

The background of the page is a faded architectural rendering of the John Hunter Hospital. It shows a modern, multi-story building with large glass windows and a curved entrance. In the foreground, there is a paved area with some landscaping, including trees and shrubs. A family consisting of a man, a woman, and a small child is walking away from the viewer towards the hospital entrance. The overall scene is bright and clear, suggesting a sunny day.

MULTIPLEX

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

John Hunter Health & Innovation Precinct:
Enabling Works Stage

MPX-MNGPL-EW-004
Revision 5

Multiplex Constructions Pty Limited
www.multiplex.global

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1. Introduction

1.1 Purpose

The purpose of this Environmental Management Plan (Plan) is to provide a coordinated high level plan that details, at a Project level, the environmental management strategies and procedures that will be adopted on the John Hunter Health & Innovation Precinct Project (the Project) on which Multiplex is operating as the Principal Contractor.

This plan is a sub-plan of the Project Management Plan, which forms part of Multiplex Management System which is certified to:

- » AS/NZS ISO 9001:2015 – Quality Management System
- » AS/NZS ISO 14001:2015 – Environmental Management System
- » AS/NZS ISO 45001:2018 – Occupational Health and Safety Management System
- » New South Wales Government Accreditation Scheme.

Copies of these certifications can be found on the Multiplex Operating System ‘Document and Forms Library’.

1.2 Scope of this Plan

This Plan applies to the works associated with the Project and consists of:

- » An overview of the Environmental Management System (EMS)
- » The organisational structure for environmental management
- » Applicable legislative requirements
- » Sub-plans to manage the environmental aspects of the Project
- » Environmental incident management processes
- » Processes to monitor and evaluate environmental performance.

1.3 Abbreviations

The abbreviations used in this Plan are outlined below.

Abbreviation	Definition
AS/NZS	Australian and/or New Zealand Standard
ASS	Acid Sulfate Soil
EMP	Environment Management Plan
DEC	Department of Environment and Conservation
DIA	Department of Indigenous Affairs
EMS	Environmental Management System
EWMS	Environmental Work Method Statement
SDS	Safety Data Sheet
MPX	Multiplex Constructions Pty Ltd
MSOP	Management System Operational Procedures
NEPC	National Environment Protection Council
NEPM	National Environmental Protection Measures

Figure 1 *Abbreviations*

1.4 Precedence

Where ambiguity is detected between the procedures and requirements in this plan and the MSOPs located on Multiplex Operating System, then the procedures nominated in this Plan will take precedence.

1.5 Interface with other Operational Procedures and Project Plans

This Plan should be read in conjunction with the MSOP and Management Plans detailed in Section 2.2 of this Plan.

The MSOP referenced in this Plan are confidential documents, and as such, will not be issued outside of Multiplex. However, they will be made available, for the purpose of surveillance and audit of the EMS.

1.6 Project Description

The John Hunter Health and Innovation Precinct Project consists of the construction and operation of an eleven storey Acute Services Building comprising of a podium with four levels of semi-basement parking and seven levels above and a rooftop helipad.

The Project also includes the refurbishment of existing JHH buildings, construction of new road infrastructure and improvements to existing drop-off facilities, temporary construction access road, new pedestrian connections to the ASB and a link bridge to the Hunter Medical Research Institute (HMRI), upgrade to existing car parking facilities, landscape and public domain works, mines grouting remediation works, building services works and utility adjustments, stormwater drainage works, signage and site preparation, including bulk earthworks and tree removal.

The JHHIP Project will be constructed in stages. This Construction Environmental Management Plan has been developed for the purposes of the 'Enabling Works' stage of the Project. The activities associated with this stage are outlined in further detail below.

1.7 Enabling Works Scope

The Enabling Works stage of the Project involves preparing the JHHIP site for the construction of the Acute Services Building. It involves activities such as site preparation, creation of access routes, mine seam injection works, tree clearing/ protection, and precinct car park expansion works. These activities are outlined in further detail in the table below.

SCOPE	ACTIVITIES
Enabling Works	» Site access roads » Temporary accommodation/ fencing/ signage » Tree clearance/ protection » Earthworks/ Sedimentation controls » Mines grouting » Services diversions and utility adjustments » Demolition works » On-grade car parking expansions » In-ground substructure

Figure 2 JHHIP Enabling Works Stage

1.8 Hours of Work

The Hours of Work for the John Hunter Health and Innovation Precinct Project – Enabling Works Stage are approved under **Conditions C4 to C7** in Schedule 2 of the State Significant Development Approval **SSD-9351535**. These Conditions are outlined in the table below.

Condition Number	Condition description
C4	Construction, including the delivery of materials to and from the site, may only be carried out between the following hours: Note: these extended working hours are subject to approval from DPIE. Otherwise working hours are to comply with Statutory Requirements. (a) between 6am and 6pm, Mondays to Fridays inclusive; and (b) between 7am and 5pm, Saturdays. No work may be carried out on Sundays or public holidays.
C5	Construction activities may be undertaken outside of the hours in condition C4 if required: (a) by the Police or a public authority for the delivery of vehicles, plant or materials; or (b) in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or (c) where the works are inaudible at the nearest sensitive receivers; or (d) for the delivery, set-up and removal of construction cranes, where notice of the crane- related works is provided to the Planning Secretary and affected residents at least seven days prior to the works; or (e) where a variation is approved in advance in writing by the Planning Secretary or his nominee if appropriate justification is provided for the works.
C6	Notification of such construction activities as referenced in condition C5 must be given to affected residents before undertaking the activities or as soon as is practical afterwards.
C7	Concrete finishing works (including the use of a helicopter float) may be undertaken outside of the hours in condition C4, unless directed otherwise by the Planning Secretary, between the following hours: (a) Saturday: 1pm to 3pm.
C8	Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours: (a) 9am to 12pm, Monday to Friday; (b) 2pm to 5pm Monday to Friday; and (c) 9am to 12pm, Saturday.

Figure 3 JHHIP Hours of Work

1.9 Legal and Other Requirements

In accordance with Procedure BU AUS IMS P DIV 050 – Document and Records Management, a schedule of environmental legislation has been developed to identify all environmental legal and other requirements that are applicable to the project. This schedule is maintained on Multiplex Operating System and is reviewed annually by the WHS&E Manager/Coordinator.

1.9.1 Legislative References

The pertinent Acts, Regulations and Guidelines that apply to the project are outlined below:

ENVIRONMENTAL LEGISLATION REGULATIONS AND GUIDELINES	
Acts	
» Contaminated Land Management Act 1979	» Ozone Protection Act 1989
» Environmentally Hazardous Chemicals Act 1985	» Pesticides Act 1999
» Environmental Planning and Assessment Act 1979	» Protection of the Environment Operations Act 1997
» Heritage Act 1977	» Soil Conservation Act 1938
» Land and Environment Court Act 1979	» Waste Avoidance and Resource Recovery Act 2001
» Local Government Act 1993	» Water Act 1912
» National Parks and Wildlife Act 1974	

ENVIRONMENTAL LEGISLATION REGULATIONS AND GUIDELINES	
Regulations	
» Contaminated Land Management Regulation 2013 » Environmentally Hazardous Chemicals Regulation 2017 » Environmental Planning and Assessment Regulation 2000 » Heritage Regulation 2012 – various amendments and Regulations » Land and Environment Court Regulation 2005 » Local Government (General) Regulation 2005 » National Parks and Wildlife Regulation 2009 » Pesticides Regulation 2017	» Protection of the Environment Operations (Clean Air) Regulation 2010 » Protection of the Environment Operations (General) Regulation 2009 » Protection of the Environmental Operations (Underground Petroleum Storage Systems) Regulations 2014 » Protection of the Environment Operations (Noise Control) Regulation 2017 » Protection of the Environment Operations (Waste) Regulation 2014
Commonwealth (National) Environmental Legislation	
» Aboriginal and Torres Strait Islander Heritage Protection Act 1984 » Environmental Protection and Biodiversity Conservation Act 1999 » National Environment Protection Council Act 1994 » National Greenhouse and Energy Reporting Act 2007	» Ozone Protection and Synthetic Greenhouse Gas Management Act 1989 » Product Stewardship Act 2011 » Water Efficiency Labelling and Standards Act 2005
Commonwealth National Environmental Protection Measures	
» National Environment Protection (National Pollutant Inventory) Measures 1998 » National Environment Protection (Ambient Air Quality) Measure 1998 » National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)	» National Environment Protection (Diesel Vehicle Emissions) Measure 2001 » National Environment Protection (Used Packaging Materials) Measure 2011 » National Environment Protection (Air Toxics) Measure 2011
NSW Environmental Planning Policies	
» State Environmental Planning Policy (State and Regional Development) 2011 » State Environmental Planning Policy (Exempt and Complying Development Codes) (2008) » State Environmental Planning Policy (Infrastructure) 2007 » State Environmental Planning Policy (Major Development) 2005	» State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 » State Environmental Planning Policy No 71 (Coastal Protection) » State Environmental Planning Policy No 55 (Remediation of Land)
Guidelines/ Australian Standards	
» Air Quality Guidance Notes for Construction Sites » Assessing Significance for Historical Archaeological Sites and Relics » Assessing Vibration – Technical Guidelines (2006) – DEC (EPA) AS1055 » Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000) » Technical Guidelines to Minimise Blasting Overpressure and Ground Vibration » Environmental Management Systems Guidelines for the Construction Industry » Interim Construction Noise Guideline » Know Your Responsibilities – Managing Waste From Construction Sites » Managing Urban Stormwater – Soils and Construction » National Australian Built Environment Rating System (NABERS Energy)	» NSW Heritage Office Guidelines- Photographic Recording of Heritage Items using Film or Digital Capture. » AS 1940-2017 – The storage and handling of flammable and combustible liquid » AS 4976-2008 – The removal and disposal of underground petroleum storage tanks » AS 4897-2008 – The design, installation and operation of underground petroleum storage systems » AS 4282-1997 – Control of The Obtrusive Effects Of Outdoor Lighting » UPSS Technical Note: Site Validation Reporting » UPSS Technical Note: Decommissioning, Abandonment and removal of UPSS

Figure 4 Environmental Legislative Regulation and Guidelines

1.9.2 Environmental Approvals, Licenses and Permits

The relevant approvals, permits and licenses for the project are outlined below:

Approval/Licence/Permit	Relevant Authority	Details
SA NSW approval	Subsidence Advisory NSW	SA NSW approval under section 22 of the Coal Mine Subsidence Compensation Act 2017
Retiring of ecosystem/species credits	Biodiversity Conservation Fund	The number and classes of ecosystem credits and species credits set out in the BAM Biodiversity Credit Report must be retired prior to the commencement of construction
Unexpected Finds – Aboriginal Heritage	NSW Planning Secretary	In the event that surface disturbance identifies a new Aboriginal object all works must halt in the immediate area to prevent any further impacts to the object(s). Works may only recommence with the written approval of the Planning Secretary
Unexpected Finds – Historic Heritage	NSW Planning Secretary	If any unexpected archaeological relics are uncovered during the work, then all works must cease immediately in that area and notice is to be given to Heritage NSW and the Planning Secretary. Works may only recommence with the written approval of the Planning Secretary
Proposed Independent Environmental Auditors	NSW Planning Secretary	Proposed independent auditors must be agreed to in writing by the Planning Secretary prior to the commencement of an Independent Audit.
Disposal of Seepage and Stormwater	Newcastle City Council	The prior written approval of Council must be obtained to connect or discharge site stormwater to Council's stormwater drainage system or street gutter.
Imported fill	EPA	Ensure that only VENM, ENM, or other material that meets the requirements of a relevant order and exemption issued by the EPA, is brought onto the site

Figure 5 Approvals, permits and licenses for the JHHIP Project Enabling Works

1.9.3 Development Conditions

The relevant development conditions relating to environmental management for the project are outlined below:

Approval No.	Requirement/s
SSD-9351535	A copy of the State Significant Development approval for this Project is provided in Appendix 3 of this Construction Environmental Management Plan. A copy of this approval can also be found on the Site Notice Board or via the NSW Planning Portal website at: https://pp.planningportal.nsw.gov.au/major-projects/projects/john-hunter-health-and-innovation-precinct
REF Approval No: 14/2022	A copy of the REF Approval associated with HMRI Car Park Expansion works is provided in Appendix 4 of this Construction Environmental Management Plan. A copy of this approval can also be found on the Site Notice Board.

Figure 6 Development Approvals for the JHHIP Project

1.10 Document Control

This plan and relevant environmental sub-plans will be revised:

- » Six monthly
- » In response to future project approvals or modifications
- » In response to changes in law, risks or accepted practices
- » In response to major changes in site conditions or work methods, or due to incidents
- » Commencement of new phases or stages of design and construction
- » In response to the findings, recommendations or outcomes of a planned management review, audit or risk assessment
- » Requests or requirements of EPA or any other Authority
- » In support of planning approvals or licence variations as necessary.

Electronic distribution of this Plan will be made to those detailed on the distribution list on Aconex.

All changes will be identified as below, and communicated to all relevant personnel.

Revision	Date	Description	Page	Reviewed By	Approved By
1	10/02/2022	Amendment of Management for JHHIP	ALL	M.Sturn	J.Wal
2	11/04/2022	Consultant-authored MSP's included	ALL	S.Russell	J.Wall
3	28/03/2022	Updated CTPMSP in Appendix 7	100-143	S.Russell	J.Wall
4	31/05/2022	Updated in response to DPIE comments	ALL	S.Russell	J.Wall
5	25/08/2022	Updated in response to IAR#1 findings	13	S.Russell	J.Wall

Figure 7 Document Revisions Control

2. Environmental Management System Framework

2.1 Approach to Environmental Management

Multiplex is continuously seeking to improve environmental culture and standards across its business and the broader industry.

Multiplex works with its clients to integrate environmental management controls at the earliest opportunity. Our aim is to eliminate critical risks which may have long-term consequences.

Multiplex's approach to environmental management is underpinned by a mature and disciplined environmental culture which is embraced by its people and driven by what its leaders do and say. Multiplex encourages its people to learn from each other's experiences and share best practice.

2.2 Management System Framework

Multiplex has a management framework which is applied throughout the business and on all projects it undertakes. The EMS documentation forms part of this System Framework and maintained in electronic format on Multiplex Operating System.

The structure of the overall Management System is explained below.

Element	Content	
Internal Control Framework	» Operating Environment » Risk Assessment » Control Activities	» Information and Communication » Monitoring Activities
Polices	» Work Health and Safety » Environmental » Quality » Risk	» Drugs and Alcohol » Injury and Rehabilitation » Indigenous Engagement » Diversity
Operational Procedures	» Risk Management » Integrated Management » Quality Management » Design Management » Construction Management » Health and Safety Management	» Environmental Management » Project Administration » Bid Management » Human Resources Management » Planning and Programming
Management Plans	» Project » Quality » Design » Work Health and Safety » Environmental » Emergency	» Construction » Stakeholder » Risk » Commissioning and Testing » Social Action » Workplace Relation
Sub Plans	» Construction Noise and Vibration » Dust and Air Quality » Water Quality » Erosion and Sediment » Chemicals » Land Contamination	» Waste » Heritage » Flora and Fauna » Site Office » Construction Traffic and Pedestrian » Contamination
Risk Management	» Project Risks	» Aspects and Impacts
Forms and Guides	» As per Appendix 2	

Figure 8 Management Framework

3. Responsibility and Accountability

3.1 Environmental Policy

Multiplex policies relating to environmental management are contained in **Appendix 1**.

This policy will be made publicly available through the Multiplex Intranet and distributed for display in prominent Project locations. In addition, all personnel attending Project inductions will be made aware of the policy and Multiplex's commitment to implement it.

3.2 Objectives, Targets and Programs

Environmental objectives and targets established in the table below and in each sub-plan will be monitored, reviewed and assessed by Senior Management, in accordance with Procedure BU AUS IMS P DIV 030 – *Planning and Performance Measurement*.

Objective	Target	Measure
Maximising opportunity to control risk by design, planning and re-planning.	Conduct an environmental risk workshop within 2 months of project commencement.	Environmental aspects and impacts register established within 2 months of project commencement.
Focusing priority on control of critical risks.	Continuously monitor and improve environmental performance through a program of inspections.	Inspections conducted on a fortnightly basis by the onsite Environmental Coordinator.
Closing the gap between paperwork and practice.	Conduct environmental training of all onsite Environmental Coordinators prior to assigned responsibility.	Training conducted prior to assigned responsibility.
Growing a mature culture: innovative, reporting, learning and collaborative.	No environmental regulatory infringements or major pollution incidents.	Number of environmental regulatory infringements and major pollution incidents.

Figure 9 Environmental Project Objectives and Targets

3.3 Management Review

Through the use of audit results, inspection reports, corrective and preventative actions and meetings, Multiplex will continually improve the effectiveness of the EMS in accordance with Procedure BU AUS IMS P DIV 140 – *Management Review*.

Changes to existing procedures will be recorded and communicated to the affected personnel.

3.4 EMS Organisational Chart

Environmental management during construction is the responsibility of each and every member of the Multiplex project team. Management and supervisory personnel lead environmental management by example, through provision of suitable resources to implement and monitor environmental measures, identify and correct any non-conforming conditions or behaviours, and actively promote environmental awareness and individual environmental responsibility. For a full organisation chart which identifies the Multiplex personnel responsible for the implementation of the EMS, please refer to John Hunter Health & Innovation Precinct Project management plan.

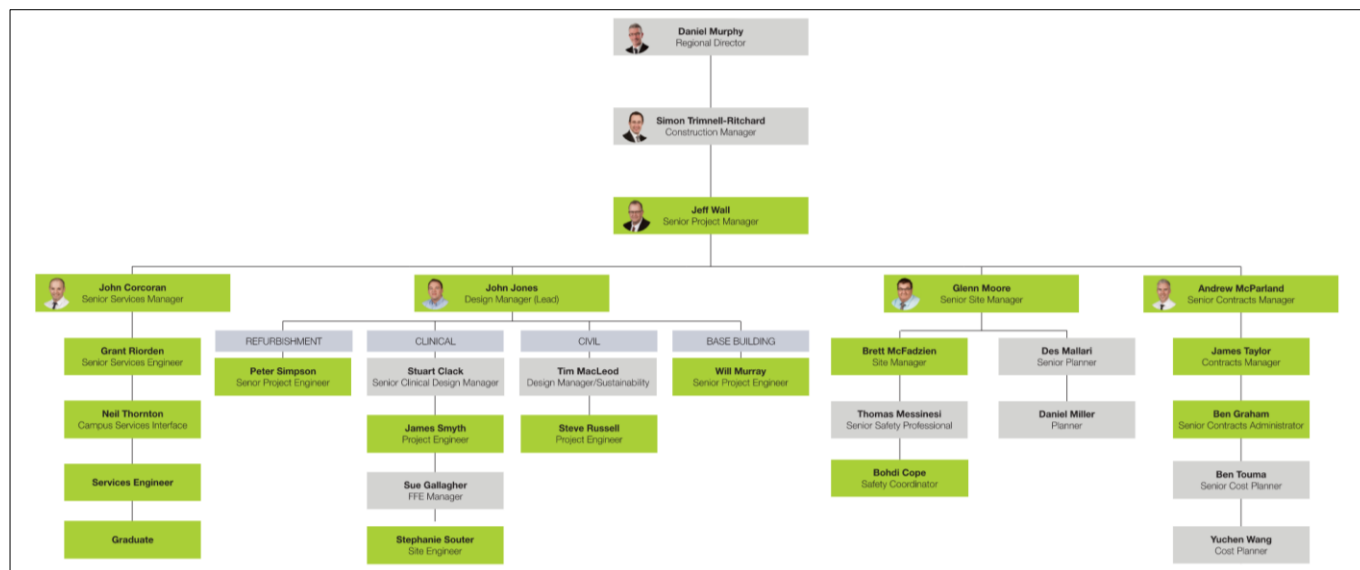


Figure 10 EMS Organisational Chart

3.5 24-Hour Contact Details of Site Manager

The 24-hour contact details of the Multiplex Constructions' Site Managers are provided in the table below.

Site Manager	Contact details (phone)	Contact details (email)
Glenn Moore Senior Site Manager Multiplex Constructions	P. 0414 299 229	E. Glenn.Moore@multiplex.global
Brett McFadzien Site Manager Multiplex Constructions	P. 0423 000 487	E. brett.mcfadzien@multiplex.global

Figure 11 24-hour Contact Details of the Site Manager

3.6 Multiplex Roles and Responsibilities

Multiplex has identified appropriate levels of resources, individual responsibility, and accountability for managing environmental across all roles within the Project Team. These are contained in Procedure BU AUS IMS P DIV 010 – *Responsibility and Accountability*. The general responsibilities and accountabilities of key project personnel in relation to Environmental are outlined over.

Role and Responsibility	CEO	Group Sustainability Manager	Regional Managing Director	Regional Director	WHS&E Manager/Coordinator	Project Manager	Site Manager	Design Manager	Contracts Manager/Admin	Engineer/s	Supervisor/s	WHS&E Coordinator	Construction Workers
Provide resources including personnel, time and finances to ensure compliance with Environmental legislation and the Environmental Management System.	✓	✓	✓	✓									
Ensure MPX operations identify monitors and complies with the current legislation for Environmental Management.	✓	✓	✓	✓	✓								
Ensure that the MPX Management System , risk assessment and procedures reflect the requirements of current environmental, legislation, guidelines and standards.		✓		✓	✓								
Identify by way of subscription, all environmental legislation , standards, codes of practices and guidelines pertinent to our works.					✓								
Promote a positive workplace environmental culture .	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Engage in risk workshops to identify, assess and determine appropriate controls for all potential risk and opportunity where required.				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Establish realistic project specific measurable targets . Monitor and report.					✓	✓	✓						
Have a working knowledge of the MPX Environmental Management System.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Complete project specific environmental documents utilising templates.					✓	✓	✓					✓	
Establish the environmental requirements for the projects site establishment and planning requirements.					✓	✓	✓					✓	
Establish a schedule of environmental legislation , Communicate and monitor for change.					✓								
Establish records filing system and maintain environmental records .												✓	
Establish and maintain environmental registers including legislation, training and quantifiable targets .					✓							✓	
Establish and organise the environmental component of the induction programme .					✓		✓					✓	
Identify and assess competency of employee's incl. any unforeseen workforce requirements. Undertake training needs analysis and facilitate any training requirements.				✓	✓	✓	✓						
Determine and assess requirements for environmental monitoring (ie. noise, air and dust) and implement. Review results to determine compliance.					✓		✓					✓	
Assess subcontractor's ability to comply with the project environmental requirements and environmental contract requirements.					✓	✓	✓		✓			✓	
Provide SC's with relevant environmental documents templates, EMPS, EWMS relevant parts of the site specific MPX EMP.												✓	
Obtain Environmental documentation from each subcontractor prior to commencing. Register and review adequacy and request changes prior to accessing the site.					✓		✓					✓	
Monitor subcontractors activities and report on performance against EWMS and EMP.					✓		✓				✓	✓	
Conduct inductions for all persons attending site and maintain records.												✓	✓

Role and Responsibility	CEO	Group Sustainability Manager	Regional Managing Director	Regional Director	WHS&E Manager/Coordinator	Project Manager	Site Manager	Design Manager	Contracts Manager/Admin	Engineer/s	Supervisor/s	WHS&E Coordinator	Construction Workers
Complete an environmental aspects, impacts and risk assessment at commencement of the project and update as required to reflect current site conditions.					✓	✓	✓					✓	
Identify and maintain a register of all onsite hazardous materials and dangerous goods .												✓	
Obtain safety data sheets no greater than 5 years old and provide adequate hazardous substances and dangerous goods storage facilities onsite.							✓				✓	✓	✓
Conduct Environmental inspections distribute for action, obtain sign-offs from SC and close out.					✓							✓	
Attend projects to monitor and discuss Environmental issues with project management, supervisors and workers.		✓	✓	✓	✓								
Monitor, resolve and prevent significant Environmental issues and share lessons learnt.	✓	✓	✓	✓	✓								
Schedule and conduct environmental audits of Subcontractors. Distribute report and monitor status.					✓							✓	
Conduct Environmental consultation and communication on environmental matters where required.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Implement emergency response procedures as outlined in the site Emergency Response Plan						✓	✓				✓	✓	✓
Record, report and investigate environmental incidents . Monitor corrective actions and distribute any lessons learnt.				✓	✓	✓	✓					✓	
Report and distribute non-conformances and implement corrective and preventative actions. Review effectiveness of corrective actions.					✓	✓	✓			✓	✓	✓	✓
Implement environmental sub-plans and procedures.					✓	✓	✓	✓	✓	✓	✓	✓	✓
Prepare monthly report on the status of the environmental management system.						✓	✓					✓	
Review Environmental performance including adequacy of resources.	✓	✓	✓	✓	✓	✓	✓					✓	
Obtain feedback for both internal/external training conducted and evaluate the effectiveness of the training programs .		✓			✓								
Review environmental objectives and targets annually and provide clear direction of the Environmental management system for the next 12 months.		✓	✓	✓	✓								
Acquire and disseminate Environmental and related information including alerts and lessons learnt.		✓			✓								
Review procedures and forms resulting from any changes in legislation, regulation, standards, codes of practices and incidents.					✓								
Attend collaborative post project review meeting to assess environmental performance, identify and document lessons learnt.					✓	✓	✓	✓			✓	✓	✓

Figure 12 Multiplex EMS Roles and Responsibilities Matrix

3.7 Contractor Roles and Responsibilities

Contractors must ensure they have an EMP and comply with statutory requirements and instructions given by Multiplex representatives in the performance of work in which they are engaged. Contractors will be responsible for:

- » Implementing their EMS
- » Reporting incidents, near misses and issues of non-compliance with EMS procedures to their supervisor or Multiplex contact
- » Ensuring construction work complies with environmental legislative requirements.

4. Communication and Consultation

4.1 Communication

Multiplex will ensure meaningful and effective communication processes are established and maintained in accordance with Procedure BU AUS IMS P DIV 040 – *Communication and Consultation*.

Communication on EMS matters will occur through the mechanisms outlined below.

Event	Frequency Requirement	Participants	Record/Evidence
Project specific induction	Prior to commencement of contracted work	All personnel	Project induction and declaration form
Work activity Induction (in EWMS or equivalent).	Prior to commencing any building/construction work	Personnel carrying out specific work activities	Record of training – listed on the EWMS or toolbox meeting record
Toolbox meetings	During the introduction of a new process (EWMS) or when discussing environmental issues / topics	MPX Supervisors and Subcontractors	Toolbox meeting record
Subcontractor meetings	Weekly or as required	Project team / Subcontractors, their employees and others as required	Minutes of meeting
Project team meetings.	Fortnightly or as required	Project team	Minutes of meeting
PCG meetings	Monthly	Client and Project Manager.	PCG report
Electronic media (i.e. Aconex)	As required	All personnel	Aconex
Project notice board and general signage	As required	All personnel	Project notice board
Environmental Site inspection actions	Fortnightly	Project team and subcontractors	Environmental Site inspection report
Enquiries and Complaints	As required	As per Stakeholder Management Plan	Communications register
Enabling Works Coordination Meetings	As required	MPX Project Team and Principal's Representative	Coordination Meeting Minutes
GC21 Site Inspection	As required	Site Manager and Principal/ Principal's Representative	Construction Work Site Checklist
RP2J/ JHHIP Interface Coordination Meetings	As required	MPX Project Team, JHHIP Principal's Representative, RP2J Principal's Representative, RP2J Head Contractor	Coordination Meeting Minutes
GC21 Progress Waste Recycling/ Purchasing Report	Every 1-month	Multiplex/ Waste Sub-Contractor	Progress Waste Recycling and Purchasing Report
GC21 Summary Waste Recycling and Purchasing Report	Prior to completion	Multiplex/ Waste Sub-Contractor	Summary Waste Recycling and Purchasing Report
Comprehensive Summary of Monitoring Results	Quarterly	Multiplex/ Civil Contractor	Quarterly Comprehensive Summary of Monitoring Results (<i>published on JHHIP Project website</i>)

Figure 13 Project EMS Communication Mechanisms

4.2 Consultation

To ensure effective consultation occurs at all levels throughout the life of the Project, Multiplex will operate in accordance with Procedure BU AUS IMS P DIV 040 – *Communication and Consultation*.

Employees and contractors will be consulted with regard to aspects and impacts that have the potential to impact on the environment.

Consultation on environmental matters will occur through the mechanisms outlined in the table below.

Event	Frequency	Participants	Record
Pre-Construction Dilapidation Report	Prior to commencing construction	Relevant owner and provider of services and infrastructure	Email correspondence/ phone call records
Construction Traffic and Pedestrian Management Sub-Plan	Prior to commencing construction	Newcastle City Council and TfNSW	Email correspondence/ phone call records/ Meeting Minutes
Work activity induction (in EWMS or equivalent)	Prior to commencing work	Personnel carrying out specific work activities	Record of training – listed on the SWMS or Toolbox Talk Record
Discharge site stormwater to Council's stormwater system	Prior to stormwater discharge	Newcastle City Council	Email correspondence/ phone call records/ Meeting Minutes
Aspects and Impacts Risk Workshops	6 monthly	Project team and subcontractors (where required)	Aspects and Impacts Register
Toolbox meetings	As required	Subcontractors	Toolbox meeting record
Subcontractor meetings	As required	Project team and subcontractors	Minutes of meeting
Project team meetings	Weekly	Project team	Minutes of meeting

Figure 14 Project EMS Consultation Mechanisms

4.3 Evidence of Consultation

Condition A8 in Schedule 2 of the State Significant Development Approval **SSD-9351535** outlines a number of requirements where conditions require consultation with interested external stakeholders. These requirements are outlined below.

Condition Number	Condition description
A8	Where conditions of this consent require consultation with an identified party, the Applicant must: (a) consult with the relevant party prior to submitting the subject document for information or approval; and (b) provide details of the consultation undertaken including: (i) the outcome of that consultation, matters resolved and unresolved; and (ii) details of any disagreement remaining between the party consulted and the Applicant and how the Applicant has addressed the matters not resolved.

Figure 15 Requirement to provide 'Evidence of Consultation'

5. Contractor Management

5.1 Evaluation and Selection of Contractors

All Multiplex Contractors (including subcontractors, suppliers and consultants) will be selected and appointed in accordance with Procedures BU AUS IMS P DIV 060 – *Contractor Management*, PAM P DIV 030 – *Tendering Subcontracts* and PAM P DIV 040 – *Letting of Agreements*.

Multiplex's procurement processes ensure that all contractors engaged must meet the environmental Management requirements. This is achieved by:

- » Documenting and correctly completing subcontract agreements, supplier agreements and consultant deeds that include a scope of work and environmental requirements
- » Examination and evaluation of subcontractor's demonstrated experience and capabilities
- » Selecting appropriate subcontractors and suppliers for tender
- » Conducting a tender interview to verify the environmental requirements related to the contract can be met
- » Evaluation, recommendation and seeking approval from senior management for engagement of the preferred contractor.

5.2 Subcontractors Environmental Management Plans and EWMS

All subcontractors are required to operate with the requirements of the EMP and associated documents.

Based on the EMP and risks identified in the Project Risk Assessment, MPX will assess the subcontractor's environmental management strategies against the following:

- » The potential environmental impacts of the subcontractor's activities
- » The environmental sensitivity of the area(s) in which the subcontractors will be working
- » The nature and scope of the subcontractor's activities
- » The scale of the subcontractor's activities
- » The subcontractor's capacity to manage its own environmental performance effectively
- » The subcontractor's previous performance.

Where a subcontractor is determined to be working in an area identified as high risk for potential impact to the environment, additional management controls will be put in place. These may include the submission of a dedicated EMP / EWMS to address the specific work package(s) awarded and be submitted for review to MPX prior to commencement of work on site. Comments resulting from the review by Multiplex will be issued to the subcontractor for action and where required, re-submission. The EMP / EWMS must assess the level of environmental risk and implement appropriate management controls for the subcontractor's full scope of work.

EWMSs are aimed specifically for use by foremen and construction workers, and are reviewed by each member of the work team before they commence work. This review provides an opportunity for the work team to contribute to environmental controls, and ensure that the work team is trained in environmental methods. Changes to EWMSs are documented and communicated to workers prior to commencing changed methods.

5.3 Contractor EMS Submission Requirements

A summary of the subcontractors EMS submission requirements is outlined in the table below.

Item	Description	Time Frame / Frequency of Submission
1	Project Environmental Management Plan for selected trades determined by Multiplex	10 days before commencing on site.
2	Environmental Work Method Statement (EWMS) for all high activities	10 days before commencing on site.
3	Incident/Near Miss Report	Following an incident
4	Incident Investigation Reports	Following an incident
5	MPX Inspections – completed and signed off	As per timeframe nominated in report
6	Inspection and Monitoring Records as detailed in each Environmental Sub-Plan	As per Environmental Sub-Plan

Figure 16 Summary of Subcontractor Environmental Submission Requirements

5.4 Subcontractor Environmental Management Monitoring

Multiplex will monitor work activities in accordance with Procedures BU AUS IMS P DIV 060 – *Contractor Management* – to ensure that subcontractors are carrying out work in accordance with SWMS documentation. Monitoring may be achieved by one or more of the following:

- » Ongoing visual inspections by supervisors
- » Environmental inspections
- » External Inspections/Audits.

5.5 Purchasing of Goods and Services

Multiplex personnel responsible for the procurement of materials, plant and equipment will ensure that the requirements outlined in Procedures BU AUS IMS P DIV 060 – *Contractor Management* – are implemented to ensure compliance with the relevant Australian Standards and environmental legislation.

Where goods such as materials, plant and equipment are procured, procedures for complying with environmental specifications will be implemented and will cover all environmental standards, legislation or organisational compliance requirements.

Items and equipment that are used to execute the work potentially impacting on the health and safety of a worker of the public, will be subject to hazard identification and risk assessment prior to purchase or hire.

Workers or their WHS Representatives will be consulted regarding any purchasing decisions that could affect their health and safety.

6. Risk Management

6.1 Risk Workshops

Multiplex and its subcontractors will undertake risk workshops outlined in the table below. Further detail relating to risk management is detailed in Procedure BU AUS IMS P DIV 020 – *Risk and Opportunity Management*.

Type of Risk Programme	Purpose	Frequency	Participants	Record
Project Risk Workshops	Overarching risk workshop conducted to identify all significant risks/opportunities and develop control strategies relating to the project	As per schedule	Project Team	Project Risk Register
Project EMS Risk Workshops	To identify key EMS aspects, impacts and develop control strategies for all works associated with the project	Six monthly intervals	Project Team, WHS&E Manager / Coordinator	Project Risk Register
Trade/Element Risk Workshops	To identify key EMS aspects, impacts and develop control strategies for all works associated with the project	As per schedule	Project Team, WHS&E Manager / Coordinator	Project Risk Register

Figure 17 Risk Workshops

6.2 Aspects and Impacts

Key activities carried out by or on behalf of MPX in connection with the Project are identified in the Environmental Aspects and Impacts Risk Register outlined in the table below. This register is completed during the preliminary risk assessment process to help establish key project risks in accordance with Procedure BU AUS IMS P DIV 020 – *Risk and Opportunity Management*.

All risks identified are managed in Project Risk Register on Multiplex Operating System. For each activity the environmental aspects and associated actual and potential environmental impacts are identified for normal operations and uncommon events. All aspects are assessed for risk based on standard controls being in place. Any aspects with a risk rating of high or extreme will be considered a significant aspect and require additional controls / plans to minimise the risk. Additional controls or plans will be referenced in the Environmental Management Sub-plans.

		Consequence	Likelihood	Risk Rating
Aspect	Impact			
Water Quality	Pollution / contamination of atmospheric, ground or surface water bodies through degradation of water quality.			
Erosion & Sediment Control	Soil loss to environment potentially affecting water quality subsequently impacting ecological values.			
Site Contamination	Mobilisation of chemicals above the level normally found in nature, potentially having an adverse effect on the surrounding environment.			
Air Quality	Pollution/ contamination of atmosphere from dust, exhaust emissions, odour and air-born chemicals.			
Noise & Vibration	Disturbance/ nuisance caused from 'unreasonable' or excessive levels of noise to public/ environment.			
Hazardous Chemicals	An acute event where hazardous chemicals have the potential to be spilt and released to the environment causing adverse effects.			
Cultural Heritage	Damage or disturbance to archaeological/cultural artefacts including skeletal remains, shell middens or other artefacts.			
Flora and Fauna	Direct / indirect impact (stress-death) on an individual or species of flora/ fauna.			
Waste Management	Degradation of aesthetic values due to ineffective waste management. Build-up of chemical and organic waste.			
Office Resources	Depletion of resources as a result of construction and office operations			

Figure 18 Environmental Aspects and Impacts Register

		Likelihood				
		Almost certain	Likely	Possible	Unlikely	Rare
Consequence	A. Extraordinary	1	2	4	7	11
	B. Major	3	5	8	12	16
	C. Moderate	6	9	13	17	20
	D. Minor	10	14	18	21	23
	E. Insignificant	15	19	22	24	25

Figure 19 Consequence and Likelihood Matrix

6.3 Environmental Controls Map

An Environmental Controls Map has been prepared for the Project to include key information from the sub-plans and other sources. The plan will be displayed on site notice boards, and include:

- » The worksite layout and boundary
- » Location of the nearest noise sensitive receivers
- » Sediment and erosion control measures
- » Noise barriers
- » Site offices
- » Construction traffic routes within and adjacent to the worksite
- » Dust control measures
- » Monitoring equipment (e.g. dust and noise monitors)
- » Location of environmentally sensitive areas (e.g. conservation areas, protected trees)
- » Location of heritage (indigenous and non-indigenous) items (e.g. artefacts, registered sites)
- » Location of spill containment and clean-up equipment
- » Location of hazardous substance storage
- » Stormwater drainage and watercourses
- » Location of worksite waste management facilities
- » Demolition works.

7. Training and Competency

7.1 Training and Competencies

Multiplex is committed to achieving and maintaining high standards in training and development.

Multiplex will implement systems in accordance with Procedure BU AUS IMS P DIV 110 – *Training and Competency* – to ensure employees have the required skills and training to competently perform required tasks. Multiplex will maintain a training program that identifies:

- » The training required to meet statutory and legislative obligations
- » The training required for each role or position to meet the required competencies
- » A schedule of required refresher training.

Training programs will remain current and be reviewed at least annually or:

- » When new or unforeseen workplace requirements are identified
- » Following significant changes to the division's business operation
- » Following a significant incident
- » Following changes in legislation
- » Following feedback from employees.

Multiplex will review the training programs to ensure that the training has been effective.

7.2 Induction Training

The Project has developed induction programmes for Project personnel. The project induction outlines key environmental issues. All personnel directly or indirectly working on the Project, including sub-contractors, are required to complete the induction prior to starting work, and will be provided with identification to show they have been inducted. The environmental induction will be periodically reviewed for adequacy.

The project induction includes the following environmental aspects:

- » Key issues relating to the project and existing environment, such as ecological and heritage conservation areas
- » Relevant environmental requirements, relevant conditions of planning approvals and environmental licences, and the obligations of all staff in relation to compliance with approvals and licences
- » Environmental policy
- » Site specific issues, such as:
 - Waste management and minimisation
 - Washing, refuelling and maintenance of vehicles, plant and equipment
 - Efficient use of plant, equipment and materials
 - Minimising potential environmental impacts including noise, air and water quality
 - Site-specific erosion and sedimentation controls, and use of spill kits to contain spills
 - Environmental emergency plans, and incident reporting procedures for environmental harm/incidents.
 -

7.3 Tool Box Meetings

Where deemed necessary toolbox meetings are used to highlight specific environmental and community issues relevant to site personnel. Toolbox meetings will be held as required.

A signoff sheet is completed by all personnel in attendance at toolbox meetings to acknowledge understanding of the information provided.

8. Incident and Emergency Management

8.1 Incident Management

Multiplex maintains a uniform system for the management and investigation of incidents which is outlined in Procedure BU AUS IMS P DIV 100 – *Incident Management*.

All incidents and near misses will be investigated by competent personnel, reported and recorded in the electronic database and conducted in line with the requirements set out in the internal investigation proforma and procedures. All incident investigations will identify the root causes of the incident so that appropriate remedial and preventative control measures can be identified and implemented.

Where required and where possible, incidents will be reported to EPA.

Corrective actions resulting from incident investigations will be prioritised and carried out in accordance with defined priorities. The corrective action will be evaluated for its effectiveness and whether the initially identified deficiency has been corrected and prevented from recurring.

8.2 Emergency Management

Emergency situations are to be managed through Procedure BU AUS IMS P DIV 100 – *Incident Management and include:*

- » An Emergency Management Plan details a single set of emergency contacts and procedures, consistent with the Project activities that can be scaled as appropriate for any incident or emergency
- » A Site Evacuation Diagram identifies the locations of emergency assembly points, fire exits, first aid kits and associated equipment, directional flow of pedestrian traffic and firefighting equipment
- » A Crisis Management Plan which provides guidance, details, responsibilities and lines of communication for effective emergency management.

Relevant details of the Emergency Management Plan will be provided to all personnel during the site induction, and information posted on notice boards.

9. Inspections, Testing and Monitoring

9.1 Environmental Site Inspections

To ensure compliance with both regulatory requirements environmental inspections detailed in the table below will be implemented in accordance with Procedure BU AUS IMS P DIV 070 – *Inspection Testing and Monitoring*.

The outcomes and status of inspection activities will be recorded in inspection reports and issued to the persons delegated with responsibility for rectifying the impact. The onsite WHS&E Coordinator will be responsible for tracking actions resulting from all inspections.

Type of Inspection	Inspection By	Frequency	Record
General	All Supervisors	Daily	Visual
Environmental Impacts	Environmental graduate	Fortnightly and after a shower / rain event.	Environmental Site Inspection
Environmental Impacts	WHS&E Manager / Coordinator	Monthly	Environmental Site Inspection Report
Other	Project Team / Subcontractors	As per Environmental sub-plans	As per Environmental sub-plans

Figure 20 EMS Inspection Programme

9.2 Environmental Site Testing and Monitoring

To ensure compliance with regulatory, testing and monitoring requirements, all monitoring and testing will be conducted in accordance with the environmental sub-plans outlined in section 13 and Procedure BU AUS IMS P DIV 070 – *Inspection Testing and Monitoring*.

10. Audits and Non-Conformances

10.1 Audits

An EMS auditing programme outlined below will be established and implemented to assess compliance, identify trends, drive continual improvement and provide assurance that management processes are being effectively implemented and that performance objectives are being met.

Audit procedures including the scope, frequency and methodology to be used as well as the responsibilities and requirements for conducting audits and reporting results will be in accordance with Procedure BU AUS IMS P DIV 120 – *Internal / External Auditing*.

Type of Audit	Audit By	Frequency	Purpose	Record
Internal EMS audit	WHS&E Manager / Coordinator	3 monthly	To confirm compliance against the MPX EMS.	Audit Report
External surveillance audits	External certified organisation	As per schedule	To confirm compliance of the MPX EMS and AS/NZS 14001.	Audit Report
Independent Environmental Audits	Independent Environmental Auditor	As per IAPAR	Access compliance with State Significant Development approval conditions	Independent Audit Report

Figure 21 EMS Audit Programme

Audit results will be recorded and an action plan developed identifying the observations and corrective action required against each of the findings in the audit report. Details of any non-conformance reports will be issued in accordance with Procedure BU AUS IMS P DIV 080 – *Control of Non Conformances*.

A follow-up audit will be carried out, as deemed necessary by the auditor, in order to verify and record the implementation and effectiveness of the corrective action taken. Implementation and effectiveness of the corrective actions will be verified and recorded during follow-up. Audits will be closed out in a timely manner.

10.2 Non-Conformances, Corrective and Preventative Action

Deficiencies identified during audits, site inspections or observations of day-to-day operations will be generally recorded on the audit report or inspection report/checklist and actioned.

When non-compliance is identified, Multiplex will document the issue on the Non-Conformance Report in accordance with Procedure BU AUS IMS P DIV 080 – *Control of Non Conformances* – on Aconex identifying the non-conformance and corrective actions. Where appropriate, the recipient and/or Multiplex will also develop measures to prevent recurrence of the non-conformance. The instigator will carry out a follow up review and closeout of the Non-Conformance Report to verify completion of measures taken to rectify and to prevent recurrence of the Non-Conformance within the specified time frame.

11. Document and Records Management

11.1 Document Control

Multiplex's system of document management and record keeping is detailed at Procedure BU AUS IMS P DIV 050 – *Document and Records Management*. The EMS documentation is maintained in electronic format on Multiplex Operating System and describes and provides direction to the core documents that make up the system. The documentation consists of the following:

- » Policy statements which summarise and detail Multiplex high level commitment to the implementation of the EMS
- » Management System Operating Procedures to effectively and efficiently manage projects from feasibility and planning phase's right through to the design and construct phases of a project
- » Supporting materials including Forms, Guides (as outlined in **Appendix 2**) and Management Plans provide the tools to ensure conformance with operational procedures.

Project documentation will be controlled in accordance with the Procedure BU AUS IMS P DIV 050 – *Document and Records Management* – which defines the controls to ensure that:

- » The documentation is periodically reviewed, revised as necessary and approved for adequacy prior to issue
- » The documentation is current, readily identifiable and available at all points of use
- » The staff are immediately notified of any changes in the documentation such as, the development or receipt of new documentation and any amendments to the current documentation
- » The documentation of external origin is registered and regularly reviewed for currency
- » The obsolete documents are appropriately identified and archived.

11.2 Record Control

The Project will maintain records in Aconex (web-based document control system), S:Drive and other applications as defined in the table below to demonstrate conformance to specified requirements and to ensure the effectiveness of the operation of the EMS. Pertinent EMS records from subcontractors will be an element of this data.

Record	MPX OP System	Aconex	Share Drive	CHEMALERT	SMARTEK
MPX Management Plans	☐	☒	☐	☐	☐
Subcontractor EMP	☐	☒	☐	☐	☐
Subcontractor EWMS	☐	☒	☐	☐	☐
Permits	☐	☐	☒	☐	☐
Incident and Investigation Reports	☐	☐	☐	☐	☐
Inspection and Test Reports	☐	☒	☒	☐	☐
Audit Reports	☐	☒	☐	☐	☐
Safety Data Sheets	☐	☐	☐	☒	☐
Meeting Minutes	☐	☒	☐	☐	☐
Toolbox Meetings	☐	☐	☒	☐	☐
Environmental Risk Workshops	☒	☐	☐	☐	☐
Induction Records	☐	☐	☐	☐	☒
Training Records	☒	☐	☐	☐	☐
Reports	☐	☒	☒	☐	☐
Monitoring Records	☐	☒	☒	☐	☐
Environmental Complaints	☒	☐	☐	☐	☐

Figure 22 Records Management

12. Reporting

The Project will establish and maintain a uniform system of record keeping to enable accurate reporting of EMS matters in accordance with Procedure BU AUS IMS P DIV 130 – *Reporting*. Reporting on environmental matters will include those outlined in the table below.

Type of Report	Report By	Frequency	Recipient/s
Monthly PCG Report	Project Manager/Site Manager	Monthly	Client, Client's Representative and Regional Director.
Environmental Incident Notification Report	Project Manager/Site Manager	As required	Directors, WHS&E Manager/Coordinator and DEC where required.
Environmental Incident Investigation Report	Project Manager/Site Manager or others nominated by Project Manager /Site Manager	As required	Directors, WHS&E Manager/Coordinator and DEC where required.
Environmental Internal Audit Report	Project Manager / Site Manager / Environmental Manager	As required	Project Team and WHS&E Manager/Coordinator
External Surveillance Audit	External Auditor	As required	WHS&E Manager/Coordinator, Systems Manager, Directors, Project Manager
Other	As per environmental sub-plan	As per environmental sub-plan	As per environmental sub-plan

Figure 23 EMS Reporting Programme

13. Environmental Management Sub Plans

13.1 Construction Traffic and Pedestrian Management Sub-Plan

13.1.1 Objectives and Targets

Objective	Target	Key Performance Indicator
The public way (outside of any approved construction works zone) must not be obstructed by any materials, vehicles, refuse, skips, or the like, under any circumstances.	No complaints or incidents from/ with the public or Local Council.	No. of complaints from residents/ businesses related to traffic control.
Ensure that works do not impact negatively on the local road network and surrounding businesses and residences, including pedestrians and cyclists.	No complaints from the public or Local Council.	No. of complaints from residents/ businesses related to traffic control.
Compliance with State and Local regulatory requirements in relation to traffic management.	No injuries or accidents relating to the traffic management of the construction site.	No. of injuries/ incidents associated with the traffic management of the construction site.

13.1.2 Management Strategies

Parameter	Action	Timing	Responsibility
Qualified consultancy	The purpose of the Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP) is to outline the strategies to be employed for the management of traffic and pedestrians on the JHHIP Project. This CTPMSP has been prepared in accordance with Schedule 2, Part 2, Condition B18 of the JHHIP State Significant Development (SSD-9351535) and the relevant conditions of Section 6.3 (Summary of Mitigation Measures) included in the Review of Environmental Factors Approval. A copy of the original Construction Traffic and Pedestrian Management Sub-Plan is provided in Appendix 8 below. Construction Traffic and Pedestrian Management Sub-Plan for works conducted on, or adjacent to public roadways must: › Be developed by an accredited person who is suitably experienced and competent in traffic management; › Is in accordance with the relevant legislation, codes of practice, Australian standards and road/local authority requirements; › Includes location specific traffic control plans; › Details the methodology for implementing and dismantling traffic control devices; › Be approved as required by the relevant authority prior to implementation; and › Be reviewed for adequacy as the project develops. › The Traffic Management provider must consider methodology of how the approved traffic control devices will be safely installed/ removed.	Prior to construction	MPX/ Traffic Plan Designer

Parameter	Action	Timing	Responsibility
Site Induction	All staff employed on the site by Multiplex (including sub-contractors) would be required to undergo a site induction. The induction would include permitted access routes to and from the construction site for site staff and delivery vehicles, limited parking arrangements, as well as standard environmental, workplace health and safety, driver protocols and emergency procedures. The approved work hours must be included as part of this induction.	Establishment	MPX/ All subcontractors
Consultation	In accordance with Condition B18 of the SSD Approval, the Construction Traffic and Pedestrian Management Sub-Plan described above must be prepared in consultation with Council and TfNSW.	Establishment	MPX/ Traffic subcontractor
Planning	Within workplace risk assessments and SWMSs the hierarchy of risk control must be applied when planning work that is on or adjacent to a road that is in use by traffic.	Establishment	MPX/ Traffic subcontractor
Construction Work Hours	Construction, including the delivery of materials to and from the site, may only be carried out between the following hours: › Monday to Friday - 7:00am and 6:00pm › Saturday - 8:00am and 1:00pm › Sunday/ public holiday no work. Notwithstanding the above, provided noise levels do not exceed the existing rating background noise level plus 5dB, works may also be undertaken during the following hours: › Monday to Friday - 6:00am to 7:00am › Saturday - 7:00am to 8:00am, and 1:00pm to 5:00pm. Construction activities may be undertaken outside of the hours outlined above if required: › by the Police or a public authority for the delivery of vehicles, plant or materials; or › in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or › where the works are inaudible at the nearest sensitive receivers; or › for the delivery, set-up and removal of construction cranes, where notice of the crane related works is provided to the Planning Secretary and affected residents at least seven days prior to the works; or › where a variation is approved in advance in writing by the Planning Secretary or his nominee if appropriate justification is provided for the works.	Construction	All Subcontractors
Emergency Management	Site-specific emergency procedures must be established to manage potential emergencies associated with traffic management.	Establishment	MPX

Parameter	Action	Timing	Responsibility
Traffic Management Plan	A Traffic Management Plan (TMP) for works conducted on, or adjacent to public roadways must: › Be developed by an accredited person who is suitably experienced and competent in traffic management; › Is in accordance with the relevant legislation, codes of practice, Australian standards and road/local authority requirements; › Includes location specific traffic control plans; › Details the methodology for implementing and dismantling traffic control devices; › Be approved as required by the relevant authority prior to implementation; and › Be reviewed for adequacy as the project develops. › The Traffic Management provider must consider methodology of how the approved traffic control devices will be safely installed/ removed.	Prior to commencement	MPX/ Traffic subcontractor
Traffic control plans (only if required)	Traffic Control Plans (TCPs) must be developed for each stage of the works by a competent person for works within the workplace and include where relevant: › Site layout; › Separate entrance and exit points for pedestrians and vehicles; › Designated travel paths for vehicles and pedestrians; › Consideration of one-way systems or turning circles so that vehicles can turn without reversing; › Traffic control devices and speed limits; › Delivery, loading/unloading areas and work zones; › Emergency access; and › Signage including warning and directional. › All appropriate written authorisations/permits/licences must be considered whilst developing the TCP and must be obtained from the relevant road authority or local authority in accordance with regulations prior to implementing the Traffic Management. › TCPs must be regularly monitored and reviewed to ensure they are effective and take into account any changes at the workplace. › Prestart meetings or other forms of communication must consider and communicate any major changes to TCPs.	Construction	Traffic subcontractor
Inspection	Traffic management including traffic control devices (barriers) must be installed, verified and maintained in accordance with the TMP or TCP and manufacturer's specifications. All Traffic Control set up must be as a minimum inspected by the work supervisor at the beginning of the shift and at the end of the shift (if set up more than one shift), to ensure compliance with the TCP and effectiveness of control measures. Periodic inspection and maintenance schedule shall be developed for long-term Traffic Control at work sites to ensure: › Traffic management is implemented in accordance with the TMP/TCP and reviewed for adequacy as the project develops; and › Traffic control devices are installed as per the manufacturer's instructions, implemented in accordance with the TMP/TCP and monitored for tampering/vandalism.	Construction	MPX/ Traffic subcontractor

Parameter	Action	Timing	Responsibility
Traffic Controllers (only if required)	Traffic Controllers must: › Wear approved hi-visibility clothing and control traffic using a Stop/Slow batten; and › Maintain communication through proper line of sight and portable two way radios. › Where night works are required, traffic controllers must: › Have night work clothing which consists of a 'Class N' outer garment made from retro reflective material, including retro reflective hoops on the body, arms and legs, (i.e. white 'night overalls'); and › Be equipped with illuminated wands.	Construction	Traffic subcontractor
Workers (only if required)	Workers working adjacent to traffic under Traffic Control set up, must wear approved hi-visibility clothing. Where night works are required, night work clothing is to consist of a 'Class N' outer garment made from retro reflective material, including retro reflective hoops on body, arms and legs, (i.e. white 'night overalls').	Construction	All subcontractors
Training and Competency	Workers responsible for implementing traffic management must hold the appropriate competency. Traffic Controller - required to control traffic with a Stop/Slow bat. This does not qualify a participant to set up or work with traffic control plans. Implement Traffic Control Plans - required to set up and work with Traffic Control Guidance Schemes/Traffic Control Plans at a work site. This does not qualify a participant to control traffic with a Stop/Slow bat, or modify existing traffic control plans. Prepare a Work Zone Traffic Management Plan - required to design new traffic management plans and TCGS/TCP's for road works, produce major upgrades of standard plans and/or inspect traffic control plans on any road construction site. This does not qualify a participant to control traffic with a Stop/Slow bat or set up work with traffic control plans. Relevant personnel including Multiplex supervisors, crane crew, traffic controllers and security guards must be inducted into the TMP and TCPs.	Construction	Traffic subcontractor
Pedestrian/ Cyclist Management	Pedestrian movements will be maintained through the provision of an A Class hoarding and fencing round perimeter of the work compounds. Pedestrian and cyclist movements are not expected to be impacted along the site frontage. Footpaths and cycle paths are not to be closed unless written permission has been provided by the Principal. Some minor increases in average delay to vehicles at surrounding key intersections such as on Lookout Road can be expected at times during the construction period as is typical for large construction sites. That said, traffic generated by the Enabling Works will be minimised during peak periods, to ensure the development does not exasperate the existing constrained conditions. Signage will be positioned at all site accesses to clearly identify the access as being for construction vehicles only. This includes along the fire trails to ensure pedestrians and cyclists accessing the trails are aware of any temporary closures or diversions as a result of construction activities. As part of any site induction, drivers should be specifically alerted to the pedestrian activity associated with the broader hospital, with appropriate care and safety on both approach and departure.	Construction	All subcontractors

Parameter	Action	Timing	Responsibility
Emergency Vehicle Access	Access to the subject site and adjacent buildings by emergency Construction vehicles would not be affected by the works as road and footpath frontages would be unaffected. Emergency protocols on the site would include a requirement for suitably accredited site personnel to assist with emergency access from the street. Consequently, any potential impacts on emergency access would be effectively managed throughout the works. Liaison would be maintained with the police and emergency services agencies throughout the construction period and a 24-hour contact would be made available for 'out-of-hours' emergencies and access.	Construction	All subcontractors
Construction Site Access	Multiplex will be responsible for instructing and controlling all Construction subcontractors regarding the hours of work. Access to the John Hunter Hospital campus is to remain open at all times. All on-site construction traffic is to be avoided during peak AM and PM peak hours at the John Hunter Hospital campus. Peak hours will be regularly monitored to ensure that this requirement is satisfied. The existing fire trail located on the northern edge of Jacaranda Drive near car park 9 is proposed to be upgraded to provide a dedicated construction vehicle access road to/ from the northern aspect of the works site. By utilising the existing (part cleared) fire trail, this also assists with reducing environmental impacts while still enabling a viable construction access. A total of seven construction vehicle access gates are proposed as detailed in Figure 6, with Gate 1 to be provided off Jacaranda Drive via a fire trail, Gates 2, 3 and 7 provided off Kookaburra Circuit and all other gates accessed via the fire trail along the northern boundary of the site which interconnect the HMRI car park and Car Park 4.	Construction	All subcontractors
Site Inspections and Record Keeping	The construction work would be monitored to ensure that it proceeds as set out in the Construction Management Plan provided by Multiplex. Where traffic control devices are installed on-site, a daily inspection before the start of the construction activity should take place to ensure that conditions accord with those stipulated in the plan and there are no potential hazards. Any possible adverse impacts would be recorded and dealt with if they arise.	Construction	MPX
Traffic Movements in Adjoining Council Areas	No adverse effects are expected from the movement of heavy vehicles through adjacent council areas. This will be monitored regularly to ensure that this remains the case.	Construction	MPX
Road sweeping	Regular road sweeping/cleaning is to be undertaken on Jacaranda Drive and Lookout Road or more frequently as instructed/needed during the contract duration. Cleaning of Kookaburra Circuit is required as instructed/needed when exemptions to use this road are granted.	Construction	Civil Contractor

Parameter	Action	Timing	Responsibility
Construction Vehicle Routes	Generally, construction vehicles will have origins and destinations from a wide variety of locations. However, all construction vehicles will be restricted to the State and Regional Road network where practicable. The directional distribution and assignment of traffic generated by the development will be influenced by a number of factors, most notably the origin/ destination of materials, configuration of access points to the site and the configuration of the arterial road network near the site. The construction vehicle routes are detailed below and shown in Figure 7 and Figure 8 of the Construction Traffic and Pedestrian Management Sub-Plan. No queuing or marshalling of construction vehicle will be permitted on public roads. All construction traffic is to arrive on site via Jacaranda Drive. Exceptions must be approved in writing by the Principal for any construction vehicles accessing site via Kookaburra Circuit. Should queuing on JHH or external roads be unavoidable during certain phases of the project, the contractor is to submit a Notice of Disruption to the Principal, in a format approved by the Principal. Where required appropriate notification and applications are to be issued to Council/TfNSW.	Construction	All subcontractors

13.1.3 Monitoring and Reporting

Type of Monitoring / Reporting	Timing	Responsibility	Record
Check that traffic control devices (incl. signs, barricades, pedestrian ramps, etc.) are properly installed.	Daily	Traffic subcontractor	Daily inspection record (only if required)
Check that traffic control devices (incl. signs, barricades, pedestrian ramps, etc.) are properly installed.	Weekly	Traffic subcontractor	Weekly inspection record (only if required)
Check that traffic control devices (incl. signs, barricades, pedestrian ramps, etc.) are properly installed.	Fortnightly	Subcontractors / MPX	WHS site inspection (only if required)

13.2 Biodiversity Management Sub-Plan

13.2.1 Objectives and Targets

Objective	Target	Key Performance Indicator
To reduce the impact of construction on native flora and fauna.	No damage / injury to preserved flora and fauna.	Weekly Environmental Inspection

13.2.2 Management Strategies

Parameter	Action	Timing	Responsibility
Biodiversity Management Plan	The purpose of the Biodiversity Management Plan (BMP) is to outline the strategies to be employed for the management of biodiversity as part of the JHHIP Project. This BMP has been prepared in accordance with Schedule 2, Part 2, Condition B16 of the JHHIP State Significant Development (SSD-9351535), with reference to Condition C18 and the 'Flora and Fauna' conditions of Section 6.3 (Summary of Mitigation Measures) included in the Review of Environmental Factors Approval (Ethos Urban 2022). This BMP has also been prepared to satisfy the recommendations in the Minimisation and Mitigation Measures in the Biodiversity Development Assessment Report (BDAR), prepared by Umwelt (Australia) Pty Limited, revision 6 dated 21 October 2021. A copy of the original Biodiversity Management Plan is provided in Appendix 9 below.	Establishment	MPX/ Ecologist
Induction/ Workforce Education and Training	Undertake a site induction addressing the management of flora and fauna including: › No employee on the Project will intentionally injure native fauna including reptiles. › Construction personnel are not to handle fauna. › All rubbish and food scraps must be placed in lidded bins that will be serviced regularly. › Native fauna are not to be fed by project employees. Inductions for the workforce will be undertaken to make them aware of the key ecological issues present in the Development › Footprint and Study Area so that they know their role and responsibilities in the protection and/or minimisation of impacts to all native biodiversity. › Inductions will identify the location of sensitive flora and fauna and the policies being implemented to protect the biodiversity values of such areas.	Establishment	MPX/ All subcontractors

Parameter	Action	Timing	Responsibility
Salvage and Installation of Compensatory Habitat Features	Resources that can be salvaged (where practical) include key habitat features such as hollow logs, fallen timber and boulders. These should be stockpiled separately to other vegetation stockpiles. Where appropriate these resources may be re-used in remnant or landscaped areas to improve revegetation outcomes and to augment habitat features. Thirty-eight nest boxes that were previously installed within the Development Footprint will be removed and relocated to suitable nearby secure habitat prior to construction. Nest boxes will be installed in similar sized and same species tree and oriented in the same direction to replicate current conditions where possible. In addition, 18 nest boxes will be removed from the TfNSW RP2J disturbance corridor and relocated nearby prior to construction commencing. Nest boxes will be installed in similar sized and same species tree and oriented in the same direction to replicate current conditions where possible. It is assumed that the boxes already installed, their position and orientation meet the requirements of the TfNSW Biodiversity Guidelines so replicating that within the adjacent area will satisfy the requirements of the guidelines.	Establishment	MPX/ Ecologist
Fencing and bunting/ Access control	Fencing/bunting and signage is to be installed to protect vegetation identified for retention within the works area. During construction, fencing will be used to demarcate vegetation where required to avoid accidental damage to areas outside of the Development Footprint. Access control is an important feature in protecting and demarcating areas outside the Development Footprint from vehicle access, human access, and accidental disturbance. Measures include: › Appropriate fencing and signposting of areas to prevent the uncontrolled entry of people, accidental disturbance and to minimise vehicular and human traffic › Clear and visible signage is to be appropriately located to inform the workforce and others of the restricted access or otherwise of areas outside the Development Footprint and › Locking of gates to prevent unwanted vehicle, person access and disturbance.	Establishment	MPX

Parameter	Action	Timing	Responsibility
Tree Protection	For the duration of the construction works: › Street trees must not be trimmed or removed unless it forms a part of this development consent or is required in an emergency to avoid the loss of life or damage to property › All trees immediately adjacent to the Development Footprint must be protected at all times during construction in accordance with Council's tree protection requirements. Any tree, which is damaged or removed during construction due to an emergency, must be replaced › All trees that are not approved for removal are to be retained and must be suitably protected during construction as per the recommendations of the Arboricultural Impact Assessment, prepared by ArborSafe (2021) › If access to the area within any protective barrier is required during the works, it must be carried out under the supervision of a qualified arborist. Alternative tree protection measures must be installed, as required. The removal of tree protection measures, following completion of the works, must be carried out under the supervision of a qualified arborist and must avoid both direct mechanical injury to the structure of the tree and soil compaction within the canopy or the limit of the former protective fencing, whichever is the greater › an arborist is to be engaged to implement tree protection measures for the hollow-bearing trees and other native trees to be retained on site, and › All project materials must be stored in cleared areas of the site.	Establishment	MPX/ Civil Contractor
Pre-Clearance Surveys	Pre-clearance surveys are to be undertaken prior to tree felling works, be undertaken by suitably qualified and experienced persons/personnel and include: › The demarcation of areas approved for clearing to reduce risk of accidental clearing › Key habitat features, including habitat trees should be identified and marked. Habitat trees are those containing hollows, cracks or fissures and spouts, peeling bark, active nests, possum dreys or other signs of recent fauna usage. Other key habitat features to be identified include fallen timber/hollow logs, burrows, and boulder piles › the potential presence of threatened flora and fauna species, endangered populations and TECs should be identified › the identification of threatened species or key habitat features that are suitable for translocation or salvage › disturbance activities should be targeted to specific times of the year to minimise impacts to threatened species usage of habitat features for breeding and roosting, where practicable › identification of further actions required following surveys, including (but not limited to) salvage of identified key habitat features, additional surveys to determine threatened fauna usage of the area (if required), identification of active dens or burrows, any actions required to discourage fauna occupation and weed or feral fauna management requirements.	Establishment	MPX/ Ecologist

Parameter	Action	Timing	Responsibility
Vegetation Clearing	A clearing permit must be obtained and approved from the relevant authority prior to any clearing works undertaken. Vegetation removal is to be minimised wherever possible by clearly defining designated work areas. Designated exclusion zones (i.e. retained vegetation) are to be made secure with fencing/bunting and signage.	Construction	MPX / clearing subcontractor
Tree-felling supervision – Generally	Tree felling will be completed as close to the completion of pre-clearance surveys as practicable to limit the potential for new issues to arise (such as new nests being built). Tree felling supervision will be undertaken by an appropriately qualified and experienced person after pre-clearance surveys have identified potential habitat features.	Construction	MPX / clearing subcontractor
Tree-felling supervision – Prior to Felling Habitat Trees	The tree-felling process will include the following (Prior to Felling Habitat Trees Ecologist not required): › Completion of actions recommended from the pre-clearing surveys › Removal of non-habitat trees/vegetation as close to the habitat tree felling date as possible in order to create disturbance to discourage fauna usage of the habitat trees › Prior to removal of non-habitat trees/vegetation, a canopy inspection should be completed to search for threatened species which may have moved in since pre-clearing surveys were completed. If fauna encountered, ecologist advice should be sought › Shaking of habitat trees (with heavy machinery) the day before felling, for at least 30 seconds to encourage fauna to abandon trees.	Construction	MPX / clearing subcontractor

Parameter	Action	Timing	Responsibility
Tree-felling supervision – On the Day of Felling Habitat Trees	On the Day of Felling Habitat Trees (Ecologist required): › All habitat trees will be subject to a visual inspection to survey for threatened species prior to felling › Trees previously identified as containing fauna will be shaken and then felled as gently as possible, › providing no threatened species are identified › Lowering habitat trees to be done as gently as possible with heavy machinery using bucket to slow fall › If a threatened species is identified in a habitat tree on the day of felling, the supervising person is to advise the most appropriate method to minimise potential harm. This may include leaving the tree overnight, further shaking to encourage the animal to vacate the tree, gradual removal of branches to discourage ongoing use, soft-felling of the tree with the animal in the tree, or measures to capture and relocate the animal to nearby suitable secure habitats › Once felled, hollows will be inspected for remaining or injured fauna › Felled trees are to be rolled where appropriate so that the number of hollows blocked against the ground is minimised › Uninjured animals should be released on the day/evening of capture into nearby suitable secure habitat and should not be held for extended periods of time. Nocturnal animals should be held in suitable housing until dusk and then released › Injured animals will be triaged immediately, humanely euthanised if required, or taken to the nearest veterinary clinic or wildlife carer as soon as possible for assessment and treatment › All felled habitat trees should remain in place for a least one night to allow any remaining fauna to escape, and › Habitat features identified for translocation or salvage operations should be extracted and stored appropriately.	Construction	MPX/ Ecologist
Arborist	All works carried out on either foliage or root systems will be carried out as per the Australian Standard 4970-2009 <i>Protection of Trees on Development Sites</i> and will be undertaken in consultation with a qualified Arborist.	Construction	MPX / Clearing subcontractor
Excavation	All trenches / excavations are to be inspected each morning by the excavation subcontractor. Where flora and fauna are discovered, personnel are to cease work in the subject area and notify the WHS&E Manager/Coordinator / MPX Supervisor / or appointed Catcher.	Construction	MPX / Excavation subcontractor
Unidentified Flora or Fauna	If any previously unidentified flora or fauna is discovered on-site, personnel are required to notify the Site Manager.	Construction	All subcontractors
Active Nests of Native Birds	Any trees or shrubs to be removed from the site are to be checked for the presence of active nests of native birds (i.e. those containing fertile eggs or nestlings) and arboreal mammals (e.g. possums) prior to removal or relocation by a Qualified Wildlife Spotter / Catcher.	Construction	All subcontractors
Rehabilitation	Monitor disturbed areas for weed invasion, and undertake control measures as necessary. Regularly water, weed and fertilise rehabilitated areas to ensure their success.	Construction	MPX / Landscape subcontractor

Parameter	Action	Timing	Responsibility
Weed Management	All declared weeds within the site are to be removed in accordance with the below procedures: › The use of pesticides and herbicides is to be restricted, have specific application, storage and clean up procedures, and meet requirements of relevant agencies. › Herbicides are to be administered by contractors licensed in accordance with the provisions of State Legislation. › Chemical products must always be used as per Safety Data Sheets. › Only qualified personnel should undertake chemical control of weeds. › Correct disposal of weeds is to be undertaken ensuring accidental spread of weeds does not occur. Weeds or material containing weed matter must be transported to a landfill under covered load. The cover must seal the top and sides of the load to prevent any weed material being transported by wind. Weed species could be inadvertently brought into the Study Area or surrounding habitats with vehicle movement, imported materials or could invade naturally through removal of native vegetation. The presence of weed species has the potential to decrease the value of vegetation for native species, particularly threatened species. Weed management controls will include: › All machinery and equipment will be cleaned thoroughly prior to entering the Study Area. Cleaning must include the removal of all mud and plant matter, followed by washing with high pressure water › Mulch containing weeds is to be placed in piles separate from clean mulch, removed from site, and disposed of in accordance with weed management guidelines as soon as practicable.	Construction	MPX / Civil subcontractor

13.2.3 Monitoring and Reporting

Type of Monitoring / Reporting	Timing	Responsibility	Record
Protected tress	As per the DA	MPX	Environmental site inspection
Clearing Monitoring	Daily during clearing works	MPX / clearing subcontractor	Clearing permit
Rehabilitation Areas	As per the DA	MPX	Environmental site inspection

13.3 Construction Noise and Vibration Management Sub-Plan

13.3.1 Objectives and Targets

Objective	Target	Key Performance Indicator
To ensure any works causing noise or vibration do not effect nearby structures or residents.	No complaints from the community regarding noise or vibration.	No. of complaints from residents / businesses related to noise.
Compliance with State and Local requirements as required.	Compliance with the Environmental Protection (Noise) Regulations 1997 - Section 6 of AS 2436-2010 (Standards Australia, 1981). Compliance with 10mm/s vibration limit or as otherwise specified.	Results from environmental inspections Noise and vibration monitoring records

13.3.2 Management Strategies

Parameter	Action	Timing	Responsibility
Construction Noise and Vibration Management Sub-Plan	The purpose of the Construction Noise and Vibration Management Sub-Plan is to outline the strategies to be employed for the management of construction noise and vibration associated with the JHHIP Project. Acoustic Logic (qualified and experienced noise expert) has prepared this Management Sub-Plan in accordance with condition B19 of the SSD Approval and Section 6.3 (Summary of Mitigation Measures) of the REF Approval. A copy of the original Construction Noise and Vibration Management Sub-Plan is provided in Appendix 10 below.	Establishment	MPX/ Acoustic Engineer
Dilapidation Reports	Dilapidation studies to be undertaken of surrounding structures and building prior to any construction.		MPX
Construction Work Hours	Construction, including the delivery of materials to and from the site, may only be carried out between the following hours: › Monday to Friday - 7:00am and 6:00pm › Saturday - 8:00am and 1:00pm › Sunday/ public holiday no work. Notwithstanding the above, provided noise levels do not exceed the existing rating background noise level plus 5dB, works may also be undertaken during the following hours: › Monday to Friday - 6:00am to 7:00am › Saturday - 7:00am to 8:00am, and 1:00pm to 5:00pm. Construction activities may be undertaken outside of the hours outlined above if required: › by the Police or a public authority for the delivery of vehicles, plant or materials; or › in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or › where the works are inaudible at the nearest sensitive receivers; or › for the delivery, set-up and removal of construction cranes, where notice of the crane related › works is provided to the Planning Secretary and affected residents at least seven days prior to the works; or › where a variation is approved in advance in writing by the Planning Secretary or his nominee if appropriate justification is provided for the works.	Construction	All Subcontractors

Parameter	Action	Timing	Responsibility
Plant and Equipment	Plant and equipment noise control equipment to be maintained in accordance with manufacturer's specification to reduce noise levels. Stationed equipment shall be located as far as practicable from immediate sensitive receivers.	Construction	All Subcontractors
Plant and Equipment Noise Control	All mobile machinery and stationary equipment to be fitted with noise control equipment as per the manufacturer's specifications.	Construction	All Subcontractors
Quiet work methods/ technologies	Quiet work methods/ technologies include: › The primary noise generating activity at the site will be the bulk excavation period. As much as practicable, use of quieter excavation methods is adopted. › Excavation is conducted initially using excavator with bucket (quietest excavation method), then use of rock rippers (as opposed to hydraulic hammers and rock saws) when rock strength permits. Use of the loudest excavation equipment (hydraulic hammers/rock saws) is used only with other options are not available. › Concrete pump trucks should generally be located along the western boundary of the site, or within the bounds of the site.	Construction	All Subcontractors
Materials handling/ vehicles	Materials handling/ vehicles techniques include: › Trucks and forklifts in general use on site are to use a non-tonal reversing beacon where possible (subject to OH&S requirements) to minimise potential disturbance of surrounding receivers › Avoid careless dropping of construction materials into empty trucks › Trucks, trailers, and delivery vehicles are to turn off engines when idling to reduce noise impacts (unless required for concrete pumping or similar).	Construction	All Subcontractors
Noise Monitoring	Noise monitoring will be undertaken in line with the Construction Noise and Vibration Management Plan which was required to be submitted under SSD condition B19 and item 24 of the NSW Health Infrastructure REF Condition. These levels will be assessed against levels set in the Environmental Protection (NoiseControl) Regulations 2017. Noise monitoring will be conducted using Acoustic Research Laboratories noise loggers. All monitoring equipment used retains current calibration, either manufacturers' calibration or NATA certified calibration. Noise monitoring locations are to be proposed in consultation with Multiplex and will be confirmed with Health Infrastructure, APP and the Hunter New England Local Health District (LHD) prior to and during the construction works. Indicative monitoring locations are provided in Appendix 1 of the Construction Noise and Vibration Management Sub-Plan. Noise monitoring can be downloaded either on site (typically during a monitoring service visit) or remotely to actively review all monitoring data recorded at each monitoring location. Relating to the vibration monitors, this will include any vibration events found to exceed the trigger levels nominated in Section 4.2 of the Construction Noise and Vibration Management Sub-Plan. Monitoring reports are anticipated to be provided on a monthly basis, documenting all recorded exceedances that can be reviewed by the contractor and actioned accordingly. Multiplex are to forward all monitoring reports to APP on a monthly basis.	Establishment / Construction	MPX

Parameter	Action	Timing	Responsibility
Vibration Monitoring	Vibration monitoring will be conducted using Texcel ETM type monitors with externally mounted tri-axial geophones. The geophones will be located as close as practicably possible to the location of the sensitive structure. The monitors are to be set to send an SMS message when alert levels have been exceeded at the location of the geophone. Vibration monitoring locations are to be proposed in consultation with Multiplex and will be confirmed with Health Infrastructure, APP and the Hunter New England Local Health District (LHD) prior to and during the construction works. Indicative monitoring locations are provided in Appendix 1 of the Construction Noise and Vibration Management Sub-Plan. Vibration monitoring can be downloaded either on site (typically during a monitoring service visit) or remotely to actively review all monitoring data recorded at each monitoring location. Relating to the vibration monitors, this will include any vibration events found to exceed the trigger levels nominated in Section 4.2 of the Construction Noise and Vibration Management Sub-Plan. Monitoring reports are anticipated to be provided on a monthly basis, documenting all recorded exceedances that can be reviewed by the contractor and actioned accordingly. Multiplex are to forward all monitoring reports to APP on a monthly basis.	Establishment / Construction	MPX
Noise / Vibration – Control Measures	In the event of complaints, there are several noise mitigation strategies available which can be considered. The determination of appropriate noise control measures will be dependent on the activities and construction appliances. The following techniques should be considered to reduce impact to adjoining owners: › Undertake works outside of adjoining building operating hours/ peak hours as per the approved Construction Noise and Vibration Management › Isolate work activity using noise barriers › Ring saw instead of hammering column / beams › Use smaller machinery or quieter alternative › Use static rolling where possible. Where a particular activity or construction appliance is found to generate excessive noise levels, it may be possible to select an alternative approach or appliance. For example, the use of a hydraulic hammer on certain areas of the site may potentially generate high levels of noise. Undertaking this activity using bulldozers, ripping and/or milling machines will result in lower noise levels.	Construction	MPX / Subcontractor
Communication and Notification	Community consultation is proposed to be undertaken throughout the process. In this regard regular letterbox drops detailing site progress and scheduled works is proposed. In particular, these should detail the extent and times of rock hammering which is planned to be undertaken. A contact list to be prepared to enable nearby residents and owners to be notified regarding works that may impact them as a result of noise and vibration. This will be managed in accordance with the Communication Management Plan and approved Noise Management Plan (where applicable).	Establishment / Construction	MPX

Parameter	Action	Timing	Responsibility
Complaints	An after-hour's contact number is displayed outside of the building site, so that in the event that surrounding development believes that a noise breach is occurring, they may contact the site. Where a complaint is received regarding noise and vibration, the complaint will be investigated and where appropriate, additional control measures will be taken to address the nature of the complaint All complaints will be managed in accordance with the Communication and Stakeholder Management Plan established for the Project.	Establishment / Construction	MPX

13.3.3 Monitoring and Reporting

Type of Monitoring / Reporting	Timing	Responsibility	Record
Vibration monitors will be installed and utilised throughout the period of construction.	At commencement and over the course of the construction period	MPX	Vibration monitoring records
Noise monitors will be installed and utilised throughout the period of construction.	At commencement and over the course of the construction period	MPX	Noise monitoring records
Integrity of noise control equipment (if deemed applicable)	During construction	MPX / All Subcontractors	Environmental Site Inspection
Number of noise and/or vibration complaints	As required	MPX	Communications Register

13.4 Construction Waste Management Sub Plan

13.4.1 Objectives and Targets

Objective	Target	Key Performance Indicator
Solid and liquid waste to be disposed of as per Regulatory requirements.	All waste to be disposed of by a licensed waste contractor	Onsite waste disposal facilities confirmed and documented.
MPX aim to maximise landfill diversion.	Recycle 90% of demolition and construction waste.	Waste reporting by waste contractors.
No waste to affect nearby premises.	No complaints related to construction waste affecting nearby premises during construction.	No. of complaints relating to waste.

13.4.2 Management Strategies

Parameter	Action	Timing	Responsibility
Induction	During inductions all personnel are to be made aware of individual responsibilities in regards to waste management, including the understanding that all personal rubbish and construction rubbish generated is to be properly disposed of in designated disposal facilities.	Establishment	All subcontractors
Waste Reduction	Design in waste minimisation during the design phases by standard sizing of materials, the use of modular and prefabricated construction techniques. Stockpile clean fill during the excavation phase by for use as backfill on-site Provide sub-contractors during the construction phase with clear guidance for reducing packaging on their own materials by both their suppliers and subcontractors, by accurate ordering and handling of materials. Specify reusable, stackable and returnable packaging.	Establishment / Construction	MPX, Consultants and Subcontractors
Waste Management Plan	Demolition and excavation subcontractors will be required to develop a Waste Management Plan for their Scope of Work detailing the type of waste generated, waste avoidance / reduction / reuse / recycling strategies.	Establishment	Demolition and Excavation Subcontractors
Waste disposal storage area/ Recycling and disposal locations	Appropriate recycling/ waste disposal facilities (e.g. bins) shall be provided in strategic locations onsite. Recycling/ waste bins shall be located such that they do not affect the community and not close to surrounding premises. Separation of waste for recycling will be enforced and monitored, however, the separation of waste for recycling may be done at an offsite facility.	Establishment / Construction	MPX
	Recycling/ waste disposal facilities shall be regularly collected or emptied by a licensed waste collector in accordance with Local Council Health Laws.	Construction	MPX
	Where possible a storage area allocated for the separation, collection and recycling of wastes will be established.	Establishment	MPX
Waste contractors	Licensed contractors shall be engaged to remove construction waste. A minimum target of 80% landfill waste diversion will be achieved.	Establishment	MPX
Putrescibles waste (Organic waste)	All putrescibles waste to be placed in a lidded bin and removed separately.	Establishment	MPX
Recycling / waste reduction	Recycling initiatives will be investigated and where practicable implemented onsite. This may include dedicated bins for different waste streams and use of alternative products.	Establishment / Construction	MPX / All subcontractors

Parameter	Action	Timing	Responsibility
Site office	The site office shall implement the following office waste minimisation techniques: » Organising recycling paper bins in the office for waste paper » Recycle toner cartridges pick-ups » Using electronic storage to reduce use of paper » Purchasing products in bulk to reduce packaging	Establishment	MPX
Hazardous waste	Hazardous waste will be managed and disposed of as per the Safety Data Sheet requirements and Environmental Protection (Controlled Waste) Regulations 2004.	Construction	MPX / All subcontractors
Servicing	Where practicable plant will be serviced offsite to reduce the generation of hydrocarbon waste onsite and potential for spills.	Construction	All Subcontractors
Recording of quantities, classification and validation of each type of waste generated during construction	A Waste Recycling and Purchasing Report will be required to be generated on a monthly basis during the construction works. The Waste Management Report will include the following details: » The total quantity of material purchased, » The quantity purchased with recycled content, » The total quantity of waste generated, » The total quantity recycled, » The total quantity disposed of; and » The method and location of disposal Periodic inspections will be undertaken to validate the waste and recycling information provided by sub-contractors and suppliers.	Construction	MPX/ Waste subcontractor

13.4.3 Monitoring and Reporting

Type of Monitoring / Reporting	Timing	Responsibility	Record
Percentage of diversion from landfill	Monthly	MPX	Monthly Waste Report
Segregated waste and appropriate waste placement	Weekly	MPX	Environmental Site Inspection

13.4.4 Demolition and Excavation Phase Waste Management Plan

MATERIALS ONSITE	REUSE AND RECYCLING		DISPOSAL
ONSITE		OFF-SITE	
Type of Materials	Specify methods	Specify contractor and recycling outlet	Disposal
DEMOLITION			
Masonry, brick & tile	General waste bin	Transfer for reprocess or recycle - Demolition subcontractor	Divert from Landfill
Timber	General waste bin	Transfer for reprocess or recycle - Demolition subcontractor	Divert from Landfill
Metal	General waste bin / dedicated steel scrap bin	Transfer for reprocess or recycle - Demolition subcontractor	Divert from Landfill
Mixed waste	General waste bin	Transfer for reprocess or recycle - Demolition subcontractor	90% Recycling
Asbestos	As per standards	Transfer & disposal at hazardous landfill - Demolition subcontractor	Hazardous Landfill
Bitumen	General waste bin	Transfer for reprocess or recycle - Demolition subcontractor	Divert from Landfill
The demolition contractor prior to commencement shall develop a Waste Management Plan for the Project. Material shall be separated on site and removed in separate trucks for recycling, re-use and landfill.			
EXCAVATION			
Clean Fill	Assess, excavate & stockpile	Transport & fill	Nil
Any hazardous waste will be isolated and managed as per the legislation for hazardous waste. 100% of the clean excavation material will be diverted from landfill.			

13.4.5 Construction Phase Waste Management Plan

MATERIALS ONSITE	REUSE AND RECYCLING		DISPOSAL
ONSITE		OFF-SITE	
Type of Materials	Specify methods	Specify contractor and recycling outlet	Disposal
Concrete	General waste bin.	Transfer for reprocess or recycle - Waste contractor	Divert from Landfill
Masonry, Brick& Tile	General waste bin	Transfer for reprocess or recycle - Waste contractor	Divert from Landfill
Timber	General waste bin	Transfer for reprocess or recycle - Waste contractor	Divert from Landfill
Metal	General waste bin	Transfer for reprocess or recycle - Waste contractor	Divert from Landfill
Plasterboard	Separate in designated bin	Transfer for reprocess or recycle - Waste contractor & plasterboard recycler	Divert from Landfill
Cardboard	Separate in designated bin	Transfer for reprocess or recycle - Contractor to be confirmed	Divert from Landfill
Mixed waste	General waste bin	Transfer for reprocess or recycle - Waste contractor	90% Recycling
Paper	Separate in designated bin	Transfer for reprocess or recycle - Waste contractor	Divert from Landfill
Packaging	Separate in designated bin	Transfer for reprocess or recycle - Waste contractor	Divert from Landfill
Waste will be minimised through reduction of waste generated, reuse of products and recycling. The waste stream will be separated where possible to maximise landfill diversion. Subcontractors will be responsible for recycling and reuse of their waste material.			

13.5 Dust and Air Quality Management Sub-Plan

13.5.1 Objectives and Targets

Objective	Target	Key Performance Indicator
Ensure that dust or odour emissions do not adversely affect the health or visual amenity of surrounding communities.	No complaints from adjoining owners in relation to dust emissions from the works.	No. of public complaints from the public related to dust.
Compliance with State and Local regulatory requirements in relation to dust management.	No visual evidence of deposited dust or suspended particulate matter. Compliance with National Environment Protection Measures (NEPM) standards (where required) and DEC standards during construction.	Visual monitoring of dust movement during environmental inspections. Dust monitoring results (where required).

13.5.2 Management Strategies

Parameter	Action	Timing	Responsibility
Stabilised Driveways	A stabilised driveway is to be installed to minimise the tracking of dirt on public roadways.	Establishment	MPX
Dust Control Method – Physical Barriers	A physical barrier can be erected perpendicular to prevailing winds prior to the commencement of works along the boundary or around uncontrolled dust sources. Fences can be standard hoarding panels / fence or a fence with a screening material with a porosity of 50% or less.	Establishment	All Subcontractors
Dust Control Method – Chemical Stabilisation	Where an exposed area or stockpile is located away from traffic and needs to sit for up to 3 months or where an area needs immediate stabilisation, a chemical soil stabiliser can be used such as Zerosion or the area hydromulched (seed free).	Construction	Bulk Earthworks / Civil / MPX
External Roads	If any sediment is deposited onto the roads adjoining the site, the roads are to be swept regularly and including prior to any rainfall. No hosing is to be undertaken external to the site.	Construction	MPX
Haul roads	Haul roads to be covered with gravel / road base to minimise dust production or at best concrete to be regularly swept.	Construction	MPX
Speed limits	The speed of all vehicles on-site to be restricted to 10 km/hr. This speed to be further reduced if large amounts of dust are still being generated.	Construction	All Subcontractors
Windy Conditions	Dust generating activities to be assessed during periods of excessively windy conditions (>40km/h). Where dust cannot be adequately controlled work is to be ceased and rescheduled to a time when adequate control of dust generation can be achieved.	Construction	All Subcontractors
Water Carts/ Sprays	Water carts or sprinklers are to be used for specific process activities that may cause dust, and can be used to assist in the dust control on access tracks. Consideration should be given to water efficiency and the possible use of a dust control method above.	Construction	Excavation / Demolition Subcontractor
Housekeeping	During construction the site to be kept clean to reduce dust lift off during windy days.	Construction	All Subcontractors
Plant and Equipment Maintenance	All construction plant and equipment with access to the site to be properly maintained and serviced in accordance with the manufacturer's specification. During the works maintenance logs are to be maintained and available during inspections and audits.	Construction	All Subcontractors

Parameter	Action	Timing	Responsibility
Exhaust Fumes	Operating machinery and vehicles to be visually checked to ensure exhaust fumes are not discharged into adjoining buildings air intakes.	Construction	All Subcontractors
Truck Transportation	Trucks transporting materials such as sand, soil, landscape materials and gravel to have loads covered and tailgates secured.	Construction	All Subcontractors
Paint-Spraying	Paint-spraying activities not be undertaken in adverse weather conditions or near building air intakes.	Construction	All Subcontractors
Exposed Areas	Measures including watering down exposed areas and access will be undertaken to reduce dust generation.	Construction	All Subcontractors
Hazmat	Any Hazmat discovered on the project to be left undisturbed and subsequently managed in accordance with the WHS Management Plan. Asbestos or other containment material found in ground will require assessment in accordance with State requirements. Refer to WHS Handbook Rev 3 – - Asbestos - Lead Dust/Paint	Construction	All Subcontractors
Sweeping	Where applicable, sealed roads to be swept to remove deposited material that could generate dust.	Demolition , Excavation and Construction	All Subcontractors
Complaints	Where a complaint is received regarding dust, the complaint will be investigated and where appropriate, additional dust control measures taken to address the nature of the complaint	Construction	MPX

13.5.3 Monitoring and Reporting

Type of Monitoring / Reporting	Timing	Responsibility	Record
Inspect dust control measures, to ensure they are in place and implemented.	Fortnightly	MPX	Environmental Site Inspection
Visually inspect emissions from plant to ensure they are not contributing to ill health effects.	Fortnightly	MPX	Environmental Site Inspection
Dust monitoring in response to community complaints or in accordance with regulatory requirements.	As required	MPX	Dust monitoring records

13.6 Ground Water/ Water Quality Management Sub-Plan

13.6.1 Objectives and Targets

Objective	Target	Key Performance Indicator
Avoid the release of contaminants to waterways or drainage systems.	All water discharged complies with minimum water quality criteria.	Water quality records conforming to minimum water quality criteria (where applicable). No breaches of management strategies in applicable Management Plans. Results from environmental inspections.
Ensure that groundwater quality or height is not significantly affected by the construction.	No significant change in groundwater levels and quality during dewatering activities (if applicable).	Groundwater quality reports.

13.6.2 Management Strategies

Parameter	Action	Timing	Responsibility
Baseline surface water testing	Undertake baseline surface water testing to establish condition of existing stormwater located on the site.	Pre commencement	MPX/Civil Contractor
Dewatering for construction purposes	Water to be discharged from sediment basins or similar must be tested and, if required, treated to ensure that it meets water quality criteria and that pollution of the receiving waters does not occur; Results of testing and details of any treatment undertaken must be documented i.e. MPX water Discharge Permit, photographic evidence (photograph of the PH strip and Turbidity tube) » Turbidity: <50 NTU » Suspended solids: <50 mg/L (Nata tested) » pH: 6.5-8.5 » Oil and Grease (visual only) The discharge must be monitored throughout to ensure that the water being pumped; » complies with the discharge criteria » Does not come into contact with any soil or exposed surfaces before discharging does not mix with any sediment laden/untested water at either the inlet or outlet. » Water must never be discharged or reused onsite in a manner that exceeds the capacity of sediment controls and/or generates runoff with the potential to discharge from site.	Establishment	MPX / Excavation Subcontractor
Abstraction of groundwater for construction purposes	Multiplex are not intending to undertake ground water extraction. However on the occurrence ground water extraction is required a Licence to Take Water is to be obtained from Department of Water before abstraction of groundwater can commence for use in dust suppression and other construction activities. A groundwater abstraction licence is to be obtained for all projects before dewatering can commence. Exemption from a dewatering licence is only available if: » Abstraction is from the water table aquifer » Abstraction is solely for the purpose of removing groundwater to facilitate construction » Abstraction pump rate does not exceed 10L/sec over a period of 30 consecutive days The volume of water taken over the 30 days period does not exceed 25,000kL.	Establishment	MPX / Excavation Subcontractor

Acid Sulfate Soil	Section 5.18 of the Environmental Impact Statement prepared for the JHHIP Project indicates that <i>“Acid sulfate screening tests indicate low potential for acid sulfate rock drainage. RCA (geotechnical engineer) confirm there is no need for an acid sulfate management plan.”</i> Where Acid Sulphate Soils are encountered on the Project a suitably qualified geotechnical engineer will be engaged to provide an assessment of the affected areas and advise on the most suitable method of remediation.	Establishment / Construction	MPX / Excavation Subcontractor
Trade Waste	Installation of a 3 x 1m3 settlement system for wet-trade washout to be completed	Establishment	Hydraulic Subcontractor
Tool box meeting	All construction personnel undertaking discharge of water to on-site or off-site areas to undergo a tool box meeting to ensure the correct controls are in place.	Establishment	MPX / Subcontractor
Static Concrete Pumping	A designated washout area and purpose built bunded structure to be provided for concrete pumps and their attachments.	Establishment	Concrete Subcontractor
Mobile Concrete Pumping	An impervious catch tray to be placed below the pump's hopper to contain any possible spillage or droppings. Concrete washout to be undertaken in designated concrete washout area.	Construction	Concrete Subcontractor
Concrete Truck Washout	Concrete trucks are not allowed to wash out on site.	Construction	Concrete Subcontractor
Spills	All spills on site of hazardous chemicals to be cleaned up immediately to minimise pollution of stormwater/groundwater. If water contaminated by hazardous chemicals requires discharge it will need to be sampled and analysed before release to ensure it meets ANZECC water quality criteria for Aquatic Ecosystems. If contaminated, it will need to be removed and treated by an appropriately licence waste contractor.	Construction	MPX / Subcontractor
Chemical Storage	Paint, form oil, solvents and fuels to be stored correctly and bunded in accordance with Chemical Management Sub-plan.	Construction	All Subcontractors
Paint Washout	The painting subcontractor is required to wash out into purpose built tanks that are to be removed by the painting contractor through a licensed liquid waste facility with an arrangement to attain verifiable proof of disposal.	Construction	Painting Subcontractor

13.6.3 Monitoring and Reporting

Type of Monitoring / Reporting	Timing	Responsibility	Record
Dewatering process and water quality results	Daily (while dewatering) or as specified in the management plan	Supervisor / Onsite WHS&E Coordinator	Environmental site inspection Water Discharge permit
Monitor abstraction of ground water to ensure compliance with licence	Weekly or as per licence requirements	Supervisor / Onsite WHS&E Coordinator	Environmental site inspection Abstraction records
Trade waste and washouts	Weekly	Supervisor / Onsite WHS&E Coordinator	Environmental site inspection

13.7 Soil and Water Management Sub-Plan

13.7.1 Objectives and Targets

Objective	Target	Key Performance Indicator
Prevent clay, silt or sand from entering stormwater drains and waterways.	All disturbed stormwater to pass through primary erosion and sediment controls listed below.	Environmental Inspection records of no uncontrolled release of disturbed stormwater to drains and waterways.

13.7.2 Management Strategies

Parameter	Action	Timing	Responsibility
Erosion and Sediment Control Plan	Erosion and Sediment Control Plan is to be prepared by a Certified Practitioner in erosion and sediment control.	Establishment	Multiplex
Minimum Requirements for sites <2500m ² and less <10% slopes	» Evaluate site limitations: - Isolate retained vegetation from clearing with tape - Identify highly erodible soils with advice from geotech - Identify up-slope drainage catchments to be diverted around works - Identify work areas to allow for erosion and sediment controls. » Stabilise all site entry / exit points in accordance with MPX minimum requirements. Inspect all vehicles for residual mud and remove before leaving the site. Street sweeping (never hosing down) is to be carried out to reduce sediment on roads. » Install sediment fence(s) down-slope of the site. Treat sediment laden water with the use of sediment fencing installed in accordance with MPX minimum requirements to allow ponding. » The runoff from any slope catchment area exceeding 1,500m² is to be diverted around works. The diversion drain is to be appropriately lined to prevent erosion and discharged to lawful stormwater connection outlet. » Clear only those areas necessary for building works to occur. » Strip and stockpile any weed-free topsoil to be reused in re-vegetation works. Ensure the top soil stockpile is long and low to maintain aeration and microbiological properties and ensure it is stabilised to prevent erosion. » All stockpiles are to be located away from drainage areas and surrounded with sediment fence or covered with a product that will prevent erosion if in an area where it has the potential to enter the stormwater system. All stockpiles stored for longer than 2 weeks are to be covered to prevent erosion. » Prevent erosion by mulching areas that have achieved final levels but are not ready for landscape works immediately. For completed areas ensure appropriate top soil is available and establish grass cover within 10 days. » Commence building activities. » Ensure all runoff from concreted and roof areas is immediately connected to the stormwater. » Regularly inspect all drainage, erosion and sediment controls and maintain. » Progressively re-vegetate / stabilise the site. » Remove any remaining temporary drainage, erosion and sediment control measures upon complete stabilisation of the site.	Establishment / Construction / Completion	Multiplex

13.7.3 Monitoring and Reporting

Type of Monitoring / Reporting	Timing	Responsibility	Record
Inspect erosion and sediment controls are effective and maintained	Fortnightly or after a shower / rain event.	Multiplex/ Subcontractor	» Environmental Site Inspection » Erosion and Sediment Control Plan

13.8 Chemicals Management Sub-Plan

13.8.1 Objectives and Targets

Objective	Target	Key Performance Indicator
Avoid contamination of soil and water from chemicals.	No release of chemicals/pollutants as listed under the Environmental Protection (Unauthorised Discharges) Regulations 2004, into the environment during construction.	No instances of uncontrolled spills.

13.8.2 Management Strategies

Parameter	Action	Timing	Responsibility
Hazardous Chemicals	Safety data sheets which outline the procedures for handling, storage and emergency response for all hazardous chemicals stored or used on the Project, to be available in the first aid facility.	Establishment	MPX
Spill Kits	Spill kits are to be established at locations adjacent to where chemical spills have the potential to occur. The spill kits are to be maintained and readily available in the event of a spill.	Establishment	MPX / All Subcontractors
Toolbox Talks	Toolbox talks will be undertaken in the use of spill kits and the steps taken in the event a spill.	Construction	MPX / All subcontractors
Tank and Mobile Tankers	Tank and mobile tankers to be fitted with a screw fitting or overflow protection connected to prevent leaks.	Construction	All subcontractors
Bunds	Bunds capable of storing 110% of the largest container volume to be installed around areas where chemicals are stored. The bund is to be impervious, chemically resistant and fire resistant. Further, the bund is to be protected from weather to avoid the potential of rain reducing the bund capacity. Must be compliant with AS 1940 -2017- The Storage and handling of flammable and combustible liquid	Construction	All subcontractors
Labelling of Chemicals	All chemicals and dangerous goods used on site to be appropriately labelled.	Construction	All subcontractors
Fuel Tankers	Fuel tankers to be equipped with an appropriate device to prevent overfilling. An emergency shut off valve is also to be installed.	Construction	All subcontractors
Handling of Chemicals	Handling of chemicals is to take place in a designated area where there is no potential for spills or contaminated run-off that could to reach stormwater. Fuel stored on vehicles is to be stored in a spill tray or other approved container capable of handling a spill.	Construction	All subcontractors
Fuelling of Vehicles or Construction Plant	Refuelling is to take place in designated areas or where contaminated run-off could reach the stormwater. Fuel tankers will use a spill tray beneath the refuelling connection to prevent spills on ground.	Construction	All subcontractors
Fluid Leaks	Trucks that leak any sort of mechanical fluid will not be permitted on or adjacent to the site.	Construction	All subcontractors
Oil Contaminated Stormwater	Oil contaminated water is to be disposed of through a licensed waste facility by a licensed subcontractor.	Construction	All subcontractors
Minor Spills (<100L)	In the event of a spill, the spill kit is to be utilised and the cleaned up material taken to a licensed facility as trackable waste and reported.	Construction	All subcontractors

Parameter	Action	Timing	Responsibility
Major Spills (>100L)	In the event of a major spill, the procedures contained in the Emergency Management Plan are to be implemented and reported.	Construction	All subcontractors
Volume of Fuel and Chemicals	Volumes of fuels and chemicals kept on site are to include only those volumes necessary to complete the works within a reasonable delivery schedule.	Construction	All subcontractors
Solvent Based Paints	Containers of solvent based paints are to be disposed of at an appropriate recycling depot by the subcontractor and a verifiable receipt or docket retained on file by the subcontractor and produced upon request to Site Management.	Construction	All subcontractors

13.8.3 Monitoring and Reporting

Type of Monitoring / Reporting	Timing	Responsibility	Record
Check all bunds are the appropriate size and they are functioning.	Fortnightly	Subcontractors / MPX	Environmental site inspection
Check all chemicals are labelled, stored in a container in good condition and in a bunded area.	Fortnightly	Subcontractors / MPX	Environmental site inspection
Check equipment is free from leaks.	Fortnightly	Subcontractors / MPX	Environmental site inspection
Check the spill kit is available and adequately stocked.	Fortnightly	Subcontractors / MPX	Environmental site inspection

13.9 Land Contamination Management Sub-Plan

13.9.1 Objectives and Targets

Objective	Target	Key Performance Indicator
To manage contamination in accordance with regulatory requirements.	No spread of contaminants onsite	No Environmental Notices issued to MPX. Waste disposal receipts (where applicable)

13.9.2 Management Strategies

Parameter	Action	Timing	Responsibility
Induction	During inductions all personnel are to be made aware of individual responsibilities in regards to contamination management.	Establishment	All subcontractors
Contamination Investigation	Where a site is to have known contamination, and has not been remediated, a qualified environmental consultant/professional is to be engaged to determine whether a Contaminated Site Investigation is required. Where required, a Contaminated Site Investigation is to be carried out in accordance with State and Local Government requirements. (amend above) In the Executive Summary of the Contamination and Waste Classification Report for the JHHIP indicates that <i>"RCA analysed 48 samples for hydrocarbons and metals across the site...no indications of contamination or anthropogenic waste"</i> where found <i>"RCA considers that it is unlikely to pose a risk to the environment for the proposed site use"</i>	Establishment	MPX
Management of Contamination	Where contamination is found and requires additional management measures to that found in this EMP, a Remedial Action Plan is to be developed and attached to this EMP as an Appendix.	Establishment	MPX
Contaminated Water	Where contaminated water is proposed to be discharged a full site contamination analysis is to be undertaken on the water prior to works commencing and prior to discharge. Where water is found to be contaminant free in accordance with the ANZECC Water Quality Guidelines, water is to be discharged in accordance with the Water Quality Management Sub Plan. Where water is found to contain contaminates above the criteria in the ANZECC Water Quality Guidelines, water management is to be undertaken with advice from a qualified environmental consultant/professional.	Establishment	MPX / Excavation Subcontractor
Acid Sulfate Soils (ASS)	Section 5.18 of the Environmental Impact Statement prepared for the JHHIP Project indicates that <i>"Acid sulfate screening tests indicate low potential for acid sulfate rock drainage. RCA (geotechnical engineer) confirm there is no need for an acid sulfate management plan."</i> Where Acid Sulphate Soils are encountered on the Project a suitably qualified geotechnical engineer will be engaged to provide an assessment of the affected areas and advise on the most suitable method of remediation.	Establishment / Construction	MPX / Excavation Subcontractor

Parameter	Action	Timing	Responsibility
Commissioning and decommissioning and removal of UPSS	SAFework NSW Requirements SafeWork NSW is responsible for the WHS issues relating to decommissioning and removal of tanks from a site. The following SafeWork NSW requirements must be met during decommissioning: the tank and contents made safe in line with Code of Practice: Storage and handling of dangerous goods & AS 1940: 2017 The storage and handling of flammable and combustible liquids SafeWork NSW to be notified of the abandonment within seven days, so the tank can be removed from their database. SafeWork licensed demolition contractors are authorised to carry out decommissioning, abandonment or removal of UPSS that have contained flammable or combustible liquids. Contractors with a restricted demolition licence are not authorised to do demolition of chemical installations unless they have made an application for an upgraded restricted demolition licence that authorises demolition of chemical installations PCBU's should ask for written confirmation that the work will be completed by a Safework NSW licensed demolition contractor who is not restricted for demolition of chemical installations. <u>Installation/Commissioning of storage tanks:</u> The tank must be installed and commissioned in line with POEO- UPSS Regs 2014 & AS 4897 The design, installation and operation of UPSS .	Excavation	Excavation Contractor /Demolition Contractor
Excavated Materials	All excavated materials removed from the site is to be removed in accordance with the approved plan for the management of contamination and disposed of at a facility licensed to take that level of contamination.	Excavation	Excavation Subcontractor
Waste Transport Certificate	A Waste Transport Certificate for all contaminated material is required from the responsible contractor.	Excavation	Excavation Subcontractor
Unexpected Contamination	If unexpected contaminants are identified, all associated activities are to be ceased and a reassessment of the area/contaminants undertaken by a qualified environmental consultant/professional. Contamination is to be managed as per State and Local Government requirements. Refer to WHS Handbook Rev 3 – Flow Chart Unexpected Find Protocol Refer to – Appendix 5 - Unexpected Finds Protocol for Contamination	Excavation	MPX / Subcontractor

13.9.3 Monitoring and Reporting

Type of Monitoring / Reporting	Timing	Responsibility	Record
Contamination Assessment	Commencement	MPX	Site contamination report / Acid Sulfate Soil Report
Management of Contaminated Material	Construction	MPX	Environmental site inspection Water quality records Remediation Report

13.10 Aboriginal and Historic Management Sub-Plan

13.10.1 Objectives and Targets

Objective	Target	Key Performance Indicator
Comply with the requirements of the Heritage Act 1977, Environmental Planning and Assessment Act 1979, and the National Parks and Wildlife Act 1974	Protection of all sites of Aboriginal Heritage significance, both known and as yet unknown.	Immediate reporting of archaeological remains if discovered. Level of disturbance to significance sites recorded.
Minimise impacts on unknown Cultural and Aboriginal Heritage sites.	As above.	As above.

13.10.2 Management Strategies

Parameter	Action	Timing	Responsibility
Management Plan	Develop an Aboriginal and Historical Heritage Management Sub-Plan (this Sub-Plan) for the Project is based on Aboriginal Cultural Heritage Assessment 2021, noting the following details: Note: Umwelt have conducted an Aboriginal Cultural Heritage Assessment 2021 for the JHHIP and have stated in the results section Umwelt state “...it is considered unlikely that Aboriginal objects or sites would be present within the Project Area in detectable quantities. The Project Area is assessed as having low archaeological potential”. Note: Umwelt have also conducted an Heritage Impact Statement 2021 for the JHHIP and have outlined “Based on the assessment presented in this report, it is assessed that the JHHIP Project will not result in any physical impacts to buildings/structures of identified heritage significance, or to the overall heritage significance of the subject site”.	Establishment	Multiplex
Induction	Aboriginal Heritage protection related material will be included in workforce inductions including a list of offences associated with the harm or desecration of Aboriginal objects or places.	Establishment	MPX / All subcontractors

Parameter	Action	Timing	Responsibility
Object discovery during works	- An Unexpected Finds Protocol (Heritage), outlined in Appendix 6 and Appendix 7, addresses unexpected aboriginal heritage finds and historic heritage finds which will be included in the Construction Environmental Management Plan and are included as part of the site induction. - If any archaeological relics are uncovered during the course of the work, then all works shall cease immediately in that area and the OEH Heritage Branch contacted. Depending on the possible significance of the relics, an archaeological assessment and an excavation permit under the NSW Heritage Act 1977 may be required before further works can continue in that area. - In the event that surface disturbance identifies a new Aboriginal object, all works must halt in the immediate area to prevent any further impacts to the object(s). A suitably qualified archaeologist and the registered Aboriginal representatives must be contacted to determine the significance of the objects. The site is to be registered in the Aboriginal Heritage Information Management System (AHIMS) which is managed by OEH and the management outcome for the site included in the information provided to AHIMS. The proponent must consult with the Aboriginal community representatives, the archaeologist and OEH to develop and implement management strategies for all objects/sites. - If suspected Aboriginal objects, such as stone artefacts are identified during works, works must cease within 10m of the affected area and an archaeologist called in to assess the finds. If the finds are found to be Aboriginal objects, the OEH must be notified under section 89A of the NPW Act. - Appropriate management or avoidance should be sought if Aboriginal objects are to be moved or harmed.	Main Works	MPX/ Archaeological consultant
Skeletal remains discovery during works	In the extremely unlikely event that human remains are found, works should immediately cease and the NSW Police are to be contacted. If the remains are suspected to be Aboriginal, the OEH may also be contacted at this time to assist in determining appropriate management.	Construction	MPX

13.11 Site Office Environmental Management Sub-Plan

13.11.1 Objectives and Targets

Objective	Target	Key Performance Indicator
Maximise the efficient use of resources within the office environment.	Recycle 100% office paper	Monthly Recycling Reports
	Recycle 100% of materials where available	Monthly Recycling Reports

13.11.2 Management Strategies

Parameter	Action	Timing	Responsibility
Use of Resources	Recycle office paper and cardboard cans, bottles and printer cartridges.	Commencement to completion	MPX
Use of Energy	Turn off electrical equipment where practicable and use energy efficient products.	Establishment to completion	MPX
Use of Resources	Use office paper with recycled content.	Commencement to completion	MPX
Double Sided Printing	Use double sided printing on photocopiers where possible.	Commencement to completion	MPX
External Lighting	Ensure all temporary external lighting is be installed in accordance with the requirements of AS 4282-2019 Control of the obtrusive effects of outdoor lighting	Commencement to completion	MPX

13.11.3 Monitoring and Reporting

Type of Monitoring / Reporting	Timing	Responsibility	Record
Percentage of diversion from landfill	Monthly	Waste Contractor	Monthly recycling report.

14. Appendices

14.1 Appendix 1: Environmental Policy



OUR COMMITMENT

Multiplex and its senior management is committed to:

- Protecting the health and safety of everyone within our workplaces including employees, contractors, visitors, public, neighbours and the community.
- Ensuring that our activities place minimal impact on the environment including pollution.
- Delivering projects that add economic, social and environmental value to our clients, our community and those who invest in us.

OUR STRATEGIES

Multiplex works collaboratively with key stakeholders, including our clients, regulators, industry peers, suppliers and contractors, to exceed our legal, contractual and other compliance obligations through the following key strategies:



- Managing risks and opportunities through early intervention in planning and design.
- Monitoring constantly the changing landscape over the project lifecycle and develop rigorous controls in response.
- Creating an outlook and culture in which our commitments are front of mind and part of everyday business.
- Valuing the competency (skills, knowledge and experience) of all persons to perform and find better ways of doing the work.
- Providing employees and other stakeholders the opportunity and expectation to acquire the appropriate competency to enable them to carry out their work safely without risk to themselves, fellow workers and the public.
- Focusing on open conversations between our employees, our clients and the people we work with not just paperwork.
- Creating a culture that encourages the reporting of incidents and occurrences to enable knowledge sharing, learning and information to facilitate improvements in performance.
- Promoting strategies that are driven and embedded by senior management who encourage ownership and continuous improvement in behaviours, practices and outcomes by all persons.
- Aligning our behaviour to our values with an emphasis on teamwork and recognition for innovation and initiative.

CEO
Multiplex Australasia
September 2016

MULTIPLEX

14.2 Appendix 2: EMS Forms and Guides

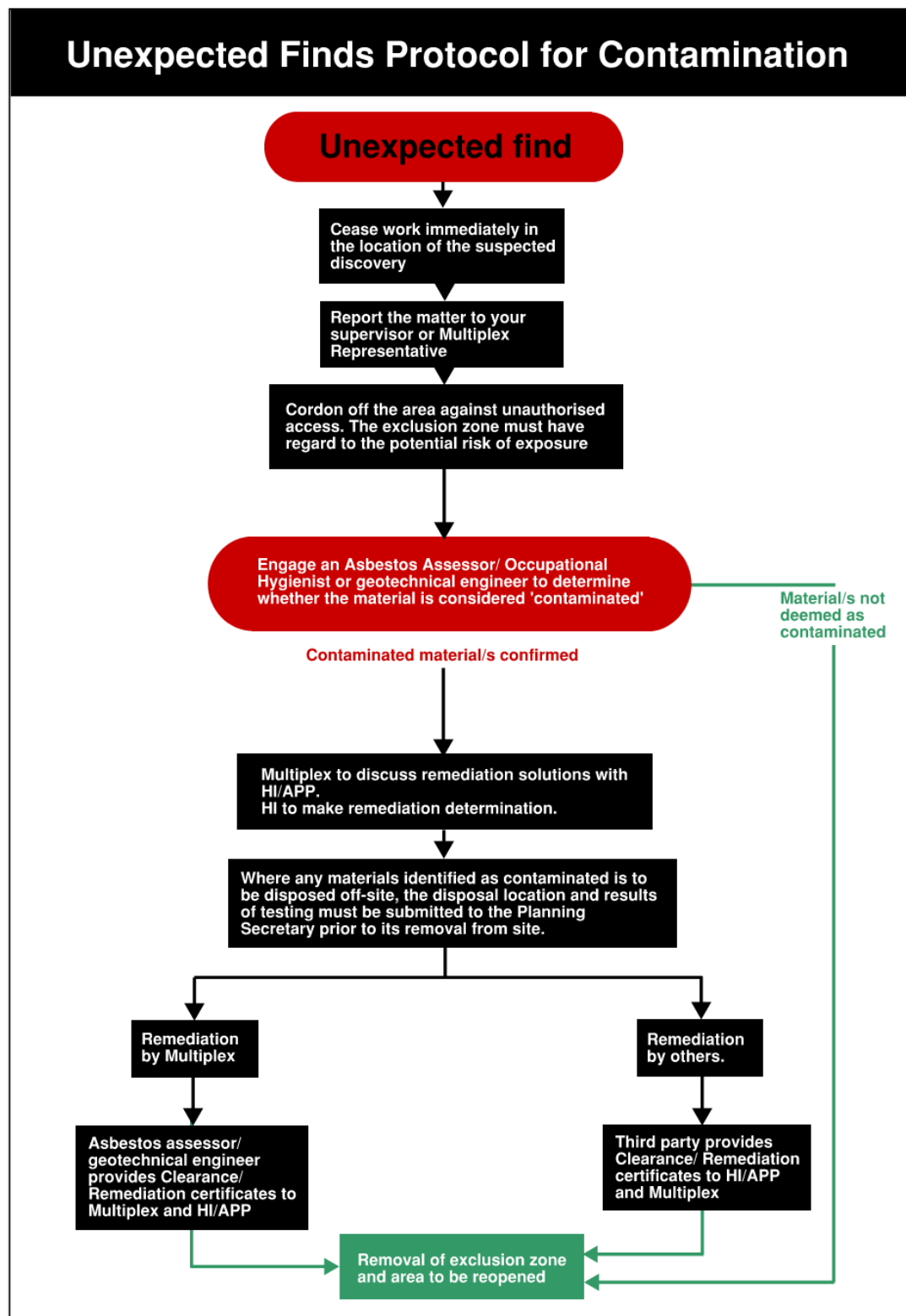
Category	Forms	Guides
Planning	» Environmental Subcontractor Documentation Status Chart	» Schedule of Environmental Legislation and Other Requirements NSW
Communication and Consultation		» Environmental Fact Sheets
Incident and Emergency Management	» Incident Investigation Report	
Induction and Training	» Induction Training Handout » Project Induction and Declaration	
Hazardous Chemicals Wash Box		» ChemAlert
Inspection and Monitoring	» Environmental Site Inspection	
Subcontractor Management	» Environmental Management Plan Review Checklist » Environmental Safe Work Method Statement Review Checklist	» Subcontractor Environmental Management Plan Template
Audits	» Environmental Internal Audit Checklist	

Note: Reference should be made to the Multiplex Operating System Document and Forms library to obtain the current versions of the documents above.

14.3 Appendix 3: Copy of Development Approval Conditions (SSD-9351535)

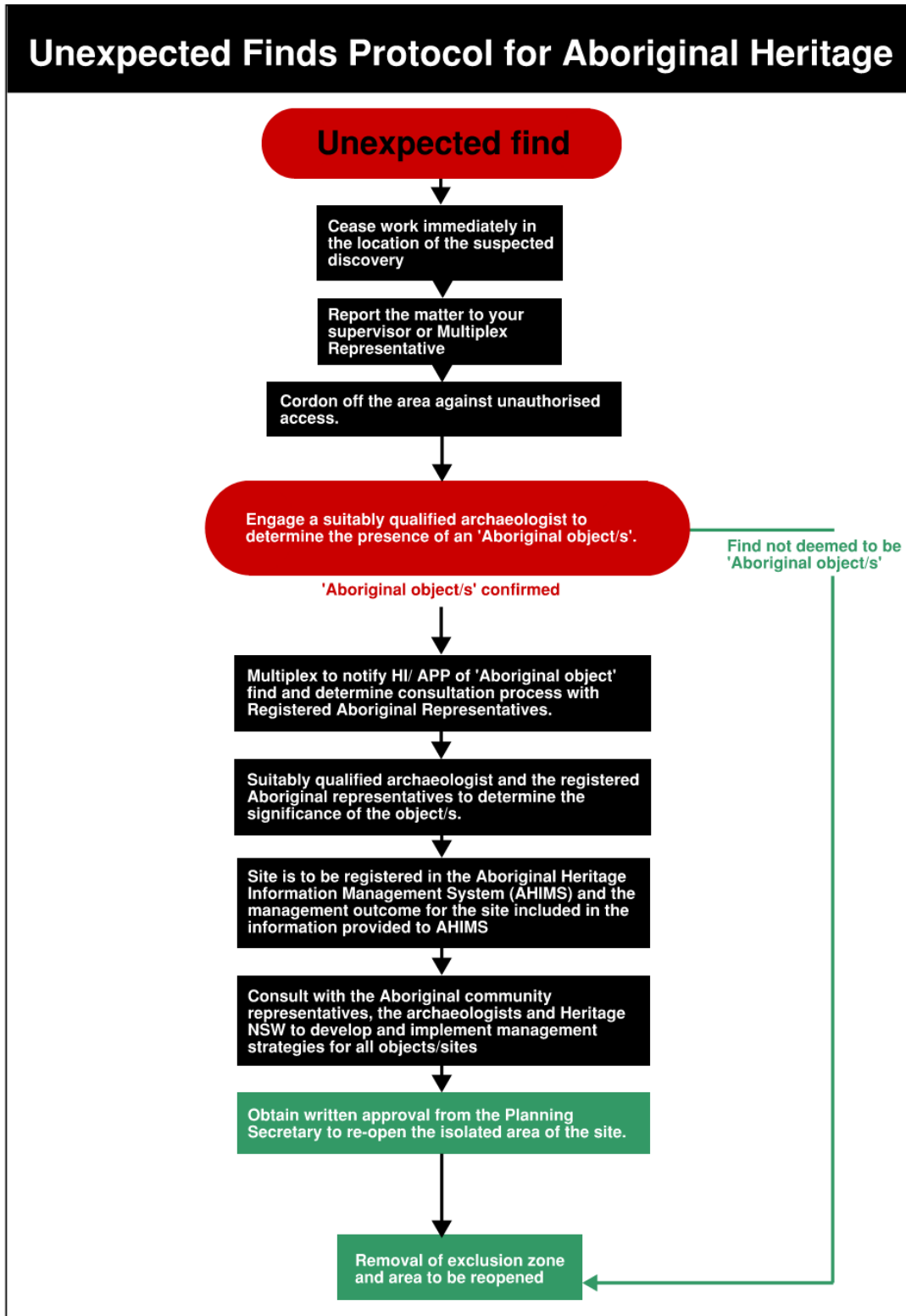
14.5 Appendix 5: Unexpected Finds Protocol for Contamination

Note: This Unexpected Finds Protocol included here has been developed in accordance with conditions B6 and B16 (b) of SSD-9351535.



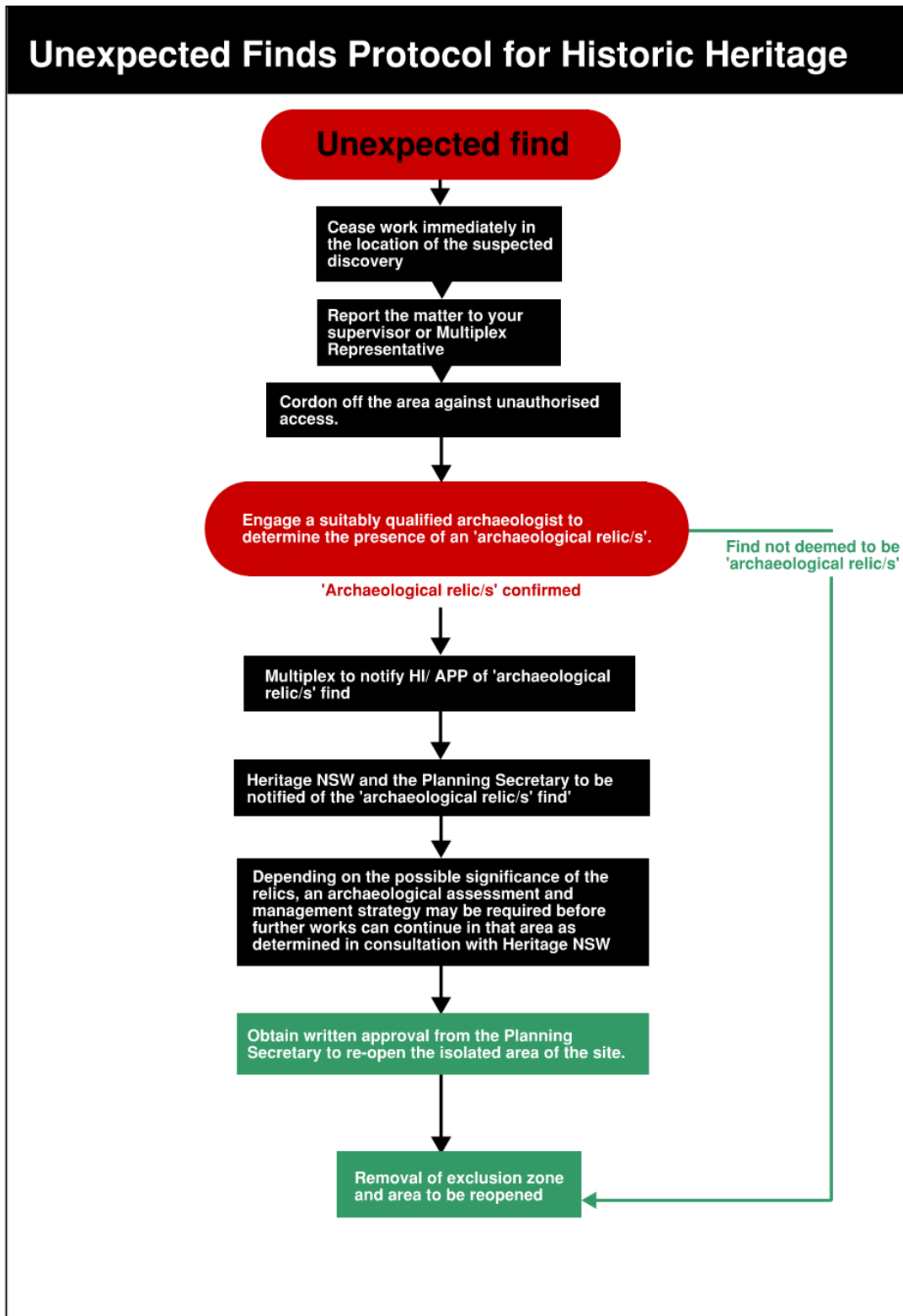
14.6 Appendix 5: Unexpected Finds Protocol for Aboriginal Heritage

Note: This Unexpected Finds Protocol included here has been developed in accordance with conditions B16(c) and C26 of SSD-9351535.



14.7 Appendix 7: Unexpected Finds Protocol for Historic Heritage

Note: This Unexpected Finds Protocol included here has been developed in accordance with conditions B16(c) and C27 of SSD-9351535.

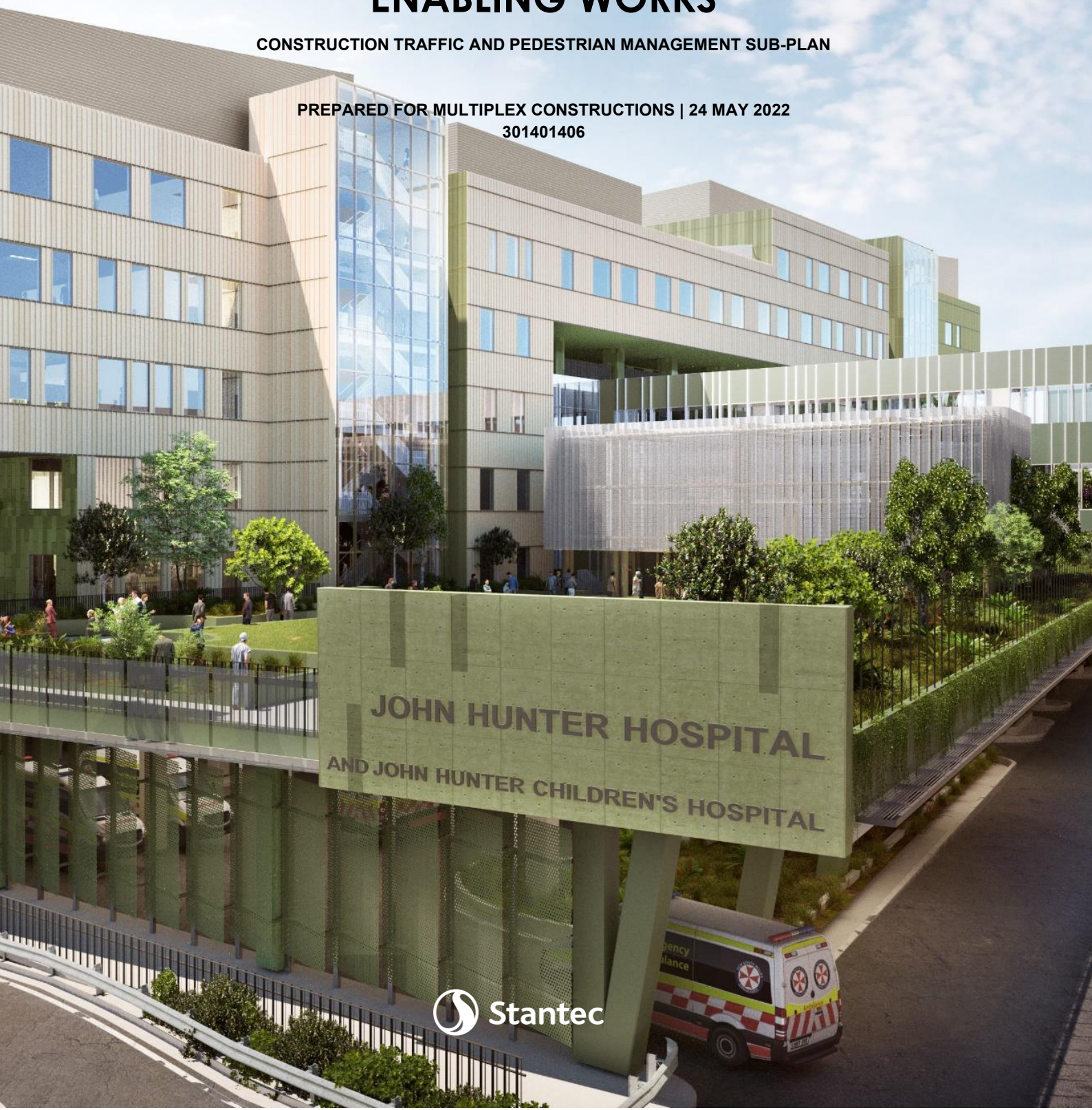


14.8 Appendix 8: Traffic and Pedestrian MSP (original consultant document)

JOHN HUNTER HEALTH AND INNOVATION PRECINCT - ENABLING WORKS

CONSTRUCTION TRAFFIC AND PEDESTRIAN MANAGEMENT SUB-PLAN

PREPARED FOR MULTIPLEX CONSTRUCTIONS | 24 MAY 2022
301401406



John Hunter Health and Innovation Precinct - Enabling Works

Revision	Date	Description	Author	Quality Check	Approver
A	07/04/2022	Final	Mackenzie Brinums	Karen McNatty	Karen McNatty
B	07/04/2022	Final – minor amendments	Mackenzie Brinums	Karen McNatty	Karen McNatty
C	11/04/2022	Final – minor amendments	Mackenzie Brinums	Karen McNatty	Karen McNatty
D	26/04/2022	Final – updated to address TfNSW and Council comments	Mackenzie Brinums	Karen McNatty	Karen McNatty
E	27/04/2022	Final – minor amendments	Mackenzie Brinums	Karen McNatty	Karen McNatty
F	24/05/2022	Final – Updates in response to DPIE comments	Mackenzie Brinums	Karen McNatty	Karen McNatty



John Hunter Health and Innovation Precinct - Enabling Works

The conclusions in the Report titled John Hunter Health and Innovation Precinct - Enabling Works are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Multiplex Constructions (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided to applicable authorities having jurisdiction and others for whom the Client is responsible, Stantec does not warrant the services to any third party. The report may not be relied upon by any other party without the express written consent of Stantec, which may be withheld at Stantec's discretion.

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1 Introduction

1.1 Background

Multiplex Constructions commissioned Stantec in March 2022 to prepare a Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP) for the Enabling Works for the John Hunter Health and Innovation Precinct project. A further CTPMSP will be submitted for the main building and infrastructure works at the conclusion of the detailed design phase.

Specifically, this CTPMSP seeks to address the 'Construction Traffic Management' conditions of Section 6.3 (Summary of Mitigation Measures) included in the Review of Environmental Factors approval and Condition B18 of the project approval (SSD-9351535), noting this CTPMSP only seeks to cover the Enabling Works stage. Condition B18 has been reproduced below:

B18. The Construction Traffic and Pedestrian Management Sub-Plan (CTPMSP) must be prepared to achieve the objective of ensuring safety and efficiency of the road network and address, but not be limited to, the following:

(a) be prepared by a suitably qualified and experienced person(s);

(b) be prepared in consultation with Council and TfNSW;

(c) detail:

(i) measures to ensure road safety and network efficiency during construction in consideration of potential impacts on general traffic, cyclists and pedestrians and bus services;

(ii) measures to ensure the safety of vehicles and pedestrians accessing adjoining properties where shared vehicle and pedestrian access occurs;

(iii) signage at the entrance of any bushland tracks affected by construction activities to ensure pedestrians and cyclists accessing the tracks are aware of any temporary closures or diversions as a result of construction activities;

(iv) initiatives such as park and ride, shuttle bus services and encourage carpooling to ensure that construction workers have a dedicated off-site parking area and transportation to the works site, ensuring workers do not park in local streets;

(v) how the use the Lookout Road / Kookaburra Circuit signalised intersection for construction access would be discouraged where possible and the alternatives of Lookout Road / Jacaranda Drive and the future Newcastle Inner City Bypass be considered in the first instance. Where this is not possible additional measures to specifically address the safety of pedestrians and the movement of operational traffic including staff, visitors and emergency vehicles through this intersection;

(vi) heavy vehicle routes, access and parking arrangements;



(vii) the swept path of the longest construction vehicle entering and exiting the site in association with the new work, as well as manoeuvrability through the site, in accordance with the latest version of AS 2890.2; and

(viii) arrangements to ensure that construction vehicles enter and leave the site in a forward direction unless in specific exceptional circumstances under the supervision of accredited traffic controller(s).

The overall principles of traffic management during the construction activity include:

- provide an appropriate and convenient environment for pedestrians
- minimise the impact on pedestrian movements
- minimise the impact on cyclists
- maintain appropriate capacity for pedestrians at all times on footpaths around the site
- maintain appropriate public transport access
- minimise the loss of parking
- maintain access to/ from adjacent buildings
- restrict construction vehicle movements to designated routes to/ from the site
- manage and control construction vehicle activity in the vicinity of the site
- carry out construction activity in accordance with Council's approved hours of works.

This report has been prepared by engineers who holds the SafeWork NSW Traffic Control Work accreditation. Details of the accredited engineers are provided below:

- Mackenzie Brinums – Card No. TCT0044967.

1.2 References

In preparing this report, reference has been made to the following:

- Traffic Control at Work Sites Technical Manual, Transport for NSW, February 2022
- Australian Standard AS1742.3:2019 'Manual of Uniform Traffic Control Devices – Traffic control for works on roads'
- Austroads Guide to Temporary Traffic Management series (2021)
- John Hunter Health and Innovation Precinct, State Significant Development Application, Transport Impact Assessment prepared by GTA, now Stantec dated 14 May 2021.



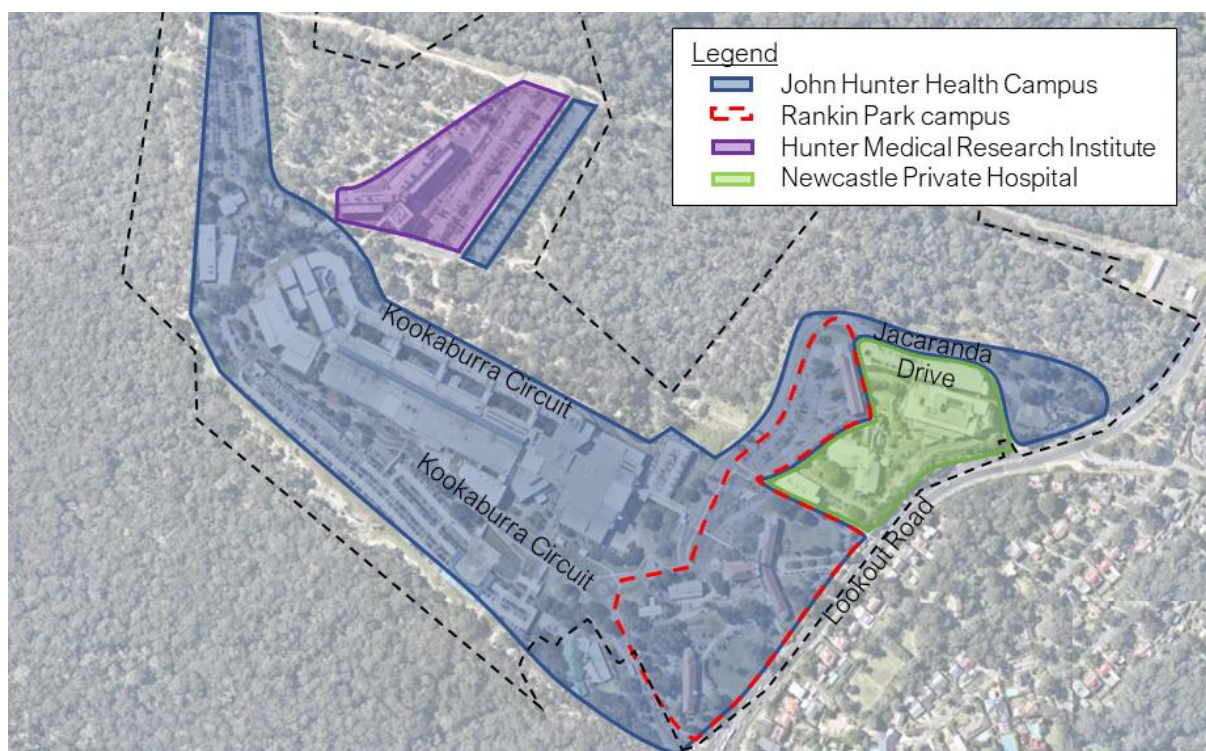
2 Existing Conditions

2.1 Location

The John Hunter Health Campus is located on Lookout Road, Lambton Heights, NSW, and is located within Hunter New England Local Health District (HNELHD). The John Hunter Health Campus comprises John Hunter Hospital, John Hunter Children's Hospital, the Royal Newcastle Centre, the Rankin Park Rehabilitation Unit (Rankin Park Campus) and the Nexus Unit (Children & Adolescent Mental Health Unit). It currently has around 3,900 full time equivalent (FTE) staff across HNELHD, HealthShare NSW and pathology.

Newcastle Private Hospital and Hunter Medical Research Institute (HMRI) are respectively located adjacent to the John Hunter Health Campus on its eastern and north-western side, as shown in Figure 1.

Figure 1: John Hunter Health Campus



Base image source: Nearmap

The location of the subject site and its surrounding environs is shown in Figure 2.

Figure 2: Subject site and its environs



Base image source: Google Maps

2.2 Road Network

2.2.1 LOOKOUT ROAD

Lookout Road is classified as a State Road in the Roads and Maritime Schedule of Classified Roads and State and Regional Roads versions 2011/ 1. It is aligned in a north south direction and is a two-way road, near the site Lookout Road is configured with two travel lanes in each direction and auxiliary right-hand turning lanes on approach to signalised intersections.

Lookout Road has a sign posted speed limit of 60 kilometres per hour.

1.1.1. KOOKABURRA CIRCUIT

Kookaburra Circuit functions as a local road that provides the primary staff and visitor access to the John Hunter Health Campus and associated parking facilities. It circulates around the John Hunter Hospital and is predominately aligned in an east-west direction. Between Jacaranda Drive and the northern most access from the southwestern carpark on the southern side of the building, it is a two-way road configured with one travel lane in each direction. North of the northern most access from the southwestern carpark, it is a one-way road configured with one travel lane circulating northbound then eastbound with one parking lane in the direction of travel. Kerbside parking is permitted for fleet and service permit holders only.

Kookaburra Circuit has a sign posted speed limit of 40 kilometres per hour.

1.1.2. JACARANDA DRIVE

Jacaranda Drive functions as a local road that provides a secondary access for staff and visitors to John Hunter Hospital, Newcastle Private Hospital and the surrounding health precinct. It is aligned in a north-south direction and connects Kookaburra Circuit with Lookout Road north of Newcastle Private Hospital. It is a two-way road, configured with one travel lane in each direction.

Figure 3 provides an overview of the road network surrounding the site.

Figure 3: Existing road network



Base image source: Nearmap

2.3 Road Network Operation

Traffic modelling completed as part of the SSDA indicated that the intersection of Lookout Road/ Kookaburra Circuit is currently approaching capacity in peak conditions. The south-west and north-east approaches experience notable average queuing of 340 and 290 metres respectively in the AM and PM peak hours. Furthermore, the north-west approach (Kookaburra Circuit) experiences notable queuing and delays in the PM peak hour due to the high volume of vehicles exiting the hospital.

The intersection of Lookout Road/ Jacaranda Drive currently operates well and with spare capacity in peak conditions. The south-west approach experiences notable queuing in the AM peak period. Observations show that vehicles typically queue in the right-hand lane in preparation to turn right at the Lookout Road/ Russell Street intersection.

The intersection of Lookout Road/ Russell Street currently operates near capacity in peak conditions. The south-west approach experiences notable queuing in peak conditions due to the high volume of right turning vehicles. It is noted that delays and queuing for through movements are considered satisfactory at this approach. Furthermore, the north-east approach (Croudace Street) experiences notable queuing and delays in peak conditions. The south-east approach (Russell Road) right turn also experiences notable delays in peak conditions.

2.4 Public Transport and Cycling Networks

A bus stop is provided at the main hospital entrance at the southern side of the building along Kookaburra Circuit. Buses servicing this stop provide convenient connections with key local and regional destinations, including Newcastle Central Business District, Broadmeadow, Charlestown and Glendale. The 13 and/ or 26 bus routes connect with railway stations, including Broadmeadow and Cardiff Stations, providing connection to the Central Coast, Sydney, Lower and Upper Hunter and North Coast. Train services from these stations generally have frequencies of around two or three services per hour throughout the day (the full timetable for the Central Coast and Newcastle Line can be accessed from <https://transportnsw.info/documents/timetables/93-CCN-Central-Coast-Newcastle-Line-20220219.pdf>).

A review of the bus routes available at the John Hunter Health Campus is summarised in Table 1 and shown indicatively in Figure 4, with the inset of public transport around Broadmeadow Station shown in Figure 5.

As noted in Sections 3.3 and 4.13, information on the existing public transport options will be included within all site inductions for workers and visitors engaged on the Project.

Table 1: Bus services

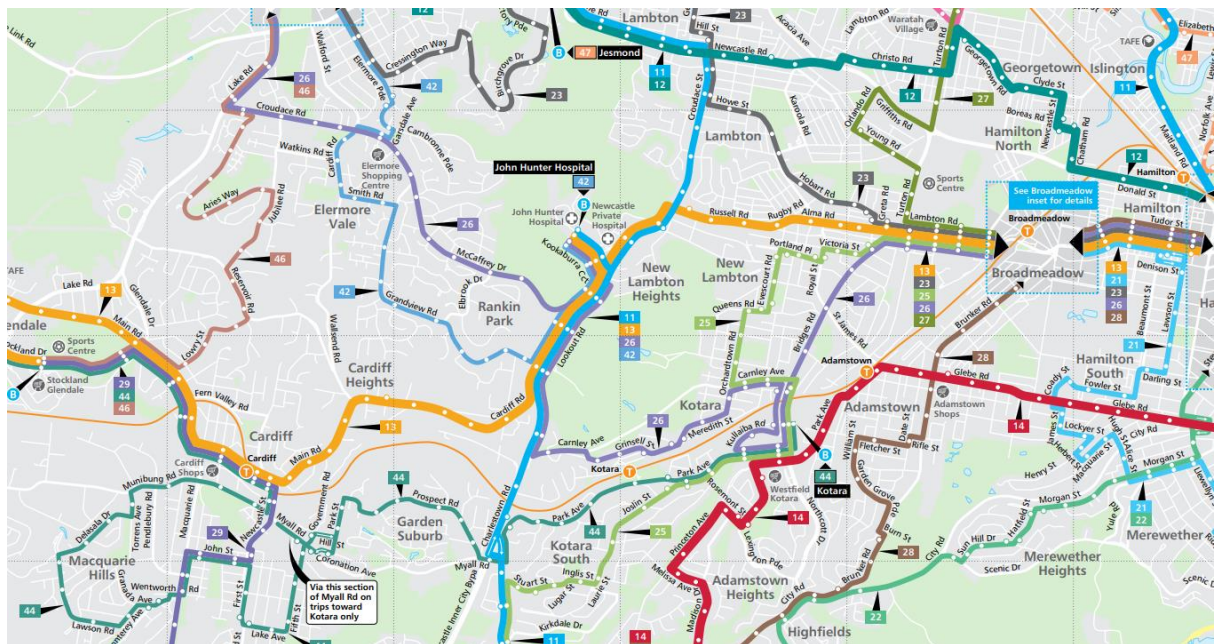
Route number	Route description	Location of stop	Frequency on/ off-peak
11	Charlestown to Newcastle	Main Hospital Entrance along Kookaburra Circuit	Every 15 mins
13	Newcastle to Glendale		Every 15 mins
26	Newcastle West to Wallsend		30 mins/ 1 hour
42	John Hunter Hospital to Wallsend		Hourly between 6am and 6pm



John Hunter Health and Innovation Precinct - Enabling Works

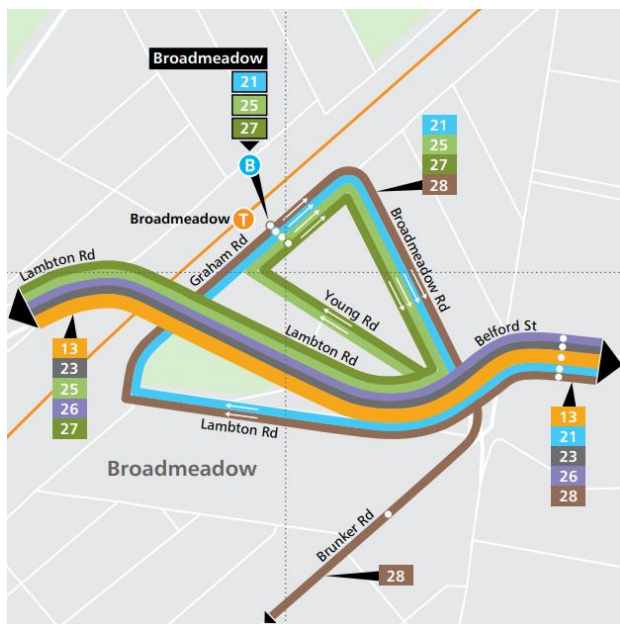
2 Existing Conditions

Figure 4: Surrounding public transport network



Base image source: <https://transportnsw.info/document/3151/newcastle-transport-network-map.pdf>, accessed April 2022

Figure 5: Bus routes servicing Broadmeadow Station



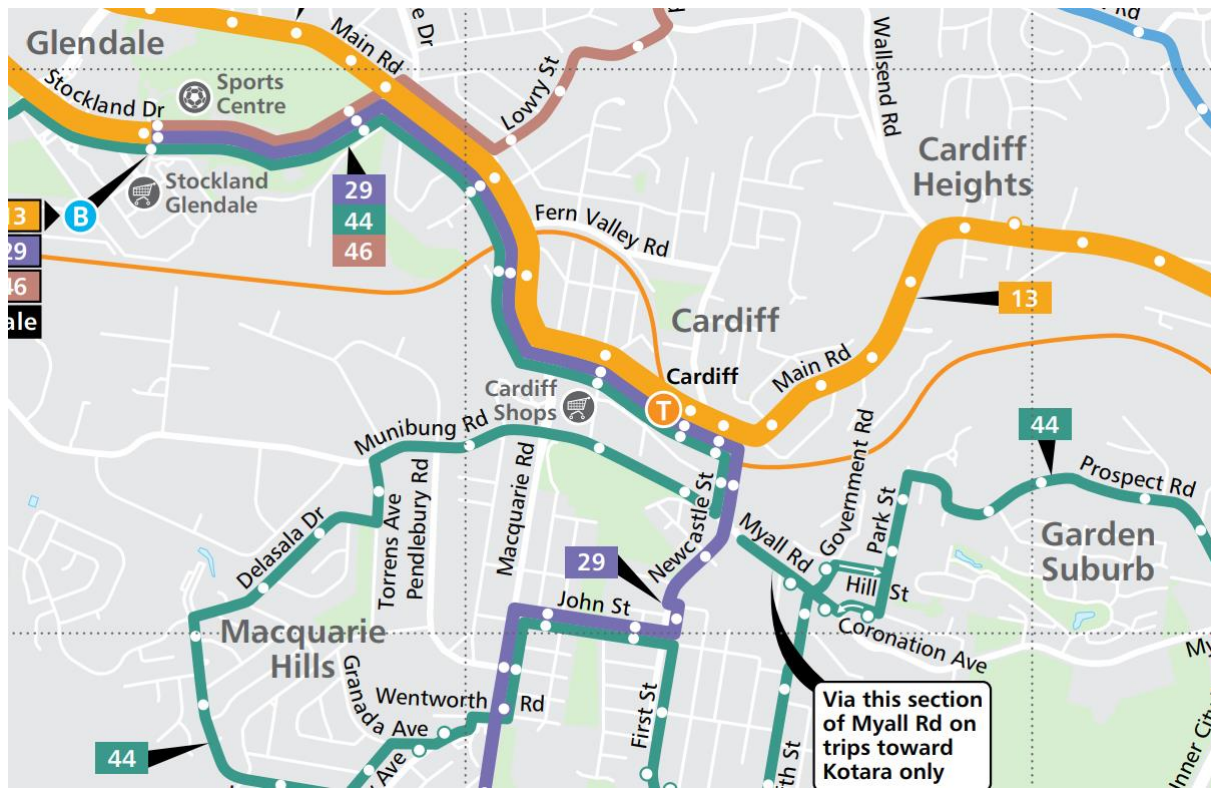
Base image source: <https://transportnsw.info/document/3151/newcastle-transport-network-map.pdf>, accessed April 2022



John Hunter Health and Innovation Precinct - Enabling Works

2 Existing Conditions

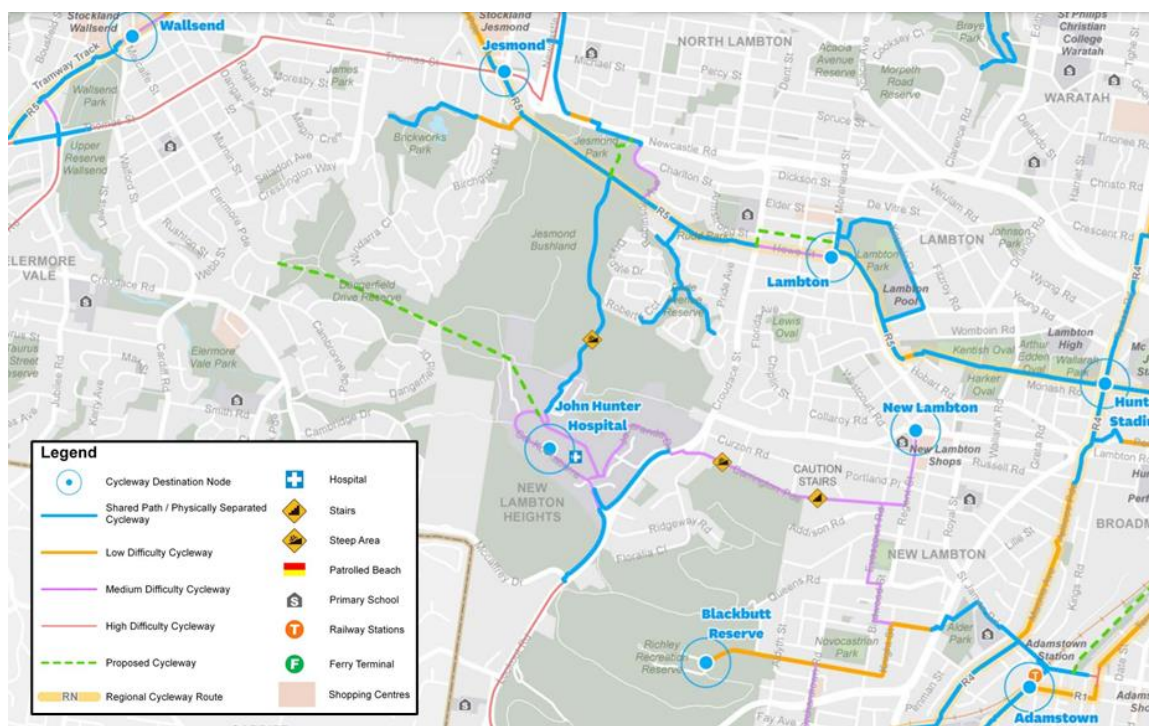
Figure 6: Bus routes servicing Cardiff Station



Base image source: <https://transportsw.info/document/3151/newcastle-transport-network-map.pdf>, accessed April 2022

Surrounding cycling infrastructure is shown in Figure 7.

Figure 7: Surrounding cycling network



Base image source: <https://newcastle.nsw.gov.au/Newcastle/media/Documents/Cycling%20and%20Walking/Newcastle-Cycleways-LGA-Map-WEB.pdf>, accessed April 2022



3 Overview of Construction Activities

3.1 Description of Construction Activities

The Enabling Works for the John Hunter Hospital redevelopment project involves the following:

- Reconfiguration and construction of additional parking areas to car park 4 and the HMRI car park.
- Site clearing and excavation to HMRI carpark, carpark 4, fire trail for construction road and proposed ASB location.
- Piling to the ASB, along with retaining wall construction within the ASB, carpark 4 and HMRI carpark.
- Stormwater services install to the ASB, carpark 4 and HMRI carpark, in-ground services: diversion, lighting, security and boom gate services.

The expected duration of the Enabling Works is around seven months, with the works planned to commence in April 2022 and be completed by November 2022. Access to the Hospital campus is to remain open at all times.

3.2 Work Hours

Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:

- Monday to Friday 7:00am and 6:00pm
- Saturday 8:00am and 1:00pm
- Sunday/ public holiday no work.

Notwithstanding the above, provided noise levels do not exceed the existing rating background noise level plus 5dB, works may also be undertaken during the following hours:

- Monday to Friday 6:00am to 7:00am
- Saturday 7:00am to 8:00am, and 1:00pm to 5:00pm.

Construction activities may be undertaken outside of the hours outlined above if required:

- by the Police or a public authority for the delivery of vehicles, plant or materials; or
- in an emergency to avoid the loss of life, damage to property or to prevent environmental harm; or
- where the works are inaudible at the nearest sensitive receivers; or
- for the delivery, set-up and removal of construction cranes, where notice of the crane related works is provided to the Planning Secretary and affected residents at least seven days prior to the works; or



- where a variation is approved in advance in writing by the Planning Secretary or his nominee if appropriate justification is provided for the works.

Multiplex will be responsible for instructing and controlling all subcontractors regarding the hours of work. Construction worker arrivals and departures will be minimised during peak hours.

3.3 Construction Worker Parking

It is anticipated that there will be on average up to 60 workers on-site at any given time during the works.

Construction workers will not be allowed to park within the Hospital campus car parking supply, associated road network or on surrounding streets. Limited on-site parking is provided for construction workers within the various work areas. Construction worker arrival and departures will be minimised during peak hours.

Workers will be encouraged to use public transport and other off-site parking initiatives to access the site where practical. During site induction, workers will also be provided with information on existing public transport options and off-site parking initiatives. Appropriate arrangements will be made for any equipment/ tool storage and drop-off requirements.

Multiplex will also provide initiatives such as park and ride shuttle bus services, with construction vehicles that are required to be used on site to also pick-up workers from subcontractor depots, travelling to site and parking within the construction compound. Carpooling will also be encouraged. These initiatives will be amended as required to respond to changes in construction worker parking volumes anticipated in the future stages of the JHHIP Project. All parking initiatives will be reviewed on a regular basis to ensure that they are being implemented effectively.

Any construction worker arrivals and departures by vehicle would be outside of road network peak hours and as such is unlikely to impact the surrounding road network.

3.4 Construction Site Access

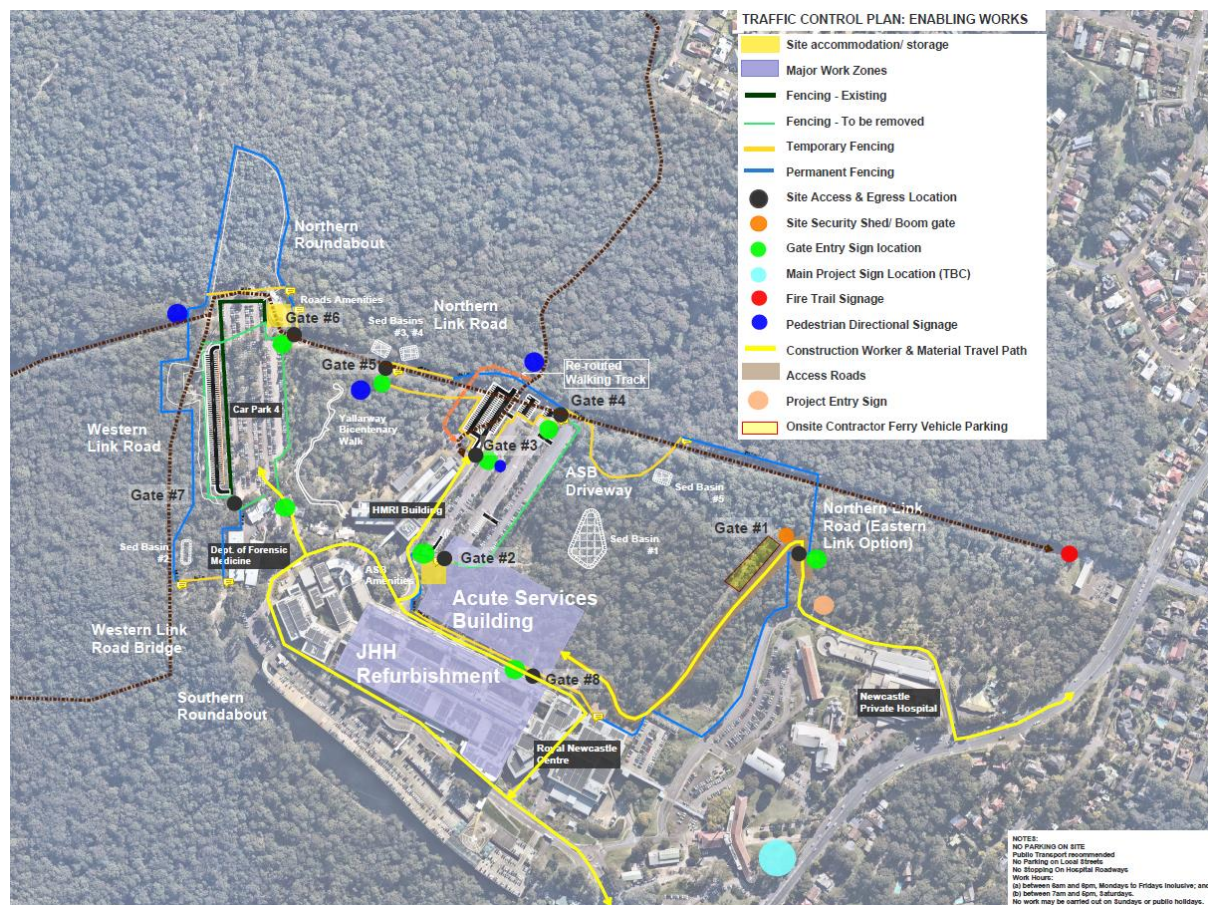
The existing fire trail located on the northern edge of Jacaranda Drive near car park 9 is proposed to be upgraded to provide a dedicated construction vehicle access road to/ from the northern aspect of the works site. By utilising the existing (part cleared) fire trail, this also assists with reducing environmental impacts while still enabling a viable construction access.

A total of seven construction vehicle access gates are proposed as detailed in Figure 8, with Gate 1 to be provided off Jacaranda Drive via a fire trail, Gates 2, 3 and 7 provided off Kookaburra Circuit and all other gates accessed via the fire trail along the northern boundary of the site which interconnect the HMRI car park and Car Park 4.

John Hunter Health and Innovation Precinct - Enabling Works

3 Overview of Construction Activities

Figure 8: Construction site access arrangement



Source: Multiplex Constructions

Construction vehicle access to the site will generally involve 12.5 metre heavy rigid vehicles and 18.1 metre truck and dogs, with occasional access required by 19 metre semi-trailers.

Construction vehicles will use the Lookout Road/ Jacaranda Drive intersection to access Gate 1 to minimise the length of time vehicles travel on the hospital road network. Due to existing geometric constraints, vehicles cannot turn left into Jacaranda Drive from Lookout Road. Therefore, all heavy vehicles would be instructed to arrive from the north if accessing Gate 1. Gates 2, 3 and 7 will all be required to be accessed via Kookaburra Circuit and will involve vehicles accessing the hospital via the Lookout Road/ Kookaburra Circuit intersection. Use of these accesses will be minimised as much as possible, particularly during peak periods, so as to minimise any disruptions to general hospital operations. All vehicles will enter and exit the construction compounds in a forward direction unless in specific exceptional circumstances under the supervision of accredited traffic controller(s).

In response to this requirement, the construction site has been specifically designed to allow all vehicles to enter and exit the construction compounds in a forward direction only. A review of the delivery routes proposed for the Project does not anticipate the need for construction vehicles to enter the construction compound in a reverse direction. However, where this is required, it will only be done under the supervision of accredited traffic controller(s).

Queuing or marshalling of construction vehicles will not be permitted on the road network, with call-up procedures to be put in place to manage arrivals.



3.5 Construction Vehicle Volumes

The site will have various types of construction vehicles accessing the site. The largest construction vehicles will include 12.5 metre heavy rigid vehicles and 18.1 metre truck and dogs, with occasional access also required by 19 metre semi-trailers.

It is expected that there will be on average around 20 heavy vehicles per day (two per hour) accessing the work areas, with peak construction vehicle activity likely to generate up to 50 vehicles (five per hour) per day.

As outlined in Section 3.3 construction workers will not be able to park on site and will be required to access the site via public transport or carpooling, therefore vehicles associated with workers onsite will be minimal and contained within the site compound area.

3.6 Construction Vehicle Routes

Generally, construction vehicles will have origins and destinations from a wide variety of locations. However, all construction vehicles will be restricted to the State and Regional Road network where practicable. In general, all construction traffic is to arrive on site via Jacaranda Drive. Exceptions must be approved in writing by the Principal for any construction vehicles accessing the site via Kookaburra Circuit.

The directional distribution and assignment of traffic generated by the development will be influenced by a number of factors, most notably the origin/ destination of materials, configuration of access points to the site and the configuration of the arterial road network near the site.

The construction vehicle routes are detailed below and shown in Figure 9 and Figure 10. No queuing or marshalling of construction vehicle will be permitted on public roads. Should queuing within the Hospital campus be unavoidable during certain phases of the project, Multiplex is to submit a Notice of Disruption to the Principal, in a format approved by the Principal.

Approach Routes

- North:
 - Newcastle Inner City Bypass, Newcastle Road, Lookout Road
 - Turton Road, Newcastle Road, Lookout Road
 - Griffiths Road, Newcastle Road, Lookout Road.

Departure Routes

- North:
 - Lookout Road, Newcastle Road, Newcastle Inner City Bypass
 - Lookout Road, Turton Road, Newcastle Road
 - Lookout Road, Newcastle Road, Griffiths Road.



John Hunter Health and Innovation Precinct - Enabling Works

3 Overview of Construction Activities

- South:
 - Lookout Road, Charlestown Road, Newcastle Inner City Bypass.

Figure 9: Construction vehicle approach routes



Base image source: Nearthmap

Figure 10: Construction vehicle departure routes



Base image source: Nearthmap



4 Construction Traffic Management

4.1 Swept Path Analysis

A swept path assessment has been completed for the largest construction vehicles anticipated for the proposed works accessing the various site access locations, including 12.5m heavy rigid vehicles, 18.1 metre truck and dog combinations and 19 metre semi-trailers. The swept path assessment is provided in Appendix A.

4.2 Traffic Guidance Schemes

Where required, Traffic Guidance Schemes (formerly known as Traffic Control Plans) will be developed by a suitably qualified TGS designer in accordance with the Traffic Control at Work Sites Technical Manual (Transport for NSW, 2022). This would include confirming any modifications required to accommodate vehicle swept paths across the site. The control of traffic at work sites must be undertaken with reference to SafeWork requirements and any other Workplace Health and Safety manuals.

4.3 Existing Shared Paths and Cycleways

There are existing shared paths and cycleways located around the JHH Precinct that will be impacted by the works. Directional signage will be provided at locations where access is restricted by the works prior to the shared path being closed.

The existing shared path/ cycleway located to the north of the site (near the HMRI Car Park) will be maintained for the duration of the works via a temporary diversion. The temporary diversion will be sealed for all-weather access and its orientation may need to be adjusted to suit the different stages of the works.

The existing trail located near the Department of Forensic Medicine building should be maintained during the Enabling Works Stage of the JHHIP Project but would eventually be cut off during the construction of the new internal roads and roundabout. Directional signage will be provided at this location where access is restricted by any works associated with the Project, prior to the trail being closed.

4.4 Existing Fire Trails

Multiplex Constructions will meet with representatives of Fire Rescue NSW (FRNSW) and NSW Rural Fire Service (NSW RFS) on-site to discuss impacts on existing fire trails on the JHH Precinct site. 003 padlocks will be provided at all impacted fire trail access points to ensure uninterrupted 24/7 access for FRNSW/ NSW RFS during the construction works.



4.5 Access to Existing Utilities/ Services

Multiplex will contact any impacted Utility Service providers to confirm their access requirements on the JHHIP site. Utility padlocks will be provided at all impacts locations such as Car Park 4 to ensure uninterrupted 24/7 access for the relevant Utility Service providers during the construction works.

4.6 Other Pedestrian, Cyclist and Traffic Management Considerations

Pedestrian movements will be maintained through the provision of A Class hoarding and fencing around perimeter of the work compounds. Pedestrian and cyclist movements are not expected to be impacted along the site frontage other than those impacts outlined in Section 4.3. Footpaths and cycle paths are not to be closed unless written permission has been provided by the Principal.

Some minor increases in average delay to vehicles at surrounding key intersections such as on Lookout Road can be expected at times during the construction period as is typical for large construction sites. That said, traffic generated by the Enabling Works will be minimised during peak periods, to ensure the development does not exasperate the existing constrained conditions.

Signage will be positioned at all site accesses to clearly identify the access as being for construction vehicles only. This includes along the fire trails to ensure pedestrians and cyclists accessing the trails are aware of any temporary closures or diversions as a result of construction activities. As part of any site induction, drivers should be specifically alerted to the pedestrian activity associated with the broader hospital, with appropriate care and safety on both approach and departure.

4.7 Road Occupancy Permits

A road occupancy permit is required for the use of part or all of a Newcastle City Council or Transport for NSW road (roadway or footpath within the road reserve) to carry out different type of works. Any proposed works on Newcastle City Council or Transport for NSW roads will require a Road Occupancy Permit prior to undertaking the works via the Road Occupancy Permit approval process.

4.8 Public Transport

The construction activities are not expected to impact existing public transport services near the site.

4.9 Emergency Vehicle Access

Access to the subject site and adjacent buildings by emergency vehicles would not be affected by the works as road and footpath frontages would be unaffected. Emergency protocols on the site would include a requirement for suitably accredited site personnel to assist with emergency access from the street.

Consequently, any potential impacts on emergency access would be effectively managed throughout the works.



Liaison would be maintained with the police and emergency services agencies throughout the construction period and a 24-hour contact would be made available for 'out-of-hours' emergencies and access.

4.10 Existing and Future Developments

Transport for NSW is planning to extend the Newcastle Inner City Bypass between Rankin Park and Jesmond, for a length of 3.4 kilometres. The project received environmental approval from the minister of planning in February 2019 and early works have begun with the construction of a shared path bridge across Newcastle Road.

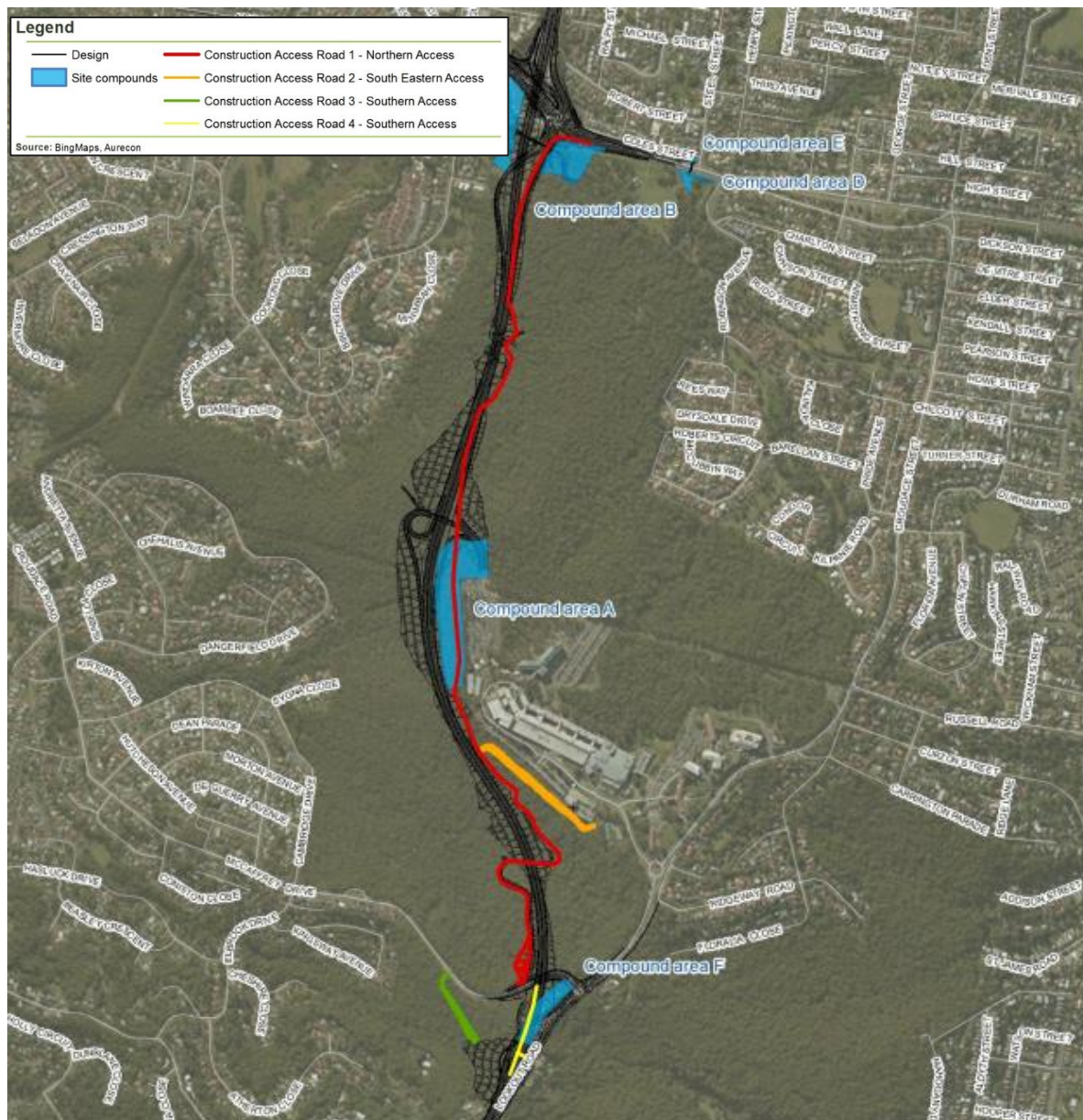
The anticipated construction impacts and construction traffic management measures are outlined in the Traffic and Transport Assessment (Aurecon 2016) and Supplementary Traffic and Transport Assessment (April 2018) as discussed throughout this section.

The assessments indicate that the majority of construction traffic movements are expected to be contained within the project's construction boundary with the exception of deliveries to site, disposal of waste and construction worker travel. The site layout and key construction site accesses are illustrated in Figure 11.

John Hunter Health and Innovation Precinct - Enabling Works

4 Construction Traffic Management

Figure 11: Newcastle Inner City Bypass Rankin Park to Jesmond – construction access roads



Source: Figure 4-1 and 3-2 out of Newcastle Inner City Bypass – Rankin Park to Jesmond, Technical Paper 2 Supplementary Traffic and Transport Assessment, page 53 prepared by Aurecon for Roads and Maritime dated April 2018

The assessment indicates that the Newcastle Inner City Bypass development is expected to generate up to 50 two-way vehicle trips along Lookout Road at its frontage to John Hunter Health Campus during the AM and PM road network peak periods during peak construction. This results in an approximate one per cent increase in overall traffic volumes and is not expected to affect the level of service at the intersections servicing these roads.

Notwithstanding, traffic generated by the Enabling Works will be minimised during peak periods, particularly during construction of the Bypass, to ensure the development does not exasperate the existing constrained conditions.

Regular meetings have been established with Transport for NSW in relation to the Newcastle Inner City Bypass and JHHIP Projects to discuss and address items including but not limited to interface management, traffic and pedestrian management, programme including peak construction activities and accumulative impacts/ management measures.

Consultation with City of Newcastle Council in October 2020 and review of approved or planned development in the area indicates there are no other major developments planned that may contribute to cumulative construction traffic along Lookout Road.

Regular meetings have also been established with the Newcastle City Council in relation to the JHHIP Project to keep Council up-to-date on any approved or planned development in the area, as well as to discuss any updates to traffic and pedestrian management, project programme including peak construction activities and accumulative impacts/ management measures.

Evidence of consultation with Transport for NSW and Newcastle City Council is provided in Appendix B.

4.11 Traffic Movements in Adjoining Council Areas

No adverse effects are expected from the movement of heavy vehicles through adjacent council areas.

4.12 Site Inspections and Record Keeping

The construction work would be monitored to ensure that it proceeds as set out in the Construction Management Plan provided by Multiplex. Where traffic control devices are installed on-site, a daily inspection before the start of the construction activity should take place to ensure that conditions accord with those stipulated in the plan and there are no potential hazards. Any possible adverse impacts would be recorded and dealt with if they arise.

Road sweeping/ cleaning is to be undertaken on Jacaranda Drive and Lookout Road as required or as instructed for the duration of the works. Cleaning of Kookaburra Circuit is required as instructed/ needed when exemptions to use this road are granted.

4.13 Site Induction

All staff employed on the site by Multiplex (including sub-contractors) would be required to undergo a site induction.

The induction would include permitted access routes to and from the construction site for site staff and delivery vehicles, information on existing public transport options and other off-site parking initiatives, restrictions on on-site parking arrangements, Precinct peak hours, as well as standard environmental, workplace health and safety, driver protocols and emergency procedures. The approved work hours must be included as part of this induction.



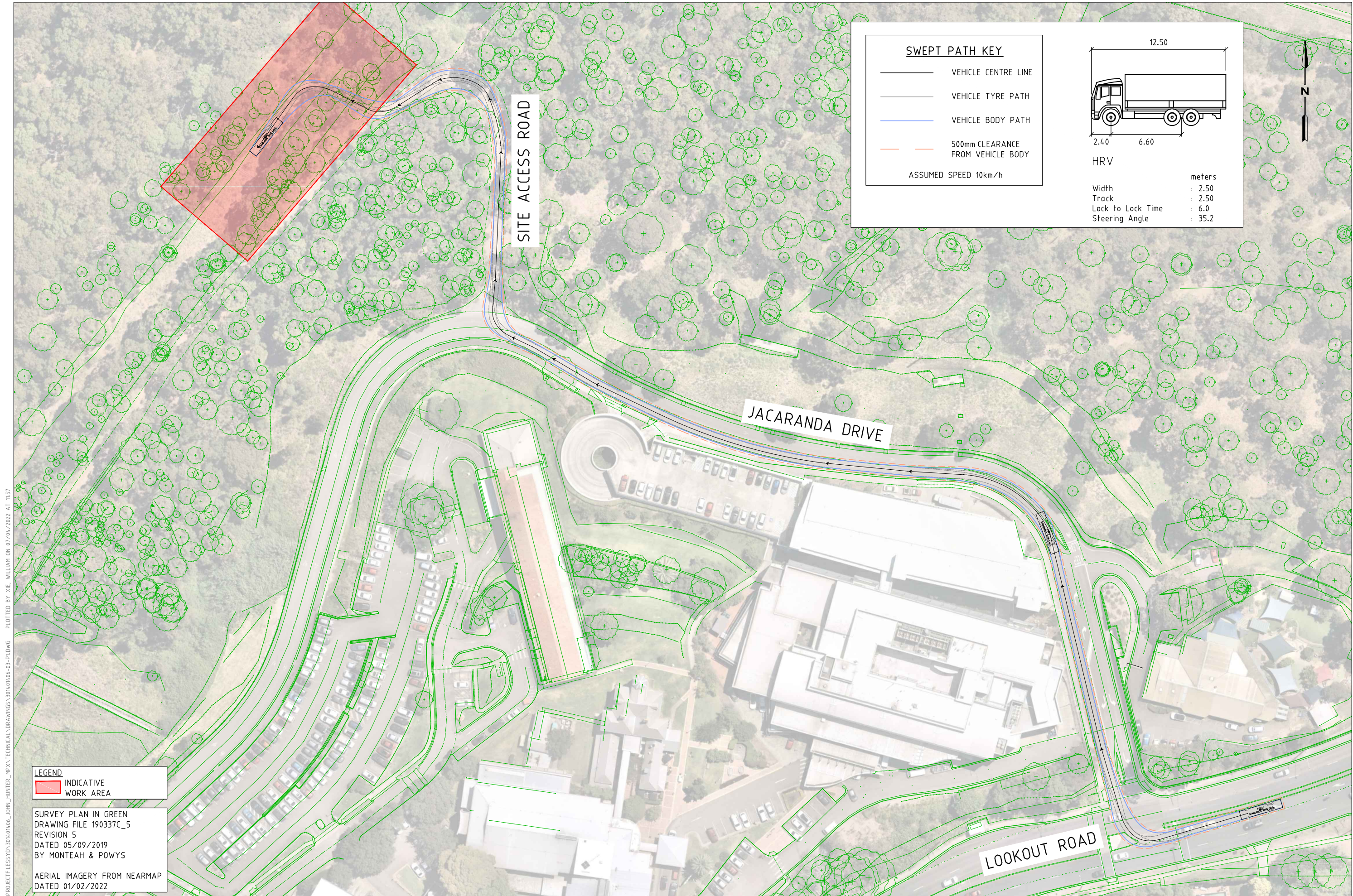
APPENDICES



Appendix A Swept Path Assessment



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SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

HRV

	metres
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 35.2

LEGEND

- INDICATIVE WORK AREA

SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
REVISION 5
DATED 05/09/2019
BY MONTEAH & POWYS

AERIAL IMAGERY FROM NEARMAP
DATED 01/02/2022



PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT
NOTIFICATION

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE
APPROXIMATE ONLY AND THEIR EXACT POSITION
SHOULD BE PROVEN ON SITE. NO GUARANTEE IS
GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED
W.XIE

DESIGN CHECK
M.BRINUMS

APPROVED BY
K.McNATTY

DATE ISSUED
6 APRIL 2022

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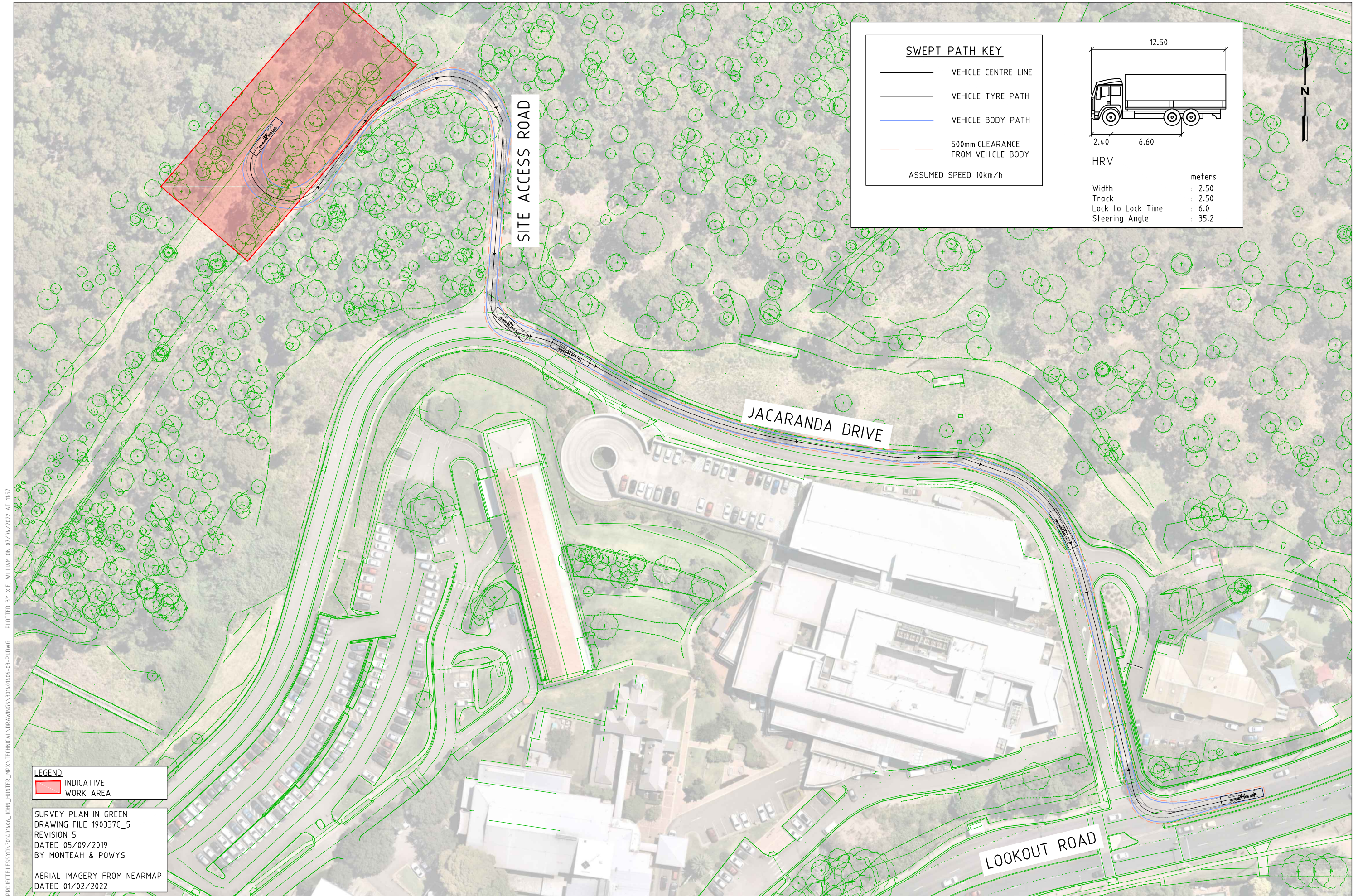
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JOHN HUNTER HOSPITAL

VEHICLE SWEEP PATH ASSESSMENT

DRAWING NO. 301401406-03-01 SHEET 01 OF 24 ISSUE P1

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SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

HRV

	metres
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 35.2

LEGEND

- INDICATIVE WORK AREA

SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
REVISION 5
DATED 05/09/2019
BY MONTEAH & POWYS

AERIAL IMAGERY FROM NEARMAP
DATED 01/02/2022



PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY
SUBJECT TO CHANGE WITHOUT
NOTIFICATION

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE
APPROXIMATE ONLY AND THEIR EXACT POSITION
SHOULD BE PROVEN ON SITE. NO GUARANTEE IS
GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED
W.XIE

DESIGN CHECK
M.BRINUMS

APPROVED BY
K.McNATTY

DATE ISSUED
6 APRIL 2022

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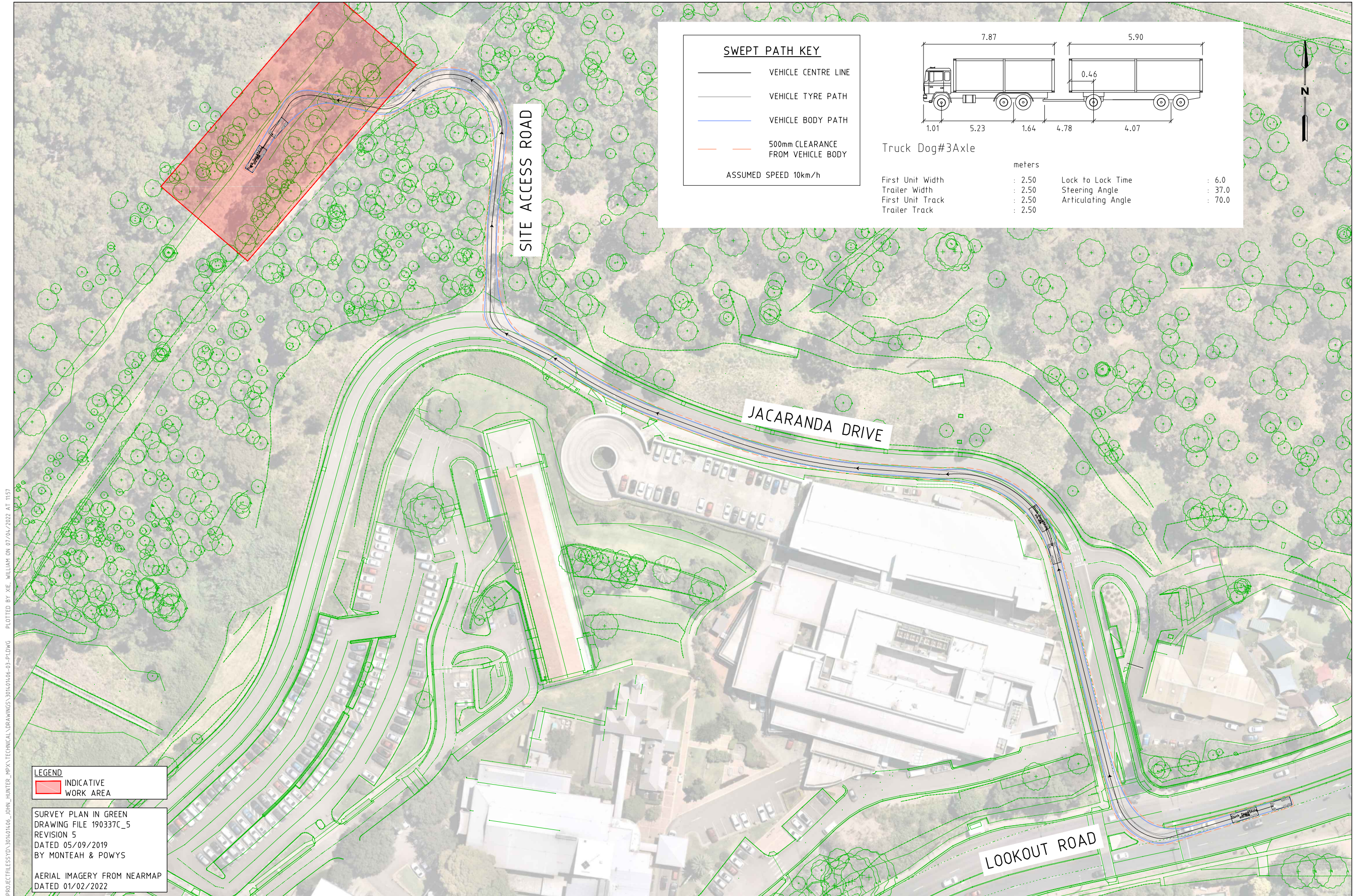
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JOHN HUNTER HOSPITAL

VEHICLE SWEEP PATH ASSESSMENT

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SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

Truck Dog#3Axle

	7.87	5.90
First Unit Width	2.50	2.50
Trailer Width	2.50	2.50
First Unit Track	2.50	2.50
Trailer Track	2.50	2.50
Lock to Lock Time	6.0	37.0
Steering Angle	37.0	70.0
Articulating Angle	70.0	

Truck dimensions: 1.01, 5.23, 1.64, 4.78, 4.07, 0.46

LEGEND

- INDICATIVE WORK AREA

SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
REVISION 5
DATED 05/09/2019
BY MONTEAH & POWYS

AERIAL IMAGERY FROM NEARMAP
DATED 01/02/2022



PRELIMINARY PLAN
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WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES ARE
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DESIGNED
W.XIE

DESIGN CHECK
M.BRINUMS

APPROVED BY
K.McNATTY

DATE ISSUED
6 APRIL 2022

SCALE
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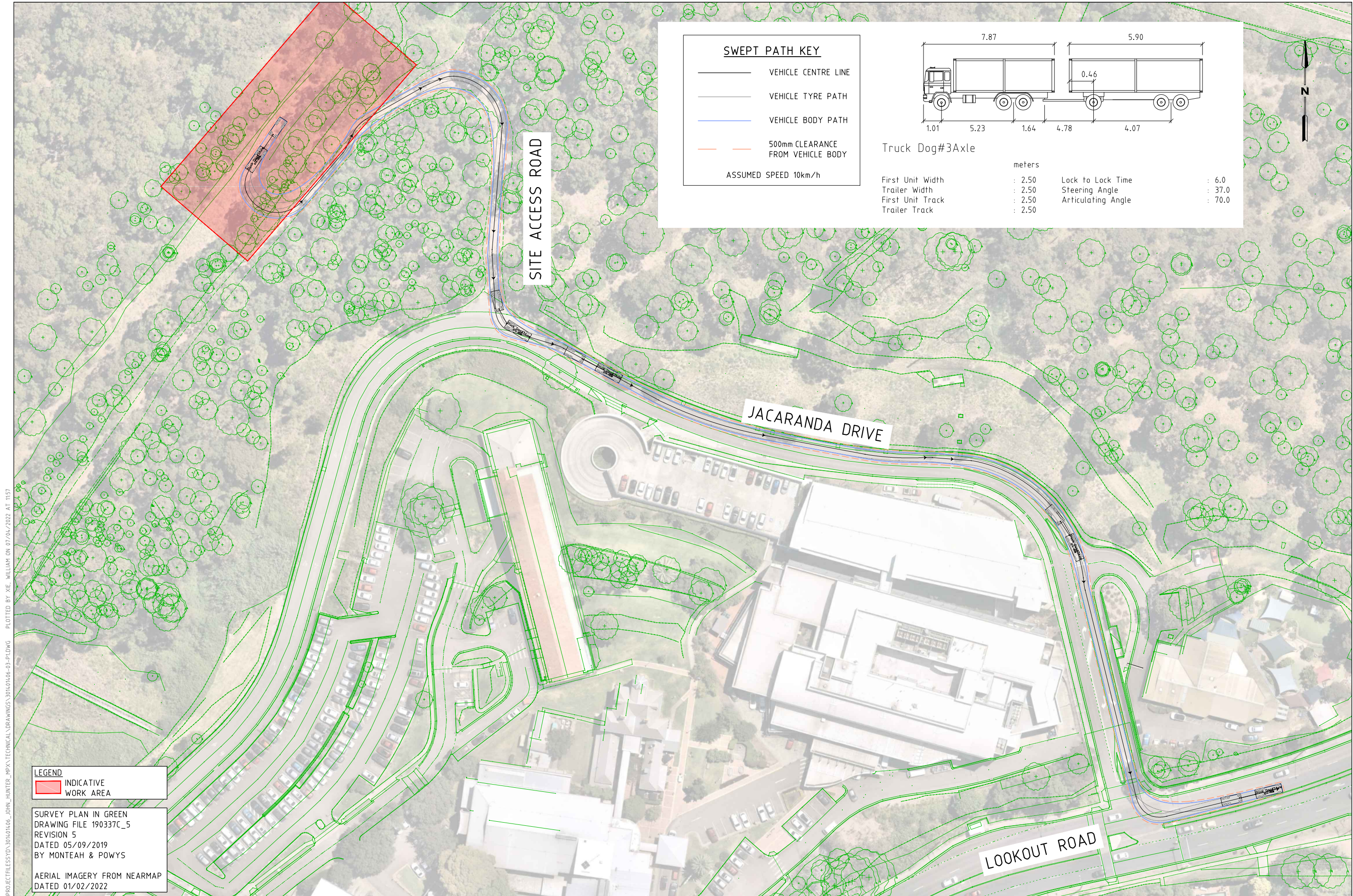
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301401406-03-P1.DWG

JOHN HUNTER HOSPITAL

VEHICLE SWEEP PATH ASSESSMENT

DRAWING NO. 301401406-03-03 SHEET 03 OF 24 ISSUE P1

\\CORP-ADS\GTADATA\PROJECT\FILESS\301401406 JOHN_HUNTER_MPX\TECHNICAL DRAWINGS\301401406-03-P1.DWG PLOTTED BY XIE, WILLIAM ON 07/04/2022 AT 11:57



SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

Truck Dog#3Axle

	7.87	5.90
First Unit Width	2.50	2.50
Trailer Width	2.50	2.50
First Unit Track	2.50	2.50
Trailer Track	2.50	2.50

Lock to Lock Time : 6.0
Steering Angle : 37.0
Articulating Angle : 70.0

LEGEND

- INDICATIVE WORK AREA

SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
REVISION 5
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BY MONTEAH & POWYS

AERIAL IMAGERY FROM NEARMAP
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DESIGN CHECK
M.BRINUMS

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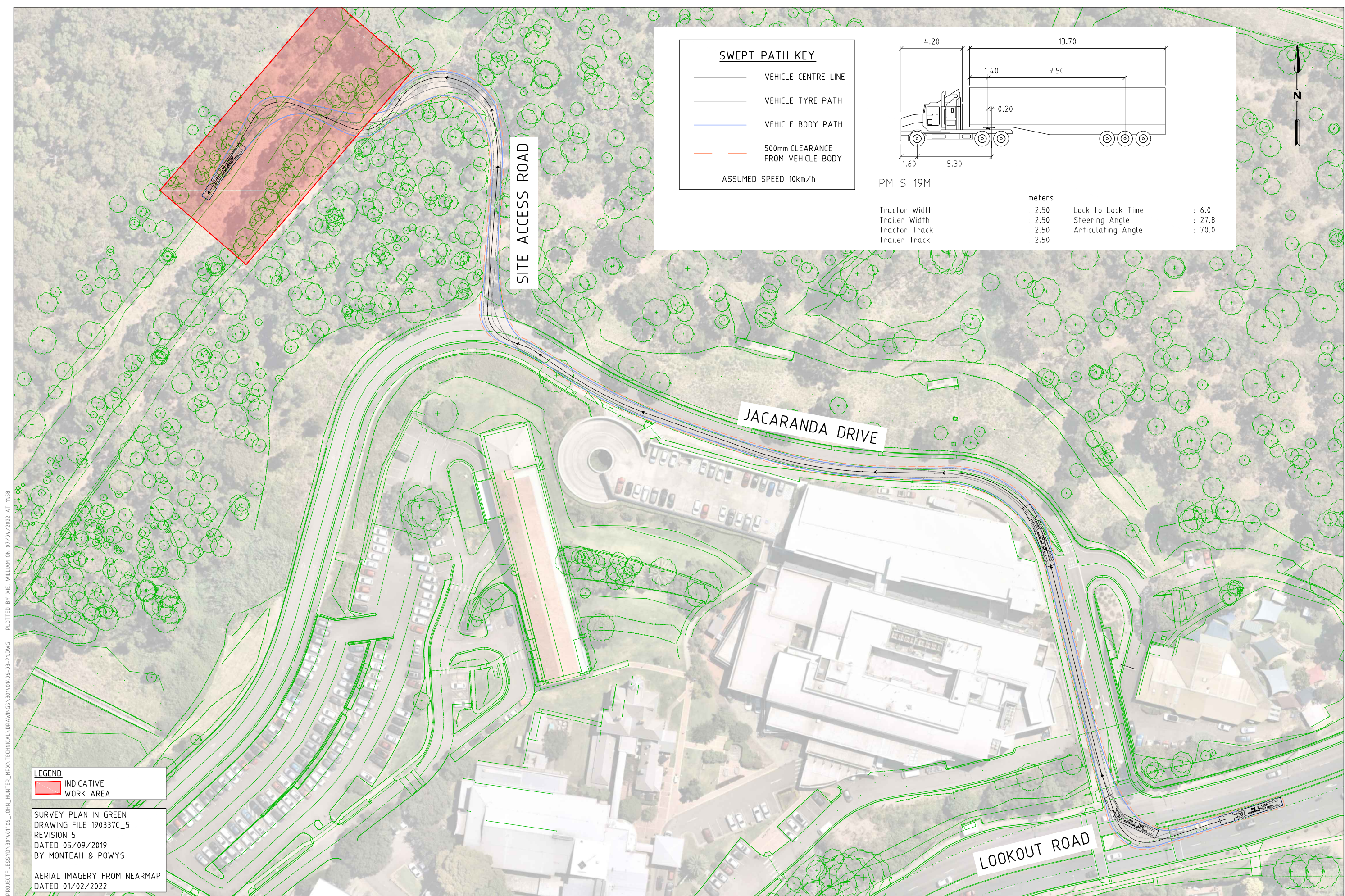
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JOHN HUNTER HOSPITAL

VEHICLE SWEEP PATH ASSESSMENT

DRAWING NO. 301401406-03-04 SHEET 04 OF 24 ISSUE P1

\\CORP-ADS\GTADATA\PROJECT\FILESS\301401406 JOHN_HUNTER_MPX\TECHNICAL DRAWINGS\301401406-03-P1.DWG PLOTTED BY XIE, WILLIAM ON 07/04/2022 AT 11:58



SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

PM S 19M

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

meters

LEGEND

- INDICATIVE WORK AREA

SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
REVISION 5
DATED 05/09/2019
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DESIGN CHECK
M.BRINUMS

APPROVED BY
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DATE ISSUED
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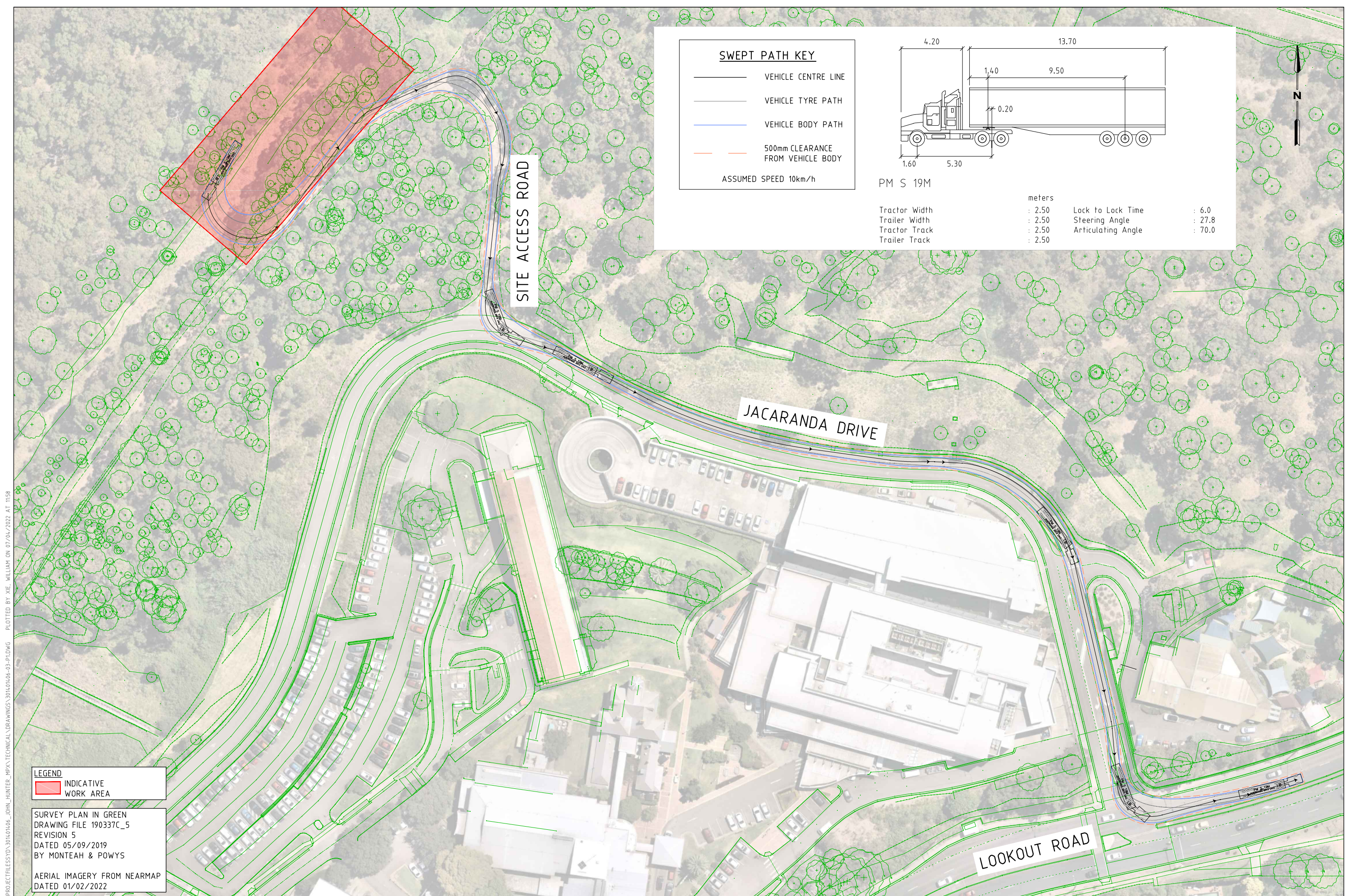
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JOHN HUNTER HOSPITAL

VEHICLE SWEEP PATH ASSESSMENT

DRAWING NO. 301401406-03-05 SHEET 05 OF 24 ISSUE P1

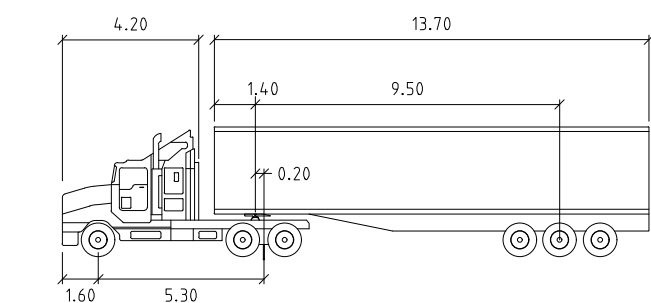
\\CORP-ADS\GTADATA\PROJECT\FILESS\301401406 JOHN_HUNTER_MPX\TECHNICAL DRAWINGS\301401406-03-P1.DWG PLOTTED BY XIE, WILLIAM ON 07/04/2022 AT 11:58



SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h



PM S 19M

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

LEGEND

- INDICATIVE WORK AREA

SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
REVISION 5
DATED 05/09/2019
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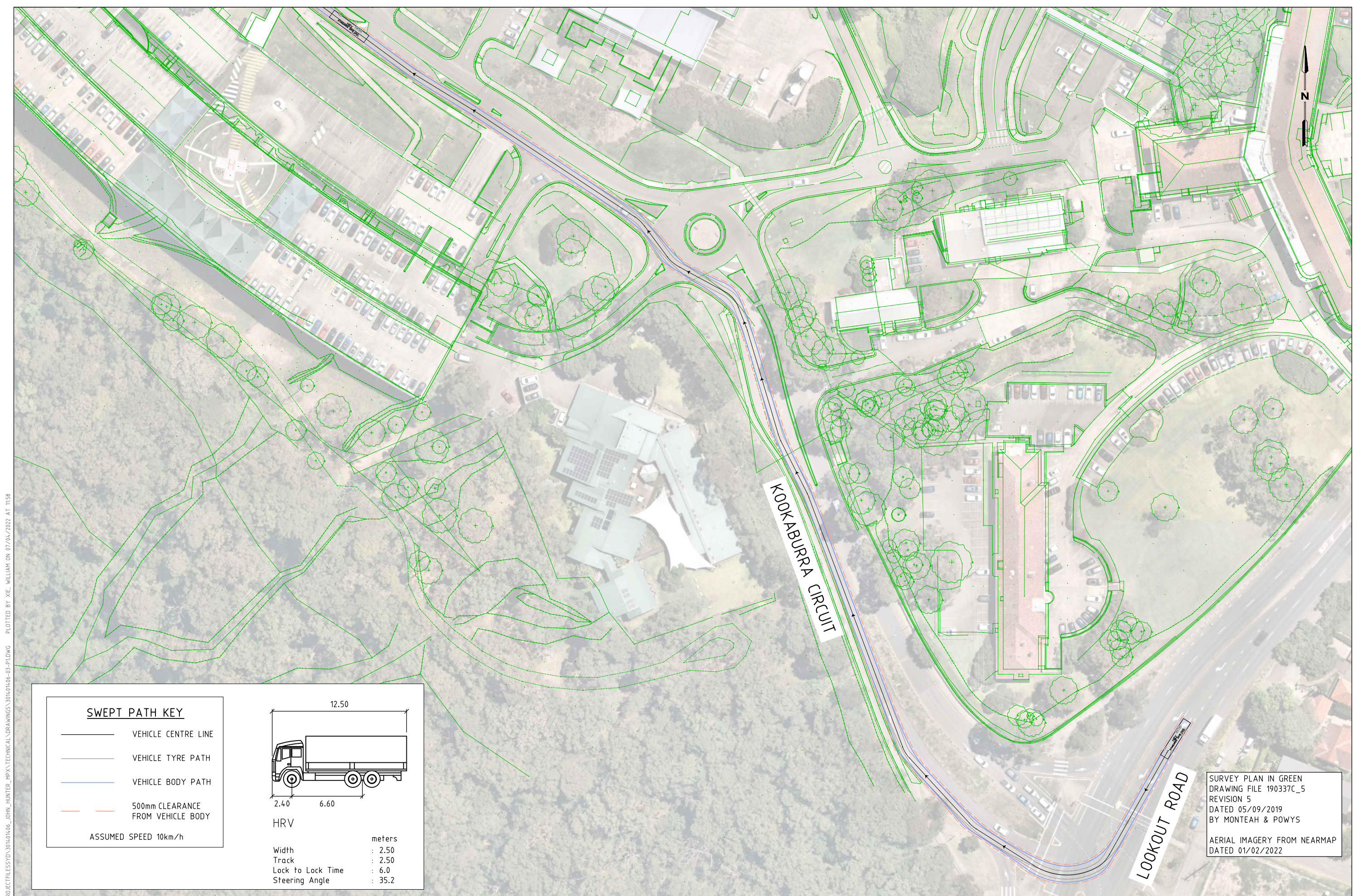
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VEHICLE SWEEP PATH ASSESSMENT

DRAWING NO. 301401406-03-06 SHEET 06 OF 24 ISSUE P1

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SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

HRV

Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 35.2

meters

SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
REVISION 5
DATED 05/09/2019
BY MONTEAH & POWYS

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DATE ISSUED
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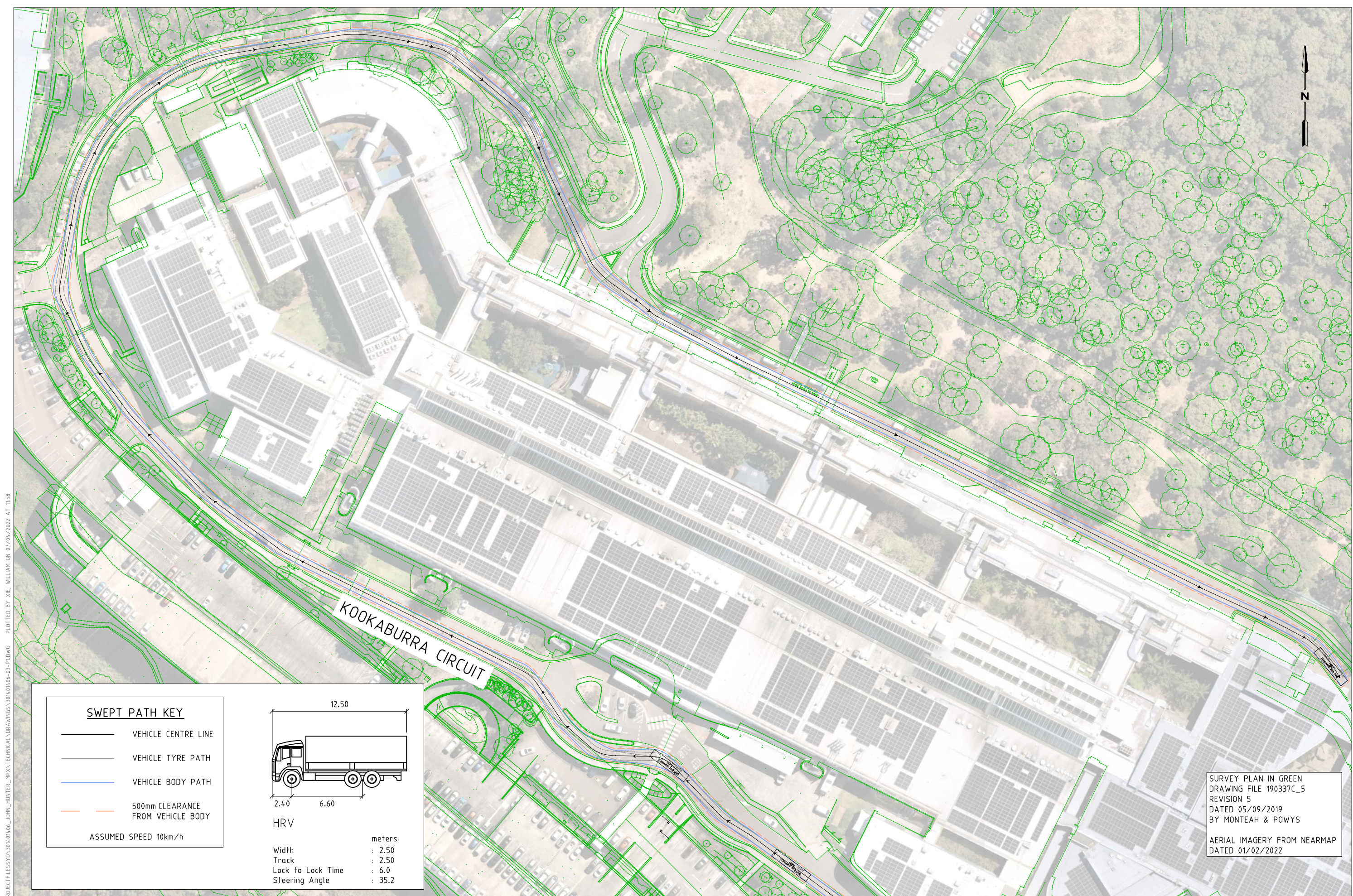
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VEHICLE SWEEP PATH ASSESSMENT
DRAWING NO. 301401406-03-07 SHEET 07 OF 24 ISSUE P1

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SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

HRV

Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 35.2

meters

SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
REVISION 5
DATED 05/09/2019
BY MONTEAH & POWYS

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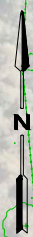
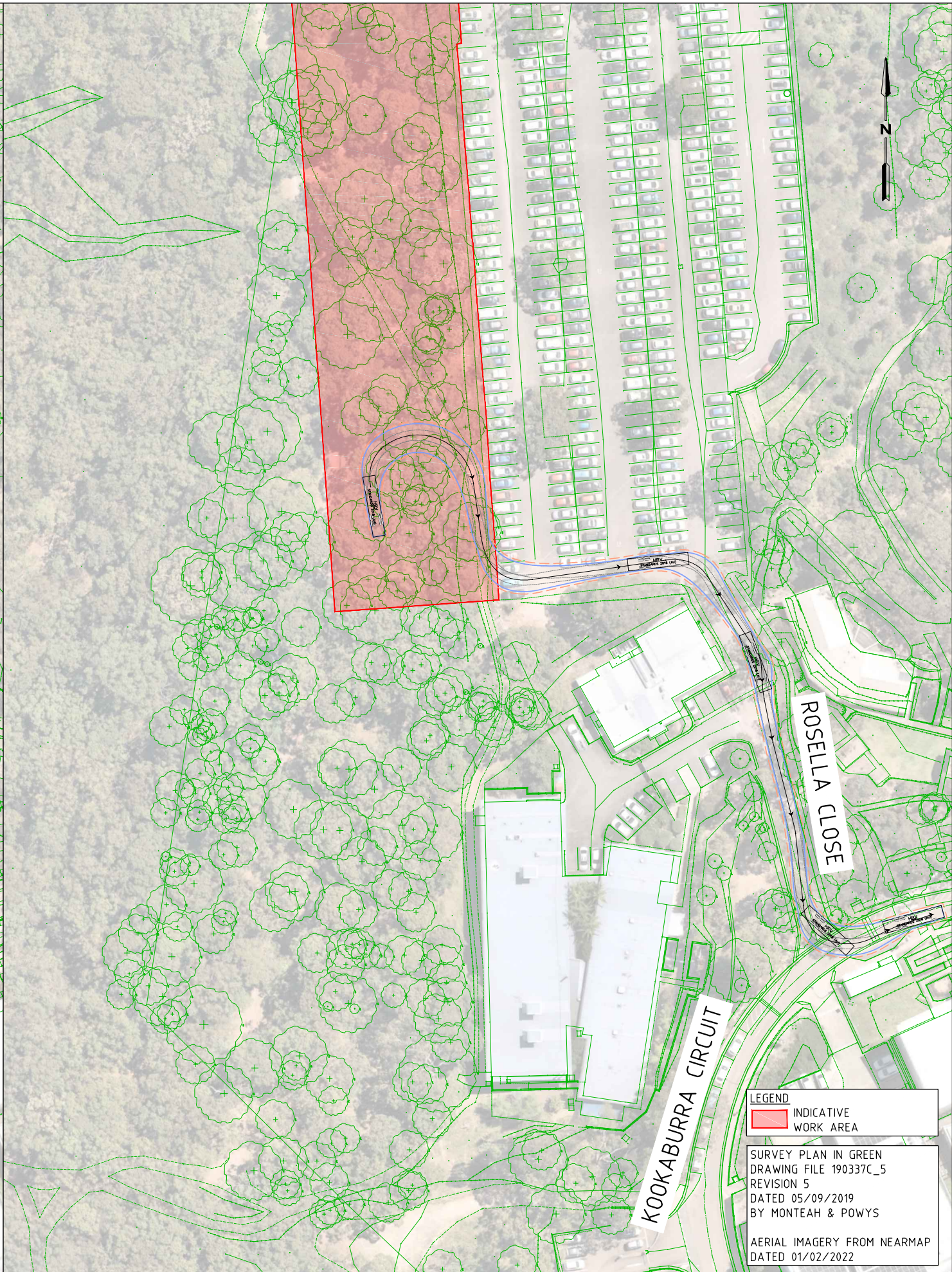
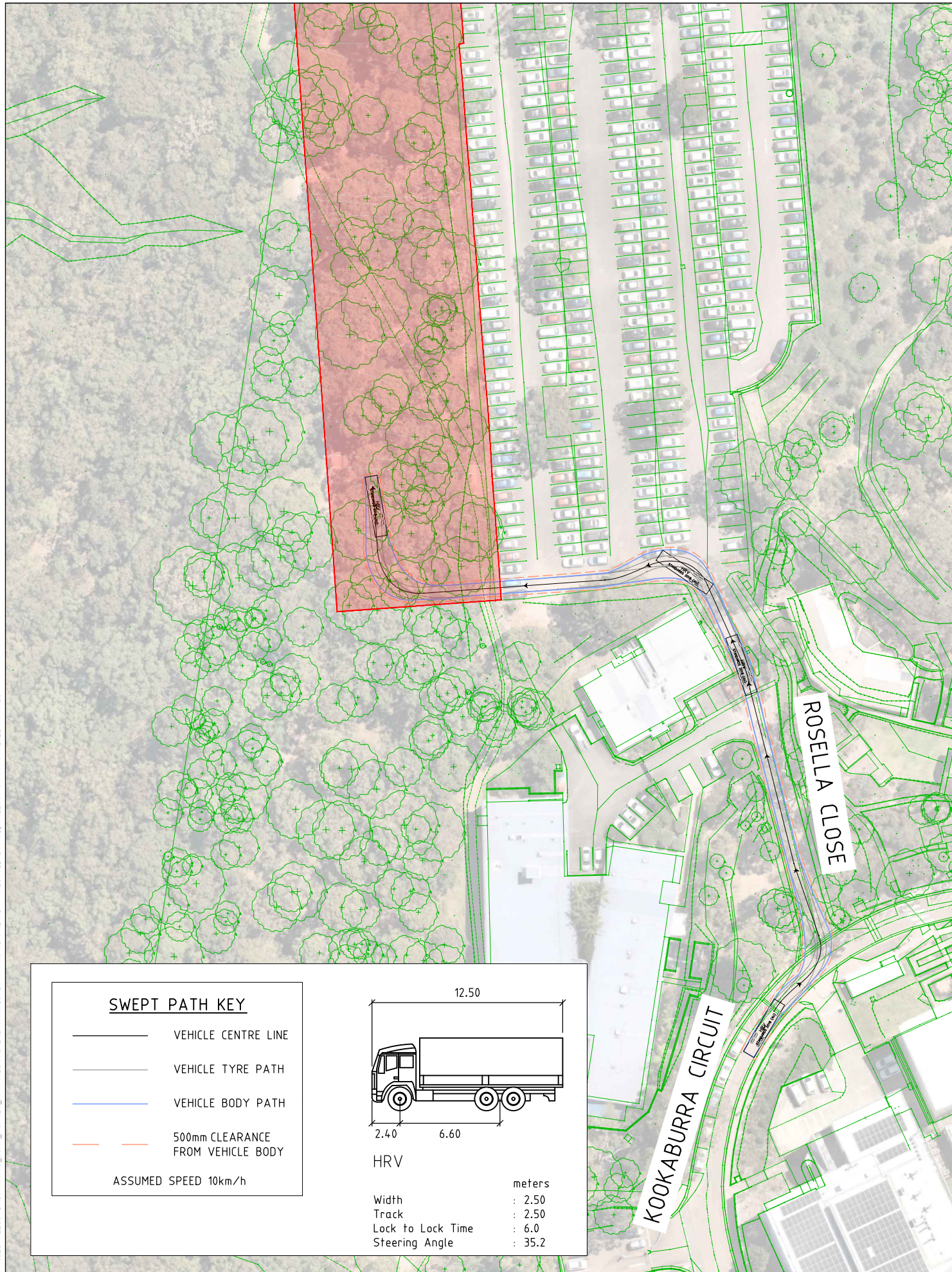
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VEHICLE SWEEP PATH ASSESSMENT

DRAWING NO. 301401406-03-08 SHEET 08 OF 24 ISSUE P1

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SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

HRV

Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 35.2

meters

LEGEND

- INDICATIVE WORK AREA

SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
REVISION 5
DATED 05/09/2019
BY MONTEAH & POWYS

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DESIGN CHECK
M.BRINUMS

DATE ISSUED
6 APRIL 2022

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301401406-03-P1.DWG

JOHN HUNTER HOSPITAL

VEHICLE SWEEP PATH ASSESSMENT

DRAWING NO. 301401406-03-09 SHEET 09 OF 24 ISSUE P1

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SWEPT PATH KEY

VEHICLE CENTRE LINE

VEHICLE TYRE PATH

VEHICLE BODY PATH

500mm CLEARANCE
FROM VEHICLE BODY

ASSUMED SPEED 10km/h

12.50

2.40

6.60

HRV

Width

: 2.50

Track

: 2.50

Lock to Lock Time

: 6.0

Steering Angle

: 35.2

KOOKABURRA CIRCUIT

LEGEND

INDICATIVE
WORK AREA

SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
REVISION 5
DATED 05/09/2019
BY MONTEAH & POWYS

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DESIGNED
W.XIE

APPROVED BY
K.McNATTY

DESIGN CHECK
M.BRINUMS

DATE ISSUED
6 APRIL 2022

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301401406-03-P1.DWG

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VEHICLE SWEEP PATH ASSESSMENT

DRAWING NO.

301401406-03-10

SHEET

10 OF 24

ISSUE

P1

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SWEPT PATH KEY

VEHICLE CENTRE LINE

VEHICLE TYRE PATH

VEHICLE BODY PATH

500mm CLEARANCE
FROM VEHICLE BODY

ASSUMED SPEED 10km/h

12.50

2.40

6.60

HRV

Width

: 2.50

Track

: 2.50

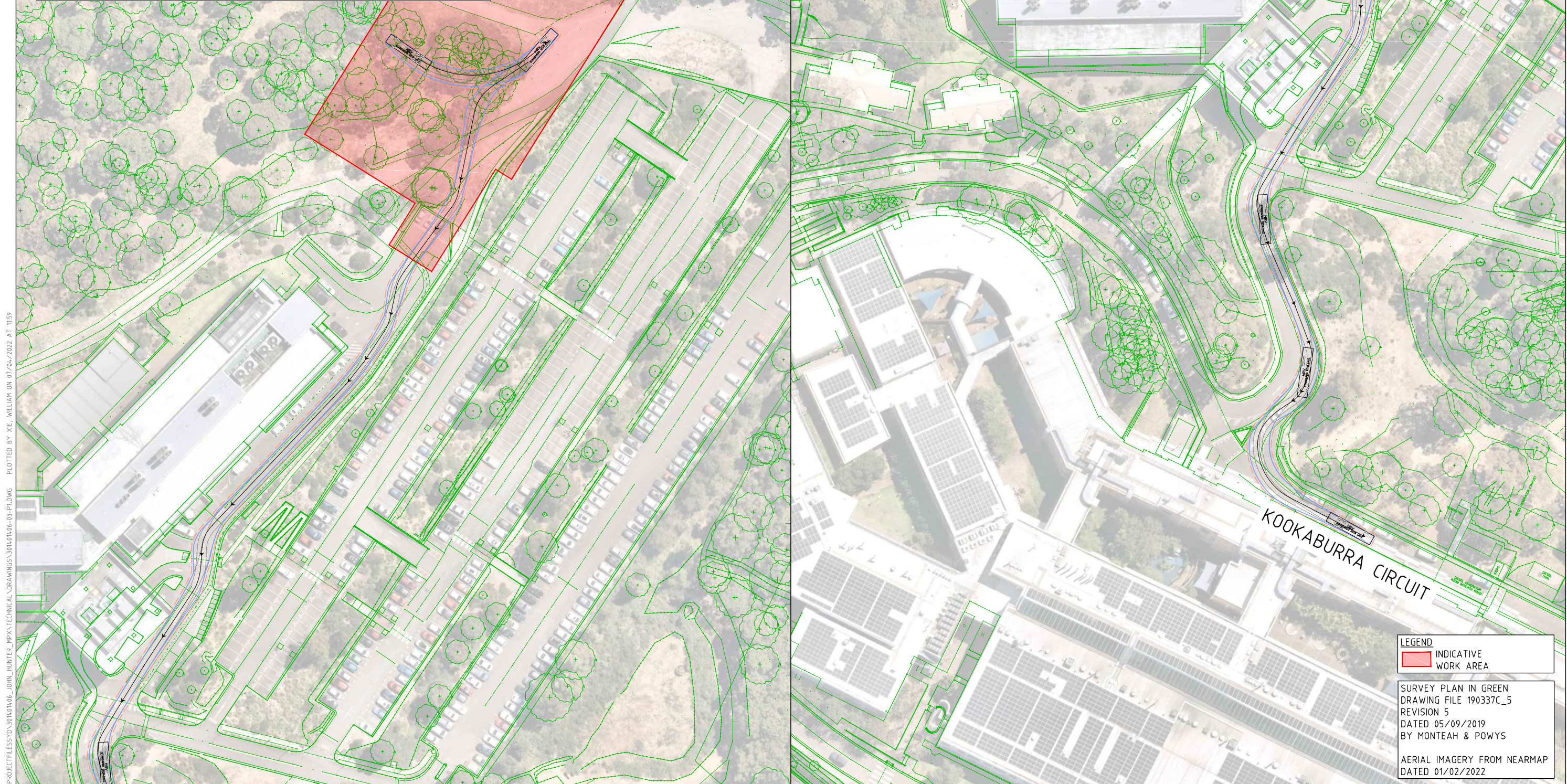
Lock to Lock Time

: 6.0

Steering Angle

: 35.2

meters



LEGEND

INDICATIVE
WORK AREA

SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
REVISION 5
DATED 05/09/2019
BY MONTEAH & POWYS

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DESIGN CHECK
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DATE ISSUED
6 APRIL 2022

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VEHICLE SWEEP PATH ASSESSMENT

DRAWING NO.

301401406-03-11

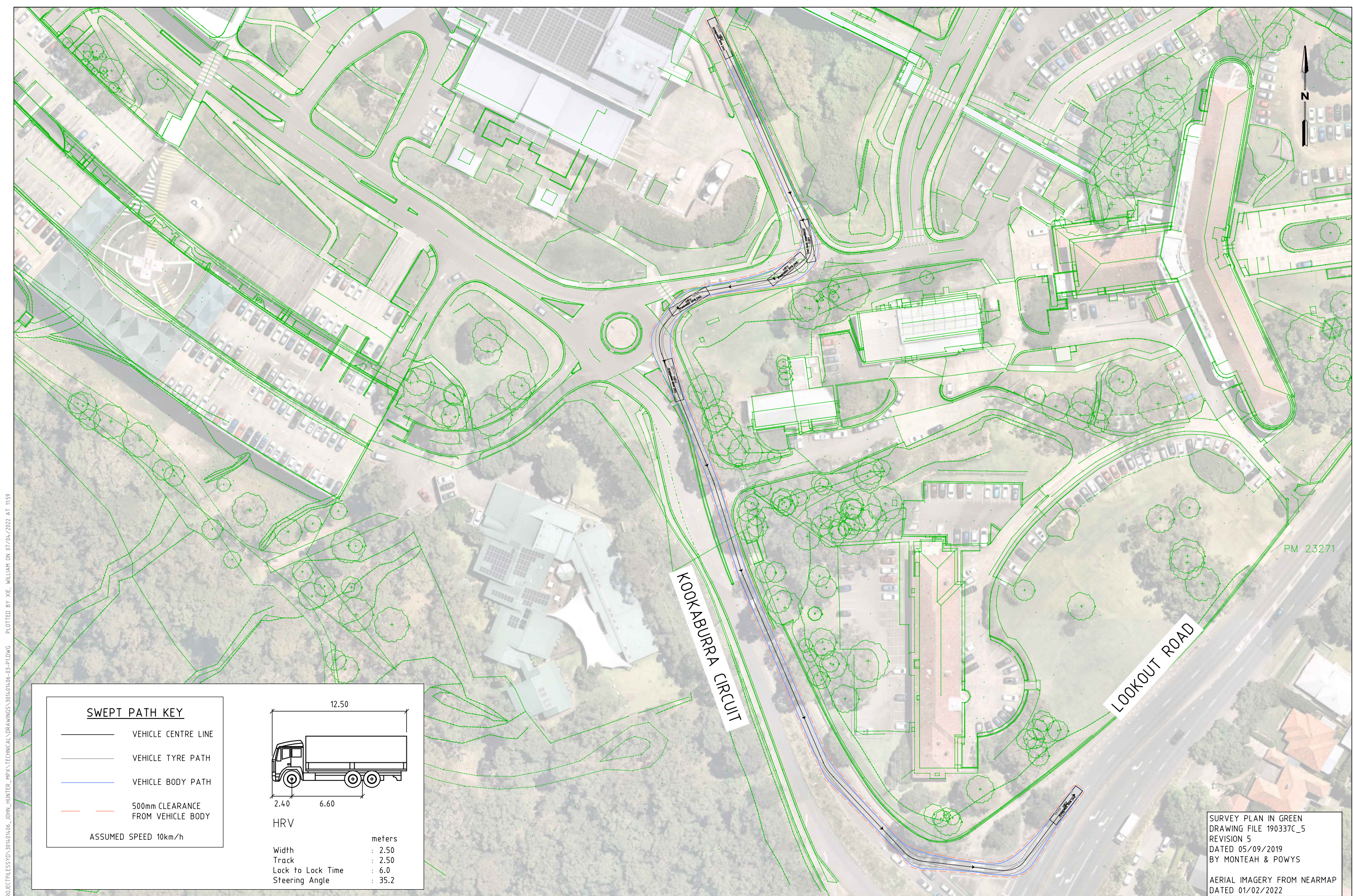
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11 OF 24

ISSUE

P1

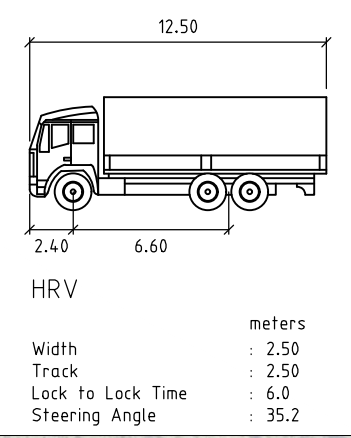
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PM 23271

SWEPT PATH KEY

- VEHICLE CENTRE LINE
 - VEHICLE TYRE PATH
 - VEHICLE BODY PATH
 - 500mm CLEARANCE FROM VEHICLE BODY
- ASSUMED SPEED 10km/h



SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
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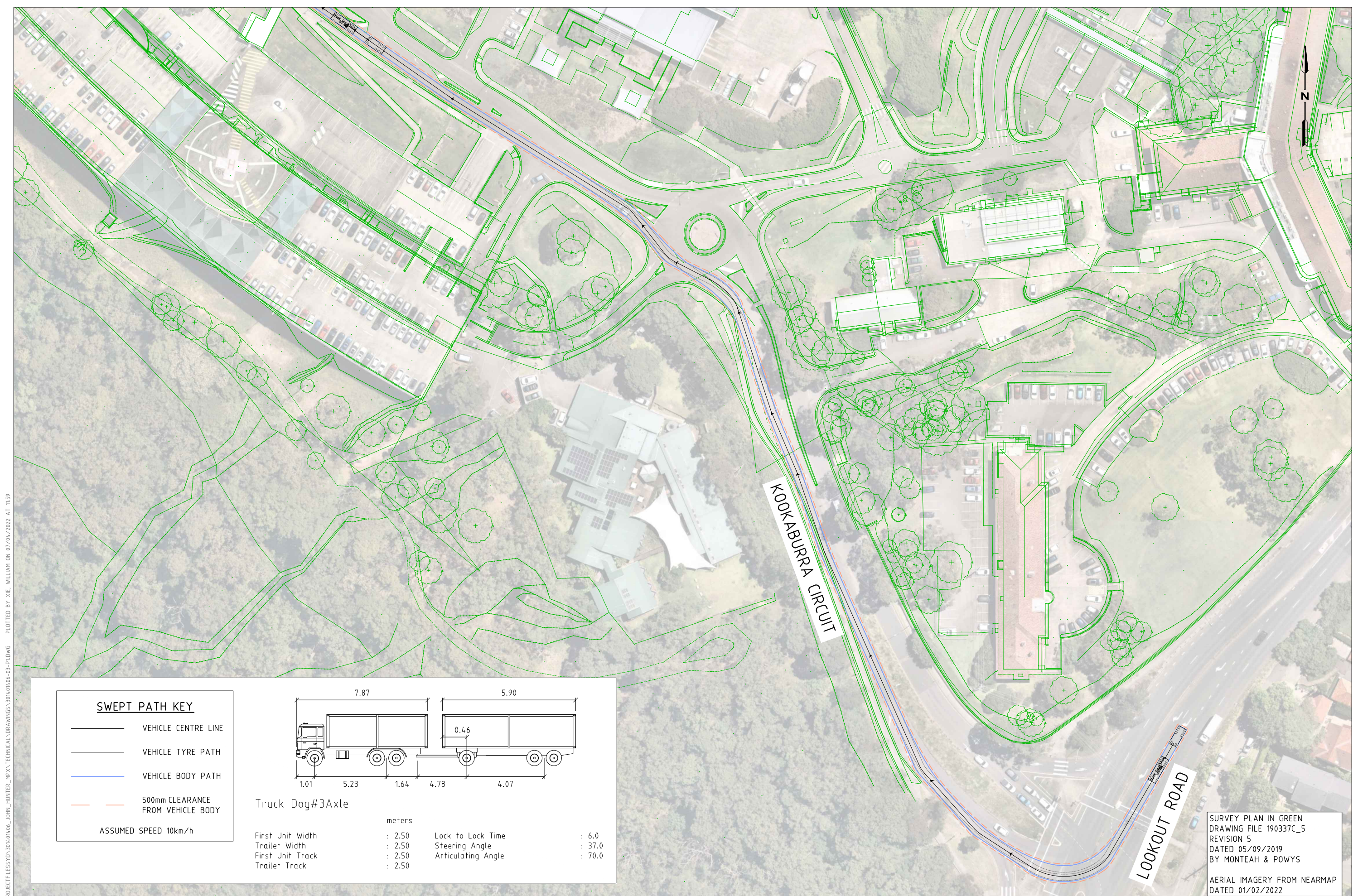
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CAD FILE NO.
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JOHN HUNTER HOSPITAL

VEHICLE SWEEP PATH ASSESSMENT
DRAWING NO. 301401406-03-12 SHEET 12 OF 24 ISSUE P1

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SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

Truck Dog#3Axle

First Unit Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 37.0
First Unit Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
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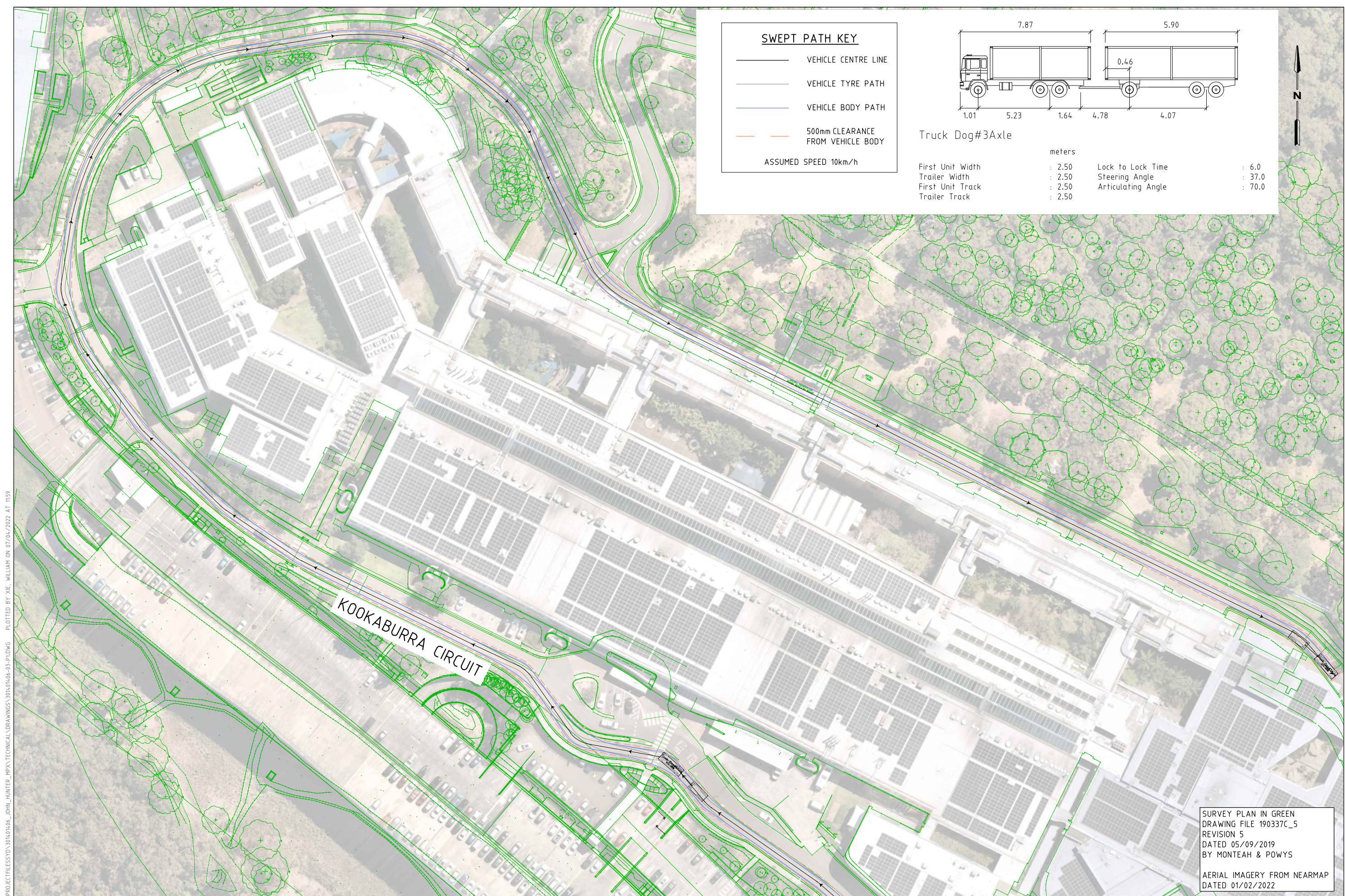
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VEHICLE SWEEP PATH ASSESSMENT
DRAWING NO. 301401406-03-13 SHEET 13 OF 24 ISSUE P1

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SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

Truck Dog#3Axle

First Unit Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 37.0
First Unit Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

SURVEY PLAN IN GREEN
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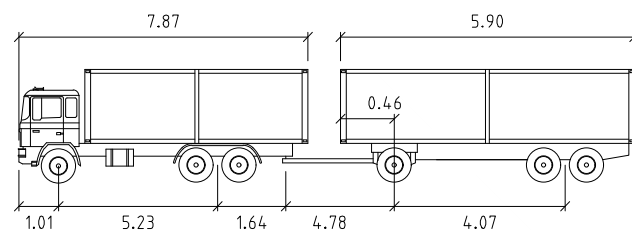
VEHICLE SWEEP PATH ASSESSMENT
DRAWING NO. 301401406-03-14 SHEET 14 OF 24 ISSUE P1

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SWEPT PATH KEY

- VEHICLE CENTRE LINE
 - VEHICLE TYRE PATH
 - VEHICLE BODY PATH
 - 500mm CLEARANCE FROM VEHICLE BODY
- ASSUMED SPEED 10km/h



Truck Dog#3Axle

	meters		
First Unit Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 37.0
First Unit Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

LEGEND

- INDICATIVE WORK AREA

SURVEY PLAN IN GREEN
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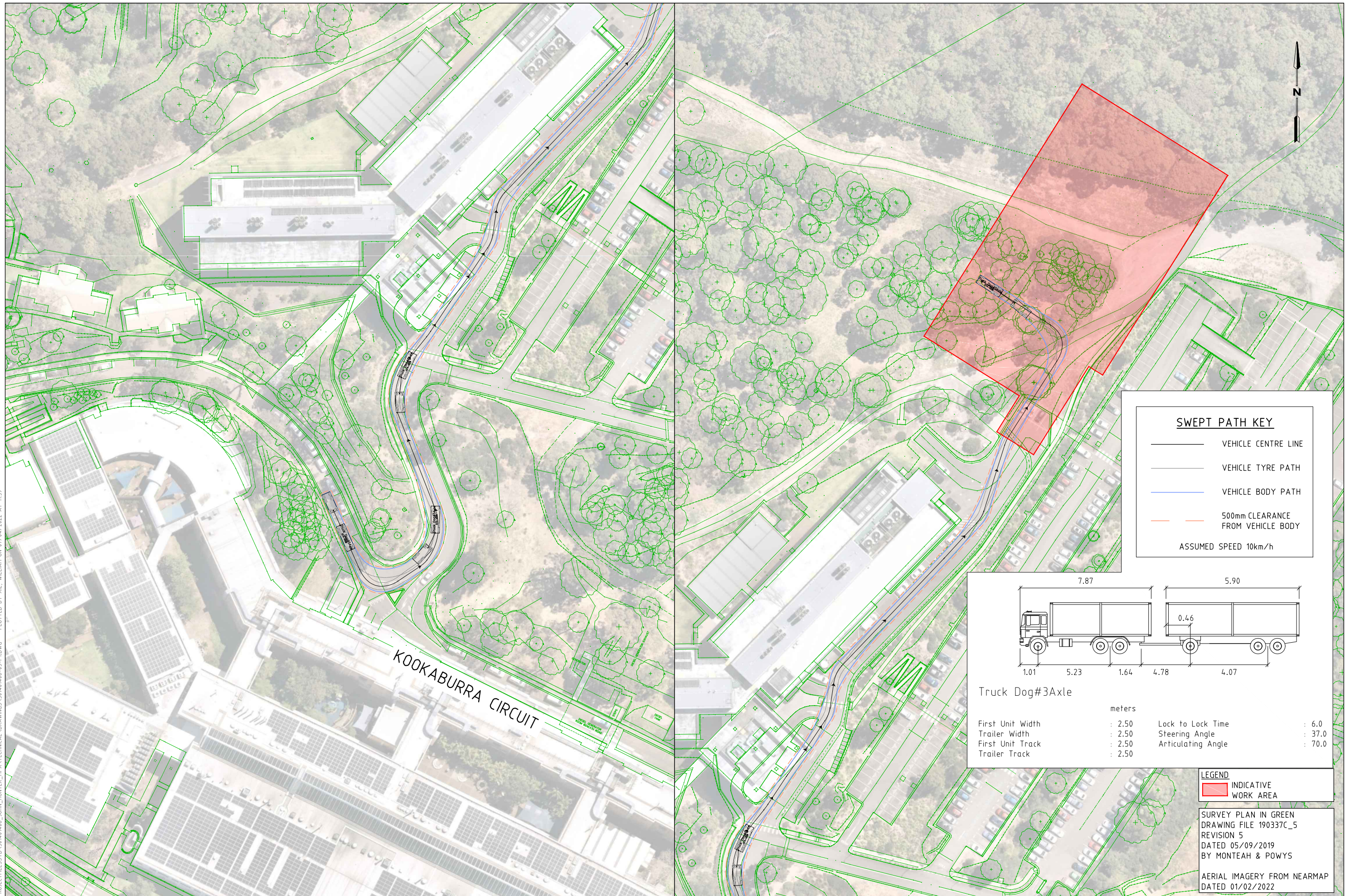
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JOHN HUNTER HOSPITAL

VEHICLE SWEEP PATH ASSESSMENT

DRAWING NO. 301401406-03-15 SHEET 15 OF 24 ISSUE P1

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APPROVED BY
K.McNATTY

DATE ISSUED
6 APRIL 2022

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CAD FILE NO.
301401406-03-P1.DWG

JOHN HUNTER HOSPITAL

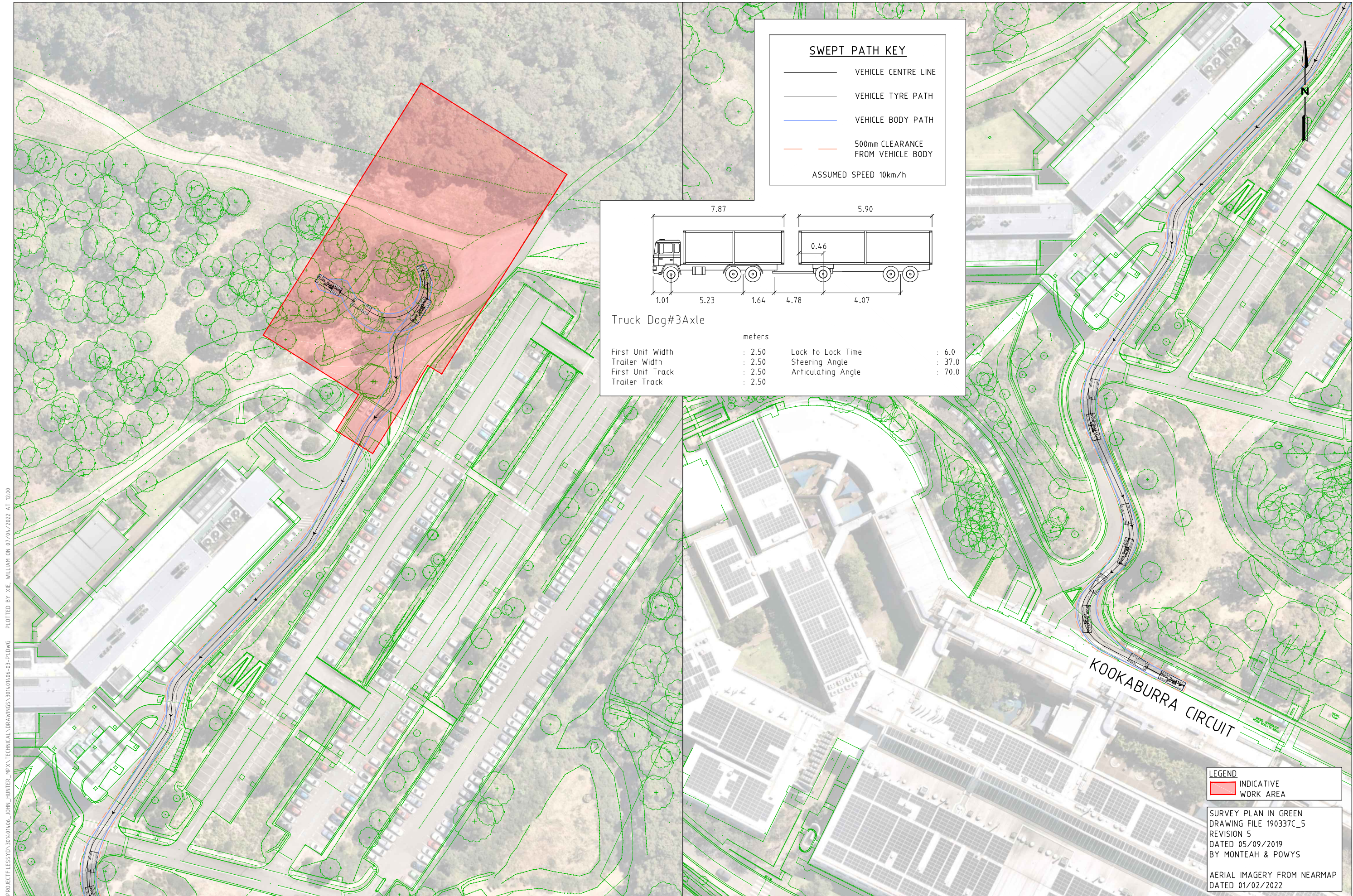
VEHICLE SWEEP PATH ASSESSMENT

DRAWING NO. 301401406-03-16

SHEET 16 OF 24

ISSUE P1

\\CORP-ADS\GTADATA\PROJECT\FILESS\301401406 JOHN_HUNTER_MPX\TECHNICAL DRAWINGS\301401406-03-P1.DWG PLOTTED BY XIE, WILLIAM ON 07/04/2022 AT 12:00



SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY
- ASSUMED SPEED 10km/h

Truck Dog#3Axle

	Trailer	Trailer	Trailer	Trailer	Trailer
Overall Length	7.87			5.90	
Trailer Width				0.46	
First Unit Width	1.01	5.23	1.64	4.78	4.07
Trailer Track					2.50
Lock to Lock Time					6.0
Steering Angle					37.0
Articulating Angle					70.0

LEGEND

- INDICATIVE WORK AREA

SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
REVISION 5
DATED 05/09/2019
BY MONTEAH & POWYS

AERIAL IMAGERY FROM NEARMAP
DATED 01/02/2022



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SHOULD BE PROVEN ON SITE. NO GUARANTEE IS
GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED
W.XIE

DESIGN CHECK
M.BRINUMS

APPROVED BY
K.McNATTY

DATE ISSUED
6 APRIL 2022

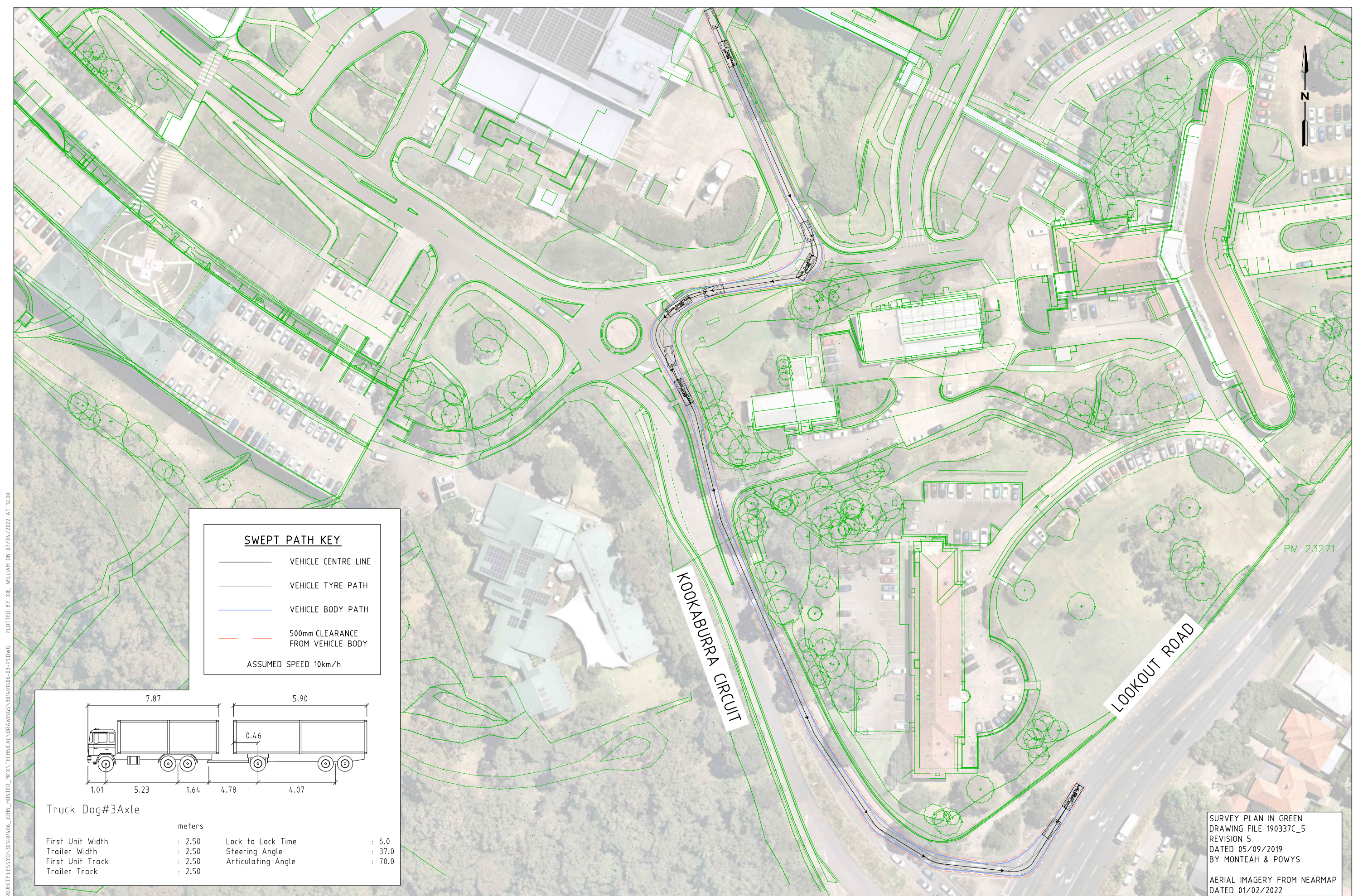
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CAD FILE NO.
301401406-03-P1.DWG

JOHN HUNTER HOSPITAL

VEHICLE SWEEP PATH ASSESSMENT
DRAWING NO. 301401406-03-17 SHEET 17 OF 24 ISSUE P1

\\CORP-ADS\GTADATA\PROJECT\FILESS\301401406 JOHN_HUNTER_MPX\TECHNICAL DRAWINGS\301401406-03-P1.DWG PLOTTED BY XIE, WILLIAM ON 07/04/2022 AT 12:00



SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

Truck Dog#3Axle

First Unit Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 37.0
First Unit Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
REVISION 5
DATED 05/09/2019
BY MONTEAH & POWYS

AERIAL IMAGERY FROM NEARMAP
DATED 01/02/2022



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DESIGNED
W.XIE

DESIGN CHECK
M.BRINUMS

APPROVED BY
K.McNATTY

DATE ISSUED
6 APRIL 2022

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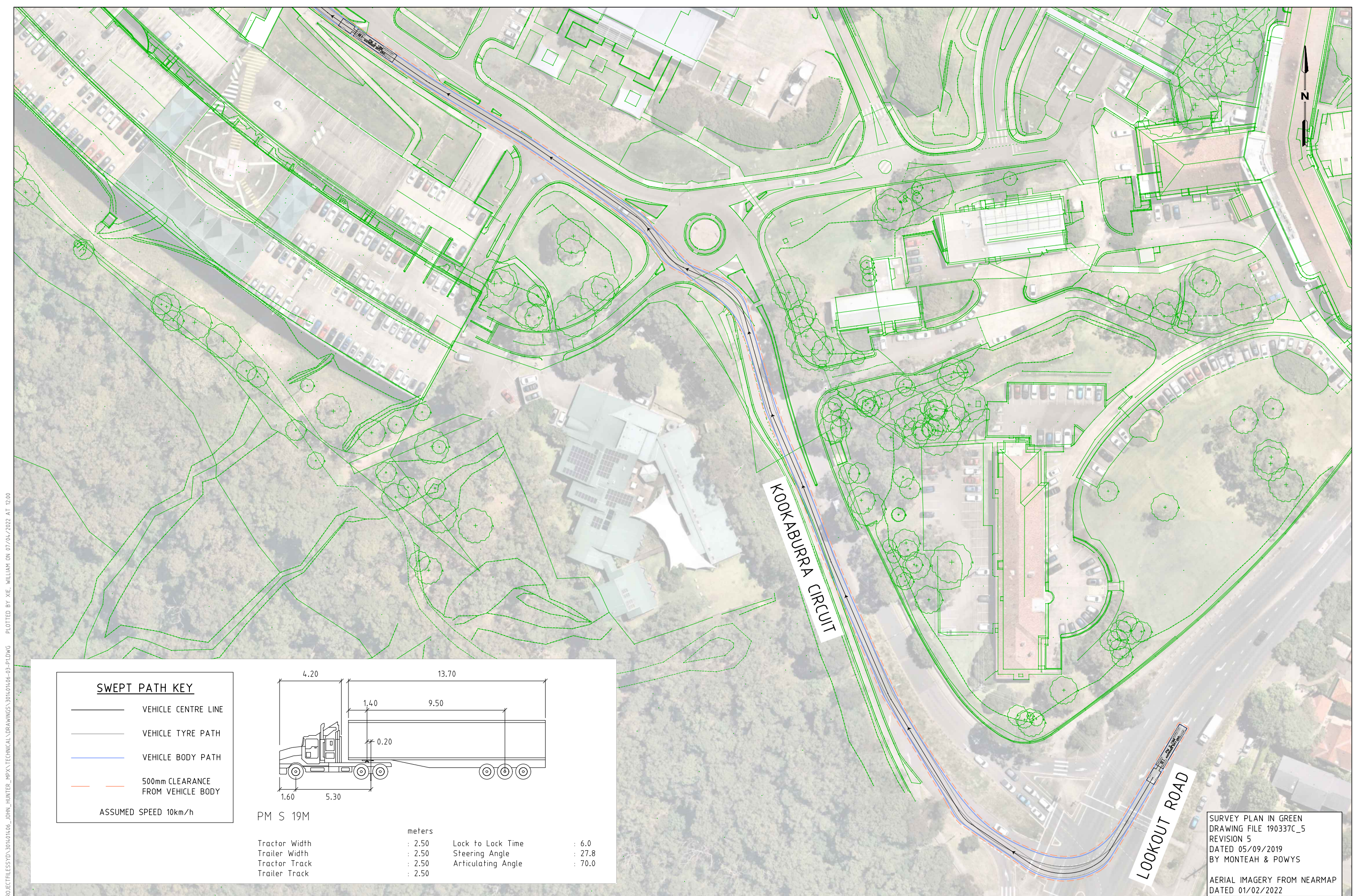
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JOHN HUNTER HOSPITAL

VEHICLE SWEEP PATH ASSESSMENT

DRAWING NO. 301401406-03-18 SHEET 18 OF 24 ISSUE P1

\\CORP-ADS\GTADATA\PROJECTS\301401406_JOHN_HUNTER_MPX\TECHNICAL DRAWINGS\301401406-03-P1.DWG PLOTTED BY XE.WILLIAM ON 07/04/2022 AT 12:00



SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

PM S 19M

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

meters

SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
REVISION 5
DATED 05/09/2019
BY MONTEAH & POWYS

AERIAL IMAGERY FROM NEARMAP
DATED 01/02/2022



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K.McNATTY

DESIGN CHECK
M.BRINUMS

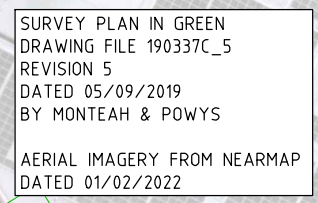
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6 APRIL 2022

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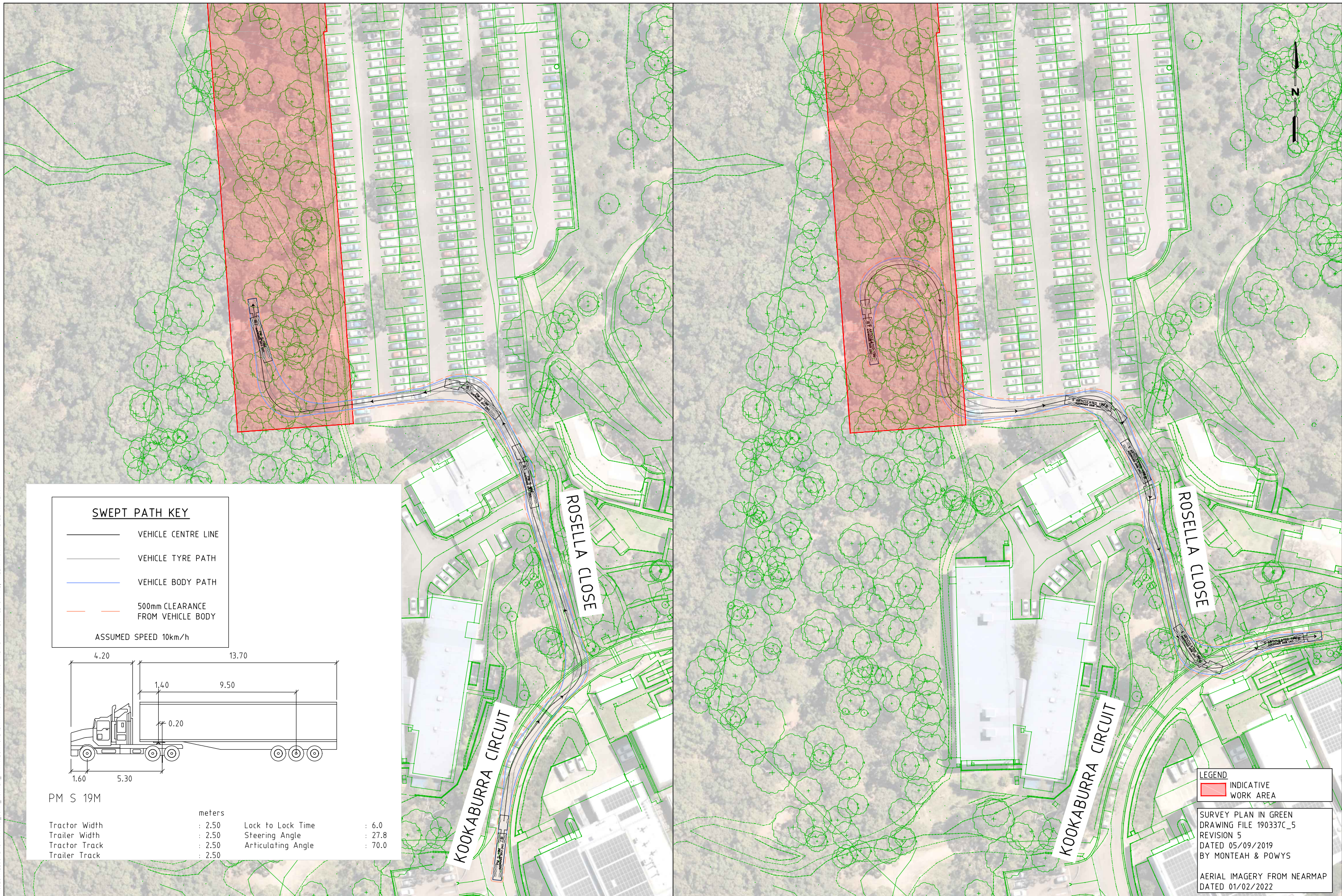
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JOHN HUNTER HOSPITAL

VEHICLE SWEEP PATH ASSESSMENT
DRAWING NO. 301401406-03-19 SHEET 19 OF 24 ISSUE P1



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DESIGNED
W.XIE

APPROVED BY
K.McNATTY

DESIGN CHECK
M.BRINUMS

DATE ISSUED
6 APRIL 2022

SCALE
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1:1000

CAD FILE NO.
301401406-03-P1.DWG

JOHN HUNTER HOSPITAL

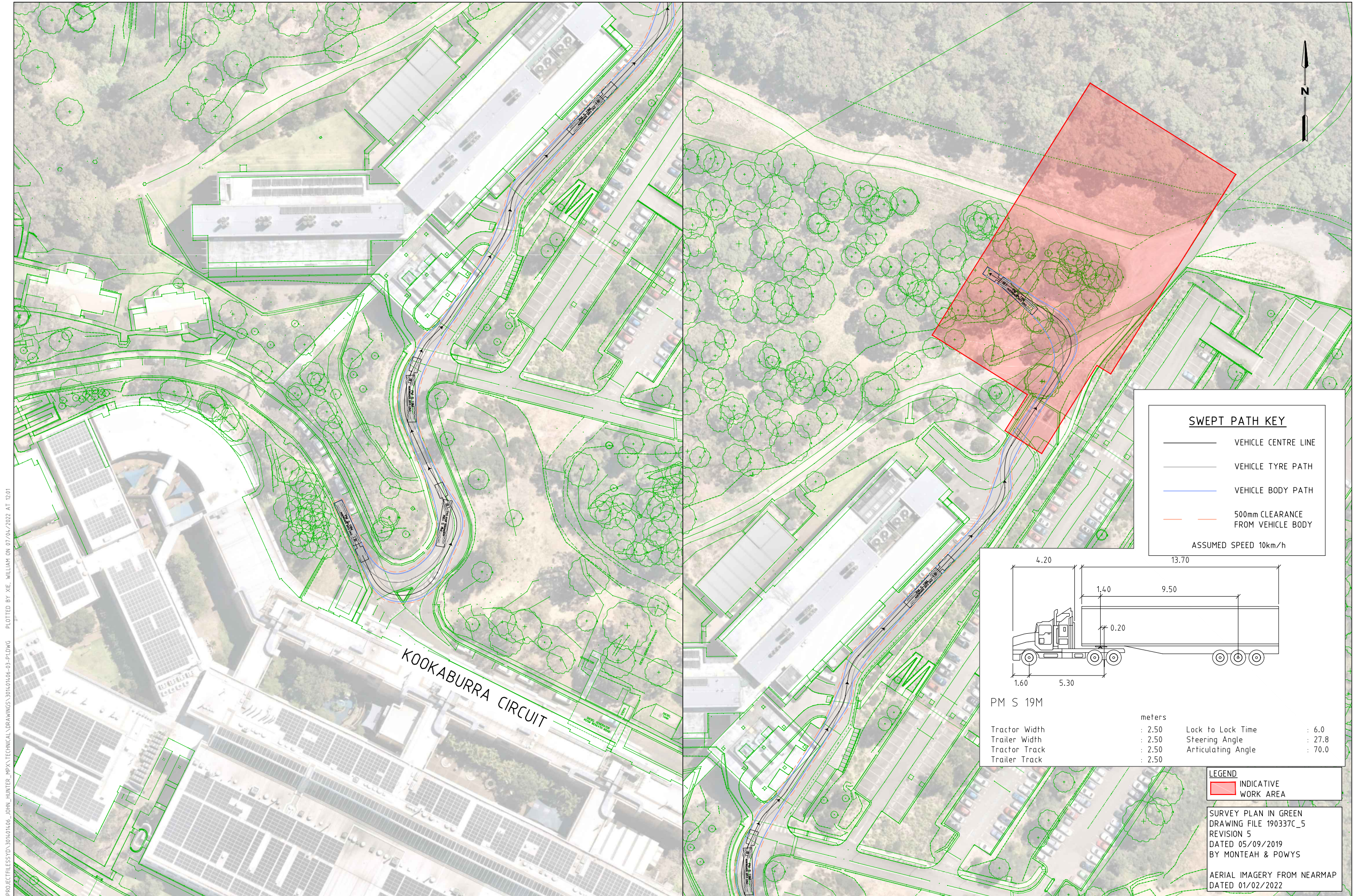
VEHICLE SWEEP PATH ASSESSMENT

DRAWING NO. 301401406-03-21

SHEET 21 OF 24

ISSUE P1

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W.XIE

DESIGN CHECK
M.BRINUMS

APPROVED BY
K.McNATTY

DATE ISSUED
6 APRIL 2022

SCALE
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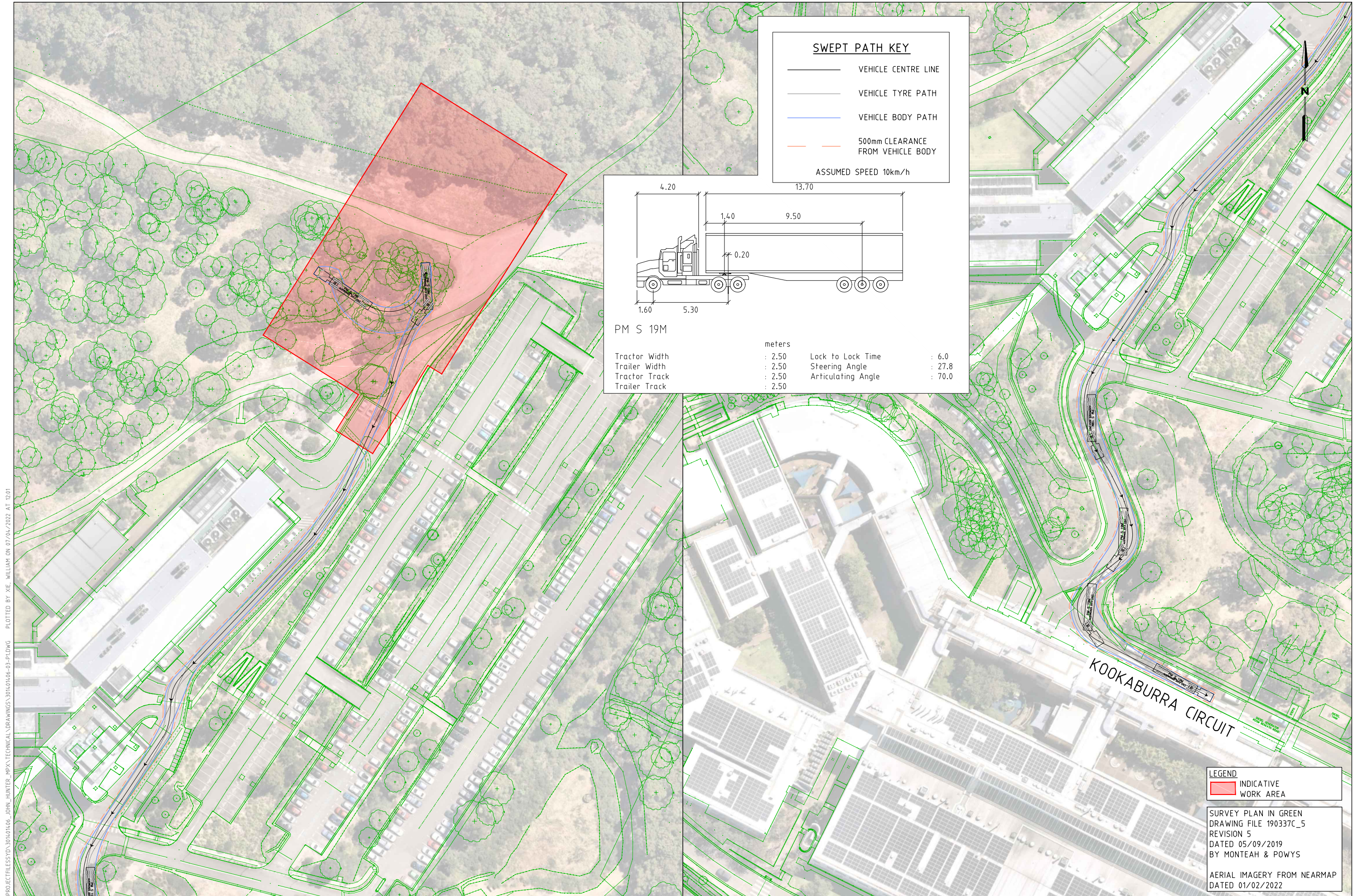
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JOHN HUNTER HOSPITAL

VEHICLE SWEEP PATH ASSESSMENT

DRAWING NO. 301401406-03-22 SHEET 22 OF 24 ISSUE P1

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SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

PM S 19M

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

LEGEND

- INDICATIVE WORK AREA

SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
REVISION 5
DATED 05/09/2019
BY MONTEAH & POWYS

AERIAL IMAGERY FROM NEARMAP
DATED 01/02/2022



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W.XIE

DESIGN CHECK
M.BRINUMS

APPROVED BY
K.McNATTY

DATE ISSUED
6 APRIL 2022

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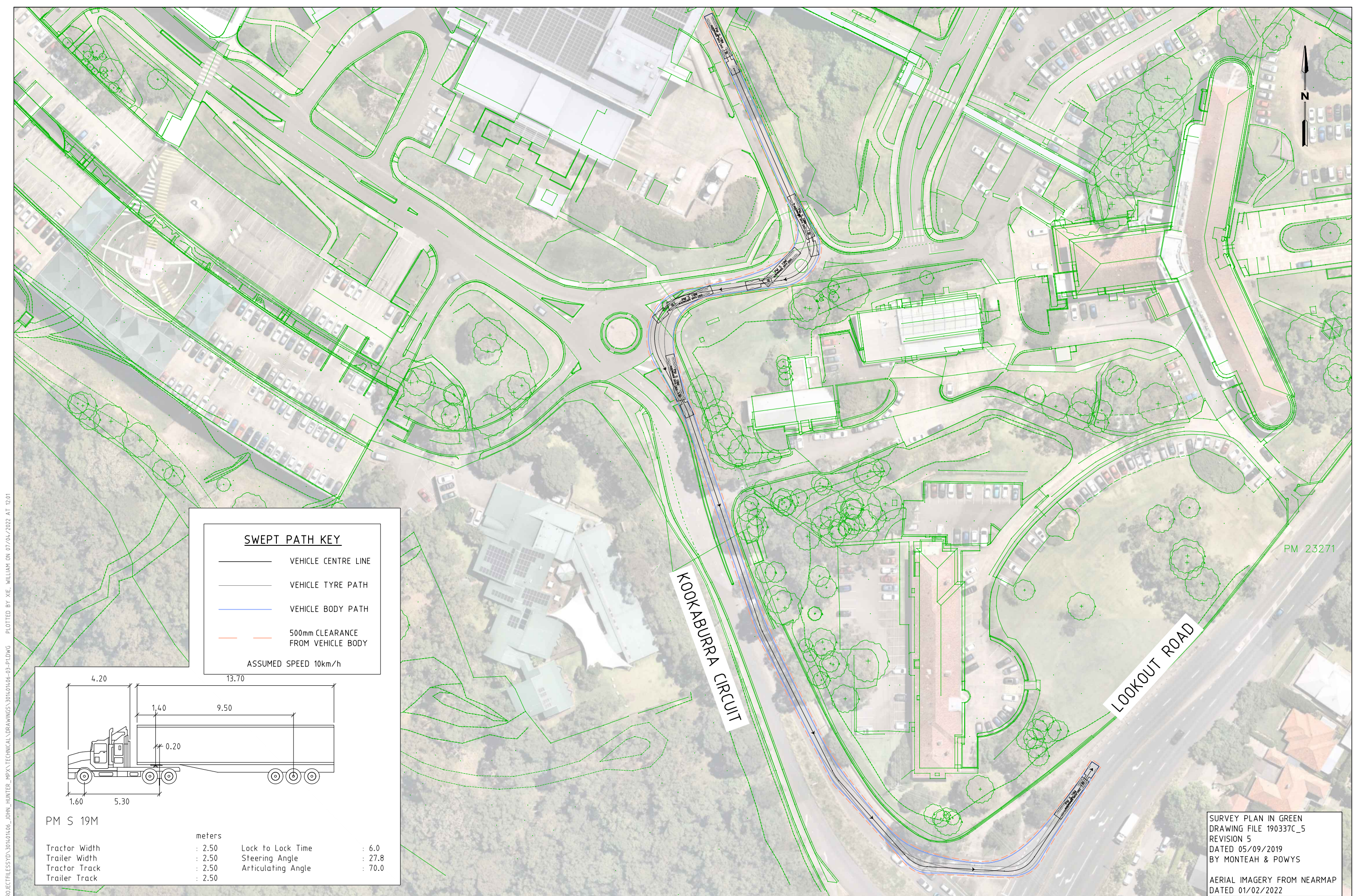
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JOHN HUNTER HOSPITAL

VEHICLE SWEEP PATH ASSESSMENT

DRAWING NO. 301401406-03-23 SHEET 23 OF 24 ISSUE P1

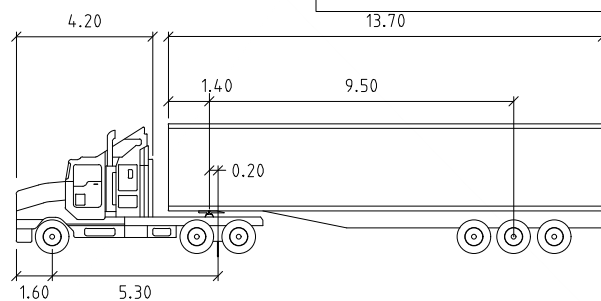
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SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h



PM S 19M

	meters		
Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

SURVEY PLAN IN GREEN
DRAWING FILE 190337C_5
REVISION 5
DATED 05/09/2019
BY MONTEAH & POWYS

AERIAL IMAGERY FROM NEARMAP
DATED 01/02/2022



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W.XIE

DESIGN CHECK
M.BRINUMS

APPROVED BY
K.McNATTY

DATE ISSUED
6 APRIL 2022

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CAD FILE NO.
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VEHICLE SWEEP PATH ASSESSMENT

DRAWING NO. 301401406-03-24

SHEET 24 OF 24

ISSUE P1

Appendix B Evidence of Consultation



JHH Construction Traffic and Pedestrian Management Sub-Plan - TfNSW Review Comments							
Element	Reference	Comment	Contractors Response	CTPMSP Rev.E reference	Response Date	Status	Comments
Public Transport and Cycling Network	2.4	Suggest including information on existing public transport options during site induction for workers	> Details have now been included within the updated CTPMSP noting that information on existing public transport options will be provided to workers and sub contractors during the "on boarding" process and during site inductions.	2.4 - Paragraph 3 4.12 - Paragraph 2	27-Apr-22	Response provided	
Construction Worker Parking	3.3	Concerns around increased traffic congestion in the area with construction workers not allowed to park on site and increased heavy vehicle movements from this project and RP2J Bypass. The plan suggests use of public transport for construction workers, which outside of Sydney is generally not an option.	> As noted, the CTPMSP does propose the use of public transport for construction workers on the Project. > The use of public transport for construction workers is consistent with the strategies outlined within the 'Transport Impact Assessment' prepared as part of the State Significant Development application for the JHHIP Project. > Details on the bus routes servicing the Broadmeadow and Cardiff train stations have been included within the updated CTPMSP. > The statement that 'All parking initiatives will be reviewed on a regular basis to ensure that they are being implemented effectively' has also been included within the updated CTPMSP.	2.4 - Paragraph 1 2.4 - Figures 5 and 6 3.3 - Paragraph 4	27-Apr-22	Response provided	
Construction Worker Parking	3.3	The plan should include specific details of how traffic related impacts from the development will be mitigated, such as park and ride shuttle bus services and car-pooling including exact locations and enforcement measures.	> The CTPMSP outlines specific details on how traffic related impacts from the development will be mitigated during the Project including Construction Worker Parking, Construction Site Access, Construction Vehicle Volumes and Construction Vehicle Routes. > Multiplex have established a number of specific locations for park-and-ride shuttle bus services and car-pooling with the sub-contractors/ consultants engaged on the Project which are aligned with the CTPMSP, Head Contract and overall traffic management strategy for the JHHIP Project. However, given the range of these individual strategies/ locations Multiplex have chosen not to reference them within the CTPMSP. > Multiplex have included enforcement measures within our supply chain subcontracts which are aligned with the CTPMSP, Head Contract and overall traffic management strategy for the JHHIP Project. However, given the confidential nature of these agreements Multiplex have chosen not to include these details within the CTPMSP. > The statement that 'These initiatives will be amended as required to respond to changes in construction worker parking volumes anticipated in the future stages of the JHHIP Project.' has been included within the updated CTPMSP. > The statement that 'All parking initiatives will be reviewed on a regular basis to ensure that they are being implemented effectively' has also been included within the updated CTPMSP.	3.3 - Paragraphs 3 and 4	27-Apr-22	Response provided	
General Comment		The JHH construction team should regularly liaise with RP2J (Inner City Bypass extension) project to ensure there is no conflict with any traffic changes and heavy vehicle movements.	> Multiplex understands that regular meetings have been established between representatives of the RP2J and JHHIP Projects via the RP2J JHHIP Control Group. Multiplex are available to attend and contribute to these ongoing meetings as required to address traffic changes and heavy vehicle movements associated with the JHHIP Project. > Multiplex are also available to participate in the 'RP2J/ JHHIP Project Coordination Meetings' proposed to coordinate the interface between the RP2J and JHHIP Projects once these meetings have been established. > A reference to 'regular meetings' between the RP2J and JHHIP Projects has now been included within the updated CTPMSP.	4.9 - Paragraph 6	27-Apr-22	Response provided	
General Comment		The applicant should be encouraged to continue liaising with the JHH Steering Committee and incorporate outcomes of these meetings into the construction related documentation.	> Refer to comments included above.	4.9 - Paragraph 6	27-Apr-22	Response provided	

Steve Russell

From: Steve Russell
Sent: Wednesday, 27 April 2022 1:07 PM
To: Antonn Russek; Peter McNally; Shannon Drewe
Cc: Clark, Ethan; Nicholas Rayner (Health Infrastructure); Jeff Wall; Glenn Moore; Watson, Mathew; Brett McFadzien
Subject: RE: SSD-9351535 JHHIP Traffic Management Plan Consultation [APPC.c58Zw]
Attachments: JHHIP CTPMSP MPX Response to Comments, 20220427.xlsx; Construction Traffic and Pedestrian Management Sub-Plan, Rev.E.pdf

Antonn,

Thank you for sending TfNSW's consolidated comments back to us last week.

Multiplex has updated the 'Construction Traffic and Pedestrian Management Sub-Plan' (CTPMSP) in response to the comments received. Please find Revision E of the CTPMSP attached above.

Please also find attached a copy of the updated 'JHHIP CTPMSP MPX Response to Comments' table dated 27 Apr 2022 which identifies the changes made to the CTPMSP in response to the comments.

Please feel free to contact me if you wish to discuss any of the information provided in further detail.

Regards,

Steve Russell
Project Engineer

MULTIPLEX

John Hunter Health and Innovation Precinct
Lookout Road, New Lambton NSW 2299
M 0472 828 766
multiplex.global

From: Watson, Mathew <Mathew.Watson@app.com.au>
Sent: Thursday, 21 April 2022 11:07 AM
To: Antonn Russek <anton.n.russek@transport.nsw.gov.au>; Peter McNally <Peter.Mcnally@transport.nsw.gov.au>; Shannon Drewe <Shannon.Drewe@transport.nsw.gov.au>
Cc: Clark, Ethan <ethan.clark@app.com.au>; Nicholas Rayner (Health Infrastructure) <Nicholas.Rayner@health.nsw.gov.au>; Steve Russell <Steve.Russell@multiplex.global>
Subject: RE: SSD-9351535 JHHIP Traffic Management Plan Consultation [APPC.c58Zw]

Thank you Antonn and Team,
We will review in detail and revise the CTMP. Once complete we will reissue to TfNSW.

Regards,

Mathew Watson | Senior Project Manager
APP Corporation Pty Limited



APP Corporation acknowledges Aboriginal and Torres Strait Islander Peoples as the Traditional Custodians of the Land, Rivers and Sea. We acknowledge and pay our respects to the Elders past, present and emerging of all Nations.

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From: Antonn Russek <antonnn.russek@transport.nsw.gov.au>
Sent: Wednesday, 20 April 2022 2:06 PM
To: Watson, Mathew <Mathew.Watson@app.com.au>; Peter McNally <Peter.Mcnally@transport.nsw.gov.au>; Shannon Drewe <Shannon.Drewe@transport.nsw.gov.au>
Cc: Clark, Ethan <ethan.clark@app.com.au>; Nicholas Rayner (Health Infrastructure) <Nicholas.Rayner@health.nsw.gov.au>; Steve Russell <Steve.Russell@multiplex.global>
Subject: RE: SSD-9351535 JHHIP Traffic Management Plan Consultation

EXTERNAL

Hi Mat,

Please find attached the consolidated comments from various TfNSW representatives, as discussed in yesterday's PCG meeting, regarding the JHHIP TMP for the enabling works scope.

If you have any queries please let me know.

Thanks,

Antonn

From: Watson, Mathew <Mathew.Watson@app.com.au>
Sent: Tuesday, 12 April 2022 3:51 PM
To: Peter McNally <Peter.Mcnally@transport.nsw.gov.au>; Shannon Drewe <Shannon.Drewe@transport.nsw.gov.au>
Cc: Antonn Russek <antonnn.russek@transport.nsw.gov.au>; Clark, Ethan <ethan.clark@app.com.au>; Nicholas Rayner (Health Infrastructure) <Nicholas.Rayner@health.nsw.gov.au>; Steve Russell <Steve.Russell@multiplex.global>
Subject: SSD-9351535 JHHIP Traffic Management Plan Consultation

CAUTION: This email is sent from an external source. Do not click any links or open attachments unless you recognise the sender and know the content is safe.

Hi Peter and Team,

Please see attached construction traffic and pedestrian management sub-plan for the JHHIP project. This has been provided for distribution within TfNSW for feedback/comments Transport have. We will also table at the upcoming PCG meeting, with agenda to be issued shortly.

Regards,

Mathew Watson | Senior Project Manager
APP Corporation Pty Limited



m 0408 927 612 | e mathew.watson@app.com.au | Awabakal Country | a Level 2, 426 King Street, Newcastle, NSW 2300

app.com.au    [Connect with me on LinkedIn](#)

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OFFICIAL

[illegible]

1	Submit road occupancy permit/license applications to City of Newcastle (CN) for the proposed TCP/s as per the process detailed here: https://www.newcastle.nsw.gov.au/Council/Forms-Publications/Forms/Roads-Road-Occupancy-Application-Form . This email does not constitute the approval of any TCP contained in the CTMP, only the overall support for the work proposed by the CTMP. You must apply for an Road Occupancy Permit (ROP) as needed. o Given the proximity of the proposed works to traffic control signals and state roads near the location you must also seek a Road Occupancy Licence from Transport for NSW. This will be a condition of any ROP at the location.	> Noted > A reference to the Road Occupancy Permit approval process has been included within the updated CTPMSP.	4.6, pg.15	27-Apr-22	Response provided	
2	Traffic lanes, road shoulder and footpath must remain fully open and unaffected by construction activities unless permitted as part of a road occupancy permit or Work Zone.	> Noted	n/a	n/a	n/a	> No updates to the CTPMSP in relation to this comment
3	Affected residents must be notified of the construction duration and likely changes to their local road environment at least 5 business days prior to commencement.	> Noted	n/a	n/a	n/a	> No updates to the CTPMSP in relation to this comment
4	Parking spaces not affected by works (determined to be all on-street parking spaces in the vicinity of the site) must remain available to the public and cannot be especially reserved by workers.	> Noted	n/a	n/a	n/a	> No updates to the CTPMSP in relation to this comment

Steve Russell

From: Steve Russell
Sent: Wednesday, 27 April 2022 1:27 PM
To: Peter R. McMurray
Cc: Watson, Mathew; Clark, Ethan; Nicholas Rayner (Health Infrastructure); Jeff Wall; Glenn Moore; Brett McFadzien
Subject: RE: SSD-9351535 JHHIP Traffic Management Plan Consultation [APPC.c58Zw]
Attachments: JHHIP CTPMSP MPX Response to CN Comments 20220427.xlsx; Construction Traffic and Pedestrian Management Sub-Plan, Rev.E.pdf

Peter,

Thank you for sending CN's comments back to us last week.

Multiplex has updated the 'Construction Traffic and Pedestrian Management Sub-Plan' (CTPMSP) in response to the comments received. Please find Revision E of the CTPMSP attached above.

Please also find attached a copy of the updated 'JHHIP CTPMSP MPX Response to CN Comments' table dated 27 Apr 2022 which identifies the changes made to the CTPMSP in response to the comments.

Please feel free to contact me if you wish to discuss any of the information provided in further detail.

Regards,

Steve Russell
Project Engineer

MULTIPLY

John Hunter Health and Innovation Precinct
Lookout Road, New Lambton NSW 2299
M 0472 828 766
multiplex.global

From: Watson, Mathew <Mathew.Watson@app.com.au>
Sent: Thursday, 21 April 2022 11:09 AM
To: Peter R. McMurray <prmcmurray@ncc.nsw.gov.au>
Cc: Steve Russell <Steve.Russell@multiplex.global>
Subject: RE: SSD-9351535 JHHIP Traffic Management Plan Consultation [APPC.c58Zw]

Thank you Peter, and thank you to your team on providing this a short notice.
We will review in detail and revise the CTMP. Once complete we will reissue to CN.

I will shortly issue a reoccurring monthly meeting with the project and CN. Was there a more suitable time of the month for these at your end?

Regards,

Mathew Watson | Senior Project Manager
APP Corporation Pty Limited



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From: Peter R. McMurray <prmcurray@ncc.nsw.gov.au>

Sent: Wednesday, 20 April 2022 3:48 PM

To: Watson, Mathew <Mathew.Watson@app.com.au>; Steve Russell <Steve.Russell@multiplex.global>

Subject: FW: SSD-9351535 JHHIP Traffic Management Plan Consultation

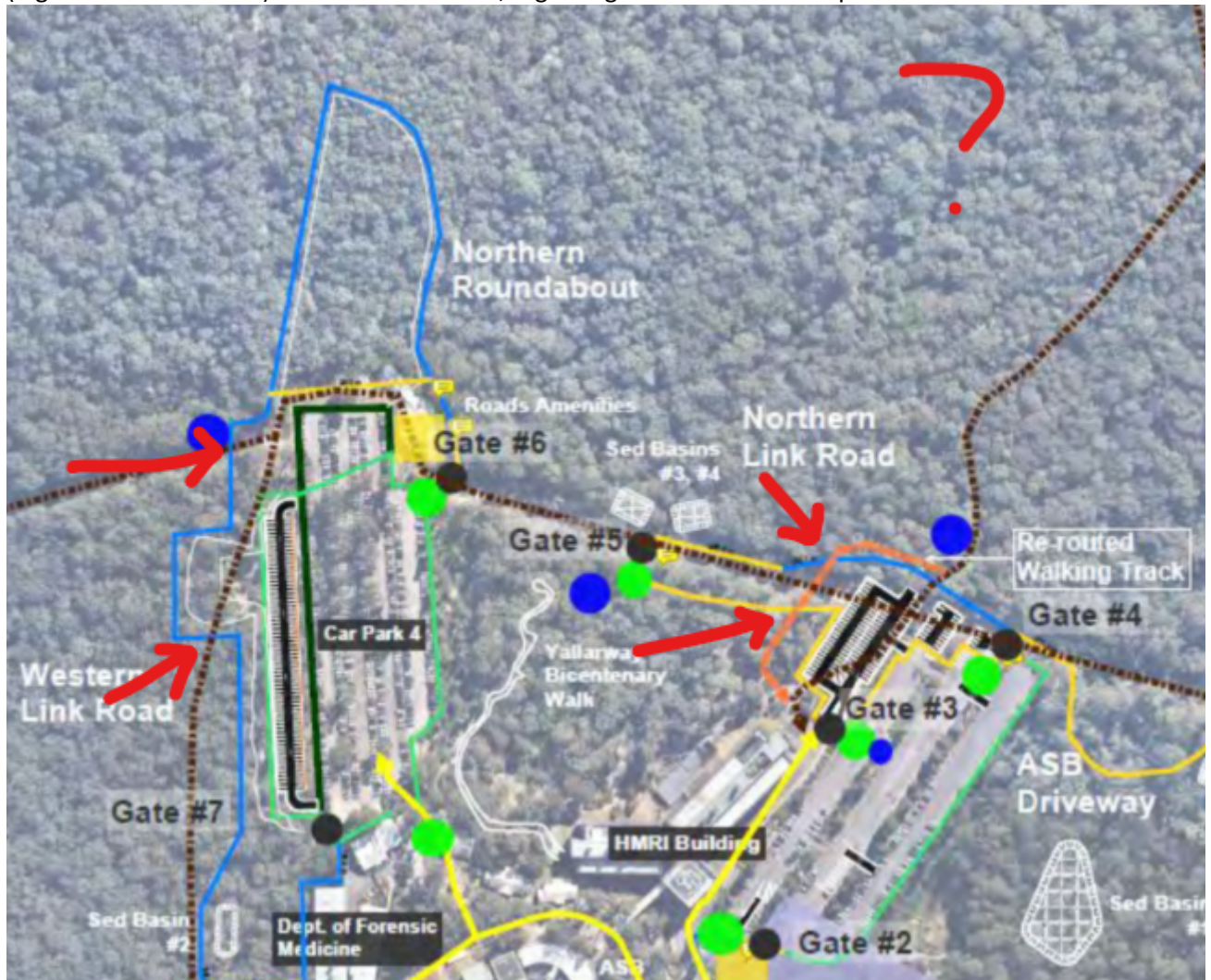
EXTERNAL

Hi Steve, Mat

Please see below comments below (*Italics* are in context outlining reasons for the dot point comment).

- On review it is determined the CTMP does not directly impact CN-controlled local roads at any stage.
 - *This is on the basis that TfNSW own the road pavement segment between Lookout Road and the roundabout at Ronald McDonald Cl and Kookaburra Cct and is not controlled/maintained by City of Newcastle (CN). Further, we have no concerns with this particular segment if we do own it – swept paths should be ok, vehicle mass is possibly not (but not mine to answer).*
 - *The only other segment in OneMap (Jacaranda Dr at Lookout Rd) is interpreted as not ours due to proximity to traffic signals and the state road.*
- On review the CTMP does not directly impact any intersection which CN has any control of.
- There are on-and-off road cycle networks nearby which fall under various controllers, the cycleway of concern is the off-road cycleway connecting the HMRI to the north (i.e. Roberts Circuit, et al.)
 - *This cycleway is used as a footpath connecting the hospital to on-street parking otherwise located in residential areas. All care and control needs to be taken to ensure there are no disruptions/impacts for users along this section of cycleway.*
 - *Displayed controls and diversion appear sufficient. Any diversion path would need to conform to considerations set out in Table 4-4 and the related section of the latest revision of "Traffic control at work sites - Technical manual".*
- There are numerous un-marked fire trails in the area which can potentially be points of conflict between construction activity and trail users (see red arrows below)
 - Specific treatment at each trail intersection should be implemented (e.g. gate, fencing, signposting, diversions, etc.). This is noted to have occurred at some locations (see also below point).
- Paths in the area are noted to be crossing sections of 'permanent' or 'temporary' fence which do not appear to have a gate (only some indicated below). The public should be informed, and relevant emergency services

(e.g. Rural Fire Services) should be consulted, regarding the closure of such paths at minimum.



- Given existing on-street parking issues in the nearby area, CN would mandate construction workers use public transport or that construction companies organise park-and-ride services from an off-street parking location somewhere else in the city. **Merely 'encouraging' construction workers to use public transport and otherwise allowing them to park using their own initiative within the road reserve is viewed as entirely insufficient in protecting public amenity. Note, the provision for worker park and ride is understood to be a tender condition, can this be confirmed.**
 - This is particularly important as the period of the works detailed in the CTMP is understood to be concurrent (in-part or whole) with the inner-city bypass work adjacent. The two projects occurring concurrently will cause many flow-on impacts to local roads if suitable parking arrangements are not in-place. It is not the responsibility for local residents to absorb the shock of the flow-on impacts due to this concurrence. All options to reduce amenity impacts due to on-street parking must be considered and enacted if possible.
 - The hospital has been a noted cause of significant on-street parking problems in the nearby area. Local residents complain to CN regularly concerning on-street parking issues connected to staff, visitors and patients at the hospital. CN cannot accept additional impacts to public amenity or bushland due to poor planning/controls on the part of any party conducting works within the hospital area.
 - *See here for an example of something which will get much worse with uncontrolled parking: <https://www.google.com/maps/@-32.9155799,151.6960393,3a,75y,358.68h,70.51t/data=!3m6!1e1!3m4!1sFAhcARetflyTrerVV iETdA!2e0!7i16384!8i8192>. Parking on the bushland side will encroach on the vegetation for sure.*
 - *Providing worker parking within the health precinct is CN's first preference but is understandably off the table.*

Other generic conditions:

1. Submit road occupancy permit/license applications to City of Newcastle (CN) for the proposed TCP/s as per the process detailed here: <https://www.newcastle.nsw.gov.au/Council/Forms-Publications/Forms/Roads-Road-Occupancy-Application-Form>. This email does not constitute the approval of any TCP contained in the CTMP, only the overall support for the work proposed by the CTMP. You must apply for an Road Occupancy Permit (ROP) as needed.
 - o Given the proximity of the proposed works to traffic control signals and state roads near the location you must also seek a Road Occupancy Licence from Transport for NSW. This will be a condition of any ROP at the location.
2. Traffic lanes, road shoulder and footpath must remain fully open and unaffected by construction activities unless permitted as part of a road occupancy permit or Work Zone.
3. Affected residents must be notified of the construction duration and likely changes to their local road environment at least 5 business days prior to commencement.
4. Parking spaces not affected by works (determined to be all on-street parking spaces in the vicinity of the site) must remain available to the public and cannot be especially reserved by workers.

Happy to discuss as needed.

Kind regards,

Peter

Peter R. McMurray | Asset Services Manager

City of Newcastle | Infrastructure & Property

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From: Watson, Mathew <Mathew.Watson@app.com.au>

Sent: Tuesday, 12 April 2022 3:17 PM

To: Peter R. McMurray <prmcmurray@ncc.nsw.gov.au>

Cc: Steve Russell <Steve.Russell@multiplex.global>; Geof Mansfield <gmansfield@ncc.nsw.gov.au>; Official Mail <officialmail@ncc.nsw.gov.au>

Subject: SSD-9351535 JHHIP Traffic Management Plan Consultation

[EXTERNAL] This email originated from outside of the organisation.

Hi Peter and Team,

Further to our meeting last week, please see attached construction traffic and pedestrian management sub-plan. This has been provided for distribution within Council for feedback/comments Council have.

We will issue a schedule for upcoming construction documents for Council information/input, however request if Council can provide comments to the attached initially.

Regards,

Mathew Watson | Senior Project Manager
APP Corporation Pty Limited



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APP Corporation acknowledges Aboriginal and Torres Strait Islander Peoples as the Traditional Custodians of the Land, Rivers and Sea. We acknowledge and pay our respects to the Elders past, present and emerging of all Nations.

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14.9 Appendix 9: Biodiversity MSP (original consultant document)

JOHN HUNTER HEALTH INNOVATION PRECINCT PROJECT

Biodiversity Management Plan

FINAL

April 2022

JOHN HUNTER HEALTH INNOVATION PRECINCT PROJECT

Biodiversity Management Plan

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Multiplex Constructions

Project Director: Rebecca Vere, Principal Ecologist, BSc.(Hons),
MEMRebecca Vere, Principal Ecologist, BSc.(Hons),
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Project Manager: Rhys Osborne, Senior Ecologist, BSc. (Hons)Rhys
Osborne, Senior Ecologist, BSc. (Hons)

Report No. 22284_R01_V222284_R01_V2

Date: April 2022



QMS Certification Services

This report was prepared using
Umwelt's ISO 9001 certified
Quality Management System.

Acknowledgement of Country

Umwelt would like to acknowledge the traditional custodians of the country on which we work and pay respect to their cultural heritage, beliefs, and continuing relationship with the land. We pay our respect to the Elders – past, present, and future.

Disclaimer

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Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
1	Rhys Osborne	31/03/2022	Rebecca Vere	01/04/2022
2	Rhys Osborne	7/04/2022	Rebecca Vere	07/04/2022

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1.0 Introduction

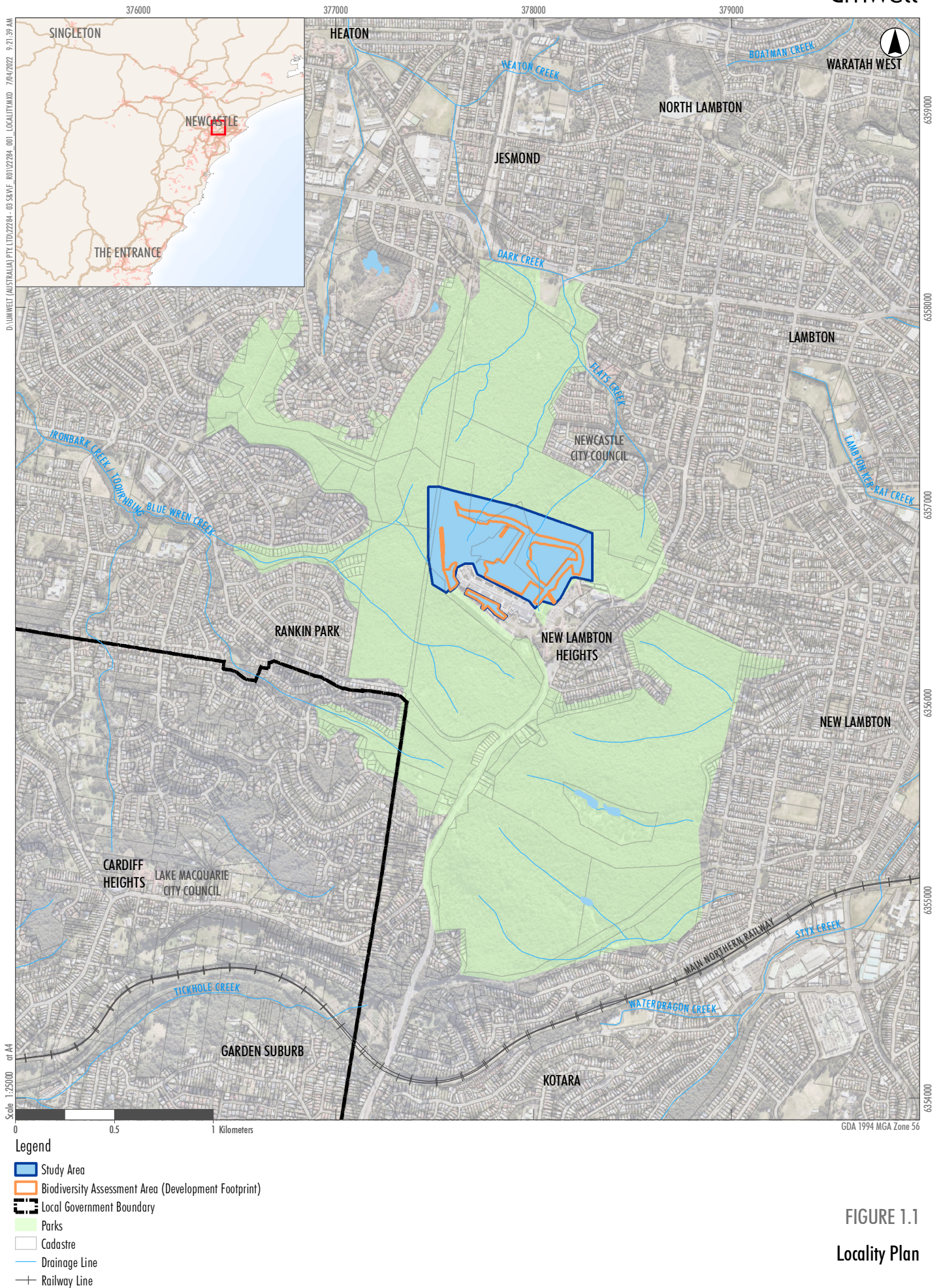
The John Hunter Health and Innovation Precinct (JHHIP) Project consists of the construction and operation of an eleven storey Acute Services Building (ASB) comprising of a podium with four levels of semi-basement parking and seven levels above and a rooftop helipad. The Project also includes the refurbishment of existing JHH buildings, construction of new road infrastructure and improvements to existing drop-off facilities, temporary construction access road, new pedestrian connections to the ASB and a link bridge to the Hunter Medical Research Institute (HMRI), upgrade to existing car parking facilities, landscape and public domain works, mines grouting remediation works, building services works and utility adjustments, stormwater drainage works, signage and site preparation, including bulk earthworks and tree removal.

The John Hunter Hospital Campus (JHHC) comprises the John Hunter Hospital (JHH), John Hunter Children's Hospital (JHCH), Royal Newcastle Centre (RNC), the Rankin Park Rehabilitation Unit and the Nexus Unit (Children and Adolescent Mental Health). JHHC is a Level 6 Principal Referral and tertiary Hospital, providing the clinical hub for medical, surgical, child and maternity services within the Hunter New England Local Health District (HNELHD) and across northern NSW through established referral networks. Other services at the campus include the Hunter Medical Research Institute (HMRI), Newcastle Private Hospital and the HNELHD Headquarters.

The JHHC is located on Lookout Road, Lambton Heights, within the City of Newcastle Local Government Area (LGA), approximately 8km west of the Newcastle CBD (**Figure 1.1**).

Approval has been granted for a new Acute Services Building and refurbishment of existing hospital facilities at John Hunter Hospital comprising:

- construction and operation of a new seven-storey Acute Services Building (plus four semi-basement levels)
- refurbishment of existing buildings to provide additional Inpatient Units and expanded support services
- a new Hospital entry canopy and works to the existing drop off
- link bridge to the Hunter Medical Research Institute (HMRI)
- campus wayfinding and signage
- landscape works
- site preparation including bulk earthworks, tree removal, environmental clearing, cut and fill
- mines grouting remediation works
- construction of internal roads network and construction access roads and works to existing at-grade carparking
- connection to the future Newcastle Inner City Bypass and
- inground building services works and utility adjustments.



1.1 Purpose and Approval Requirements

The purpose of this Biodiversity Management Plan (BMP) is to outline the strategies to be employed for the management of biodiversity as part of the JHHIP Project. This BMP has been prepared in accordance with Schedule 2, Part 2, Condition B16 of the JHHIP State Significant Development (SSD-9351535), with reference to Condition C18 and the 'Flora and Fauna' conditions of Section 6.3 (Summary of Mitigation Measures) included in the Review of Environmental Factors Approval (Ethos Urban 2022).

This BMP has also been prepared to satisfy the recommendations in the Minimisation and Mitigation Measures in the Biodiversity Development Assessment Report (BDAR), prepared by Umwelt (Australia) Pty Limited, revision 6 dated 21 October 2021.

This BMP applies to all land within the Development Footprint shown on **Figure 1.1**, and indirect impacts resulting from works should be considered under the BMP within the wider Study Area boundary.

1.2 Roles and Responsibilities

Relevant roles and responsibilities have been developed for the implementation of this BMP. These are outlined in **Table 1.1**.

Table 1.1 Roles and Responsibilities of this BMP

Role	Accountabilities for this document
Operations Manager	• Provide sufficient resources for the implementation of this plan.
Site Manager	• Oversee the implementation of this plan. • Have working knowledge of this plan. • Be aware of the environmental legislative requirements associated with the project and take measures to ensure compliance. • Ensure employees are competent through training and awareness programs. • Schedule management activities as per this plan.
Project Engineer	• Review of this plan as required. • Confirm that the personnel involved in undertaking the activities required under this plan are suitably qualified, licensed and experienced to undertake the task. • Confirm all internal and external biodiversity reporting requirements are met. • Ensure that all relevant records are effectively maintained on site. • Periodically review progress against compliance criteria in accordance with the requirements of this plan. • Assess the effectiveness of the management strategies and implement corrective actions as required. • Coordinate biodiversity-related incident investigations and reporting as required by legislation and internal standards and guidelines. • Manage/control access to areas covered by the BMP.
All employees and contractors	• Comply with all requirements in this Plan. • Receive training regarding controls on activities within the area subject to this BMP. • Observe boundaries of the area subject to this BMP when undertaking work on site. • Undertake activities in line with directions from the Site Manager or Project Engineers. • Report all actual or potential environmental incidents to the Site Manager immediately.

2.0 Existing Environment

The Study Area covered by the BMP (**Figure 1.1**) is 33 hectares (ha) in size and located approximately 8 km west of the Newcastle CBD. The Study Area occurs within the Sydney Basin IBRA Bioregion and Wyong IBRA subregion. It is characterised by remnant bushland vegetation and habitats surrounding the existing John Hunter Hospital.

The Development Footprint (**Figure 1.1**) represents areas which will be subjected to a range of disturbances resulting from the Project. This includes access roads and associated batters, bushfire asset protection ones (APZs), Acute Services Building Footprint and other ancillary infrastructure. All areas of direct impact are confined to the Development Footprint, which is approximately 9.4 ha in size. This area is the focus of the management actions outlined in this BMP. The Study Area includes areas immediately adjacent to the Development Footprint that may be subject to indirect impacts which also require management under this BMP. **Table 2.1** provides details for the Study Area.

Table 2.1 Study Area Details

Study Area Details	
Name	JHHIP Project
Size	33 ha
Development Footprint	9.4 ha
Lot and DP	1/DP1228246 2/DP1228246 9/DP826092 11/DP826092 41/DP1176191 202/DP1176551
Current Land Use	Existing John Hunter Hospital infrastructure, with patches of the Jesmond Bushland Reserve bushland used for recreational activities.
LGA	Newcastle
LEP Zoning	Newcastle Local Environmental Plan (LEP) 2012

The JHHIP project application was supported by a BDAR prepared by Umwelt (Australia) Pty Limited (2021). A summary of the information presented in this assessment is provided in the sections below.

2.1 Landscape Context

The Study Area occurs within the Sydney Basin Bioregion, which extends from north of Batemans Bay to Nelson Bay, and West to Mudgee. It falls within the Gosford-Cooranbong Coastal Slopes Mitchell landscape, which comprises hills and sandstone plateau outliers of Triassic Narrabeen sandstones, with extensive rock outcrop and low cliffs along ridge margins (DECC 2008).

The 1:100,000 Soil Landscape Sheet of the Newcastle Region indicates that the Study Area is characterised mostly by the Killingworth (ki) soil landscape of undulating to rolling hills and low hills on the Newcastle Coal Measures of the Awaba Hills region. Dominant soil materials include brownish black pedal loam (topsoil), bleached hard setting loamy sand to sandy clay loam (topsoil) and pedal yellowish brown clay (subsoil) (DPIE 2020a).

The Study Area encompasses some of the existing John Hunter Hospital infrastructure and facilities, and patches of the Jesmond Bushland Reserve. Vegetation in this area is characterised by open forest and woodland and is currently used for conservation and recreational activities such as cycling and bushwalking.

Several first order (Strahler 1952) streams occur within and around the Study Area, including Jesmond Creek, Barrie Creek and Kaiyutibbin Creek. The Hunter Estuary Wetlands (Ramsar) are located approximately 7 km to the north-east of the Study Area (DPIE 2012). See **Table 2.2** for a summary of the other relevant landscape features that pertain to the Study Area.

Table 2.2 Landscape Features within the Development Footprint

Landscape Features	
NSW Mitchell Landscape	Gosford - Cooranbong Coastal Slopes
Native Vegetation Cover	38%
Strahler Streams	Jesmond and Flats Creek – 1 st Order
Important and Local Wetlands	Nil
Areas of Geological Significance and Soil Hazard Features	Nil
Areas of Outstanding Biodiversity Value	Nil
Connectivity Features	Remnant bushland in Jesmond Bushland Reserve provides movement corridor for fauna to nearby Reserves including Blackbutt Nature Reserve to the southeast which comprises over 180 ha of native bushland.
Priority Investment Areas	Nil

2.2 Flora and Fauna

2.2.1 Vegetation Communities

The vegetation within the JHHIP project Development Footprint covered by this BMP has been somewhat modified due to historical disturbance, presence of APZs and easements, constructed wetlands and landscaping. This disturbance has also facilitated encroachment by exotic species in some areas. The vegetation identified in the Development Footprint is shown in **Figure 2.1**.

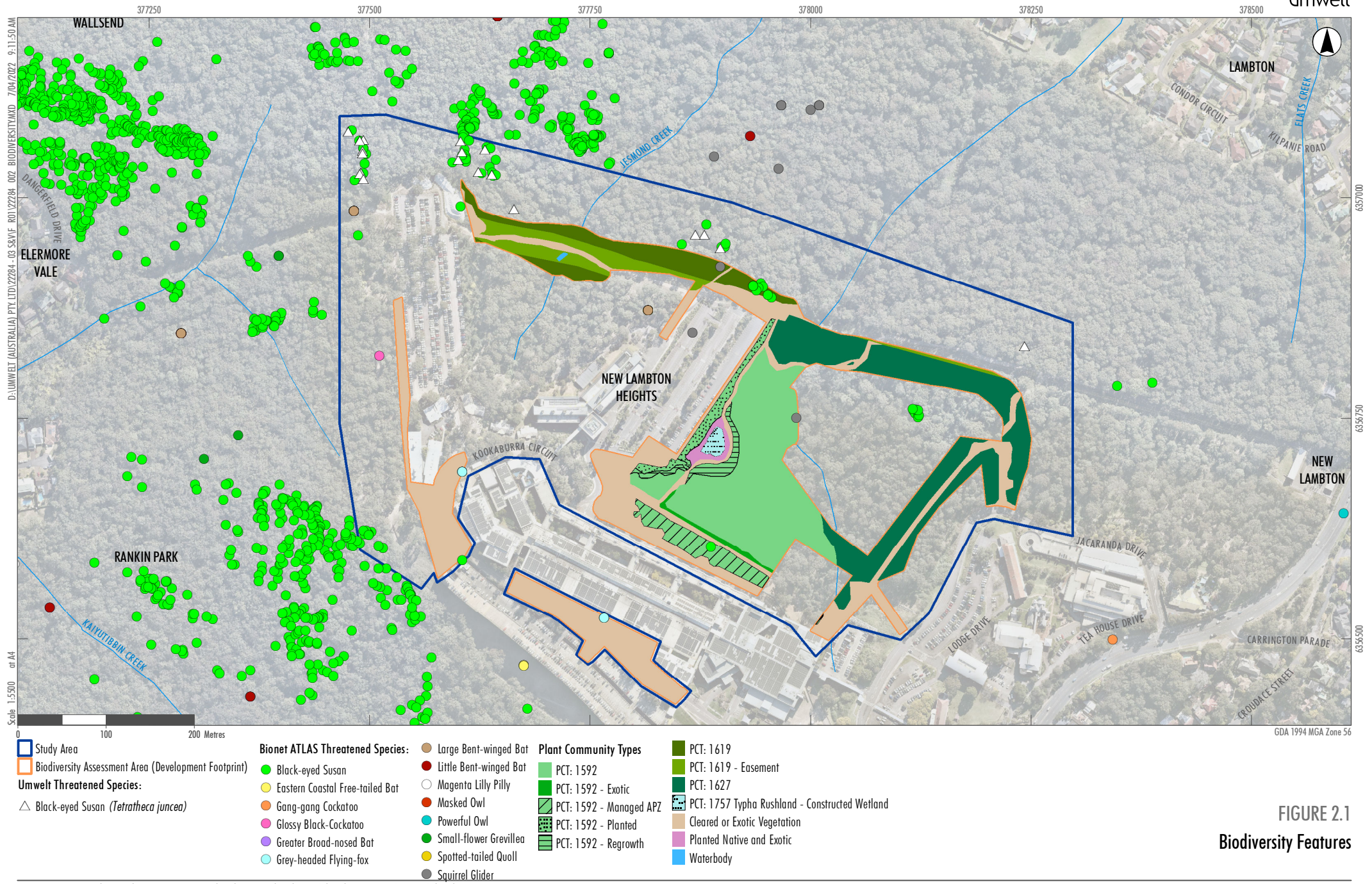


FIGURE 2.1
Biodiversity Features

Surveys of the Study Area identified four Plant Community Types (PCTs) across multiple condition classes being:

- PCT 1592 Spotted Gum – Red Ironbark – Grey Gum shrub – grass open forest of the Lower Hunter
 - Good
 - Regrowth
 - APZ
 - Planted
 - Exotic
- PCT 1619 Smooth-barked Apple – Red Bloodwood – Brown Stringybark – Hairpin Banksia heathy open forest of coastal lowlands
 - Good
 - Easement
- PCT 1627 Smooth-barked Apple – Turpentine – Sydney Peppermint heathy woodland on sandstone ranges of the Central Coast
 - Good
- PCT 1737 Typha Rushland
 - Constructed Wetland.

The approximate area of vegetation in each zone to be cleared is outlined in **Table 2.3**.

Table 2.3 Vegetation Zones in the Development Footprint

Veg Zone	PCT ID and Name <i>Condition Class</i>	Area to be cleared (ha)
1	PCT 1592 – Spotted Gum - Red Ironbark - Grey Gum shrub - grass open forest of the Lower Hunter - Good	2.18
2	PCT 1627 – Smooth-barked Apple - Turpentine - Sydney Peppermint heathy woodland on sandstone ranges of the Central Coast - Good	1.98
3	PCT 1619 – Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands - Good	0.68
4	PCT 1592 – Regrowth	0.14
5	PCT 1592 – APZ	0.34
6	PCT 1592 – Planted	0.21
7	PCT 1592 – Exotic	0.07
8	PCT 1619 – Easement	0.48
11	PCT 1737 – Typha Rushland – Constructed wetland	0.06
-	Disturbed/Cleared/Stormwater Basin	3.14
TOTAL		9.4

One Threatened Ecological Community (TEC) was recorded within the Study Area, being the Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions Endangered Ecological Community (EEC) listed under the Biodiversity Conservation Act 2016 (BC Act). A total of 2.73 ha of this EEC occurs as PCT 1592 and will be removed as part of the JHHIP Project.

2.2.2 Threatened Flora

Extensive surveys of the Development Footprint only resulted in one threatened flora species being recorded, which was black-eyed Susan (*Tetratheca juncea*). This species is listed as Vulnerable under both the BC Act and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This species is commonly recorded from the locality. Its surveyed locations, along with other records of this species from the NSW BioNet Atlas of Wildlife (DPIE 2020b) in the Study Area and surrounds are shown on **Figure 2.1**.

2.2.3 Threatened Fauna

Only one species, squirrel glider (*Petaurus norfolcensis*), has been recorded from the Development Footprint, as shown in the NSW BioNet Atlas of Wildlife (DPIE 2020b) records on **Figure 2.1**. This species is listed as Vulnerable under the BC Act. Several other threatened fauna species such as grey-headed flying foxes, various micro-bats, large forest owls and cockatoos have been previously recorded within and surrounding the Study Area, which can be seen on **Figure 2.1**.

3.0 Biodiversity Management Strategies

The following specific management strategies as outlined in the BDAR are integral to the mitigation of impacts on the biodiversity features of the Study Area:

- workforce education and training
- fencing and access control
- a pre-clearing procedure will be implemented to minimise the potential for impacts on native fauna species (focusing on threatened species) as a result of the clearing of hollow-bearing trees. The pre-clearing procedure is designed to minimise impacts to hollow-dependent and ground-dwelling fauna
- salvage of biodiversity features, including habitat resources (e.g. hollow logs, tree hollows, fallen timber and rocks/boulders)
- weed management
- erosion and sedimentation control
- bushfire management.

These management strategies are discussed in the following sections, along with a summary of measures, timing and responsibilities.

3.1 Workforce Education and Training

The development of educational packages and training can help to mitigate anthropogenic impacts on biodiversity. The ability of non-ecological personnel to identify key threatened species or key ecological threats can help to mitigate impacts on threatened species. The following mitigation actions will be implemented to develop a greater understanding and awareness of biodiversity issues in non-ecological trained personnel:

- inductions for the workforce will be undertaken to make them aware of the key ecological issues present in the Development Footprint and Study Area so that they know their role and responsibilities in the protection and/or minimisation of impacts to all native biodiversity
- inductions will identify the location of sensitive flora and fauna and the policies being implemented to protect the biodiversity values of such areas.

3.2 Fencing and Access Control

During construction, fencing will be used to demarcate vegetation where required to avoid accidental damage to areas outside of the Development Footprint.

Access control is an important feature in protecting and demarcating areas outside the Development Footprint from vehicle access, human access, and accidental disturbance. Measures include:

- appropriate fencing and signposting of areas to prevent the uncontrolled entry of people, accidental disturbance and to minimise vehicular and human traffic

- clear and visible signage is to be appropriately located to inform the workforce and others of the restricted access or otherwise of areas outside the Development Footprint and
- locking of gates to prevent unwanted vehicle, person access and disturbance.

3.3 Supervision of Vegetation Clearance

Pre-clearance surveys and tree-felling supervision recommendations will be implemented to minimise the potential for impacts on native fauna species (including threatened species) as a result of the clearing of native vegetation.

3.3.1 Tree Protection

For the duration of the construction works:

- street trees must not be trimmed or removed unless it forms a part of this development consent or is required in an emergency to avoid the loss of life or damage to property
- all trees immediately adjacent to the Development Footprint must be protected at all times during construction in accordance with Council's tree protection requirements. Any tree, which is damaged or removed during construction due to an emergency, must be replaced
- all trees that are not approved for removal are to be retained and must be suitably protected during construction as per the recommendations of the Arboricultural Impact Assessment, prepared by Aborsafe (2021)
- if access to the area within any protective barrier is required during the works, it must be carried out under the supervision of a qualified arborist. Alternative tree protection measures must be installed, as required. The removal of tree protection measures, following completion of the works, must be carried out under the supervision of a qualified arborist and must avoid both direct mechanical injury to the structure of the tree and soil compaction within the canopy or the limit of the former protective fencing, whichever is the greater
- an arborist is to be engaged to implement tree protection measures for the hollow-bearing trees and other native trees to be retained on site, and
- all project materials must be stored in cleared areas of the site.

3.3.2 Pre-Clearance Surveys

Pre-clearance surveys are to be undertaken prior to tree felling works, be undertaken by suitably qualified and experienced persons/personnel and include:

- the demarcation of areas approved for clearing to reduce risk of accidental clearing
- key habitat features, including habitat trees should be identified and marked. Habitat trees are those containing hollows, cracks or fissures and spouts, peeling bark, active nests, possum dreys or other signs of recent fauna usage. Other key habitat features to be identified include fallen timber/hollow logs, burrows, and boulder piles

- the potential presence of threatened flora and fauna species, endangered populations and TECs should be identified
- the identification of threatened species or key habitat features that are suitable for translocation or salvage
- disturbance activities should be targeted to specific times of the year to minimise impacts to threatened species usage of habitat features for breeding and roosting, where practicable
- identification of further actions required following surveys, including (but not limited to) salvage of identified key habitat features, additional surveys to determine threatened fauna usage of the area (if required), identification of active dens or burrows, any actions required to discourage fauna occupation and weed or feral fauna management requirements.

3.3.3 Tree-felling supervision

Tree felling will be completed as close to the completion of pre-clearance surveys as practicable to limit the potential for new issues to arise (such as new nests being built). Tree felling supervision will be undertaken by an appropriately qualified and experienced person after pre-clearance surveys have identified potential habitat features. The tree-felling process will include the following:

Prior to Felling Habitat Trees (Ecologist not required)

- completion of actions recommended from the pre-clearing surveys
- removal of non-habitat trees/vegetation as close to the habitat tree felling date as possible in order to create disturbance to discourage fauna usage of the habitat trees
- prior to removal of non-habitat trees/vegetation, a canopy inspection should be completed to search for threatened species which may have moved in since pre-clearing surveys were completed. If fauna encountered, ecologist advice should be sought
- shaking of habitat trees (with heavy machinery) the day before felling, for at least 30 seconds to encourage fauna to abandon trees.

On the Day of Felling Habitat Trees (Ecologist required)

- all habitat trees will be subject to a visual inspection to survey for threatened species prior to felling
- trees previously identified as containing fauna will be shaken and then felled as gently as possible, providing no threatened species are identified
- lowering habitat trees to be done as gently as possible with heavy machinery using bucket to slow fall
- if a threatened species is identified in a habitat tree on the day of felling, the supervising person is to advise the most appropriate method to minimise potential harm. This may include leaving the tree overnight, further shaking to encourage the animal to vacate the tree, gradual removal of branches to discourage ongoing use, soft-felling of the tree with the animal in the tree, or measures to capture and relocate the animal to nearby suitable secure habitats
- once felled, hollows will be inspected for remaining or injured fauna

- felled trees are to be rolled where appropriate so that the number of hollows blocked against the ground is minimised
- uninjured animals should be released on the day/evening of capture into nearby suitable secure habitat and should not be held for extended periods of time. Nocturnal animals should be held in suitable housing until dusk and then released
- injured animals will be triaged immediately, humanely euthanised if required, or taken to the nearest veterinary clinic or wildlife carer as soon as possible for assessment and treatment
- all felled habitat trees should remain in place for a least one night to allow any remaining fauna to escape, and
- habitat features identified for translocation or salvage operations should be extracted and stored appropriately.

3.4 Salvage and Installation of Compensatory Habitat Features

Resources that can be salvaged (where practical) include key habitat features such as hollow logs, fallen timber and boulders. These should be stockpiled separately to other vegetation stockpiles. Where appropriate these resources may be re-used in remnant or landscaped areas to improve revegetation outcomes and to augment habitat features.

Thirty-eight nest boxes that were previously installed within the Development Footprint will be removed and relocated to suitable nearby secure habitat prior to construction. Nest boxes will be installed in similar sized and same species tree and oriented in the same direction to replicate current conditions where possible.

In addition, 18 nest boxes will be removed from the TfNSW RP2J disturbance corridor and relocated nearby prior to construction commencing. Nest boxes will be installed in similar sized and same species tree and oriented in the same direction to replicate current conditions where possible.

It is assumed that the boxes already installed, their position and orientation meet the requirements of the TfNSW Biodiversity Guidelines so replicating that within the adjacent area will satisfy the requirements of the guidelines.

3.5 Weed Management

Weed species could be inadvertently brought into the Study Area or surrounding habitats with vehicle movement, imported materials or could invade naturally through removal of native vegetation. The presence of weed species has the potential to decrease the value of vegetation for native species, particularly threatened species. Weed management controls will include:

- all machinery and equipment will be cleaned thoroughly prior to entering the Study Area. Cleaning must include the removal of all mud and plant matter, followed by washing with high pressure water
- mulch containing weeds is to be placed in piles separate from clean mulch, removed from site, and disposed of in accordance with weed management guidelines as soon as practicable.

3.6 Erosion and Sedimentation Control

A Stormwater Management Plan has been prepared to appropriately limit post development flows and manage downstream water quality as part of the State Significant Development application for site establishment and clearing works. Measures to be implemented include:

- minimising the area of disturbance
- diverting run-off water around disturbed areas
- installation and ongoing maintenance of erosion and sediment controls (e.g. sediment fencing) throughout the duration of the Project
- stabilisation (i.e. sealing, landscaping) of all disturbed areas to reduce the potential for future erosion.

3.7 Bushfire Management

The vegetation that will be retained within areas adjoining of the Development Footprint will require appropriate bushfire management to protect life and property, while supporting appropriate conditions for the significant ecological features identified.

This will be achieved through the implementation of a range of measures, including:

- implementation of the requirements from the Bushfire Assessment Report (BPA 2021) for this project which outlines the required protection measures and management requirements, including:
 - maintaining a suitably equipped response to any fires on site and assisting NSW Fire and Rescue and emergency services on site in the event of a fire
 - maintaining Strategic Fire Advantage Zones (SFAZ), including strategically positioned fire breaks and access roads
 - installation and maintenance of APZs.

3.8 Summary of Measures, Timing and Responsibilities

Management requirements including the timing, action, outcome, and responsibility for these measures are outlined in **Table 3.1**.

Table 3.1 Summary of Management Strategies

Measure	Timing	Responsibility	Proposed Techniques	Outcome
Before Construction				
Workforce education and training	Pre-construction and during construction	Multiplex Constructions	Biodiversity induction	Environmental awareness for construction crews
During Construction				
Implement Construction Environmental Management Plan	Prior to clearance and during clearance activities	Multiplex Constructions	Develop plan to adequately manage environmental impacts during construction including fencing and access control, weed management and erosion and sediment control	Minimal impacts to environmental values.
Demarcation of approved clearance boundaries	Prior to clearance and during clearance activities	Multiplex Constructions	Clearly identify areas not proposed for clearance.	Minimisation of unnecessary impacts to surrounding vegetation and habitats.
Pre-clearance and tree felling supervision	Prior to clearance and during clearance activities	Project ecologist and Multiplex Constructions	Pre-clearance and tree felling in accordance with Section 3.1.	Minimise impacts to fauna and their habitats
After Construction				
Weed management	Construction and operation	Multiplex Constructions	Chemical and physical removal of invasive weed species in accordance with the Noxious and Environmental Weeds Handbook (DPI 2014). Regular inspection to identify potential weed infestations.	Minimisation of environmental and noxious weeds within the site Minimisation of weed spread from and into the wider locality.
Fencing and access control	Construction and operation	Multiplex Constructions	Temporary fencing to manage access to existing tracks and paths during construction	Provides for access control to avoid unwanted human interference and disturbance to non-operational areas. Minimisation of impacts to native fauna species from avoiding the use of barbed-wire fences.
Erosion and sedimentation control	Construction and operation	Multiplex Constructions	Adequate controls during works for erosion and sediment control	Avoid sediment entering local creeks

4.0 Compliance and Reporting

4.1 Compliance Assessment

Table 4.1 compares the management strategies against the consent conditions in SSD-9351535 and 'Flora and Fauna' conditions of Section 6.3 (Summary of Mitigation Measures) included in the Review of Environmental Factors Approval (Ethos Urban 2022).

Table 4.1 Compliance of Management Actions

Condition	Description	Management Action
SSD-9351535		
Construction Environmental Management Plan (B16)	Prior to the commencement of construction, the Applicant must submit a Construction Environmental Management Plan (CEMP) to the Certifier and provide a copy to the Planning Secretary for information. The CEMP must include, but not be limited to, the following: d) Biodiversity Management Plan incorporating the Minimisation and Mitigation Measures in the Biodiversity Development Assessment Report, prepared by Umwelt (Australia) Pty Ltd revision 6 dated 21 October 2021;	All management strategies outlined in Section 3.0. These are taken from the BDAR prepared by Umwelt (2021). This BMP is a sub-plan of the CEMP.
Tree Protection (C18)	For the duration of the construction works: a) street trees must not be trimmed or removed unless it forms a part of this development consent or is required in an emergency to avoid the loss of life or damage to property; b) all trees immediately adjacent to the approved disturbance area must be protected at all times during construction in accordance with Council's tree protection requirements. Any tree, which is damaged or removed during construction due to an emergency, must be replaced; c) all trees on the site that are not approved for removal are to be retained and must be suitably protected during construction as per the recommendations of the Arboricultural Impact Assessment, dated 12 May 2021, prepared by Aborsafe; d) if access to the area within any protective barrier is required during the works, it must be carried out under the supervision of a qualified arborist. Alternative tree protection measures must be installed, as required. The removal of tree protection measures, following completion of the works, must be carried out under the supervision of a qualified arborist and must avoid both direct mechanical injury to the structure of the tree and soil compaction within the canopy or the limit of the former protective fencing, whichever is the greater;	Management strategies for Tree Protection are outlined in Section 3.3.1.

Condition	Description	Management Action
	e) an arborist is to be engaged to implement tree protection measures for the hollow bearing trees and other native trees to be retained on site; and f) all project materials must be stored in cleared areas of the site.	
Review of Environmental Factors		
Section 6.3	Prior to commencement of works: - perform a pre-construction inspection to identify any new sensitive habitat areas, species, and controls - remove and relocate the two nest boxes within the Project Area. Suitable areas for relocation occur within the same landscape, adjacent to the Project Area - weed management actions should be developed to manage weeds during the construction phase of the Project. All machinery and equipment would be received on site free of soil and organic matter to prevent the introduction of weeds or disease species into the area.	Management strategies for these mitigation measures are outlined in Section 3.3.2, Section 3.4 and Section 3.5 respectively.
Section 6.3	During construction/undertaking of work: - retain mature trees where feasible and clearly mark trees prior to works as no-go zones - do not disturb or harm fauna on site - ensure good site housekeeping to prevent pest animals - cover all excavations over night to prevent fauna being trapped - if native fauna is present works should avoid the fauna until the fauna has relocated away from the site - if native fauna is injured or trapped onsite, contact the state wildlife authority to arrange for collection/removal from site - if previously unidentified nesting animals are found (including bats and birds) stop works in the immediate vicinity and contact your Environmental Advisor.	Management strategies for these mitigation measures are outlined in Section 3.3.3.

4.2 Risk Management

There are a number of potential risks or situations where desirable biodiversity outcomes may not be achieved. A list of potential situations where biodiversity objectives of this BMP are not met are provided in **Table 4.2** along with a list of potential corrective actions.

Table 4.2 Trigger, Action and Response Plan

Aspect	Desirable Outcome	Trigger	Corrective Action
Pre-clearance	Key habitat features requiring supervision during felling have been identified.	Un-marked key habitat features are identified during the felling process.	Stop work immediately and demarcate a no-go zone around key habitat features. Advice from project ecologist should be sought before continuing work.
Tree Felling	Minimal fauna injury/fatality arising from tree felling.	Fauna fatality regularly occurring during tree-felling.	Investigate what stage fauna fatalities are occurring and what the cause of death is. If possible, revise tree-felling protocols to reduce injury or fatality occurrences.
Tree Protection	Protection of remnant vegetation outside clearing boundary.	Vegetation outside of approved areas is subject to clearing.	Investigate whether areas were subject to appropriate demarcation. Rehabilitate areas immediately with compatible vegetation. Reporting, as required.
Compensatory Habitat	Nest boxes are installed according to the strategy outlined in Section 3.4 .	Subsequent checks show that nest boxes are installed in an inappropriate host species or at an inappropriate height or orientation.	Nest box to be relocated to an appropriate height, host tree or orientation.
	Available habitat materials are salvaged for compensatory habitat.	Habitat features salvaged are damaged during salvage or during stockpiling.	Investigate machinery and equipment currently being used to salvage and translocate habitat features. Update protocols based on findings. Investigate adequacy of storage emplacement areas of features. Revise locations if necessary.
Weeds	There is no significant weed infestation as a result of the works.	Evidence of weed infestation.	Adapt/modify weed control strategy. Undertake weed management strategies as necessary.
Fencing and Access	Appropriate mechanisms are established to control access and manage public safety post-closure.	Evidence of unauthorised access.	Review site security and re-secure site access points where possible. Repair site fencing.
Bushfire	Appropriate bushfire hazard controls have been implemented.	Increased bushfire hazards identified.	Liaise with RFS and adapt bushfire control measures.
Erosion and Sedimentation Control	No significant erosion is present that would constitute a safety hazard or compromise the capability of supporting the end land use.	Erosion causing a safety issue or impacting final land use. Contour banks are unstable or there is evidence of overtopping or significant scouring as a result of runoff. Sediment fences are compromised.	Adapt erosion control strategy to stabilise landform.

4.3 Reporting

A concise letter shall be prepared at the completion of the project which documents the compliance of management actions completed, including:

- timing, process followed and records arising from the completion of pre-clearance and tree-felling works including number of habitat trees felled, fauna encountered and their fate and any issues noted with tree protection requirements
- process followed and locations of re-located nest boxes and salvage/relocation of any key habitat features
- any weed management issues identified or recommended actions
- documentation of any recommended actions for fencing/access or erosion/sediment control works
- a record of any hazards or incidents that occurred during construction and details of how these were addressed, with reference to the Trigger Action Response Plan, if applicable
- a record of where management strategies applied differed from those outlined in this Plan, if applicable.

5.0 References

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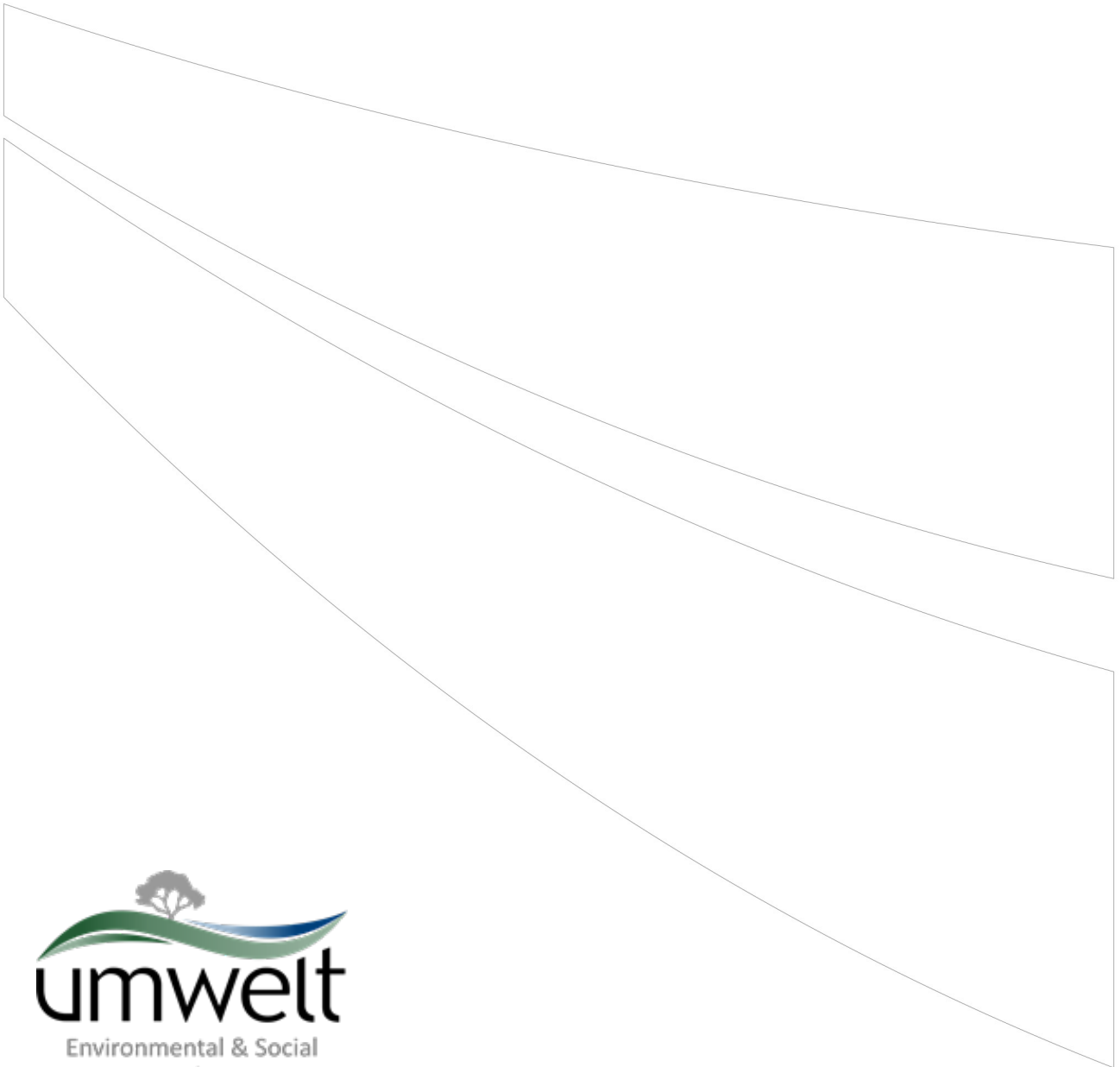
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Strahler, A. N., (1952) Hypsometric (area-altitude) analysis of erosional topography, *Geological Society of America Bulletin* 63 (11): 1117-1142.

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14.10 Appendix 10: Noise and Vibration MSP (original consultant document)

John Hunter Health and Innovation Precinct Project - Enabling Works

Construction Noise and Vibration Management Sub-Plan

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1 INTRODUCTION

Acoustic Logic has been engaged to prepare a construction noise and vibration management sub-plan for the Enabling Works stage of the John Hunter Health and Innovation Precinct project. The project has received development approval via separate State Significant Development (SSD) and Review of Environmental Factors (REF) approvals. In response to this, Acoustic Logic has prepared this management plan in accordance with B19 of the SSD approval and Section 6.3 (Summary of Mitigation Measures) of the REF approval.

Condition B19 of the SSD approval notes the following matters:

- "(a) be prepared by a suitably qualified and experienced noise expert.*
- (b) describe procedures for achieving the noise management levels in EPA's Interim Construction Noise Guideline (DECC, 2009).*
- (c) outline vibration surveys be carried out of each key vibration-generating-activity / equipment*
- (d) at the relevant on campus buildings (including but not limited to the existing JHH, HMRI, Private Hospital) and other hospital campus areas where sensitive equipment is operated, that the equipment-specific vibration criteria are set and managed accordingly.*
- (e) vibration assessment at the commencement of operations for each vibration generating activity to determine whether the existence of significant vibration levels justifies a more detailed investigation. Site law tests will help determine allowable working distances from structures to manage vibration.*
- (f) describe the measures to be implemented to manage high noise generating works such as piling, in close proximity to sensitive receivers*
- (g) include strategies that have been developed with the community for managing high noise generating works*
- (h) outlines the community consultation undertaken to develop the strategies in condition B19(g)*
- (i) include a complaints management system that would be implemented for the duration of the construction; and*
- (j) include a program to monitor and report on the impacts and environmental performance of the development and the effectiveness of the implemented management measures in accordance with the requirements of condition B15."*

2 SITE DESCRIPTION & PROPOSED WORKS

The John Hunter Health and Innovation Precinct project consists of the construction and operation of an eleven storey Acute Services building comprising of a podium with four levels of semi-basement car parking and seven levels above with a rooftop helipad. The project also includes the refurbishment of the existing JHH buildings, construction of new road infrastructure and improvements to existing drop-off facilities, temporary access road, new pedestrian connections to the ASB and a link bridge to the Hunter Medical Research Institute (HMRI), upgrade to existing car parking facilities, landscape and public domain works, mines grouting remediation works, building services works and utility adjustments, stormwater drainage works, signage and site preparation, including bulk earthworks and tree removal.

The JHHIP Project will be constructed in stages. This Construction Noise and Vibration Management Sub-Plan has been developed for the purposes of the "Enabling Works" stage of the Project.

The "Enabling Works" stage of the project involves preparing the JHHIP site for the construction of the Acute Services Building. It involves activities such as site preparation, creation of site access routes, mine seam injection works, tree clearing/protection, and precinct car park expansion works. These activities are outlined in further detail:

- Site access roads
- Temporary accommodation/fencing/signage
- Tree clearance/protection
- Earthworks/Sedimentation controls
- Mines grouting
- Services diversions and utility adjustments
- Demolition works
- On-grade car parking expansions
- In-ground substructure

The site is immediately bounded by the existing hospital buildings and parklands. The nearest residential development is adjacent Lookout Road, New Lambton Heights, south-east of the project site.

2.1 CONSTRUCTION WORK HOURS

In accordance with condition C4 to C8 of the SSD approval and Section 3.2, Table 4 of the REF, the hours of construction work are as follows:

- "C4. Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:*
- (a) Between 7am and 6pm, Monday to Fridays, inclusive; and*
 - (b) Between 8am and 1pm, Saturdays.*
- No work may be carried out on Sundays, or public holidays.*
- C5. Notwithstanding condition C4, provided noise levels do not exceed the existing rating background noise level plus 5 dB, works may also be undertaken during the following hours:*
- (a) Between 6am and 7am, Mondays to Fridays inclusive.*
 - (b) Between 7am and 8am, Saturdays; and*
 - (c) Between 1pm and 5pm, Saturdays.*
- C6. Construction activities may be undertaken outside of the hours in condition C4 and C5 if required:*
- (a) By the Police or a public authority for the delivery of vehicles, plant, or materials; or*
 - (b) In an emergency to avoid the loss of life, damage to property, or to prevent environmental harm; or*
 - (c) Where the works are inaudible at the nearest sensitive receivers; or*
 - (d) For the delivery, set-up, and removal of construction cranes, where notice of the crane-related works is provided to the Planning Secretary and affected residents at least seven days prior to the works; or*
 - (e) Where a variation is approved in advance in writing by the Planning Secretary or his nominee if appropriate justification is provided for the works.*
- C7. Notification of such construction activities, as referenced in condition C6, must be given to affected residents before undertaking the activities or as soon as is practical afterwards.*
- C8. Rock breaking, rock hammering, sheet piling, pile driving, and similar activities may only be carried out between the following hours:*
- (a) 9am to 12pm, Monday to Friday;*
 - (b) 2pm to 5pm Monday to Friday; and*
 - (c) 9am to 12pm, Saturday.*

2.2 NEAREST SENSITIVE RECEIVER LOCATIONS

Sensitive receiver locations as presented in Figure 1 and detailed below. These locations will be used as a basis for this assessment.

- **O1:** Hunter Medical Institute, to the north-west of the project site.
- **H1:** John Hunter Hospital, to the south of the project site.
- **MC1:** Newcastle Private Specialist Centre, east of the project site.
- **MC2:** The Heights Private Medical Centre, east of the project site.
- **H2:** Newcastle Private Hospital, north-east of the project site.
- **CC1:** Possum Place Child Care Centre, north-east of the project site.
- **R1:** Residential development along Lookout Road, Ridgeway Road, Bushlands Close and Ardlessa Way, New Lambton Heights.
- **R2:** Residential development along Sygna Close and Roberts Circuit, New Lambton Heights.

Figure 2 below presents the short-term monitoring locations carried out on campus by Acoustic Studio (ref: 20210513 SVM.0005.Rep.docx) during the SSD approval stage.

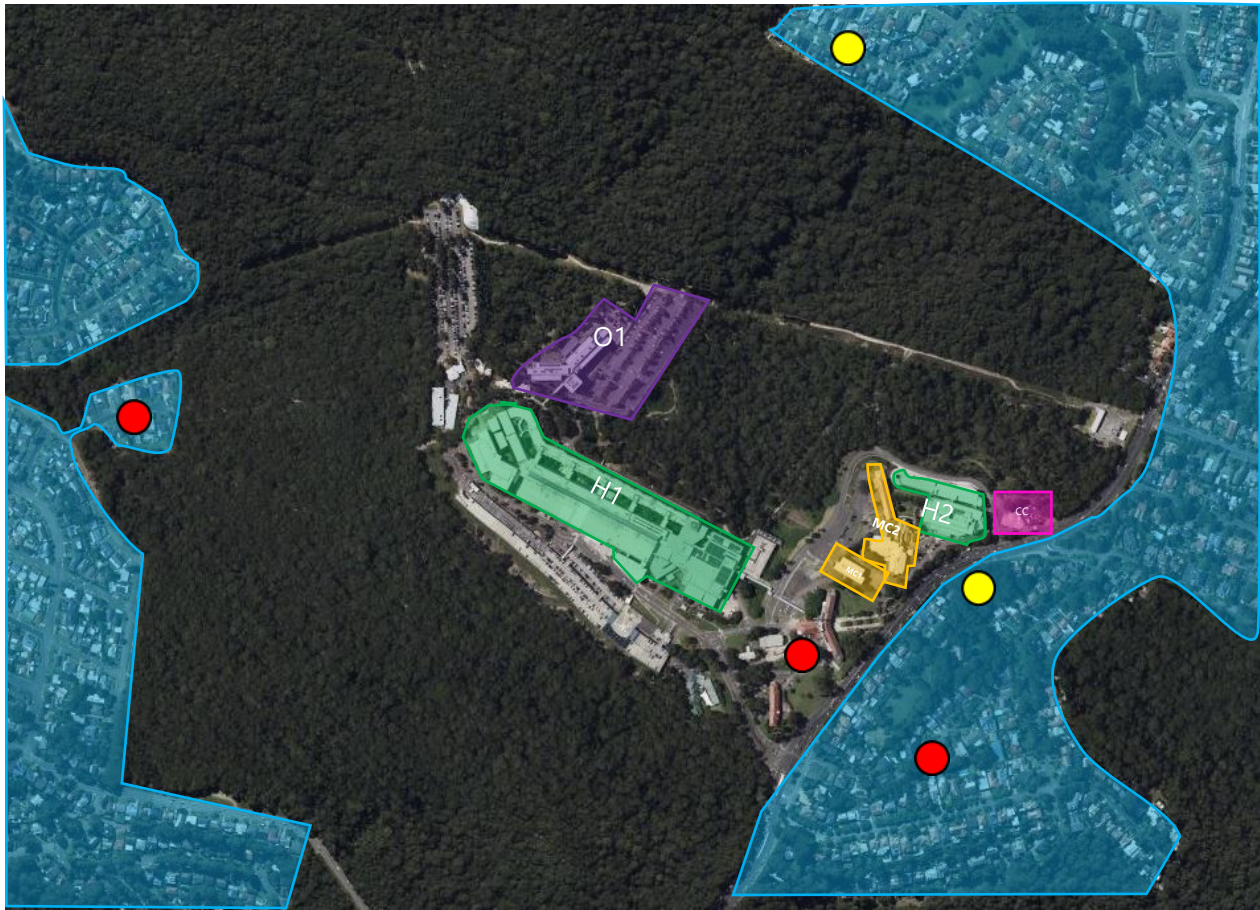


Figure 1 – Site Plan Showing Monitoring Locations and Surrounding Land Uses/Receivers

● - Unattended Noise Monitoring Location* ● - Attended Noise Monitoring Location*	■ - Residential ■ - Medical Clinics/Centres ■ - Hospitals ■ - Childcare ■ - Other (as noted)
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*Attended and unattended noise monitoring at identified locations undertaken by Acoustic Studio during the SSD approval stage.

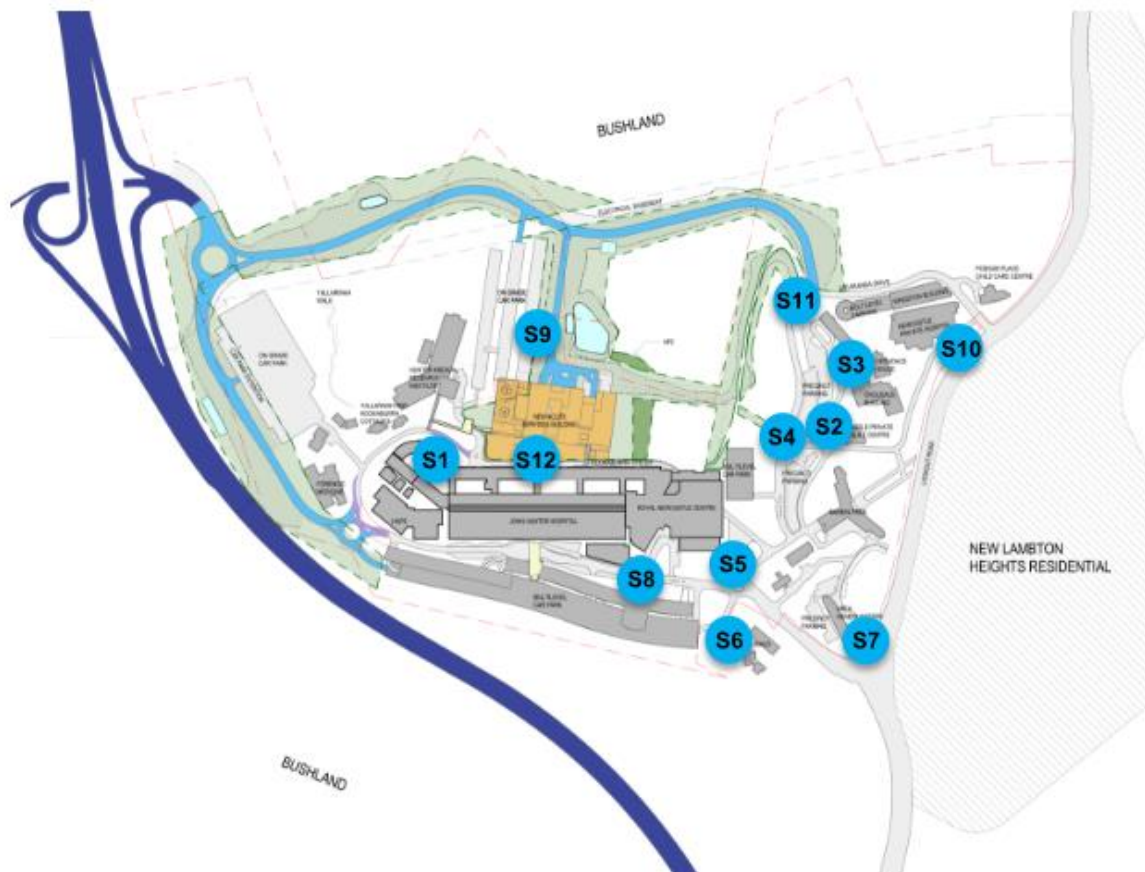


Figure 2 – Site Plan Showing Short-Term Monitoring Locations conducted by Acoustic Studio

3 EXISTING ACOUSTIC ENVIRONMENT

3.1 NOISE DESCRIPTORS

Ambient noise constantly varies in level from moment to moment, so it is not possible to accurately determine prevailing noise conditions by measuring a single, instantaneous noise level.

To quantify ambient noise, a 15-minute measurement interval is typically utilised. Noise levels are monitored continuously during this period, and then statistical and integrating techniques are used to characterise the noise being measured.

The principal measurement parameters obtained from the data are:

L_{eq} - represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period. **L_{eq}** is important in the assessment of noise impact as it closely corresponds with how humans perceive the loudness of time-varying noise sources (such as traffic noise).

L₉₀ – This is commonly used as a measure of the background noise level as it represents the noise level heard in the typical, quiet periods during the measurement interval. The **L₉₀** parameter is used to set noise emission criteria for potentially intrusive noise sources since the disturbance caused by a noise source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the **L₉₀** level.

L₁₀ is used in some guidelines to measure noise produced by an intrusive noise source since it represents the average of the loudest noise levels produced at the source. Typically, this is used to assess noise from licenced venues.

L_{max} is the highest noise level produced during a noise event and is typically used to assess sleep arousal impacts from short term noise events during the night. It is also used to assess internal noise levels resulting from aircraft and railway ground vibration induced noise.

L₁ is sometimes used in place of **L_{max}** to represent a typical noise level from a number of high-level, short-term noise events.

3.2 BACKGROUND NOISE LEVELS

Background noise levels have been obtained from the approved acoustic report prepared by Acoustic Studio (ref: 20210513 SVM,0005.Rep.docx, dated 13th May 2021). Monitoring locations have been identified in Figures 1 and 2 above.

Table 1 – Long-Term Monitoring Background Noise Levels

Location	Time of Day		
	Daytime (7am – 6pm)	Evening (6pm – 10pm)	Night (10pm – 7am)
Monitor Location 1 (R1)	56 dB(A) _{Leq} 41 dB(A) _{L90}	48 dB(A) _{Leq} 41 dB(A) _{L90}	47 dB(A) _{Leq} 35 dB(A) _{L90}
Monitor Location 2 (R2)	57 dB(A) _{Leq} 32 dB(A) _{L90}	50 dB(A) _{Leq} 35 dB(A) _{L90}	42 dB(A) _{Leq} 29 dB(A) _{L90}
Monitor Location 3 (JHH Campus)	58 dB(A) _{Leq} 47 dB(A) _{L90}	57 dB(A) _{Leq} 47 dB(A) _{L90}	55 dB(A) _{Leq} 47 dB(A) _{L90}

Table 2 – Short-Term Monitoring Results¹

Location	Time of Day	Measured Noise Level
S1 JHH, overlooking HMRI	Between 2-3pm, 9 th October 2020	49 dB(A) _{Leq} 45 dB(A) _{L90}
S2 Private Specialist Centre	Between 2-3pm, 9 th October 2020	56 dB(A) _{Leq} 49 dB(A) _{L90}
S3 The Lodge	Between 12-1pm, 9 th October 2020	54 dB(A) _{Leq} 48 dB(A) _{L90}
	Between 2-3pm, 9 th October 2020	51 dB(A) _{Leq} 47 dB(A) _{L90}
S4 Corner Jacaranda Dr and Tea House Rd	Between 3-4pm, 9 th October 2020	66 dB(A) _{Leq} 54 dB(A) _{L90}
	Between 12-1pm, 16 th October 2020	60 dB(A) _{Leq} 55 dB(A) _{L90}
S5 JHH Entrance Roundabout	Between 3-4pm, 9 th October 2020	64 dB(A) _{Leq} 55 dB(A) _{L90}
S6 Ronald McDonald House	Between 3-4pm, 9 th October 2020	57 dB(A) _{Leq} 47 dB(A) _{L90}
	Between 12-1pm, 16 th October 2020	53 dB(A) _{Leq} 47 dB(A) _{L90}

S7 Lookout Road; JHH Entrance Road (Traffic Measurement)	Between 3-4pm, 9 th October 2020	72 dB(A) _{L_{eq}} 58 dB(A) _{L₉₀}
	Between 12-1pm, 16 th October 2020	71 dB(A) _{L_{eq}} 58 dB(A) _{L₉₀}
S8 Kookaburra Cct. Opposite Helipad	Between 4-5pm, 9 th October 2020	62 dB(A) _{L_{eq}} 49 dB(A) _{L₉₀}
	Between 1-2pm, 16 th October 2020	60 dB(A) _{L_{eq}} 51 dB(A) _{L₉₀}
S9 HMRI Carpark	Between 4-5pm, 9 th October 2020	53 dB(A) _{L_{eq}} 45 dB(A) _{L₉₀}
S10 Lookout Road; adjacent to Newcastle Private Hospital (Traffic Measurement)	Between 4-5pm, 9 th October 2020	71 dB(A) _{L_{eq}} 59 dB(A) _{L₉₀}
S11 Jacaranda Dr. north bend (Traffic Measurement)	Between 5-6pm, 9 th October 2020	58 dB(A) _{L_{eq}} 45 dB(A) _{L₉₀}
S12 JHH Service Road, overlooking HRMRI Carpark	Between 1-2pm, 16 th October 2020	57 dB(A) _{L_{eq}} 46 dB(A) _{L₉₀}
S01 28 Roberts Circuit	Between 2-3pm, 9 th October 2020	47 dB(A) _{L_{eq}} 38 dB(A) _{L₉₀}
	& Between 1-2pm, 16 th October 2020	45 dB(A) _{L_{eq}} 40 dB(A) _{L₉₀}

Table Notes:

1. Multiplex are proposing to undertake updated background noise monitoring prior to the commencement of any construction works for the Enabling Works Stage, to verify the background noise levels previously undertaken.

4 NOISE AND VIBRATION MANAGEMENT LEVELS

4.1 EPA INTERIM CONSTRUCTION NOISE GUIDELINE

The EPA Interim Construction Noise Guideline (ICNG) assessment requires:

- Determination of noise management levels (based on ambient noise monitoring).
- Review of operational noise levels at nearby development.
- If necessary, recommendation of noise controls strategies in the event that compliance with noise emission management levels is not possible.

EPA guidelines adopt differing strategies for noise control depending on the predicted noise level at the nearest residences:

- *"Noise affected" level*. Where construction noise is predicted to exceed the "noise effected" level at a nearby residence, the proponent should take reasonable/feasible work practices to ensure compliance with the "noise effected level". For residential properties, the "noise effected" level occurs when construction noise exceeds ambient levels by more than 10dB(A) $L_{eq(15min)}$.
- *"Highly noise affected level"*. Where noise emissions are such that nearby properties are "highly noise effected", noise controls such as respite periods should be considered. For residential properties, the "highly noise effected" level occurs when construction noise exceeds 75dB(A) $L_{eq(15min)}$ at nearby residences.

A summary of the management noise levels from the ICNG is presented below.

Table 3 – ICNG Construction Noise Management Levels – Residential

Location	<i>"Noise Affected" Level –</i> dB(A) $L_{eq(15-min)}$	<i>"Highly Noise Affected"</i> Level – dB(A) $L_{eq(15-min)}$
R1 Residents south-east of the project site	51	75

For non-residential receivers, the following noise management levels apply:

Table 4 – ICNG Construction Noise Management Levels – Non-Residential

Land Use	<i>"Management" Level –</i> dB(A) L_{eq}
Child Care Centres	45 (internally)
Hospital wards and operating theatres	45 (internally)
Offices	75 (externally)
Medical Centres	45 (internally)

4.2 VIBRATION

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

- For structural damage vibration, German Standard DIN 4150-3 *Structural Vibration: Effects of Vibration on Structures*; and
- For human exposure to vibration, the evaluation criteria presented in the British Standard BS 6472:1992 *Guide to Evaluate Human Exposure to Vibration in Buildings (1Hz to 80Hz)* for low probability of adverse comment.

4.2.1 Structure Borne Vibrations (Building Damage Criteria)

German Standard DIN 4150-3 (1999-02) provides vibration velocity guideline levels for use in evaluating the effects of vibration on structures. The criteria presented in DIN 4150-3 (1999-02) are presented in Table 4.

It is noted that the peak velocity is the value of the maximum of any of the three orthogonal component particle velocities as measured at the foundation, and the maximum levels measured in the x- and y- horizontal directions in the plane of the floor of the uppermost storey.

Table 5 – DIN 4150-3 (1999-02) Safe Limits for Building Vibration

TYPE OF STRUCTURE		PEAK PARTICLE VELOCITY (mms^{-1})			
		At Foundation at a Frequency of			Plane of Floor of Uppermost Storey
		< 10Hz	10Hz to 50Hz	50Hz to 100Hz	All Frequencies
1	Buildings used in commercial purposes, industrial buildings, and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g., buildings that are under a preservation order)	3	3 to 8	8 to 10	8

The surrounding commercial and residential buildings would be classified as a type 2 structure.

4.2.2 Assessing Amenity

The NSW EPA document "*Assessing Vibration: A Technical Guideline*" provides procedures for assessing tactile vibration and regenerated noise within potentially affected buildings and is used in the assessment of vibration impact on amenity.

Relevant criteria are presented below.

Table 6 – Preferred and Maximum Weighted RMS Values for Continuous and Impulsive Vibration Acceleration (m/s²) 1-80Hz

Location	Assessment Period	Preferred Values		Maximum Values	
		z-axis	x- and y-axes	z-axis	x- and y-axes
Continuous Vibration					
Critical Areas	Daytime	0.005	0.0036	0.01	0.0072
Residences		0.010	0.0071	0.020	0.014
Offices		0.020	0.014	0.040	0.028
Impulsive Vibration					
Critical Areas	Daytime	0.005	0.0036	0.010	0.0072
Residences		0.3	0.21	0.6	0.42
Offices		0.64	0.46	1.28	0.92

Acceptable values for intermittent vibration shall comply with the requirements in Table 2.4 of the NSW EPA's "*Assessing Vibration: A Technical Guideline*" as detailed below:

Table 7 – Acceptable Vibration Dose Values for Intermittent Vibration (m/s^{1.75})

Location	Daytime	
	Preferred Value	Maximum Value
Critical Areas	0.10	0.20
Residences	0.20	0.4
Offices	0.40	0.80

4.2.3 Hospital Specific Vibration Limits

This office has been advised that vibration sensitive equipment is located within the existing John Hunter Hospital.

No specific allowable vibration levels have been provided to this office. Given this, the appropriate vibration curve from the American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE) Handbook based on the equipment type that will be used.

The ASHRAE Handbook provides specific vibration levels associated with potential disruption to the use of sensitive equipment within the Hospital. The maximum vibration velocities ($\text{mm}\cdot\text{s}^{-1}$) recommended from 1-100Hz is given in Figure 37 of the Handbook, used in conjunction with the recommended equipment requirement curves given in Table 46. Figure 37 and Table 46 of the Handbook is presented below in Figure 3 and Table 8 respectively.

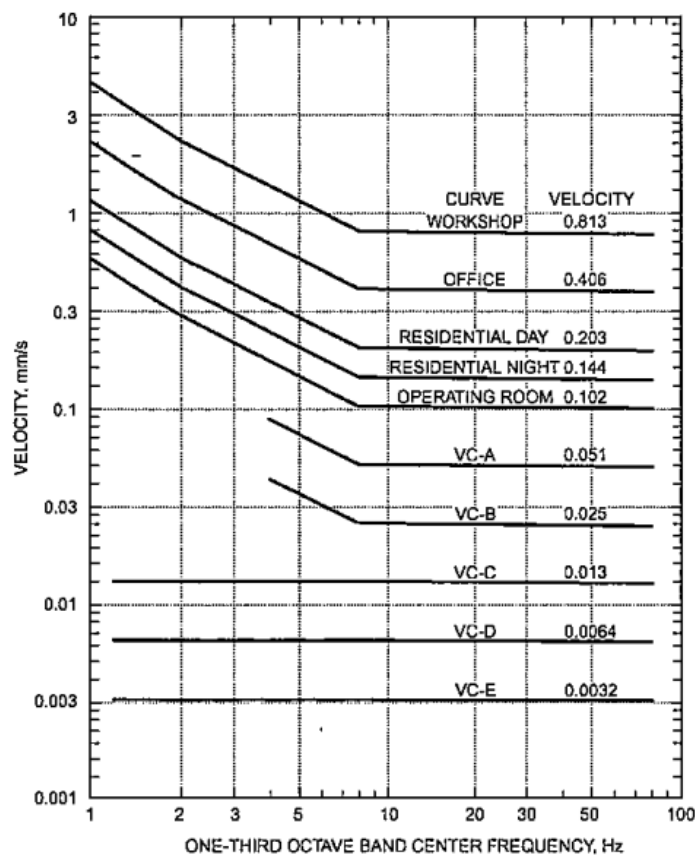


Fig. 37 Building Vibration Criteria for Vibration Measured on Building Structure

Figure 3 – Vibration Curves as per Figure 37 of ASHRAE Handbook (2007)

Table 8 – Equipment Vibration Criteria – ASHRAE Handbook (2007)

Equipment Requirements	Curve
Adequate for computer equipment, probe test equipment, and microscopes less than 40x magnification	0.203 (Residential – day)
Bench Microscopes up to 100x magnification; laboratory robots	0.102 (Operating Room)
Bench microscopes up to 400x magnification; optical and other precision balances; coordinate measuring machines; metrology laboratories; optical comparators; microelectronics manufacturing equipment; proximity and projection aligners, etc.	0.051 (VC – A)
Microsurgery, eye surgery, neurosurgery; bench microscopes at magnification greater than 400x magnification; optical equipment on isolation tables; microelectronic manufacturing equipment, such as inspection and lithography equipment (including steppers) to 3mm line widths	0.025 (VC – B)
Electron microscopes up to 30,000x magnification; microtomes; magnetic resonance imagers; microelectronics manufacturing equipment, such as lithography and inspection equipment to 1mm detail size	0.013 (VC – C)
Electron microscopes at magnification greater than 30,000x magnification; mass spectrometers; cell implant equipment; microelectronic manufacturing equipment such as, aligners, steppers and other critical equipment for photolithography with line widths of 1/2µm; includes electron beam systems	0.0064 (VC – D)
Un-isolated laser and optical research systems; microelectronics manufacturing equipment, such as aligners, steppers and other critical equipment for photolithography with line widths of 1/4µm; includes electron beam systems	0.0032 (VC – E)

Table Notes:

- Refer to Figure 3 for corresponding vibration curve

All vibration monitoring results recorded on site are presented against the vibration curves listed above. The appropriate level of vibration will ultimately be determined by the staff operating the equipment and whether or not the level of distortion created by the excavation works is acceptable. We note that the VC curves are a representation of the level of disruption to the activities and/or operations undertaken by the machine and not the limit where damage would be expected to occur to the unit.

5 NOISE AND VIBRATION ASSESSMENT AND RECOMMENDATIONS

5.1 ACTIVITIES TO BE CONDUCTED AND THE ASSOCIATED NOISE LEVELS

Typically, the most significant sources of noise generated during a construction project will be demolition, excavation, civil works, and piling. A summary of sound power levels of major construction processes/equipment is detailed in Table 9.

With respect to construction noise, the impact on nearby development will be dependent on the activity in question and where on the site the activity is undertaken. The primary construction equipment and sound power levels associated with the works are as follows:

Table 9 - Sound Power Levels of the Proposed Equipment

Equipment / Process	Sound Power Level – dB(A)*
Pneumatic Hammer	115
Asphalting	110
Compactor (vibratory)	110
Piling Rig	110
General Trucks	108
Concrete Pump	105
Concrete Truck	105
Electric Hammer	105
Site Crane	105
Impact Drill	105
Concrete Float/Vibrators	105
Excavator (bucket attachment)	105
Compactor (roller)	105
Forklifts	100
Bobcat	100
Powered Hand Tools	95

***Noise levels take into account correction factors (for tonality, intermittency where necessary).**

The noise levels presented in the above table are derived from the following sources, namely:

- Table A1 of Australian Standard 2436-2010.
- Data held by this office from other similar studies.

Noise levels take into account correction factors (for tonality, intermittency where necessary).

5.2 NOISE IMPACT ASSESMENT

The predicted noise levels during excavation and construction will depend on:

- The activity undertaken; and
- The distance between the work site and the receiver. For many of the work areas, the distance between the noise source and the receiver will vary depending on which end of the site the work is undertaken. For this reason, the predicted noise levels will be presented as a range.

Predicted noise levels are presented below. Predictions take into account the noise reduction as a result of distance only.

Table 10 – Predicted Noise Generation to R1 (Residential Receivers)

Activity	Predicted Level – dB(A) L_{eq}(15min)	Comment
Pneumatic Hammer	48-51	Complies with the management level
Asphalting	43-46	
Compactor (vibratory)	43-46	
Piling Rig	43-46	
General Trucks	41-44	
Concrete Pump	38-41	
Concrete Truck	38-41	
Electric Hammer	38-41	
Site Crane	38-41	
Impact Drill	38-41	
Concrete Float/Vibrators	38-41	
Excavator (bucket attachment)	38-41	
Compactor (roller)	38-41	
Forklifts	33-36	
Bobcat	33-36	
Powered Hand Tools	28-31	

Table 11 – Predicted Noise Generation to H1 (John Hunter Hospital Building)

Activity	Predicted Level – dB(A) Leq(15min) (Internally)	Comment
Pneumatic Hammer	35-48	Marginally exceeds the management level
Asphalting	30-43	Marginally exceeds the management level
Compactor (vibratory)	30-43	Complies with the management level
Piling Rig	30-43	
General Trucks	28-41	
Concrete Pump	25-38	
Concrete Truck	25-38	
Electric Hammer	25-38	
Site Crane	21-33	
Impact Drill	25-38	
Concrete Float/Vibrators	25-38	
Excavator (bucket attachment)	25-38	
Compactor (roller)	25-38	
Forklifts	20-33	
Bobcat	20-33	
Powered Hand Tools	15-28	

Table 12 – Predicted Noise Generation to H2 (Newcastle Private Hospital)

Activity	Predicted Level – dB(A) Leq(15min) (Internally)	Comment
Pneumatic Hammer	23-27	Complies with the management level
Asphalting	18-22	
Compactor (vibratory)	18-22	
Piling Rig	18-22	
General Trucks	16-20	
Concrete Pump	13-17	
Concrete Truck	13-17	
Electric Hammer	13-17	
Site Crane	14-15	
Impact Drill	13-17	
Concrete Float/Vibrators	13-17	
Excavator (bucket attachment)	13-17	
Compactor (roller)	13-17	
Forklifts	8-12	
Bobcat	8-12	
Powered Hand Tools	3-7	

Table 13 – Predicted Noise Generation to MC2 (The Heights Specialist Centre)

Activity	Predicted Level – dB(A) Leq(15min) (Internally)	Comment
Pneumatic Hammer	24-28	Complies with the management level
Asphalting	19-23	
Compactor (vibratory)	19-23	
Piling Rig	19-23	
General Trucks	17-21	
Concrete Pump	14-18	
Concrete Truck	14-18	
Electric Hammer	14-18	
Site Crane	15-17	
Impact Drill	14-18	
Concrete Float/Vibrators	14-18	
Excavator (bucket attachment)	14-18	
Compactor (roller)	14-18	
Forklifts	9-13	
Bobcat	9-13	
Powered Hand Tools	4-8	

Table 14 – Predicted Noise Generation to MC1 (Newcastle Private Specialist Centre)

Activity	Predicted Level – dB(A) Leq(15min) (Internally)	Comment
Pneumatic Hammer	24-28	Complies with the management level
Asphalting	19-23	
Compactor (vibratory)	19-23	
Piling Rig	19-23	
General Trucks	17-21	
Concrete Pump	14-18	
Concrete Truck	14-18	
Electric Hammer	14-18	
Site Crane	15-17	
Impact Drill	14-18	
Concrete Float/Vibrators	14-18	
Excavator (bucket attachment)	14-18	
Compactor (roller)	14-18	
Forklifts	9-13	
Bobcat	9-13	
Powered Hand Tools	4-8	

Table 15 – Predicted Noise Generation to CC1 (Possum Place Child Care Centre)

Activity	Predicted Level – dB(A) Leq(15min) (Internally)	Comment
Pneumatic Hammer	21-25	Complies with the management level
Asphalting	16-20	
Compactor (vibratory)	16-20	
Piling Rig	16-20	
General Trucks	14-18	
Concrete Pump	11-15	
Concrete Truck	11-15	
Electric Hammer	11-15	
Site Crane	13-15	
Impact Drill	11-15	
Concrete Float/Vibrators	11-15	
Excavator (bucket attachment)	11-15	
Compactor (roller)	11-15	
Forklifts	6-10	
Bobcat	6-10	
Powered Hand Tools	1-5	

Table 16 – Predicted Noise Generation to O1 (Hunter Medical Research Institute)

Activity	Predicted Level – dB(A) Leq(15min) (Internally)	Comment
Pneumatic Hammer	24-32	Complies with the management level
Asphalting	19-27	
Compactor (vibratory)	19-27	
Piling Rig	19-27	
General Trucks	17-25	
Concrete Pump	14-22	
Concrete Truck	14-22	
Electric Hammer	14-22	
Site Crane	15-19	
Impact Drill	14-22	
Concrete Float/Vibrators	14-22	
Excavator (bucket attachment)	14-22	
Compactor (roller)	14-22	
Forklifts	9-17	
Bobcat	9-17	
Powered Hand Tools	4-12	

5.2.1 Discussion of Noise Impacts

As indicated in the tables above, the predicted construction noise levels will generally achieve the management levels stated in the NSW EPA *Interim Construction Noise Guideline* and in Section 4.1 above. Based on this, “high noise generating works” aren’t expected to be exceeded at any point during the construction works. A letter has been prepared by this office, in support of this (ref 20181544.2/204A/R0/TA, 27th April 2022) and is appended in this management plan (refer to Appendix 3).

To ensure the management controls are effective, continuous unattended noise monitoring is being carried out during construction works (refer to Appendix 1 for locations). This will allow Multiplex to provide alternative solutions or methodologies/procedures to mitigate construction noise in real time with minimal disruption to potentially affected noise receivers.

In the event of strong community reaction or scenarios where constant exceedances of the management levels are recorded, attended noise measurements may be undertaken to determine the cause and effect of the activity and to provide additional mitigation where necessary.

5.3 VIBRATION IMPACTS

Equipment items typically associated with high levels of vibration generated are sheet/impact piling, extensive excavation in rock and vibratory compaction. Of these activities, it is only vibratory compaction which is likely to be used extensively. Given the distance from the proposed works and the residential properties, the vibration criteria in Section 4.2 are not expected to be exceeded during the construction activities.

All other construction items are also not expected to generate vibration exceeding building damage or amenity acoustic criteria.

Unattended vibration monitoring is being undertaken during works (in the locations marked up in Appendix 1) to ensure that the vibration generating activities is sufficiently managed to the levels identified in Section 4.2.

In the event of strong community reaction or scenarios where constant exceedances of the management levels are recorded, attended vibration measurements may be undertaken to determine the cause and effect of the activity and to provide additional mitigation where necessary.

5.4 RECOMMENDATIONS

The following specific noise controls are recommended:

- Construction work is to follow the approved hours of Condition C4 through to C8. The approved hours are as follows:

"C4. Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:

- a) Between 7am and 6pm, Monday to Fridays, inclusive; and*
- b) Between 8am and 1pm, Saturdays.*

No work may be carried out on Sundays, or public holidays.

C5. Notwithstanding condition C4, provided noise levels do not exceed the existing rating background noise level plus 5 dB, works may also be undertaken during the following hours:

- a) Between 6am and 7am, Mondays to Fridays inclusive.*
- b) Between 7am and 8am, Saturdays; and*
- c) Between 1pm and 5pm, Saturdays.*

C6. Construction activities may be undertaken outside of the hours in condition C4 and C5 if required:

- a) By the Police or a public authority for the delivery of vehicles, plant, or materials; or*
- b) In an emergency to avoid the loss of life, damage to property, or to prevent environmental harm; or*
- c) Where the works are inaudible at the nearest sensitive receivers; or*
- d) For the delivery, set-up, and removal of construction cranes, where notice of the crane-related works is provided to the Planning Secretary and affected residents at least seven days prior to the works; or*
- e) Where a variation is approved in advance in writing by the Planning Secretary or his nominee if appropriate justification is provided for the works.*

C7. Notification of such construction activities, as referenced in condition C6, must be given to affected residents before undertaking the activities or as soon as is practical afterwards.

C8. Rock breaking, rock hammering, sheet piling, pile driving, and similar activities may only be carried out between the following hours:

- a) 9am to 12pm, Monday to Friday;*
- b) 2pm to 5pm Monday to Friday; and*
- c) 9am to 12pm, Saturday.*

- All excavation and construction equipment shall be well maintained.
- Stationed equipment shall be located as far as practicable from immediate sensitive receivers.
- Community consultation is proposed be undertaken throughout the construction process. In this regard regular letterbox drops detailing site progress and scheduled works is proposed. In particular, these should detail the extent and times of rock hammering which is planned to be undertaken.
- Quiet work methods/technologies:
 - The primary noise generating activity at the site will be the bulk excavation period. As much as practicable, use of quieter excavation methods is adopted.
 - Excavation is conducted initially using excavator with bucket (quietest excavation method), then use of rock rippers (as opposed to hydraulic hammers and rock saws) when rock strength permits. Use of the loudest excavation equipment (hydraulic hammers/rock saws) is used only with other options are not available.
 - Concrete pump trucks should generally be located along the western boundary of the site (along Premier Street), or within the bounds of the site.
- Materials handling/vehicles:
 - Trucks and forklifts in general use on site are to use a non-tonal reversing beacon where possible (subject to OH&S requirements) to minimise potential disturbance of surrounding receivers;
 - Avoid careless dropping of construction materials into empty trucks.
 - Trucks, trailers, and delivery vehicles are to turn off engines when idling to reduce noise impacts (unless required for concrete pumping or similar).
- Complaint's handling:
 - An afterhours contact number is displayed outside of the building site, so that in the event that surrounding development believes that a noise breach is occurring, they may contact the site.
 - In the event of complaint, the procedures outlined in Section 8 are adopted.
- Community consultation:
 - Informing nearby receivers is typically a critical aspect in reducing the risk of complaint when it comes to construction noise. The objective in undertaking a consultation process is to:
 - Inform and educate the groups about the project and noise controls being implemented.
 - Increase understanding of all acoustic issues related to the project and options available.
 - Identify group concerns generated by the project, so they can be addressed.
 - Provide advice about the time and duration of potential noisy activities.
 - Ensure that concerned individuals or groups are aware of and have access to a Site Complaints Register which will be used to address any construction noise related problems should they arise.

7 ONGOING CONSTRUCTION VIBRATION AND NOISE MONITORING

Multiplex, during the Enabling Works stage of the JHHIP project, will be undertaking ongoing construction noise and vibration monitoring. Below is an overview of the monitoring equipment that will be used and locations where monitoring is to be undertaken.

7.1 NOISE AND VIBRATION MONITORING EQUIPMENT

Noise monitoring will be conducted using Acoustic Research Laboratories noise loggers. All monitoring equipment used retains current calibration, either manufacturers' calibration or NATA certified calibration.

Vibration monitoring will be conducted using Texcel ETM type monitors with externally mounted tri-axial geophones. The geophones will be located as close as practicably possible to the location of the sensitive structure. The monitors are to be set to send an SMS message when alert levels have been exceeded at the location of the geophone.

7.2 NOISE AND VIBRATION MONITORING LOCATIONS

Noise and vibration monitoring locations are to be proposed in consultation with Multiplex and will be confirmed with Health Infrastructure, APP and the Hunter New England Local Health District (LHD) prior to and during the construction works. Monitoring locations are provided in Appendix 1.

7.3 NOISE AND VIBRATION MONITORING RESULTS

Noise and vibration monitoring can be downloaded either on site (typically during a monitoring service visit) or remotely to actively review all monitoring data recorded at each monitoring location. Relating to the vibration monitors, this will include any vibration events found to exceed the trigger levels nominated in Section 4.2.

If multiple vibration events exceeding the nominated trigger levels are recorded, all data recorded by the monitor is to be reviewed and forwarded to a nominated representative of Multiplex. From there, alternative methodologies and procedures can be explored to ensure such activity can be appropriately managed.

7.4 NOISE AND VIBRATION MONITORING PROGRAM AND REPORTING

Monitoring reports are anticipated to be provided on a monthly basis, documenting all recorded exceedances that can be reviewed by the contractor and actioned accordingly. Multiplex are to forward all monitoring reports to APP on a monthly basis. Monitoring reports will detail the location of all monitors within the vicinity of the site (inclusive of photos), construction work that has been carried to date, recorded noise and/or vibration levels during the works carried out, a comparison of the recorded levels to the associated management criteria and a discussion of exceedances and how they can be appropriately controlled. In the event that attended monitoring has been carried, a report will be prepared and issued after the monitoring visit has been completed.

7.5 VIBRATION MONITORING ALERTS

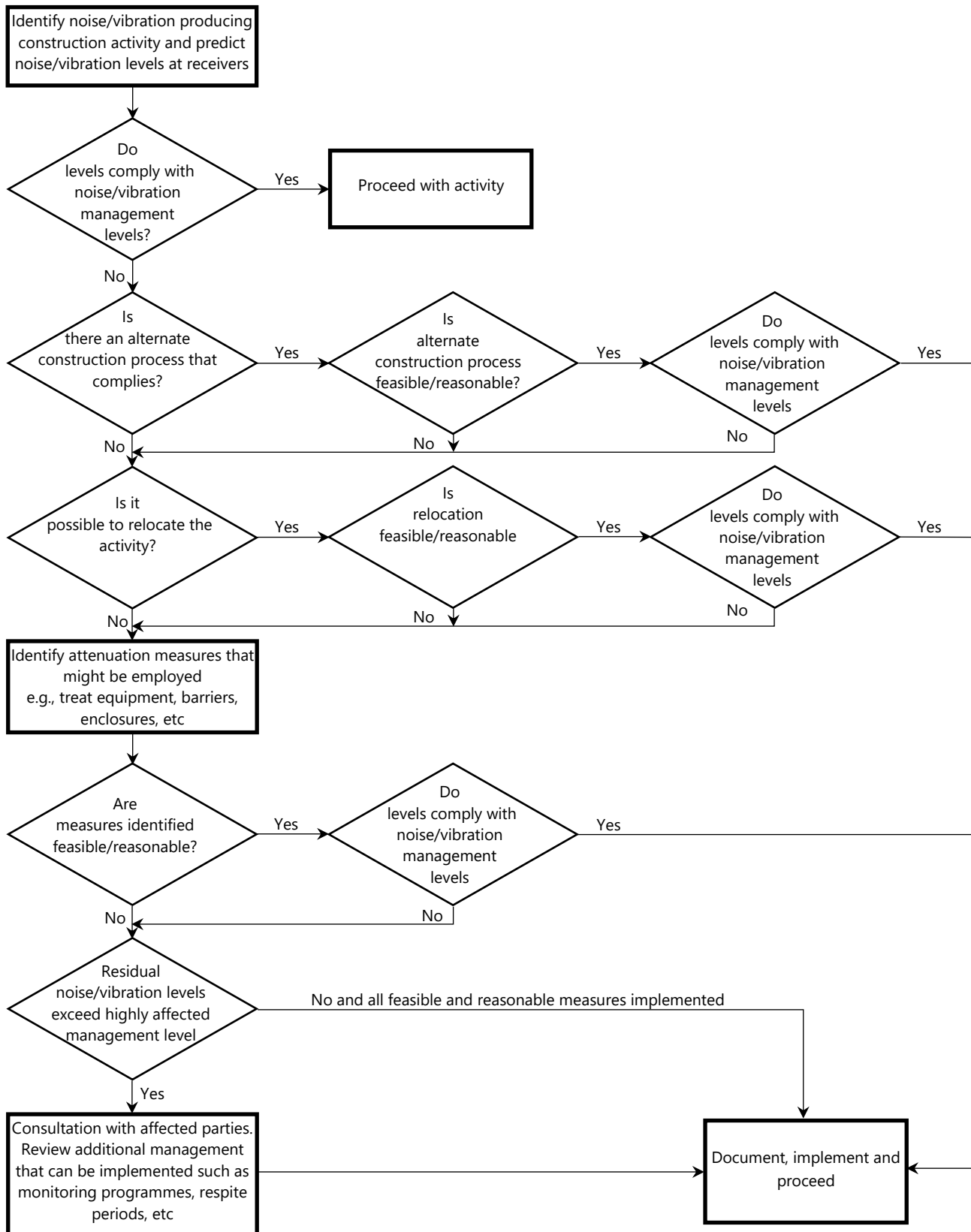
If the nominated vibration trigger level is exceeded, the following personnel will receive SMS alerts:

1. Project acoustic consultant
2. Site foreman

3. Head contractor and any other representative nominated by the project's head contractor

8 CONTROL OF CONSTRUCTION NOISE AND VIBRATION – PRECEDURAL STEPS

The flow chart presented below illustrates the process that will be followed in assessing construction activities.



9 ADDITIONAL NOISE AND VIBRATION CONTROL METHODS

In the event of complaints, there are several noise mitigation strategies available which can be considered. The determination of appropriate noise control measures will be dependent on the activities and construction appliances. This section provides an outline of available methods.

9.1 SELECTION OF ALTERNATE APPLIANCE OR PROCESS

Where a particular activity or construction appliance is found to generate excessive noise levels, it may be possible to select an alternative approach or appliance. For example, the use of a hydraulic hammer on certain areas of the site may potentially generate high levels of noise. Undertaking this activity using bulldozers, ripping and/or milling machines will result in lower noise levels.

9.2 ACOUSTIC BARRIER

Given the position of adjacent development, it is unlikely that noise screens will provide significant acoustic benefit for commercial or residential receivers but will provide noticeable improvement for those on ground level.

The placement of barriers at the source is generally only effective for static plant. Equipment which is on the move or working in rough or undulating terrain cannot be effectively attenuated by placing barriers at the source.

Barriers can also be placed between the source and the receiver.

The degree of noise reduction provided by barriers is dependent on the amount by which line of sight can be blocked by the barrier. If the receiver is totally shielded from the noise source reductions of up to 15dB(A) can be expected. Where only partial obstruction of line of sight occurs, noise reductions of 5 to 8dB(A) may be achieved. Where no line of sight is obstructed by the barrier, generally no noise reduction will occur.

As barriers are used to provide shielding and do not act as an enclosure, the material they are constructed from should have a noise reduction performance that is approximately 10dB(A) greater than the maximum reduction provided by the barrier. In this case the use of a material such as 10mm or 15mm thick plywood (radiata plywood) would be acceptable for the barriers.

9.3 MATERIAL HANDLING

The installation of rubber matting over material handling areas can reduce the sound of impacts due to material being dropped by up to 20dB(A).

9.4 TREATMENT OF SPECIFIC EQUIPMENT

In certain cases, it may be possible to specially treat a piece of equipment to dramatically reduce the sound levels emitted.

9.5 ESTABLISHMENT OF SITE PRACTICES

This involves the formulation of work practices to reduce noise generation. A more detailed management plan will be developed for this project in accordance with the construction methodology outlining work procedures and methods for minimising noise.

9.6 COMBINATION OF METHODS

In some cases, it may be necessary that two or more control measures be implemented to minimise noise.

10 COMMUNITY CONSIDERATIONS AND COMPLAINTS HANDLING

10.1 DEALING WITH COMPLAINTS

Should ongoing complaints of excessive noise or vibration recommendations occur immediate measures shall be undertaken to investigate the complaint, the cause of the exceedances and identify the required changes to work practices.

If a noise complaint is received the complaint should be recorded. Any complaint form should list:

- The name and address of the complainant (if provided);
- The time and date the complaint was received;
- The nature of the complaint and the time and date the noise was heard;
- The name of the employee who received the complaint;
- Actions taken to investigate the complaint, and a summary of the results of the investigation;
- Required remedial action, if required;
- Validation of the remedial action; and
- Summary of feedback to the complainant.

Multiplex have developed a 'Stakeholder and Communications Management Plan' to ensure complaints are appropriately managed. The Plan outlines the following:

- Strategies to manage communications when dealing with all stakeholders
- Protocols to manage enquiries from the public, media, neighbourhood groups and other interested stakeholders.
- Methods to inform the local community, including the public, media, neighbourhood groups, local community and adjoining neighbours, of construction or other works.
- Defined roles and responsibilities for the Multiplex personnel involved in implementing this plan.
- A suite of consultation and communications will be delivered by Multiplex to ensure the objectives are achieved.

Multiplex is to notify APP if a complaint is receiver (via Aconex). The complaints register is to be provided to APP monthly.

10.2 COMMUNITY CONSIDERATIONS

With reference to the JHHIP EIS prepared by Ethos Urban (ref: 2190777) measures to minimise disruption to the community have been undertaken in the form of the extended construction hours proposed for normal construction activities. The EIS have determined that extended construction hours are needed in order to:

- Reduce the length of the project to meet the critical project delivery timeframes driven by:
 - The need to provide clinical services to meet the significant forecast population growth, ageing population and Socio-economic status of residents within the JHHIPs tertiary catchment;
 - The need to replace current infrastructure to provide contemporary patient centred models of care in the delivery of Level 6 tertiary services; and
 - Significant increased demand for acute, sub-acute and ambulatory health services.
- Allow construction vehicles to avoid peak road network times and shift changeover times to reduce impact on the surrounding road network; and
- Minimise the impact on hospital operations during core business hours such as planned surgery and outpatient clinics.

In addition, to ensure ongoing community notice regarding construction work, letter drop activities have been performed within the greater vicinity of the site. A distribution map is appended within this management plan (See Appendix 4). The letter details monthly project updates with the associated construction work, procedures/methodologies in which noise and vibration is being minimised as well as relevant contact details. A sample letter is appended in this management plan (See Appendix 4).

11 CONCLUSION

This report presents a construction noise and vibration management plan associated with the construction works of the John Hunter Hospital redevelopment.

An assessment of potential noise and vibration impacts of typical construction equipment/processes anticipated for the stages of work have been detailed in Section 5. Ameliorative measures to mitigate these impacts are detailed from Sections 6 to 8.

Provided the recommendations, management controls and procedures outlined in this report are implemented, noise and vibration impacts from the proposed construction work can be appropriately managed.

Appendix 2 provides the relevant curriculum vitae for the authors of this document.

Appendix 3 provides a letterhead statement prepared by this office in relation to "high noise generating activities".

Appendix 4 provides the associated documentation with regards to community consultation that has currently been implemented to date.

Please contact us should you have any further queries.

Yours faithfully,



Acoustic Logic Consultancy Pty Ltd
Adrian Zappia
B.CrTech (Audio Engineering and Sound Production)

APPENDIX 1 – INDICATIVE NOISE AND VIBRATION MONITORING LOCATIONS

Note: The final locations for the noise and vibration monitors will be determined in consultation with Health Infrastructure, APP and the Hunter New England LHD prior to and during construction works.

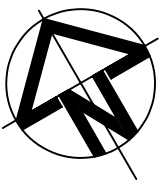
Proposed Vibration Monitoring Locations within existing John Hunter Hospital Building - Level 2

LEGEND

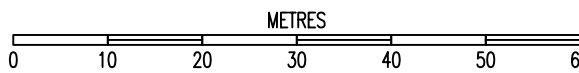
NOTE



A	INITIAL ISSUE	TH		23/02/21
No.	REVISION	BY	CHK	DATE



1:800



JOHN HUNTER HOSPITAL

COMBINED BUILDINGS

LEVEL 2

PROJECT NUMBER:	
ISSUED:	23/02/21
DRAWN BY:	TH
CHECKED BY:	
FILENAME:	FP_HNELHD_John Hunter Hospital_Overall Plan_L2.dwg

JH.01.102

A

DRAWING NUMBER

REVISION

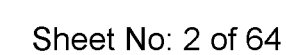
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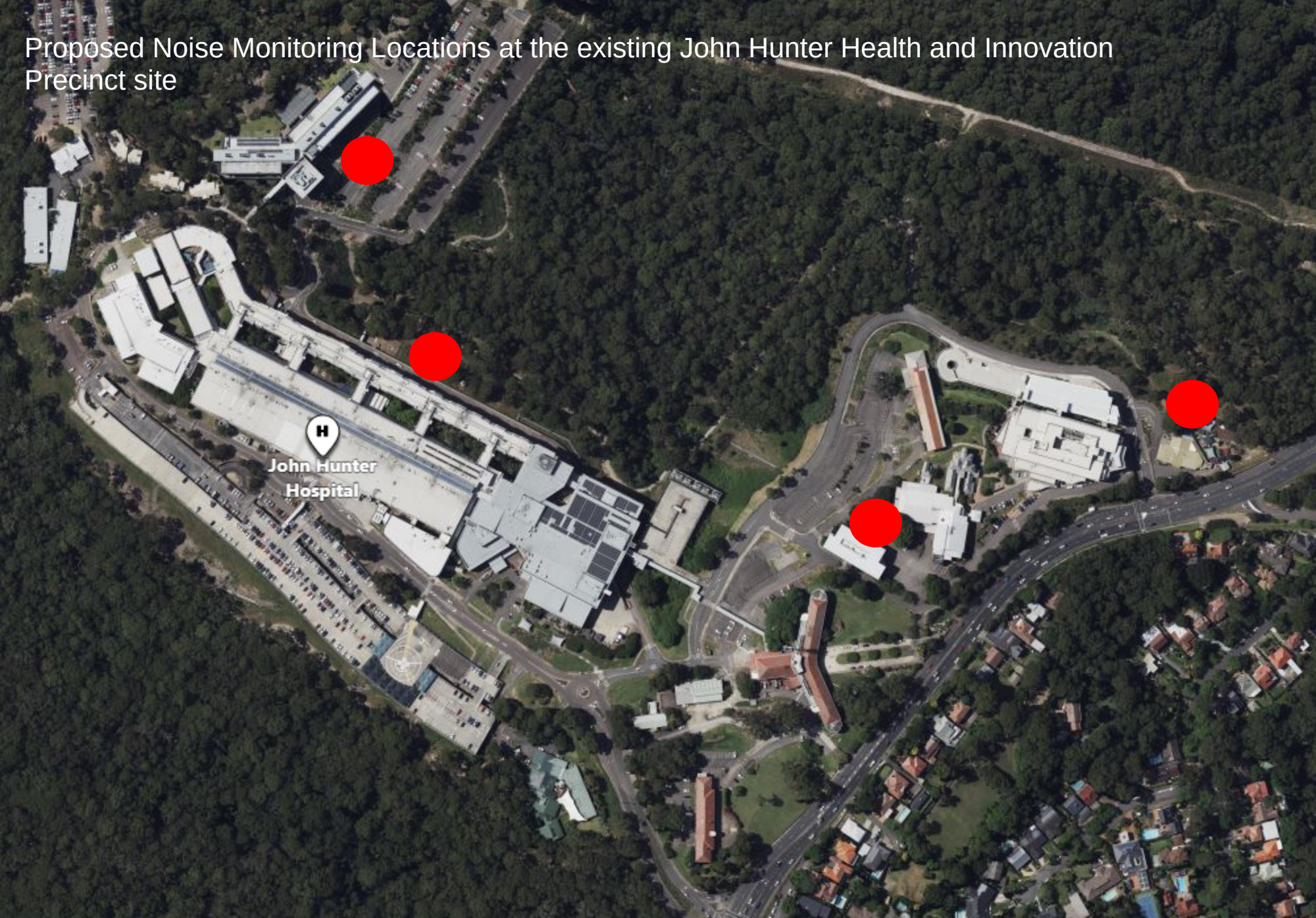
Coordination with TfNSW required to ensure accumulated vibration effects do not exceed maximum allowable levels.



-  EXISTING BUILDINGS
-  EXISTING ROAD
-  MODIFICATION TO EXISTING ROAD
-  PROPOSED ROAD
-  PROPOSED NEWCASTLE INNER CITY BYPASS, APPROVAL UNDER SEPARATE APPLICATION
-  PROPOSED ACUTE SERVICES BUILDING
-  PUBLIC DOMAIN
-  STORMWATER BASIN
-  EARTHWORKS
-  EXTENT OF TREE CLEARANCE
-  EXTENT OF APZ - PARTIALLY CLEARED
-  INDICATIVE SERVICES DIVERSION



Proposed Noise Monitoring Locations at the existing John Hunter Health and Innovation Precinct site



APPENDIX 2 – AUTHORS’ CURRICULUM VITAE

Position – Project Engineer**Qualifications**

2018 – 2020 Bachelor of Audio Engineering and Sound Production, JMC Academy
2019 – 2020 Technical Officer, Acoustic Logic Consultancy
2020 – current Project Engineer, Acoustic Logic Consultancy

Outline of Experience

Whilst at AL, Adrian has been trained in the measurement and analysis of noise and vibration. Adrian has worked in detailed assessment of acoustic impacts and been involved in the design of noise/vibration attenuation systems to meet relevant statutory codes (BCA, EPA guidelines and Australian Standards).

His work involves the investigation, design and construction supervision of noise and vibration control measures associated with mechanical services and building works.

Whilst being employed with Acoustic Logic, Adrian has been responsible for noise and vibration engineering for residential, commercial and special projects including;

- Noise investigations
- Building acoustics and building services noise control.
- Environmental noise modelling and assessment as required for consent authorities and master planning.
- Traffic, train and aircraft noise prediction.
- Industrial Noise Control.
- Construction Noise and Vibration.
- NSW Office of Liquor and Gaming acoustic assessment.
- Testing and assessment of walls/floors/glazing/building services.

Project Experience

A sample of projects Adrian has been or is currently involved with as a Project Engineer include the following:

Grand Reve, Castle Hill – Residential Development (Planning, Design & Construction)
338 Botany Road, Alexandria – Residential Development (Planning)
New Gosford Library (Design & Construction)
Green Square, Site 15 – Residential Development (Construction Noise & Vibration)
Sydney Roosters Centre of Excellence – Sydney Football Stadium (Design & Construction)
Stadium Club & Sydney Fitness Facilities – Sydney Football Stadium (Design & Construction)
Walsh Bay Arts Precinct (Construction)
Woolworths North Parramatta – Retail Development (Planning)
Parramatta Aquatic Centre (Design & Construction)
Coffs Harbour Hospital Expansion (Design & Construction)
Kingfisher Grove Retirement Village, Jordan Springs (Design & Construction)
Log Cabin Hotel, Penrith (Design & Construction)
45-47 Epping Road, Macquarie Park – Commercial Development (Planning)
63-71 Waterloo Road, Macquarie Park – Commercial Development (Planning)
50 Kent Road, Mascot – Commercial Development (Planning)
Australian Technology Park – Locomotive Workshop – Commercial Development

Qualifications

Master of Design Science (Audio & Acoustics) Sydney University 2008
Member of the Australian Acoustical Society
Member of the International Institute of Acoustics and Vibration (IIAV)

2018 – present	Associate Director, Acoustic Logic Consultancy
2012 – 2018	Senior Acoustic Consultant, Acoustic Logic Consultancy
2007 - 2012	Project Acoustic Consultant, Acoustic Logic Consultancy

Outline of Experience

Starting at Acoustic Logic Consultancy (ALC) in 2007, Tom has been involved in numerous State Significant Developments (SSDs) with a focus on entertainment precincts such as the Star Casino, The Darling Harbour Live Redevelopment, Western Sydney Stadium and Sydney Football Stadium.

Tom has also been intensely involved in the analysis, acoustic design, and construction supervision of two of Australia's leading acoustic research and development buildings, The Australian Hearing Hub located at Macquarie University, and the University of Technology Acoustic Laboratories. Tom was responsible for the full acoustic design and construction supervision of the anechoic chambers, hemi-anechoic chambers, reverberation rooms, ANSI test rooms, audiometric rooms etc).

Tom's areas of expertise include:

Theatre acoustics,
Spatial planning of development (room layouts, wall design etc).
Acoustic control of mechanical systems (ventilation systems, air-conditioning etc).
Acoustic design of reverberant noise in critical spaces (seminar rooms, theatres).
Environmental noise modelling and assessment as required for consent authorities.
Review of external noise impacts (traffic, rail).
Review of acoustic impact of helicopters/helipads.

Project Experience

Sydney International Convention, Exhibition and Entertainment Precinct (Lend Lease)
Star Multi Use Entertainment Facility (MUEF) (Brookfield Multiplex)
Blacktown Hospital
Lismore Hospital
Prince of Wales CCBDC / NCCC & AATC
Comprehensive Cancer and Blood Disorder Centre (CCBDC) – Prince of Wales
Australian Hearing Hub - (Macquarie University) – Cochlear / WATPAC NSW
New South Glasgow Hospitals – Brookfield Europe
CSR Trinit Office Fitout – CSR Limited / FDC Building
Cochlear Global Headquarters (Macquarie University) – Cochlear / WATPAC NSW
Macquarie University Private Hospital Medical Imaging Unit – Macquarie University
Royal North Shore Hospital Refurbishment – Thiess Pty Ltd
Milton Railway Redevelopment (Milton, Queensland) – FKP Limited

**AUSTRALIAN
ACOUSTICAL
SOCIETY**



This is to certify that

THOMAS AUBUSSON

was admitted to the grade of

MEMBER

of the Australian Acoustical Society

on 26th May 2014

and is entitled to use the letters

M.A.A.S.

issued on 4 July 2014



President



General Secretary



APPENDIX 3 – ACOUSTIC LOGIC LETTERHEAD IN RELATION TO CONDITION 12(6)

20181544.22/2704A/R0/TA

27/04/2022

Multiplex Constructions Pty Ltd
Level 23
135 King Street
SYDNEY NSW 2000

Attn: Steve Russell

John Hunter Hospital - Condition B19 (g)

This letter has been prepared to address Condition B19 (g) which states the following:

(g) include strategies that have been developed with the community for managing high noise generating works;

As per the Construction Noise and Vibration Management Sub-Plan (ref: 20181544.10/0804A/R3/AZ) prepared for the site we can confirm that the "highly noise affected level" is not predicted to be exceeded at any point during the construction works. The highly noise affected level is described as follows:

"Highly noise affected level". Where noise emissions are such that nearby properties are "highly noise effected", noise controls such as respite periods should be considered. For residential properties, the "highly noise effected" level occurs when construction noise exceeds 75dB(A)_{Leq(15min)} at nearby residences.

The highly noise affected level occurs when construction noise exceeds 75dB(A)_{Leq(15min)}.

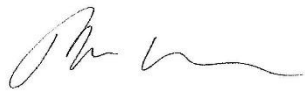
As per Tables 8 – 14 of the Construction Noise and Vibration Management Sub-Plan, this level "Highly noise affected level" is not predicted to be met or exceeded at any surrounding receiver, with a compliance buffer generally in the order of 30dB(A)_{Leq(15min)}.

SYDNEY
9 Sarah St
MASCOT NSW 2020
(02) 8339 8000ABN 98 145 324 714
www.acousticlogic.com.au

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We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Thomas Aubusson', with a stylized, flowing script.

Acoustic Logic Pty Ltd
Thomas Aubusson

APPENDIX 4 – COMMUNITY CONSULTATION MEASURES IMPLEMENTED BY MULTIPLEX



JOHN HUNTER HEALTH AND INNOVATION PRECINCT

APRIL 2022 UPDATE



ARTIST IMPRESSION



ARTIST IMPRESSION

GOT A QUESTION?

We're always happy to hear from you. If you would like to know more about the project, have feedback or would like to register to receive regular project updates, please contact us at:

HI-JHHIP@health.nsw.gov.au

or visit our website for further information.

ENABLING WORKS START

Our expansion is now underway, with Multiplex Constructions appointed the enabling works contractor for our new state-of-the-art John Hunter Health and Innovation Precinct. The enabling works signal the start of the construction

process by preparing the site for the main construction works, and are expected to be completed by the end of 2022. The main construction works will then follow.

More information can be found at our website: hneinfra.health.nsw.gov.au

Keep in touch with the John Hunter Health and Innovation Precinct

 hneinfra.health.nsw.gov.au  [@HI-JHHIP](https://twitter.com/HI-JHHIP) health.nsw.gov.au

CHANGES AROUND THE CAMPUS

You will notice some changes around the campus as part of our enabling works, including the establishment of site sheds, temporary signage, environmental clearing, fencing and machinery. Construction activities will take place from 6am to 6pm Monday to Friday, and 7am to 5pm on Saturdays. We're working hard to ensure there's minimum impact to our neighbours.

Noise and vibrations

Reducing noise, vibration and dust during construction is our key focus. Noise and vibration monitors will be placed in surrounding buildings and connect into a network that provides real-time monitoring.

There's also several dust mitigation measures on-site, including:

- ensuring fences have shade cloth to help suppress dust
- changing the activities that take place during high winds and poor weather conditions
- covers on material stockpiles
- application of 'dust block' which seals dirt to ensure it doesn't become airborne
- road sweepers along surrounding roads to collect dust and dirt
- hand-held water sprays and construction vehicle water carts
- daily air monitoring and real time tracking during construction.

If you have any concerns at any time about the construction activities please contact Multiplex on 0414 299 229.

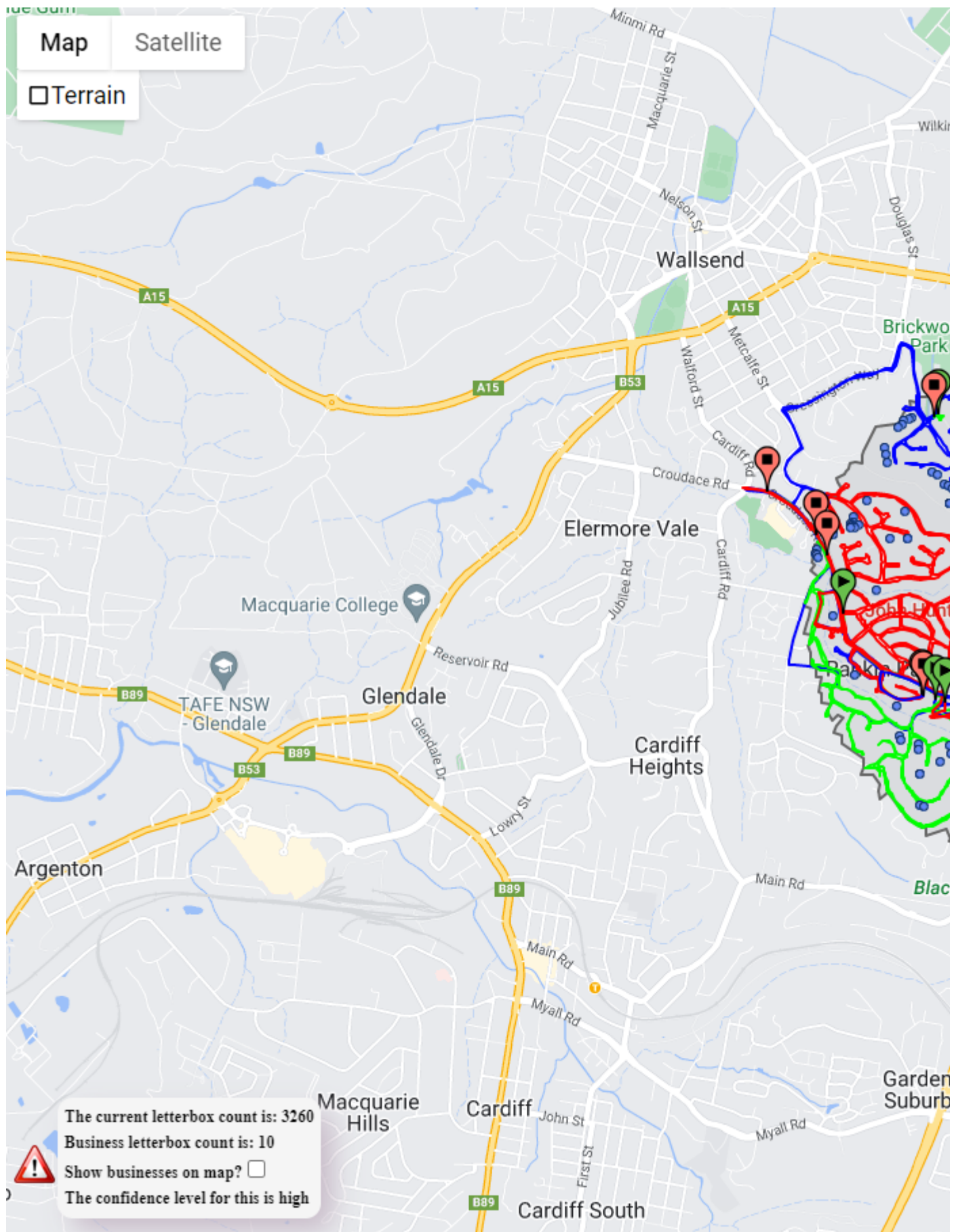


Steve Russell

From: Watson, Mathew <Mathew.Watson@app.com.au>
Sent: Thursday, 28 April 2022 2:47 PM
To: Steve Russell
Subject: FW: Health I-ADVICE-000074: Neighbour letterbox
ACNXREF<L4jILpulkmu2PpFwNhoY4> [APPC.c58Zw]

Hi Steve,

As requested this morning please see email below with link to area of distribution. I have screenshot and provided that here in case the link stops working at some point in time.



Regards,

Mathew Watson | Senior Project Manager



m 0408 927 612 | e mathew.watson@app.com.au | Awabakal Country | a Level 2, 426 King Street, Newcastle, NSW 2300

app.com.au [in](#) [t](#) [@](#) [Connect with me on LinkedIn](#)

APP Corporation acknowledges Aboriginal and Torres Strait Islander Peoples as the Traditional Custodians of the Land, Rivers and Sea. We acknowledge and pay our respects to the Elders past, present and emerging of all Nations.

This email and any files transmitted with it is confidential and intended solely for the use of the individual to whom it is addressed. If you have received this email in error please inform the postmaster@app.com.au or the sender.

From: Kylie Neville (Health Infrastructure) <Kylie.Neville@health.nsw.gov.au>

Sent: Thursday, 28 April 2022 2:12 PM

To: Watson, Mathew <Mathew.Watson@app.com.au>

Subject: RE: Health I-ADVICE-000074: Neighbour letterbox ACNXREF<L4jlLpulkmu2PpFwNhoY4> [APPC.c58Zw]

EXTERNAL

Hi Mat, this is the distribution area [click here](#) 3260 households. Hope this helps.
We will also get GPS coverage once the drop is completed, which I can provide.
Thanks,
Kylie

Kylie Neville

Communication and Engagement Lead | **Health Infrastructure (Monday, Tuesday & Thursday)**

0438 254 008 | Kylie.Neville@health.nsw.gov.au

From: Watson, Mathew <Mathew.Watson@app.com.au>

Sent: Thursday, 28 April 2022 2:00 PM

To: Kylie Neville (Health Infrastructure) <Kylie.Neville@health.nsw.gov.au>

Subject: FW: Health I-ADVICE-000074: Neighbour letterbox ACNXREF<L4jlLpulkmu2PpFwNhoY4> [APPC.c58Zw]

Good afternoon Kylie,

Do HI have a distribution map for the attached letter box drop? As part of project requirements we need to provide evidence of consultation and notices, a distribution map for this particular one would be handy to illustrate this.

Regards,

Mathew Watson | Senior Project Manager

APP Corporation Pty Limited



m 0408 927 612 | e mathew.watson@app.com.au | Awabakal Country | a Level 2, 426 King Street, Newcastle, NSW 2300

app.com.au [in](#) [t](#) [@](#) [Connect with me on LinkedIn](#)

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From: Nicholas Rayner <auto-reply-au1@au.aconex.com>
Sent: Wednesday, 27 April 2022 9:52 AM
To: Watson, Mathew <Mathew.Watson@app.com.au>
Subject: Health I-ADVICE-000074: Neighbour letterbox ACNXXREF<L4jlLpulkmu2PpFwNhoY4>

EXTERNAL

When replying, do not delete the content below this line.

You have received a new **Advice: Health I-ADVICE-000074**

Project: JHHIP

Type: Advice

Mail Number: Health I-ADVICE-000074

To: Brett McFadzien, Multiplex Constructions Pty Ltd
Mr Glenn Moore, Multiplex Constructions Pty Ltd
Jeffrey Wall, Multiplex Constructions Pty Ltd

Cc: Mr Ethan Clark, APP Corporation Pty Ltd

Mr Mathew Watson, APP Corporation Pty Ltd

Scott Liddell, Health Infrastructure

Mr Simon Ritchard, Multiplex Constructions Pty Ltd

From: N Rayner, Health Infrastructure

Sent: 27/04/2022 9:51:34 AM AEST (GMT +10:00)

Status: N/A

Subject: Neighbour letterbox

Hi Team

HI Comms have finalised the attached flyer which will be distributed to 3,400 neighbours to the precinct advising of the commencement of enabling works.

This will be distributed on Friday 29 April 2022.

regards

Nicholas Rayner

Project Director

Rural & Regional

Health Infrastructure

M 0421 716 347 **E** Nicholas.Rayner@health.nsw.gov.au

This is an automatic notification from **Aconex** .

To reply to this message, **hit the Reply button on your email program or [view this Mail on Aconex](#)**. Do not edit the subject line.

Aconex

Project success. Easy as Aconex.

This email is automatically generated by Aconex.

If you would like to turn off email messages, log into Aconex and edit your "Notifications" user preferences.

If you need assistance, please contact our [Service Desk](#).

Regards,

The Aconex Team

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This message is intended for the addressee named and may contain confidential information. If you are not the intended recipient, please delete it and notify the sender.

Views expressed in this message are those of the individual sender, and are not necessarily the views of NSW Health or any of its entities.

Map

Satellite

☐ Terrain

The current letterbox count is: 3260

Business letterbox count is: 10

Show businesses on map? ☐

The confidence level for this is high