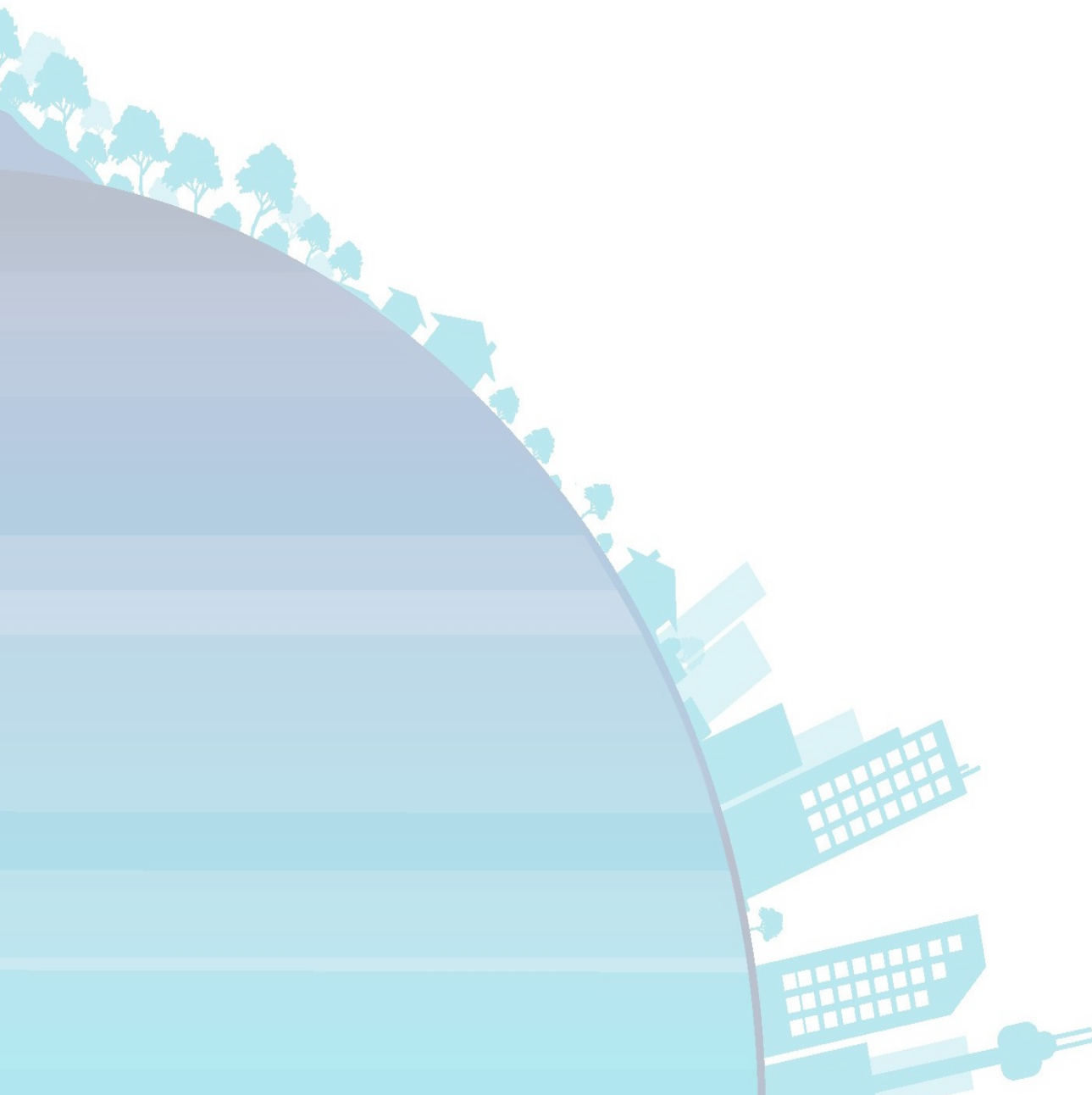


Appendix E. Updated Preliminary Construction Management Plan

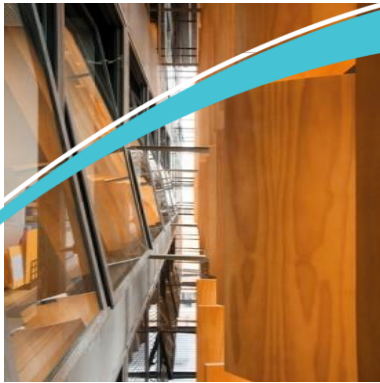




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UNIVERSITY
OF WOLLONGONG
AUSTRALIA



Molecular & Life Sciences Building

University of
Wollongong

September 2017

**Preliminary
Construction
Management Plan**
(subject to confirmation by appointed
Construction Contractor)

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INTRODUCTION

This Preliminary Construction Management Plan (the Plan) has been prepared for the University of Wollongong (UOW) Molecular & Life Sciences Building (MLS) project, and accompanies the State Significant Development Application (SSDA). The plan sets out the minimum provisions for compliance by the principal contractor once the construction contract is awarded.

The MLS site (the Site) is currently occupied by an on grade bitumen car parking. The location plan of the Site is show below in Figure 1.

The project Works involve the following:

- Demolition of an existing substation and gas bottle store (Building 66)
- Demolition of an existing on grade carpark (P7)
- Construction of two substations
- Construction of a new chemical store
- Construction of the new MLS building.

The MLS building will contain a Cryogenic Transmission Electron Microscope microscopy suite, other advanced microscopy suites, biological laboratories, animal (rodent and aquatic) holding and support facilities and a rooftop platform for Atmospheric Chemistry.

The anticipated construction commencement is January 2018 and completion by August 2019.

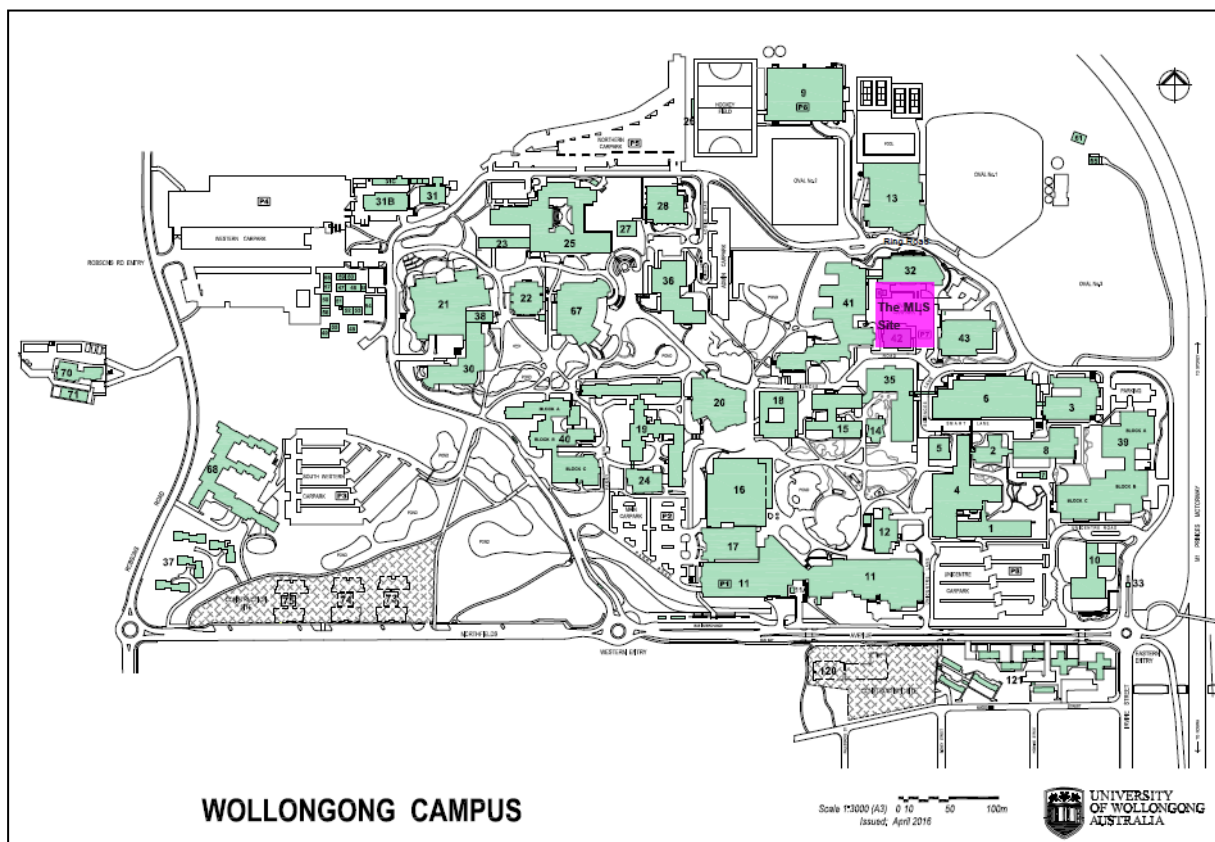


Figure 1 – University of Wollongong Campus Plan and the Site

The Plan covers the following areas of management:

- Legislative requirements;

- Hours of operation;
- Public and property protection;
- Noise;
- Dust Management;
- Odour control;
- Storage of dangerous goods;
- Water quality / stormwater runoff;
- Waste management principles;
- Hazardous materials management;
- Traffic and pedestrian management; and
- Services disconnections.

The Works will be undertaken by a suitably licensed principal contractor (the Contractor) holding current and appropriate licences and insurances.

All statements and proposals documented in this Plan will be reviewed at the time of contract award for the Works to ensure alignment with proposed preferred methodologies and sequencing developments.

LEGISLATIVE REQUIREMENTS

The Works will be undertaken in accordance with the following legislative requirements:

- Protection of the Environment Operations Act and Regulations
- Environmentally Hazardous Chemicals Act 1985
- Protection of the Environment Administration Act and Regulations
- Work Health and Safety 2012 and relevant codes of practice and Standards
- Australian Standard 2601-2001: Demolition of Structures
- Code of Practice for the Safe Removal of Asbestos (NOHSC:2002 (1998))
- Guide to the Control of Asbestos Hazards in Buildings and Structures (NOHSC:3002 (1998));
- Resource and Recovery Act 2001
- Environmental Planning and Assessment Act 1979
- Heritage Act 1997
- Local Government Act 1993
- Work Health and Safety Act 2011- NSW
- Soil Conservation Act 1983.

HOURS OF OPERATION

The hours of construction are proposed to be:

- 7am to 6pm Monday to Friday
- 7:30 am to 5pm on Saturday
- No work Sundays and Public Holidays

Additional construction hours are proposed for Saturdays as the closest residential receiver is 300m away however educational receivers are close by and immediately adjacent. On Saturdays the educational receivers will primarily be vacant and therefore noisier works will have a lesser impact on the surrounding environment. Saturdays have been identified as the most appropriate for noisier works and therefore an increase in construction hours on Saturday is warranted to allow these noisier works to be carried out with minimal impacts on the operation of the university. The updated Noise Report identifies requirements for noise monitoring during construction.

Deliveries of heavy machinery may be required out of the proposed hours of operation to conform to the overriding requirements of the Roads & Maritime Services (RMS).

PUBLIC & PROPERTY PROTECTION

All Works will be undertaken in accordance with the public protection measures as required in the applicable Australian Standards.

It is proposed to install Australian Temporary Fencing with shade cloth around the construction zone within the Site to prevent public access into the area of the Works and to maintain security to the Site.

A methodology will be developed that provides the least disruption to the Campus during the construction program.

The above public and property protection measures will be reviewed at the time of contract award for the construction of the Works for alignment with proposed preferred methodologies and sequencing developments and to ensure that the safety of the public is maintained at all times during the Works.

ENVIRONMENTAL

The Contractor constructing the Works will be required to submit for approval a comprehensive Environmental Management Plan (EMP) to ensure that all elements of the plan meet all statutory requirements as well as UOW requirements.

As a minimum, the erosion and sediment controls for the Works shall be designed, installed and maintained in accordance with the requirements of Managing Urban Stormwater: Soils and Construction "The Blue Book" 2004 (4th edition).

The environmental performance of the Contractor will be monitored and reported monthly, throughout the Works.

The following specific environmental management principles will be implemented on site.

NOISE AND VIBRATION

Noise from the Site shall not exceed the limits set out in the Protection of the Environment Operations Act 1997. No machine work will occur outside the normal working hours set unless approval has been given by the consent authority.

Demolition work shall comply with Australian Standard 2436-1981 "Guide to Noise Control on Construction, Maintenance and Demolition Sites".

The noise and vibration from the use of any plant equipment and/or building services associated with the premises shall not give rise to an offensive noise as defined under the provisions of the Protection of the Environment Operations Act 1997.

Prior to commencement of the demolition/construction works, liaison will take place with staff from UOW whom occupy neighbouring buildings on the campus.

DUST

To control dust generation and where necessary, water will be sprayed at the source of origin, over demolition materials during demolition and loading activities to prevent airborne dust particles migrating into the surrounding environment.

Ground coverings including existing sealed areas of bitumen and concrete will remain as the final item for demolition. This will act as a manageable hardstand for vehicular traffic and will also provide a seal to the underlying material to assist in minimising erosion and sediment run off.

Additional precautions that will be implemented during the Works include the covering of all haulage trucks with tarpaulins and the use of mobile water points during the hammering, processing and loading of concrete.

ODOUR CONTROL

In terms of demolition activity for the Site, odour problems will be minimal. All plant and machinery involved in the Works will be regularly serviced and checked for exhaust emissions.

Stormwater gully pits will preferably be cleaned with shovels. Debris collected will be bagged to minimise odour, and disposed of appropriately.

STORAGE OF DANGEROUS GOODS

It is unlikely that the Works will involve the use of flammable fuels such as petrol, diesel, Oxy-acetylene, oils, etc.

Storage of any such items will be in a lockable compound with sufficient ventilation in accordance with relevant codes of practice and Standards.

Material safety data sheets on all of these flammable and potentially harmful liquids will be provided by the Contractor undertaking the Works.

STORMWATER RUN OFF

Drainage of surface run-off will be allowed to flow along existing contours with the existing drainage system on-site of kerbs, gutters, gully pits, pipes and stormwater runoff passing through installed filtration systems prior to being discharged off-site.

The site will be kept clean of rubble to minimise possible sediment flow during rainfall periods.

Stormwater kerbs and drainage lines will have sediment controls in the form of hay bales or sedimentation socks.

Stormwater grate inlets surrounding the demolition areas will be covered with geotextile fabric to allow water to enter into drains whilst retaining sediments.

Should external surface run-off flow into areas of demolition and excavation work, it may need to be diverted (using hay bales) to reduce sediment transportation.

All drainage control devices will be regularly checked particularly during heavy rainfall periods.

WASTE MANAGEMENT / RECYCLING PRINCIPLES

The Contractor will be required to achieve compliance with the EPA guidelines.

Prior to demolition activities being undertaken, the Contractor is required to review the geotechnical and land contamination investigation reports. If required, any hazardous materials encountered will be removed and disposed of at a licensed waste facility.

As part of the contractual requirements for the Works, the Contractor will be required to provide all transport and disposal documentation for all waste materials.

The key to maximising recycling and minimising waste going to landfills is to effectively separate the individual materials during the demolition phase.

Material generated from the Works will be recycled where appropriate apart from selected soft demolition materials and any encountered hazardous materials such as asbestos, SMF, PCB'S and the like.

For detailed assessment of the likely waste generated from the Works, please refer to the Jacobs' Waste and Recycling Management Plan.

HAZARDOUS MATERIAL MANAGEMENT

IDENTIFICATION

Previous studies of the site have identified that there is no asbestos in Building 66 or general site pavements and on grade carpark, which are proposed to be demolished. If any further asbestos is identified during the demolition phase, the management and site removal of these products will be done in accordance with Australian Standards.

These reports will be used as the basis for identifying and managing the removal of hazardous materials during the Works. 'Unexpected finds' protocols and secure isolation of the Site from the general public will also reduce the risk of potential harm to people.

AIR MONITORING

As an integral component of the Works and in accordance with all codes and standards, air monitoring will be undertaken by a registered occupational hygienist if asbestos removal works are being undertaken.

The daily monitoring results will be assessed by an Occupational Hygienist and distributed daily to the Contractor and the Client.

REMOVAL

All asbestos and hazardous material works will be undertaken by WorkCover licensed contractors supervised and monitored by registered occupational hygienists.

The Works will comply with all relevant codes and Standards.

DISPOSAL

Asbestos and other hazardous materials will be loaded and transported in accordance with all relevant codes and Standards.

All asbestos materials will be bagged and wrapped and placed in plastic lined disposal containers.

All asbestos and hazardous materials will be disposed of at a registered EPA landfill with full accountability and traceability of transport and disposal monitoring enforced and monitored throughout the construction period.

TRAFFIC MANAGEMENT

The following sections provide indicative traffic management information. Additional information is to be provided by the Contractor once it is appointed to undertake the Works.

OTHER UOW CONSTRUCTION PROJECTS

Competing UOW construction projects can cause a cumulative traffic impact and must be considered. The UOW P5 Car Park Extension project is currently under construction, and is on track to complete by January 2018. The MLS is currently programmed to commence construction in early February 2018. Therefore it is unlikely that these projects will be in construction at the same time.

At this stage UOW is not anticipating that other construction activities will be occurring at the same period as the MLS. However, should this not be the case then the relevant project teams are to consider the MLS construction traffic and mitigate against exacerbating the construction traffic impacts. One such measure would be to use other campus access roads e.g. western access to the campus.

As part of the proposal the workers are expected to organise their own travel arrangement and no on-site parking will be provided.

INDICATIVE TRUCK MOVEMENT NUMBERS AND SIZES

It is proposed that all construction and demolition traffic will enter and exit the Site from Sciences Road, off Campus Ring Road (refer to Figure 3 below). Trucks are to have enough room to enter, turn and manoeuvre on the Site and are to be able to enter and exit the Site in forward directions. The following typical trucks are proposed to be used during the project:

- Medium Rigid Vehicles (MRVs), including concrete agitators and pumps
- Articulated Vehicles (AVs)

All trucks will be loaded to their prescribed weight limits, within the Site boundary and be covered with a tarp (rubbish/excavation loads only) prior to exiting the Site.

All deliveries are to be organised to mostly occur outside peak traffic periods. As a minimum, it will be expected that all deliveries will be pre-arranged to coordinate vehicle movements to prevent backing up of vehicles on internal/external roads.

The estimated frequency, time and size of the demolition and construction vehicles will be confirmed by the Contractor prior to commencing the Works. It is expected that vehicle movements will start low, increase during the middle stages of the project and reduce again as the project nears completion. The following table provides an estimate of numbers of anticipated truck movements per day.

Type of Works	Timeline	Maximum Anticipated Vehicle Quantity/Day
Initial Establishment and Demolition	Months 0-2	8
Foundation and Ground Floor Construction	Months 2-6	20
Suspended Structure	Months 6-12	40
Facade and Internal Finishes	Months 9-16	10
External Landscaping	Months 16-18	10
FF&E and Specialist Equipment Install	Months 16-20	10

It is anticipated that the above vehicle movements can be accommodated within the road network.

INDICATIVE SITE MAP SHOWING ACCESS POINTS AND TURNING AREAS

The vehicles that are being used for construction and demolition purposes will access the site via Sciences Road - turning left off the Ring Road. The proposed vehicle sizes will include a Medium Rigid Vehicle and an Articulated Vehicle.

To test if these vehicle sizes are suitable to access the site, Turning Path Assessments have been conducted for the following scenarios (refer to Appendix A for the drawings):

Drawing Number	Vehicle Type	Turning Path
CKC UOW2V01	19.0m LONG SEMI-TRAILER	Entering Sciences Road
CKC UOW2V02	19.0m LONG SEMI-TRAILER	Exiting Sciences Road onto Ring Road
CKC UOW2V03	19.0m LONG SEMI-TRAILER	Entering Site in forward direction
CKC UOW2V04	19.0m LONG SEMI-TRAILER	Performing U-Turn within site
CKC UOW2V06	19.0m LONG SEMI-TRAILER	Exiting the site
CKC UOW2V07	MRV	Manoeuvres within site to ensure it exits in forward direction
CKC UOW2V08	MRV	Entering the Site

TRAFFIC CONTROL AND PEDESTRIAN PROTECTION MEASURES EXPECTED TO BE IMPLEMENTED DURING CONSTRUCTION

The access to the Site is to be controlled by qualified traffic controllers and managed to meet the staging requirements of the Works. Hoardings, temporary fencing and construction gates with appropriate signage will prevent unauthorised access to the Site during the Works. Pedestrians will be diverted and controlled by the traffic controllers as necessary.

Driver conduct is to be controlled via the following measures:

- All deliveries are to be pre booked
- All deliveries are to check in at the site office
- Vehicles are to enter and exit the site in a forwards direction along the nominated travel path
- Drivers are to give way to pedestrians and plant at all times.

In the case that an articulated vehicle (AV) needs to access the site, to facilitate the turning movements for both entry and exit, a qualified traffic controller will be stationed at the intersection of Sciences Road and The Ring Road, as well as the entrance into the site itself.

SUITABILITY OF THE INTERSECTION OF SCIENCES ROAD AND RING ROAD FOR CONSTRUCTION AND DEMOLITION VEHICLE ACCESS

Sciences Road joins Ring Road forming a T-Intersection with the Ring Road having priority. The road geometry of the intersection provides sufficient manoeuvrability to accommodate turning movements for an articulated vehicle (as demonstrated in the turning path assessment referred to earlier).

In regards to an articulated vehicle accessing the site, it is expected that as the vehicle turns, it will encroach across both sides of the carriageway (i.e. utilising the full width of the carriageway). The Contractor for the MLS will need to ensure this is communicated to the relevant stakeholders including the traffic controllers.

SERVICES DISCONNECTION

The Contractor will be required to notify the UOW Facilities Management Department if there is an anticipated services disruption and coordinate its shutdown to suit operational needs. The Contractor is to follow the UOW procedure for notification of disruption to services at all times. There is a minimum of 7-days notice requirement to UOW.

Such site services include:

- Wastewater
- Water
- Electricity
- Stormwater
- Telecommunications
- Gas.

In general terms the following principles will be adopted by the Contractor when disconnecting services:

- Service authorities will be consulted prior to the Works commencing to ascertain lead times and correct termination locations
- Termination works will be undertaken in accordance with design engineers' specifications and instructions
- Termination works will be undertaken by suitably licensed contractors
- Any termination works that impact on adjoining owners/departments will be notified and will be undertaken out of hours to minimise impact.

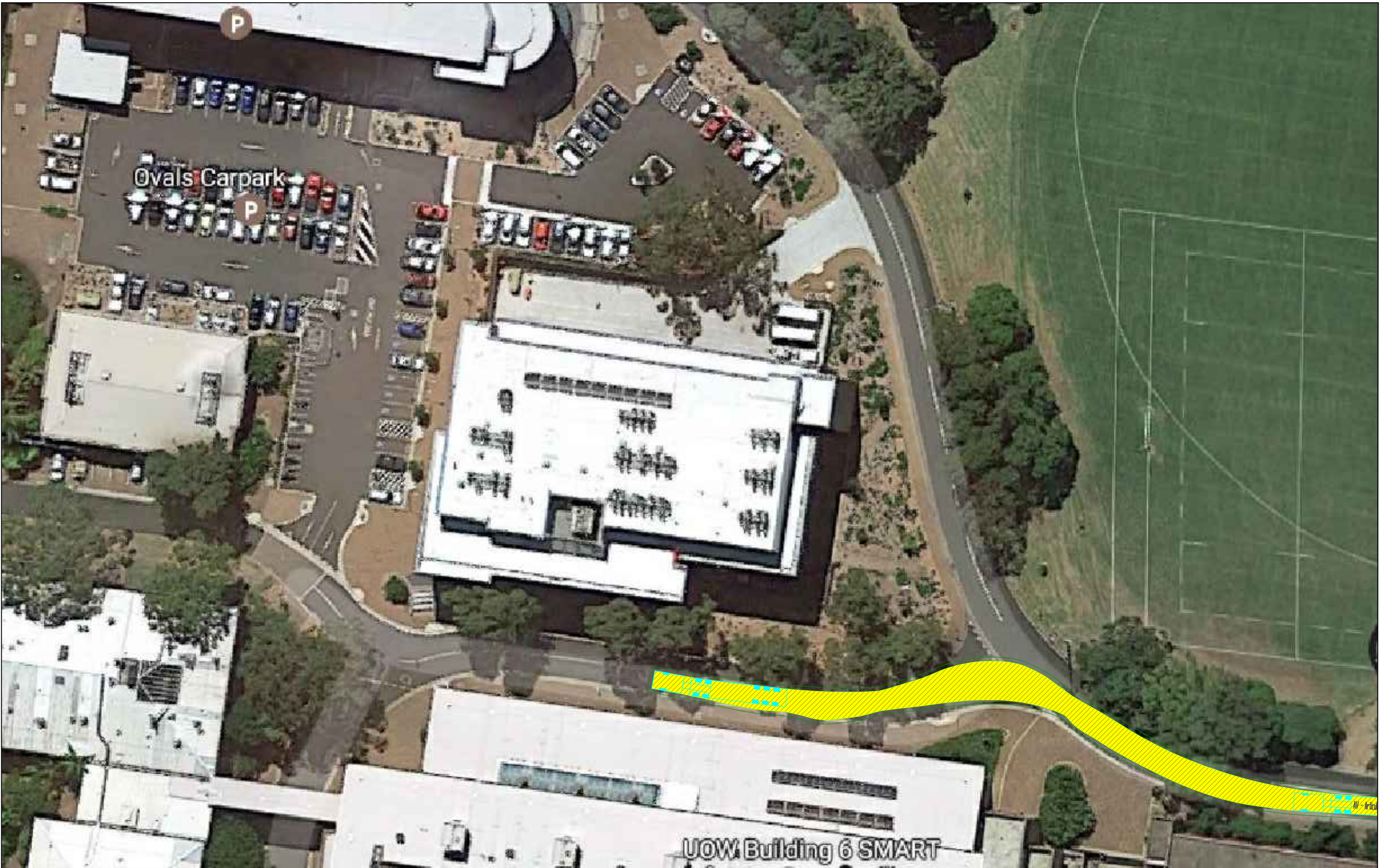
CONSTRUCTION STEPS

Subject to verification in accordance with the Contractor's construction methodology when appointed:

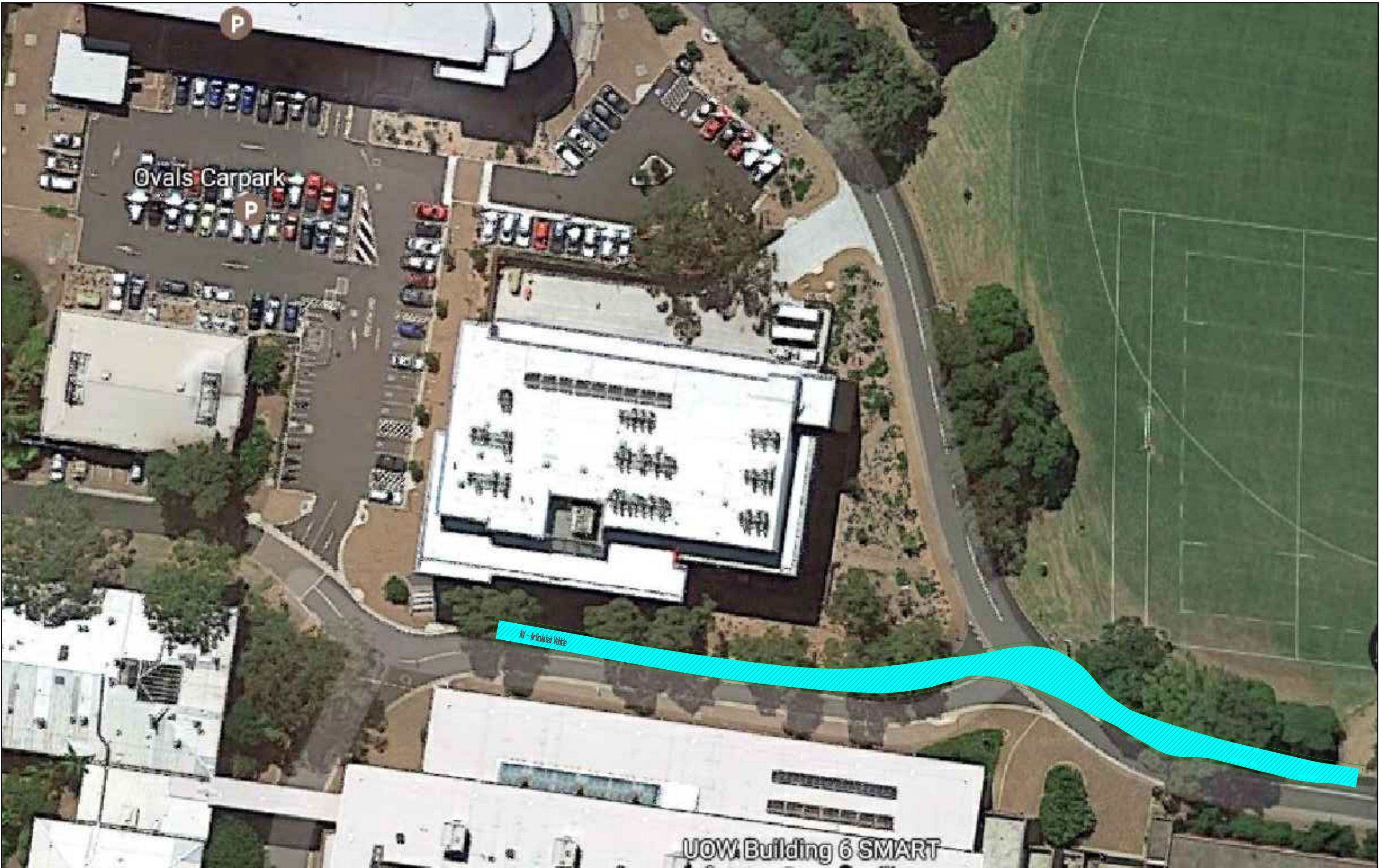
1. Construction of two substations
2. Construction of a new chemical store
3. Demolition of an existing substation and gas bottle store (Building 66)
4. Demolition of an existing on grade carpark (P7)
5. Construction of the new MLS building.

APPENDIX

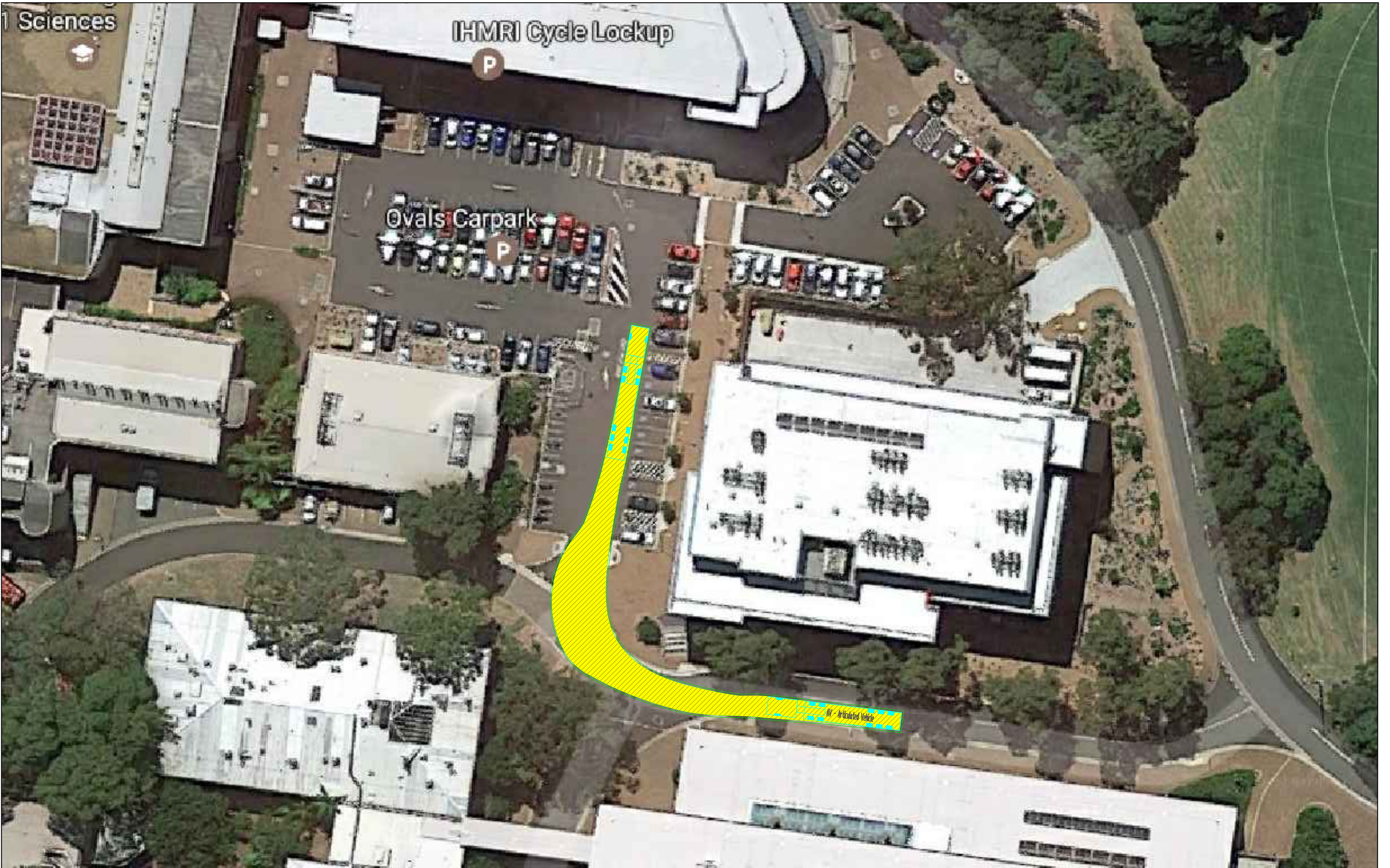
APPENDIX A: TURNING PATH ASSESSMENT DRAWINGS



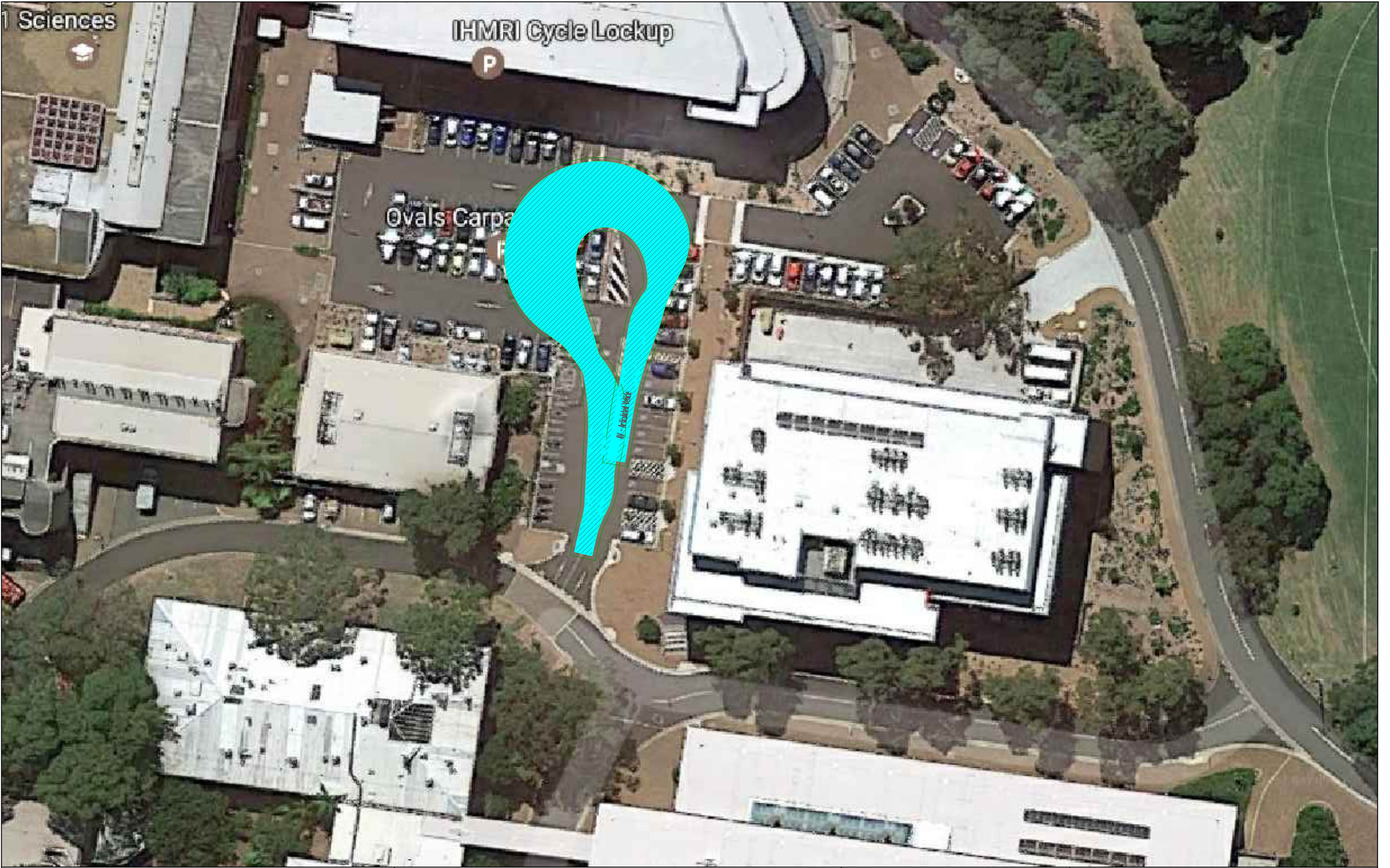
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	PROJECT ADDRESS - MOLECULAR BUILDING	NOTES - CONSTRUCTION VEHICLES	



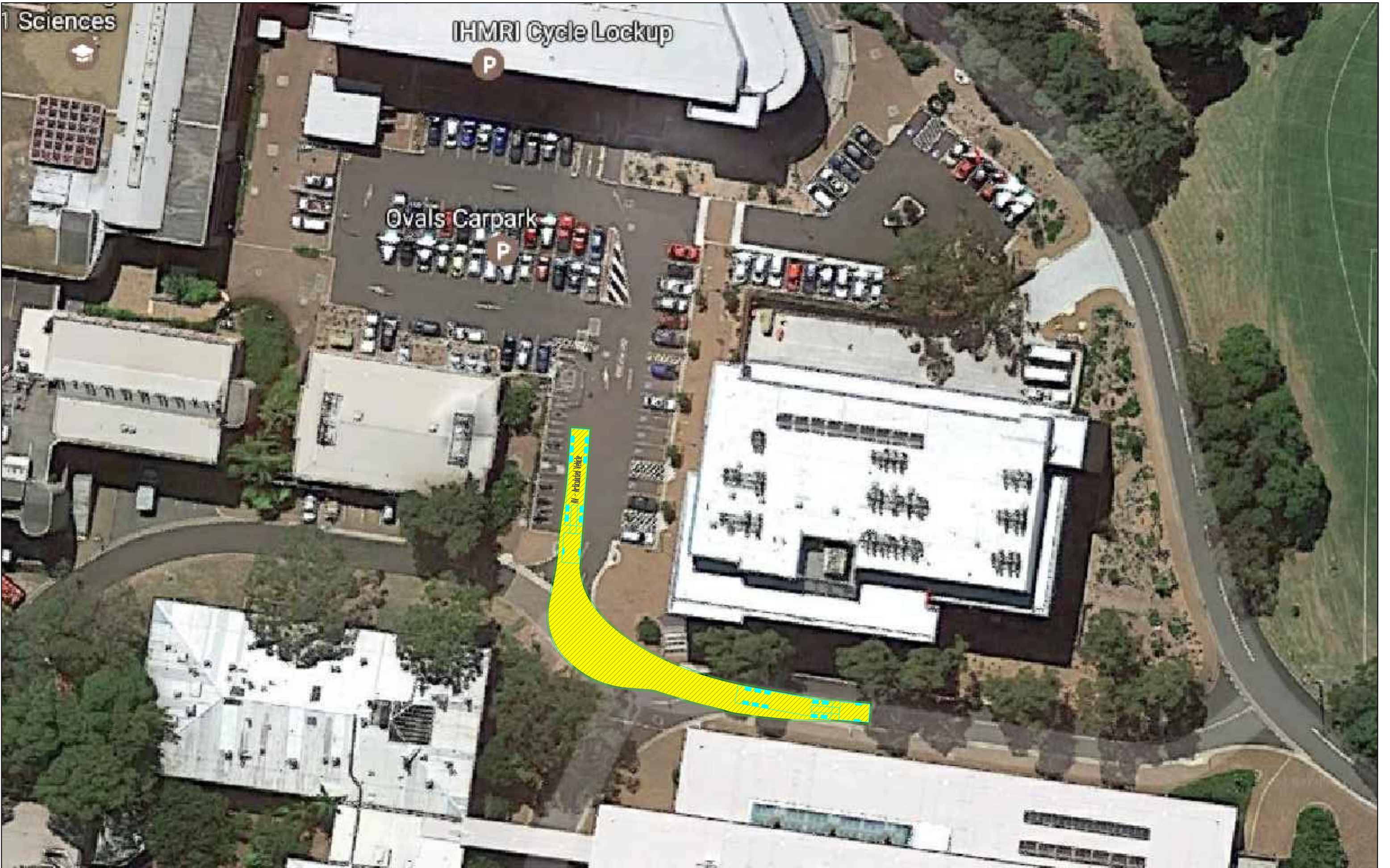
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	CLIENT- UNIVERSITY OF WOLLONGONG	DRAWING NO - CKC UOW2V02	DATE - 24/04/2017
	PROJECT ADDRESS - MOLECULAR BUILDING	NOTES - CONSTRUCTION VEHICLES	



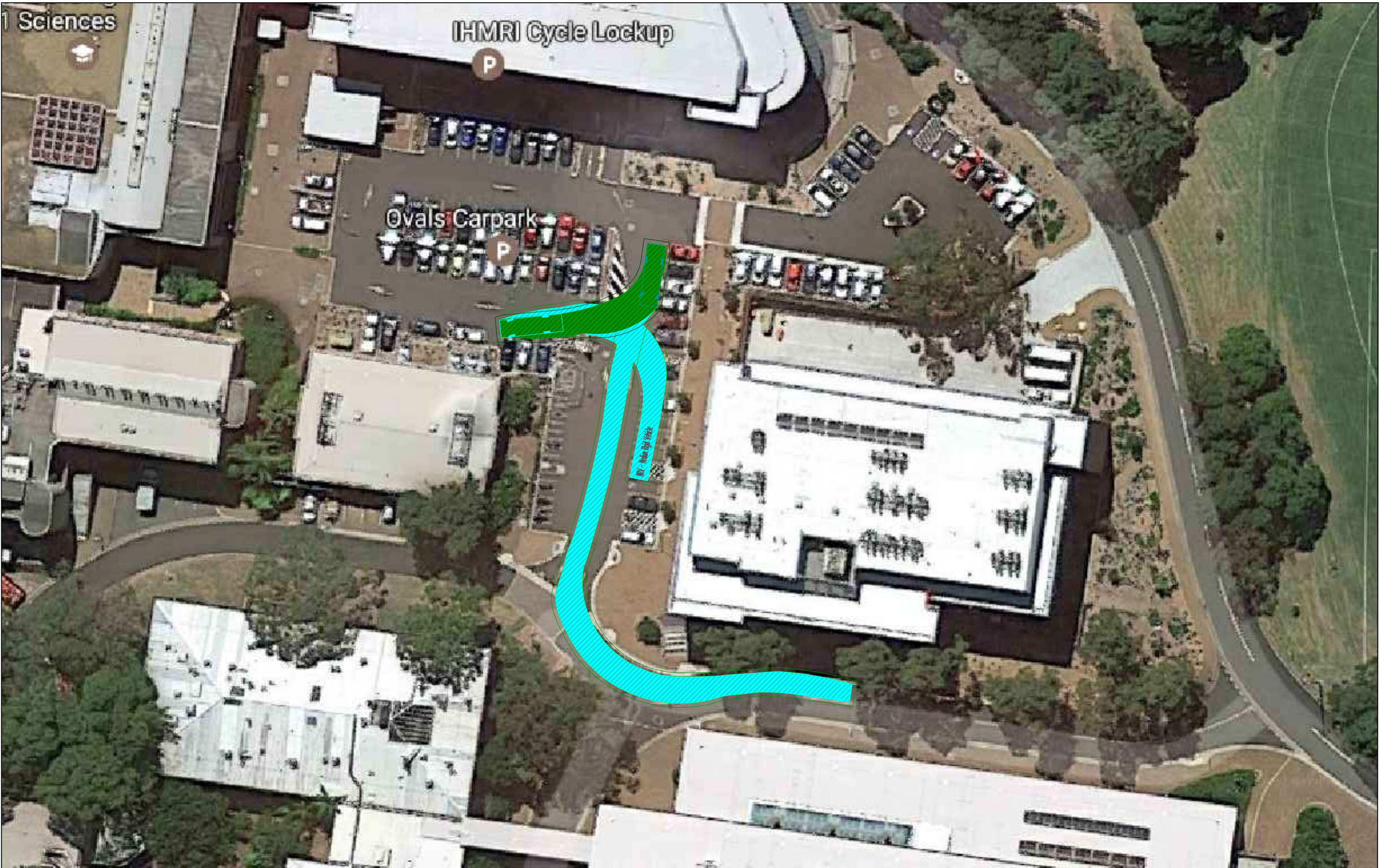
DRAWING TITLE- 19.0m LONG SEMI-TRAILER ACCESSING THE SITE	PROJECT NO - CKC UOW02	SCALE - NTS
CLIENT- UNIVERSITY OF WOLLONGONG	DRAWING NO - CKC UOW2V03	DATE - 24/04/2017
PROJECT ADDRESS - MOLECULAR BUILDING	NOTES - CONSTRUCTION VEHICLES	



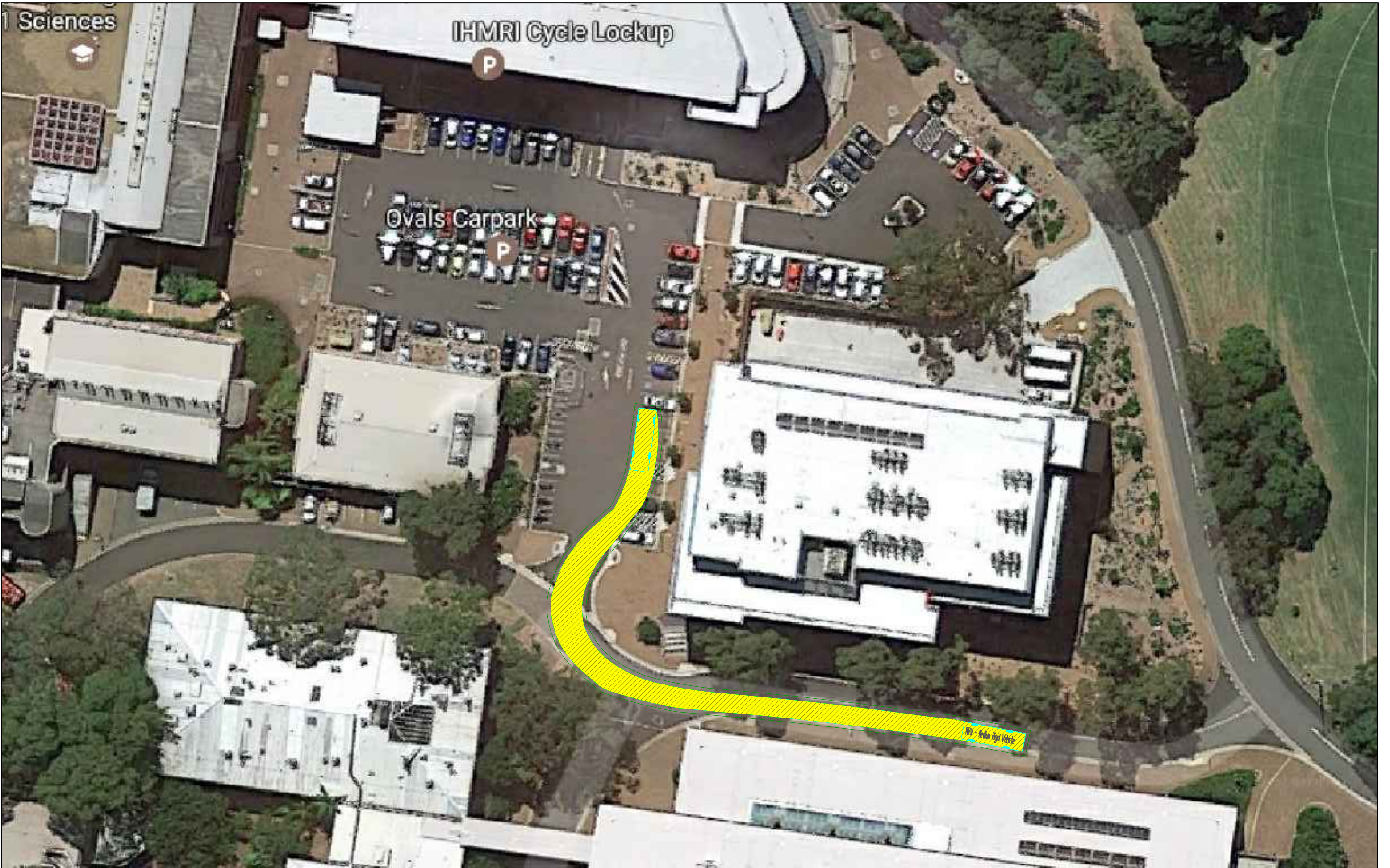
	DRAWING TITLE- 19.0m LONG SEMI-TRAILER TURNING AROUND THE SITE	PROJECT NO - CKC UOW02	SCALE - NTS
	CLIENT- UNIVERSITY OF WOLLONGONG	DRAWING NO - CKC UOW2V04	DATE - 24/04/2017
	PROJECT ADDRESS - MOLECULAR BUILDING	NOTES - CONSTRUCTION VEHICLES	



 	DRAWING TITLE- 19.0m LONG SEMI-TRAILER EXITING THE SITE	PROJECT NO - CKC UOW02	SCALE - NTS
	CLIENT- UNIVERSITY OF WOLLONGONG	DRAWING NO - CKC UOW2V06	DATE - 24/04/2017
	PROJECT ADDRESS - MOLECULAR BUILDING	NOTES - CONSTRUCTION VEHICLES	



 	DRAWING TITLE- MRV VEHICLE TYPE EXITING THE SITE	PROJECT NO - CKC UOW02	SCALE - NTS
	CLIENT- UNIVERSITY OF WOLLONGONG	DRAWING NO - CKC UOW2V07	DATE - 24/04/2017
	PROJECT ADDRESS - MOLECULAR BUILDING	NOTES - CONSTRUCTION VEHICLES	



	DRAWING TITLE- MRV VEHICLE TYPE ACCESSING THE SITE	PROJECT NO - CKC UOW02	SCALE - NTS
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	PROJECT ADDRESS - MOLECULAR BUILDING	NOTES - CONSTRUCTION VEHICLES	