inspections, ITPs'
3.22 Tilt-up / Precast Concrete				
Section	Requirements	Responsibility	Accountability	Tools
3.22.3	A Design Plan for Tilt-up/Precast activities shall be developed and certified by a Structural Engineer qualified as a member of the Institution of Engineers Australia to address: - design and construction of panels including identifiers for each panel; - lifting points and panel placement; - erection requirements that include panel bracing and details of anchorage designs; and - inspection requirements for panels, lifting points, bracing prior to, during and after installation.	Site Manager	Foreman	Design Plan
3.22.2	Prior to commencing Tilt-up/precast activities the following must be provided to FDC: - project design engineer's certificate of compliance; - manufacturer's certificate of compliance; - component schedule; - design drawings, including approval of proprietary or manufactured inserts and fixings; and - shop drawings.	Site Manager	Foreman	Compliance certificates; drawings; schedules
3.22.3	The subcontractor shall develop safe system of work, including SWMS prior to activities commencing on site to address:	Site Manager	Foreman	SWMS; Lift Plan

	- that a Lift Plan has been developed in consultation with crane crew; - erection, bracing and stripping; - protection of workers under and around Tilt-up/Precast; - falls and falling objects; - unloading and slinging panels and crane requirements and the protection of panels and bracing from damage by inadvertent contact with Mobile Plant or other site activities; and - changes to the design approved by the design engineer			
3.22.4	Subcontractors shall provide FDC evidence of inspections to verify that Tilt-up/Precast panels have been installed in accordance with the manufacturers' instructions and relevant legislation, codes of practice and Australian standards and applicable drawings/plans. Changes to the design or installed system shall be approved by the design engineer. Ongoing inspection by subcontractors that provide FDC evidence of ongoing inspection of braces / props / fixtures / bolts conducted in accordance with the frequencies and requirements of the Design Plan. Daily visual inspections of braced and bracing concrete elements shall be conducted and recorded where corrective action is required.	Site Manager	Foreman	Inspection records

3.23 Traffic

Section	Requirements	Responsibility	Accountability	Tools
3.23.1	The Site Risk Assessment shall identify who is responsible for developing and implementing the traffic management plan for roads around the site. A Vehicle Movement Plan shall be developed for onsite activities in accordance with the Mobile Plant section of this PMP.	Site Manager	Foreman	Site Risk Assessment F001
3.23.2	A project specific Traffic Management Plan (TMP) shall be developed to inform, control and guide road users and to protect the safety of construction personnel and the public. The TMP shall: - be prepared in accordance with relevant legislation, Codes of Practice, Australian Standards, or other requirements; - include location specific traffic control plans (e.g. diagrams/drawings); - detail the methodology for safely implementing and dismantling traffic control devices; and - be approved as specified by the relevant authority prior to implementation where required. The TMP and associated control plans shall be prepared by qualified and licensed personnel. The FDC Traffic Management Plan template shall be used in the absence of any externally provided TMP. Traffic management requirements shall be communicated through Site Inductions, as a minimum, and other communication forums (e.g. Prestart Meetings) as required.			Traffic Management Plan

3.23.3	FDC shall ensure that personnel developing, installing, using, and monitoring traffic control devices are suitably qualified and licenced with the relevant road authority. G012 Plant and Equipment Competency and Inspection Schedule is available for further guidance. Evidence of specific qualifications and licensing shall be recorded through the site inductions.	Site Manager	Foreman	G012 Plant and Equipment Competency and Inspection Schedule
3.23.4	Monitoring of traffic management shall be conducted at least daily when traffic controls are active. Inspections shall ensure controls are in accordance with requirements specified in the TMP and that controls have not been vandalised or tampered with. Inspections shall be documented and maintained.	Site Manager	Foreman	Traffic control inspections
3.23.5	FDC shall ensure that the TMP is reviewed at frequencies specified in the plan and following an incident to determine its adequacy in managing traffic and potential hazards. Reviews shall verify that: - Revisions to the plan have been made, approved/acknowledged, uploaded, and communicated; or - the current plan remains unchanged and has been confirmed as adequate in managing project requirements.	Site Manager	Foreman	TMP Review

3.24 Working at Height

Section	Requirements	Responsibility	Accountability	Tools
3.24.1	The primary methods to prevent falls from height and falling objects shall be managed in accordance with safe systems of work for Demolition, Excavation, Formwork, Mobile Plant, Scaffold and Tilt Up / Pre Cast activities. Proposed working at heights activities not covered by those activities shall be identified, assessed, and controlled in accordance with the hierarchy of control and applicable legislation, codes of practice and Australian standards in the Site Risk Assessment and the following requirements. To reduce potential risk of harm work methods to avoid working at heights shall be considered. Where not reasonably practicable the following sections for harness use; temporary edge protection and ladder use shall apply.	Site Manager	Foreman	Site Risk Assessment F001
3.24.2	Harness Use Training - Workers using fall restraint/fall arrest equipment shall hold Nationally recognised Work at Height training course or applicable high risk construction work license including EWP >11m, Riggers/Scaffolders tickets. Maintenance - Evidence of equipment maintenance and inspections shall be provided prior to works commencing, and continue throughout the project in accordance with an equipment maintenance schedule. Attachment Point Design - Engineering design for proprietary attachment points (e.g. eye bolts, static lines) shall be in accordance with manufacturers' requirements and provided and certified by a qualified Engineer with experience in fall restraint/fall arrest equipment and a member of Engineers Australia. Evidence of qualifications and competency must be kept on site. Attachment Point Installation - Installation and inspection of proprietary attachment points (e.g. eye bolts, static lines) shall be in accordance with manufacturers' requirements and conducted and certified by a competent person trained in the use of the anchor points design and manufacturers requirements.	Site Manager	Foreman	Training/Qualification Equipment maintenance; Design documentation Harness Permit (F064).

	Attachment Point Inspection – Prior to harness use, inspections of installed anchor points shall be conducted by a competent person trained in the use of the installed systems manufacturers requirements. Where fall restraint / fall arrest equipment is attached to a structural element (e.g. a concrete column) this shall be done so by a person holding Riggers (All) / Scaffolders (Advanced / Intermediate) high risk work license.			
3.24.3	The Harness Permit shall be issued by FDC where safe systems of work, including SWMS and associated design, installation, maintenance, inspection, and training records are developed where the risk of working at heights is identified. The Permit shall be approved by FDC when safe systems of work have been developed and evidence of SWMS, equipment inspections, design and installation information of attachment points and training records have been received. The Permit shall remain valid for one week from date of issue unless a new harness user is required, or equipment and attachment points change within that period. A permit is not required when using a harness as a secondary control measure such as EWP and Work Box.	Site Manager	Foreman	Harness Permit (F064).
3.24.4	Temporary edge protection systems (including proprietary and engineered systems) shall: - be installed as directed by either the designers, manufacturers, or suppliers of the system; - be installed and inspected by a Ticketed Scaffolders, or a Rigger, or a worker trained in the use of the system, prior to handover. Evidence of the initial installation/inspection shall be documented; - Ongoing inspections are conducted through weekly inspections by a Ticketed Scaffolders, or a Rigger, or a worker trained in the use of the system shall be documented.	Site Manager	Foreman	Training/Qualification Equipment maintenance; Design documentation; SWMS
3.24.5	Safe systems of work shall be developed to prevent people or objects falling through penetrations. Safe system may include handrails, mesh, plywood covers and signage. Where subcontractors are installing roof safety mesh the Roof Installation Permit shall be required in accordance with the Site Risk Assessment and SWMS. Safe access and egress for workers working at height shall be assessed and controlled in accordance with the Site Risk Assessment > Working at Heights. Controls may include scaffold stair access, hoist, good lift etc.	Site Manager	Foreman	SWMS, Roof Installation Permit (F061), Site Risk Assessment F001
3.24.6	Ladders shall primarily be used as a means of access (e.g. access to mobile scaffolds, formwork decks etc.) and not a working platform. The use of ladders (i.e. A frames/rung ladders) for other purposes shall only be considered if safer alternatives, such as scaffolding or elevating work platforms, Platform Ladders or trestles are not reasonably practicable. The A-Frame Ladder permit is required where scaffolding, elevating work platforms, platform Ladders or trestles are not reasonably practicable. The permit shall ensure safe systems, including SWMS, Site Risk Assessment or other standard operating procedure shall be developed to address potential hazards and controls relating to working from the ladder. In these cases the safe use of ladders shall only be used for light duty work of short duration. Domestic ladders are not permitted.	Site Manager	Foreman	A-Frame Ladder Permit F065; SWMS

3.25 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Section	Requirements	Responsibility	Accountability	Tools
3.25.1	Workers must wear the mandatory personal protective equipment (PPE) including hard hats, high visibility clothing and steel capped safety footwear when performing construction work. Additional PPE shall be worn where specified in safe systems of work, including SWMS, permits or the workplace specific induction. Visitors must wear the mandatory personal protective equipment (PPE) including hard hats, high visibility clothing and enclosed footwear when visiting construction sites. Additional PPE shall be worn where specified in safe systems of work, including SWMS, permits or the workplace specific induction.	Project Manager	Site Manager	Site Risk Assessment; SWMS; Site Induction

3.26 HOT AND COLD WORK ENVIRONMENTS

3.26.1	Where work is conducted in extreme temperatures these require hazard identification, risk, and control through the Site Risk Assessment in accordance with the Hot and Cold Work Environment Policy.	Site Manager	Foreman	Site Risk Assessment F001; Hot and Cold Work Environment Policy.
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3.27 PSYCHOSOCIAL HAZARDS

Section	Requirements	Responsibility	Accountability	Tools
3.27.1	Psychosocial hazards may cause psychological and physical harm and arise from, or in relation to: - the design or management of work; - the working environment; - plant at the workplace; or - workplace interactions or behaviours. Psychosocial hazards shall be identified and controlled through the Site Risk Assessment and safe systems of work including SWMS. Psychosocial hazards and appropriate control measures may vary between workplaces and workers depending on the work environment, organisational context and the nature of work. The duration, frequency, or severity of the exposure of workers and other persons to psychosocial hazards shall be considered when determining control measures.	Project Manager	Site Manager	Site Risk Assessment, SWMS

3.27.2	Workers are responsible for their own safety and of those working with and around them. Potential psychosocial hazards can be raised through the agreed consultation process or site management and the privacy and confidentiality of parties involved maintained. Professional services support is available via the project noticeboard, Employee Assistance Program and FDC's intranet 'The Vault').	Project Manager	Site Manager	Consultation arrangements FDC Vault Resources: -EAP -Guidance – Mental Health in our Workplaces
3.27.3	Psychosocial hazard training is included in FDC HIRAC recorded on the Training and Experience Register (F024). Additional training and information is provided through the site induction and may be addressed through toolbox talks and the agreed consultation arrangements. Education and awareness is supported through various programs including R U O K, Mates in Construction, Bluehats, Foundoblu, International women's day, Safe Work Month to draw awareness to psychosocial hazards in the workplace. Information on programs is available through FDC's intranet 'The Vault'.	Project Manager	Site Manager	Training and Experience Register (F024), Site Induction-Site Rules F018; consultation, tool box talks; FDC Vault
3.27.4	Investigations into reports of incidents involving psychosocial hazards aim to identify hazards, improve control measures, and prevent recurrence. Reported incidents may be investigated through project consultation arrangements or an agreed reviewer at the request of an affected worker. Investigations shall be conducted to maintain privacy and confidentiality of workers involved to the extent permitted by law. Records of the incident and actions shall be maintained and registered on the Project Monthly HSEQ Report. The incident management procedure can be enacted at the discretion of an affected worker in consultation with FDC management.	HSEQ Manager	Project Manager	Project Monthly HSEQ Report (F090).Cor-8.5-001 Incident Management

ENVIRONMENTAL

4.1 ENVIRONMENTAL ASPECTS AND IMPACTS

Section	Requirements	Responsibility	Accountability	Tools
4.1.1	Potential environmental obligations and risks associated with the project shall be identified prior to the start of the project by commencing the Environmental Risk Assessment. The Environmental Risk Assessment identifies project specific aspects and impacts, and operational controls used to manage and monitor environmental issues. The Environmental Risk Assessment shall be developed, approved, and issued to subcontractors and be reviewed for ongoing suitability during the monthly project review. Where updates are required these shall be made, approved, and reissued to relevant parties.	Project Manager	Project Manager	Environmental Risk Assessment F010
4.1.2	Information of hazardous materials, including material's potential impact on the environment and measures to be taken in the event of accidental release will be managed via the Hazardous Chemical Register.	Project Manager	Project Manager	Hazardous Chemical Register F086
4.1.3	FDC shall notify as soon as possible the statutory authority in the event of pollution incidents that have occurred during its activities that has caused or is likely to cause serious or material environmental harm from pollution. Failure to notify may lead to a maximum penalty of \$5,500 for an individual or \$27,500 for a company.	Divisional HSEQ representative	Project Manager	Incident Report F035

4.2 LICENSES AND APPROVALS

Section	Requirements	Responsibility	Accountability	Tools														
4.2.1	Licences and approvals required for the project are listed below (Insert relevant local authorities): <table><tr><td>Licence/Approval:</td><td>Number:</td></tr><tr><td>OEH</td><td>02 9995 5000</td></tr><tr><td>Water Authority (Sydney Water)</td><td>13 20 92</td></tr><tr><td>Roads and Transport Authority (TfNSW)</td><td>131 500</td></tr><tr><td>Energy provider (Ausgrid)</td><td>13 13 88</td></tr><tr><td></td><td></td></tr><tr><td>•</td><td></td></tr></table>	Licence/Approval:	Number:	OEH	02 9995 5000	Water Authority (Sydney Water)	13 20 92	Roads and Transport Authority (TfNSW)	131 500	Energy provider (Ausgrid)	13 13 88			•		Project Manager	Site Manager	Licence/approval documents
Licence/Approval:	Number:																	
OEH	02 9995 5000																	
Water Authority (Sydney Water)	13 20 92																	
Roads and Transport Authority (TfNSW)	131 500																	
Energy provider (Ausgrid)	13 13 88																	
•																		
4.2.2	In addition to key aspects and impacts identified through the Environmental Risk Assessment additional Sub Plans may be required by the contract, Development Application or as deemed necessary by the Project Manager shall be developed. The following environmental sub plans are available for FDC workers on the Vault > Manage My Project > Project Set Up > Plans: <table><tr><td> ▪ Air Quality Management Plan ▪ Flora and Fauna Management Plan ▪ Hazardous Materials Management Plan ▪ Infection Control Management Plan </td><td> ▪ Noise and Vibration Management ▪ Noise Management and Communication Plan ▪ Soil and Water Management Plan ▪ Waste Management Plan ▪ ESD and WOL Management Plan </td></tr></table>	▪ Air Quality Management Plan ▪ Flora and Fauna Management Plan ▪ Hazardous Materials Management Plan ▪ Infection Control Management Plan	▪ Noise and Vibration Management ▪ Noise Management and Communication Plan ▪ Soil and Water Management Plan ▪ Waste Management Plan ▪ ESD and WOL Management Plan	Project Manager	Site Manager	Environmental Risk Assessment F010; Sub plans												
▪ Air Quality Management Plan ▪ Flora and Fauna Management Plan ▪ Hazardous Materials Management Plan ▪ Infection Control Management Plan	▪ Noise and Vibration Management ▪ Noise Management and Communication Plan ▪ Soil and Water Management Plan ▪ Waste Management Plan ▪ ESD and WOL Management Plan																	

4.3 CONTAMINATED SITE MANAGEMENT

Section	Requirements	Responsibility	Accountability	Tools
4.3.1	Projects undertaken on contaminated sites shall undergo a Contaminated Site Assessment (CSA) by an external consultant. A report of the CSA shall be provided as part of planning approvals process of a proposed development. All relevant CSA reports, documents and approvals will be obtained and reviewed prior to site activities commencing. Operational controls may include any specific procedures described in the report or approvals.	Project Manager	Site Manager	CSA Report
4.3.2	Where required, ITPs and/or SWMS will be developed to address requirements of CSAs and to ensure verification of the works being completed safely and with minimal impact as described.	Project Manager	Site Manager	SWMS; ITP's
4.3.3	The site workforce shall be made aware of potential contamination issues through the site induction, toolbox, or prestart meetings. Advice shall be provided should problems be identified. Spoil disposal records shall be maintained.	Site Manager	Foreman	Site Induction – Site Rules (F018). Toolbox Talks (F050).

4.4 ENVIRONMENTAL RATING TOOLS

Section	Requirements	Responsibility	Accountability	Tools
4.4.1	The Australian Building Greenhouse Rating (ABGR) scheme assists office building owners and tenants to reduce energy use, reduce energy costs and reduce greenhouse emissions. The ABGR rating for this project is N/A	Project Manager	Project Manager	ABGR records
4.4.2	Green Star rating system is a comprehensive, national, voluntary environmental rating scheme that evaluates the environmental design and achievements of buildings. Green Star is Australia's trusted mark of quality for the design and construction of sustainable buildings, fitouts, and communities. Green Star rating tools help the property industry to reduce the environmental impact of buildings, improve occupant health and productivity and achieve real cost savings, while showcasing innovation in sustainable building practices. New Generation Green Star rating tools include Green Start – Communities; Green Star - Design and As Built; Green Star – Interiors; and Green Star – Performance. Potential risks to Green Star including controls measures and responsible parties shall be documented in the Environmental Risk Assessment. The Green Star rating for this project is 5 star	Project Manager	Project Manager	Environmental Risk Assessment (F010).

4.5 ECOLOGICALLY SUSTAINABLE DEVELOPMENT (ESD) and WHOLE OF LIFE (WOL) MANAGEMENT PLAN

Section	Requirements	Responsibility	Accountability	Tools
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4.5.1	FDC is committed to responsible and sustainable environmental management practices and has developed processes to embed sustainability into the design and construction of our projects. The purpose of the ESD/WOL Plan is to describe the systems and processes that FDC shall implement to embed sustainability into the construction of our projects, as specified and as required. The ESD/WOL Plan and ESD & WOL Measures Matrix (F011) may be used to complement the FDC Project Management Plan, as specified and as required.	Project Manager/ Delegated ESD & WOL Manager	Project Manager	FDC ESD & WOL Management Plan. F011 - FDC ESD & WOL Measures Matrix

4.6 ENVIRONMENTAL RISK ASSESSMENT

Environmental Aspect/Impact	Legal Requirements	Environmental Actions, Controls and Criteria	Operational Controls			Monitoring			Checking, Corrective & Preventative Action
			Induction and/or toolbox	FDC	Subcont. SWMS & contracts	Type	Frequency	Responsibility	NCR/ Refer PMP
Dust Generation Particulate Emissions (General)	NSW - POEO Act (Sections 124-126)	- Install shade cloth on perimeter fencing. - Vehicle corridors will be clearly identified and restricted to control vehicle access onsite. - Limit vehicle speed onsite to 10km/hr. - Fixed and mobile (water tanker) water sprays. - Reduce work activities /stop work during moderate to high wind velocity periods. - Maintain equipment. Smokey plant to be stopped until repair works completed. - Turn off vehicle engines whilst not in use (no long periods of idling).	Y	Y	Y	Visual Inspection	Daily Weekly	Diary Site Inspection Checklist	As required
Dust Generation (Demolition)	NSW - POEO Act (Sections 124-126)	Breakers and crushing equipment to be fitted with dust filtration equipment or water sprays to control dust emissions.	Y	Plant/ Machinery Register	Y	Visual Inspection	Daily Weekly	Diary Site Inspection Checklist	As required
Dust Generation (Construction)	NSW - POEO Act 1997 (s 124-126)	- Minimise areas of site disturbed and stage works where possible. - Dust suppression strategies to be used, i.e. water sprays, soil binders, hydromulching, controlled speed onsite, roadbase + shaker grids.	Y	Y	N	Visual Inspection	Daily Weekly	Diary Site Inspection Checklist	As required

Environmental Aspect/Impact	Legal Requirements	Environmental Actions, Controls and Criteria	Operational Controls			Monitoring			Checking, Corrective & Preventative Action
			Induction and/or toolbox	FDC	Subcont. SWMS & contracts	Type	Frequency	Responsibility	NCR/Refer PMP
		- Stockpiled topsoils and rubble will be restricted to 4m high. Stabilise if insitu for >4-6months. - On site drilling or coring operations will be undertaken by equipment fitted with air filtration equipment.							
Odour	NSW - (POEO Act 1997 s 142	- If odorous materials uncovered, recover immediately. - Seek advice from consultant regarding soil /materials management.	N	Y	N	Visual	Daily	Diary	As required
Emissions to Air	NSW (POEO Act 1997, s 124-125	Ensure machinery is maintained correctly.	Y	Y	Y	Visual	Daily	Diary	As required
Stormwater (Discharge from sedimentation basins, flooding)	NSW - POEO Act (Section 120) ANZECC Water Quality Guidelines NSW Department of Housing's Managing Urban Stormwater (2004)	- Water quality to meet ANZECC Water Quality Guidelines. → PH 6.5- 8.5, Turbidity <50NTU, No visible oil & grease. - Obtain advice for use of flocculants to settle sediment from water. - Sedimentation pond to be maintained at low levels to ensure capacity during rainfall event. - DO NOT DISCHARGE IF CONTAMINANTS SUSPECTED. Obtain advice.	Y	Stormwater & Sediment Control Plan	Y	Visual Inspection	Daily Weekly	Diary Site Inspection Checklist	As required
Adjoining waterways (dewatering, soil erosion & runoff)	NSW - POEO Act 1997(s 120, 122) NSW - PEO (General) Regulation 1998,cl 55;	- Temporary drainage systems will be established to divert clean waters around the land development areas as appropriate. - Erect silt fences, bunds and construct swale drains. - Inspect at least weekly and after rainfall. - Maintain and/or replace as required. - Street sweepers will be employed on regular basis. - Install erosion and sediment controls before work starts.	Y	Stormwater & Sediment Control Plan	Y	Visual Inspection	Daily Weekly	Diary Site Inspection Checklist	As required

Environmental Aspect/Impact	Legal Requirements	Environmental Actions, Controls and Criteria	Operational Controls			Monitoring			Checking, Corrective & Preventative Action
			Induction and/or toolbox	FDC	Subcont. SWMS & contracts	Type	Frequency	Responsibility	NCR/Refer PMP
	<i>NSW - Local Government Act 1993, s 638]</i> NSW Department of Housing's Managing Urban Stormwater (2004) ANZECC Water Quality Guidelines	• Leave as much vegetation as possible. • Install temporary fences to define 'no go' areas in those areas that are not to be disturbed. Include the area under the canopy of trees so that tree roots will not be damaged by soil compaction. • Divert run-off from upslope away from the site, but ensure that you do not flood your neighbours. For example, dig drainage channels (catch drains sized to accommodate the upslope catchment). • Install sediment controls downslope of the site to catch sediment. • Check the erosion and sediment controls every day and keep them in good condition. • Leave or lay a kerbside turf strip (for example, the nature strip) to slow the speed of water flows and to trap sediment. • Limit vehicle entry and exit to one point, and lay geotextile and blue metal to stabilise it for all-weather access. • Clearly mark the access point and give an access map to all suppliers. • Protect all drains with a gravel sausage made from geotextile filled with blue metal. • Save the topsoil and stockpile it for use later in revegetation. Never place it around trees as this will kill them. • Store all stockpiles and building materials behind sediment fences. Cover them with plastic to prevent erosion by wind. • Get council approval before placing stockpiles or other materials on the nature strip or footpath. • Connect downpipes from the guttering to the stormwater drain as soon as the roof goes on.							

Environmental Aspect/Impact	Legal Requirements	Environmental Actions, Controls and Criteria	Operational Controls			Monitoring			Checking, Corrective & Preventative Action
			Induction and/or toolbox	FDC	Subcont. SWMS & contracts	Type	Frequency	Responsibility	NCR/Refer PMP
		- Build a dam below the area used for cutting tiles, concrete and bricks. - Surround the wash-out area with a sediment fence that slows down the water flow. Site this area upslope of another sediment control. - Fill in all trenches immediately after services have been laid. - Spread the topsoil back when the work is finished and revegetate the site as soon as possible to control erosion. - Remove the sediment and erosion controls only after this is done. - Sweep the road and footpath every day. Washing down is unacceptable. - Never place any materials in the gutter or on the road. You will be fined for this. - Filter or settle-out all water pumped off the site. The water must be clear before it enters the stormwater system or creeks. Gypsum can be applied to muddy (turbid) water to help clay particles settle.							
Sewer (Trade waste)	Comply with the conditions of the trade waste consent or permit, or the local council approval, including acceptance standards	- No paints or other chemical to be poured down drains. - If required, obtain trade waste licence for discharge or local council approval.	Y	Stormwater & Sediment Control Plan	Y	Visual Inspection	Daily Weekly	Diary Site Inspection Checklist	As required
Land	NSW - Contaminated	Stop work if unexpected potentially contaminated soils are encountered.	Y	Acid Sulphate	Y				As required

Environmental Aspect/Impact	Legal Requirements	Environmental Actions, Controls and Criteria	Operational Controls			Monitoring			Checking, Corrective & Preventative Action
			Induction and/or toolbox	FDC	Subcont. SWMS & contracts	Type	Frequency	Responsibility	NCR/Refer PMP
(Acid sulphate soils, contaminated soils, imported fill)	Land Management Act 1997, s 60; NSW - Contaminated Land Management Regulation 1998, cl 3 Acid Sulfate Soils Management Advisory Committee	- Obtain waste classification from consultant in accordance with OEH\EPACW\EPA guidelines Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-Liquid Wastes (June 2004) www.environment.nsw.gov.au/waste/envguidlms/index.htm. - Where required a Remediation Action Plan will be developed and implemented. - Sign off by Site Auditor may be required to validate cleanup. - Any groundwater or ponded rainwater will be tested and classified by consultants prior to disposal. - Check geotech requirements. Ensure soil classification suitable for land use i.e. Schools, residential, commercial etc.		Soils Management Plan					
Land	NSW - Contaminated Land Management Act 1997, s 60 NSW - Contaminated Land Management Regulation 1998, cl 3	- Potential for acid sulphate soils will be assessed based on the sites proximity to low-lying coastal areas e.g. Coastal plains, wetlands and mangroves where the surface elevation is less than five metres above mean sea level. - If odorous soils (rotten egg gas) or grey/yellowed mottled soils encountered, stop work. - If suspected, consultant to prepare Acid Sulphate Soil management Plan (ASSMP). - Excavation and neutralisation to be supervised by consultants as per ASSMP. - The requirements to import fill will be minimised by utilising on site cut material wherever possible. - All analysis certificates shall be handed over as part of the completion documents to the client. - Record all imported fill on Form F067 – Imported Fill Register. - Mark up locations where fill compacted in site plan. Survey if required		Y	Y				As required

Environmental Aspect/Impact	Legal Requirements	Environmental Actions, Controls and Criteria	Operational Controls			Monitoring			Checking, Corrective & Preventative Action
			Induction and/or toolbox	FDC	Subcont. SWMS & contracts	Type	Frequency	Responsibility	NCR/Refer PMP
Resources – water, materials, energy		- For design and construct jobs, refer to the design specification for ESD requirements and product choices. - Buy local wherever possible to reduce impacts of transport on environment.		Y					As required
Noise	NSW - POEO Act (Sections 139, 140)	- Refer to DA for noise restrictions and working hours. - Use hoarding or acoustic mats as required. - Situate generators and plant away from sensitive receivers. - Turn off machinery. Maintain equipment and stop noisy plant until repaired. - No early deliveries.	Y	Noise Management Plan	Y	Visual Inspection	Daily Weekly	Diary Site Inspection Checklist	As required
Vibration		- Conduct dilapidation report prior to work starting. - Limit the use of vibratory rollers, rock breakers, impact piling etc. adjacent to buildings (>7m). - Regenerated noise may also transfer through bedrock and building structures. - Obtain advice if required.	Y		Y				As required
Community Concerns		- Provide information (e.g. Signage, letterbox drops) to community on programmed works. - Provide contact name for inquiries. - Advise locals of “noisy” work. - If required in noise sensitive areas and/or in response to complaints, engage consultants to undertake monitoring at nominated receivers. - Vehicles will not be permitted to queue outside the site or in residential areas unless a defined area is established which does not adversely impact on neighbours.	Y	Y					As required
Flora	NSW - State Environmental Planning Policy	Review planning documentation to determine the presence of any protected, threatened or significant flora. Obtain approvals as required.	Y	Y		Visual Inspection	Daily Weekly	Diary	As required

Environmental Aspect/Impact	Legal Requirements	Environmental Actions, Controls and Criteria	Operational Controls			Monitoring			Checking, Corrective & Preventative Action
			Induction and/or toolbox	FDC	Subcont. SWMS & contracts	Type	Frequency	Responsibility	NCR/Refer PMP
	No 14 - Coastal Wetlands, s 7(1, 5), 7A; NSW - Native Vegetation Act 2003, s 12; Forestry Act 1916, s27(1); NSW - National Parks and Wildlife Act 1974, s 117(1), 118(1)] Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth), s 12, 15B, 16, 18, 20, 21, 23	- Engage aborist to develop tree management plan or refer DA and aborist reports. - Education and training at site toolbox meetings and induction. - Report all sightings to the Site Manager. - Fence or barricade protected flora at the drip zone. Erect Keep Out signage. - Do not stack materials under/against trees. - The potential for reuse of vegetative wastes by mulching, chipping or on-site placement of trunks or limbs shall be reviewed for each project.		Consultant Report				Site Inspection Checklist	
Fauna	NSW Environmental Planning and Assessment Act 1979, s 5A, 78A(8))(b), 79B, 111 & 112-112E NSW - Threatened	- All native animals protected. - Review planning documentation to determine the presence of any protected, threatened or significant fauna. Obtain approvals as required. - Site rules/induction to include information regarding of the - For injured animals, to relocate call WIRES.	Y	Y Consultant Report		Visual Inspection	Daily Weekly	Diary Site Inspection Checklist	As required

Environmental Aspect/Impact	Legal Requirements	Environmental Actions, Controls and Criteria	Operational Controls			Monitoring			Checking, Corrective & Preventative Action
			Induction and/or toolbox	FDC	Subcont. SWMS & contracts	Type	Frequency	Responsibility	NCR/Refer PMP
	Species Conservation Act NSW - 1995; National Parks and Wildlife Act 1974, Part 8A Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth), s 12, 15B, 16, 18, 20, 21, 23								
Waste Litter	NSW - POEO Act (Section 116, 142), NSW - Waste Avoidance and Resource Recovery Act 2007 NSW - PEOA Act 1997, s 143, 144-146 NSW Crown Lands Act 1989, s 155	- Hazardous materials surveys to be completed. - Materials to be removed prior to demolition. - Registers and waste disposal requirements as per WorkCover and OEH\EPACW\EPA requirements for removal, storage, transport and disposal. - General site wastes –use one bin system and sort in contractors yard to produce quantities of material for recycling, reuse, disposal etc. - Empty drums are to be taken off-site for disposal. - Empty drums shall be crushed prior to recycling/disposal. - Do not overfill skip bins. Provide plenty for use. Cover where potential for windblown litter.	Y	Waste Management Plan	Y	Visual Inspection	Daily Weekly	Diary Site Inspection Checklist	As required

Environmental Aspect/Impact	Legal Requirements	Environmental Actions, Controls and Criteria	Operational Controls			Monitoring			Checking, Corrective & Preventative Action
			Induction and/or toolbox	FDC	Subcont. SWMS & contracts	Type	Frequency	Responsibility	NCR/Refer PMP
	<i>NSW Management of Waters and Waterside Lands Regulations - N.S.W., cl 13;</i> <i>NSW - PEO (Waste) Regulation 2005, cl 49</i>								
Landfilling	<i>NSW - POEO Act (Section 116, 142)</i>	- Reduce, reuse and then dispose. - Dispose of hard construction wastes for recycled gravels and sands. - Do not send soil to landfill until alternatives for beneficial reuse have been explored as per consultants advice. - Consideration should be given to chipping of the vegetation and reuse. - Reuse packaging to protect works.	Y	Y					As required
Chemicals	<i>NSW - POEO Act (Section 116, 142,)</i> <i>NSW - Occupational Health and</i>	- Chemicals to be stored in bunded areas (impervious + 110% of largest container) away from stormwater drains & pits. - Refer Workcover Code of Practice for Storage & Handling of Dangerous Goods, OEH\EPACW\EPA Guidelines for Bunding & Spill Management. Appropriate chemicals storage is in conformance with:	Y	Y	Y	Visual Inspection	Daily Weekly	Diary Site Inspection Checklist	As required

Environmental Aspect/Impact	Legal Requirements	Environmental Actions, Controls and Criteria	Operational Controls			Monitoring			Checking, Corrective & Preventative Action
			Induction and/or toolbox	FDC	Subcont. SWMS & contracts	Type	Frequency	Responsibility	NCR/Refer PMP
	<i>Safety Regulation 2001</i>	→ AS 1940 The Storage and Handling of Flammable and Combustible Liquids → Storage and Handling of Dangerous Goods WorkCover Code of Practice 2005– refer p. 86 • OEH\EPA requirements http://www.environment.nsw.gov.au/water/bundingspill.htm • Poned water within bunds will not be discharged to stormwater. • Fuel and hydraulic leaks to be cleaned up immediately. • Drilling muds to be contained within bunds and reused. • Liquid paints NOT to be poured down drains. Spread on waste cardboard or similar and leave to dry. Paint brushes to be rinsed and paint solids allowed to settle. Container of paint solids to be disposed to liquid waste facility. • Construct concrete washout pit for washout, away from stormwater drains. Send back to batch plant where possible. • Concrete cuttings to be contained and wetvac to prevent runoff into stormwater drains. • Storage of bulk fuels (>200L) on site is prohibited. All refuelling shall be undertaken by a mobile facility with appropriate spill control and containment control equipment. • MSDS's must be provided to the Foreman prior to a chemical being received on site and by subcontractors using chemicals/products.							
Traffic	<i>Local Government Requirements</i>	• Develop and implement traffic management plans. Submit to local council as required. • Signage and notices regarding disruptions. • Use crushed concrete, mulches etc. along site access roads.	Y	Traffic Management Plan	Y	Visual Inspection	Daily Weekly	Diary Site Inspection Checklist	As required

Environmental Aspect/Impact	Legal Requirements	Environmental Actions, Controls and Criteria	Operational Controls			Monitoring			Checking, Corrective & Preventative Action
			Induction and/or toolbox	FDC	Subcont. SWMS & contracts	Type	Frequency	Responsibility	NCR/Refer PMP
		- Install shakers and wheel wash as required. - Organise regular street sweeping. - Haulage routes and rules will be provided to subcontractors prior to commencing on site. - All loads of soil, demolition wastes, general wastes etc. are to be tarped							
Hazardous Materials (Lead paint)	NSW - POEO Act (Section 142)	- If disturbing or removing dust or paint that could contain lead, wear a respirator or dust mask and protective clothing. - Seal the rooms with plastic. - Do not use open-flame torches on lead paint as they create lead fumes. If you must use a heat gun, use it on the lower setting to keep the paint temperature below 370 degrees C. - Avoid using dry-sanding techniques: keep the surface wet to minimise dust. - Don't sweep or use a domestic vacuum cleaner to clean up; lead dust will pass right through it. Use a high-efficiency particulate air (HEPA) vacuum cleaner. These can be hired. - When finished, wipe all surfaces with a damp cloth and high-phosphate detergent. - Wash face and hands before eating, drinking or smoking. - Refer to Lead Safe: A Renovator's Guide to the Dangers of Lead and the Australian Standard AS4361.2 Guide to Lead Paint Management: Part 2 Residential and Commercial Buildings 1998.	Y	Consultant's Report	Y				
Hazardous Materials (Asbestos)	NSW - POEO Act (Section 142) NSW PEO (Waste)	- A licence subcontractor must be used to demolish, remove, repair or disturb asbestos. - A WorkCover asbestos licence is required to remove 10 square metres or more of bonded asbestos.	Y		Y				

Environmental Aspect/Impact	Legal Requirements	Environmental Actions, Controls and Criteria	Operational Controls			Monitoring			Checking, Corrective & Preventative Action
			Induction and/or toolbox	FDC	Subcont. SWMS & contracts	Type	Frequency	Responsibility	NCR/Refer PMP
	Regulation 2005, cl 42	A Workcover licence is required to remove, repair or disturb friable asbestos.							
Aboriginal heritage	National Parks and Wildlife Act 1974, s 90-91 NSW - Heritage Act 1977, s 146	- Education and training at site toolbox meetings and induction. It is illegal to destroy heritage items. - Review local or regional environmental plans, or on the State Heritage Register is to be consulted prior to work starting onsite. - Obtain excavation permit issued by the Heritage Council of NSW if required. - Any heritage relics or sites discovered during construction shall be reported to the Office of Environment and Heritage. - Work in the subject area to cease until specialist advice is obtained. - The area will be fenced and signs erected to restrict access. - Heritage consultants may be required to provide advice on demolition/construction processes and finishes.	Y	Consultant Report	Y	Visual Inspection	Daily Weekly	Diary Site Inspection Checklist	As required
European heritage	NSW - Heritage Act 1977	- Education and training at site toolbox meetings and induction. It is illegal to destroy heritage items. - Check the OEH\EPACW\EPA Aboriginal Heritage Information Management System (AHIMS). - Also check the register of the National Estate. - Obtain approval from NPWS (Section 90 consent). - Any evidence of Aboriginal relics discovered during construction shall be reported to the National Parks and Wildlife Service. - Local Land Council representatives may be required to monitor stripping/excavation.	Y	Consultant Report	Y	Visual Inspection	Daily Weekly	Diary Site Inspection Checklist	As required

Environmental Aspect/Impact	Legal Requirements	Environmental Actions, Controls and Criteria	Operational Controls			Monitoring			Checking, Corrective & Preventative Action
			Induction and/or toolbox	FDC	Subcont. SWMS & contracts	Type	Frequency	Responsibility	NCR/Refer PMP
		- Work in the subject area to cease until specialist advice is obtained. - The area will be fenced and signs erected to restrict access.							
Emergency Preparedness		- Spill kit onsite. - Refer to the MSDS for advice and procedures. - All spills must be reported to the Site Manager & cleaned up. Complete FDC Incident Report (F035). - Sediment pond pumped out regularly to maintain capacity in case of emergency. - Ensure you know where stormwater drains are and have materials to block them in case of a fire.	Y	Y	Y	Inspection	Weekly	Site Inspection Checklist	As required

APPENDIX A – Key Policies



Work Health And Safety Policy

The work, health and safety elements of FDC's integrated management system manages the provision of project and construction management for residential, industrial and commercial building, including ground up construction, refurbishment or additions and interior fitout to existing buildings and the provision of project management, design management, installation and maintenance of electrical, communication and mechanical services to industrial, commercial and civil buildings.

The directors and senior management of FDC are committed to ensuring the health and safety of workers and visitors and stakeholders that interact with our activities.

Our aim is to provide safe and healthy work conditions to prevent work related injuries and illness.

To achieve this, FDC is committed to the following key objectives:

- Implementing a strategic framework to enable continual improvement of systems, people and performance;
- Providing systems and resources to effectively manage work, health and safety including rehabilitation and return to work processes;
- Ensuring work is conducted in accordance with applicable WHS legislation, standards and workplace directions;
- Identifying and eliminating hazards and reducing the risks of activities with the potential to produce injury or illness;
- Consulting with workers on work, health and safety matters and ways to identify, assess and control workplace hazards;
- Providing instruction, training and supervision to enable understanding of workplace hazards, safe work practices and emergency procedures; and
- Conducting workplace inspections to identify opportunities for improvement.

FDC managers and supervisors are responsible and accountable for the health and safety of workers, visitors and company property and ensuring applicable WHS legislation, procedures and safe work practices are followed.



Bentley Cottle
Managing Director

Rev.:1 Date: 25 / 08 / 2020

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Quality Policy

The quality elements within the integrated management system manage the provision of the project and construction management for residential, industrial and commercial buildings, including ground up construction, refurbishment or additions and interior fitout to existing buildings and the provision of project management, design management, installation and maintenance of electrical, communication and mechanical services to industrial, commercial and civil buildings.

The directors and senior management of FDC recognize the importance of providing quality management to meet the needs and expectations to our clients. FDC is committed to the achievement of a level of quality and professional competence to ensure our clients receive the best value for service in the market. Our aim is to be recognized for outstanding performance, the quality of our people, our relationship with clients and associated enterprises and authorities.

Our goal and commitment to providing quality management solutions is maintained by:

- Compliance with statutory obligations, standards and relevant codes of practice;
- Establishing, monitoring and auditing our system that meet the requirements of AS/NZS ISO 9001;
- Providing resources to implement and maintain the quality management system;
- Continually improving worker skills and knowledge via education and further training of staff;
- Identifying, investigating and suitable resolving any non-conformances to maintain and improve compliance;
- Reviewing performance measures and taking action to improve performance; and
- Monitoring and evaluating quality performance via implementing effective communication on quality and non-conformance issues.

The FDC quality framework is based upon the requirements of AS/NZS ISO 9001 and allows workers at all levels within the company structure to understand the quality and organizational objectives of the company, and position themselves to achieve these goals.



Bentley Cottle
Managing Director

Rev.:0 Date: 01 / 04 / 2019

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Environmental Policy

The environmental elements within FDC's integrated management system manage the provision of project and construction management for residential, industrial and commercial building, including ground up construction refurbishment or additions and interior fitout to existing buildings.

FDC shall:

- "Reduce, re-use and recycle" wherever possible, be it on site or within the office environment;
- Promote environmentally friendly solutions;
- Ensure that environmental considerations form part of our business planning and decision-making processes;
- Promote a culture of responsible environmental management;
- Protect the natural environment and social surroundings, preserve biodiversity, prevent pollution and minimize waste;
- Comply with applicable environmental laws;
- Continually improve our environmental performance;
- Establish measurable objectives and targets; and
- Communicate with stakeholders on environmental matters.

FDC encourage, on a personal and corporate basis, sound environmental considerations for protection of our natural resources.

We discourage any practice or product selection that is knowingly detrimental to environmental protection. FDC Management and staff are committed to the implementation and maintenance of an environmental management system based on ISO14001.



Bentley Cottle
Managing Director

Rev.:0 Date 01 / 04 / 2019

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APPENDIX B – Revision Table

[illegible]

APPENDIX C – Construction Traffic Management Plan



17-23 Talavera Road, Macquarie Park Construction Traffic Management Plan

Prepared for:
Macquarie Data Centres Pty Ltd

12 June 2024

The Transport Planning Partnership

17-23 Talavera Road, Macquarie Park Construction Traffic Management Plan

Client: Macquarie Data Centres Pty Ltd

Version: V04

Date: 12 June 2024

TTPP Reference: 21178

Quality Record

Version	Date	Prepared by	Reviewed by	Approved by	Signature
V01	11/04/2024	Ashwini Uthishtran	Oasika Faiz	Ken Hollyoak	DRAFT
V02	03/05/2024	Ashwini Uthishtran	Oasika Faiz	Ken Hollyoak	Ken Hollyoak
V03	10/05/2024	Ashwini Uthishtran	Oasika Faiz	Ken Hollyoak	Ken Hollyoak
V04	12/06/2024	Ashwini Uthishtran	Oasika Faiz	Ken Hollyoak	

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APPENDICES

- A. TRAFFIC GUIDANCE SCHEME
- B. DRIVER CODE OF CONDUCT

1 Introduction

1.1 Background

A development consent (SSD-24299707) was issued by the NSW Department of Planning, Housing and Infrastructure on 19 January 2024 for construction and operation of an expansion to an existing data centre at 17-23 Talavera Road, Macquarie Park, comprising:

- a seven (7) storey building extension with ancillary office space
- supporting infrastructure & services, including back-up generators and diesel fuel storage
- minor earthworks, additional car parking, hardstand areas, landscaping and relocation of utilities.

The subject site is located within the City of Ryde Local Government Area (LGA).

This Construction Traffic Management Plan (CTMP) has been prepared by The Transport Planning Partnership (TPPP) on behalf of Macquarie Data Centres (MDC). This report has been prepared and checked by engineers who hold the SafeWork NSW Work Health & Safety – Traffic Control Work (PWZ) Training Card (Previously Transport for NSW *Prepare a Works Zone Traffic Management Plan (PWZTMP)* certification), as follows:

- Oasika Faiz– Card No. TCT1036880

1.2 Purpose of the CTMP

The purpose of this CTMP is to assess the traffic and pedestrian implications and outline how vehicular, cyclist and pedestrian traffic and access will be managed during the construction period. This CTMP provides a structured approach to manage traffic and access during construction to provide a safe road environment, minimise impact on the surrounding road network and maintain access for all road users and the local community.

Specifically, the purpose of this CTMP is to:

- maintain vehicle and pedestrian access to/from adjacent properties at all times
- restrict construction vehicle movements to designated routes to/from the site
- manage and control construction vehicle activity in the vicinity of the site
- provide an appropriate and convenient environment for pedestrians and cyclists around the construction site
- minimise the impact of construction activity on traffic flows, emergency vehicle access and pedestrian movements
- maintain appropriate public transport access
- carry out construction activity in accordance with the approved work hours.

1.3 Department of Planning and Environment Conditions

The CTMP is prepared in accordance with the Condition B25 – CTMP (SSD-24299707) issued by NSW Department of Planning, Housing and Infrastructure.

Table 1.1 describes each of the specific requirements of Condition B25 and provides reference to the specific section of this document that address each CTMP requirement.

Table 1.1: DPE Conditions

Condition B25	Comments / Sections Addressed in the Document
Prior to the commencement of construction, the Applicant must prepare a Construction Traffic Management Plan (CTMP) for the development to the satisfaction of the Planning Secretary. A copy of the CTMP must be included in the development's CEMP (see condition C2), and must:	This document
a) be prepared by a suitably qualified and experienced person(s)	This report has been prepared and checked by engineers who hold the SafeWork NSW Work Health & Safety – Traffic Control Work (PWZ) Training Card (Previously Transport for NSW Prepare a Works Zone Traffic Management Plan (PWZTMP) certification). These details are provided in Section 1.1,
b) be prepared in consultation with Council;	This CTMP has been prepared in consultation with City of Ryde Council. Further details are provided in Section 1.4.
c) detail the measures that are to be implemented to ensure road safety and network efficiency during construction, including consideration of limiting heavy vehicle movements to the site during peak periods;	Refer to Section 4 & 5
d) include details of:	
i- heavy vehicle routes, parking and access arrangements;	Refer to Section 3.4, 3.6, 3.7
ii- the strategies which would be implemented to maintain access to the existing data centre; and	Refer to Section 4.2 and Section 3.7.2.
iii- the strategies which would be implemented to manage construction workers, including any on-site parking as well as strategies to minimise the number of construction workers who drive to the site;	Refer to Section 3.7
e) include a Driver Code of Conduct to:	Refer to Appendix B
i- minimise the impacts of earthworks and construction on the local and regional road network;	
ii- minimise conflicts with other road users;	
iii- minimise road traffic noise; and	
iv- ensure truck drivers use specified routes	
f) include a program to monitor the effectiveness of these measures; and	Refer to Section 5.4 and 5.9
g) if necessary, detail procedures for notifying surrounding businesses of any potential disruptions to routes.	N/A. No disruptions to surrounding businesses are expected.

1.4 Consultation Summary

TTPP has prepared this CTMP in consultation with City of Ryde Council (Council). This feedback received from Council on 2 May and 8 May 2024, is detailed in Table 1.2.

Council's approval of the latest CTMP is provided in Appendix

Table 1.2: Response to Council's Comments Received on 2/5/2024

Council Comments	Proposal in this CTMP
1) Truck movements allowed during commuting peak periods (8am-9.30am & 4.30pm-6pm): preferably all of truck movements are to be restricted outside the commuting peak periods in Macquarie Park area. However, due to the site concrete pouring works associated with piling/basement/structures, only concrete trucks are allowed during commuting peak periods. Please provide the estimation for the concrete truck demand and truck size per hour and per day during piling/basement/above structure stages in the CTMP. Not sure if the stated 1-2 truck movements during peak periods in CTMP are referred to concrete truck or not.	Agree to truck movement restrictions. Concrete truck movements during peak will be 4 trucks/hr. See Section 4.1 for further detail.
2) Pedestrians/cyclists protection. It's proposed to use southwestern kerbside parking area of Talavera Road along site frontage as truck loading/unloading area, please clarify: - whether the shared use paths for pedestrians/cyclists along the site frontage are still maintained to be open to the public, and - whether there is overhead protection, i.e. class B hoarding is provided along the proposed work zone area.	All pedestrian and cyclist access to be maintained. Class B hoarding to be provided along the Works Zone area. See Section 3.9 and 4.2 for further detail.
3) Truck routes: the departure route is required only turning right onto Talavera Road from the site and then turning left/right onto Lane Cove Road. The reasons for such a requirement are listed here: - The construction works of Macquarie University Bus Interchange would start soon, which include the reconstruction works of Herring Road/Talavera Road intersection. - Some construction sites at Waterloo Road have been approved to use Talavera road section between Herring Road and Khartoum Road already. - The previous approval of truck exiting route to use Herring Road during stormwater and sewer alignment stage is based on limited truck demand and short construction timeframe. The proposed construction timeframe for this CTMP would last 2 years. The truck route has to be regulated with minimum truck number on Talavera Road between Khartoum Road and Herring Road. If some trucks have to use M2 on-ramp at Herring Road due to various reasons, this should be minimised. Please also explain why these trucks have to use M2 on-ramp via Herring Road in the CTMP report.	Truck route modified. Trucks will not be exiting via Herring Road. See Section 3.6 for further detail.
4) Trucks into/out of work zone. Please clarify: 4.1) how trucks from west via Talavera Road to move into work zone. Do these trucks directly turn around within Talavera Road? This is not supported. It is advised: either all trucks entering Work Zone from east without from west, or the internal pedestrian bridge within the site providing 4.5m standard clearance allowing these trucks turning around within the site and then turning left from the site onto the work zone. 4.2) After loading/unloading on work zone, these trucks would have to move north-west along Talavera Road, and most of trucks may need to return Lane Cove Road via Khartoum Road and Waterloo Road, which would	Trucks will be instructed to arrive from the east such that they are able to enter the works zone in a forward movement. If a truck should arrive from the west, they can travel through the site and access

significantly increase the use of and impacts on local road network. Therefore, it is advised to minimise the use of work zone, and increase the internal pedestrian bridge clearance from 3m to 4.5m, allowing those trucks coming from Lane Cove Road to complete loading/unloading within the site, and then directly to return Lane Cove Road via turning right from the site onto Talavera Road heading south-east.	the works zone from the exit driveway. See Section 3.6 for further detail.
5) The issue of pedestrian bridge with 3m low clearance. The 3m low clearance of the internal pedestrian bridge leads to the issues as described in comments 4.1) & 4.2). This is advised to increase to 4.5m.	The pedestrian bridge has been raised to permit a height of 4.5m. See Section 4.2 for further detail.
- In section 3.5, please specify the use of truck & dog, AV/semi-truck, and the demand per day - In section 4.1, please state, there will be only concrete trucks operating during commuting peak periods. All other trucks will be operating outside commuting peak periods.	Addressed as requested.

2 Existing Conditions

2.1 Site Description

The site is described as Lot 527 DP 752035, commonly known as 17 – 23 Talavera Road, Macquarie Park. Has a total area of approximately 20,000m², with access achieved via Talavera Road.

The site is currently a commercial development as an existing Data Centre (LDA/2018/0322). The are adjoining / surrounding commercial premises along Talavera Road, which form part of the wider Macquarie Park Corridor.

The site is situated approximately 12.5 km northwest of the Sydney CBD and 11.3 km northeast of Parramatta. It is within close proximity of transport infrastructure routes (predominantly the bus and rail networks), as well as sharing direct links with the wider regional road network, including Talavera Road, Lane Cove Road, Epping Road and the M2 Motorway. These road networks provide enhanced connectivity to the subject site and wider locality.

The location of the site is shown in Figure 2.1.

Figure 2.1: Location Plan



Base Map Source: Nearmap

2.2 Road Network

The local road network surrounding the subject site includes Lane Cove Road, Talavera Road and Khartoum Road. These roads are discussed below.

2.2.1 Lane Cove Road

Lane Cove Road is an RMS classified State Road (A3) and forms one of the major north-south arterial links in the northern/ north-western suburbs. The road provides good connectivity to the wider arterial road network, notably to Ryde Road, M2 Motorway, Victoria Road and Devlin Street. Within the vicinity of the site, Lane Cove Road runs in a north-east to south-west direction. The road provides three through traffic lanes in each direction separated by a central median. The road has a posted speed limit of 70 km/h in both directions within the vicinity of the site.

2.2.2 Talavera Road

Talavera Road is a regional road, generally aligned in the north-west to south-east direction along the frontage of the site. The road carriageway measures approximately 15m kerb to kerb with restricted kerbside parking permitted along both sides of the road near the site. This includes ticketed parking for five hours between 10:00am and 3:00pm, Monday to Friday. Talavera Road has a posted speed limit of 50km/h.

2.2.3 Khartoum Road

Khartoum Road is a local road, generally aligned in the north-east to south-west direction. The road carriageway measures approximately 12m kerb to kerb with restricted kerbside parking permitted along both sides of the road. This includes ticketed parking for five hours between 10:00am and 3:00pm, Monday to Friday and parking for twelve hours between 7:00am and 7:00pm, Monday to Friday. Khartoum Road has a posted speed limit of 50km/h.

2.3 Public Transport

The closest metro station is Macquarie Park Station, located 950m walking distance from the site (a 13-minute walk). Macquarie Park Station services the Tallawong to Chatswood line with services running every 4 minutes during the peak hours and every 10 minutes in the off-peak hours.

The subject site is also located in proximity of high frequency bus services. There are several bus stops close to the site, located on Talavera Road and Lane Cove Road.

Table 2.1 presents a summary of the existing public transport services near the site, including their respective frequencies.

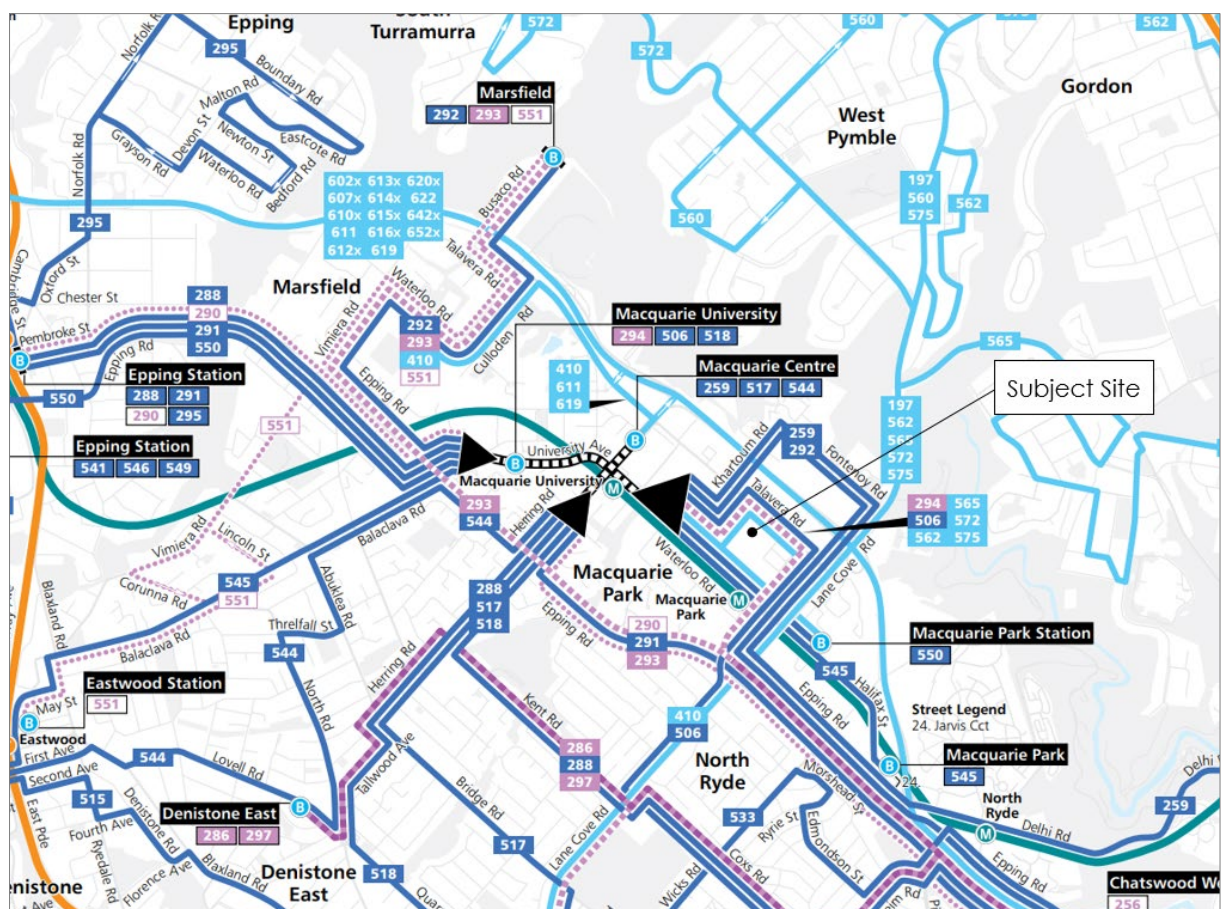
Table 2.1: Existing Public Transport Services

Service	Route Description	Location of Service	Frequency
Rail	Metro North West Line	Macquarie Park Station	Peak (every 4 mins) Off-Peak (every 10 mins)
Bus	294	15 Talavera Road	Every 15-30 minutes (AM)
	506	15 Talavera Road	Every 15-30 minutes
	562	15 Talavera Road	3 services
	565	15 Talavera Road	Every 60 minutes
	572	15 Talavera Road	Every 10-30 minutes
	575	15 Talavera Road	Every 15-30minutes

As indicated above, there is a good level of public transport provision in the immediate vicinity of the site.

Figure 2.2 shows a map of the existing bus network surrounding the site.

Figure 2.2: Existing Bus Network



Source: TfNSW - State Transit North Shore and West Network Map – viewed online 30/07/21

2.4 Pedestrian and Cycling Facilities

In the immediate vicinity of the subject site, pedestrian paths are provided on both sides of Talavera Road. Footpaths along these roads extend onto the wider network, providing passage on foot onto Lane Cove Road and Khartoum Road.

An extract of Council's existing cycle network map is shown in Figure 2.3.

Figure 2.3: Existing Cycle Network



Source: Extract of the City of Ryde Existing Cycle Map – viewed online 30/07/2021

Figure 2.3 demonstrates that there are a number of off-road shared cycle paths near the site, with the main routes providing travel to Macquarie Park University, Epping and North Ryde. On-road cycle lanes surrounding the site also provide good cycle connectivity to the wider road network.

3 Proposed Construction Activities

3.1 Description of Works

The description of construction works is presented in Table 3.1.

Table 3.1: Description of Works

Construction Activity	Description
Site Establishment	Set up of site shed, amenities and site access
Minor demolition works	Demolition and removal of existing landscaping and asphalt
Earthworks and substructure	Trim, fill and prepare building platform, piling works (piling, reinforcement, concrete), strip footing form, reo and pour
Structure and façade	Form, reo, pour all concrete components of the building, erect all structural steel and install all façade components
Services and finishes	Includes installation of all building services and finishes

3.2 Duration and Staging of Works

The proposed works and the anticipated duration are shown in Table 3.2. The anticipated start date for construction is 26 April 2024.

Table 3.2: Construction Activities and Duration

Proposed Works	Duration
Site establishment	20 days
Minor demolition works	12 days
Earthworks and substructure	146 days
Structure and façade	320 days
Services and finishes	284 days

3.3 Construction Work Hours

The construction work hours are subject to the Consent Condition B1.

The hours of construction specified in the Consent Condition are:

- Monday to Friday: 7am-7pm
- Saturday: 8am-3pm
- No work is to be undertaken on Sundays or Public Holidays.

In accordance with Consent Condition B2, works outside of the hours identified in condition B1 may be undertaken in the following circumstances:

- works that are inaudible at the nearest sensitive receivers;
- works agreed to in writing by the Planning Secretary;
- for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or
- where it is required in an emergency to avoid the loss of lives, property or to prevent environmental harm.

3.4 Construction Site Access Arrangements

Vehicular access to the construction site is to be via the existing eastern driveway off Talavera Road. Vehicles exiting from the construction site will do so via the existing western driveway off Talavera Road.

All construction vehicles will enter and exit the site in a forward direction (no reverse-in movements to the site would be permitted).

It is proposed to have one site personnel near the entry gate and a traffic controller managing and directing vehicle movements at the exit gate as well as at the work zone (discussed in Section 3.9). This is shown in the traffic guidance scheme attached in Appendix A.

3.5 Construction Vehicle Types and Volumes

Various types of trucks will visit the site, including articulated vehicles, truck and dogs, heavy rigid vehicles (HRVs), medium rigid vehicles (MRVs) and small rigid vehicles (SRVs).

It is anticipated that there will be an average of 3 construction vehicles per hour throughout the duration of the construction activity.

Concrete truck movements during the peak periods will be 4 trucks per hour. Deliveries are to be on site between 7:00am-8:00am and 9:30am-4:30pm. Concrete trucks are expected to be 8m long MRVs.

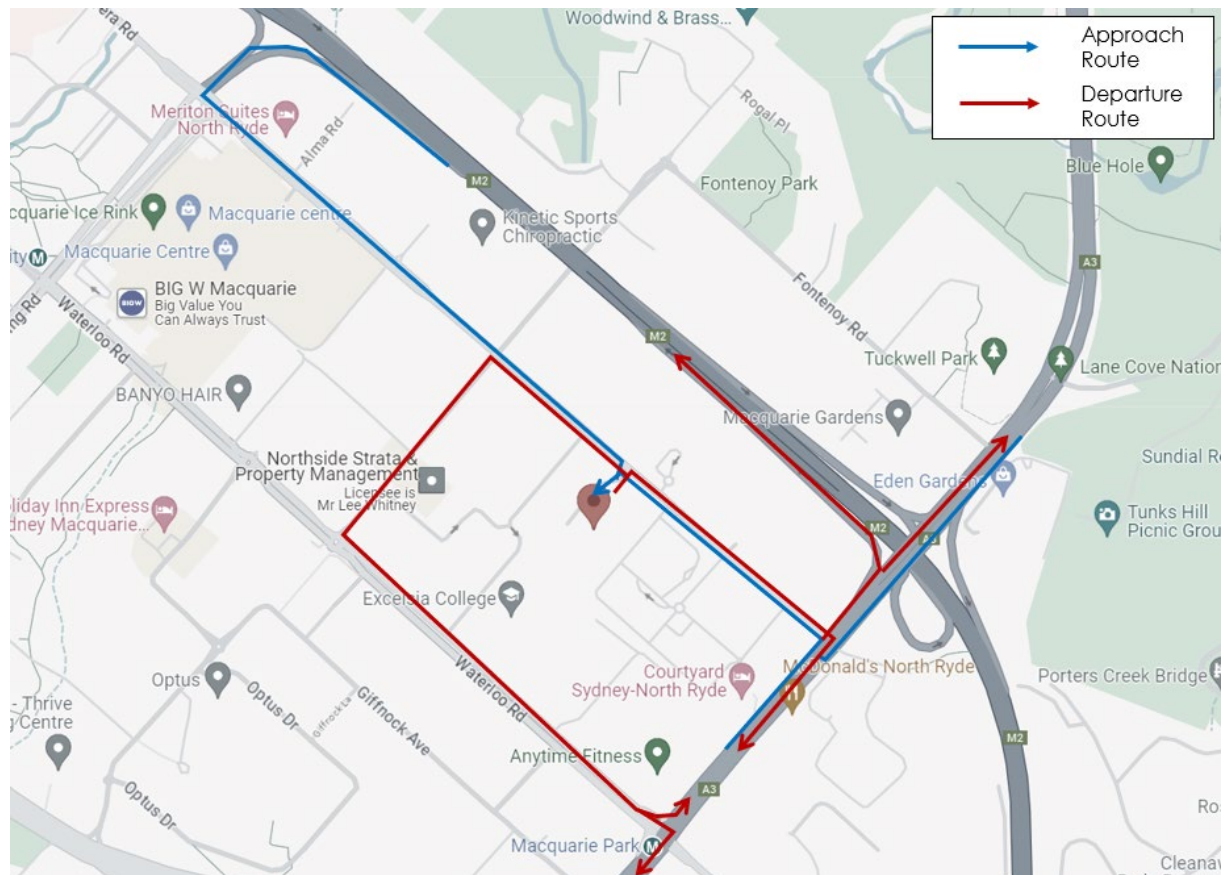
3.6 Construction Vehicle Routes

Generally, construction vehicles would have origins and destinations throughout Sydney. Dedicated construction vehicle routes have been developed to provide the shortest distances to/from the arterial road network, whilst minimising the impact of construction traffic on local streets within the vicinity of the site.

All truck drivers will be advised of the designated truck routes to/from the site and be required to adhere to the nominated routes.

On a local level, the designated truck routes to/from the works site shall be provided off Talavera Road in order to travel to/from the wider arterial road network via Lane Cove Road and the M2 Motorway as shown in Figure 3.1.

Figure 3.1: Nominated Construction Vehicle Routes



Base Map Source: Google Maps – viewed online 3/05/24

3.7 Staffing and Parking Arrangements

3.7.1 Construction Staff

It is expected that there will be an average of 200 construction workers per day and a peak of 300 construction workers per day. The breakdown of construction workers anticipated on-site per construction activity is shown in Table 3.3.

Table 3.3: Construction Workers in Each Stage

Construction Activity	Construction Workers
Site Establishment	75 workers
Minor Demolition Works	100 workers
Earthworks and Substructure	120 workers
Structure and Façade	250-300 workers
Services and Finishes	250-300 workers

Due to the constraints of the site, on-site parking is not feasible. Therefore, parking for construction staff will not be provided.

Instead, all construction staff will be encouraged to use public transport to travel to/from the site and instructed not to park on public roads.

This will be incorporated in the workers induction program to ensure minimal parking impact on the surrounding streets. Taking into consideration of the above, it is proposed to implement the following measures for workers to use public transport:

- instruct workers during the induction and regular toolbox meetings to use public transport to travel to the site.
- display public transport timetable information at key locations within the work site and ensure that it is easily accessible by staff – notably, the timetable for services at Macquarie Park Station, located 950m walking distance from the site (a 13-minute walk).
- encourage staff to use public transport, and
- encourage staff to use trip planning mobile apps such as, TripView, Opal by Transport for NSW etc.

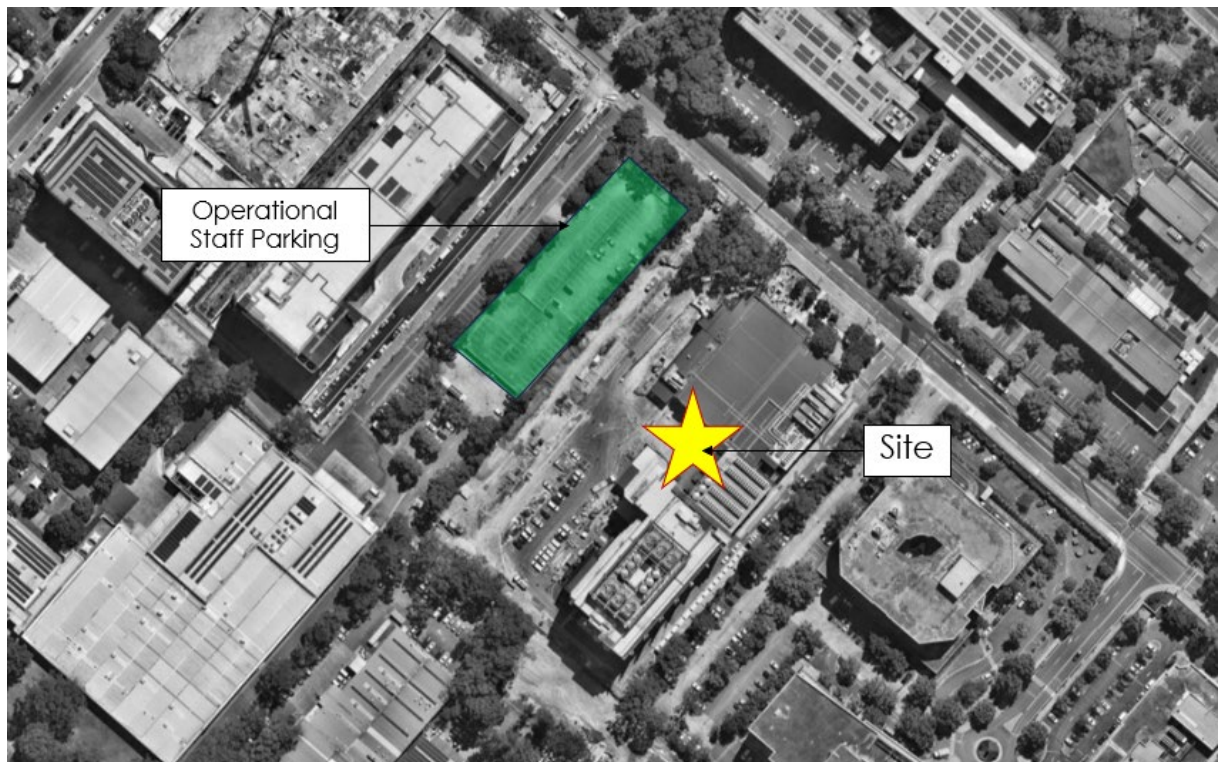
Given the limited public car parking availability in the surrounding areas, construction workers and operating staff are unlikely to drive to the site unless parking is provided.

3.7.2 Operational Staff

During the construction works, the existing MDC facility is to continue operations with a reduced staffing levels (i.e. 35 staff members working on-site per day). During this time, parking for operational staff is to be provided off-site, at the neighbouring Johnson & Johnson car park at 25 Talavera Road. This arrangement is permissible under a private agreement between the site operator and the owner of the Johnson & Johnson car park.

The Johnson & Johnson car park adjacent to the site is shown in Figure 3.2.

Figure 3.2: Operational Staff Parking



3.8 Materials and Handling Area

All materials handling and plant equipment, including waste storage, are expected to be wholly stored on-site within the enclosed construction area. It is not expected that any public road will be required for such purposes. However, if temporary use of any public road is required for temporary storage purposes or the like, prior consultation with Council will be undertaken. All relevant permit approvals will also be obtained prior to the commencement of such activities.

3.9 Work Zone Requirements

A 77m work zone is proposed along the site frontage during the proposed work hours. This zone will be used for construction vehicle parking and undertake loading/ unloading activities.

The use of the work zone will be minimised for large deliveries/ trucks. Majority of deliveries will be undertaken on site.

Trucks required to access the works zone will be advised to plan their route ahead of time such that they arrive from the east and are able to enter the works zone directly in a forward movement. If a trucks approaches from the west, they will travel through the site and enter

the works zone from the site egress driveway. Vehicles are not permitted to undertake u-turns on Talavera Road.

The contractor is to apply for all relevant permits.

3.10 Crane Installation

Two cranes are required on site for construction.

Installation and dismantling of the crane are to be undertaken by way of a separate Stand Plant Permit. On this basis, this CTMP does not include swept paths or a traffic control plan for the installation/dismantling of the crane.

4 Construction Traffic Assessment and Implications

4.1 Construction Traffic Generation

It is anticipated that there will be an average of three construction vehicles (or six two-way vehicle movements) generated per hour throughout the entire duration of construction.

Concrete truck movements will be four trucks per hour (or eight two-way vehicle movements per hour).

Deliveries to the site are to be restricted to occur outside of the road network peak periods, that is, 8am-9.30am and 4:30pm-6:00pm. The exception would be the concrete pouring stage, when concrete trucks would be arriving to the site during all hours at a peak rate of four trucks per hour.

Trips generated by construction trade-person would be negligible as no on-site parking is provided for construction workers.

The low levels of construction traffic volumes would not be expected to result in adverse traffic impacts on the operation of the surrounding road network.

4.2 Pedestrian and Cycle Access

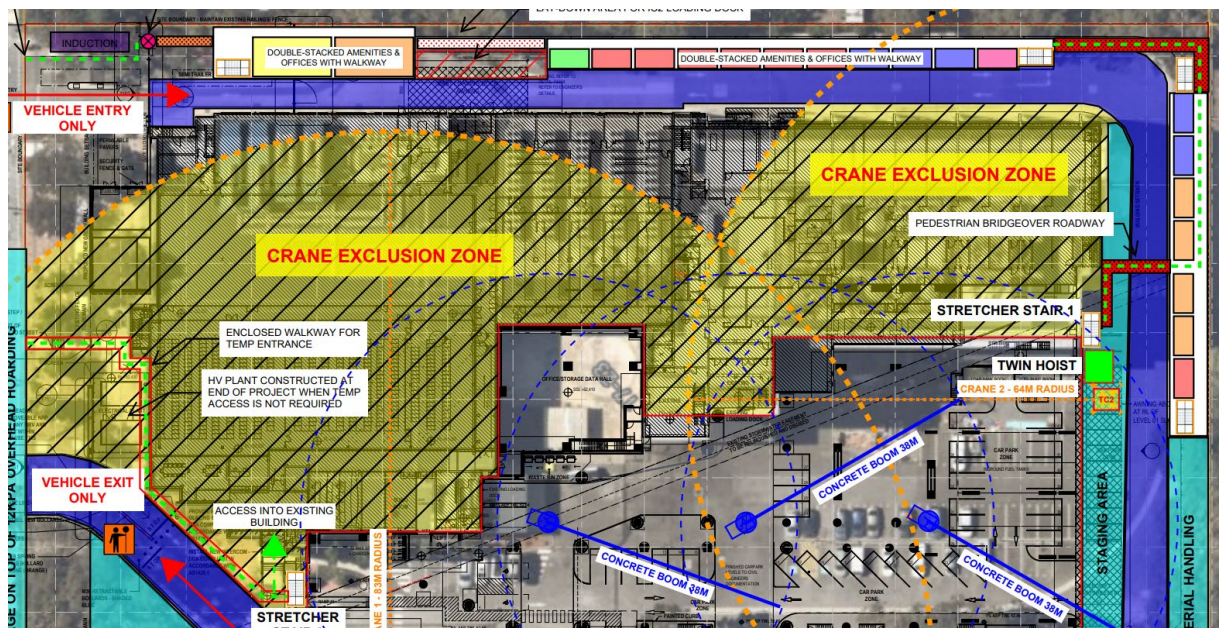
Pedestrian and cycle safety shall be maintained at all times, particularly when trucks are entering and exiting the site.

The shared use paths for pedestrians/ cyclists along the site frontage will still be maintained and open to the public.

Temporary pedestrian walkways will be in place to ensure that access to the existing data centre is maintained during the construction works. This includes the provision of a temporary pedestrian bridge over the internal driveway for operational staff access. Operational staff will be able to access the existing building by following the path of the green dotted line as shown Figure 4.1.

The internal driveway below the temporary pedestrian bridge would have maximum head clearance of 4.5m. Contractor is to ensure that all construction vehicles accessing the site are below a height of 4.5m.

Figure 4.1: Operational Staff Pedestrian Access



There will be site fencing installed around the construction area, to ensure pedestrian safety around the work area. Class A hoarding is to be placed around the site perimeter and along temporary walkways within the existing site. Class B hoarding is to be provided along the footpath adjoining the works zone on Talavera Road.

A traffic controller will be assigned at the construction entry gate to guide construction vehicles entering the construction site and manage interactions with pedestrians, as well as guiding staff/visitors of the existing data centre to the temporary pedestrian walkways.

A traffic controller will also manage vehicle movements at the work zone and exit gate, as needed to spot any pedestrians/cyclists/vehicles prior to guiding construction vehicles to exit the construction site.

4.3 Public Transport Facilities

The proposed construction activities would not impact existing public transport services.

It is noted that up to 300 workers are expected to access the site during the peak.

The construction work hours as per the consent conditions are 7am to 7pm on weekdays. Therefore, construction workers travel outside of public transport peak hours and would therefore, not put pressure on the capacity of the public transport network.

4.4 Emergency Vehicles and Service Vehicles

Emergency vehicles will be permitted access through the construction site area and the existing data centre. Service vehicle access to the existing data centre shall be maintained at all times.

4.5 Adjoining Properties and Local Access

Access to adjoining properties will not be affected by the works. Fencing would clear structures at the adjoining site.

5 Construction Traffic Management Measures

5.1 Traffic Guidance Scheme

A site-specific Traffic Guidance Scheme (TGS) has been prepared in accordance with TfNSW's *Traffic Control at Work Sites Manual*. The TGS is provided in Appendix A.

Advisory truck turning signs would be installed on Talavera Road to warn drivers approaching the site of construction trucks turning, and signage would be installed at the site exit driveway, so construction vehicle drivers are aware of pedestrians and cyclists.

All advisory signage will be installed in accordance with *AS1742.3 Manual of uniform traffic control devices – Traffic control devices for works on roads* and the *Traffic Control at Worksites Manual*. Signs will be installed and maintained throughout on days that truck movements are scheduled to occur.

Temporary traffic controls will be inspected by the contractor prior to construction works commencing to identify potential safety hazards to enable implementation of corrective solutions.

The Site Supervisor will check all relevant traffic control management measures are in place prior to commencement of works.

5.2 Vehicle Access

Construction vehicles shall radio / call the site office on approach to the site to ensure access to the works site is available. All loading and unloading shall be undertaken either on-site or at the work zone during the approved work hours.

As noted previously, the queuing or marshalling of construction vehicles shall not be permitted on public roads.

Notwithstanding this, if there are any materials spilt onto the road, site personnel and equipment shall rectify the issue accordingly, subject to appropriate OH&S provision.

5.3 Truck Routes

Protocols must be in place to ensure:

- site induction shall include procedures for accessing the site
- drivers shall adhere to the nominated truck routes, as shown in Figure 3.1

- drivers shall be aware of pedestrians and cyclists in the immediate vicinity of the site
- drivers shall be aware of existing sign posted speed limits.

5.4 Site Inspections and Record Keeping

The construction works will be monitored to ensure that it proceeds as set out in the CTMP. A daily inspection before the start of any construction activity shall take place to ensure that conditions accord with those stipulated in the plan and that there are no potential hazards. Any possible adverse impact shall be recorded and dealt with as they arise.

5.5 Site Induction

All staff employed on the site by the construction contractor shall be required to undergo a site induction. The induction shall include permitted access routes to and from the proposed work site for site personnel and construction vehicles as well as standard environmental, OH&S, driver protocols and emergency protocols. The workers will be encouraged to use public transport to travel to/from the site during the induction.

5.6 Heavy Vehicle Load Requirements

All drivers will be required to adhere with the posted vehicle load limits on all roads and not overload vehicles beyond its maximum loading limits and/or relevant approvals.

5.7 Spoil Management

Truck wheels will be washed prior to exiting site to avoid tracking any spoil onto adjacent roadways. Street sweepers will be used where required.

The roadway (including footpath) will be kept in a serviceable condition for the duration of demolition. Remedial treatments such as patching will be undertaken at the direction of Council.

5.8 Driver Code of Conduct

The Driver Code of Conduct specific to this site shall be included with all new site inductions for all heavy vehicle drivers accessing the site. One-off truck delivery drivers must agree to abide by the Driver Code of Conduct by having read and signed the Code.

Prior to commencement of construction works, all drivers shall be provided with a copy of the Driver Code of Conduct. It is intended that all truck drivers would have signed the Driver

Code of Conduct declaration and agree to be bound by its behavioural requirements before entering the site. The Driver Code of Conduct is provided in Appendix B.

5.9 Complaints and Compliments Register

A complaints and compliments register detailing matters such as truck driver behaviours and truck related noise issues shall be developed and maintained by the Contractor.

The register shall be reviewed monthly to determine if any systematic issues are arising from the implementation of the CTMP and Driver Code of Conduct.

Positive and negative feedback shall be documented using a Customer, Community and Stakeholder Complaint/ Compliment Form. The Contractor shall gather as much information as possible which would allow them to take appropriate action. Appropriate action may include:

- Arranging a meeting to discuss and/or resolve issues.
- Calling the customer, member of community or stakeholder to acknowledge feedback.
- Writing a letter responding to the feedback.

Drivers shall also be provided the opportunity to give feedback on the implementation of the Driver Code of Conduct and other measures which could be considered for implementation into the Code.

6 Conclusion

The key findings of the assessment are as follows:

- The construction work is expected to commence on 26 April 2024 with each construction activity taking between 12 to 320 days to complete.
- Overall, construction traffic impacts would be minor considering that there would be a low number of heavy vehicles generated during the road network peak periods.
- Construction workers would be strongly encouraged to travel to work using public transport as no on-site parking is provided.
- Construction workers and construction vehicle movements would not result in any adverse safety or operational impacts on the surrounding road network, pedestrians and cyclists, public transport capacity, and emergency services.
- A number of driver protocols will be established as part of the site induction procedure for drivers to ensure the safety of motorists, pedestrians and cyclists.
- Truck drivers are to be instructed to use the designated truck routes to/from the site.

In summary, it is concluded that the proposed traffic control measures will adequately address potential implications associated with proposed construction activities.

Appendix A

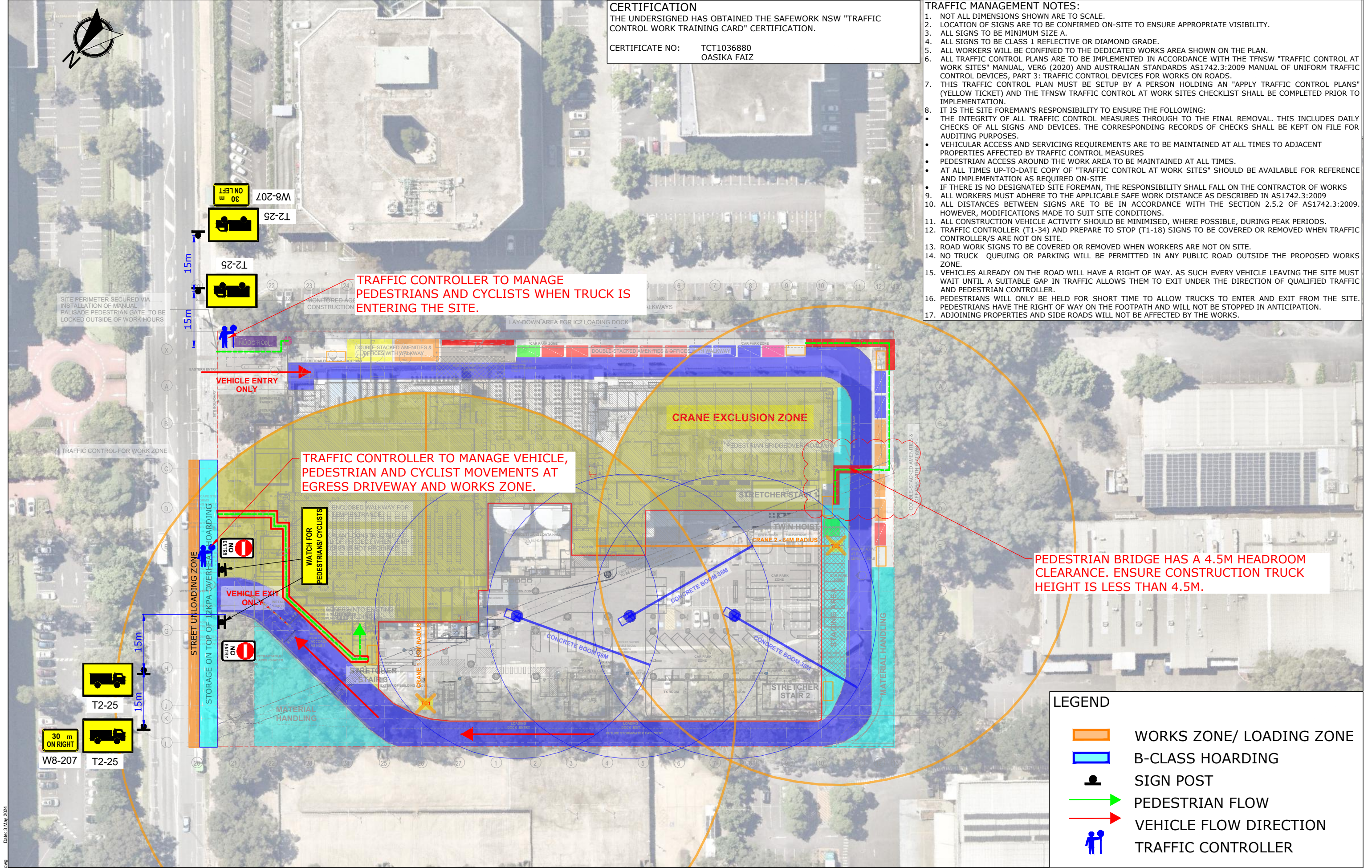
Traffic Guidance Scheme



CERTIFICATION
THE UNDERSIGNED HAS OBTAINED THE SAFEWORK NSW "TRAFFIC CONTROL WORK TRAINING CARD" CERTIFICATION.

CERTIFICATE NO: TCT1036880
OASIKA FAIZ

- TRAFFIC MANAGEMENT NOTES:**
1. NOT ALL DIMENSIONS SHOWN ARE TO SCALE.
 2. LOCATION OF SIGNS ARE TO BE CONFIRMED ON-SITE TO ENSURE APPROPRIATE VISIBILITY.
 3. ALL SIGNS TO BE MINIMUM SIZE A.
 4. ALL SIGNS TO BE CLASS 1 REFLECTIVE OR DIAMOND GRADE.
 5. ALL WORKERS WILL BE CONFINED TO THE DEDICATED WORKS AREA SHOWN ON THE PLAN.
 6. ALL TRAFFIC CONTROL PLANS ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE TfNSW "TRAFFIC CONTROL AT WORK SITES" MANUAL, VER6 (2020) AND AUSTRALIAN STANDARDS AS1742.3:2009 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 3: TRAFFIC CONTROL DEVICES FOR WORKS ON ROADS.
 7. THIS TRAFFIC CONTROL PLAN MUST BE SETUP BY A PERSON HOLDING AN "APPLY TRAFFIC CONTROL PLANS" (YELLOW TICKET) AND THE TfNSW TRAFFIC CONTROL AT WORK SITES CHECKLIST SHALL BE COMPLETED PRIOR TO IMPLEMENTATION.
 8. IT IS THE SITE FOREMAN'S RESPONSIBILITY TO ENSURE THE FOLLOWING:
 - THE INTEGRITY OF ALL TRAFFIC CONTROL MEASURES THROUGH TO THE FINAL REMOVAL. THIS INCLUDES DAILY CHECKS OF ALL SIGNS AND DEVICES. THE CORRESPONDING RECORDS OF CHECKS SHALL BE KEPT ON FILE FOR AUDITING PURPOSES.
 - VEHICULAR ACCESS AND SERVICING REQUIREMENTS ARE TO BE MAINTAINED AT ALL TIMES TO ADJACENT PROPERTIES AFFECTED BY TRAFFIC CONTROL MEASURES
 - PEDESTRIAN ACCESS AROUND THE WORK AREA TO BE MAINTAINED AT ALL TIMES.
 - AT ALL TIMES UP-TO-DATE COPY OF "TRAFFIC CONTROL AT WORK SITES" SHOULD BE AVAILABLE FOR REFERENCE AND IMPLEMENTATION AS REQUIRED ON-SITE
 - IF THERE IS NO DESIGNATED SITE FOREMAN, THE RESPONSIBILITY SHALL FALL ON THE CONTRACTOR OF WORKS
 9. ALL WORKERS MUST ADHERE TO THE APPLICABLE SAFE WORK DISTANCE AS DESCRIBED IN AS1742.3:2009
 10. ALL DISTANCES BETWEEN SIGNS ARE TO BE IN ACCORDANCE WITH THE SECTION 2.5.2 OF AS1742.3:2009. HOWEVER, MODIFICATIONS MADE TO SUIT SITE CONDITIONS.
 11. ALL CONSTRUCTION VEHICLE ACTIVITY SHOULD BE MINIMISED, WHERE POSSIBLE, DURING PEAK PERIODS.
 12. TRAFFIC CONTROLLER (T1-34) AND PREPARE TO STOP (T1-18) SIGNS TO BE COVERED OR REMOVED WHEN TRAFFIC CONTROLLER/S ARE NOT ON SITE.
 13. ROAD WORK SIGNS TO BE COVERED OR REMOVED WHEN WORKERS ARE NOT ON SITE.
 14. NO TRUCK QUEUING OR PARKING WILL BE PERMITTED IN ANY PUBLIC ROAD OUTSIDE THE PROPOSED WORKS ZONE.
 15. VEHICLES ALREADY ON THE ROAD WILL HAVE A RIGHT OF WAY. AS SUCH EVERY VEHICLE LEAVING THE SITE MUST WAIT UNTIL A SUITABLE GAP IN TRAFFIC ALLOWS THEM TO EXIT UNDER THE DIRECTION OF QUALIFIED TRAFFIC AND PEDESTRIAN CONTROLLER.
 16. PEDESTRIANS WILL ONLY BE HELD FOR SHORT TIME TO ALLOW TRUCKS TO ENTER AND EXIT FROM THE SITE. PEDESTRIANS HAVE THE RIGHT OF WAY ON THE FOOTPATH AND WILL NOT BE STOPPED IN ANTICIPATION.
 17. ADJOINING PROPERTIES AND SIDE ROADS WILL NOT BE AFFECTED BY THE WORKS.



LEGEND

- WORKS ZONE/ LOADING ZONE
- B-CLASS HOARDING
- SIGN POST
- PEDESTRIAN FLOW
- VEHICLE FLOW DIRECTION
- TRAFFIC CONTROLLER

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	HT	PC	KH	03/05/24



PROJECT
17-23 TALAVERA ROAD, MACQUARIE PARK

TITLE
TRAFFIC GUIDANCE SCHEME - CIVIL WORKS

DWG No.	21178CAD005
FIGURE 1	
DATE STAMP	03 MAY 2024
PROJECT No.	21178
SCALE	1:900 @A3
REV.	A

Appendix B

Driver Code of Conduct

Driver Code of Conduct

This document sets out the requirements for all employees and contractors working at the site.

DECLARATION

I, the undersigned, hereby agree to abide by the Driver Code of Conduct for the transportation of construction materials to/ from the site in a safe manner.

I have read and understand the requirements outlined in the Code and will, to the best of my ability, comply and assist with their implementation, requirements and ongoing administration.

Driver

Full Name: _____

Organisation: _____

Signature: _____

Date: _____

General Requirements

The Driver Code of Conduct would be distributed to all sub-contractors with fleet accessing the site prior to the commencement of works. The Code would be provided to each driver to read and sign to confirm they have understood and pledge to follow the haulage instructions. Once completed, a copy of the signed Code would be supplied to the contractor for record keeping.

Heavy vehicle drivers hauling to and from the subject site must:

- Have read and signed the Driver Code of Conduct (this document) prior to entry to the site;
- Hold a valid driver's license for the class of vehicle that it being operated;
- Operate the vehicle in a safe manner while on site and public road network;
- Comply with the direction of authorised site personnel when onsite;
- All drivers are to use seat belts when driving; and
- All drivers are to drive to the sign posted speed limit, both on public roads and within the site.

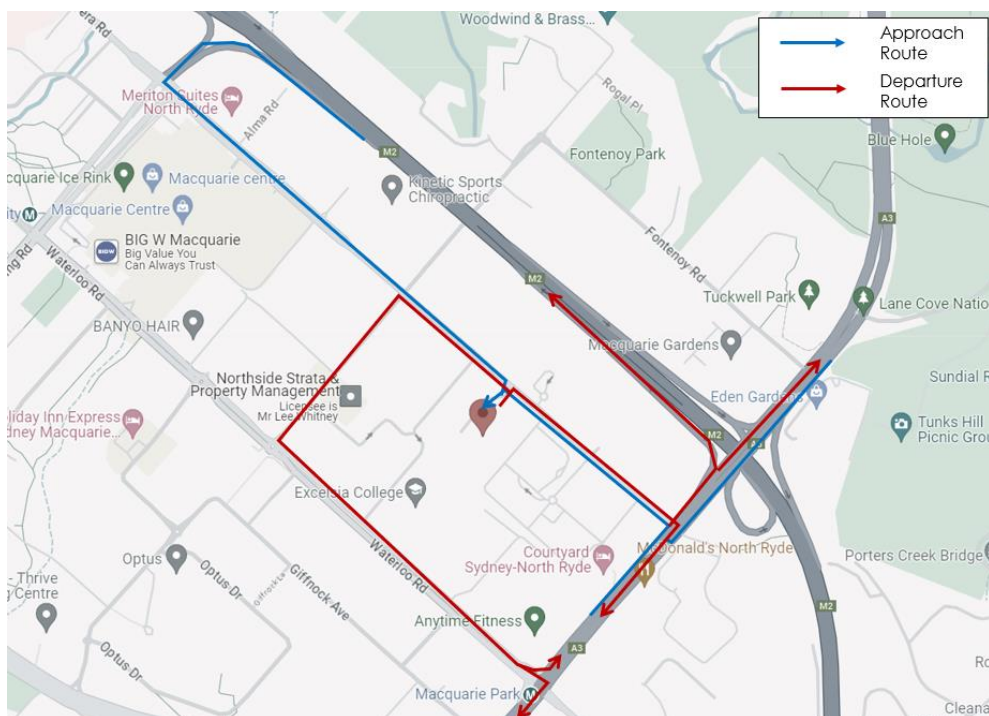
Site Access

All access to the construction site is to be via Talavera Road only.

Heavy Vehicle Haul Routes

All heavy vehicle drivers must adhere to the designated truck routes to/from the site which is via Talavera Road only.

The truck routes are shown in the figure below.



Heavy Vehicle Speed

Truck drivers must comply with the Australian Road Rules with travelling along public roads. Drivers are to observe the posted speed limits, and adjust speed appropriately to suit the road and weather conditions at the time.

The maximum speed that a vehicle must travel is the signposted speed. Warning signs indicating a reduction in speed ahead must also be obeyed.

Upon reaching the site, drivers will be instructed by traffic controllers on when and how to enter the site.

The speed limit within the site is 5km/hr (unless signposted otherwise in an area) which is to be strictly maintained.

Heavy Vehicles Driver Fatigue

The heavy vehicle driver fatigue law commenced in NSW in 2008 and applies to trucks and truck combinations over 12 tonnes GVM (however, Ministerial Exemption Notices may apply).

Under the law, industry has the choice of operating under three fatigue management schemes, namely:

1. Standard Hours of Operation
2. Basic Fatigue Management (BFM)
3. Advanced Fatigue management (AFM).

All heavy vehicle drivers associated with the construction works at the subject site must be aware of their adopted fatigue management scheme and operate within its requirements.

Heavy Vehicle Compression Braking

Compression braking/ engine braking is not permitted within the vicinity of the site, that includes, internal to and surrounding the subject site.

Heavy Vehicle Noise

Permitted times of construction works at the site are as follows:

- Construction works shall be carried out on:
 - Monday to Friday 7:00am – 7:00pm
 - Saturday 8:00am – 3:00pm
 - No work is to be undertaken on Sundays or public holidays

Any works outside these times will only occur with approval from the relevant authorities prior to the commencement of any works.

Load Covering

All loaded trucks arriving at and departing from the construction site are required to have an effective cover over their load for the duration of the journey. The load cover may be removed only upon arrival at the destination (ie. at the site).

Care must be taken to ensure that all loose debris from vehicles and wheels is removed prior to exiting the site.

Site management is to monitor loose material on the side of the haul route and take appropriate action regularly.

Other Safety Considerations Along the Haul Route

Heavy vehicle drivers should be aware of the following:

- Concealed driveways – drivers are to drive with caution around any signed concealed driveways
- Wet weather safety – drivers should adjust their driving speed to suit weather condition at the time.
- Other motorists – drivers should stay alert to other drivers, motorcyclists and cyclists on whilst driving to/ from the site.
- Pedestrians who are walking through the car park area and adjacent driveway close to the site

Appendix C

Council Correspondence

From: [Costan Griziotis](#)
To: [Adam Pavlovic](#)
Subject: FW: ATTN: Traffic Engineers & Development Engineers - SSD-24299707, 17-23 Talavera Road, Macquarie Park
Date: Wednesday, 12 June 2024 2:10:57 PM
Attachments: [image004.png](#)
[image001.png](#)

Costan Griziotis
Project Engineer

0466 546 850
costang@fdcbuilding.com.au
22 - 24 Junction Street, Forest Lodge, NSW 2037



[LinkedIn](#) | [Facebook](#) | [Instagram](#)
www.fdcbuilding.com.au

From: Joey Huang <JoeyH@ryde.nsw.gov.au>
Sent: Friday, May 10, 2024 3:55 PM
To: Costan Griziotis <costang@fdcbuilding.com.au>
Cc: Amir Mousavi <AmirM@ryde.nsw.gov.au>; Matthew Hezlett <matthewh@fdcbuilding.com.au>; Daniel Faulkner <danielf@fdcbuilding.com.au>
Subject: RE: ATTN: Traffic Engineers & Development Engineers - SSD-24299707, 17-23 Talavera Road, Macquarie Park

Hi Costan,

Thanks for providing the updated CTMP, which is deemed to address all of our comments!

Kind regards,

Joey

Joey Huang
Traffic & Development Engineer
TRAFFIC SERVICES
M +61421718187
E JoeyH@ryde.nsw.gov.au
W www.ryde.nsw.gov.au



Customer Service Centre 1 Pope Street, Ryde (Within Top Ryde City shopping centre)
North Ryde Office Riverview Business Park, Building 0, Level 1, 3 Richardson Place, North Ryde

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From: Costan Griziotis <costang@fdcbuilding.com.au>

Sent: Friday, May 10, 2024 11:12 AM

To: Joey Huang <JoeyH@ryde.nsw.gov.au>

Cc: Amir Mousavi <AmirM@ryde.nsw.gov.au>; Matthew Hezlett
<matthewh@fdcbuilding.com.au>; Daniel Faulkner <danielf@fdcbuilding.com.au>

Subject: RE: ATTN: Traffic Engineers & Development Engineers - SSD-24299707, 17-23 Talavera Road, Macquarie Park

Hi Joey,

Please see attached with below comments captured.

Thank you,

Costan Griziotis

Project Engineer

0466 546 850

costang@fdcbuilding.com.au

22 - 24 Junction Street, Forest Lodge, NSW 2037



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www.fdcbuilding.com.au

From: Joey Huang <JoeyH@ryde.nsw.gov.au>

Sent: Wednesday, May 8, 2024 11:31 AM

To: Costan Griziotis <costang@fdcbuilding.com.au>

Cc: Amir Mousavi <AmirM@ryde.nsw.gov.au>; Matthew Hezlett
<matthewh@fdcbuilding.com.au>; Daniel Faulkner <danielf@fdcbuilding.com.au>

Subject: RE: ATTN: Traffic Engineers & Development Engineers - SSD-24299707, 17-23 Talavera Road, Macquarie Park

Hi Costan,

As discussed, please update the CTMP for below:

- In section 3.5, please specify the use of truck & dog, AV/semi-truck, and the demand per day
- In section 4.1, please state, there will be only concrete trucks operating during commuting

peak periods. All other trucks will be operating outside commuting peak periods.

Kind Regards,
Joey

Joey Huang
Traffic & Development Engineer
TRAFFIC SERVICES
M [+61421718187](tel:+61421718187)
E JoeyH@ryde.nsw.gov.au
W www.ryde.nsw.gov.au



Customer Service Centre 1 Pope Street, Ryde (Within Top Ryde City shopping centre)
North Ryde Office Riverview Business Park, Building 0, Level 1, 3 Richardson Place, North Ryde

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From: Costan Griziotis <costang@fdcbuilding.com.au>

Sent: Monday, May 6, 2024 7:23 AM

To: Joey Huang <JoeyH@ryde.nsw.gov.au>

Cc: Amir Mousavi <AmirM@ryde.nsw.gov.au>; Matthew Hezlett
<matthewh@fdcbuilding.com.au>; Daniel Faulkner <danielf@fdcbuilding.com.au>

Subject: RE: ATTN: Traffic Engineers & Development Engineers - SSD-24299707, 17-23 Talavera Road, Macquarie Park

Hi Joey,

Amended as final attached for your information capturing below comments.

Thank you,

Costan Griziotis
Project Engineer

0466 546 850
costang@fdcbuilding.com.au
22 - 24 Junction Street, Forest Lodge, NSW 2037



[LinkedIn](#) | [Facebook](#) | [Instagram](#)
www.fdcbuilding.com.au

From: Costan Griziotis <costang@fdcbuilding.com.au>

Sent: Thursday, May 2, 2024 3:47 PM

To: Joey Huang <JoeyH@ryde.nsw.gov.au>

Cc: Amir Mousavi <AmirM@ryde.nsw.gov.au>; Matthew Hezlett
<matthewh@fdcbuilding.com.au>; Daniel Faulkner <danielf@fdcbuilding.com.au>

Subject: RE: ATTN: Traffic Engineers & Development Engineers - SSD-24299707, 17-23 Talavera Road, Macquarie Park

No worries Joey.

1. Truck length will be roughly 8m
2. FDC will amend CTMP to ensure it notes an overhead protection based off council advice and install when we start on site.

Thank you,

Costan Griziotis
Project Engineer

0466 546 850
costang@fdcbuilding.com.au
22 - 24 Junction Street, Forest Lodge, NSW 2037



[LinkedIn](#) | [Facebook](#) | [Instagram](#)
www.fdcbuilding.com.au

From: Joey Huang <JoeyH@ryde.nsw.gov.au>

Sent: Thursday, May 2, 2024 3:43 PM

To: Costan Griziotis <costang@fdcbuilding.com.au>

Cc: Amir Mousavi <AmirM@ryde.nsw.gov.au>; Matthew Hezlett
<matthewh@fdcbuilding.com.au>; Daniel Faulkner <danielf@fdcbuilding.com.au>

Subject: RE: ATTN: Traffic Engineers & Development Engineers - SSD-24299707, 17-23 Talavera Road, Macquarie Park

You don't often get email from joeyh@ryde.nsw.gov.au. [Learn why this is important](#)

Hi Costan,

Thanks for your prompt reply! Most of replies are fine. Please see my further comments in blue following two red replies.

Kind Regards,
Joey

Joey Huang
Traffic & Development Engineer
TRAFFIC SERVICES
M [+61421718187](tel:+61421718187)
E JoeyH@ryde.nsw.gov.au
W www.ryde.nsw.gov.au



Customer Service Centre 1 Pope Street, Ryde (Within Top Ryde City shopping centre)
North Ryde Office Riverview Business Park, Building 0, Level 1, 3 Richardson Place, North Ryde

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From: Costan Griziotis <costang@fdcbuilding.com.au>
Sent: Thursday, May 2, 2024 2:00 PM
To: Joey Huang <JoeyH@ryde.nsw.gov.au>
Cc: Amir Mousavi <AmirM@ryde.nsw.gov.au>; Matthew Hezlett <matthewh@fdcbuilding.com.au>; Daniel Faulkner <danielf@fdcbuilding.com.au>
Subject: RE: ATTN: Traffic Engineers & Development Engineers - SSD-24299707, 17-23 Talavera Road, Macquarie Park

Thanks Joey, I will have our traffic engineer update. Please see further comments below in **Red** for consideration.

I will issue final CTMP once received with the below captured for information once received.

Cheers,

Costan Griziotis
Project Engineer

0466 546 850
costang@fdcbuilding.com.au
22 - 24 Junction Street, Forest Lodge, NSW 2037



[LinkedIn](#) | [Facebook](#) | [Instagram](#)
www.fdcbuilding.com.au

From: Joey Huang <JoeyH@ryde.nsw.gov.au>
Sent: Thursday, May 2, 2024 1:24 PM
To: Costan Griziotis <costang@fdcbuilding.com.au>
Cc: Amir Mousavi <AmirM@ryde.nsw.gov.au>; Matthew Hezlett

<matthewh@fdcbuilding.com.au>; Daniel Faulkner <danielf@fdcbuilding.com.au>

Subject: RE: ATTN: Traffic Engineers & Development Engineers - SSD-24299707, 17-23 Talavera Road, Macquarie Park

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Hi Coston,

Thanks for submitting CTMP! Traffic Services Department reviewed the CTMP and provide following comments for your attention:

1. **Truck movements allowed during commuting peak periods (8am-9.30am & 4.30pm-6pm):** preferably all of truck movements are to be restricted outside the commuting peak periods in Macquarie Park area. However, due to the site concrete pouring works associated with piling/basement/structures, only concrete trucks are allowed during commuting peak periods. Please provide the estimation for the concrete truck demand and truck size per hour and per day during piling/basement/above structure stages in the CTMP. Not sure if the stated 1-2 truck movements during peak periods in CTMP are referred to concrete truck or not. **1 – 2 trucks was an average. We will update CTMP to note that all deliveries (barring concrete trucks during large pours) are to be scheduled in for and arrive on site between 7am – 8am & 9:30am-4:30pm. Estimation for concrete truck demand during a large pour will be 3 – 4 per hr and these will be 8 – wheelers. Please also provide the truck length.**
2. **Pedestrians/cyclists protection.** It's proposed to use southwestern kerbside parking area of Talavera Road along site frontage as truck loading/unloading area, please clarify:
 - whether the shared use paths for pedestrians/cyclists along the site frontage are still maintained to be open to the public, and **Yes, these will remain open.**
 - whether there is overhead protection, i.e. class B hoarding is provided along the proposed work zone area. **Overhead protection is not currently proposed. Will this be an issue for council? Yes, this is a major concern for the safety of pedestrians/cyclists moving along the shared use path, when trucks load/unload materials within work zone, and these loaded/unloaded materials will be transported into the site over the top of pedestrians/cyclists.**
3. **Truck routes:** the departure route is required only turning right onto Talavera Road from the site and then turning left/right onto Lane Cove Road. The reasons for such a requirement are listed here:
 - The construction works of Macquarie University Bus Interchange would start soon, which include the reconstruction works of Herring Road/Talavera Road intersection.
 - Some construction sites at Waterloo Road have been approved to use Talavera road section between Herring Road and Khartoum Road already.
 - The previous approval of truck exiting route to use Herring Road during stormwater and sewer alignment stage is based on limited truck demand and short construction timeframe. The proposed construction timeframe for this CTMP would last 2 years. The truck route has to be regulated with minimum truck number on Talavera Road between Khartoum Road and Herring Road.If some trucks have to use M2 on-ramp at Herring Road due to various reasons, this should be minimised. Please also explain why these trucks have to use M2 on-ramp via Herring Road in the CTMP report. **Above is noted and will be incorporated in the CTMP.**
4. **Trucks into/out of work zone.** Please clarify:

4.1) how trucks from west via Talavera Road to move into work zone. Do these trucks directly turn around within Talavera Road? This is not supported. It is advised: either all trucks entering Work Zone from east without from west, or the internal pedestrian bridge within the site providing 4.5m standard clearance allowing these trucks turning around within the site and then turning left from the site onto the work zone. Trucks coming in from the West will be brought into site and turned around rather than completing a U-turn across Talavera road or alternatively they will approach from the eastern direction (note – it will be strongly encouraged all trucks approach from the east). Pedestrian bridge height will be increased.

4.2) After loading/unloading on work zone, these trucks would have to move north-west along Talavera Road, and most of trucks may need to return Lane Cove Road via Khartoum Road and Waterloo Road, which would significantly increase the use of and impacts on local road network. Therefore, it is advised to minimise the use of work zone, and increase the internal pedestrian bridge clearance from 3m to 4.5m, allowing those trucks coming from Lane Cove Road to complete loading/unloading within the site, and then directly to return Lane Cove Road via turning right from the site onto Talavera Road heading south-east. Bridge height will be increased to cater and where possible/practicable, use of work zone for large deliveries/trucks will be minimized so as to control traffic flow exiting site in a North West direction as noted above. I will have this note added to the CTMP.

5. The issue of pedestrian bridge with 3m low clearance. The 3m low clearance of the internal pedestrian bridge leads to the issues as described in comments 4.1) & 4.2). This is advised to increase to 4.5m. Noted – bridge to be increased to 4.5m.

Kind Regards,
Joey

Joey Huang
Traffic & Development Engineer
TRAFFIC SERVICES
M +61421718187
E JoeyH@ryde.nsw.gov.au
W www.ryde.nsw.gov.au



Customer Service Centre 1 Pope Street, Ryde (Within Top Ryde City shopping centre)
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From: Costan Griziotis <costang@fdcbuilding.com.au>

Sent: Wednesday, April 24, 2024 12:10 PM

To: City of Ryde <CityofRyde@ryde.nsw.gov.au>

Cc: Matthew Hezlett <matthewh@fdcbuilding.com.au>; Daniel Faulkner <danielf@fdcbuilding.com.au>

Subject: ATTN: Traffic Engineers & Development Engineers - SSD-24299707, 17-23 Talavera Road, Macquarie Park

Good Afternoon,

With relation to the DA in the subject matter, please see attached draft Construction Traffic Management Plan for Council Review.

Note that the attached captures minor changes to what has been previously issued for the development (i.e. truck routes etc remain identical). Previous council consultation is captured within the attached on page 5.

Could Council please review and provide comments.

What timeframe is usually allowed for the review period?

Thank you,

Costan Griziotis

Project Engineer

0466 546 850

costang@fdcbuilding.com.au

22 - 24 Junction Street, Forest Lodge, NSW 2037



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The Transport Planning Partnership
Suite 402 Level 4, 22 Atchison Street
St Leonards NSW 2065

P.O. Box 237
St Leonards NSW 1590

02 8437 7800

info@tpp.net.au

www.tpp.net.au

APPENDIX D – Noise & Vibration Management Plan

MACQUARIE TELECOM IC3W

Construction Noise & Vibration Management Plan

12 June 2024

FDC

TM162-06F02 CNVMP (r3)

Document details

Detail	Reference
Doc reference:	TM162-06F02 CNVMP (r3)
Prepared for:	FDC
Address:	22-24 Junction Street Forest Lodge NSW 2037
Attention:	Costan Griziotis

Document control

Date	Revision history	Non-issued revision	Issued revision	Prepared	Instructed	Reviewed / Authorised
01.05.2024	Draft	0	1	C. Chan	-	M. Gange
06.05.2024	Final incorporating FDC comment	-	2	C. Chan	-	M. Gange
12.06.2024	Amended incorporating DPHI comments	-	3	C. Chan	-	M. Gange
File Path: R:\AssocSydProjects\TM151-TM200\TM162 bc Macquarie Telecom IC3w\Task 6 Construction\1 Docs\TM162-06F02 CNVMP (r3).docx						

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1 Introduction

Renzo Tonin & Associates ('RT&A') has been engaged by FDC to prepare a Construction Noise and Vibration Management Plan ('CNVMP') for the construction of the expansion to the existing data centre at 17-23 Talavera Road, Macquarie Park (State Significant Development SSD-24299707). The expansion is known as IC3 West ('the Project').

As part of the State Significant Development Application ('SSDA'), a noise and vibration assessment report was prepared for the Project by RT&A¹, which included a preliminary assessment of construction noise and vibration. RT&A have also prepared a CNVMP which specifically addressed the early works stormwater and sewer realignment component of the Project².

The scope of this CNVMP is to describe how noise and vibration impacts during the construction of the Project will be managed. This CNVMP will:

- Identify the site, proposed works and nearby noise sensitive development.
- Present information about ambient noise levels in the vicinity of the site.
- Identify relevant noise and vibration objectives.
- Assess likely noise and vibration impacts from the works.
- Identify noise and vibration mitigation / management measures for the works to avoid or minimise noise and vibration impacts, and how these measures are to be implemented (where feasible and reasonable).

The work documented in this report was carried out in accordance with Renzo Tonin & Associates Quality Assurance System, which is based on Australian Standard / NZS ISO 9001. APPENDIX A contains a glossary of acoustic terms used in this report.

Renzo Tonin & Associates is a member firm of the Association of Australasian Acoustical Consultants ('AAAC') and the author of this CNVMP, Chris Chan, is a member of the Australian Acoustical Society ('AAS').

1.1 Consent conditions

This CNVMP has been prepared with respect to the relevant consent conditions in SSD-24229707 which are summarised in Table 1-1.

¹ Renzo Tonin & Associates, TM162-03F02 Acoustic Assessment (r3), Macquarie Data Centres IC3 Super West Noise and Vibration Report for SSDA, 4 November 2022

² Renzo Tonin & Associates, TM162-05F02 Stormwater and Sewer Realignment CNVMP (r3), Macquarie Data Centre IC3 Super West – Stormwater and Sewer Realignment Works Construction Noise and Vibration Management Plan, 24 January 2024

Table 1-1: Consent condition requirements

Requirement	CNVMP section where this is addressed											
NOISE	Section 3.1											
Hours of Work												
B1. The Applicant must comply with the hours detailed in Table 1 below.												
<i>Table 1 Hours of work</i> <table><tr><th>Activity</th><th>Day</th><th>Time</th></tr><tr><td>Construction</td><td>Monday – Friday Saturday</td><td>7 am to 7 pm 8 am to 3 pm</td></tr><tr><td>Operation (excluding back-up generator testing)</td><td>Monday – Sunday</td><td>24 hours</td></tr><tr><td>Back-up generator testing</td><td>Monday – Friday</td><td>7 am to 6 pm</td></tr></table>		Activity	Day	Time	Construction	Monday – Friday Saturday	7 am to 7 pm 8 am to 3 pm	Operation (excluding back-up generator testing)	Monday – Sunday	24 hours	Back-up generator testing	Monday – Friday
Activity	Day	Time										
Construction	Monday – Friday Saturday	7 am to 7 pm 8 am to 3 pm										
Operation (excluding back-up generator testing)	Monday – Sunday	24 hours										
Back-up generator testing	Monday – Friday	7 am to 6 pm										
B2. Works outside of the hours identified in condition B1 may be undertaken in the following circumstances:												
(a) works that are inaudible at the nearest sensitive receivers;												
(b) works agreed to in writing by the Planning Secretary;												
(c) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or												
(d) where it is required in an emergency to avoid the loss of lives, property or to prevent environmental harm.												
Construction Noise Limits	Section 3.2											
B3. The development must be constructed to achieve the construction noise management levels detailed in the ICNG (as may be updated or replaced from time to time). All feasible and reasonable noise mitigation measures must be implemented and any activities that could exceed the construction noise management levels must be identified and managed in accordance with the management and mitigation measures in Appendix 2 of this consent.	Section 4											
Construction Noise and Vibration Management Plan	Section 4.6											
B4. Prior to the commencement of construction, the Applicant must prepare a Construction Noise and Vibration Management Plan (CNVMP) for the development to the satisfaction of the Planning Secretary. A copy of the CNVMP must be included in the development’s CEMP (see condition C2), and must:	Section 6.3											
(a) be prepared by a suitably qualified and experienced noise expert(s);	APPENDIX B											
(b) describe procedures for achieving the noise management levels in the ICNG (as may be updated or replaced from time to time);	APPENDIX D											
(c) describe the measures that would be implemented to manage high noise-generating works (such as piling);												
(d) include strategies that have been developed in consultation with adjoining businesses for managing high noise-generating works, including those works that will be undertaken in close proximity to Excelsia College;												
(e) describe the consultation that would be undertaken with adjoining businesses during construction, including direct consultation with Excelsia College to develop the strategies outlined in condition B4(d); and												
(f) include a complaints management system that would be implemented for the duration of construction.												
VIBRATION	Section 3.3											
Vibration Criteria	Section 5											
B8. Vibration caused by construction at any residence or structure outside the site must be limited to:	APPENDIX C											
(a) for structural damage, the latest version of <i>DIN 4150-3:2016-12 Vibration in buildings – Part 3: Effects on Structures</i> (German Institute for Standardisation); and												
(b) for human exposure, the acceptable vibration values set out in the <i>Environmental Noise Management Assessing Vibration: A technical guideline</i> (DEC, 2006) (as may be updated or replaced from time to time).												
B9. The limits in condition B8 apply unless otherwise outlined in the development’s CNVMP (see condition B4).												

1.2 Site description

The site is located at 17-23 Talavera Road, Macquarie Park (LOT 527 DP 752035). The site is currently occupied by the existing data centre buildings, including the IC2 building on the northern half of the site and the IC3e building in the south-eastern corner of the site. The subject IC3w building will be located in the south-western corner of the site. The site has a total area of approximately 20,000m² and is accessed via Talavera Road.

The site is described through its current commercial setting as an existing Data Centre (LDA/2018/0322), which is surrounded by other commercial premises fronting Talavera Road and forms part of the wider Macquarie Park Corridor.

Macquarie Park Corridor is a strategic centre of Macquarie Park, being a health and education precinct and an important economic / employment powerhouse in Sydney's North District. It is situated approximately 12.5km to the north-west of the Sydney CBD and 11.3km north-east of Parramatta. It is within close proximity to bus and rail public transport routes, and has direct links to the wider regional road network including Talavera Road, Lane Cove Road, Epping Road and the M2 Motorway.

The site is bound by Talavera Road to the north, commercial premises to the east and west, and an education premises to the south. The nearest residential receivers are located north of the M2 Motorway, approximately 310m from the site.

Figure 1 presents an aerial view showing the Project site and surrounding area.

1.3 Nearest noise and vibration sensitive receivers

The site is surrounded by commercial premises to the north, east and west and an education premises to the south. The nearest residential receivers are located to the north of the M2 Motorway, approximately 310m from the site.

The receiver locations that have been assessed are set out in Table 1-2 and Figure 1.

Additionally, the nearby receivers have been grouped into Noise Catchment Areas (NCAs) based upon areas with similar acoustic environments. This has undertaken to allocate the appropriate ambient background noise and noise management levels to each receiver.

The location of these noise catchment area boundaries are also shown in Figure 1.

Table 1-2: Assessment locations

Receiver number	Address / location	Receiver type	Noise Catchment Area (NCA)	Approximate distance to subject site, metres
R1	1-15 Fontenoy Road Level 1	RES	1a	350
R2	1-15 Fontenoy Road Level 4	RES	1b	350
R3	1-15 Fontenoy Road Level 7	RES	1c	350
R4	25 Fontenoy Road, Macquarie Park	RES	1	310
R5	7 Tasman Place	RES	1	320
R6	33 Tasman Place, Macquarie Park	RES	1	370
R7	101 Waterloo Road, Macquarie Park	RES	2	470
R8	80 Waterloo Road, Macquarie Park	RES	2	490
R9	384-386 Lane Cove Road, Macquarie Park	RES	2	500
R10	136 Epping Road, North Ryde	RES	3	635

Receiver number	Address / location	Receiver type	Noise Catchment Area (NCA)	Approximate distance to subject site, metres
R11	24 Talavera Road, Macquarie Park - North Ryde Early Learning Centre	OSR_CHC	1	110
R12	40-52 Talavera Road, Macquarie Park (Guardian Childcare)	OSR_CHC	1	160
R13	34-41 Waterloo Road, Macquarie Park (Only About Children Macquarie Park Station)	OSR_CHC	2	220
R14	Building B/11 Talavera Road, Macquarie Park (Macquarie Early Learning Centre)	OSR_CHC	2	130
R15	97 Waterloo Road, Macquarie Park (Greenwood North Ryde)	OSR_CHC	2	390
R16	63-71 Waterloo Road, Macquarie Park - Excelsia College	OSR_EDU	2	Common boundary
R17	44 Waterloo Road, Macquarie Park - Macquarie University (School of Engineering)	OSR_EDU	2	225
R18	7/11 Talavera Road, Macquarie Park (Marriot Hotel)	OSR_HOT	1	270
R19	88 Talavera Road, North Ryde (Meriton Suites)	OSR_HOT	1	680
R20	10 Byfield St, Macquarie Park (Holiday Inn Express)	OSR_HOT	2	550
R21	11 Khartoum Road, Macquarie Park (WiSE Medical)	OSR_MED	1	140
R22	24 Talavera Road, Macquarie Park	OSR_COM	1	60
R23	19-25 Talavera Road, Macquarie Park	OSR_COM	1	105
R24	15 Talavera Rd, North Ryde	OSR_COM	1	Common boundary
R25	11 Talavera Rd, Macquarie Park	OSR_COM	1	Common boundary
R26	11-17 Khartoum Road, Macquarie Park (Stockland Data Centre)	OSR_COM	1	60
R27	11-17 Khartoum Road, Macquarie Park (Stockland Data Centre)	OSR_COM	1	60
R28	1-5 Khartoum Road, Macquarie Park	OSR_COM	2	Diagonally adjacent
R29	26 Talavera Road, Macquarie Park	OSR_COM	1	60
R30	7 Harvest Street, Macquarie Park	OSR_COM	2	140
R31	50 Waterloo Road, Macquarie Park	OSR_COM	2	230
R32	8 Khartoum Road, Macquarie Park	OSR_COM	1	250

Notes: RES = Residential, IND = Industrial, COM = Commercial, CHC = Childcare, EDU = Educational, MED = Medical

Plot Date: 30/04/24 - 20:45
Layout: Land Use, Site Layout, Receiver Location
GIS File: R:\AssocSydProjects\TM151-TM200\TM162 bc Macquarie Telecom IC3w Task 6 Construction\GIS\Calcs\TM162-02 QGIS (r1) copy.qgz

LEGEND

Unattended noise monitoring

- Additional monitoring location
- SLR monitoring (SSD-46011220)
- Previous unattended noise monitoring
- Representative Receiver

Noise Catchment Area

- Noise Catchment Area
- Subject Site

Landuse

- Education
- Hotel
- Residential
- Commercial
- Medical
- Childcare
- Industrial

IC2

- IC2
- IC3E
- IC3SW

Landuse

- Education
- Hotel
- Residential
- Commercial
- Medical
- Childcare
- Industrial

Scale

0 200 400 m

1:7,000

CLIENT

FDC

ACOUSTIC CONSULTANT

RENZO TONIN & ASSOCIATES

Acoustics, Vibration & Structural Dynamics
Sydney Melbourne Brisbane Gold Coast Kuwait

Ph (02) 8218 0500 Fax (02) 8218 0501

Macquarie Data Centre

Figure 1:

Site location, land uses, NCAs, and noise monitoring locations

REV	BY	DATE	DESCRIPTION	APPROVED
0	CC	30/04/24	Prepare figure	

A3 Original

Co-ordinate System: GDA94 / MGA zone 56

NOTE: Do not scale from this drawing.

Full Size A3

Sheet 1 of 1

1.4 Summary of construction works

Table 1-3 presents a high-level programme of the construction works as advised FDC.

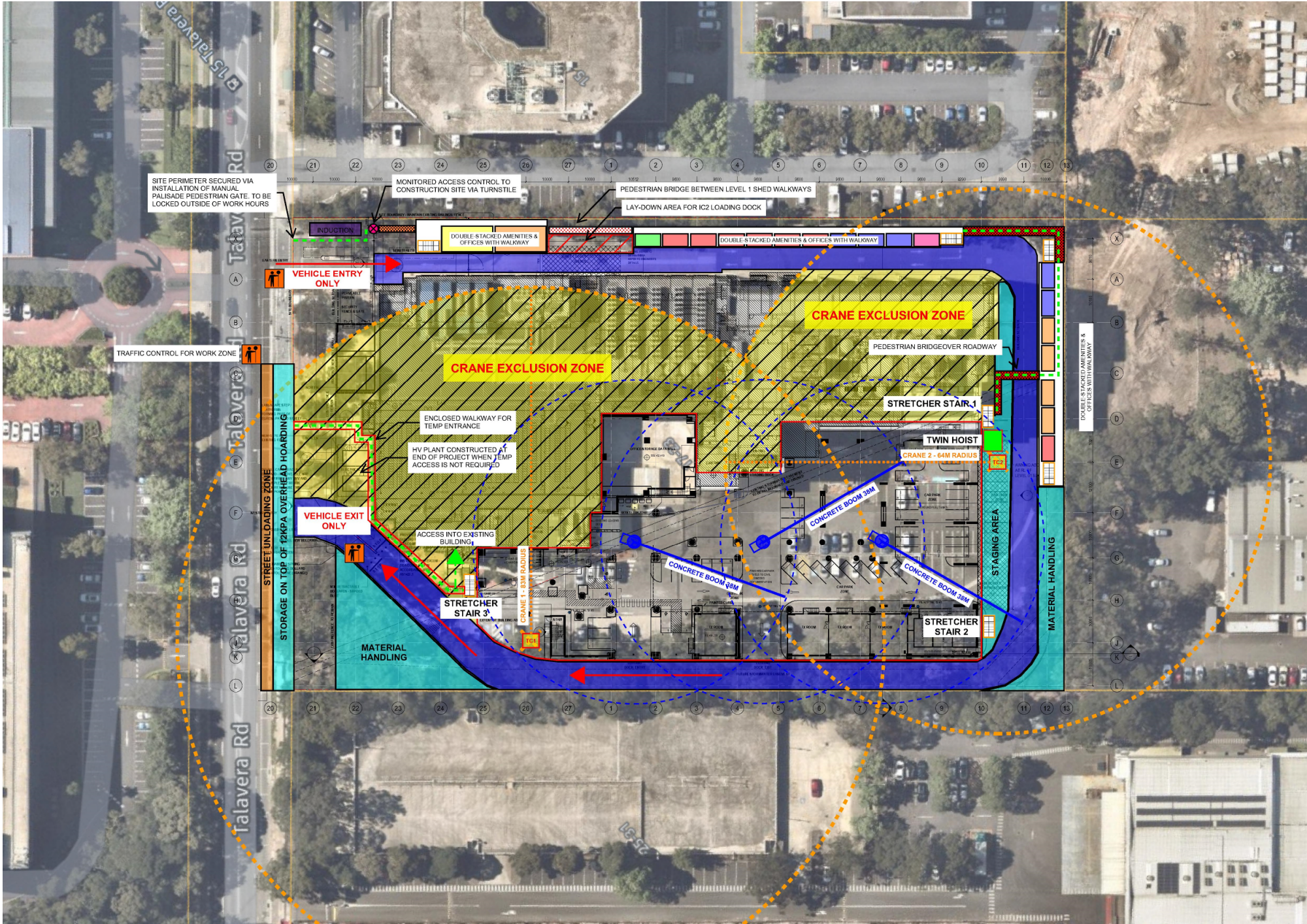
Table 1-3: Indicative construction works schedule and durations

Stage	Duration of works	Brief description of works
1. Site establishment	20 days	Site shed, amenities and site access set up
2. Minor demolition works	12 days	Demolition and removal of existing landscaping, asphalt and concrete
3. Earthworks and substructure	146 days	- Trim, fill and prepare building platform - Piling works (piling, reinforcement, concrete) - Strip footing form, reo, pour
4. Structure and facade	320 days	- Form, reo, pour all concrete components of the building - Erect all structural steel - Install all facade components
5. Services and finishes	284 days	- Install of all building services and finishes - Overlaps partly with Stage 4

The proposed works will result in increased noise level during construction. The works undertaken can consist of a mixture of both high and low noise activities. This assessment identifies potentially noisy activities, their impacts on surrounding receivers and outlines management strategies to control the impacts of noise and vibration during the construction stages of the Project.

Figure 2 presents the site establishment plan from FDC.

Figure 2: Site establishment plan



2 Existing noise environment and noise / vibration sensitive receivers

Criteria for the assessment of operational and construction noise are usually derived from the existing noise environment of an area, excluding noise from the subject development.

Fact Sheet B of the NSW EPA *Noise Policy for Industry* (NPfI) outlines two methods for determining the background noise level of an area, being 'B1 – Determining background noise using long-term noise measurements' and 'B2 – Determining background noise using short-term noise measurements'. This assessment has used long-term noise monitoring.

As the noise environment of an area almost always varies over time, background and ambient noise levels need to be determined for the operational times of the proposed development. For example, in a suburban or urban area the noise environment is typically at its minimum at 3am in the morning and at its maximum during the morning and afternoon traffic peak hours. The NPfI outlines the following standard time periods over which the background and ambient noise levels are to be determined:

- Day: 07:00-18:00 Monday to Saturday and 08:00-18:00 Sundays & Public Holidays
- Evening: 18:00-22:00 Monday to Sunday & Public Holidays
- Night: 22:00-07:00 Monday to Saturday and 22:00-08:00 Sundays & Public Holidays

2.1 Environmental noise monitoring

At the time of preparing the SSDA noise and vibration assessment report, the COVID-19 pandemic and lockdowns within Greater Sydney were impacting the ambient noise environment and restricting the possibility of undertaking noise monitoring for the purposes of establishing background noise levels.

As such, the SSDA noise and vibration assessment report relied on noise measurement data collected by RT&A at 82 Waterloo Road, Macquarie Park (in 2016) and noise data presented within the AECOM prepared *Macquarie Park Data Centre - Environmental Impact Statement – Appendix J Noise and Vibration Assessment* (reference: 60628128-RPNV-02, Revision B, dated 9 November 2020) (EIS 2020). The EIS 2020 was sourced via the DPHI Planning Portal and was prepared for 11-17 Khartoum Road and 33-39 Talavera Road, Macquarie Park, which is located in proximity to the Project site.

Additional noise measurements have recently been conducted which improve the understanding of the local noise environment. Measurements were conducted on the elevated balconies of the residential apartment tower at 1-15 Fontenoy Road, Macquarie Park by RT&A (in 2024) and by SLR Consulting as part of *SSDA Noise Impact Assessment Macquarie Park Logistics Warehouse (SSD-46011220)* (reference: 610.30904.00100-R01-v1.3-20230120, dated January 2023). The noise impact assessment by SLR Consulting was sourced via the DPHI Planning Portal and was prepared for a proposed warehouse facility at 4-38 Talavera Road, Macquarie Park, which is located in proximity to the Project site.

The measured background noise levels around the Project site are summarised in Table 2-1.

Table 2-1: Long-term noise monitoring results, dB(A)

ID	Monitoring location	Rating Background Level (RBL), LA90,15min		
		Day ¹	Evening ²	Night ³
L1	Unit 6, 37 Khartoum Road, Macquarie Park	45	45	38
L2	82 Waterloo Road, Macquarie Park ⁴	52	48	40
L3	7 Booth Street, Marsfield	42	42	33
L4	1-15 Fontenoy Road, Macquarie Park, Level 3	60	56	45
L5	1-15 Fontenoy Road, Macquarie Park, Level 7, Unit 188	70	64	51
L6	1-15 Fontenoy Road, Macquarie Park, Level 7, Unit 192	57	55	48

- Notes:
- 1. Day: 7:00am to 6:00pm Monday to Saturday and 8:00am to 6:00pm Sundays and public holidays
 - 2. Evening: 6:00pm to 10:00pm Monday to Sunday and public holidays
 - 3. Night 10:00pm to 7:00am Munday to Saturday and 10:00pm to 8:00am Sundays and public holidays
 - 4. As required by the NPfl, the external ambient noise levels presented are free-field noise levels (ie. no facade reflection)

3 Construction noise and vibration objectives

3.1 Construction hours

3.1.1 Standard construction hours

The NSW Interim Construction Noise Guideline (ICNG) recommends the following standard construction hours:

- Monday to Friday 7:00am to 6:00pm
- Saturday 8:00am to 1:00pm
- Sunday and public holidays No work performed

However, Condition B1 of the Development Consent (January 2024) approves extended works hours up to 7:00pm on Monday to Friday and up to 3:00pm on Saturdays.

Therefore, the approved standard hours are:

- Monday to Friday 7:00am to 7:00pm
- Saturday 8:00am to 3:00pm
- Sunday and public holidays No work performed

We are advised that the construction works are proposed to take place during these approved hours.

3.1.2 Works outside standard construction hours

There are no out-of-hours ('OOH') works proposed for the construction of the subject expansion to the existing data centre.

As per Consent Condition B2, construction works may be undertaken outside the approved hours identified in Condition B1 in the following circumstances, what are to be confirmed following approval:

1. Works that are inaudible at the nearest sensitive receivers
2. Works agreed to in writing by the Planning Secretary
3. For the delivery of materials required outside these hours by the NSW Police force or other authorities for safety reasons
4. Where it is required in an emergency to avoid the loss of lives, property or to prevent environmental harm.

3.2 Noise management levels (NMLs)

3.2.1 NSW *Interim Construction Noise Guideline* (ICNG)

The NSW *Interim Construction Noise Guideline* (ICNG, 2009) provides guidelines for assessing noise generated during the construction phase of developments.

The key components of the guideline that are incorporated into this assessment include:

- Identification and minimisation of noise from construction works
- Encourage construction during standard hours, unless approval is given for works that cannot be undertaken during these hours
- Use of L_{Aeq} as the descriptor for measuring and assessing construction noise.

NSW noise policies, including the INP, RNP and RING have moved to the primary use of L_{Aeq} over any other descriptor. As an energy average, L_{Aeq} provides ease of use when measuring or calculating noise levels since a full statistical analysis is not required as when using, for example, the L_{A10} descriptor.

- Establishment of 'Noise Management Levels'. These are noise levels which if exceeded, trigger the need to consider the application of feasible and reasonable noise mitigation. They are not intended to act as a prohibition on an activity if the trigger level is expected to be exceeded.
- As stated in the ICNG, a noise mitigation measure is feasible if it is capable of being put into practice, and is practical to build given the project constraints.
- Selecting reasonable mitigation measures from those that are feasible involves making a judgement to determine whether the overall noise benefit outweighs the overall social, economic and environmental effects.

The ICNG provides two methods for assessment of construction noise, being either a quantitative or a qualitative assessment. A quantitative assessment is recommended for major construction projects of significant duration, and involves the measurement and prediction of noise levels, and assessment against set criteria. A qualitative assessment is recommended for small projects with a duration of less than three weeks and focuses on minimising noise disturbance through the implementation of reasonable and feasible work practices, and community notification.

Given the scale of the construction works proposed, a quantitative assessment is carried out herein, consistent with the ICNG requirements.

Table 3-1, reproduced from the ICNG, sets out the noise management levels and how they are to be applied for residential receivers.

Table 3-1: Noise management levels at residential receivers

Time of day	Management level L_{Aeq} (15 min) *	How to apply
Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Noise affected RBL + 10dB	The noise affected level represents the point above which there may be some community reaction to noise. - Where the predicted or measured L_{Aeq} (15 min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. - The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. - Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: - times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences) - if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected RBL + 5dB	- A strong justification would typically be required for works outside the recommended standard hours. - The proponent should apply all feasible and reasonable work practices to meet the noise affected level. - Where all feasible and reasonable practices have been applied and noise is more than 5dB(A) above the noise affected level, the proponent should negotiate with the community. - For guidance on negotiating agreements see section 7.2.2 <i>[of the ICNG]</i>.

* Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.

Table 3-2 sets out the ICNG noise management levels for other noise sensitive receiver locations. As identified for residential receivers, a 'highly affected' noise objective of $L_{Aeq(15min)}$ 75dB(A) is adopted for all noise sensitive receivers, with exceedances addressed as described in Table 3-1.

Table 3-2: Noise management levels at other noise sensitive land uses

Land use	Where objective applies	Management level L_{Aeq} (15 min)
Classrooms at schools and other educational institutions	Internal noise level	45 dB(A)
	External noise level ¹	65 dB(A)
Hospital wards and operating theatres	Internal noise level	45 dB(A)
	External noise level ¹	65 dB(A)
Places of worship	Internal noise level	45 dB(A)
	External noise level ¹	65 dB(A)
Active recreation areas	External noise level	65 dB(A)

Land use	Where objective applies	Management level L_{Aeq} (15 min)
Passive recreation areas	External noise level	60 dB(A)
Commercial premises	External noise level	70 dB(A)
Industrial premises	External noise level	75 dB(A)

- Notes:
1. External noise levels based on internal noise level in ICNG and assumes 20dB attenuation through a closed window
 2. Noise management levels apply when receiver areas are in use only.

3.2.2 Summary of construction noise management levels

Table 3-3 presents the construction noise management levels established for the nearest noise sensitive residential receivers and other sensitive receivers in accordance with the ICNG. The assessment locations and nearby sensitive receivers for the construction assessment are identified in Section 1.3.

With respect to NCA1, the additional noise measurements recently conducted on the elevated balconies of the residential apartment tower at 1-15 Fontenoy Road, Macquarie Park (NCA1b and NCA1c) found the upper level receivers to be subject to higher ambient noise levels as they have a greater exposure to the M2 Motorway. As a conservative approach, this assessment has still applied the lower background noise level of 45dB(A) measured at Location L1 (Unit 6, 37 Khartoum Road, Macquarie Park) to all receivers in NCA1, including elevated receiver locations within NCA1b and NCA1c.

Table 3-3: Construction noise management levels

ID	Location description	Noise management level $L_{Aeq}(15min)$
		Monday to Fridays (7am to 6pm) Saturdays (8am to 1pm)
NCA1	Residences on north-eastern side of the M2 Motorway	55
NCA1a	Residences on ground floor and Level 1 of 1-15 Fontenoy Road, Macquarie Park	55
NCA1b	Residences on Levels 2-4 of 1-15 Fontenoy Road, Macquarie Park	55
NCA1c	Residences on Levels 5-7 of 1-15 Fontenoy Road, Macquarie Park	55
NCA2	Residences west of site near Waterloo Road	62
NCA3	Residences south-west of site near Epping Road	52
R11-R15	Childcare centre – classroom (external)	65 ^{1,2}
	Childcare centre - playground	65 ¹
R16-R17	Education - classroom (external)	65 ^{1,2}
R21	Medical - operating theatres (external)	65 ^{1,2}
R22-R32	Commercial	70 ¹

Notes:

1. Noise management levels apply when receiver areas are in use only.
2. External noise management level assuming a 20 dB(A) outside-to-inside loss through a closed window.
3. Noise management levels based on daytime RBL. Analysis of the long-term noise monitoring data reveals L_{A90} levels from 6:00am to 7:00am and 6:00pm to 7:00pm Mondays to Friday; 6:00am to 7:00am Saturday; and 7:00am to 8:00am Sunday are typically louder than the quietest part of the day.

3.3 Construction Vibration Objectives

As presented in Section 1.1, Conditions B8 and B9 refer to the construction vibration objectives approved for the SSD.

VIBRATION

Vibration Criteria

B8. *Vibration caused by construction at any residence or structure outside the site must be limited to:*

- for structural damage, the latest version of DIN 4150-3:2016-12 Vibration in buildings – Part 3: Effects on Structures (German Institute for Standardisation); and*
- for human exposure, the acceptable vibration values set out in the Environmental Noise Management Assessing Vibration: A technical guideline (DEC, 2006) (as may be updated or replaced from time to time).*

B9. *The limits in condition B8 apply unless otherwise outlined in the development's CNVMP (see condition B4).*

It is interpreted that Condition B8 does not prevent the consideration of British Standard 7385: Part 2 'Evaluation and measurement of vibration in buildings' in the CNVMP as per Condition B9.

3.3.1 Disturbance to building occupants

The acceptable vibration values to assess the potential for human annoyance from vibration are set out in the NSW 'Environmental Noise Management Assessing Vibration: A Technical Guideline' (AVTG).

To assess the potential for vibration impact on human comfort, an initial screening test will be done based on peak velocity units, as this metric is also used for the cosmetic damage vibration assessment. The screening test is based on the continuous vibration velocity (i.e. vibration that continues uninterrupted for a defined period). If the predicted vibration exceeds the initial screening test, the total estimated Vibration Dose Value (i.e. eVDV) will be determined based on the level and duration of the vibration event causing exceedance.

The initial screening test values and VDV's recommended in BS 6472-1992 for which various levels of adverse comment from occupants may be expected, are presented in Table 3-4. The 'Low probability of adverse comment eVDV' represent the preferred and maximum value presented in the AVTG.

Table 3-4: Vibration management levels for disturbance to building occupants

Place and Time	Initial screening test Velocity, PEAK, mm/s (> 8Hz)	Low probability of adverse comment eVDV m/s ^{1.75}	Adverse comment possible eVDV m/s ^{1.75}	Adverse comment probable eVDV m/s ^{1.75}
Critical areas (day or night) ¹	0.28	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8
Residential buildings 16 hr day ²	0.56	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8 hr night ²	0.40	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8
Offices, schools, educational institutions and places of worship (day or night)	1.10	0.4 to 0.8	0.8 to 1.6	1.6 to 2.4
Workshops (day or night)	2.20	0.8 to 1.6	1.6 to 3.2	3.2 to 6.4

Notes 1. Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring. There may be cases where sensitive equipment or delicate tasks require more stringent criteria than the human comfort criteria specify above

2. Daytime is 7am to 10pm and night-time is 10pm to 7am

3.3.2 Building damage

Potential structural damage of buildings as a result of vibration is typically managed by ensuring vibration induced into the structure does not exceed certain limits and standards, such as British Standard 7385 Part 2 and German Standard DIN 4150-3. Currently there is no existing Australian Standard for assessment of structural building damage caused by vibration energy.

It is noted that vibration levels required to cause minor cosmetic damage are typically 10 times higher than levels that will cause disturbance to building occupants. Many building occupants assume that building damage is occurring when they feel vibration or observe rattling of loose objects, however the

level of vibration at which people perceive vibration or at which loose objects may rattle is far lower than vibration levels that can cause damage to structures.

Within British Standard 7385 Part 1, different levels of structural damage are defined:

- *Cosmetic - The formation of hairline cracks on drywall surfaces, or the growth of existing cracks in plaster or drywall surfaces; in addition the formation of hairline cracks in mortar joints of brick/concrete block construction.*
- *Minor - The formation of large cracks or loosening of plaster or drywall surfaces, or cracks through bricks/concrete blocks.*
- *Major - Damage to structural elements of the building, cracks in supporting columns, loosening of joints, splaying of masonry cracks, etc.*

The vibration limits in Table 1 of British Standard 7385 Part 2 are for the protection against cosmetic damage, however guidance on limits for minor and major damage is provided in Section 7.4.2 of the Standard:

7.4.2 Guide values for transient vibration relating to cosmetic damage

Limits for transient vibration, above which cosmetic damage could occur are given numerically in Table 1 and graphically in Figure 1. In the lower frequency region where strains associated with a given vibration velocity magnitude are higher, the guide values for the building types corresponding to line 2 are reduced. Below a frequency of 4 Hz, where a high displacement is associated with a relatively low peak component particle velocity value a maximum displacement of 0.6 mm (zero to peak) should be used.

Minor damage is possible at vibration magnitudes which are greater than twice those given in Table 1, and major damage to a building structure may occur at values greater than four times the tabulated values.

Within DIN 4150-3, damage is defined as “any permanent consequence of an action that reduces the serviceability of a structure or one of its components” (p.4). The Standard also outlines:

"For buildings as in lines 2 and 3 of Tables 1, 4 or B.1, the serviceability is considered to have been reduced if, for example

- *cracks form in plastered or rendered surfaces of walls;*
- *existing cracks in a structure are enlarged;*
- *partitions become detached from load-bearing walls or floor slabs.*

These effects are deemed 'minor damage. " (DIN 4150.3:2016, p.6)

While the DIN Standard defines the above damage as 'minor', based on the definitions provided in BS 7385, the DIN standard is considered to deal with cosmetic issues rather than major structural failures.

3.3.2.1 British Standard

British Standard 7385: Part 2 '*Evaluation and measurement of vibration in buildings*', can be used as a guide to assess the likelihood of building damage from ground vibration. BS 7385 suggests levels at which 'cosmetic', 'minor' and 'major' categories of damage might occur.

The cosmetic damage levels set by BS 7385 are considered 'safe limits' up to which no damage due to vibration effects has been observed for certain particular building types. Damage comprises minor non-structural effects such as hairline cracks on drywall surfaces, hairline cracks in mortar joints and cement render, enlargement of existing cracks and separation of partitions or intermediate walls from load bearing walls. 'Minor' damage is considered possible at vibration magnitudes which are twice those given and 'major' damage to a building structure may occur at levels greater than four times those values.

BS 7385 is based on peak particle velocity and specifies damage criteria for frequencies within the range 4Hz to 250Hz, being the range usually encountered in buildings. At frequencies below 4Hz, a maximum displacement value is recommended. The values set in the Standard relate to transient vibrations and to low-rise buildings. Continuous vibration can give rise to dynamic magnifications due to resonances and may need to be reduced by up to 50%. Table 3-5 sets out the BS 7385 criteria for cosmetic, minor and major damage.

Regarding heritage buildings, BS 7385 Part 2 (1993) notes that "*a building of historical value should not (unless it is structurally unsound) be assumed to be more sensitive*" (p.5).

Table 3-5: BS 7385 structural damage criteria

Group	Type of structure	Damage level	Peak component particle velocity, mm/s		
			4Hz to 15Hz	15Hz to 40Hz	40Hz and above
1	Reinforced or framed structures Industrial and heavy commercial buildings	Cosmetic	50		
		Minor*	100		
		Major*	200		
2	Un-reinforced or light framed structures Residential or light commercial type buildings	Cosmetic	15 to 20	20 to 50	50
		Minor*	30 to 40	40 to 100	100
		Major*	60 to 80	80 to 200	200

Notes: Peak Component Particle Velocity is the maximum Peak particle velocity in any one direction (x, y, z) as measured by a tri-axial vibration transducer.

* Minor and major damage criteria established based on British Standard 7385 Part 2 (1993) Section 7.4.2

3.3.2.2 German Standard

German Standard DIN 4150 - Part 3 (2016) '*Vibration in buildings - Effects on Structures*' (DIN 4150-3:2016), also provides recommended maximum levels of vibration that reduce the likelihood of building damage caused by vibration and are generally recognised to be conservative.

DIN 4150-3:2016 presents the recommended maximum limits over a range of frequencies (Hz), measured at the foundations, in the plane of the uppermost floor of a building or structure or vertically on floor slabs. The vibration limits at the foundations increase as the frequency content of the vibration increases. The criteria are presented in Table 3-6.

Table 3-6: DIN 4150-3:2016 structural damage criteria

Group	Type of structure	Vibration velocity, mm/s				
		At foundation in all directions at frequency of			Plane of floor uppermost storey in horizontal direction	Floor slabs, vertical direction
		1Hz to 10Hz	10Hz to 50Hz	50Hz to 100Hz	All frequencies	All frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40	20
2	Residential buildings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15	20
3	Structures that because of their particular sensitivity to vibration, cannot be classified under Groups 1 and 2 and are of great intrinsic value (eg listed buildings)	3	3 to 8	8 to 10	8	20

4 Construction noise assessment

4.1 Construction traffic

The construction works will generate additional traffic movements in the form of:

- Light vehicle movements generated by construction personnel travelling to and from work
- Heavy vehicle movements generated by:
 - o Delivery vehicles bring raw materials, plant and equipment to the site
 - o Concrete trucks

Noise emission from the vehicle movements on site is included as part of the construction noise assessment. When the construction-related traffic is on the public road network, a different noise assessment methodology is appropriate as it would be regarded as additional traffic generated on the public road network rather than a part of activities on the construction site.

Access to the site will be from Talavera Road. We are advised that due to Council feedback on the CTMP, there will be minimal deliveries through peak periods (8:00am – 9:30am and 4:30pm – 6:00pm). The only exemption to this will be for large concrete pours which will have up to three to four concrete trucks accessing the site per hour. This volume of heavy vehicles is not expected to significantly alter existing traffic noise and for the majority of construction works, will be significantly lower. Furthermore, there are no noise-sensitive residential receiver located along Talavera Road.

The generation of additional traffic on the public road network by the construction works is not expected to give rise to any significant noise impacts and is not further addressed in this report.

4.2 Construction noise sources

The schedule of plant and equipment items likely to be used during the construction phases of the Project is presented in Table 4-1 below.

Table 4-1: Typical construction equipment & sound power levels, dB(A) re 1pW

Plant item	Plant description	Estimated number of items	Sound power levels L _{Aeq} (15min)
Stage 1 - Site establishment			
1	Delivery trucks	1-2	108
2	Mobile cranes	2	105
3	Excavator (10T)	2	103
Stage 2 – Minor demolition works			
4	Truck & dog	1-2	108
5	Bobcat	1	102

Plant item	Plant description	Estimated number of items	Sound power levels L _{Aeq} (15min)
6	Excavator (8-35T)	3	103
7	Watercart	1	104
Stage 3 – Earthworks and substructure			
8	Dump trucks	1-2	108
9	Tower crane	2	105
10	Bobcat	1	102
11	Excavator (15-35T)	2	103
12	Watercart	1	104
13	Pilling rig – bored	1-2	108
14	Grader	1	109
15	Vibratory roller	1	113 ¹
Stage 4 – Structure and facade			
16	Delivery trucks	1-2	108
17	Tower crane	2	105
18	Concrete pump	2	102
19	Concrete trucks	2	108
20	Non-powered hand tools	Various	98
21	Concrete vibrator	4	99
22	Hand tools	Various	107
Stage 5 – Services and finishes			
23	Delivery trucks	1-2	108
24	Non-powered hand tools	Various	98
25	Bobcat	1	102
26	Hand tools	Various	107
27	Scissor lift (internal)	12	95

Notes 6. A 5 dB(A) penalty has been factored into the sound power level to allow for particularly annoying activities

The sound power levels for the majority of construction plant and equipment presented in the above table are based on maximum noise levels given in Table A1 of Australian Standard 2436 - 2010 'Guide to Noise Control on Construction, Demolition and Maintenance Sites', the Interim Construction Noise Guideline (ICNG), information from past projects and/or information held in our library files.

4.3 Noise prediction methodology

A noise model was developed for the Project using the CadnaA computer modelling program and noise levels were predicted using the noise propagation algorithm ISO 9613-2 (1996).

The noise prediction model considers:

- Location of noise sources and sensitive receiver building locations

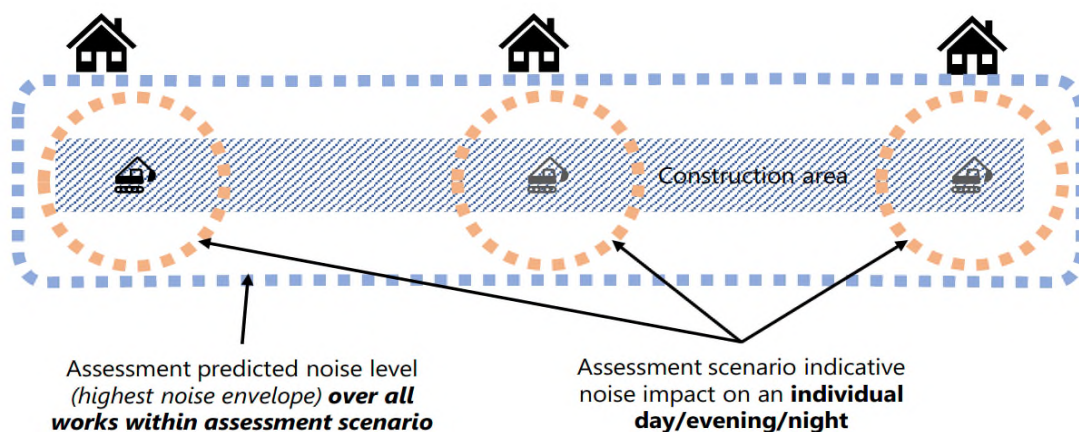
- Height of sources and receivers referenced to digital ground contours for the site and surrounding area
- Sound Power Levels (Lw) of plant and equipment likely to be used during the various construction activities
- Separation distances between sources and receivers
- Acoustic shielding, potential reflections and attenuation from intervening structures, barriers and topography (natural and purpose built)
- Ground absorption between the source and receiver

The predicted levels are conservative and represent the equipment / plant operating simultaneously in any 15-minute period. Where plant items are not operating simultaneously, or for reduced times in a 15-minute period, noise impacts could be lower than predicted.

A 5 dB(A) penalty in accordance with the ICNG has been factored into the noise modelling levels where applicable to allow for particularly annoying activities, such as the operation of the vibratory roller.

For the predicted noise levels in Section 4.4 that are the upper end of the range, these noise levels assume that the assessed activities could occur at the closest point to each receiver. While in practice, high noise generating construction works would occur at different locations throughout the work area, resulting in differing noise levels at each receiver. This means that predicted noise levels are only likely to occur when works are at the closest point to each receiver. The noise impacts may be lower than predicted as the construction activities move around or progress around the construction site, as shown by the lower end of the range in Section 4.4. This concept is demonstrated in Figure 3 and should be considered when reviewing the predicted noise levels in this assessment.

Figure 3: Predicted noise level range over works area



4.4 Predicted noise levels

Noise levels at any receiver location resulting from construction works would depend on the location of the receiver with respect to the area of construction, shielding from intervening topography and structures, and the type and duration of construction being undertaken. Furthermore, noise levels at receivers would vary significantly over the total construction program due to the transient nature and large range of plant and equipment that could be used.

Construction noise levels were predicted by modelling the noise sources, receiver locations, and operating activities.

Table 4-2 presents noise levels likely to be experienced at the nearby affected receivers based on the construction activities, and plant / equipment associated with the Project, where the range represents the plant items operating at a location furthest away and a location closest to each receiver. Noise levels were calculated taking into consideration attenuation due to distance between the construction works and the receiver locations and any intervening structures. The noise predictions are conservative and do not incorporate acoustic shielding provided by hoarding. For the internal building fit-out works, the predictions include a modest 20dB(A) loss from inside-to-outside through the building fabric.

The worst affected receivers are typically the receivers with direct line-of-sight to the construction work area. Receivers located without direct line-of-sight to the construction area would typically be exposed to construction noise levels 5 to 10 dB(A) lower than the levels predicted for the worst affected receivers.

Table 4-2: Predicted L_{Aeq(15min)} noise levels for construction plant and activities, dB(A)

Receiver ID	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16	R17	R18	R19	R20	R21	R22	R23	R24	R25	R26	R27	R28	R29	R30	R31	R32	
NCA	NCA1a	NCA1b	NCA1c	1	1	1	2	2	2	3	1	1	2	2	2	2	2	1	1	2	1	1	1	1	1	1	2	1	2	2	1		
Receiver type ²	RES	RES	RES	RES	RES	RES	RES	RES	RES	RES	OSR_ CHC	OSR_ CHC	OSR_ CHC	OSR_ CHC	OSR_ CHC	OSR_ EDU	OSR_ EDU	OSR_ HOT	OSR_ HOT	OSR_ HOT	OSR_ MED	OSR_ COM	OSR_ COM	OSR_ COM	OSR_ COM	OSR_ COM	OSR_ COM	OSR_ COM	OSR_ COM	OSR_ COM	OSR_ COM		
NML dB(A)	55	55	55	55	55	55	62	62	62	52	65	65	65	65	65	65	65	70	70	70	65	70	70	70	70	70	70	70	70	70	70	70	
Stage 1 - Site establishment																																	
1. Delivery trucks	<20	<20	23	28	31	30	29	23	24	23	37	34	29	26	<20	52	33	27	<20	<20	<20	46	40	54	50	50	45	54	46	36	38	<20	
2. Mobile crane	<20-22	<20-23	<20-26	23-27	34-35	34-41	26-40	25-32	<20-32	29-30	25-47	36-44	21-38	24-33	<20-26	49-62	35-36	22-24	<20	<20-25	25-27	26-40	41-49	32-42	32-37	55-57	48-54	53-60	47-54	24-43	41-44	22-27	
3. Excavator (10T)	<20-22	<20-25	<20-31	<20-27	21-40	27-42	21-38	<20-35	<20-33	<20-29	22-47	30-48	<20-36	21-27	<20-26	45-59	<20-35	<20-29	<20-31	<20-29	22-25	23-51	38-52	28-48	26-42	52-57	45-53	49-63	34-54	<20-42	31-44	<20-26	
Up to 3 noisiest plant operating concurrently + vehicle movements on site	21-27	22-30	25-35	29-33	36-44	37-47	31-44	28-39	26-38	30-34	38-52	39-52	30-42	30-35	21-31	55-65	37-41	29-34	20-34	22-33	29-31	46-55	46-56	54-56	50-51	59-62	52-58	58-67	49-59	37-47	43-49	26-31	
Stage 2 - Minor demolition works																																	
4. Truck & dog	<20	<20	23	28	31	30	29	23	24	23	37	34	29	26	<20	52	33	27	<20	<20	<20	46	40	54	50	50	45	54	46	36	38	<20	
5. Bobcat	<20-21	<20-24	<20-30	<20-26	<20-39	26-41	<20-37	<20-34	<20-32	<20-28	21-46	29-47	<20-35	20-26	<20-25	44-58	<20-34	<20-28	<20-30	<20-28	21-24	22-50	37-51	27-47	25-41	51-56	44-52	48-62	33-53	<20-41	30-43	<20-25	
6. Excavator (8-35T)	<20-22	<20-25	<20-31	<20-27	21-40	27-42	21-38	<20-35	<20-33	<20-29	22-47	30-48	<20-36	21-27	<20-26	45-59	<20-35	<20-29	<20-31	<20-29	22-25	23-51	38-52	28-48	26-42	52-57	45-53	49-63	34-54	<20-42	31-44	<20-26	
7. Watercart	<20-23	<20-26	<20-32	<20-28	22-41	28-43	22-39	21-36	<20-34	<20-30	23-48	31-49	<20-37	22-28	<20-27	46-60	<20-36	<20-30	<20-32	<20-30	23-26	24-52	39-53	29-49	27-43	53-58	46-54	50-64	35-55	20-43	32-45	21-27	
Up to 3 noisiest plant operating concurrently + vehicle movements on site	20-27	22-31	25-36	28-33	32-46	34-48	31-43	27-40	25-38	24-35	38-52	37-53	30-42	29-33	21-32	54-64	33-41	28-35	20-36	21-34	28-31	46-56	45-57	54-57	50-52	58-63	51-58	57-68	46-60	36-47	40-49	26-31	
Stage 3 - Earthworks and substrate																																	
8. Dump truck	<20	<20	23	28	31	30	29	23	24	23	37	34	29	26	<20	52	33	27	<20	<20	<20	46	40	54	50	50	45	54	46	36	38	<20	
9. Tower crane	34-35	34-37	36-39	36-37	36-39	38-42	38-38	36-38	27-36	29-32	40-47	40-46	32-42	31-35	31-37	52-60	35-37	40-41	29-30	34-36	28-30	44-49	46-51	42-52	47-52	54-56	48-54	53-60	46-53	33-48	42-45	25-27	
10. Bobcat	<20-21	<20-24	<20-30	<20-26	<20-39	26-41	<20-37	<20-34	<20-32	<20-28	21-46	29-47	<20-35	20-26	<20-25	44-58	<20-34	<20-28	<20-30	<20-28	21-24	22-50	37-51	27-47	25-41	51-56	44-52	48-62	33-53	<20-41	30-43	<20-25	
11. Excavator (15-35T)	<20-22	<20-25	<20-31	<20-27	21-40	27-42	21-38	<20-35	<20-33	<20-29	22-47	30-48	<20-36	21-27	<20-26	45-59	<20-35	<20-29	<20-31	<20-29	22-25	23-51	38-52	28-48	26-42	52-57	45-53	49-63	34-54	<20-42	31-44	<20-26	
12. Watercart	<20-23	<20-26	<20-32	<20-28	22-41	28-43	22-39	21-36	<20-34	<20-30	23-48	31-49	<20-37	22-28	<20-27	46-60	<20-36	<20-30	<20-32	<20-30	23-26	24-52	39-53	29-49	27-43	53-58	46-54	50-64	35-55	20-43	32-45	21-27	
13. Piling rig - bored	<20-27	<20-30	<20-36	20-32	26-45	32-47	26-43	25-40	<20-38	<20-34	27-52	35-53	22-41	26-32	<20-31	50-64	<20-40	22-34	<20-36	<20-34	27-30	28-56	43-57	33-53	31-47	57-62	50-58	54-68	39-59	24-47	36-49	25-31	
14. Grader	<20-28	<20-31	<20-37	21-33	27-46	33-48	27-44	26-41	<20-39	<20-35	28-53	36-54	23-42	27-33	20-32	51-65	21-41	23-35	<20-37	<20-35	28-31	29-57	44-58	34-54	32-48	58-63	51-59	55-69	40-60	25-48	37-50	26-32	
15. Vibratory roller	23-32	23-35	24-41	25-37	31-50	37-52	31-48	30-45	23-43	21-39	32-57	40-58	27-46	31-37	24-36	55-69	25-45	27-39	22-41	24-39	32-35	33-61	48-62	38-58	36-52	62-67	55-63	59-73	44-64	29-52	41-54	30-36	
Up to 3 noisiest plant operating concurrently + vehicle movements on site	34-37	35-40	37-44	37-41	38-52	42-54	39-50	37-47	30-45	31-41	42-58	44-60	35-49	36-40	32-40	58-71	37-47	41-44	30-42	35-42	34-37	48-63	52-63	54-61	52-57	64-69	57-64	62-75	50-66	39-54	46-56	32-38	
Stage 4 - Structure and façade																																	
16. Delivery trucks	<20	<20	23	28	31	30	29	23	24	23	37	34	29	26	<20	52	33	27	<20	<20	<20	46	40	54	50	50	45	54	46	36	38	<20	
17. Tower crane	34-35	34-37	36-39	36-37	36-39	38-42	38-38	36-38	27-36	29-32	40-47	40-46	32-42	31-35	31-37	52-60	35-37	40-41	29-30	34-36	28-30	44-49	46-51	42-52	47-52	54-56	48-54	53-60	46-53	33-48	42-45	25-27	
18. Concrete pump	<20	<20-20	<20-24	<20-22	28-33	31-39	22-26	29-30	<20-27	27-28	28-31	34-38	<20-24	21-23	<20-25	51-55	<20-33	<20	<20	22-26	22-23	32-36	39-42	29-38	26-28	53-54	46-49	54-58	47-50	22-34	40-41	<20-22	
19. Concrete trucks	<20-24	<20-28	21-31	25-36	36-39	37-44	28-37	31-36	23-33	31-33	36-45	40-44	26-37	28-34	23-31	59-61	38-41	22-35	<20-25	25-30	28-28	41-54	45-48	35-62	32-58	58-59	52-53	62-64	53-54	31-44	46-47	26-28	
20. Non-powered hand tools	<20	<20-20	<20-26	<20-22	<20-35	22-37	<20-33	<20-30	<20-28	<20-24	<20-42	25-43	<20-31	<20-22	<20-21	40-54	<20-30	<20-24	<20-26	<20-24	<20-20	<20-46	33-47	23-43	21-37	47-52	40-48	44-58	29-49	<20-37	26-39	<20-21	
21. Concrete vibrator	<20	<20-21	<20-27	<20-23	<20-36	23-38	<20-34	<20-31	<20-29	<20-25	<20-43	26-44	<20-32	<20-23	<20-22	41-55	<20																

4.5 Discussion of construction noise results

The predicted noise levels presented above indicate that the noise levels during the phases of construction are likely to achieve the NML at most of the nearby sensitive receivers and at all residential locations. No receivers are predicted to be highly noise affected (i.e., exposed to noise levels greater than 75 dB(A)).

The predictions identify Receivers R16 (Excelsia College at 63-71 Waterloo Road, Macquarie Park) and R28 (commercial premises at 1-5 Khartoum Road, Macquarie Park) located adjacent to the Project site are most likely to be impacted by construction noise. At these receivers, there may be times when the use of loud equipment such as a vibratory roller or a number of concurrent construction activities may result in construction noise levels being over the NML, particularly when these activities are operating in close proximity to these receiver locations.

Noise emissions are predicted to be highest when high noise generating equipment such as piling rigs, graders and vibratory rollers operate close to receivers. For works where high noise generating equipment is not operating, and where the works are occurring within the site further away from receivers, the predicted noise levels are generally below the NMLs.

Considering the predicted noise levels above, it is recommended that a feasible and reasonable approach towards noise mitigation measures be applied to reduce construction noise levels towards achieving the NMLs. Further details on construction noise mitigation and management measures are provided in Section 4.6.

4.6 Construction noise mitigation measures

4.6.1 Noise management measures

The following recommendations provide feasible and reasonable noise control solutions to reduce noise impacts to sensitive receivers. These should be considered and implemented where feasible and reasonable where there is potential for the noise management levels presented in Section 3.2 to be exceeded by the construction works either individually or cumulatively.

Considering the predicted noise levels set out in Section 4.4, the following noise management are recommended for consideration by the contractor and implemented where feasible and reasonable. The advice provided here is in respect of acoustics only. Supplementary professional advice may need to be sought in respect of fire ratings, structural design, buildability, fitness for purpose and the like.

Table 4-3 summarises actions that can be applied to manage the potential for noise to impact on sensitive receivers near the Project construction works, which are to be applied where reasonable and feasible.

Table 4-3: Noise mitigation and management measures

Action	Applies to	Details	Estimated noise benefit
At-source mitigation measures			
Equipment selection	Airborne noise Vibration	Use quieter and less noise/vibration emitting construction methods where feasible and reasonable. Where loud plant and/or equipment are being used in construction works, where feasible and reasonable the selection of alternative quieter plant and/or equipment should be considered for tasks.	Variable. Minimise noise impact and reduce risk of annoyance.
Equipment noise and vibration levels	Airborne noise Vibration	Plant and equipment must be properly maintained. Provide special attention to the use and maintenance of 'noise control' or 'silencing' kits fitted to machines to ensure they perform as intended.	Variable. Minimise noise impact and reduce risk of annoyance.
Rental plant and equipment	Airborne noise	The noise levels of plant and equipment items are to be considered in rental decisions, with quieter and less noise/vibration emitting construction methods where feasible and reasonable.	Variable. Minimise noise impact and reduce risk of annoyance.
Use and siting of plant	Airborne noise Vibration	- Simultaneous operation of noisy plant within discernible range of a sensitive receiver is to be avoided. - The offset distance between noisy plant and adjacent sensitive receivers is to be maximised. - Plant used intermittently to be throttled down or shut down. - Noise-emitting plant to be directed away from sensitive receivers. - Any equipment not in use for extended periods during construction work must be switched off.	Up to 20 dB reduction + reduce vibration
Silencers on mobile plant	Airborne noise	Where possible reduce noise from mobile plant through additional fittings including: - Residential grade mufflers - Air parking brake engagement is silenced. Ensure plant including the silencer is well maintained.	0-20 dB reduction Reduce annoyance
Prefabrication of materials off-site	Airborne noise	Where practicable, pre-fabricate and/or prepare materials off-site to reduce noise with special audible characteristics occurring on site. Materials can then be delivered to site for installation.	5-20 dB reduction Reduce noise/vibration impact + risk of annoyance
Engine compression brakes	Airborne noise	Limit the use of engine compression brakes in residential areas. Ensure vehicles are fitted with a maintained original equipment manufacturer exhaust silencer or a silencer that complies with the National Transport Commission's 'In-service test procedure' and standard.	5-20 dB reduction
Reversing alarms	Airborne noise	Use of broadband "quacker" type of reverse/movement alarms instead of the tonal 'beeping" type.	Minimise noise impact and reduce risk of annoyance.
Path mitigation measures			
Site sheds	Airborne noise	The site establishment plan identifies temporary construction offices and amenities to be double-stacked along the eastern and southern facades which provide acoustic shielding to nearby receivers.	Receiver with line of site of the works area: 5-10 dB reduction

Action	Applies to	Details	Estimated noise benefit
Laydown and stockpiling	Airborne noise	The site establishment plan identifies material handling and staging areas that are located along to the southern site boundary. The stockpiling of material at these locations will act as noise mounds and provide acoustic shielding to nearby receivers.	Variable. Minimise noise impact and reduce risk of annoyance.
Management measures			
Implement stakeholder consultation measures	Airborne noise	Letterbox drop detailing all upcoming construction activities delivered to sensitive receivers at least 7 days prior to commencement of relevant works. In particular it is recommended that notification be provided to Excelsia College (R16) to assist with minimising high noise generating construction activities during sensitive periods for these receiver buildings (ie. exam periods) where feasible and reasonable.	Keeps stakeholders informed of the likely impact. Community may identify solution to assist in managing impacts.
Site inductions	Airborne noise Vibration	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: • All relevant project specific and standard noise and vibration mitigation measures • Permissible hours of work • Any limitations on noise generating activities with special audible characteristics • Location of nearest sensitive receivers • Construction employee parking areas • Designated loading/unloading areas and procedures • Site opening/closing times (including deliveries) • Environmental incident procedures.	Keeps construction workforce informed of actions required to minimise noise and vibration impact.
Behavioural practices	Airborne noise	No swearing or unnecessary shouting or loud stereos/radios on site. No dropping of materials from height, throwing of metal items and slamming of doors. No excessive revving of plant and vehicle engines. Controlled release of compressed air.	0-20 dB reduction Reduce annoyance.
Verification monitoring	Airborne noise	In response to noise complaints, a noise monitoring program should be carried out for the duration of works in accordance with the Construction Noise and Vibration Management Plan (CNVMP) or CEMP and any approval conditions.	Minimises noise impacts
Complaints management	Airborne noise Vibration	See Section 6.3 for further details. In addition to the noise mitigation measures outlined above, a management procedure will need to be put in place to deal with noise complaints that may arise from construction activities. Each complaint will need to be investigated and appropriate noise amelioration measures put in place to mitigate future occurrences, where the noise in question is in excess of allowable limits.	Minimise noise impact and reduce risk of annoyance.

Additionally, implementation of noise control measures, such as those suggested in Australian Standard 2436-2010 'Guide to Noise Control on Construction, Demolition and Maintenance Sites', are expected to reduce predicted construction noise levels. Australian Standard 2436-2010, Appendix C, Table C1 suggests possible remedies and alternatives to reduce noise emission levels from typical construction equipment.

4.6.2 Highly noise affected receivers

Where construction noise is likely to be above the 'highly noise affected' level, respite periods should be considered where feasible and reasonable. There are no highly noise affected residential receivers therefore respite periods are not required as a management measure for this project.

4.6.3 Noise monitoring

The following approach could be adopted regarding noise monitoring procedures during the construction works. Details of the procedures for noise monitoring are presented in APPENDIX B.

- In the event of a sustained complaint, noise monitoring may be carried out to examine noise impacts.
 - o Reasonable and feasible noise reduction measures must be investigated, where necessary.
 - o Typically, short term (attended) noise monitoring would be undertaken to investigate a complaint as opposed to ongoing noise logging as this will enable a faster response time.
 - o Where short term attended noise measurements cannot produce a suitable outcome, long term noise monitoring will be considered. Typically, long term monitoring is useful primarily to check if start/finish times or respite periods have been adhered to. Given this limitation, that are not typically proposed in first instance.

5 Construction vibration assessment

5.1 Minimum working distances

The pattern of vibration radiation is very different to the pattern of airborne noise radiation and is very site specific as final vibration levels are dependent on many factors including the actual plant used, its operation and the intervening geology between the activity and the receiver. Potential vibration generated at receivers for this project will be dependent on separation distances, the intervening soil and rock strata, dominant frequencies of vibration and the receiver building's construction and structure.

The recommended minimum working distances for vibration intensive plant are presented in Table 5-1.

Table 5-1: Recommended minimum working distances for vibration intensive equipment

Plant item	Minimum working distance, m				
	Cosmetic damage			Human disturbance	
	Commercial and industrial buildings ¹	Dwellings and similar structures ¹	Sensitive structures (e.g. heritage) ¹	Residences Day ²	Offices
Truck traffic (over irregular surfaces)	5	5	10	15	10
Excavator 35T (travelling / digging)	5	5	10	20	10
Piling Rig (bored)	5	5	10	15	10
Grader	5	5	10	20	10
Vibratory Roller 6T	5	15	20	40	20

Notes: 1. Vibration limits referenced from DIN 4150 Structural Damage - Safe Limits for Short-term Building Vibration.

2. Daytime is 7 am to 10 pm;

Site specific buffer distances for vibration significant plant items must be measured on site where plant and equipment are likely to operate close to or within the minimum working distances for cosmetic damage.

As previously identified, unlike noise, vibration cannot be 'predicted' due to many variables from site to site, for example soil type and conditions; sub surface rock; building types and foundations; and actual plant on site. The data relied upon in this assessment (tabulated above) is taken from a database of vibration levels measured at various sites or obtained from other sources (eg. BS 5228-2:2009). They are not specific to this project as final vibration levels are dependent on many factors including the actual plant used, its operation and the intervening geology between the activity and the receiver.

5.2 Potential vibration impacts

Based on the proposed plant items presented, vibration generated by construction plant was estimated and potential vibration impacts are summarised in Table 5-2 below.

The assessment is relevant to the identified residential buildings and other similar type structures in the project area and has been assessed against the vibration limits DIN 4150-3:2016 (see Section 3.3.2.2). Receivers R1 to R15, R17 to R23 and R30 to R32 are located greater than 100m from the works and considered to have a low to negligible risk of vibration impact.

Table 5-2: Potential vibration for residential and commercial properties

Receiver location ¹	Approx. distance to nearest buildings from works (m)	Group classification in accordance with Table 3-6	Assessment on potential vibration impacts		
			Structural damage risk	Human disturbance	Vibration monitoring
R16	55 m	Group 1 (commercial /industrial)	Very low risk of structural damage from construction works	Low risk of adverse comment as a result of construction works	Vibration monitoring not required
R24	80 m	Group 1 (commercial /industrial)	Very low risk of structural damage from construction works	Low risk of adverse comment as a result of construction works	Vibration monitoring not required
R25	95 m	Group 1 (commercial /industrial)	Very low risk of structural damage from construction works	Low risk of adverse comment as a result of construction works	Vibration monitoring not required
R26	65 m	Group 1 (commercial /industrial)	Very low risk of structural damage from construction works	Low risk of adverse comment as a result of construction works	Vibration monitoring not required
R27	85 m	Group 1 (commercial /industrial)	Very low risk of structural damage from construction works	Low risk of adverse comment as a result of construction works	Vibration monitoring not required
R28	45 m	Group 1 (commercial /industrial)	Very low risk of structural damage from construction works	Low risk of adverse comment as a result of construction works	Vibration monitoring not required
R29	100 m	Group 1 (commercial /industrial)	Very low risk of structural damage from construction works	Low risk of adverse comment as a result of construction works	Vibration monitoring not required

Note: 3. The sources of vibration levels is the vibratory roller 6T. If alternative equipment with higher vibration levels are used, there is an additional risk.

Based on the above assessment for the receivers surrounding the site, there is a low risk of vibration impact. Nevertheless, potential vibration impacts should be reviewed during construction considering site specific buffer distances for vibration significant plant items where plant and equipment is likely to operate close to or within the minimum working distances for cosmetic damage at nearby vibration sensitive receivers, and recommendations for reducing or managing potential vibration impacts are provided in the following section.

5.3 Vibration mitigation measures

The following vibration management measures are provided to minimise vibration impact from construction activities to the nearest affected receivers and to meet the relevant human comfort and building damage vibration limits:

1. A management procedure should be implemented to deal with vibration complaints. Each complaint should be investigated and where vibration levels are established as exceeding the set limits, appropriate amelioration measures should be put in place to mitigate future occurrences.
2. Where vibration is found to be excessive, management measures should be implemented to ensure vibration compliance is achieved. Management measures may include modification of construction methods such as using smaller equipment, establishment of safe buffer zones as mentioned above, and if necessary, time restrictions for the most excessive vibration activities. Time restrictions are to be negotiated with affected receivers.
3. Where construction activity occurs in close proximity to sensitive receivers (i.e. within the minimum working distances within Table 5-1), vibration testing of actual equipment on site should be carried out prior to their commencement of site operation to determine site-specific acceptable buffer distances to the nearest affected receiver locations.

6 Compliance management

6.1 Roles and responsibilities

Specific responsibilities for the implementation of environmental controls, including noise and vibration mitigation and management measures are the responsibility of the Contractor (FDC).

6.2 Training

All employees, contractors, sub-contractors and utility staff working on site will undergo site induction training that includes construction noise and vibration management issues. The induction training will address elements related to noise and vibration management including:

- Existence and requirements of this sub-plan
- Relevant legislation
- Approved construction hours
- Location of noise sensitive areas
- Complaints reporting
- General noise and vibration management measures
- Specific responsibilities to minimise impacts on the community and built environment from noise and vibration associated with the works.

6.3 Community consultation and complaints management

Noise and vibration levels generated by construction activities associated with the construction of the development must aim to comply with the noise and vibration goals set by the relevant regulations and guidelines.

Good relations with people living and working in the vicinity of a construction site should be established at the beginning of a project and be maintained throughout the project, as this is of paramount importance. Keeping people informed of progress and taking complaints seriously and dealing with them expeditiously is critical. The person selected to liaise with the community must be adequately trained and experienced in such matters.

The contractor is responsible for ensuring that all reasonable and feasible mitigation and management measures are implemented such as the provision of a *Community and Stakeholder Engagement Strategy* developed specifically for the Project, to minimise the generation of excessive noise and/or vibration levels from the site to nearby sensitive areas.

Owners and occupants of nearby affected properties are to be informed by direct mail of a direct telephone line and contact person to either make a noise and/or vibration complaint or request information.

Nearby development should be notified of the proposed works.

The notification should outline:

- Detail of a site point of contact.
- The anticipated duration of the project works.
- Identify what stages will have greatest potential impact on each property. This will provide much clearer information for each party about how the site work will impact them specifically (the duration over which the greatest noise impact will occur).

All noise and/or vibration complaints associated with the construction works shall be investigated in accordance with the Noise / Vibration Complaint Management Procedure identified in APPENDIX D.

Excelsia College

We note that GIDDIS Project Management (on behalf of Macquarie Telecom) has initialised contact with Excelsia College in December 2023 to advise on the potential noise impacts and mitigation / management measures for:

- Early drainage works starting around January 2024 and continuing until around June 2024 which involves realignment of stormwater and sewer pipes near the shared boundary; and
- The main construction works which are expected to commence around June 2024.

FDC are to continue consulting with Excelsia College to assist with the development of noise mitigation strategies for high noise generating works specific to the proposed stages of the construction works and satisfy the requirements of Condition B4(d) and B4(e) (eg. establishing when student / staff are on site or any particularly noise-sensitive time periods where high noise generating works should be avoided).

7 Conclusion

A Construction Noise and Vibration Management Plan has been prepared for the construction of the expansion to the existing data centre at 17-23 Talavera Road, Macquarie Park (State Significant Development SSD-24299707). Specifically, this report has been prepared to address the relevant consent conditions in SSD-24229707 which are summarised in Table 1-1.

The noise and vibration impacts from the construction equipment / machinery that will be used at the IC3 West project site have been predicted and presented in Sections 4.4 and 5.2.

Where the assessment has found potential exceedances of the noise objectives, noise mitigation and management measures have been presented in Section 4.6 to aid in providing additional noise reduction benefits.

The assessment of vibration levels from the construction works provides recommended buffer distances for vibration compliance. The assessment revealed the construction works to have a low risk of impacting the surrounding receivers as they are outside of the recommended buffer distances. However, buffer distances should be confirmed prior to the start of the construction works through on-site measurements of vibration.

Procedures to manage complaints are also provided in Section 6.3 and APPENDIX D to ensure complaints are dealt with accordingly.

References

- [1] NSW Department of Climate Change and Water (2011), *Road Noise Policy* (RNP)
- [2] NSW Department of Environment and Climate Change (2009), *Interim Construction Noise Guideline* (ICNG)
- [3] NSW Environment Protection Authority (2017), *Noise Policy for Industry* (NPfI)
- [4] NSW Department of Environment and Conservation, *Assessing Vibration – a technical guideline* (AVTG), 2006
- [5] British Standard BS 6472-2008, *Evaluation of human exposure to vibration in buildings (1-80Hz)*
- [6] British Standard 7385: Part 2-1993 *Evaluation and measurement of vibration in buildings*
- [7] German Standard DIN4150-2016 *Structural vibration Part 3: Effects of vibration on Structures*
- [8] Standards Australia (2016), *Guide to Noise Control on Construction, Demolition and Maintenance Sites*, AS 2436:2010 (R2016)
- [9] Standards Australia (2018), *Acoustics—Description and measurement of environmental noise*, AS1055:2018
- [10] AS IEC 61672.1-2004 *Electroacoustic - Sound Level Meters - Specifications*

APPENDIX A Glossary of terminology

A.1 Glossary of terminology - Noise

The following is a brief description of the technical terms used to describe noise and to assist in understanding the technical issues presented.

Absorption Coefficient α	The absorption coefficient of a material, usually measured for each octave or third-octave band and ranging between zero and one. For example, a value of 0.85 for an octave band means that 85% of the sound energy within that octave band is absorbed on coming into contact with the material. Conversely, a low value below about 0.1 means the material is acoustically reflective.
Adverse weather	Weather effects that enhance noise (particularly wind and temperature inversions) occurring at a site for a significant period of time. In the NSW INP this occurs when wind occurs for more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of nights in winter.
Air-borne noise	Noise which is fundamentally transmitted by way of the air and can be attenuated by the use of barriers and walls placed physically between the noise source and receiver.
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Amenity	A desirable or useful feature or facility of a building or place.
AS	Australian Standard
Assessment period	The time period in which an assessment is made. e.g. Day 7am-10pm & Night 10pm-7am.
Assessment Point	A location at which a noise or vibration measurement is taken or estimated.
Attenuation	The reduction in the level of sound or vibration.
Audible Range	The limits of frequency which are audible or heard as sound. The normal hearing in young adults detects ranges from 20 Hz to 20 kHz, although some people can detect sound with frequencies outside these limits.
A-weighting	A filter applied to the sound recording made by a microphone to approximate the response of the human ear.
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the LA90 noise level if measured as an overall level or an L90 noise level when measured in octave or third-octave bands.
Barrier (Noise)	A natural or constructed physical barrier which impedes the propagation of sound and includes fences, walls, earth mounds or berms and buildings.
Berm	Earth or overburden mound.
Buffer	An area of land between a source and a noise-sensitive receiver and may be an open space or a noise-tolerant land use.
Bund	A bund is an embankment or wall of brick, stone, concrete or other impervious material, which may form part or all of the perimeter of a compound.
BS	British Standard
CoRTN	United Kingdom Department of Environment entitled "Calculation of Road Traffic Noise (1988)"
Decibel [dB]	The units that sound is measured in. The following are examples of the decibel readings of common sounds in our environment:

	threshold of hearing	0 dB	The faintest sound we can hear, defined as 20 micro Pascal
		10 dB	Human breathing
	almost silent	20 dB	
		30 dB	Quiet bedroom or in a quiet national park location
	generally quiet	40 dB	Library
		50 dB	Typical office space or ambience in the city at night
	moderately loud	60 dB	CBD mall at lunch time
		70 dB	The sound of a car passing on the street
	loud	80 dB	Loud music played at home
		90 dB	The sound of a truck passing on the street
	very loud	100 dB	Indoor rock band concert
		110 dB	Operating a chainsaw or jackhammer
	extremely loud	120 dB	Jet plane take-off at 100m away
		130 dB	
	threshold of pain	140 dB	Military jet take-off at 25m away
dB(A)	A-weighted decibel. The A- weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter is denoted as dB(A). Practically all noise is measured using the A filter.		
dB(C)	C-weighted decibels. The C-weighting noise filter simulates the response of the human ear at relatively high levels, where the human ear is nearly equally effective at hearing from mid-low frequency (63Hz) to mid-high frequency (4kHz), but is less effective outside these frequencies. The dB(C) level is not widely used but has some applications.		
Deemed-to-Satisfy Provisions	The Deemed-to-Satisfy Provisions are an optional means of achieving compliance with the mandatory Performance Requirements of the National Construction Code. (also see Alternate Solution)		
Diffraction	The distortion of sound waves caused when passing tangentially around solid objects.		
DIN	German Standard		
Discontinuous Construction	A wall system having a minimum 20mm cavity between two separate leaves, where, for other than masonry there is no mechanical linkage between leaves except at the periphery.		
DnT,w	Weighted Standardised Field Level Difference A measure of sound insulation performance of a building element. It is characterised by the difference in noise level on each side of a wall or floor. It is measured in-situ. It is a field measurement that relates to the Rw laboratory measured value but is not equal to it because an in-situ space is not of the same quality as a laboratory space. The value is indicative of the level of speech privacy between spaces. The higher its value the better the insulation performance.		
ECRTN	Environmental Criteria for Road Traffic Noise, NSW, 1999		
ENMM	Environmental Noise Management Manual, Roads and Maritime Services (Transport for NSW)		
EPA	Environment Protection Authority		
Field Test	A test of the sound insulation performance in-situ. See also 'Laboratory Test' The sound insulation performance between building spaces can be measured by conducting a field test, for example, early during the construction stage or on completion. A field test is conducted in a non-ideal acoustic environment. It is generally not possible to measure the performance of an individual building element accurately as the results can be affected by numerous field conditions.		

FIIC	Field Impact Isolation Class. A measure of the noise impact performance of a floor. The value indicates the resistance of the floor to the transmission of impact sound and is measured using a standard tapping machine. It is measured in-situ and is therefore subject to the inherent accuracies involved in such a measurement. The term is defined in ASTM E492 and E1007. It is a field measure of the level of impact sound transmitted to a space via a floor. The equivalent measurement in a laboratory is termed the IIC. The higher the value the better the performance.
Flanking	Flanking is the transfer of sound through paths around a building element rather than through the building element material directly. For example, sound travelling through a gap underneath a door or a gap at the top of a wall.
Fluctuating Noise	Noise that varies continuously to an appreciable extent over the period of observation.
Free-field	An environment in which there are no acoustic reflective surfaces. Free field noise measurements are carried out outdoors at least 3.5m from any acoustic reflecting structures other than the ground.
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
FSTC	Field Sound Transmission Class A measure of the sound insulation performance of a building element. It is characterised by the difference in noise level on each side of a wall or floor. It is measured in the field and is therefore subject to the inherent inaccuracies involved in such a measurement. The term was referred to in older superseded versions of the Building Code of Australia and has now been replaced with the term DnT,w.
Ground-borne noise	Vibration propagated through the ground and then radiated as noise by vibrating building elements such as wall and floor surfaces. This noise is more noticeable in rooms that are well insulated from other airborne noise. An example would be vibration transmitted from an underground rail line radiating as sound in a bedroom of a building located above.
Habitable Area	Includes a bedroom, living room, lounge room, music room, television room, kitchen, dining room, sewing room, study, playroom, family room, home theatre and sunroom. Excludes a bathroom, laundry, water closet, pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom, clothes drying room, and other spaces of a specialised nature occupied neither frequently nor for extended periods.
Heavy Vehicle	A truck, transporter or other vehicle with a gross weight above a specified level (for example: over 8 tonnes).
IGANRIP	Interim Guideline for the Assessment of Noise from Rail Infrastructure Projects, NSW DEC 2007
IIC	Impact Isolation Class A measure of the noise impact performance of a floor. It is measured in very controlled conditions in a laboratory and is characterised by how much sound reaches the receiving room from the operation a standard tapping machine placed on the floor. The term is defined in ASTM E492 and E1007. The higher the number the better the performance.
Impact Noise	The noise in a room, caused by impact or collision of an object onto the walls or the floor. Typical sources of impact noise are footsteps on the floor above a tenancy and the slamming of doors on cupboards mounted on the common wall between tenancies.
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
INP	NSW Industrial Noise Policy, EPA 1999
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation.
Intertenancy wall	Walls that separate buildings or units within a building. They may provide sound resistance or serve as a fire wall. Synonymous with 'party wall'.
Intrusive noise	Refers to noise that intrudes above the background level by more than 5 dB(A).

ISEPP	State Environmental Planning Policy (Infrastructure), NSW, 2007
ISEPP Guideline	Development Near Rail Corridors and Busy Roads - Interim Guideline, NSW Department of Planning, December 2008
L1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L10	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L10(1hr)	The L10 level measured over a 1 hour period.
L10(18hr)	The arithmetic average of the L10(1hr) levels for the 18 hour period between 6am and 12 midnight on a normal working day.
L90	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
LAeq or Leq	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time, which would produce the same energy as a fluctuating sound level. When A-weighted, this is written as the LAeq.
LAeq(1hr)	The LAeq noise level for a one-hour period. In the context of the NSW EPA's Road Noise Policy it represents the highest tenth percentile hourly A-weighted Leq during the period 7am to 10pm, or 10pm to 7am (whichever is relevant).
LAeq(8hr)	The LAeq noise level for the period 10pm to 6am.
LAeq(9hr)	The LAeq noise level for the period 10pm to 7am.
LAeq(15hr)	The LAeq noise level for the period 7am to 10pm.
LAeq (24hr)	The LAeq noise level during a 24 hour period, usually from midnight to midnight.
Lmax	The maximum sound pressure level measured over a given period. When A-weighted, this is usually written as the L _{Amax} .
Lmin	The minimum sound pressure level measured over a given period. When A-weighted, this is usually written as the L _{Amin} .
Ln,w	Weighted Normalised Impact Sound Pressure Level A measure of the sound level transmitted from impacts on a floor to a tenancy below. It is measured in very controlled conditions in a laboratory and is characterised by how much sound reaches the receiving room from a standard tapping machine. A lower value indicates a better performing floor.
LnT,w	Weighted Standardised Field Impact Sound Pressure Level As for Ln,w but measured in-situ and therefore subject to the inherent accuracies involved in such a measurement. The equivalent measurement in a laboratory is the Ln,w. A lower value indicates a better performing floor.
Laboratory Test	The performance of a building element when measured in a laboratory. The sound insulation performance of a building element installed in a building however can differ from its laboratory performance for many reasons including the quality of workmanship, the size and shape of the space in which the measurement is conducted, flanking paths and the specific characteristics of the material used which may vary from batch to batch.
Loudness	A rise of 10 dB in sound level corresponds approximately to a doubling of subjective loudness. That is, a sound of 85 dB is twice as loud as a sound of 75 dB which is twice as loud as a sound of 65 dB and so on. That is, the sound of 85 dB is four times or 400% the loudness of a sound of 65 dB.
Microphone	An electro-acoustic transducer which receives an acoustic signal and delivers a corresponding electric signal.
NCA	Noise Catchment Area. An area of study within which the noise environment is substantially similar.
NCG	Noise Criteria Guideline, Roads and Maritime Services (Transport for NSW)

NMG	Noise Mitigation Guideline, Roads and Maritime Services (Transport for NSW)
Noise	Unwanted sound
Normalised	A method of adjusting the measured noise indices in a laboratory so that they are independent of the measuring space. The noise level in a room is affected by reverberation in the room. For example, the $L_{n,w}$ impact sound pressure level measured in a laboratory is dependent upon the amount of absorptive material in the receiving room. The value is adjusted to what would be measured if the sound absorption in the receiving room is set at 10m². This enables all laboratories to report the same value when measured under slightly different conditions. See also 'Standardised'.
NRC	Noise Reduction Coefficient. A measure of the ability of a material to absorb sound. The NRC is generally a number between 0 and 1 but in some circumstances can be slightly greater than 1 because of absorption at the edges of the material. A material with an NRC rating of 1 absorbs 100% of incoming sound, that is, no sound is reflected back from the material. The NRS is the average of the absorption coefficient measured in the octave bands 250Hz, 500Hz, 1kHz & 2kHz which correspond to the predominant frequencies associated with the human voice.
Partition wall	A wall dividing two rooms.
Party wall	A wall dividing two tenancies. Synonymous with 'Intertenancy Wall'.
Pre-construction	Work in respect of the proposed project that includes design, survey, acquisitions, fencing, investigative drilling or excavation, building/road dilapidation surveys, minor clearing (except where threatened species, populations or ecological communities would be affected), establishing ancillary facilities such as site compounds, or other relevant activities determined to have minimal environmental impact (e.g. minor access roads).
RBL	Rating Background Level is the representative LA90 background noise level for a period, as defined in the NSW EPA's noise policies.
Reflection	Sound wave reflected from a solid object obscuring its path.
RING	Rail Infrastructure Noise Guideline, NSW, May 2013
RMS	Root Mean Square value representing the average value of a signal.
Rw	Weighted Sound Reduction Index A measure of the sound insulation performance of a building element. It is measured in very controlled conditions in a laboratory. The term supersedes the value STC which was used in older versions of the Building Code of Australia. Rw is measured and calculated using the procedure in ISO 717-1. The related field measurement is the $D_{nT,w}$. The higher the value the better the acoustic performance of the building element.
R'w	Weighted Apparent Sound Reduction Index. As for Rw but measured in-situ and therefore subject to the inherent accuracies involved in such a measurement. The higher the value the better the acoustic performance of the building element.
RNP	Road Noise Policy, NSW, March 2011
Sabine	A measure of the total acoustic absorption provided by a material. It is the product of the Absorption Coefficient (α) and the surface area of the material (m²). For example, a material with $\alpha = 0.65$ and a surface area of 8.2m² would have $0.65 \times 8.2 = 5.33$ Sabine. Sabine is usually calculated for each individual octave band (or third-octave).
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain Leq sound levels over any period of time and can be used for predicting noise at various locations.
Sole-occupancy Unit	An area within a building for the exclusive use of the owner or occupier.
Sound	A fluctuation of air pressure which is propagated as a wave through air.

Sound absorption	The ability of a material to absorb sound energy by conversion to thermal energy.
Sound Insulation	Sound insulation refers to the ability of a construction or building element to limit noise transmission through the building element. The sound insulation of a material can be described by the R_w and the sound insulation between two rooms can be described by the $D_{nT,w}$.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound power level	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 pico watt.
Sound pressure level	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone referenced to 20 micro Pascal.
Spoil	Soil or materials arising from excavation activities.
Standardised	A method of adjusting the measured noise indices in-situ so that they are independent of the measuring space. The noise level in a room is affected by reverberation in the room. For example, the $L'_{n,w}$ impact sound pressure level measured in a room is dependent upon the amount of absorptive material in the receiving room. The value is adjusted to what would be measured if the reverberation time in the receiving room is set at 0.5 seconds. This enables the same value to be reported independent of whether the room contains carpet and furnishings and the like. See also 'Normalised'.
STC	Sound Transmission Class A measure of the sound insulation performance of a building element. It is measured in controlled conditions in a laboratory. The term has been superseded by R_w .
Structure-borne Noise	Audible noise generated by vibration induced in the ground and/or a structure. Vibration can be generated by impact or by solid contact with a vibrating machine. Structure-borne noise cannot be attenuated by barriers or walls but requires the isolation of the vibration source itself. This can be achieved using a resilient element placed between the vibration source and its support such as rubber, neoprene or springs or by physical separation (using an air gap for example). Examples of structure-borne noise include the noise of trains in underground tunnels heard to a listener above the ground, the sound of footsteps on the floor above a listener and the sound of a lift car passing in a shaft. See also 'Impact Noise'.
Tonal Noise	Sound containing a prominent frequency and characterised by a definite pitch.
Transmission Loss	The sound level difference between one room or area and another, usually of sound transmitted through an intervening partition or wall. Also the vibration level difference between one point and another. For example, if the sound level on one side of a wall is 100dB and 65dB on the other side, it is said that the transmission loss of the wall is 35dB. If the transmission loss is normalised or standardised, it then becomes the R_w or R'_{w} or $D_{nT,w}$.

A.2 Glossary of terminology - Vibration

The following is a brief description of the technical terms used specifically to describe vibration and to assist in understanding the technical issues presented.

Acceleration	The rate of change of velocity, often measured in m/s^2 or g 's. $1 g = 9.81 m/s^2$. Commonly used to assess human response to vibration and for machine condition monitoring.
Accelerometer	A vibration transducer sensor that is used to measure acceleration.
ANC	The Association of Noise Consultants, UK.
Ambient vibration	The all-encompassing vibration occurring at a given location, at a given time, composed of all vibration sources near and far.

Amplification	Vibration amplification refers to an increase in vibration. Amplification may occur due to resonance, when an object or structure is excited at its natural frequency.
Attenuation	Attenuation refers to a reduction in vibration. This may occur due to damping of a vibration system, the inclusion of attenuating devices or, in the case of ground vibration, during propagation through the ground. Ground attenuation is determined by the dynamic properties of the site's soil and rock.
AVTG	Assessing Vibration: A Technical Guideline. NSW Department of Environment and Conservation's (DEC) 2006 guideline for assessing human responses to vibration. Based on BS 6472-1992.
Axis	A fixed reference line for the measurement for the measurement of vibration in a particular direction. Vibration is commonly measured in transverse (T), longitudinal (L) and vertical (V) axes (or X, Y and Z).
Background vibration	The underlying level of vibration present in the ambient environment, measured in the absence of the vibration sources of interest.
Blasting	Excavation or demolition using explosives.
Borehole transducer	A geophone transducer rigidly mounted at the bottom of a borehole (either permanently or temporarily) to measure underground vibration.
Broadband vibration	The overall vibration level which encompasses a wide range of frequencies. As opposed to vibration levels for specific frequency bands (see Octave) or narrowband vibration levels as produced by FFT.
BS	British Standard.
Continuous vibration	Vibration that continues uninterrupted over a defined period.
Cosmetic damage	Damage to a structure due to vibration that only affects the appearance of the structure and can be easily repaired, e.g. hairline cracks in mortar joints of brick or concrete constructions, or cracks in plasterwork.
Coupling loss	The change in vibration level when vibration is transmitted from the ground to a building's foundations.
Crest factor	The ratio of the peak value of a vibration event to the RMS value of a vibration event.
Damping	Reduction of vibrational energy due to friction or other forces.
DEC	NSW Department of Environment and Conservation, now the Department of Planning, Industry and Environment.
Decibel [dB]	The logarithmic unit used to represent sound and vibration levels. A vibration level in dB equals 20 times the logarithm to the base 10 of the ratio of the vibration level relative to the reference level. For vibration velocity, the reference level is commonly 1 nm/s. For vibration acceleration, the reference level is commonly 1 $\mu\text{m/s}^2$. Other reference values are commonly used. The reference value should always be stated.
DIN	German Standard.
Displacement	Change in position of a body from a reference point. Usually measured in m or mm.
EPA	Environment Protection Authority.
eVDV	Estimated Vibration Dose Value. See also VDV.
Filter	An electrical circuit that allows signals of certain frequency ranges to pass through, and blocks all other frequencies. Types of filters include low pass filters, high pass filters, and band pass filters.
FFT	Fast Fourier Transform. An algorithm that converts a signal from the time domain to the frequency domain.
Frequency	In the case of vibration, frequency is the number of oscillations that occurs per second. Frequency is measured in units of Hertz (Hz).
Geophone	A vibration transducer sensor that is used to measure velocity.

Ground-borne noise	Vibration propagated through the ground and then radiated as noise by vibrating building elements such as wall and floor surfaces. This noise is more noticeable in rooms that are well insulated from other airborne noise. An example would be vibration transmitted from an underground rail line radiating as sound in a bedroom of a building located above.
Ground spike	A metal stake with a flat top that is driven into the ground and used to mount a vibration transducer to measure vibration levels.
Habitable Area	Includes a bedroom, living room, lounge room, music room, television room, kitchen, dining room, sewing room, study, playroom, family room, home theatre and sunroom. Excludes a bathroom, laundry, water closet, pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom, clothes drying room, and other spaces of a specialised nature occupied neither frequently nor for extended periods.
Intermittent vibration	Either interrupted periods of continuous vibration or repeated periods of impulsive vibration.
Impulsive vibration	Vibration that rapidly builds up to a peak followed by a damped decay. May consist of multiple impulsive events, typically less than 2 seconds in duration.
Isolation	The process of reducing the vibrational energy transmitted to an object, such as a piece of equipment or building, from the source of vibrations.
Minor damage	Damage to a structure due to vibration that affects the serviceability of residential style buildings or other sensitive structures but does not affect the structural elements. E.g. cracks in plastered or rendered surfaces, existing cracks enlarged or partitions detached.
Mode	A mode of vibration is a characteristic pattern or shape in which a mechanical system will vibrate. The actual vibration of a structure is a combination of all the vibration modes, but to varying degrees, depending on the vibration source.
Natural frequency	The frequency at which a system tends to oscillate in the absence of any driving or damping force.
Noise floor	The residual level of unwanted signal measured by an instrumentation system. The signal of interest must be above the noise floor to be measured accurately. See also Signal to noise ratio.
Octave	An octave represents a doubling or halving in frequency. Noise or vibration levels across a frequency spectrum are commonly given in octave or one-third octave frequency bands.
Peak-to-peak	The difference between the highest positive peak level and the lowest negative peak of a vibration event.
Peak vibration velocity	The absolute maximum value of the vibration velocity signal measured in the X, Y or Z axis during a given time interval. Also referred to as the peak component particle velocity.
PPV	Peak Particle Velocity. The absolute maximum value of the vibration velocity signal measured in any axis during a given time interval.
PVS	Peak Vector Sum. The vector sum of the peak vibration velocities measured in the three orthogonal axes.
Resonance	The phenomenon of increased amplitude that occurs when the frequency of an applied force is equal or close to the natural frequency of the system.
RMS	Root Mean Square value representing the average value of a signal.
Sampling rate	The number of samples per second taken from a continuous signal to make a discrete or digital signal. Measured in Hertz. To accurately record the signal and determine the spectrum, the sampling rate must be two or more times the maximum frequency of interest.
Settlement	The movement of soil due to vibration or other forces, often in relation to a building's foundations. The indirect effect of settlement and ground movement may cause building damage, separately from the direct effect of building vibration.
Signal to noise ratio	A ratio of the level of a desired signal to the level of the background, often expressed in decibels.
Source vibration	A source that generates vibration. Can be quantified by the amplitude, frequency content and duration of the vibration. Common sources of vibration include rail and road traffic, construction and demolition activities and blasting.
Spectrum	The result of transforming a signal from the time domain to the frequency domain.

Structural damage	Damage to a structure due to vibration that may affect its serviceability due to damage to structural elements. May result in the reduced stability of the building and/or reduction in load-bearing capacities.
Structural fatigue	The weakening of a material caused by cyclic loading that results in progressive and localised structural damage and the growth of cracks.
Structure-borne Noise	Audible noise generated by vibration induced in the ground and/or a structure. Vibration can be generated by impact or by solid contact with a vibrating machine. Structure-borne noise cannot be attenuated by barriers or walls but requires the isolation of the vibration source itself. This can be achieved using a resilient element placed between the vibration source and its support such as rubber, neoprene or springs or by physical separation (using an air gap for example). Examples of structure-borne noise include the noise of trains in underground tunnels heard to a listener above the ground, the sound of footsteps on the floor above a listener and the sound of a lift car passing in a shaft.
Tactile vibration	Vibration of a level that can be felt by humans, dependant on the amplitude and frequency of the source. Note that vibration may also be perceived through indirect effects such as ground-borne noise or the shaking of building elements.
Transducer	A device that converts energy from one form to another. Vibration transducers convert either acceleration, velocity or displacement to an electrical signal that is processed by the monitoring system.
Triaxial	Three axes. Measurement systems often consist of three vibration transducers arranged triaxially – oriented at 90° from each other.
VDV	Vibration Dose Value. A measure of tactile vibration levels used to assess intermittent vibration.
Velocity	The rate of change of vibration displacement, usually measured in mm/s.
Vibration	A mechanical phenomenon whereby oscillations occur about an equilibrium point; a periodic back-and-forth motion of an elastic body or medium, commonly resulting when almost any physical system is displaced from its equilibrium condition.
Vrms	Root mean square (RMS) vibration level for the train passby, typically expressed in mm/s
Waveform	A graphical representation of a vibration event in the time domain, showing the measured vibration levels for each sample.

APPENDIX B Specification for Construction Noise Monitoring

B.1 Scope

This document specifies methods for undertaking noise monitoring during the construction phase of the project. This is for measurement of receivers construction noise levels, for either at-receiver measurement or intermediate locations.

B.2 Referenced standards and guidelines

- Standards Australia (2019), *Electroacoustics - Sound Level Meters - Specifications*, AS IEC 61672.1:2019 or Standards Australia (2013), *Electroacoustics - Sound Level Meters - Specifications*, IEC 61672.1:2013
- Standards Australia (2018), *Acoustics—Description and measurement of environmental noise*, AS 1055:2018
- NSW Department of Environment and Climate Change (2009), *Interim Construction Noise Guideline* (ICNG)
- NSW Environment Protection Authority (2017), *Noise Policy for Industry* (NPfI)

B.3 Monitoring procedures

The following procedures are to be followed by personnel suitably qualified and experienced in undertaking acoustic measurements.

All noise monitoring equipment used must be at least Class 2 instruments as described in IEC 61672.1:2013 and calibrated to standards that are traceable to *NATA General Accreditation Guidance: General Equipment Table* (July 2019), and consistent with the requirements of AS 1055:2018. The calibration of the monitoring equipment shall also be checked in the field before and after the noise measurement period, and in the case of long-term noise monitoring, calibration levels shall be checked at minimum weekly intervals.

Long-term noise monitoring equipment or Noise Loggers, consist of sound level meters housed in weather resistant enclosures. The operator may retrieve the data at the conclusion of each monitoring period in person or remotely if the logger is fitted with mobile communications.

All environmental noise measurements shall be taken with the following meter settings:

- Time constant: FAST (ie 125 milliseconds)
- Frequency weightings: A-weighting
- Sample period: 15 minutes

All outdoor noise measurements shall be undertaken with a windscreen over the microphone. Windscreens reduce wind noise at the microphones.

Measurements of noise should be disregarded when it is raining and/or the wind speed is greater than 5m/s (18km/h).

B.4 Long-term (unattended) noise monitoring

Noise monitoring shall be undertaken in accordance with the environmental noise measurement requirements stipulated in the reference standards and documents listed above.

Noise monitoring equipment shall be placed at positions which have unobstructed views of general site activities, while acoustically shielded as much as possible from non-construction site noise (eg. road traffic, rail noise and other surrounding noise).

Every 15 minutes, the data is to be processed statistically and stored in memory. The minimum range of noise metrics to be stored in memory for later retrieval is the following A-weighted noise levels: L_{min} , L_{90} , L_{eq} , L_{10} , L_1 and L_{max} .

Where the noise monitors are placed within 3.5 metres of building facades, walls or cliffs, then a reflection correction of up to -2.5dB(A) shall be applied to remove the effect of increased noise due to sound reflections from such structures.

Meteorological conditions including wind velocity, wind direction and rainfall shall be monitored over the entire noise monitoring period, either on site or recorded from the nearest weather station to the project site.

B.5 Short-term (attended) monitoring

Where noise complaints or requests from relevant authorities are received or as required by project approvals or this management plan, attended short-term noise monitoring shall also be conducted at the requested location and at any other relevant noise receiver location with closest proximity to the construction activities.

The noise verification monitoring locations will take into consideration the nature of construction activities being undertaken by the Project. The identification of monitoring locations will consider the following:

- Most affected noise sensitive receiver location in proximity to the assessed activities,
- Location of previous monitoring sites,
- Proximity of the receiver to a Project worksite,
- Sensitivity of the receiver to noise,
- Background noise levels, and

- Safety of personnel undertaking the measurements,
- Expected duration of the impact.

Noise monitoring should, where practicable, be in positions with unobstructed views of general site activities, whilst shielded as much as possible from non-construction site noise (e.g. road traffic, rail noise and other surrounding noise).

In accordance with Australian Standard AS1055, outdoor noise monitoring is to be undertaken at least 3.5m from any reflecting structure other than the ground. Outdoor noise monitoring is to be undertaken with the microphone at a height of 1.2 to 1.5m from the ground, unless noise measurements are taken from a balcony or veranda, in which case the same microphone height shall apply off the floor. Noise measurements inside buildings should be at least 1 m from the walls or other major reflecting surfaces, 1.2 m to 1.5m above the floor, and 1.5m from windows. Where the noise monitors are placed within 3.5 metres of building facades, walls or cliffs, then a reflection correction of up to -2.5 dB(A) shall be applied to remove the effect of increased noise due to sound reflections from such structures.

Short-term noise monitoring shall be used to supplement long-term noise monitoring undertaken at nearby locations, and to establish whether noise levels measured by the long-term noise monitors are determined by construction activities carried out on site.

All attended short-term noise monitoring shall be recorded over 15 minute sample intervals. Every 15 minutes, the data is to be processed statistically and stored in memory. The minimum range of noise metrics to be stored in memory and reported is the following A-weighted noise levels: L_{min} , L_{90} , L_{eq} , L_{10} , L_1 and L_{max} .

Noise monitoring shall be undertaken in accordance with the environmental noise measurement requirements stipulated in the reference standards and documents listed above.

The following information shall be recorded:

- Date and time of measurements;
- Name of person(s) undertaking the measurements;
- Qualifications and/or competency/suitability of the person carrying out the monitoring;
- Type and model number of instrumentation;
- Results of field calibration checks before and after measurements;
- Description of the time aspects of each measurement (ie. sample times, measurement time intervals and time of day);
- Measurement location details, measurement microphone height, and number of measurements at each location;

- Sketch map of area with critical measurement elements [ie. monitoring location, distance to operating plant/equipment, the location of noise/vibration generating items (construction activities and other environmental noise sources), the location and type of mitigation measures, the location of other acoustically relevant items (e.g. walls/barriers) along with relevant distances to the monitoring location];
- Photographs clearly identifying the monitoring location, setup, and critical measurement elements;
- Weather conditions during measurements, including wind velocity, wind direction, temperature, relative humidity and cloud cover;
- Description of operation and load conditions of the noise sources under investigation;
- Any adjustment made for presence or absence of nearby reflecting surfaces;
- Measured noise levels including the minimum descriptors required;
- Estimated noise level from construction activities only;
- Estimated noise levels from environmental noise sources other than construction; and
- Details of any extraneous noise due to other sources that influenced the measurement (eg traffic, aircraft, trains, dogs barking, insects, other construction equipment etc).

APPENDIX C Specification for Construction Vibration Monitoring

C.1 Scope

This document specifies methods for undertaking vibration monitoring during the construction phase of the project. Vibration monitoring during construction activities may be carried out for the following reasons:

- To confirm acceptability of construction techniques, or confirm compliance with limits for structural or cosmetic damage of buildings; or
- To assess compliance with vibration limits for human exposure to vibration.

Monitoring may be carried out in response to specific conditions of approval or complaint. However, the recommended work practice is to conduct proactive monitoring and establish procedures that provide greater assurance of compliance with relevant policy guidelines and Standards throughout all phases of the project works. It is noted that this specification does not address monitoring of blasting activities.

C.1.1 Requirements for vibration monitoring

Vibration monitoring is to be carried out at the following times in accordance with this Management Plan:

- At any locations identified within the projects Conditions of Approval / Consent Condition.
- Where vibration complaints or requests from relevant authorities, at the requested location and at any other relevant vibration receiver location with closest proximity to the construction activities. This may be carried out with short-term or long-term monitoring methods.

Vibration amplitude may be measured as displacement, velocity, or acceleration.

- Displacement (x) measurement is the distance or amplitude displaced from a resting position. The SI unit for distance is the meter (m), although common industrial standards (including the TfNSW vibration limits) include mm.
- Velocity ($v=\Delta x/\Delta t$) is the rate of change of displacement with respect to change in time. The SI unit for velocity is meters per second (m/s), although common industrial standards (including the TfNSW vibration limits) include mm/s. The Peak Particle Velocity (PPV) is the greatest instantaneous particle velocity during a given time interval. If measurements are made in 3-axis (x, y, and z) then the resultant PPV is the vector sum (i.e. the square root of the summed squares of the maximum velocities) regardless of when in the time history those occur.
- Acceleration ($a=\Delta v/\Delta t$) is the rate of change of velocity with respect to change in time. The SI unit for acceleration is meters per second squared (m/s²).

C.2 Referenced standards and guidelines

- AS 2775-2004 *Mechanical vibration and shock – Mechanical mounting of accelerometers*
- AS 2670.2-1990 *Evaluation of human exposure to whole body vibration*
- BS 6472-1992 *Guide to evaluation of human exposure to vibration in buildings (1 Hz to 80 Hz)*
- BS 6841-1987 *Guide to measurement and evaluation of human exposure to whole-body mechanical vibration and repeated shock*
- BS 7482-1991 Parts 1 and 3: *Instrumentation for the measurement of vibration exposure of human beings*
- BS 7385:1 *Evaluation and Measurement for Vibration in Buildings – Part 1: Guide for measurement of vibrations and evaluation of their effects on buildings*
- BS 7385:2 *Evaluation and Measurement for Vibration in Buildings – Part 2: Guide to Damage Levels from Ground borne Vibration*
- DIN 4150-2016 Part 3 *Structural vibration – Effects of vibration on structures*
- ISO 4866 *Mechanical Vibration & Shock – Vibration of Buildings – Guidelines for the Management of the Vibrations and Evaluation of their Effects on Buildings*
- NSW DEC (EPA) 2006 *Assessing Vibration: A technical guide*

Vibration monitoring shall be undertaken in accordance with the vibration measurement requirements stipulated in the reference Standards and guidelines listed above; however, the following notes of importance are included herein.

C.3 Vibration minimum working distances

Where the contractor is unsure of the minimum working distance for any item of plant, these can be established through measurements to provide site-specific minimum working distances.

The testing regime should commence at a suitable time to allow sufficient time to amend construction techniques as necessary, without affecting the overall construction program.

Minimum working distances are to be established using identical equipment or simulated practices at a location removed from the sensitive structure or receiver.

Sufficient measurements are to be carried out in accordance with the relevant Standards to confirm the minimum working distances and confirm the acceptable work practices that are likely to be compliant given the proximity of actual works to sensitive receivers and structures.

Consultation between consultants, engineers and the construction team may be required where revision to work practices is required.

C.3.1 Personnel and equipment

The following procedures are to be followed by personnel suitably qualified and experienced in undertaking vibration measurements.

All vibration monitoring equipment used must be checked for accuracy (to manufacturer's specification) at least every two years against a reference vibration transducer that is calibrated at least every three years [ref: NATA General Accreditation Guidance: General Equipment Table (July 2019)].

Vibration monitors consist of a computer unit connected by cable to a tri-axial vibration transducer which senses vertical, axial and horizontal vibration, or three separate uni-axial vibration transducers positioned in the vertical, axial and horizontal axes. The parameters to be measured differ dependent upon the relevant Standards but may include:

Assessment type	Type of vibration	Relevant standard/guideline	Measurement parameters
Human comfort	Continuous and impulsive	DECC guideline BS 6472-1992	RMS acceleration, 1-80Hz. 1/3 octave weighted as defined in BS6841-1987
	Intermittent vibration	DECC guideline BS 6472-1992	RMS acceleration, 1-80Hz Vibration Dose Values (VDVs) in accordance with BS6472-1992
Structural damage	Non-blasting	DIN 4150-2016 Part 3	Peak-particle velocity (PPV), 1-100Hz
	Non-blasting	BS 7385 Part 2	Peak-particle velocity (PPV), 4-250Hz
Structural damage – sensitive structures	Non-blasting	DIN 4150-2016 Part 3	Peak-particle velocity (PPV), 1-100Hz

Short-term vibration monitors should allow real-time analysis of vibration levels to assist assessment and feedback on the subject operations and procedures.

C.3.2 Monitoring procedure

Vibration monitoring equipment should be installed in accordance with the following guidance:

- At a location equivalent to the site and ground conditions at the sensitive receiver location. The working distances should not be established via immediate measurement and activities near the sensitive structure.
- The surface should be solid and rigid in order to best represent the vibration levels entering the building/structure under investigation.
- The vibration sensor or transducer should not be mounted on loose gravel or other unstable surfaces.
- The vibration geophone or transducer(s) should be directly mounted to the vibrating surface using bees wax, double sided adhesive tape, or magnetically fixed to a mounting plate fastened to the vibrating surface.

- Where a suitable mounting surface is unavailable, a metal stake (at least 300mm in length) with a mounting plate should be driven into solid ground adjacent to the building of interest. The vibration sensor or transducer shall be fixed on top of the mounting plate.

The following information shall be recorded:

- Date and time of measurements;
- Name of person(s) undertaking the measurements;
- Qualifications and/or competency/suitability of the person carrying out the monitoring;
- Type and model number of instrumentation;
- Description of the time aspects of each measurement (i.e. sample times, measurement time intervals and time of day);
- Sketch map of area with critical measurement elements [ie. monitoring location, distance to operating plant/equipment, the location of noise/vibration generating items (construction activities and other environmental noise sources), the location and type of mitigation measures, the location of other acoustically relevant items (e.g. walls/barriers) along with relevant distances to the monitoring location];
- Photographs clearly identifying the monitoring location, and critical measurement elements;
- Measurement location details (including distance from vibrating source) and number of measurements at each location;
- Operation and load conditions of the vibrating plant under investigation and distance from the measurement location; and
- Possible vibration influences from other sources (e.g. other mechanical plant, traffic, railway).

C.4 Long-term (unattended) monitoring

Long-term unattended vibration monitoring shall be undertaken continuously whilst the vibrating plant is operational within the pre-determined 'minimum working distances' from potentially affected buildings or sensitive structures. Long-term unattended vibration monitoring is generally carried out for the assessment of structural or cosmetic damage rather than human exposure.

C.4.1 Personnel and equipment

The following procedures are to be followed by personnel suitably qualified and experienced in undertaking vibration measurements.

All vibration monitoring equipment used must be checked for accuracy (to manufacturer's specification) at least every two years against a reference vibration transducer that is calibrated at least every three

years [ref: NATA General Accreditation Guidance - General Equipment - Calibration and Checks, General Equipment Table (January 2018)].

Vibration monitors consist of a computer unit connected by cable to a tri-axial vibration transducer which senses vertical, axial and horizontal vibration, or three separate uni-axial vibration transducers positioned in the vertical, axial and horizontal axes.

Long-term monitoring for the management of structural and cosmetic damage should include the following:

- Vibration levels are to be monitored continuously with the following parameters being stored at a maximum interval period of 5 minutes:
 - o Peak-particle velocity (PPV) between 1 Hz and 100 Hz for each direction of the tri-axial geophone (or transducers) and vector-sum peak-particle velocity [DIN4150.3];
 - o Peak-particle velocity (PPV) between 4 Hz and 250 Hz for each direction of the tri-axial geophone (or transducers) and vector-sum peak-particle velocity [BS 7385.2].
- Vibration levels are to be stored at the pre-defined intervals in the logger memory for record, data analysis or post-processing. Data may be retrieved at the conclusion of each monitoring period either by operator download or remotely via a telephone modem if the logger is fitted with a remote communications option.
- Monitors should be fitted with an audible, visual, SMS or email alert system, triggered to provide warning when the measured level of vibration approaches or exceeds the limits defined by the relevant Standard.
- Where the trigger limits are exceeded, a detailed waveform recording should be stored including a detailed frequency spectrum for assessment against the frequency limit curve.

C.4.2 Monitoring location and mounting

Vibration monitoring equipment should be installed in accordance with the following guidance:

- Equipment should be positioned at the footings or foundations of the building of interest, closest to the vibrating plant.
- The mounting surface should be solid and rigid in order to best represent the vibration levels entering the structure of the building under investigation.
- The vibration geophone or transducer(s) should not be mounted on loose tiles, loose gravel or other unstable surfaces.
- The vibration geophone or transducer(s) should be directly mounted to the vibrating surface using bees wax, double sided adhesive tape, or magnetically fixed to a mounting plate fastened to the vibrating surface.

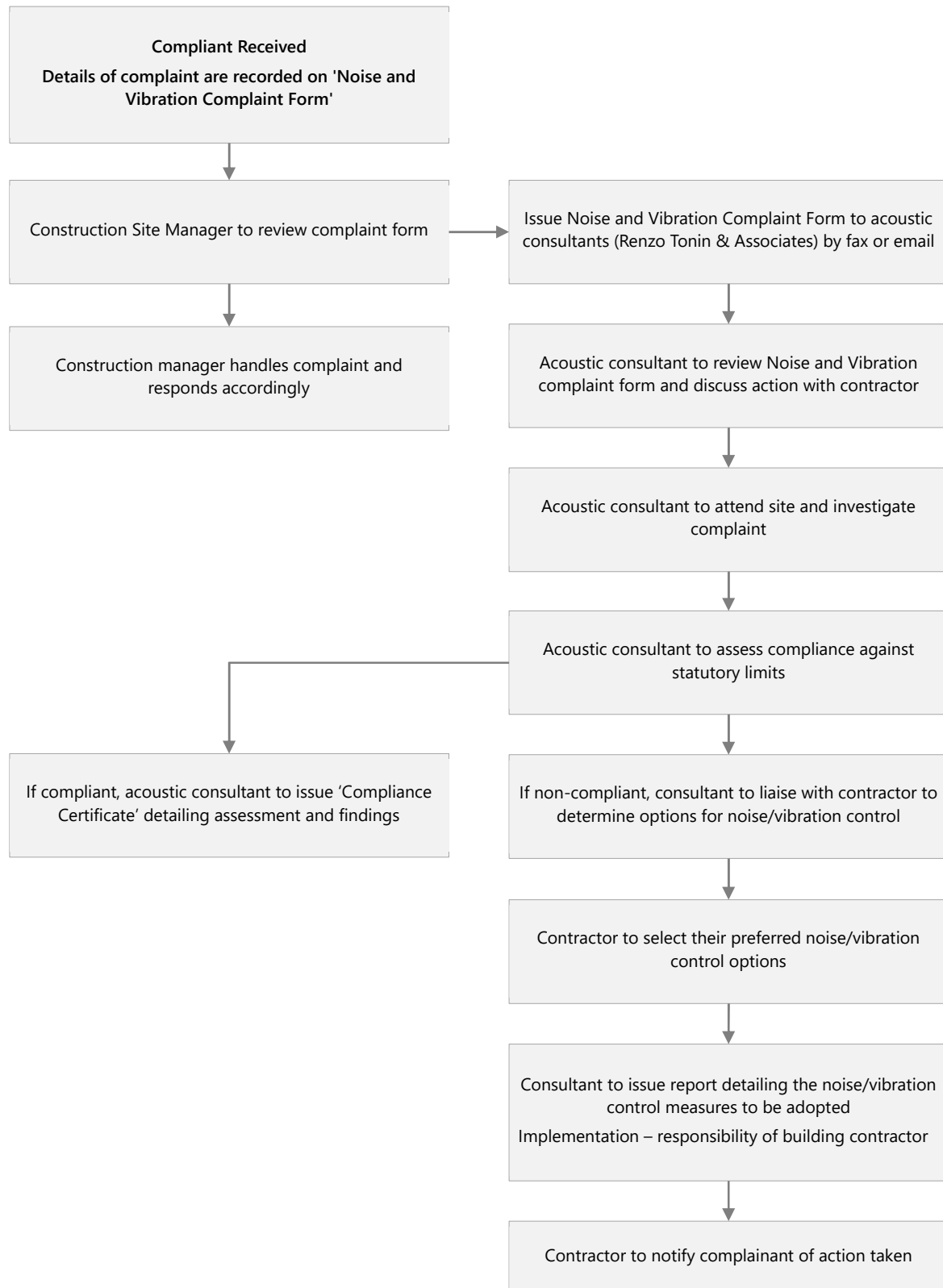
- Where a suitable mounting surface is unavailable, a metal stake (at least 300mm in length) with a mounting plate should be driven into solid ground adjacent to the building of interest. The vibration sensor or transducer shall be fixed to the mounting plate.

C.5 Vibration measurements in response to complaints

Proactive vibration monitoring and establishment of procedures that comply with the policy guidelines and Standards is the recommended work practice to reduce the risk of complaint regarding vibration from the site.

There may however be cases where specific monitoring is required to investigate a complaint or issue identified during the project works. Vibration monitoring may be carried out using either short-term or long-term methodologies depending on the nature of the complaint. Short-term attended manned procedures would generally be carried out when measurements are required inside a property or where immediate action and detailed observations are required to be made at the time of measurements. Short-term monitoring would generally follow the procedures outlined for the establishment of Minimum Working Distances. Long-term monitoring would be carried out as described in section C.4.

APPENDIX D Noise / vibration complaint management procedure



NOISE/ VIBRATION COMPLAINT FORM

Project title:	_____	Date:	_____
Site contractor:	_____	Phone:	_____
Site contact:	_____	Email:	_____

Complaint details

Received by (circle): Phone / Email / In person / Other: _____

Name:	_____	H Ph:	_____
Address:	_____	W Ph	_____
Email:	_____	M Ph	_____

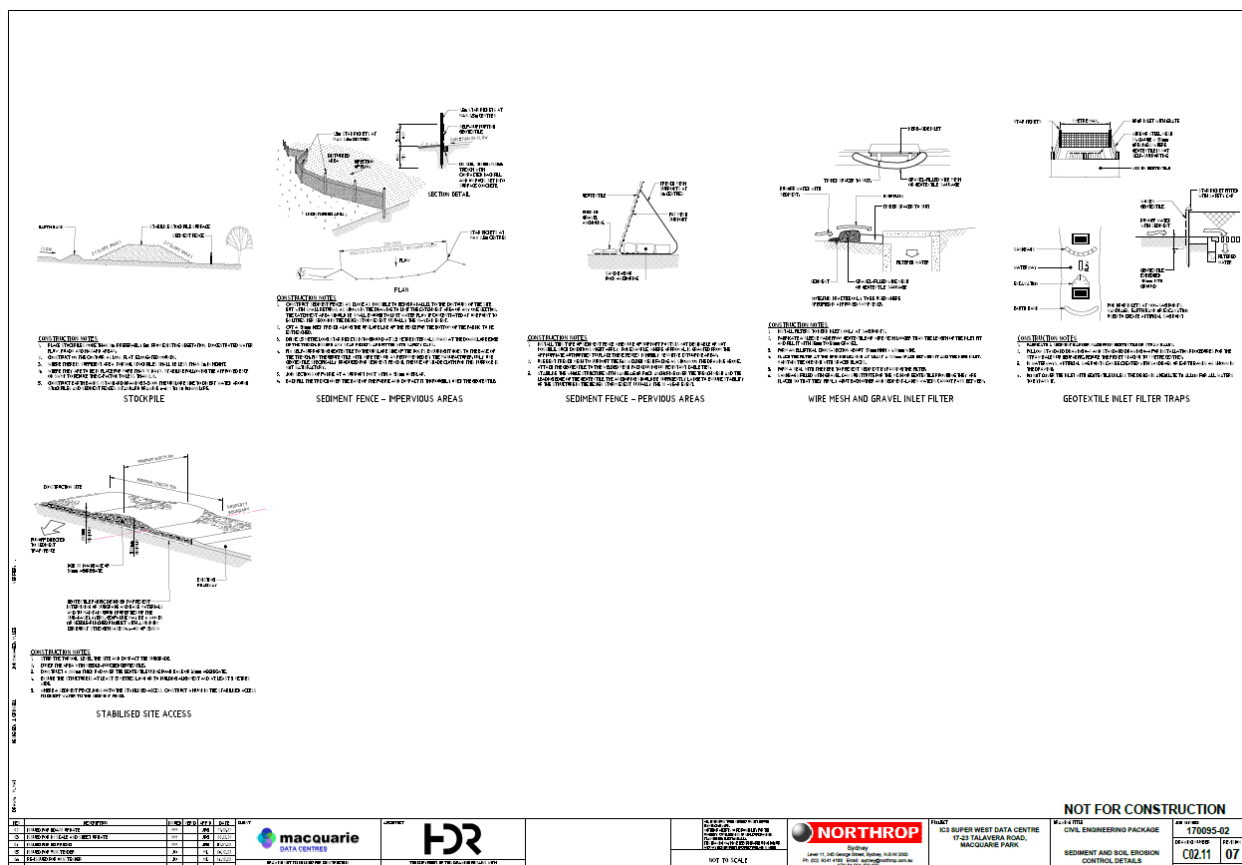
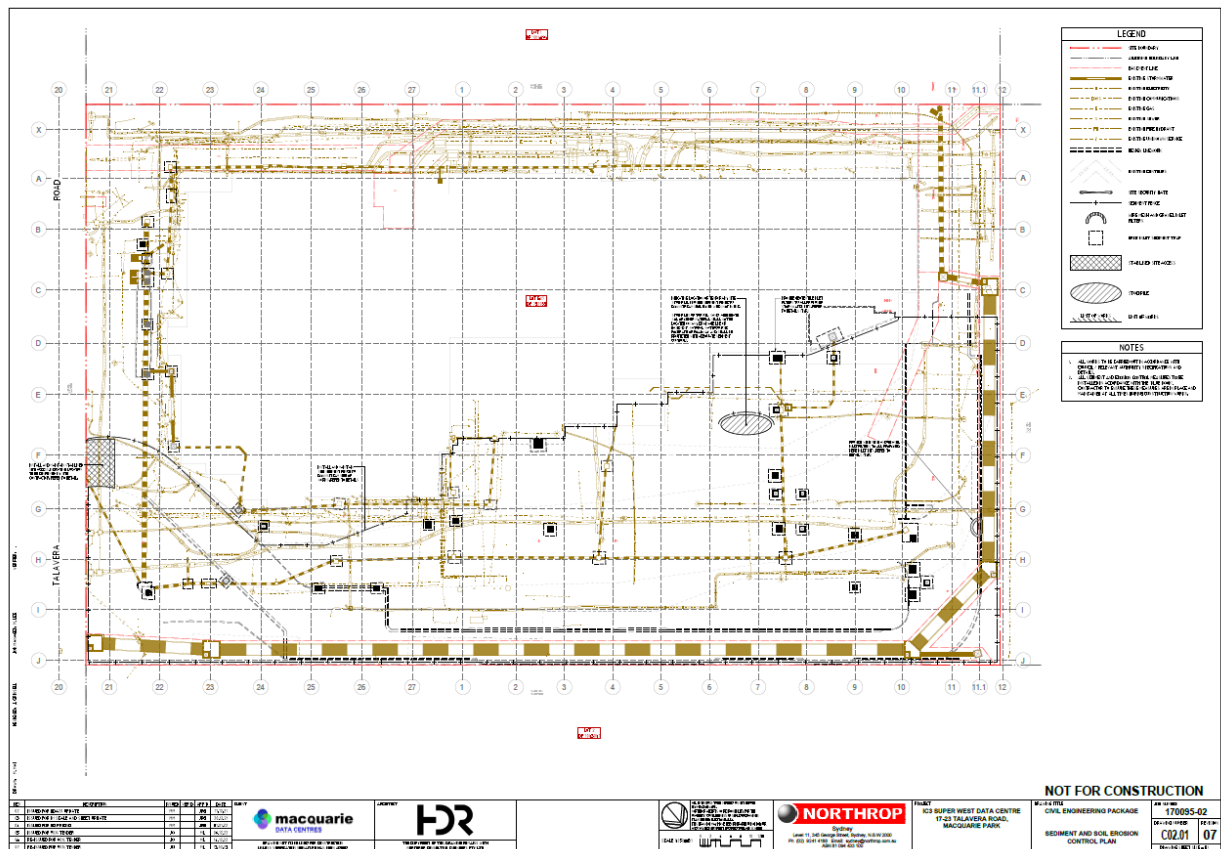
Describe when the problem occurred (date and time), what equipment caused the complaint (if known) and where person was standing when he/she experienced the noise/vibration:

Investigation

Question foreman responsible on site and obtain information on what equipment or processes would most likely have caused the complaint:

Following approval from the Project Manager, email/fax this form to Renzo Tonin & Associates

APPENDIX E – Erosion and Sediment Control Plan



APPENDIX F – Materials Management Plan

Overview

The purpose of this Material Management Plan is to outline the process of sourcing appropriate materials at a reasonable cost and ensuring their availability — at the right place and time — to meet project requirements and deadlines.

The management of a construction requires integrated processes to ensure that the work can be completed on time, cost and meet specified contract specifications. This is because management that is related to materials is very important from the design stage to the construction stage.

The management of building materials is generally recognised as an integrated coordination of material removal, purchase, delivery, receiving of materials on site, warehousing or storage and installation. However, all process of early planning cannot be performed properly without a controlled or coordinated technique or system. An important component of construction management is where the parties need to understand the appropriate material management techniques and their effectiveness on the implementation of construction projects.

Good management is carried out to resolve potential problems such as material shortages, materials supply delays, non-schedule, material damage and wastage and lack of storage space.

Materials Planning, Scheduling and Purchasing

Identification of long-lead (critical) materials is one of the practices that FDC recognise has the potential to increase productivity across our projects.

FDC's project management team plan ahead to ensure that the critical materials are identified, procured and are available on site well in advance of install. This is done through.

Finalising design & material selections as a matter of priority to allow any potential issues to be identified and resolved before they impact overall project program

Early procurement of all key trades to provide certainty around delivery times or identify any issues early and provide adequate time to seek alternatives or respond to increased lead times.

Look to procure locally rather than from overseas where possible to reduce the exposure to increased risk of shutdowns and shipping delays

Maintain flexibility in selections and seek suitable alternatives when lead time issues are identified

Encourage suppliers and subcontractors to secure products early, even if off site storage of materials needs to be considered, rather than delay purchase until it is required.

FDC recognise that most of the critical materials are imported from overseas. If these materials are not identified early, then the project could be delayed. Most building materials are purchased from abroad due to the rising costs of manufacturing in Australia. The proposition that long-lead materials identification is one of the potential areas for the enhancement of our building construction projects 'productivity will be verified.

Planning matters involving the determination of material requirements for carrying out production and other related work processes such as determining the types of materials to be used in construction works, quantities, and specifications to carry out construction work will be identified at the design stage of the project and will involve the entire project management team.

Receiving and Quality Control

FDC's on site logistics manager will determine storage locations, layouts and all necessary equipment including registering, material acceptance, material inspection, building materials storage safety, material production, stock records and disposing/returning of defected building materials.

Appropriate storage facilities will be provided for on-site materials to prevent damage or theft.

Product and Service Non-Conformance

Non-Conformance Report (F039) shall be raised where non-conforming products and services work are identified and shall be added to the monthly project report. Non-Conforming product or materials shall be **quarantined** and either returned to the supplier, disposed of or used with client approval. Records of any action taken will be maintained including emails, minutes of meetings, memos, non-conformance reports etc.

Non-conformance relating to safety and environmental issues shall be managed in accordance with the NON-CONFORMANCE section of this PMP.

Defects shall be managed in accordance with the Defects Management section of this PMP.

Materials

Purchases shall be made using FDC Purchase Order and approved by the Project Manager and contain the following:

- Description of goods or services required;
- Delivery address requirements;
- Delivery date;
- Project details such as name and/or job number, and trade and/or cost reference;
- Agreed or estimated price;
- Reference to drawings etc. (number and revision);
- WHS requirements, including Safety Data Sheets (SDS), labelling, handling, and storage.

The Purchase Order shall be sent to the supplier including relevant FDC terms and conditions.

Receipt of Goods on Site

Deliveries to site shall be compared against the supplier's Delivery Docket and the Purchase Order. Where goods meet requirements, the Delivery Docket shall be signed and filed.

Where goods do not meet requirements, the receiver shall record the discrepancies / issues (e.g. incorrect goods, incorrect quantity, damaged or faulty goods, etc.) on the Delivery Docket. Non-conforming goods shall be segregated from conforming goods and identified that they have been quarantined / put on hold. Any issues should be followed up with the supplier and/or Project Manager and resolved with appropriate actions.

The marked up / signed Delivery Docket shall be forwarded to the Contracts Administrator to reconcile and process the purchase order, delivery docket and invoice and pass to accounts department.

Client Supplied Product and Services

Product supplied by the client shall be identified and be subject to the same levels of inspection, risk assessment etc. as purchased product or services.

Hazardous Material Use and Storage

Where Safety Data Sheets (SDS) identify chemicals to be hazardous or dangerous these shall be recorded, and risk assessed for use in accordance with the Hazardous Chemical Register. Suitable safety documentation (eg SWMS, standard operating procedures as appropriate) are developed prior to works commencing for the safe use, handling, and storing of chemicals. Current SDS shall be identified and readily accessible in either hard copy or electronic format.

Hazardous chemicals and dangerous goods shall be stored and separated as required by the Dangerous Goods Regulation.

The use of hazardous chemicals requiring health surveillance, as defined by legalisation, shall be managed in accordance with the Site Risk Assessment and the Health Surveillance section of this PMP.

Waste Management

Unnecessary waste due to inefficient purchasing will be managed by proper planning ensuring the following;

- Quantities of material are surveyed prior to ordering
- Ordering and delivery of materials arrive intime for install and are not ordered week prior to the install which are then left on the ground and are subject to damage.
- Grouping recyclable materials and salvaging offcuts where possible for reuse.
Materials that can be salvaged and re-used include concrete, gravel, and other aggregates can be used for backfilling instead of having to purchase additional dirt. Drywall can be used for patching damage in the finishing stages of a project. FDC also have agreements with suppliers to buy back materials we don't use, reduce packing materials, and find better ways to store materials to prevent damage.

APPENDIX G – Unexpected Contamination Finds Procedure

Unexpected Finds Protocol – Hazardous Substance

This protocol applies to the discovery of actual or potential asbestos-containing materials, or other contaminants in building materials or soils.

What does Asbestos look like?



In the event you find asbestos, or suspect the presence of asbestos or cannot identify a substance that may be unidentified asbestos, you must:



STOP WORK IMMEDIATELY



Report the suspected find to FDC Management for assessment and/or action



FDC Management shall set-up exclusion zone around suspect area to prevent unauthorised access



FDC shall undertake verification of the suspected material



Work must not recommence until you have received instructions from FDC Management that it is safe to do so.

Failure to adhere to the above procedure may result in disciplinary action and your removal from site

If in doubt – ASK.

Unexpected Finds Protocol – Heritage

INDIGENOUS HERITAGE

All Indigenous objects, regardless of significance, are protected under law. Should any deposit, artefact, or material evidence (including skeletal remains) of Indigenous origin be found, FDC and subcontractors shall cease all construction works that might disturb or damage the deposit, artefact or material. The project manager will notify the client immediately, who will then consult the relevant government department (i.e., DECCW - National Parks, Wildlife Services or Heritage NSW. Examples of Indigenous objects include stone tool artefacts, shell middens, axe grinding groves, pigment or engraved rock art, burials, and scarred trees.

HISTORIC HERITAGE (Non-Indigenous)

Historic heritage. Historic (non-Indigenous) heritage items may include archaeological 'relics and other historical items such as works, structures, buildings or moving objects. Should any item which is suspected to be of historical heritage value be encountered, FDC and subcontractors shall cease all construction works that might disturb or damage the item. The project manager will notify the client immediately, who will arrange for an officer from the relevant government heritage department to be consulted. A 'relic' is 'any deposit, artefact, object or material evidence that relates to the settlement of the area, not being Indigenous settlement; and is of State or local heritage significance'. It can include bottles, remnants of clothing, pottery, building materials and general refuse.

Discovery of Indigenous or Historic Heritage Relics

Step 1: Any person who believes they have uncovered Indigenous, or heritage relics should notify the suspected find to FDC Management for assessment and/or action. Works must cease immediately.

Step 2: A temporary 'no-go' or buffer zone of at least 10m x 10m should be implemented to protect the suspected Indigenous or heritage relics, where practicable. FDC will then notify the client of the find. No unauthorised entry or works will be allowed within this 'no-go' zone until the suspected relics have been assessed by a consulting Archaeologist or Indigenous Heritage Officer

Step 3: Work must not recommence until you have received instructions from FDC Management.

Failure to adhere to the above procedure may result in disciplinary action and your removal from site

APPENDIX H – Air Quality Management Plan

Introduction

Scope of Works

- This Air Quality Management Plan (AQMP) shall be read and implemented in accordance with the FDC Project Management Plan;
- a) The AQMP describes how the FDC will manage air quality and minimise impacts during the project.

Objectives and Targets

- b) The key objectives of the AQMP are to prevent visible emissions of dust from the site and to ensure that impacts to air quality are minimised and within the scope permitted by the Infrastructure Approval. To achieve these objectives, the targets in Table 1 have been proposed by FDC for the management of air quality impacts during the project.

Table 1: Proposed project targets & Key Performance Indicators (KPIs) associated with the management of air quality

Metric / measure	Target	Timeframe	Accountability	Documentation / Reporting
Visible dust emissions	Visible dust responded to immediately	At all times	Site Manager	Site inspection checklist Site Supervisor's daily diary (or equivalent)
Spillage or tracking on public roads	Spillage or trackage to be removed within 24 hours	At all times	Site Manager	Site inspection checklist Site Diary
Non-compliant monitoring results that can be directly attributed to construction activities in accordance with local legislation.	Zero non-compliant monitoring results	At all times	Site Manager	Monitoring results
Meet the CoA, EMM and EPL conditions relevant to air quality	Compliance with all CoA, EMM and EPL conditions relevant to air quality	At all times	Site Manager / Environment and Sustainability Manager	Environmental inspection checklist Quarterly Construction Compliance Report

Legal and Other Requirements

Legislation

- a) Legislation relevant to air quality management for this project are identified in the Legal Register and the Environmental risk assessment and includes:
 - i. Environmental Planning and Assessment Act 1979 (EP&A Act);
 - ii. Protection of the Environment Operations Act, 1997 (POEO Act); and

- iii. Protection of the Environment Operations (Clean Air) Regulation 2010 (POEO Clean Air) Regulation 2010).

Guidelines and Relevant Documents

- a) Additional guidance, specification and policy documents relevant to this AQMP include:
 - i. National Environment Protection Council's (NEPC) – National Environment Protection Measure (NEPM) for Ambient Air Quality Guidelines;
 - ii. NSW EPA Local Government Air Quality Toolkit; Visual Guide: Dust from urban construction sites;
 - iii. AS/NZS 3580.1.1:2007 Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment OR AS 2922-1987 Ambient Air – Guide for the siting of sampling equipment;
 - iv. AS/NZS 3580.10.1:2003 Methods for sampling and analysis of ambient air – Determination of particulate matter – deposited matter – gravimetric method;
 - v. Approved methods for the Sampling and Analysis of Air Pollutants in New South Wales (NSW DEC, 2006);
 - vi. Approved methods for the Modelling and Assessment of Air Pollutants in NSW (NSW DEC, 2005); and
 - vii. 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.

Environmental Management Measures

Table 2

No.	Revised Environmental Management Measure
AQ1	Develop and implement an Air Quality Management Plan which requires consultation with NSW EPA. Any measures that are required will differ depending on the activities occurring, and so will need to be tailored for each individual site.
AQ2	Carry out regular site inspections to monitor compliance with the Air Quality Management Plan, record inspection results.
AQ3	Develop and implement a community communication strategy (or equivalent plan) that includes community engagement before work commences on site.
AQ4	Display the name and contact details of person(s) accountable for air quality and dust issues at the boundaries of each construction area. This may be the project hotline, Environment Manager / Engineer or the Site Manager.
AQ5	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
AQ6	Ensure where reasonable and feasible appropriate control methods are implemented to minimise dust emissions from the project site.
AQ7	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as soon as practicable.
AQ8	Impose and signpost a maximum-speed-limit of 20 km/h on surfaced and unsurfaced haul roads and in work areas.
AQ9	Where practicable, only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction (e.g. suitable local exhaust ventilation systems).
AQ10	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
AQ11	Where possible, use enclosed chutes and conveyors and covered skips.

AQ12	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
AQ13	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using appropriate cleaning methods.
AQ14	Avoid scabbling (roughening of concrete surfaces) if possible.
AQ15	Stockpiles would be located outside overland flowpaths, and where left exposed and undisturbed for longer than 28 days, would be finished and contoured to minimise loss of material in flood or rainfall events. Materials which require stockpiling and are undisturbed for longer than 28 days would be stabilised by compaction, covering with anchored fabrics, or seeded with sterile grass where appropriate.
AQ16	Where a stockpile, e.g. sand or fine aggregate, has the potential to generate dust, control measures would be implemented. These would include wetting the stockpile, covering the stockpile or contouring the stockpile.
AQ17	Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
AQ18	For smaller supplies of fine powder materials, ensure bags are sealed after use and stored appropriately to prevent dust.

AQ19	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site.
AQ20	Avoid dry sweeping of large areas.
AQ21	Ensure vehicles carrying materials or spoil entering and leaving sites are covered to prevent escape of materials during transport.
AQ22	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
AQ23	Record all inspections of haul routes and any subsequent action in a site inspection checklist.
AQ24	Where reasonable and feasible, haul roads will be maintained with water carts and graders, and the condition of the roads will be monitored.
AQ25	Implement site exit controls (e.g. wheel washing system and rumble grids) to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable.
AQ26	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
AQ27	Access gates to be located at least 10m from receptors where possible.
AQ28	Ensure all construction vehicles comply with their relevant emission standards.
AQ29	Ensure that, where practicable, engines idling is minimised when stationary.
AQ30	Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
AQ31	Promote and encourage sustainable travel (public transport, cycling, walking, and car-sharing).
AQ32	No bonfires and burning of waste materials
AQ33	Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
AQ34	Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume

	water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground and may be more useful for covering larger areas.
AQ35	No explosive blasting during demolition. Appropriate manual or mechanical alternatives will be used.
AQ36	Bag and remove any biological debris or other hazardous materials such as asbestos, damp down such material before demolition.
AQ37	Re-vegetate earthworks and exposed areas / soil stockpiles to stabilise surfaces as soon as practicable.
AQ38	Use hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
AQ39	Where possible, only remove any cover for exposed areas in small areas during work and not all at once.
AQ40	Regular communication with other high risk construction ancillary facilities within 500m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.
AQ41	Undertake regular on-site and off-site inspection, where receptors are nearby, to monitor dust, record inspection results.
AQ42	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
AQ43	Make complaints available to the Principal upon request.
AQ44	Record any exceptional incidents that cause dust and/or air emissions, either on or offsite, and the action taken to resolve the situation.

Table 3

No.	Environmental Management Measure	Reference
The following EMMs will also assist in the management of air quality during the project and will be implemented by way of the management documents referenced.		
Soil and Water Management		
SW6	Measures will be implemented to minimise the risk of erosion and sedimentation. These measures may include: - Disturbed areas will be minimized and revegetated or stabilized as soon as practical. - Erosion control measures such as sediment fences, check dams, temporary ground stabilizing, diversion berm or site regrading will be installed as appropriate. - Where practical, clean water will be diverted away from works or disturbed areas. - Measures will be employed to control ground stability and limit run-off lengths and velocities within the construction ancillary facilities. - Wheel wash or rumble grid systems will be installed, where practical, at compound heavy vehicle exit points to minimize the transfer of soil from construction areas to roadways. - Erosion and sedimentation controls will be regularly inspected to maintain performance to the design criteria and design specifications. Controls are to be upgraded or altered if these objectives are found to not be satisfied.	Soil and Water Management Plan
SW8	Measures will be implemented to manage stockpiles. These measures may include: - Stockpiles will be located outside of overland flowpaths and riparian corridors, and finished and contoured so as to minimize loss of material in floor or rainfall events. - Stockpiles left exposed and undisturbed for longer than 28 days will be stabilized by	Soil and Water Management Plan

	compaction, then either: ○ Sprayed with suitable tackifier. ○ Covering with anchored fabrics. ○ Seeded with sterile grass.	
SW9	Measures will be implemented to minimise the risk of spills. These measures may include: • Spill containment will be included at locations where there is direct discharge of stormwater to receiving waterways. • Appropriately bunded areas will be provided for storage of hazardous materials such as oils, chemicals and fuels. • Adequate controls around stockpile areas and excavation works will be installed to minimize the risk of contaminants being washed into waterways or stormwater systems. • Maintenance of containment / spill infrastructure and clean-up procedures for on-site spills will be undertaken. • Spilt materials and/or any contaminated materials will be disposed of appropriately.	Soil and Water Management Plan

Construction Environmental Impacts

Construction Activity

- a) The Environmental Risk Assessment shall be used, in addition to the EIS, to identify potential aspects and impacts for this project and identify monitoring and inspection requirements. Generally, the following aspects may exist:

The aspects broadly identified in the EIS that have the potential to impact on air quality are:

- i. Dust and Particulate Emissions:
 - i. Demolition: any activity that involves the removal of existing structures. This may be referred to as de-construction, specifically when a building is to be removed a small part at a time;
 - ii. Earthworks: the processes of soil stripping, ground levelling, excavation and landscaping. Earthworks will primarily involve excavating material, haulage, tipping and stockpiling;
 - iii. Construction: any activity that involves the provision of new structures, modification or refurbishment. A structure will include a residential dwelling, office building, retail outlet, road etc.; and
 - iv. Track-out: the transport of dust and dirt by heavy vehicles from the construction / demolition site onto the public road network, where it may be deposited and then re-suspended by the vehicles using the network.
- ii. Gaseous Emissions:
 - i. Mobile construction plant and equipment: diesel combustion and petrol (gasoline) combustion;
 - ii. Transport of materials, spoil and waste to/from site: diesel combustion;
 - iii. Transport of project vehicles – light vehicles (petrol), petrol (gasoline) combustion;
 - iv. Vegetation clearance: removal of planted trees and screening vegetation and removal of parklands and open space;
 - v. Electricity purchased from the grid: electricity consumption during construction;
 - vi. Odours / gases released during groundwater treatment;
 - vii. Construction materials: concrete, cement, structural steel, reinforcement steel, steel rock bolts, aggregate, asphalt, copper, plastic and mains water; and
 - viii. Waste: construction and demolition waste.

Key Construction Locations

Table 4: A high level summary of activities with potential air quality implications

Location	Typical activities with potential to generate air emissions
Entire Site as a Single Stage	Site prep works, water and sewer connections, existing services removal/connection, structural shell. 1. Staging and Phasing of the Works It is envisaged that the entire base building shell and core will be constructed as a single stage, however, should this not be feasible to meet the required ready for service date (RFS) then additional stages may be required. For the purpose of this design brief 'Stages' refers to the construction of base building shell and core. Whereas the ongoing (or subsequent) installation and fit-out of mechanical, electrical and -plant equipment within the building will occur in multiple 'Phases' in line with capacity demand. The building shall maximise the available site footprint, height and FSR wherever feasible, practical, and economical. Due to site overland flow and time constraints basements are not envisioned. To ensure consistency with previous documentation it should be noted that Stage 1 refers to the construction of IC3e which has already been completed. Stage 2 refers to the construction of IC3w. The shell and core of the Stage 2 of works will be constructed first, along with associated site works and the initial IT load deployment as stated in section 1.4. Increased IT Load capacity and Fit out of data halls shall be designed to be progressively deployed over time subject to business demand. Stage 2 shall include: • Site preparation works. • Water and sewer connections suitable for final loads. • Electricity connections suitable at least for phase1 loads with planned expansion capability. • Complete shell and core construction and water proofing. • All relevant external works (including fuel tanks, water tanks, roadways, hard standing areas, fencing, future fit out builder's provisions – sewer, water, electrical and landscaping). • Phase 1 data hall space fitted out (including building services) to the following required: - o HAC Installed: - o Structural Ceiling Installed. - o Mechanical and ECMS Data Hall Sensors Installed. - o Data Hall Bus Duct Installed (no tap off boxes installed – final number for Stage 2 Phase 1 to be agreed with MDC as part of fit out works provisions). - o Fan Walls Installed. - o Humidifiers and AHU's Installed. - o Drainage and Water Services Installed to Fan Walls and Humidifiers. - o Earthing Installed. - o Pre Action-Fire Sprinkler Services (return air void and data hall space heads) Installed - o Vesda Services Installed. - o Lighting in cold and hot aisle including light rail supports and booker rod. - o EML Lighting & Exit signs. - o Air grilles. - o Fire Extinguishers.

	• New Carrier conduit capacity to service the building allowing for at least 20m separation between each bank of conduits. • All administration, logistics and ancillary areas fitted out (including their building services) • Both Telco/MDF rooms (including their building services). Space shall be allocated in close proximity to risers to allow for the commissioning of 2 off Telco rooms, with at least 25m separation between each (spatial allowance only). • M&E systems to accommodate Phase 1 IT load capacity • Headers and risers of sufficient capacity to match final loads for ease of expansion • All necessary plant and circulation areas to support the Phase 1 requirements • Hydraulic services to support the Phase 1 fitted out areas and minimum code compliance elsewhere • Fire services to support the Phase 1 fitted out areas and minimum code compliance elsewhere • All physical and electronic security to support the Phase 1 fitted out areas – to meet SCEC Zone 3 Ready. • MEP systems monitoring. • Any other work deemed necessary to enable risk free execution of future phases with no interruption to the Phase 1 load or customers.
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Construction Impacts

- a) The dominant air quality impacts and amenity issues as a consequence of the identified construction aspect are:
- Dust deposition (soiling of surfaces) and visible dust plumes;
 - Temporary elevation of Particulate Matter concentrations due to dust-generating activities;
 - Exhaust emissions from diesel-powered construction equipment;
 - Potential adverse health effects including eye / nose / throat irritation;
 - Impacts on sensitive receivers, including outdoor areas;
 - Impacts on water quality and vegetation; and
 - Dust or odour complaints from public.

Factors Likely to Affect Construction Air Quality Impacts

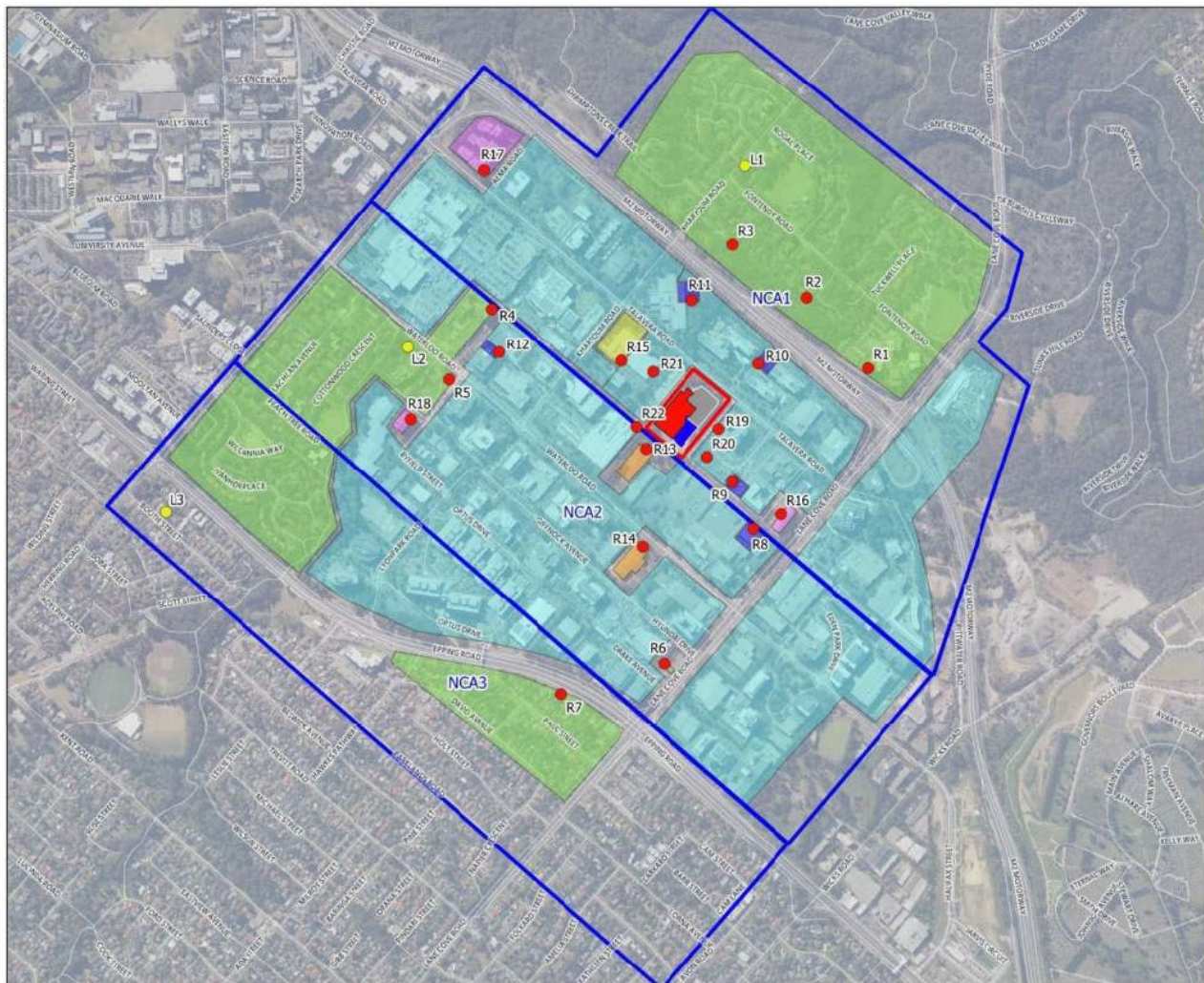
- a) The risk of dust impacts from a demolition / construction ancillary facility causing loss of amenity and/or health or ecological impacts is related to the following:
- The nature of the activities being undertaken;
 - The duration of the activities;
 - The size of the site;
 - The meteorological conditions (wind speed, direction, rainfall and dew). Adverse impacts are more likely to occur downwind of the site and during drier periods;
 - Soil moisture content and soil type and erodibility;
 - The proximity of receptors to the activities;
 - The sensitivity of the receptors to dust; and
 - The adequacy of the mitigation measures applied to reduce or eliminate dust.
- b) In addition, the risk of air quality impacts arising from exhaust emissions are related to the following:
- The number and type of plant and equipment being used;
 - The duration of use of each item of plant and equipment;
 - Appropriate operation and maintenance of plant and equipment; and
 - Compliance of plant and equipment with relevant emission standards.

Sensitive Receivers

a) Sensitive receivers likely to be impacted by the construction footprint are identified as:

- i. Residential
- ii. Commercial
- iii. Educational
- iv. Medical
- v. Hotels
- vi. Child Care

Receiver Locations Map



Consolidated Environmental Safeguards

- Environmental safeguards to manage air quality impacts prior to and during works are identified in Table 5. Elimination of the hazard is the first preference of control, followed by engineering, then administrative controls. These controls include the relevant legal and project requirements identified in the environmental management measures (EMM), Conditions of Approval (CoA) and FDC standard practice measures specific to management of air quality.

Table 5: Project Controls associated with Management of Air Quality

No.	Control SM -Site Manager, SF-Site Foreman, CA-Contract Administrator, CRM-Community Relations Manager, PM-Project Manager, EHS-National EHS Systems Manager	Source	Responsibility	Training / Induction / Toolbox	Monitoring / Inspection / Audit Check
AQL1	Communicate regularly with relevant stakeholders within the key sensitive areas.	EMM AQ40	CRM		
AQL2	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	EMM AQ5	PM		
AQL3	Ensure all air quality risks are considered as part of the development of Construction Area Plans.	FDC standard practice	CA		
AQL4	Ensure Work Packs include relevant environmental control information including a Site Environment Plan where required.	FDC standard practice	CA		
AQL5	All environmental incidents will be managed in accordance with the relevant authority reporting procedure. Where incidents cause or are likely to cause material harm to the environment, the incident will be immediately reported to NSW EPA and other authorities as per the Pollution Incident Response Management Plan.	POEO Act CoA A15, A17	PM		
AQL6	The Regulator will be notified of any incident (other than those relating to the <i>Protection of the Environment Operations Act 1997</i>) with actual, or potential, significant off-site impacts on people or the biophysical environment immediately of becoming aware of the incident on weekdays, or the following business day on weekends, public holidays and site shutdown. Full written details of the incident will be provided to the Regulator within seven days of the date on which the incident occurred.	CoA A16	HSEQ		
AQL7	Record any exceptional incidents that cause dust and / or air emissions, either on or off-site, and the action taken to resolve the situation.	EMM AQ44	SM		
AQL9	Display the name and contact details of person(s)	EMM AQ4	CRM		

No.	Control	Source	Responsibility	Training / Induction / Toolbox	Monitoring / Inspection / Audit Check
	SM -Site Manager, SF-Site Foreman, CA-Contract Administrator, CRM-Community Relations Manager, PM-Project Manager, EHS-National EHS Systems Manager				
	accountable for air quality and dust issues at the boundaries of each construction area. This may be the Project Manager or the Site Manager.				
AQL10	Record all dust and air quality complaints in accordance with the Construction Complaints Management System and make the complaints log available to the Secretary upon request.	CoA C4 EMM AQ42 EMM AQ43	CRM		
AQL11	Weather warnings and wind speeds above 25 km/hr to be reported to the Site Supervisor and Construction Teams.	FDC standard practice	PM		
AQL12	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as soon as practicable.	EMM AQ7	SM		
AQL13	Ensure an adequate water supply on the site for effective dust / particulate matter suppression / mitigation, using non-potable water where possible and appropriate.	EMM AQ10	SM		
AQL14	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using appropriate cleaning methods.	EMM AQ13	SM		
AQL15	Avoid scabbling (roughening of concrete surfaces) if possible.	EMM AQ14	SM		
AQL16	Avoid dry sweeping of large areas.	EMM AQ20	SM		
AQL17	Stockpiles shall be located outside overland flowpaths, and where left exposed and undisturbed for longer than 28 days, would be finished and contoured to minimise loss of material in flood or rainfall events. Materials which require stockpiling and are undisturbed for longer than 28 days would be stabilised by compaction, covering with anchored fabrics, or seeded with sterile grass where appropriate.	EMM AQ15	SM		
AQL18	Where a stockpile, e.g. sand or fine aggregate, has the potential to generate dust, control measures would be implemented. These would include wetting the stockpile, covering the stockpile or contouring the stockpile.	EMM AQ16	SM		
AQL20	Use hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.	EMM AQ38	SM		

No.	Control	Source	Responsibility	Training / Induction / Toolbox	Monitoring / Inspection / Audit Check
	SM -Site Manager, SF-Site Foreman, CA-Contract Administrator, CRM-Community Relations Manager, PM-Project Manager, EHS-National EHS Systems Manager				
AQL21	Where possible, only remove any cover for exposed areas in small areas during work and not all at once.	EMM AQ39	SM		
AQL22	Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	EMM AQ33	SM		
AQL23	Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground and may be more useful for covering larger areas.	EMM AQ34	SM		
AQL24	No explosive blasting during demolition. Appropriate manual or mechanical alternatives will be used.	EMM AQ35	PE		
AQL25	Bag and remove any biological debris or other hazardous materials such as asbestos, damp down such material before demolition.	EMM AQ36	SM		
AQL26	Where practicable, only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	EMM AQ9	SM		
AQL27	Where possible, use enclosed chutes and conveyors and covered skips.	EMM AQ11	SM		
AQL28	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	EMM AQ12	SM		
AQL29	Impose and signpost a maximum speed limit of 20 km/h on surfaced and unsurfaced haul roads and in work areas.	EMM AQ8	SM		
AQL30	For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.	EMM AQ18	SM		
AQL32	Ensure vehicles carrying materials or spoil entering and leaving sites are covered to prevent escape of materials during transport.	EMM AQ21	SM		
AQL33	Where reasonable and feasible, haul roads will be maintained with water carts and graders, and the	EMM	SM		

No.	Control	Source	Responsibility	Training / Induction / Toolbox	Monitoring / Inspection / Audit Check
	SM -Site Manager, SF-Site Foreman, CA-Contract Administrator, CRM-Community Relations Manager, PM-Project Manager, EHS-National EHS Systems Manager				
	condition of the roads will be monitored especially in high risk areas and/or during high risk days.	AQ24 FDC standard practice			
AQL34	Stabilised access, rumble grids, wash bays or similar must be established for site entries and exits to minimise mud on public roads. Sweepers shall be used periodically to clean public roads where mud has been deposited.	EMM AQ25 FDC standard practice	SM		
AQL35	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. Access gates to be located at least 10 m from receptors where possible.	EMM AQ26 EMM AQ27	SM		
AQL36	All construction plant and equipment must be maintained and operated to minimise emissions. Visible emissions should not be emitted for any period greater than 10 consecutive seconds. Notify EA of any defective emission controls.	POEO Act FDC standard practice	SM		
AQL37	Ensure all construction vehicles comply with their relevant emission standards: - Project would comply with the relevant emissions standards in Australian Design Rules (for heavy duty engines and vehicles); - Strategies for minimising air emissions from off road diesel equipment, including graders, bulldozers and loaders; and - Confirmation that all off road diesel equipment would meet best available diesel emissions standards or be fitted with an appropriate diesel exhaust treatment device where possible.	EMM AQ28	SM		
AQL38	Ensure that, where practicable engine idling is minimised when stationary.	EMM AQ29	SM		
AQL40	Promote and encourage sustainable travel (public transport, cycling, walking, and car- sharing).	EMM AQ31	PM, SM		
AQL41	No bonfires and burning of any materials.	EMM AQ32 FDC standard practice	SM		

AIR QUALITY RISK ASSESSMENT

Assess the Situation

- Review weather forecast for potential high winds (>25km/hr) [SM].
- Consult with SS and other subcontractors for strategies to minimise dust [SM].
- The need for and type of dust controls will be assessed prior to works being undertaken [SM/SF].
- The implementation of dust and emission controls will be progressive and continual during the various stages of construction of the temporary site facility [SM/SF].

STOP DUST GENERATING WORK if winds exceed 25km/hr and air quality controls are not sufficient to mitigate dust generation.



Implement Air Quality Controls

[SM]

The most common dust and emission control mitigation measures to be implemented include:

- Avoid dry sweeping of large areas. Use water-assisted dust sweeper(s) on the access and local roads to remove tracked out materials.
- Use a water cart or hoses to wet down access tracks, problematic areas.
- Ensure effective water suppression to be used during demolition operations.
- Cover truck loads and sweep tailgates before leaving site.
- Operate and maintain vehicle wash down facilities.
- Temporary stockpiles require regular wetting or are to be covered. Stockpiles or materials to be stored longer than 28 days are to be contoured and seeded to minimise loss of material.
- Remove materials that have potential to produce dust from site as soon as possible.
- If feasible and reasonable, erect dust screens around dust generating activities which are in close proximity to the general public.



Observe Effectiveness of Controls

[SM]

- If visible dust observed leaving site, re-assess the situation and potentially implement additional controls.
- If a dust complaint is received, re-assess the situation and potentially implement additional controls.
- Bring any significant air quality issues to the attention of the SM (in the first instance) or the PM.



Monitoring & Recording

- SM to monitor daily for tracking of mud on public roads, ensuring the integrity of the access/egress points and haul road to ensure loose material not being tracked out. Outcomes of this monitoring are to be recorded in the SS daily diary (or similar).
- SM/SF to record details of observations regarding visible dust emissions in SM/SF daily diary (or similar).
- PM to undertake weekly and fortnightly inspections in accordance with AQMP.

APPENDIX I – Waste Management Plan

Overview

- a) The purpose of this Waste Management Plan is to outline the proposed method to deal with construction waste throughout the entire construction phase of the building from demolition and excavation through to building fitout, landscaping and handover.
- b) The method of dealing with construction waste is consistent throughout to ensure that our environmental obligations are being met.
- c) The plan outlines how we propose to achieve the project requirements and shall be read and implemented in accordance with the Project Management Plan.

Recycling

- a) Recycling is a vital means whereby Australia's natural resources are conserved and efficiently utilised. FDC aim to develop a waste management system based on resource recovery and recycling.

Option 1: On-site Recycling

- a) The efficiency of on-site recycling depends on the anticipated waste stream types and quantity along with space being available (and suitable) to house the bins required.
- b) The on-site separation of scrap metals such as aluminium, copper pipe and wire, lead and steel is viable. Bins will be identified clearly on sites to aid in the separation of materials. FDC will work together to reduce waste coming to site.
- c) Site conditions permitting separate on-site bins for cardboard and paper are also possible and FDC have committed to providing a paper bin for use on site for this purpose.
- d) FDC feel that off-site recycling is the more viable option for all other wastes.

Option 2: Off-site Recycling

- a) Off-site recycling is the most appropriate course of action for mixed waste streams and sites with minimum room or access difficulties.
- b) At the landfill and recycling facility, it is possible to sort and recycle wastes coming in. This sorting and recycling includes the recovery and production of the following materials:
 - i. Paper / Cardboard / Glass
 - ii. Steel – OSI and Black Iron
 - iii. Non-ferrous metals such as: lead, copper, electrical cable, brass and aluminium, all of which are sorted and sent to the appropriate processing plants.
 - iv. Timber, such as formwork pallets, hardwood, oregon and the like are sorted for reuse with the remainder being processed to make woodchip.
 - v. Plasterboard and Gyprock are transformed into soil conditioners. Green waste is transformed into mulch.
 - vi. Problem waste, such as tree stumps and plastics are all processed or recycled to avoid the potential problems that wastes such as these cause at landfills.
- c) All hard-core materials such as bricks, mortar, concrete, dirt, soil, sand, tiles and stone are either stacked for reuse or reprocessed into high quality raw materials such as road base, aggregates for drainage, fill sand, soil and turf underlay etc.

Environmental Management and Compliance

- a) FDC offer a waste management service in accordance with the Protection of the Environment Operations Act 1997 and the Waste Minimisation and Management Act 1995.
- b) Clients of FDC are secure in the knowledge that their waste is being disposed of according to environmental protection legislation and the principles of ecologically sustainable development. FDC has in place, as a major part of our business, a materials recovery and recycling program that exceeds the objectives of the waste minimisation and management legislation.

Legislation and Due Diligence

Legislation

- a) The disposal of wastes is under the control of the local authorities and Environmental Protection Authority. The EPA administers the Protection of the Environment Operations Act and associated legislation and regulations.

Due Diligence

- a) Companies and individuals are required to act with due diligence in respect of the disposal of the waste they generate. Companies and individuals are exercising due diligence by using appropriate organisations to dispose of waste.
- b) Due diligence may be considered to be the legal opposite of negligence. If due diligence is not exercised, then negligence may be considered to have occurred. Due diligence applies to both a requirement to act and to a failure to act, thus commission and omission of action. Due diligence applies to companies, company Directors and employees. Due diligence means that companies and individuals have all the reasonable means to ensure that legal obligations have been met.
- c) For waste management, due diligence requires both the waste producer and the waste collector to mutually exercise:
 - i. Duty of care, and
 - ii. Duty of disclosure

Definitions of Waste

Wastes

- a) Wastes are described by many different names and come in many different types, i.e. industrial, commercial, building and demolition, clinical, solid, domestic, putrescible, non-putrescible, hazardous, household, inert, municipal and trade waste. They are defined for regulatory purposes in the Protection of the Environment Operations Act.
- b) For practical purposes the following waste management hierarchy that prioritises ecological sustainable waste solutions:
 - 1. Avoiding waste
 - 2. Reusing materials
 - 3. Recycling and reprocessing materials
 - 4. Waste Disposal

Waste Management

- a) Wastes need to be managed in order to comply with every aspect of the legislation covering wastes. The waste management service provided by FDC is a total waste management service. By engaging FDC to manage wastes, a waste generator has exercised complete due diligence. FDC assumes the responsibility and requirement for the correct collection, transport, storage and disposal of wastes.
- b) The waste management service of FDC covers all aspects of all wastes and a complete and thorough service to assist industry; a significant service that is keeping Australia clean.

Ecologically Sustainable Development

- a) Ecologically sustainable development as the fundamental tenant of Australian business stems from the Intergovernmental Agreement of the Environment between the Australian Commonwealth, State, Territory and Local Governments on ecologically sustainable developments made in May 1992.
- b) FDC endorses and is committed to the four principles which constitute ecologically sustainable development.

Principle 1: The Precautionary Principle

- a) For general hard wastes, there is a great deal of scientific certainty concerning their treatment, storage, transport and disposal.. For special wastes, FDC applies the measures and procedures for handling and disposal required by local legislation.
- b) These measures and procedures are designed to ensure the known and suspected effects of such materials are controlled.

Principle 2: Inter-generational Equity

- a) Resource recovery and recycling as carried out by FDC, together with corresponding savings in fossil fuel energy and more efficient use of landfill sites, are direct, positive and practical measures used to provide for inter-generational (future generations) and intra-generational (present generation) equity.

Principle 3: Conservation of Biological Diversity and Ecological Integrity

- a) Disposal of waste by FDC is at a designed licensed landfill site. The site has detailed rehabilitation plans to ensure the biological diversity and ecological integrity of the site and its environments.
- b) The recovery and recycling of resources conserves resources and consequently minimises the impact of the initial production of resources on the biological diversity and ecological integrity of land.

Principle 4: Improved Valuation and Pricing of Environmental Resources

- a) FDC applies control measures in the treatment, storage, transport and disposal of waste materials to minimise air, water and noise pollution. These control measures are the means whereby the valuation of the environmental resources of air quality, water quality and area amenity is enhanced.

Conclusion

- a) FDC's clients can feel secure in the knowledge that their waste is being disposed of and recycled according to environmental protection legislation and the principles of ecologically sustainable development.
- b) Recycling Reports are a key feature of FDC's waste management services and can be provided to clients at the end of each month, indicating the recycling results achieved by individual sites. This allows our clients the confidence of knowing they are achieving Government standards and meeting all reporting requirements.

Waste Estimates

- a) Refer to the tables on the following page.

Subcontractor TBC but is to have applicable certifications/competencies. Waste disposal location to be determined by subcontractor on award and to be reviewed to ensure suitability.

DEMOLITION STAGE

Excavation Material – 50m³

Green Waste – 100m³

Bricks/Blocks – N/A

Concrete – 100 m³

General Construction Waste – 40m³/day

Timber – N/A

Metals – N/A

Doors/Windows – N/A

Glass – N/A

Plasterboard – N/A

Asphalt – 120m³

EXCAVATION STAGE

Excavation Material – 5000m³ total. 3,400m³ to be exported off site. Location TBC.

General Construction Waste – 20m³/day

Green Waste – 50m³

ALL OTHER ITEMS NOT APPLICABLE AT EXCAVATION STAGE

CONSTRUCTION STAGE

General construction waste – 30m³/day

Bricks & Blocks – 5% of total qty documented.

Concrete – 5% of total qty documented.

Timber – N/A

Metals – N/A

Glass – N/A

Plasterboard – 5% of qty documented.

Cardboards & Paper – 1m³/day.

SECTION ONE - DEMOLITION STAGE



MATERIALS ON-SITE		DESTINATION		
		REUSE AND RECYCLING		DISPOSAL
Expected Waste Materials	Estimated Volume (m³)	ON-SITE Specify proposed reuse or on-site recycling methods.	OFF-SITE Specify contractor and recycling outlet.	Specify contractor and landfill site.
Excavation Material (topsoil)		Keep and reuse top soil for landscaping. Store on site where possible. Use some behind retaining walls	To recycling facility by Builder. To be offered for reuse as landscape supplies.	
Green Waste		Where able replant to another location on site. Unwanted shrub material chipped and re-used on-site as mulch in landscaping.	Use off site for mulch and the like if possible	
Bricks / Blocks		Quality bricks clean mortar and re-use where possible. Re-use others in fill.	Recycled via waste transfer depot through demolition / bin contractor for recycling	
Concrete		Crush and use on-site in fill. Surplus concrete to be removed from site	To be crushed and recycled	
General Construction Waste			Recycled via waste transfer depot through demolition / bin contractor for recycling	
Timber		Where able re-use as form work. Chip surplus and use in landscaping.	Recycled via waste transfer depot through bin contractor for recycling	

Metals		All existing metalwork to be removed from site.	Recycled via waste transfer depot through demolition / bin contractor for recycling	
Doors/Windows		Removed from site.	Recycled via waste transfer depot through demolition / bin contractor for recycling	
Glass		Collect on-site and stockpile.	Recycled via waste transfer depot through demolition / bin contractor for recycling	
Plasterboard		All existing plasterboard to be removed from site.	Nil	

SECTION TWO - EXCAVATION STAGE

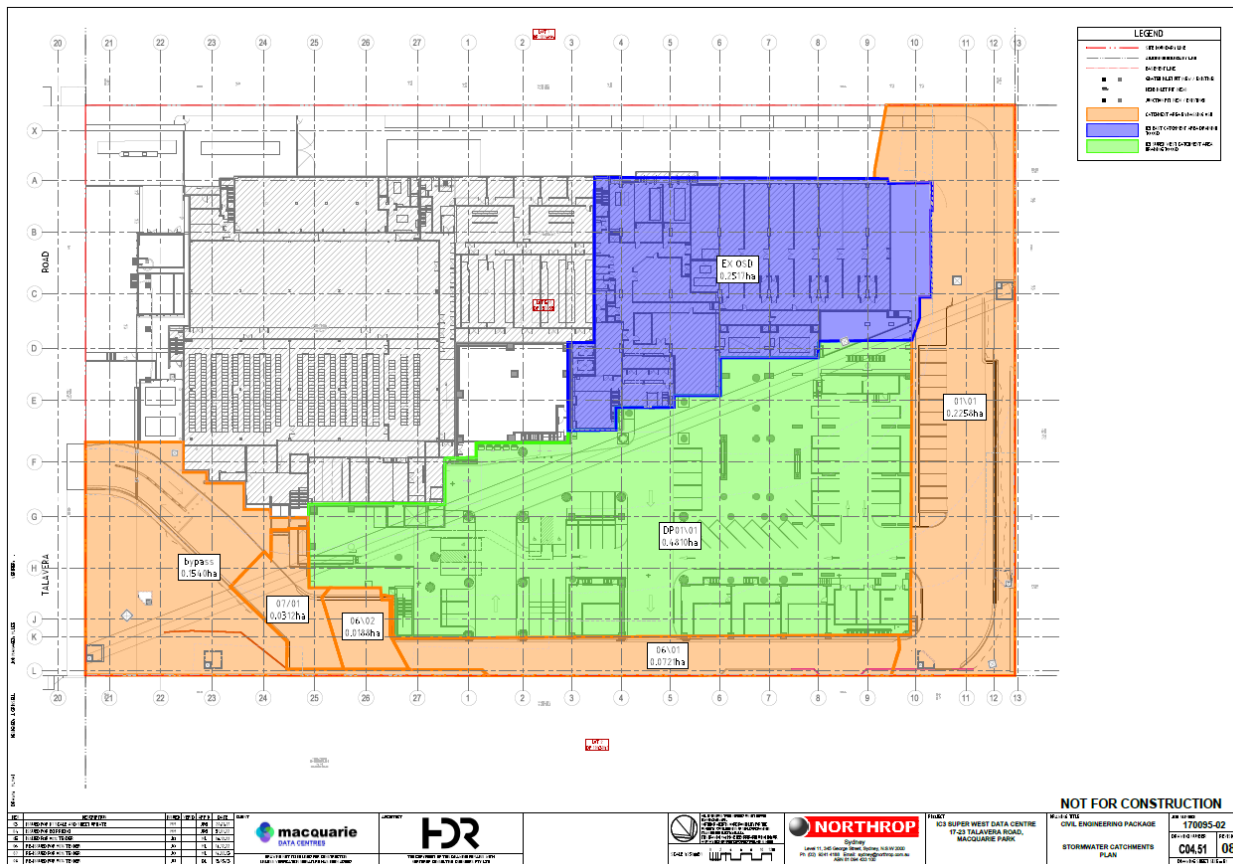
MATERIALS ON-SITE		DESTINATION		
		REUSE AND RECYCLING		DISPOSAL
Expected Waste Materials	Estimated Volume (m³)	ON-SITE Specify proposed reuse or on-site recycling methods.	OFF-SITE Specify contractor and recycling outlet.	Specify contractor and landfill site.
Excavation Material		Excavation material will be re-used as fill on site where possible	Excess material to be exported from site and re-used as fill on another site	
Green Waste				
Bricks		Nil	Surplus to Waste and Recycling Centre, by builder.	
Concrete		Nil	Surplus to Waste and Recycling Centre, by builder.	
Glass		Nil	Recycled via waste transfer depot Sims Metal Recycling (site rubbish skip bin service)	

SECTION THREE - CONSTRUCTION STAGE

MATERIALS ON-SITE		DESTINATION		
		REUSE AND RECYCLING		DISPOSAL
Expected Waste Materials	Estimated Volume (m³)	ON-SITE Specify proposed reuse or on-site recycling methods.	OFF-SITE Specify contractor and recycling outlet.	Specify contractor and landfill site.
Bricks / Blocks		Quality bricks clean mortar and re-use where possible. Re-use others in fill.	Recycled via waste transfer depot through bin contractor for recycling	
Concrete		Crush and use on-site in fill. Surplus concrete to be removed from site	To be crushed and recycled	
General Construction Waste			Recycled via waste transfer depot through bin contractor for recycling	
Timber		Where able re-use as form work. Chip surplus and use in landscaping.	Recycled via waste transfer depot through bin contractor for recycling	
Metals		All existing metalwork to be removed from site.	Recycled via waste transfer depot through bin contractor for recycling	
Glass		Collect on-site and stockpile.	Recycled via waste transfer depot through bin contractor for recycling	

Plasterboard		All existing plasterboard to be removed from site.	Nil	
Cardboards & Paper		Cardboard/Paper bin dedicated to site	Recycled via waste transfer depot through bin contractor for recycling	

APPENDIX J – Water System Pollution Plan



APPENDIX K – Community Consultation Letter



FDC Construction (NSW) Pty Ltd
ABN 72 608 609 427

22 – 24 Junction Street
Forest Lodge NSW 2037 Australia
T 61 2 8117 5000 | F 61 2 9566 2900
fdcbuilding.com.au

To:	Department of Planning and Environment – Planning Secretary		
Attention:	Joanna Bakopanos	Date	22 May 2024
Applicant:	FDC Construction Pty Ltd (NSW)		
Address:	17 to 23 Talavera Rd, Macquarie Park.		
Subject:	IC3 West Construction Works		
SSDA Reference No:	SSD-24299707		
Stage:	Construction Works- CC2	Cond No:	A15
Topic:	Commencement of Construction of IC3 West – CC2		

Dear Joanna,

Following development consent for SSD- 24299707 dated 19 January 2024, FDC Construction advise that in accordance with Condition Number A15 of the terms of consent we intend to commence the IC3 West CC2 In Ground works in one month or by 2nd July 2024.

Should you wish to discuss any of the above, please don't hesitate to contact the undersigned.

Yours sincerely,

Matthew Hezlett
Project Manager
FDC Construction (NSW) Pty Ltd
0478 403 455
matthewh@fdcbuilding.com.au

APPENDIX L – PROJECT TEAM SIGN OFF

Construction Environment Management Plan

Name	Responsibility	Signature
Michael Tornatore	Site Safety Officer	
Kieran Beatty	Contract Administrator	
Costan Griziotis	Project Engineer	
Emmanuel Androulidakis	Foreman	
Matthew Martino	Site Manager	
Matthew Hezlett	Project Manager	
Daniel Faulkner	Project Director	