



CIVIL ENGINEERING REPORT:
TRAFFIC IMPACT STUDY

Hospital Facility Development Wagga Wagga

PREPARED FOR
Innovation Property Trust
The Riverina Clinic

CR193049_EC03
Rev: 4.0
Date: 17/11/2020

Traffic Impact Study

Revision Schedule

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1. Introduction

1.1 Purpose of Report

Northrop Consulting Engineers (NCE) has been engaged by Innovation Property Trust to prepare a Traffic Impact Study on the proposed redevelopment of 336 – 344 Edward Street, Wagga Wagga.

The redevelopment will include demolition of the existing five (5) single dwellings and construction of a mental health hospital and outpatient facility. The development is proposed to include the main building, landscaped areas and on-site parking.

1.2 Study Objectives

This Traffic Impact Study examines the potential traffic and parking impacts from the proposed development in line with the details shown on drawing DA_TRC_A-060_B dated 14/09/2020 by Daryl Jackson Alistair Swain (DJAS).

This Traffic Impact Study is to be read in conjunction with CR193049_EC03 The Riverina Clinic Wagga Wagga Civil Engineering Report: Parking Assessment.

This Traffic Impact Study will detail the below:

- The existing traffic conditions during a typical weekday evening peak period and the following morning peak period;
- The parking conditions within the site and the utilisation;
- The sight distance for possible driveway locations;
- Other possible constraints and opportunities in the vicinity of the site;
- Public transport and pedestrian path network links to the site;
- The cycling network and links to the site; and
- Review of car park compliance in line with relevant standards, codes and guidelines.

1.3 Limitations

Construction at the Wagga Wagga Base Hospital was being undertaken at the time of this report. This may affect observations due to the additional construction traffic and the extent of the parking from the hospital not being representative of normal conditions.

1.4 References

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

- Wagga Wagga City Council Development Control Plan 2010;
- RTA Guide to Traffic Generating Developments (October, 2002)

2. Background

2.1 Surrounding Area

The proposed development is located in the suburb of Wagga Wagga Central. Figure 1 shows the location of Wagga Wagga in regards to the surrounding area in New South Wales.

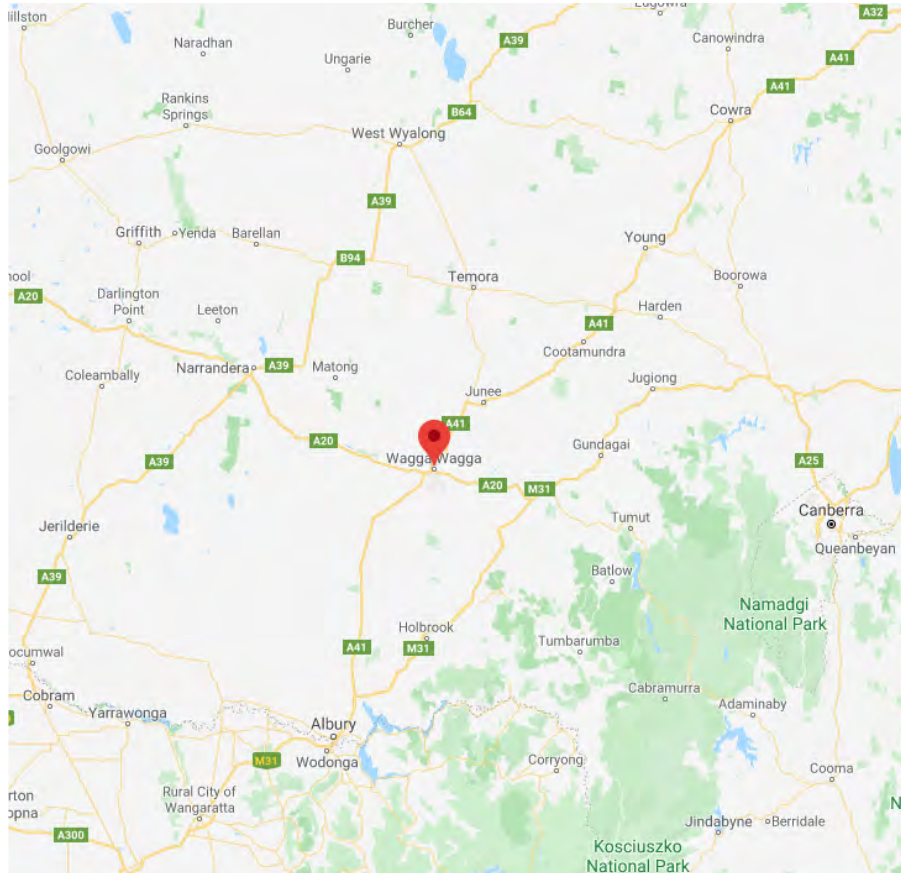


Figure 1 Development Locality in regard to the Surrounding Area

2.2 Development Locality

The proposed development is located at 336 – 344 Edwards Street, Wagga Wagga. Figure 2 shows the development locality.



Figure 2 Development Locality

The development is bound by:

- Edward Street to the North;
- Cullen Road to the West;
- 57 – 65 Gormly Avenue to the South; and
- 334 Edward Street to the East.

2.3 Development Description

The proposed development is to include a mental health hospital and outpatient facility with:

- Bedrooms for 12 inpatients;
- Consultation and interview rooms;
- An indoor exercise room for patients;
- A treatment room for patients;
- Meeting rooms;
- Office space;
- Ancillary areas; and
- Off street parking.

3. Existing Conditions

3.1 Roadways

336 – 344 Edward Street is located at the corner of Edward Street and Cullen Road.

Edward Street is part of the Sturt Highway and is a State Road which is a major road link between Adelaide and Sydney. At the location of the proposed development, Edward Street is a 4 lane 2 way road with width of approximately 19m. A concrete median is located along Edward Street adjacent to 340 – 344 Edward Street as per Figure 3. This median then stops and there is no median adjacent 336 – 338 Edward Street.



Figure 3 Concrete Median Along Edward Street

The speed limit along this section of Edward Street is 60km/hour. Refer to Figure 2 for the locality of Edward Street in relation to the site.

Cullen Road is a local road which intersects with Edward Street. Cullen Road is a 2 way 2 lane road with width of approximately 11m. There is no line marking distinguishing lanes. The speed limit is 50km/hour. Cullen Road can be accessed from Edward Street through a single lane, however there is no access from Cullen Road to Edward Street. Edward Street has a wide outside lane which minimises the impact to the Street by vehicles entering Cullen Road. Cullen Road contains a cul-de-sac at the northern end to allow vehicles to do a u – turn. Refer to Figure 2 for the locality of Cullen Road in relation to the site.

3.2 Existing Development

336 – 344 Edward Street, at the time of this study, contains five (5) single dwelling residential houses.

The houses at 338, 340, 342 and 344 Edward Street had driveways which fronted Edward Street.

The house at 344 Edward Street had a driveway which connected the house to Cullen Road (noting the house is on the corner of Edward Street and Cullen Road).

The driveway for each house led to a single garage which was visible from the street or additional parking at the rear of the house.

3.3 Existing Traffic Conditions

Existing traffic conditions were observed along Edward Street and Cullen Road and the corresponding intersection during the typical evening peak period of 4:45pm – 5:25pm on Monday 17/02/2020 and during the typical morning periods of 8:00am – 8:30am and 9:00am – 9:20am on Tuesday 18/02/2020.

3.3.1 4:45pm – 5:25pm Monday 17/02/2020

During the typical evening period, the following observations were made:

- Vehicles turning from Edward Street onto Cullen Road were much slower than vehicles turning from Edward Street onto Dobney Avenue;
- There was a negligible number of vehicle movements on Cullen Road;
- Edward Street had a relatively constant flow of vehicles throughout the duration of observation. Disruptions to the flow were impacts from the traffic signals at the intersection of Docker Street and Edward Street as well as the roundabout at the intersection of Pearson Street and Edward Street; and
- There was a mix of passenger vehicles and commercial vehicles on Edward Street however there were a negligible number of commercial vehicles on Cullen Road.

3.3.2 8:00am – 8:30am Tuesday 18/02/2020

During this typical morning period, the following observations were made:

- There was a relatively constant flow of traffic;
- There was a negligible number of vehicle movements on Cullen Road;
- There was a mix of passenger vehicles and commercial vehicles on Edward Street however there were a negligible number of commercial vehicles on Cullen Road; and
- The traffic volume was visually less than that of the evening peak.

3.3.3 9:00am – 9:20am Tuesday 18/02/2020

- There was a relatively constant flow of traffic;
- There was a negligible number of vehicle movements on Cullen Road;
- There was a mix of passenger vehicles and commercial vehicles on Edward Street however there were a negligible number of commercial vehicles on Cullen Road; and
- The traffic volume was visually more than that of the 8:00am – 8:30am peak.

3.3.4 Traffic Counts

It was noted that Edward Street (being part of the Sturt Highway) had a steady stream of vehicles from observations undertaken as part of this report.

Traffic counts were undertaken by Wagga Wagga City Council from 01/04/2020 – 17/04/2020.

The summary of the traffic count data recorded is shown in Table 1, noting the average annual daily total (AADT) vehicle movements for weekdays only has been referred to as AADT 5 and AADT 7 for weekdays and weekends. The AADT 5 provides the average number of weekday trips on a given weekday. The AADT 7 provides the average number of weekday trips over the entirety of the week inclusive of the weekend.

Table 1 Traffic Volume Data

Location	AADT 5	AADT 7
Cullen Road between Edward Street and Gormly Avenue	113	103
Cullen Road between Hardy Avenue and Gormly Avenue	262	235
Gormly Avenue between Cullen Road and Emblen Street	184	164

These traffic counts were undertaken during the COVID-19 epidemic. The data obtained and stored as the EC0 files was reviewed to examine if the traffic conditions presented from 01/04/2020 – 17/04/2020 were similar to those observed 17/02/2020 – 18/02/2020.

The EC0 data identified the data collected showed similarities to the observed conditions. Therefore for the purpose of this study, these traffic volumes will be used.

As the AADT 5 is greater than the AADT 7, the remainder of this statement focus on the higher values of the AADT 5.

On average, the intersection services approximately 24 vehicles per hour (559 vehicle movements divided by 24 hours in the day). Noting most vehicles travel between 7:00am and 7:00pm, it may be considered on average 47 vehicles per hour (559 vehicle movements divided by 12 hours in the day) are serviced by this intersection indicating it would be free flowing providing minimal average delays.

3.3.5 Traffic Speed

Traffic speed was collected by Wagga Wagga City Council from 01/04/2020 – 17/04/2020 at the intersection of Cullen Road and Gormly Avenue.

The data collected indicated there was an average speed of 38km/hour for all movements at the intersection.

The 85th percentile speeds recorded for the corresponding roads were:

- 48km/hour along Cullen Road between Edward Street and Gormly Avenue;
- 47km/hour along Cullen Road between Gormly Avenue and Hardy Avenue; and
- 47km/hour along Gormly Avenue between Cullen Road and Emblen Street.

These speeds are lower than the 50km/hour speed limit.

Sight distances will need to be reviewed to ensure there is an adequate sightline to see oncoming vehicles. It is recommended that the existing tree adjacent to the driveway is removed to allow for this.

3.4 Existing Parking Conditions

For the purpose of this Traffic Impact Statement, on street parking was reviewed within 200m of the site. This is illustrated in Figure 4.



Figure 4 200m Radius of the Site

Due to the nature of the site, off site parking to the North of the site – i.e. along the Edward Street or parking which required crossing Edward Street has been disregarded as part of this Parking Statement for safety concerns.

The remainder of the roads within 200m of the site are as follows:

- Dobney Avenue;
- Cullen Road;
- Emblen Street;
- Gormly Avenue; and
- Hardy Avenue.

These are illustrated in Figure 5.



Figure 5 Road Locality

A bus stop was observed near the corner of Edward Street and Emblen Street however no other parking restrictions were observed in the area of interest.

Observations undertaken by NCE on 17-18 February, 2020.

During the observations undertaken:

- There was ample parking along Cullen Road;
- Gormly Avenue and Hardy Avenue from Cullen Road to Emblen Road was at approximately 30% capacity. West of Emblen Road, the parking on these roads were at capacity;
- Emblen Street was at approximately 50% capacity; and
- Dobney Avenue was not observed for parking capacity due to the extent of parking in Cullen Road, Gormly Avenue and Hardy Avenue.

3.5 Public Transport

The City of Wagga Wagga Council has multiple public transport alternatives including but not limited to:

- Air travel;
- Bus routes connecting to areas outside of the council;
- Bus routes connecting to the internal areas of the council; and
- Train network connecting to areas outside of the council.

3.5.1 Air Travel

The Wagga Wagga Airport website was accessed 30/03/2020. The public services for transport option that use the airport include:

- Qantas Link which operates flights to and from Sydney;
- Rex Regional Express which operates flights to and from Sydney and Melbourne; and
- Charter Flights which operates flights on demand.

Although there is no current public transport to and from the airport, the Wagga Shuttle provides a service to and from the airport.

3.5.2 Bus Routes Connecting to Areas Outside of the Council

There are a number of services which provide connectivity between Wagga Wagga and other towns. These services stop at "Wagga Wagga Station". The services which stop at Wagga include:

- Route 621 – Central to Albury via Wagga,
- Route 622 – Albury to Central via Wagga;
- Route 621 – Central to Albury via Wagga,
- Route 622 – Albury to Central via Wagga;
- Route 702 – Wagga Wagga to Queanbeyan Bus Interchange;
- Route 704 – Wagga Wagga to Queanbeyan Bus Interchange;
- Route 727 – Wagga Wagga to Tumbarumba;
- Route 731 – Wagga Wagga to Griffith;
- Route 733 – Wagga Wagga to Echuca; and
- Route 735 – Wagga Wagga to Griffith.

These services do not provide a direct link to the development.

3.5.3 Bus Routes Connecting to the Internal Areas of the Council

There are a number of bus services provided by Busabout – the City of Wagga Wagga Council's local provider which travel through the council as per Figure 6.

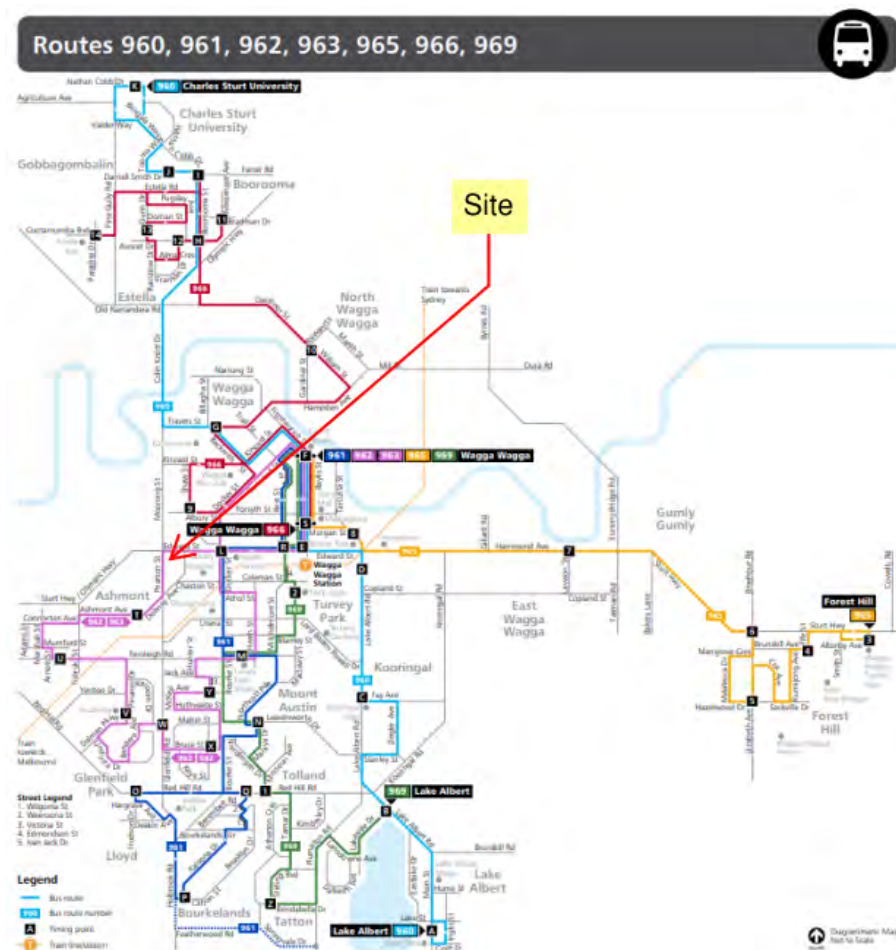


Figure 6 City of Wagga Wagga Bus Network

This is inclusive of Route 962 and Route 963 which run adjacent to the site. These routes travel from either Glenfield Park to Wagga Wagga or Wagga Wagga via Glenfield via Ashmont. Figure 6 shows these routes by the pink line. This route passes the bus stop close to the development site located outside 328 Edward Street.

As there is only one service which passes the development, it is unlikely that this service would be regularly used by users of the development unless they lived on the bus route or did not own a passenger vehicle/motorcycle.

3.6 Active Travel

The City of Wagga Wagga Integrated Transport Strategy and Implementation Plan 2040 (August 2017) was reviewed for the purpose of this report. The plan outlined how the City of Wagga Wagga Council is going to implement Active Travel Facilities across the Council. To date, there is a footpath on the roadside perimeter of the block however it is approximately 1m wide and would not be adequate for active travel for multiple users passing one another.

4. Development Conditions

4.1 Proposed Parking

4.1.1 Background

The Wagga Wagga City Council Development Control Plan 2010 – Section 2 Controls applies to all developments. The controls were reviewed against the parking generation for the proposed development.

As per Section 2.2 Off-street parking C1, parking is to be provided in accordance with the table provided as part for this section of the development control plan. If the use is not listed, a similar use should be used as a guide to assess the car parking requirements. For the purpose of this parking statement, we have adhered to this as closely as practicably reasonable as not all of the land uses are covered by this document.

For the purpose of this assessment, DJAS provided two statements to assist in guiding parking generation for the development. These statements can be summarised with the following information:

- Inpatients to be modelled at 100% occupancy and are unlikely to drive to and from the facility;
- 3 nurses on site at any one shift for inpatients with change overs to occur over a period of no more than 2 hours;
- Each patient will have visits at most twice a week, with visits to occur out of staff change over periods;
- Outpatients will have 2 psychiatrists on site during the week day, day time;
- Day therapy will have 2 allied health professionals on site during outpatient hours
- There will be capacity for up to 16 outpatients to participate in group meetings at the facility – there will be a “bus service” (assumed to be a standard car with maximum seats) provided to encourage participants not to drive.

These statements can be found in Appendix B.

Parking has been based upon these statements as it is unlikely it could be dependant upon that users of the development would use active travel or public transport as per Section 3.5 and 3.6 of this report.

4.1.2 Proposed Parking Generation

The rates for a hospital as per the Wagga Wagga City Council Development Control Plan 2010 are as follows:

- 1 space per 4 beds – assumed for visitors;
- 1 space per 2 employees; and
- 1 ambulance space.

It is noted that there are no rates suitable for the outpatient group meetings.

The RTA Guide to Traffic Generating Developments (October, 2002) was reviewed to assist with the determination of the required number of parking spaces for the outpatient groups meetings.

Due to these major documents not having a parking generation rate for outpatient which participate in group meetings, a self-assessment has been carried out.

As per the statements provided by DJAS and email correspondence from Innovation Property Trust, 1 vehicle/van will be provided by the facility operators to transport attendees at the day therapy/meeting programs to and from the facility reducing the likely impact of the outpatient clinics and therapy groups meetings in regards to the required number of car parking spaces. It would be assumed at least 50% of outpatients use this service, resulting in a proposed generation rate of 1 car parking space per 2 outpatients.

Table 2 outlines the required parking generation for proposed development at full capacity.

Table 2 Proposed Parking Generation

Description	Number of	Generation Rate	Number of Parking Spaces
Inpatients – assumed not to drive	12	0 per bed	0
Visitors	For 12 Inpatients	1 space per 4 beds	3
Employees	8	1 space per 2 employees (change over period will incorporate visitor parking to reduce conflict)	4
Ambulance	1	1 space per development	1
Outpatient Clinics and Day Therapy Services	16	2 car parking spaces plus 1 car parking space per 2 outpatients	9

The total number of parking spaces required 17. The site has provision for the 18 car parking spaces.

With the on-street parking available within the 200m radius of the site, there is capacity for overflow parking should parking exceed the proposed parking generated as per Table 2.

4.1.3 Proposed Car Park Compliance

The proposed car park has been reviewed in accordance with:

- Wagga Wagga City Council Development Control Plan 2010;
- ASNSW Ambulance Access as per the NSW Government NSW Ambulance website accessed 25/05/2020;
- Australasian Health Facility Guidelines (Revision 6.0, 01 March 2016);
- AS2890.1 (2004); and
- AS2890.6 (2009).

Commentary on the aforementioned documents in relation to car park compliance is detailed below.

4.1.3.1 Compliance with Wagga Wagga City Council Development Control Plan 2010

Drawing DA_TRC_A-060_B dated 14/09/2020 by DJAS was reviewed in relation to compliance with Wagga Wagga City Council Development Control Plan 2010. The following has been noted as part of this report:

- The driveway is located off Cullen Road rather than Edward Street – i.e. the driveway has been located off the minor road and not on the arterial road;
- The vehicle to which the car park has been designed for will be able to enter and exit the block in a forward direction;
- The typical delivery method will be couriers driving vans. This is due to the anticipated materials which the development is likely to received. These vans will be able to utilise the “visitor parking” outside visitor hours;
- Access driveways are in accordance with AS2890.1;
- Off-street parking has been designed in accordance with AS2890.1;
- Parking generation has been complete in line with the Wagga Wagga City Council Development Control Plan and self-assessment. As per Section 3.4 of this report, there is ample on street parking within close vicinity of the site for any overflow parking;
- Existing trees are proposed to be retained with landscaping elements proposed around the car park;
- Shade has been provided through the retention of existing trees, the landscape architect; and
- 1 parking space has been designated as a disabled space.

4.1.3.2 Compliance with ASNSW Ambulance Access

Drawing DA_TRC_A-060_B dated 14/09/2020 by DJAS was reviewed in relation with compliance with ASNSW Ambulance Access requirements. The following has been noted as part of this report:

- The 2WD – Mercedes Benz Sprinter 519 Bariatric Specialist ambulance swept path movements have been modelled using AutoTurn software and can be found in Appendix A;
- There is sufficient room in the car park for the ambulance vehicle to manoeuvre into the designated ambulance space with the required stretcher space;
- The ambulance may block traffic moving in and out of the car park area however it is anticipated an ambulance will be required on site infrequently.

4.1.3.3 Compliance with Australasian Health Facility Guidelines

Drawing DA_TRC_A-060_B dated 14/09/2020 by DJAS was reviewed in relation with compliance with the Australasian Health Facility Guidelines. The following has been noted as part of this report:

- Parking for disabled people has been allowed for in line with the Disability (Access to Premises – Buildings) Standards 2010;
- Parking for ambulances has been allowed for;
- Disabled parking has been located as close as possible to the entry to the proposed building; and
- During the detailed design phase of the works, the disabled space must not have a step up from the shared space level to the footpath pavement level – i.e. there is to be a pram ramp or the car park pavement is to be flush with the footpath pavement.

4.1.3.4 Compliance with AS2890.1

Drawing DA_TRC_A-060_B dated 14/09/2020 by DJAS was reviewed in relation with compliance with AS2890.1. The following has been noted as part of this report:

- For the purpose of this report, spaces with an undefined width on the plan are 2.4m wide. These spaces are generally for long term purposes – i.e. employees and patients. Visitor spaces are 2.5m wide and will need to be signposted for clarification to users of the car park.
- The aisle width is 6.5m which is greater than the required for medical centres and employee/long term parking which is 5.8m.
- A blind aisle has been allowed for at the end of the car park which exceeds one meter in length.
- Physical controls for the car parking spaces will need to be included as part of the detailed design. Kerbs and/or wheel stops will need to be considered to ensure pedestrian paths are accessible and to protect the landscape around the carpark.
- Gradients within the carpark are to be greater than 1% however for car parking spaces which are not compliant to AS2890.6, the gradient is not to exceed 5% parallel to the direction of travel and 6.25% in any other direction. The civil engineer is to detail these levels prior to construction.
- The two way driveway entry to the road into the car park has width exceeding 5.5m.
- The driveway is more than 6m from the tangent point of any intersections.
- The minimum safe sight intersection distance required for the driveway is 45m as a speed limit of 50km/hour has been applied to the frontage road for the driveway. To the North of the driveway, the distance to the intersection is less than 45m however it has been observed that vehicles tend to turn into Cullen Road at a speed less than the posted speed limit. There is a tree next to the driveway which should be removed to improve the sight distances to the North as the tree obstructs a clear view through to Edward Street. To the South of the driveway, there is a clear sight line however this may be obstructed by parked vehicles.
- The minimum sight lines for pedestrian safety have been reviewed. As the driveway is for two way access, only the Southern side of the driveway was considered. Due to the constraints of the block, the 2m wide, 2.5m deep sight triangle will not be achievable. The installation of speed controls such as speed humps within close proximity to the block boundary are likely to reduce and control the speed of vehicles exiting. The landscape architect is to ensure appropriate treatment of this area.
- During detailed design, the civil engineer is to ensure the gradient of the driveway does not exceed 5% from the road to the first 6m into the block and 2.5% across the footpath.
- There is less than 12m worth of queuing space for the car park however there is one space available for queuing. Due to the nature of the development and that accessibility to two thirds of the car park will then enable a queuing area for 2 passenger vehicles, this non-conformance to AS2890.1 is assessed as negligible.

4.2 Traffic Generation

The RTA Guide to Traffic Generating Developments was reviewed to investigate traffic generation for health facilities. There were traffic generation rates for private hospitals with beds. It is noted there is a recommendation in the RTA Guide to Traffic Generating Developments stating that “models based on the number of beds (B) should only be used when staffing data is unknown”. As the staffing data and patient data has been provided, a self-assessment will provide a more probable traffic generation rather than data from the RTA Guide to Traffic Generating Developments.

For the purpose of this self-assessment, DJAS provided two statements to assist in guiding traffic generation for the development. These statements can be summarised with the following information:

- Inpatients to be modelled at 100% occupancy and are unlikely to drive to and from the facility;
- 3 nurses on site at any one shift for inpatients with change overs to occur over a period of no more than 2 hours;
- Each patient will have visits at most twice a week, with visits to occur out of staff change over periods;

- Outpatients will have 2 psychiatrists on site during the week day, day time;
- Day therapy will have 2 allied health professionals on site during outpatient hours
- There will be capacity for up to 16 outpatients to participate in group meetings at the facility – there will be a “bus service” (assumed to be a standard car with maximum seats) provided to encourage participants not to drive.

As per the statements provided by DJAS, a vehicle will be provided to transport patients to and from the facility reducing the likely impact of the outpatient clinics and therapy groups meetings. It would be assumed at least 50% of outpatients use this service.

With the assumption for the typical day where all services are operational where there will be 3 nursing shift per day, 1 psychiatrist/allied health professional shift per day and 1 group meeting shift per day, the traffic generation for the development will be similar to that in Table 3. Note Table 3 reflects the peak day usage only and there will be days where not all services are operational.

Table 3 Probable Traffic Generation for the Development

Description	No.	Generation Rate	Total Trips
Inpatients	1 per bedroom for 12 bedrooms = 12	0 (inpatients unlikely to drive)	12 x 0 = 0 trips per day
Nurses	3 nurses per shift for 3 shifts per day = 9 nurses for the day	3 trips per nurse (assuming some nurses may leave the development and come back during their shift)	9 x 3 = 27 trips per day
Inpatient Visitors	2 visits per patient per week for 12 patients = 24 visitors per week = approximately 4 visitors per day	2 trips per visitor per day (assuming all drive)	4 x 2 = 8 trips per day
Psychiatrists	2 psychiatrists per day	3 trips per psychiatrist (assuming one psychiatrist leaves the site and comes back during their shift)	2 x 3 = 6 trips per day
Allied Health Professionals	2 Allied Health Professionals per day	3 trips per Allied Health Professionals (assuming one Allied Health Professionals leaves the site and comes back during their shift)	2 x 3 = 6 trips per day
Outpatients	16 Outpatients per day	50% may use the transport vehicle provided by the development – 4 trips per day per vehicle allowing a morning and evening pick up and drop off	4 x 1 + 50% x 16 x 2 = 20 trips per day

50% using their own transport – 2
trips per day per vehicle allowing
entry and exit only

This would result in a total of 67 trips per day noting most of these movements would occur during standards business travel hours.

The RTA Guide to Traffic Generating Developments Updated Traffic Surveys TDT 2013/04A was reviewed to determine the traffic generation should the 4 blocks have been converted to multiunit housing. The survey had conducted research into low density one storey residential in Glenfield Park which is a suburb close to Wagga Wagga as per Figure 7.



Figure 7 Glenfield Park Locality

The survey concluded that a total of 6.63 vehicle movement would occur per day per dwelling. Using this total, the traffic generated would be similar to that of 11 units. As it is likely that there could be more than 11 units built on 336 – 344 Edward Street, 67 vehicle movements per day during standard business travel hours would be less than the total vehicle movements per day which may apply to this block in regards to other development types.

4.3 Traffic Distribution

The development area of the City of Wagga Wagga has been reviewed using Six Maps to assist in the determination of the traffic distribution.

Noting that the development was relatively centrally places in relation to the residential development, it has been assumed that the incoming vehicular movement will be as per Figure 8 and outgoing vehicular movement will be as per Figure 9.



Figure 8 Incoming Movements to the Development



Figure 9 Outcoming Movements to the Development

As the roads had negligible traffic during the observations undertaken by NCE, Cullen Road and Gormly Avenue will be able to absorb the additional traffic from the proposed development.

4.4 Implication of Additional Traffic to Existing Traffic Network

As per Section 3.3.4, we have assessed that the intersection services approximately 24 vehicles per hour (559 vehicle movements divided by 24 hours in the day). Noting most vehicles travel between 7:00am and 7:00pm, it may be considered on average 47 vehicles per hour (559 vehicle movements divided by 12 hours in the day) are serviced by this intersection indicating it would be free flowing providing minimal average delays.

As per Section 4.2 of this report, there will be approximately 67 vehicles movements per day generated for the proposed development. As a conservative estimate, it could be assumed that half of the vehicles (34) would travel in a given "peak period" through the intersection of Cullen Road and Gormly Avenue.

This would result in a proposed total of 81 vehicles per hour using the intersection. The total of vehicles would then get distributed into the road network.

As per observations undertaken as part of this study, Edward Street had a steady stream of vehicles. 33% of the proposed 34 (half of the total vehicle movements per day) vehicles entering the development would provide minimal disturbance to the steady stream of vehicles using Edward Street.

Therefore it can be proposed that the generated traffic from the development will have a small impact to the surrounding area, however it is at the lower bound of the road's capacity and the impact will be negligible.

5. Conclusion

Northrop Consulting Engineers (NCE) has been engaged by Innovation Property Trust to prepare a Traffic Impact Study on the proposed redevelopment of 336 – 344 Edward Street, Wagga Wagga.

This Traffic Impact Study has detailed the below:

- The existing traffic conditions during a typical weekday evening peak period and the following morning peak period;
- The parking conditions within the site and the utilisation;
- The sight distance for possible driveway locations;
- Other possible constraints and opportunities in the vicinity of the site;
- Public transport and pedestrian path network links to the site;
- The cycling network and links to the site; and
- Review of car park compliance in line with relevant standards, codes and guidelines.

Observation identified that there were minimal movements complete at the intersection of Cullen Road and Gormley Avenue during the observed periods. This aligns with the traffic volume data received from the City of Wagga Wagga Council.

The 85th percentile speed for vehicles using the intersection of Cullen Road and Gormly Avenue ranged from 47 - 48km/hour as per speed data received from the City of Wagga Wagga Council. It is recommended to remove the tree to improve sight distances to see oncoming vehicles.

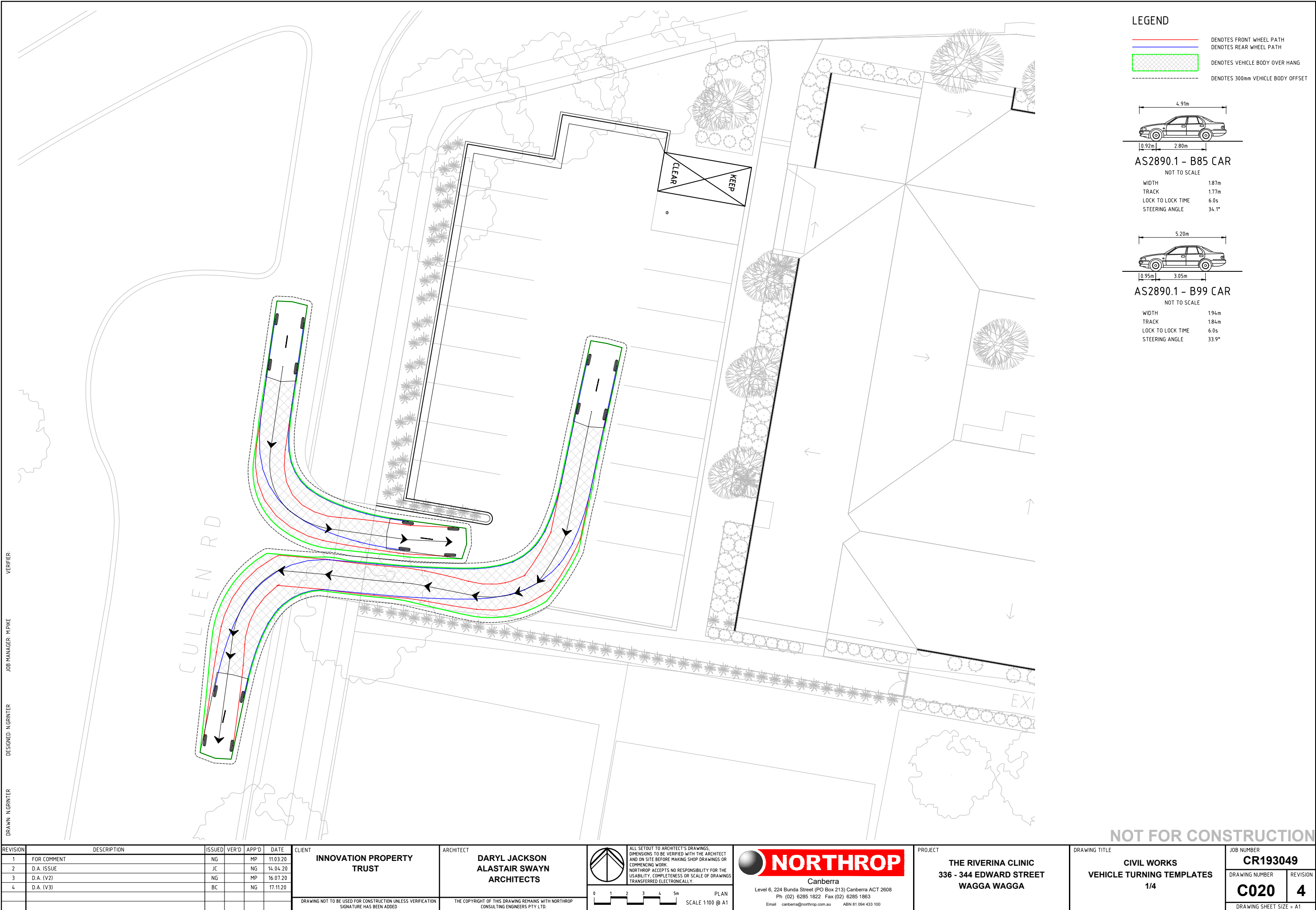
The City of Wagga Wagga Council has multiple public transport alternatives including but not limited to air travel, bus routes connecting to areas outside of the council, bus routes connecting to the internal areas of the council and train network connecting to areas outside of the council. It is unlikely however that users of the development would use public transport.

Active travel facilities near the block are unlikely to be used due to their width.

17 parking spaces are required for the development. The latest architectural drawing shows 18 car parking spaces.

A total of 67 passenger vehicle movements per day have been proposed to occur from the development. It is likely this would be less than if a residential development was to be at 336 – 344 Edward Street. The generated traffic from the development will have a small impact to the surrounding area, however it is at the lower bound of the road's capacity and the impact will be negligible.


Appendix A Drawings




REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
1	FOR COMMENT	NG		MP	11.03.20
2	D.A. ISSUE	JC		NG	14.04.20
3	D.A. (V2)	NG		MP	16.07.20
4	D.A. (V3)	BC		NG	17.11.20

CLIENT	INNOVATION PROPERTY TRUST
DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED	

ARCHITECT	DARYL JACKSON ALASTAIR SWAYN ARCHITECTS
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PLAN
SCALE 1:100 @ A1



Canberra
Level 6, 224 Bunda Street (PO Box 213) Canberra ACT 2608
Ph (02) 6285 1822 Fax (02) 6285 1863
Email canberra@northrop.com.au ABN 81 094 433 100

PROJECT	THE RIVERINA CLINIC 336 - 344 EDWARD STREET WAGGA WAGGA
---------	---

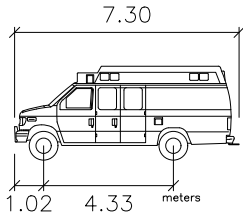
DRAWING TITLE	CIVIL WORKS VEHICLE TURNING TEMPLATES 1/4
---------------	---

JOB NUMBER	CR193049
DRAWING NUMBER	C020
REVISION	4
DRAWING SHEET SIZE = A1	



LEGEND

- DENOTES FRONT WHEEL PATH
- DENOTES REAR WHEEL PATH
- DENOTES VEHICLE BODY OVER HANG
- DENOTES 300mm VEHICLE BODY OFFSET



AMBULANCE BARIATRIC 2WD – MERCEDES SPRINTER 419


Width : 2.50
Track : 2.50
Lock to Lock Time : 6.0
Steering Angle : 44.3

NOT FOR CONSTRUCTION


REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
1	FOR COMMENT	NG		MP	11.03.20
2	D.A. ISSUE	JC		NG	14.04.20
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CLIENT	INNOVATION PROPERTY TRUST
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SCALE 1:100 @ A1

PLAN



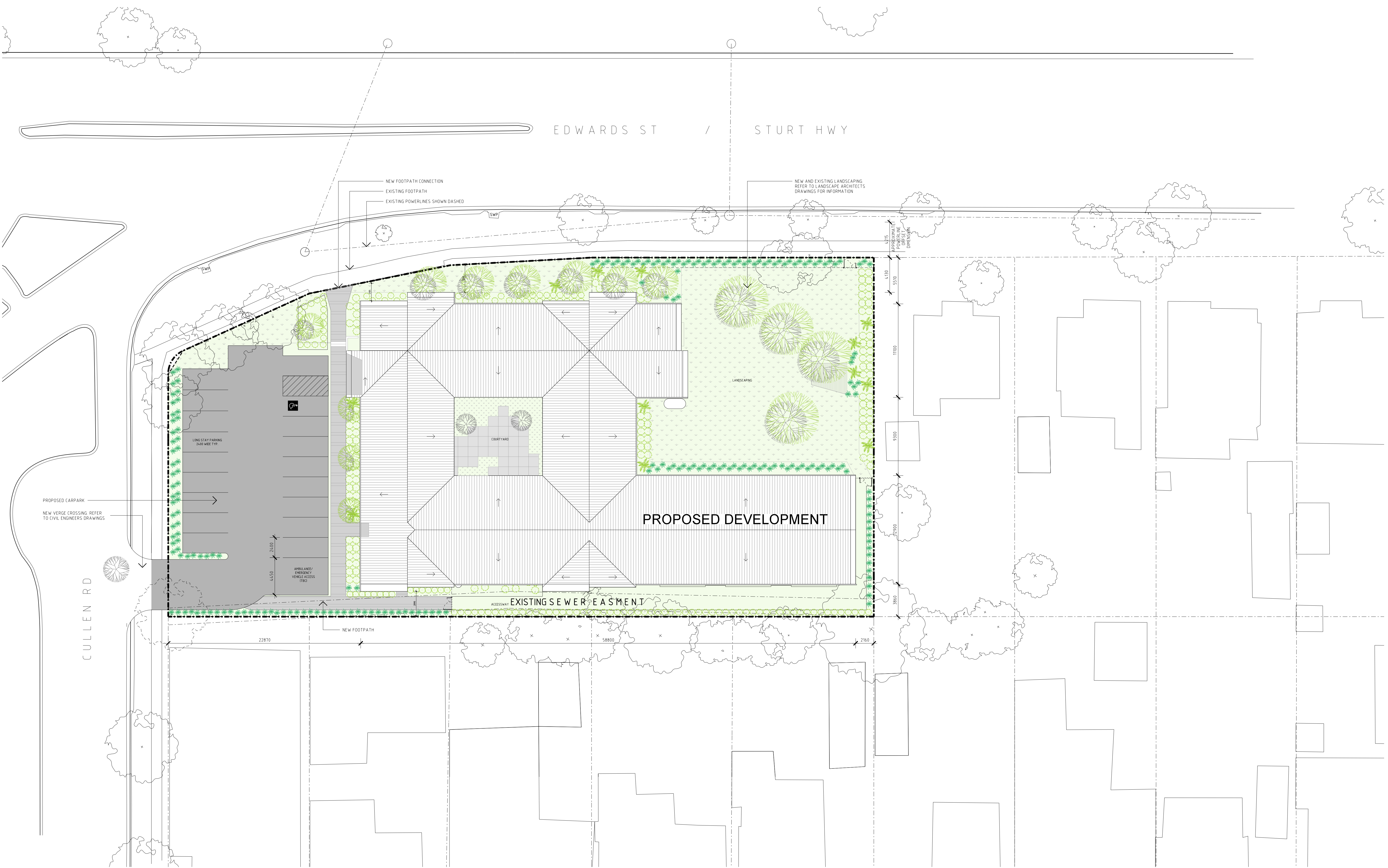
Canberra


Level 6, 224 Bunda Street (PO Box 213) Canberra ACT 2608
Ph (02) 6285 1822 Fax (02) 6285 1863
Email canberra@northrop.com.au ABN 81 094 433 100

PROJECT	THE RIVERINA CLINIC 336 - 344 EDWARD STREET WAGGA WAGGA
---------	---

DRAWING TITLE	CIVIL WORKS VEHICLE TURNING TEMPLATES 2/4
---------------	---




JOB NUMBER	CR193049
DRAWING NUMBER	C021
REVISION	4
DRAWING SHEET SIZE = A1	

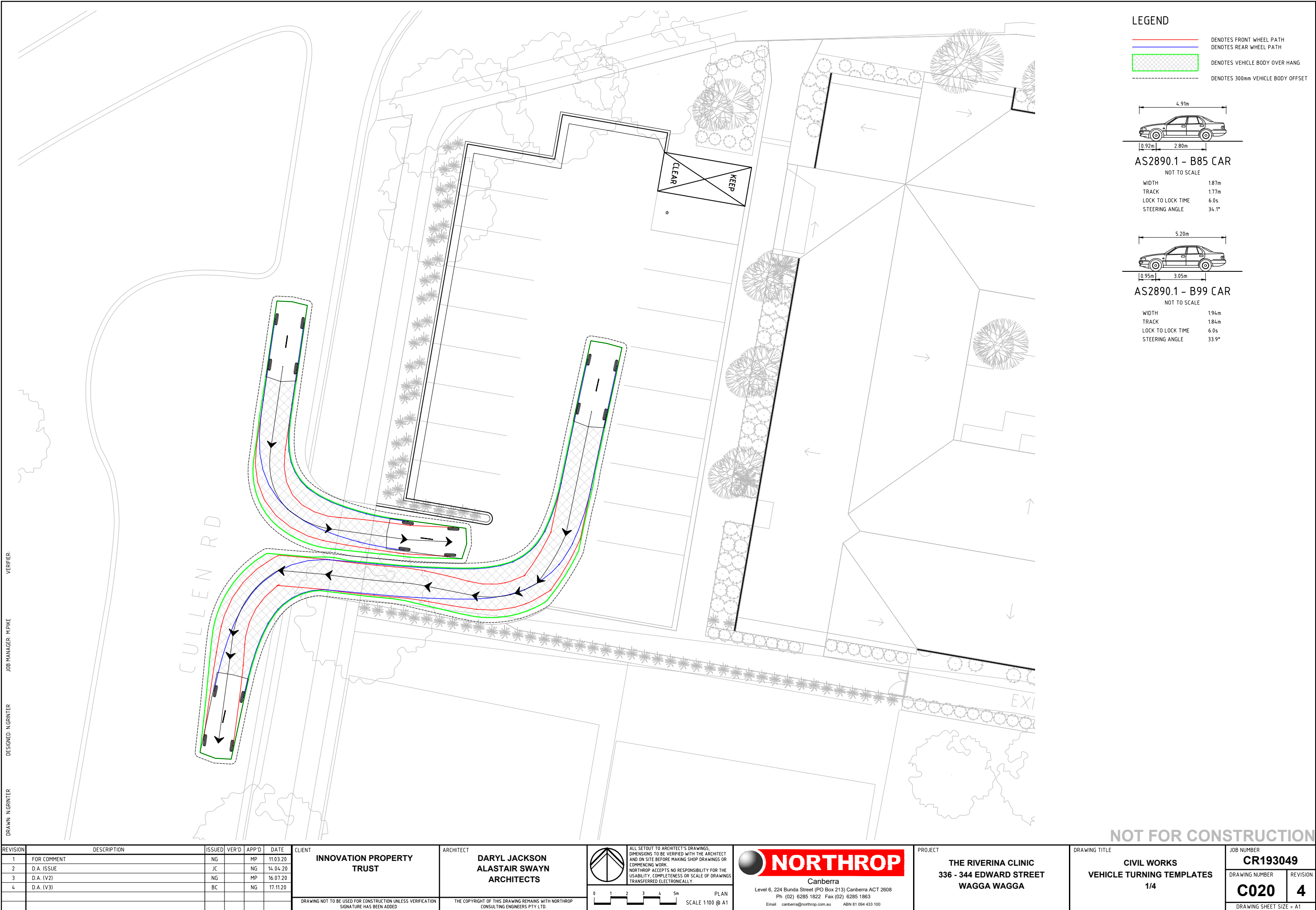


Notes	Abbreviations		Issue	Description			Drawn	Status	App vd	Date	Issue	Description			Drawn	Status	App vd	Date	Architect	Client	Job	Project Address					
All dimensions are in millimetres Levels are in metres Do not scale off drawing Use figured dimensions only Check dimensions on site	Information Only - (Uncontrolled)		I	P1	FOR INFORMATION			EW	I	JH	02/04/2020	B	FOR INFORMATION			ML	I	JH	06/11/2020	<div><div>D</div><div>J</div><div>+</div><div>A</div><div>S</div></div> <div>Daryl Jackson Alastair Swayn 49 Jardine Street Kingston ACT 2604 02 6295 2000 office@djas.com.au djas.com.au © 2020 Daryl Jackson Alastair Swayn Pty Ltd</div>	INNOVATION PROPERTY TRUST	THE RIVERINA CLINIC DEVELOPMENT APPLICATION		336 - 344 EDWARDS STREET WAGGA WAGGA NSW 2650			
	Controlled Issue		C	P2	FOR INFORMATION			EW	I	JH	09/04/2020																
	Preliminary		P	P3	FOR INFORMATION			DA	I	JH	10/06/2020																
	Project Architect		PA	P4	FOR INFORMATION			DA	I	JH	12/06/2020																
	Project Director		PD	P5	FOR INFORMATION			DA	I	JH	21/08/2020																
		A	DA APPROVAL			DA	C	JH	14/09/2020																		
<div><div>0m</div><div>2m</div><div>4m</div><div>10m</div></div>																						Scales		Date		Revision	
Job Number																						Drawing Number		Revision			
19 257																						DA_TRC_A-060		B			

Appendix B Correspondence



REVISION		DESCRIPTION	ISSUED	VER'D	APP'D	DATE	CLIENT	ARCHITECT		PROJECT	DRAWING TITLE	JOB NUMBER	
1	D.A.		BC		NG	17.11.20	INNOVATION PROPERTY TRUST	DARYL JACKSON ALASTAIR SWAYN ARCHITECTS	 <div>ALL SETOUT TO ARCHITECT'S DRAWINGS. DIMENSIONS TO BE VERIFIED WITH THE ARCHITECT AND ON SITE BEFORE MAKING SHOP DRAWINGS OR COMMENCING WORK. NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY.</div> <div><div>PLAN SCALE 1:100 @ A1</div></div>	 <div>Canberra Level 6, 224 Bunda Street (PO Box 213) Canberra ACT 2608 Ph (02) 6285 1822 Fax (02) 6285 1863 Email canberra@northrop.com.au ABN 81 094 433 100</div>	THE RIVERINA CLINIC 336 - 344 EDWARD STREET WAGGA WAGGA	CIVIL WORKS VEHICLE TURNING TEMPLATES B85 3 POINT TURN WITHOUT BAY 3/4	CR193049
					DRAWING NUMBER	REVISION							
					C022	1							
					DRAWING SHEET SIZE = A1								
DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED							THE COPYRIGHT OF THIS DRAWING REMAINS WITH NORTHROP CONSULTING ENGINEERS PTY LTD.						



VERIFIER:

JOB MANAGER: M.PIKE


DESIGNED: NGRINTER

DRAWN: NGRINTER


REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
1	FOR COMMENT	NG		MP	11.03.20
2	D.A. ISSUE	JC		NG	14.04.20
3	D.A. (V2)	NG		MP	16.07.20
4	D.A. (V3)	BC		NG	17.11.20

CLIENT	INNOVATION PROPERTY TRUST
DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED	

ARCHITECT	DARYL JACKSON ALASTAIR SWAYN ARCHITECTS
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SCALE 1:100 @ A1

PLAN



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Email canberra@northrop.com.au ABN 81 094 433 100

PROJECT	THE RIVERINA CLINIC 336 - 344 EDWARD STREET WAGGA WAGGA
---------	---

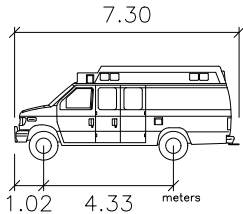
DRAWING TITLE	CIVIL WORKS VEHICLE TURNING TEMPLATES 1/4
---------------	---

JOB NUMBER	CR193049
DRAWING NUMBER	C020
REVISION	4
DRAWING SHEET SIZE	A1



LEGEND

- DENOTES FRONT WHEEL PATH
- DENOTES REAR WHEEL PATH
- DENOTES VEHICLE BODY OVER HANG
- DENOTES 300mm VEHICLE BODY OFFSET



AMBULANCE BARIATRIC 2WD – MERCEDES SPRINTER 419


Width : 2.50
Track : 2.50
Lock to Lock Time : 6.0
Steering Angle : 44.3

NOT FOR CONSTRUCTION


REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
1	FOR COMMENT	NG		MP	11.03.20
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CLIENT	INNOVATION PROPERTY TRUST
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PLAN
SCALE 1:100 @ A1

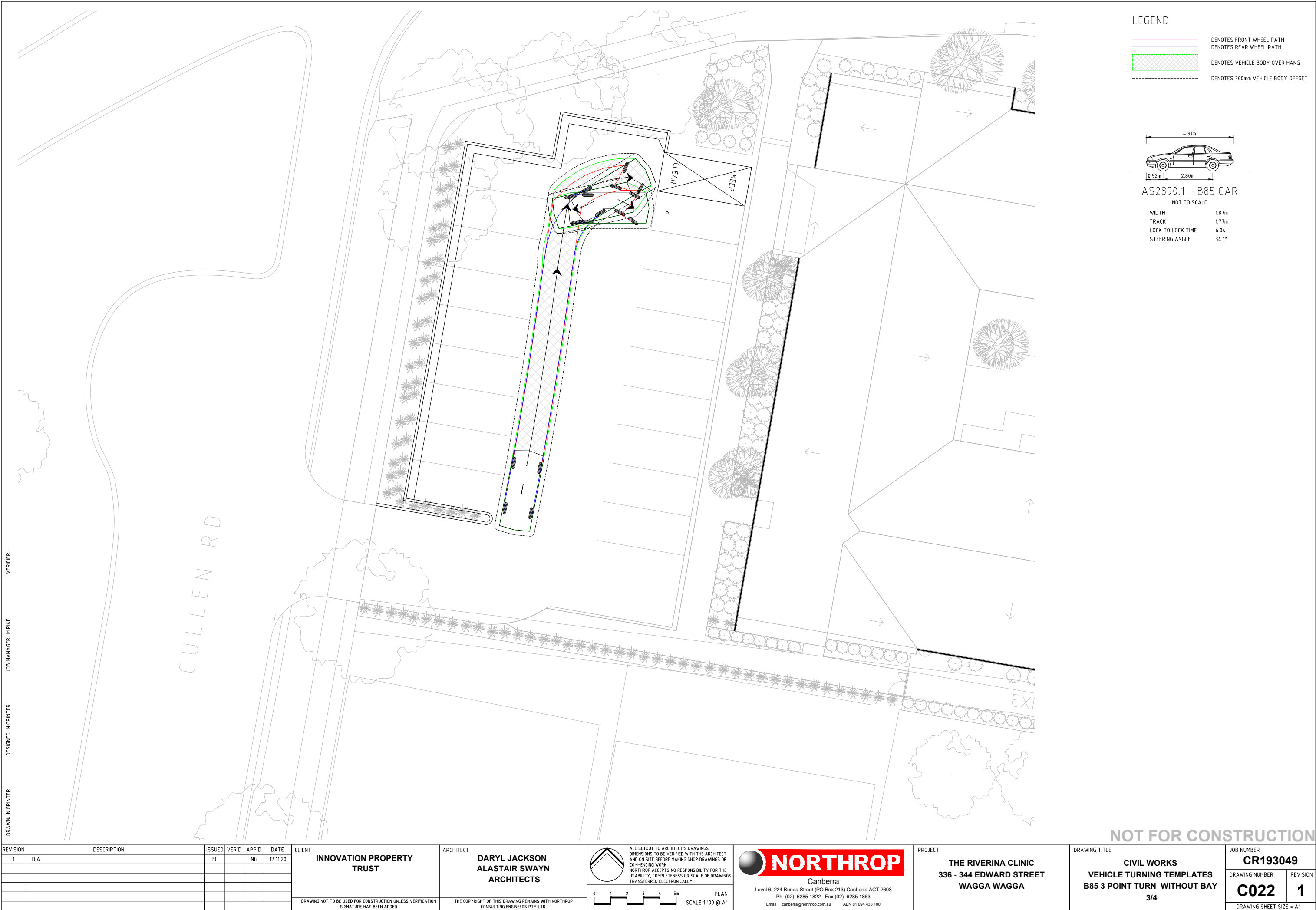


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Email canberra@northrop.com.au ABN 81 094 433 100

PROJECT	THE RIVERINA CLINIC 336 - 344 EDWARD STREET WAGGA WAGGA
---------	---

DRAWING TITLE	CIVIL WORKS VEHICLE TURNING TEMPLATES 2/4
---------------	---

JOB NUMBER	CR193049
DRAWING NUMBER	C021
REVISION	4
DRAWING SHEET SIZE = A1	



LEGEND

- DENOTES FRONT WHEEL PATH
- DENOTES REAR WHEEL PATH
- DENOTES VEHICLE BODY OVER HANG
- DENOTES 300mm VEHICLE BODY OFFSET

AS2890.1 - B85 CAR
NOT TO SCALE

WIDTH	1.87m
TRACK	1.77m
LOCK TO LOCK TIME	6.0s
STEERING ANGLE	34.1°

NOT FOR CONSTRUCTION

DRAWING TITLE		JOB NUMBER	
CIVIL WORKS VEHICLE TURNING TEMPLATES B85 3 POINT TURN WITHOUT BAY 3/4		CR193049	
DRAWING NUMBER	REVISION		
C022	1		
DRAWING SHEET SIZE = A1			

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE	CLIENT	ARCHITECT	PROJECT	DRAWING TITLE	JOB NUMBER
1	D.A.	BC		NG	17.11.20	INNOVATION PROPERTY TRUST	DARYL JACKSON ALASTAIR SWAYN ARCHITECTS	THE RIVERINA CLINIC 336 - 344 EDWARD STREET WAGGA WAGGA	CIVIL WORKS VEHICLE TURNING TEMPLATES B85 3 POINT TURN WITHOUT BAY 3/4	CR193049



LEGEND

— DENOTES FRONT WHEEL PATH
— DENOTES REAR WHEEL PATH
DENOTES VEHICLE BODY OVER HANG
- - - - - DENOTES 300mm VEHICLE BODY OFFSET

AS2890.1 – B85 CAR
NOT TO SCALE

WIDTH 1.87m
TRACK 1.77m
LOCK TO LOCK TIME 6.0s
STEERING ANGLE 34.1°

AS2890.1 – B99 CAR
NOT TO SCALE

WIDTH 1.94m
TRACK 1.84m
LOCK TO LOCK TIME 6.0s
STEERING ANGLE 33.9°

NOT FOR CONSTRUCTION

REVISION	DESCRIPTION					ISSUED	VER'D	APP'D	DATE	CLIENT	ARCHITECT	<div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div>ALL SETOUT TO ARCHITECT'S DRAWINGS. DIMENSIONS TO BE VERIFIED WITH THE ARCHITECT AND ON SITE BEFORE MAKING SHOP DRAWINGS OR COMMENCING WORK. NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY.</div></div>	PROJECT	DRAWING TITLE	JOB NUMBER				
1	D.A.					BC		NG	17.11.20	INNOVATION PROPERTY TRUST	DARYL JACKSON ALASTAIR SWAYN ARCHITECTS	<div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div>ALL SETOUT TO ARCHITECT'S DRAWINGS. DIMENSIONS TO BE VERIFIED WITH THE ARCHITECT AND ON SITE BEFORE MAKING SHOP DRAWINGS OR COMMENCING WORK. NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY.</div></div>	<div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div>Canberra Level 6, 224 Bunda Street (PO Box 213) Canberra ACT 2608 Ph (02) 6285 1822 Fax (02) 6285 1863 Email canberra@northrop.com.au ABN 81 094 433 100</div></div></div>	THE RIVERINA CLINIC 336 - 344 EDWARD STREET WAGGA WAGGA	CIVIL WORKS VEHICLE TURNING TEMPLATES 4/4	CR193049			
DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED										THE COPYRIGHT OF THIS DRAWING REMAINS WITH NORTHROP CONSULTING ENGINEERS PTY LTD.			<div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div>0 1 2 3 4 5m PLAN SCALE 1:100 @ A1</div></div>					DRAWING NUMBER C023	REVISION 1
DRAWING SHEET SIZE = A1																			



LEGEND

CARPARK

CONCRETE

150mm THICK 25MPA

1 LAYER SL72 60mm TOP COVER

BROOM FINISH

(CONCRETE THICKNESS, STRENGTH, COMPACTION, SUBBASE AND SUBGRADE TO BE CONFIRMED AT DETAILED DESIGN PHASE)

FK

FLUSH KERB

KG

KERB AND GUTTER (AS PER CITY OF WAGGA WAGGA STD DWG)

T

TRANSITION BETWEEN KERB TYPES

VC

VEHICLE CROSSING

WHEEL STOP

BOLLARD

PROPOSED LINEMARKING

M

GENERAL

MATCH TO EXISTING

178.62+

EXISTING SPOT LEVEL

179.20+

NEW SPOT LEVEL

DIRECTION OF FALL

BLOCK BOUNDARY

- NOTES
- TYPICAL JOINTING
1.

PROVIDE ISOLATION JOINT TO ALL STRUCTURES.
2.

PROVIDE EXPANSION JOINTS AT MAXIMUM 18M CENTRES.
3.

PROVIDE WEAKENED PLANE JOINTS AT MAXIMUM 6M CENTRES.
- TESTING
1.

CONTRACTOR TO ALLOW FOR ALL TESTING AS INSTRUCTED BY DETAILED DESIGN CIVIL ENGINEER AND DETAILED BY THE CITY OF WAGGA WAGGA STANDARDS, DRAWINGS AND SPECIFICATIONS AND AUSTRALIAN STANDARDS.
- GENERAL
1.

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH NORTHROP CONSULTING ENGINEERS DRAWING CR193049_C160 FOR GENERAL STORMWATER OVERLAND FLOW PATHS.
2.

CIVIL ENGINEER TO CONFIRM FALLS DURING DETAILED DESIGN PHASE ENSURING COMPLIANCE TO THE CITY OF WAGGA WAGGA STANDARDS, DRAWINGS AND SPECIFICATIONS, BUILDING CODE OF AUSTRALIA AND AUSTRALIAN STANDARDS.
3.

CONTRACTOR TO ALLOW TO REINSTATE ANY AREAS DISTURBED BY CONSTRUCTION WORK OFFSITE.
4.

CARPARK LINEMARKINGS EXCEPT THOSE SPECIFIED IN LEGEND AS PER ARCHITECTURAL DRAWING.

VERIFIER:

JOB MANAGER: M.PIKE

DESIGNED: N.GRINTER

DRAWN: N.GRINTER

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
1	FOR COMMENT	NG		MP	16.04.20
2	FOR COMMENT (V2)	NG		MP	23.04.20
3	FOR COMMENT (V3)	NG		MP	05.05.20
4	FOR COMMENT (V4)	NG		MP	10.07.20
5	DA (V2)	NG		MP	16.07.20
6	DA (V3)	NG		MP	17.11.20

CLIENT

INNOVATION PROPERTY TRUST

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ARCHITECT

DARYL JACKSON
ALASTAIR SWAYN
ARCHITECTS

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0 2 4 6 8 10m

SCALE 1:200 @ A1

PLAN

NORTHROP

Canberra

Level 6, 224 Bunda Street (PO Box 213) Canberra ACT 2608

Ph (02) 6285 1822 Fax (02) 6285 1863

Email canberra@northrop.com.au ABN 81 094 433 100

PROJECT

THE RIVERINA CLINIC

336 - 344 EDWARD STREET

WAGGA WAGGA

DRAWING TITLE

CIVIL WORKS

PRELIMINARY LEVELS AND PAVEMENT PLAN

JOB NUMBER

CR193049

DRAWING NUMBER

C120

REVISION

6

DRAWING SHEET SIZE = A1

NOT FOR CONSTRUCTION



LEGEND

PROPOSED SERVICES

SW

STORMWATER MAIN
STORMWATER SPEL FILTER
STORMWATER TANK
STORMWATER GRATED PIT
NEW STORMWATER GRATED TRENCH DRAIN

EXISTING SERVICES

eSW

STORMWATER MAIN
STORMWATER MANHOLE
STORMWATER KERB INLET PIT

--- / --- / --- / ---

BLOCK BOUNDARY

WARNING:
EXISTING SERVICES SHOWN ARE BASED ON INFORMATION PROVIDED BY SERVICE AUTHORITIES AND ARE ESTIMATES ONLY. UNDER NO CIRCUMSTANCES SHOULD THE LOCATIONS OF SERVICES SHOWN ON THIS PLAN BE RELIED UPON FOR ON SITE WORK. ALL INFORMATION MUST BE CONFIRMED IN THE FIELD.

- STORMWATER NOTES
1.

STOMWATER CONNECTION TO THE BLOCK MUST BE DESIGNED BY A SUITABLY QUALIFIED CIVIL ENGINEER PRIOR TO CONSTRUCTION.
2.

STORMWATER DESIGN TO BE REVIEWED AT DETAILED DESIGN BY A SUITABLY QUALIFIED ENGINEER PRIOR TO CONSTRUCTION.
3.

ALL EXISTING STORMWATER CONNECTIONS TO THE BLOCK ARE TO BE CAPPED AND WATERPROOFED.
4.

ALL WORKS TO BE DESIGNED AND CONSTRUCTED TO COMPLY WITH AS/NZS 3500.3:2018 EXCEPT WHERE CITY OF WAGGA WAGGA COUNCIL STANDARDS, DRAWINGS AND SPECIFICATIONS TAKE PRECEDENCE.
5.

THE CONTRACTOR MUST VISIT THE SITE OF WORKS BEFORE TENDERING AND MAKE ALLOWANCES IN THEIR TENDER FOR ALL TOPOGRAPHIC CONSTRAINTS AFFECTING THE EXECUTION OF THE WORKS AND THE RESTORATION OF THE SITE.
6.

THE CONTRACTOR MUST SECURE ALL PERMITS, ARRANGE ALL CLEARANCES AND PAY ALL FEES REQUIRED TO COMPLETE THE PROJECT, PRIOR TO THE COMMENCEMENT OF WORK.
7.

ALTHOUGH THE POSITION OF EXISTING UNDERGROUND SERVICES HAS BEEN PLOTTED FROM AVAILABLE RECORDS, THE CONTRACTOR MUST DIG TEST PITS BY HAND AT UTILITY CROSSINGS AND/OR CONNECTIONS IN ADVANCE OF TRENCHING AND ADVISE THE SUPERINTENDENT OF ANY POTENTIAL CLASHES.
8.

EXCESS EXCAVATED MATERIAL MATERIAL SHALL BE REMOVED FROM THE SITE AND DUMPED AT AN APPROVED SPOIL AREA.
9.

CONTRACTOR TO ALLOW FOR THE SUPPLY AND INSTALLATION OF 11 SPEL STORMSACKS OR EQUIVALENT.
10.

THIS PLAN IS TO BE READ IN CONJUNCTION WITH CR193049_EC06 WSUD.

VERIFIER:
JOB MANAGER: WPK
DESIGNED: NGRINTER
DRAWN: NGRINTER

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
1	FOR COMMENT	NG		MP	16.04.20
2	FOR COMMENT (V2)	NG		MP	23.04.20
3	FOR COMMENT (V3)	NG		MP	10.07.20
4	DA (V2)	NG		MP	16.07.20
5	DA (V3)	NG		MP	17.11.20

CLIENT

INNOVATION PROPERTY TRUST

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ARCHITECT

DARYL JACKSON
ALASTAIR SWAYN
ARCHITECTS

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02

04

06

08

10m

SCALE 1:200 @ A1

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PLAN

NORTHROP

Canberra

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Ph (02) 6285 1822 Fax (02) 6285 1863
Email canberra@northrop.com.au ABN 81 094 433 100

PROJECT

THE RIVERINA CLINIC
336 - 344 EDWARD STREET
WAGGA WAGGA

DRAWING TITLE

CIVIL WORKS
CONCEPT STORMWATER
MANAGEMENT PLAN

JOB NUMBER

CR193049

DRAWING NUMBER

C160

REVISION

5

DRAWING SHEET SIZE = A1

NOT FOR CONSTRUCTION

