
ENGINEERING ASSESSMENT



To: Joanne Tarbit – Development Assessment Planner

From: Erin Cotter – Assistant Development Engineer

Joe Rizzo – Engineering Design and Approvals Manager

File: DA 291/2018

Date: 13/02/2019

Re: PROPOSED 15MW SOLAR FARM – LOT 140 & 141 DP 751709 – 41 BOB IRVIN ROAD, GRIFFITH

Joanne,

This Engineering Assessment relates to the above development and addresses the following issues:

Clause 7.1 of the GLEP 2014 – Earthworks

1. *The objective of this clause is to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land.*
2. *Development consent is required for earthworks unless:*
 - a. *the earthworks are exempt development under this Plan or another applicable environmental planning instrument, or*
 - b. *the earthworks are ancillary to development that is permitted without consent under this Plan or to development for which development consent has been given.*
3. *In deciding whether to grant development consent for earthworks (or for development involving ancillary earthworks), the consent authority must consider the following matters:*
 - a. *the likely disruption of, or any detrimental effect on, drainage patterns and soil stability in the locality of the development,*

- b. the effect of the development on the likely future use or redevelopment of the land,*
- c. the quality of the fill or the soil to be excavated, or both,*
- d. the effect of the development on the existing and likely amenity of adjoining properties,*
- e. the source of any fill material and the destination of any excavated material,*
- f. the likelihood of disturbing relics,*
- g. the proximity to, and potential for adverse impacts on, any waterway, drinking water catchment or environmentally sensitive area,*
- h. any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.*

The proposed development will require Construction Certificates prior to the commencement of any earthworks, therefore the matters for consideration listed above will be addressed based on the information provided prior to Construction Certificate approval.

Clause 7.2 of the GLEP 2014 – Flood Planning

An Aerial Laser Survey (ALS) of the Griffith LGA was conducted as part of the *Griffith Main Drain J & Mirrool Creek Floodplain Risk Management Study and Plan 2015 (BMT WBM)*. Information pertaining to the flood levels of the subject allotment has been extrapolated from this documentation.

- 1. The objectives of this clause are as follows:*
 - a. to minimise the flood risk to life and property associated with the use of land,*
 - b. to allow development on land that is compatible with the land's flood hazard, taking into account projected changes as a result of climate change,*
 - c. to avoid significant adverse impacts on flood behaviour and the environment.*
- 2. This clause applies to land at or below the flood planning level.*
- 3. Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development:*
 - a. is compatible with the flood hazard of the land, and*

The Flood Report for the subject allotments indicates that the land is not flood prone for the 1% Annual Exceedance Probability (1 in 100) event. The proposed solar farm is compatible with the flood classification of the subject site.

- b. will not significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties, and*

The Flood Report for the subject allotments indicates that the land is not flood prone for the 1% Annual Exceedance Probability (1 in 100) event.

The proposed development is for the construction of a proposed solar farm on land previously used for agricultural farming purposes. The solar farm will result in an increase in hardstand area on the allotment, and alter the nature of stormwater runoff from the site. Onsite detention will therefore be required to ensure the maximum developed discharge from the site shall not exceed the pre-development stormwater discharge for the critical storm event. The onsite detention system shall be constructed in accordance with Council's *Onsite Detention Policy (CS-CP-404)* and will ensure neighbouring properties and/or downstream catchments are not impacted by the development.

The stormwater runoff from the subject allotments will discharge directly into Murrumbidgee Irrigation (MI's) drainage channel via the onsite detention system. As such, it will be conditioned as part of the subject Development Application that Murrumbidgee Irrigation's written approval for the proposed development is to be submitted to Council for the discharge of drainage waters into their system.

Detailed design drawings including hydraulic calculations for the existing and proposed stormwater drainage systems will be required to be submitted to Council for approval. The plans are to be submitted with MI's written approval of the design and calculations.

As the proposed development is not located on flood liable land, and onsite detention will be installed in accordance with Council's *Onsite Detention policy*, it is not considered that the proposed development will result in unsustainable social and economic costs to the community as a consequence of flooding.

- c. incorporates appropriate measures to manage risk to life from flood, and*

The Flood Report for the subject allotments indicates that the land is not flood prone for the 1% Annual Exceedance Probability (1 in 100).

The proposed development is for the construction of a solar farm. The development will not include the construction of any habitable rooms; and any increase in stormwater runoff as a result of the proposed development will be managed as part of the onsite detention system. It is therefore not considered that the proposed development will pose any risk to life from flood.

- d. will not significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses, and*

There will be no significant adverse effects on the environment because of this development.

There is no riparian vegetation on the area of land to be developed. Similarly, the proposed development will not result in any destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.

- e. is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding.*

The Flood Report for the subject allotments indicates that the land is not flood prone for the 1% Annual Exceedance Probability (1 in 100) event.

The proposed development is for the construction of a proposed solar farm on land previously used for agricultural farming purposes. The solar farm will result in an increase in hardstand area on the allotment, and alter the nature of stormwater runoff from the site. Onsite detention will therefore be required to ensure the maximum developed discharge from the site shall not exceed the pre-development stormwater discharge for the critical storm event. The onsite detention system shall be constructed in accordance with Council's *Onsite Detention Policy (CS-CP-404)* and will ensure neighbouring properties and/or downstream catchments are not impacted by the development.

The stormwater runoff from the subject allotments will discharge directly into Murrumbidgee Irrigation (MI's) drainage channel via the onsite detention system. As such, it will be conditioned as part of the subject Development Application that Murrumbidgee Irrigation's written approval for the proposed development is to be submitted to Council for the discharge of drainage waters into their system.

Detailed design drawings including hydraulic calculations for the existing and proposed stormwater drainage systems will be required to be submitted to Council for approval. The plans are to be submitted with MI's written approval of the design and calculations.

As the proposed development is not located on flood liable land, and onsite detention will be installed in accordance with Council's *Onsite Detention policy*, it is not considered that the proposed development will result in unsustainable social and economic costs to the community as a consequence of flooding.

4. *A word or expression used in this clause has the same meaning as it has in the Floodplain Development Manual (ISBN 0 7347 5476 0) published by the NSW Government in April 2005, unless it is otherwise defined in this clause.*

5. *In this clause:*

Flood planning level means the level of a 1:100 ARI (average recurrent interval) flood event plus 0.5 metre freeboard.

Clause 7.10 of the GLEP 2014 – Essential services

Development consent must not be granted to development unless the consent authority is satisfied that any of the following services that are essential for the development are available or that adequate arrangements have been made to make them available when required:

- a. the supply of water,*

Council's potable water system does not service the subject allotment. Murrumbidgee Irrigation's (MI) raw water supply infrastructure services the property for current farming practices.

The applicant has stated that potable water supply will not be required for the proposed development. The applicant is to make their own arrangements with MI in relation to the raw water supply to the site.

- b. the supply of electricity,*

The applicant is to make their own arrangements with the service provider for an adequate connection to electricity for the proposed development. All costs are to be borne by the applicant.

- c. the disposal and management of sewage,*

Council's sewage system does not service the subject allotments. The applicant has stated that connection to sewerage or an AWTs will not be required as there are no permanent offices or amenities proposed on site.

- d. stormwater drainage or on-site conservation,*

The Flood Report for the subject allotments indicates that the land is not flood prone for the 1% Annual Exceedance Probability (1 in 100) event.

The proposed development is for the construction of a proposed solar farm on land previously used for agricultural farming purposes. The solar farm will result in an increase in hardstand area on the allotment, and alter the nature of stormwater runoff from the site. Onsite detention will therefore be required to ensure the maximum developed discharge from the site shall not exceed the pre-development stormwater discharge for the critical storm event. The onsite detention system shall be constructed in accordance with Council's *Onsite Detention Policy (CS-CP-404)* and will ensure neighbouring properties and/or downstream catchments are not impacted by the development.

The stormwater runoff from the subject allotments will discharge directly into Murrumbidgee Irrigation (MI's) drainage channel via the onsite detention system. As such, it will be conditioned as part of the subject Development Application that Murrumbidgee Irrigation's written approval for the proposed development is to be submitted to Council for the discharge of drainage waters into their system.

Detailed design drawings including hydraulic calculations for the existing and proposed stormwater drainage systems will be required to be submitted to Council for approval. The plans are to be submitted with MI's written approval of the design and calculations.

e. suitable vehicular access.

The subject allotment is currently serviced by one accessway located approximately 400 metres southwest of Irrigation Way along Bob Irvin Road. The driveway is approximately 6.5 metres wide and is constructed to an all-weather gravel standard. At present, all ingress and egress movements are facilitated via this access to the existing residential dwelling and farm machinery sheds. The existing accessway will be retained for vehicle movements associated with the existing dwelling. It will not be utilised for the proposed Solar Farm.

The applicant has proposed to construct two (2) additional accessways as part of the subject development, however Council will only permit one (1) additional accessway to be constructed to service the proposed Solar Farm.

The new accessway shall be constructed as a "Rural Property Access" type treatment in accordance with the Austroads Guide to Road Design and cater for the largest sized vehicle accessing the site. The accessway is to cater for the left turn movements into and out of the property and it is required to be

constructed to an all-weather standard in accordance with Council's *Engineering Guidelines – Subdivision and Development Standards* between the road carriageway and the property boundary.

State Environmental Planning Policy (Infrastructure) 2007

The *State Environmental Planning Policy (Infrastructure) 2007* specifies that this Development Application requires a referral to the Roads and Maritime Services (RMS). The referral from the RMS has been received and is attached as 'Attachment A' of this Engineering Assessment. Recommendations from the RMS have been considered as part of this Engineering Assessment and have been included where applicable).

Compliance with Council's Engineering Guidelines - Subdivisions and Development Standards December

Consent Approval Conditions will ensure the development complies with *Council's Engineering Guidelines - Subdivisions and Development Standards* prior to the issue of an Occupation Certificate.

Compliance with AS 2890

The applicant is proposing to construct a temporary parking and laydown area onsite which will accommodate a minimum of 40 car parking spaces. This carparking area will only be required during the construction phase of the development and is to be detailed on the Construction Management Plan.

Once construction has finished, and the solar farm is operational, maintenance is expected to be carried out quarterly by a crew of 2 to 3 people. Carparking will not be required onsite during the operational phase of the development as workers will be required to drive between the panels requiring maintenance and will use the internal roads for parking. There will not be any conflict of vehicles using the internal roads due to the low number of staff required onsite at any one time.

All loading and unloading of vehicles is to be conducted onsite; no loading will be permitted from Council's road reserve, and all vehicles are to enter and leave the site in a forward direction.

The conditions of consent will reflect the requirements of Australian Standard 2890.

Access, Traffic and Transport

Existing Accessway(s)/Driveway(s)

The subject allotment is currently serviced by one accessway located approximately 400 metres southwest of Irrigation Way along Bob Irvin Road. The driveway is approximately 6.5 metres wide and is constructed to an all-weather gravel standard. At present, all ingress and egress movements are facilitated via this access to the existing residential dwelling and farm machinery sheds. The existing accessway will be retained for vehicle movements associated with the existing dwelling. It will not be utilised for the proposed Solar Farm.

Proposed Accessway(s)/Driveway(s)

The applicant has proposed to construct two (2) additional accessways as part of the subject development, however Council will only permit one (1) additional accessway to be constructed to service the proposed Solar Farm.

The new accessway shall be constructed as a “Rural Property Access” type treatment in accordance with the Austroads Guide to Road Design and cater for the largest sized vehicle accessing the site. The accessway is to cater for the left turn movements into and out of the property and it is required to be constructed to an all-weather standard in accordance with Council’s *Engineering Guidelines – Subdivision and Development Standards* between the road carriageway and the property boundary.

Existing Road Network

The subject allotment is located off Bob Irvin Road.

Bob Irvin Road is a two (2) lane, two (2) way gravel road with gravel shoulders along both sides of the road. Bob Irvin Road is classified as an “rural access road” as specified on Council’s *Road Hierarchy Plan*.

Bob Irvin Road is an unsealed gravel road, therefore the speed limit of the road is default 100km/h fronting the proposed development. Bob Irvin Road at this location is limited to general access vehicles only.

Council conducted a traffic count along Bob Irvin Road between 200 metres southwest of Irrigation Way in December 2006; the average daily traffic count for that period was 103 vehicles per day. Of the 103 vehicles per day 90 were light vehicles, 11 were medium to heavy rigid vehicles and 2 were 19-metre semi-trailers. Bob Irvin Road had an average peak of approximately 13 vehicles per hour.

Bob Irvin Road intersects Irrigation Way (Main Road 80) at the north-eastern most end of the road. Irrigation Way is a two (2) lane, two (2) way bitumen sealed road with gravel shoulders along both

sides of the road. Irrigation Way is classified as an “arterial road” as specified on Council’s *Road Hierarchy Plan*.

Council conducted a traffic count along Irrigation Way east of Murray Road in May 2018; the average daily traffic count for that period was 1970 vehicles per day. Of the 1970 vehicles per day 1741 were light vehicles, 129 were medium to heavy rigid vehicles, 73 were 19-metre semi-trailers and 27 were B-Doubles. Irrigation Way had an average peak of approximately 207 vehicles per hour.

Council has referred the Development Application to the Roads and Maritime Services (RMS) for recommendations associated with the use of the intersection of Irrigation Way and Bob Irvin Road to access the site.

Type of Traffic Expected to the Site

The subject site has an existing residence and has previously been used for agricultural farming purposes. The subject site would most likely have generated standard passenger vehicles and vehicles associated with farming activities.

The type of traffic expected to the site as part of the proposed development will be standard passenger vehicles.

Increase in Traffic to the Site

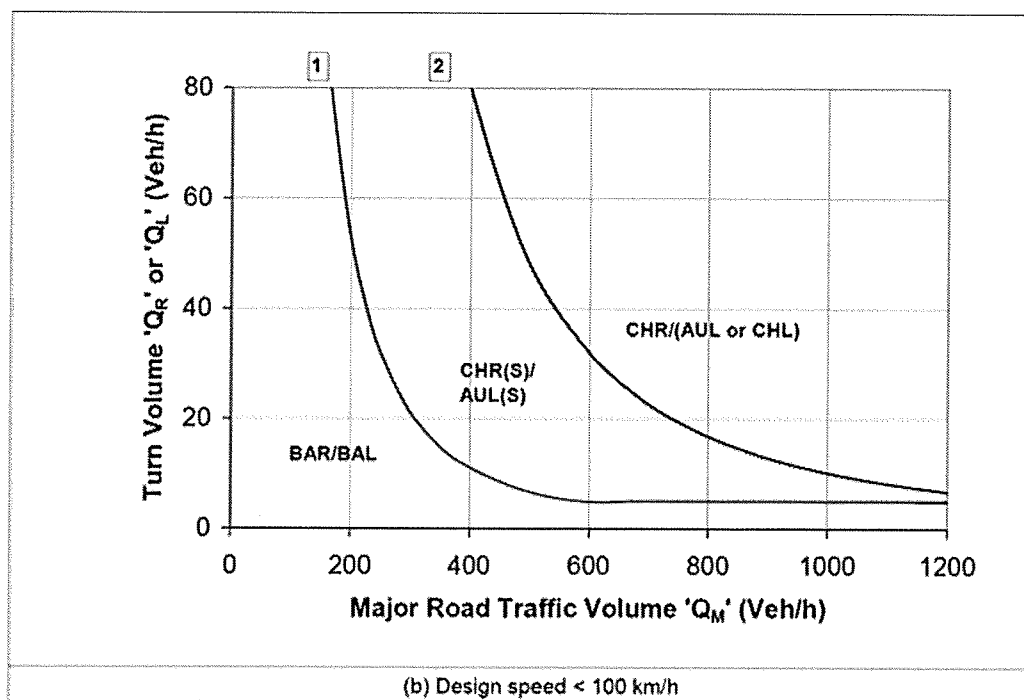
As part of the submitted documentation, the applicant has engaged ML Traffic Engineers to prepare a Traffic Impact Assessment Report and a Construction Traffic Management Plan (Received by Council on 19 December 2018). ML Traffic Engineers has indicated the following;

- On completion of the construction period it is expected that the site will be unmanned with traffic generation associated with the site reduced to quarterly maintenance vehicles only with a crew of 2 to 3 people
- Approximately 170 semi-trailer vehicles will access the site during a 10-week construction period (maximum 5 per day). **It should be noted that inconsistencies within the report outline conflicting construction period times however Council’s assessment will be based on the worst case scenario of a construction period of 18 months as indicated in the submitted Construction Traffic Management Plan.**
- A maximum of 6 construction vehicles will accessing the site daily during peak construction periods.

- Approximately 50 staff will be on-site during the construction phase with parking available for up to 40 staff vehicles in the area surrounding the existing house.
- The documentation submitted by ML Traffic Engineers identifies 19m semi-trailers require the use of both lanes when entering Bob Irvin Road. To avoid major upgrades, ML traffic engineers have proposed to use traffic management at the intersection to eliminate the conflict between 19m semi-trailers entering and exiting Bob Irvin Road. Therefore minor upgrades are required at the intersection of Irrigation Way and Bob Irvin Road to allow for these traffic control devices to be implemented. The proposed upgrades outlined in the reports identified the need for the sealing of the intersection.

The RTA's *Guide to Traffic Generating Developments* does not provide an indication of anticipated vehicle movements associated with solar farms. Currently there is minimal traffic to the site as it is used for farming activities and a place of residence.

The *Austroads Guide to Road Design - Part 4: Intersections and Crossings* - Appendix A.8 details the warrants for the basic, auxiliary and channelised intersection treatments off major roads based upon the traffic volumes through an intersection and the design speed of the major road. Detailed below is Figure A.10 (a) which is used to select the appropriate turn treatments on roads with a design speed of 100km/h or greater.



Austroads Guide to Road Design - Part 4: Intersections and Crossings - Figure A.10(b): Warrants for Turn Treatments on the Major Road at Unsignalised Intersections - Design Speed > 100km/h

Therefore, based upon the existing traffic volume of Irrigation Way and the proposed increase in traffic along Bob Irvin Road, the intersection of Irrigation Way and Bob Irvin Road is required to incorporate Basic Right Turn (BAR) and Basic Left Turn (BAL) intersection treatments as a minimum.

Pre-lodgement discussion with both RMS and the applicant for the Development Application regarding road work requirements deemed major upgrades (BAR/BAL) to be unnecessary. Given that the increase in traffic to the site is for a construction period only, the increase in traffic to the site can be managed by traffic control. As such, **the Traffic Management Plan shall be reviewed in consultation with RMS to ensure that all key traffic related issues associated with the development are addressed.**

Further to this, RMS have provided correspondence relating to dust generation and loose material being dragged onto the Irrigation Way. To address these concerns, **Bob Irvin Road is to be upgraded for 50 metres southwest from Irrigation Way. The upgrades will include; widening, bitumen sealing, line marking and signage.**

Design drawings for the roadworks shall be submitted to Council for approval prior to the issue of a Construction Approval (Civil Works). Such plans shall include designs and specifications for all proposed works as required for approval by Council. The requirements are to conform to *Council's Engineering Guidelines - Subdivisions and Development Standards*, the *Austroads Guide to Road Design* as amended by the supplements adopted by Roads and Maritime Services for the prevailing speed limit and RMS Technical Directions.

All roadworks relating to access and intersection upgrades must be completed prior to the commencement of construction work on the solar farm.

Through the implementation of a Traffic Management Plan, the existing road network can cater for the increase in traffic to the site relating to the construction of the proposed development.

Loading/Unloading Arrangements

The applicant has stated that all loading and unloading will be carried out on site. The applicant is proposing to utilise the internal roadways for the unloading and loading areas. This is considered satisfactory for the proposed development as any loading or unloading (outside of the construction period) will be related to maintenance/repair of the solar panels. Any vehicles accessing the development with replacement parts for the panels will be required to unload them as closely to the particular panel which requires maintenance as possible.

Loading and unloading during the construction period will be managed under a Construction Management Plan for the proposed development.

It will be conditioned as part of this Development Application that all loading/unloading is to be carried out onsite to prevent interference with the use of the public road by vehicles and pedestrians.

Carparking Arrangements

The applicant is proposing to construct a temporary parking and laydown area onsite which will accommodate a minimum of 40 car parking spaces. This carparking area will only be required during the construction phase of the development and is to be detailed on the Construction Management Plan.

Once construction has finished, and the solar farm is operational, maintenance is expected to be carried out quarterly by a crew of 2 to 3 people. Carparking will not be required onsite during the operational phase of the development as workers will be required to drive between the panels requiring maintenance and will use the internal roads for parking. There will not be any conflict of vehicles using the internal roads due to the low number of staff required onsite at any one time.

All loading and unloading of vehicles is to be conducted onsite; no loading will be permitted from Council's road reserve, and all vehicles are to enter and leave the site in a forward direction.

The conditions of consent will reflect the requirements of Australian Standard 2890.

Pedestrian Services

The proposed development has not been identified on Council's adopted *Griffith Pedestrian and Bicycle Strategy*; as such, the development will not be required to provide pedestrian facilities.

Non-Essential Utilities

Gas

The applicant is to make their own arrangements with the service provider for an adequate connection to this service for the proposed development. All costs are to be borne by the applicant.

Telecommunications

The applicant is to make their own arrangements with the service provider for an adequate connection to this service for the proposed development. All costs are to be borne by the applicant.

Engineering Conditions

The following engineering conditions apply to the development above:

General Conditions

1. (AMENDED) PCW1513 Sediment and Erosion

Effective dust, noise, sedimentation and erosion controls are to be implemented prior to the commencement of site works to maintain public safety/amenity.

2. AC1110 Damage to Council property

If any damage is occasioned to Council property during construction and associated works, the cost of repairs will be recoverable. It is therefore requested that any damage which is obvious before works commence be immediately notified to Council to avoid later conflict.

3. AC1107 Provision of Services

The applicant is to be responsible for all amplification, extension and adequate provision for connection to services at their own expense. The work is to be in accordance with Council's *Engineering Guidelines – Subdivisions and Development Standards* and relevant authorities' specifications.

4. (AMENDED) PCW1506 Construction Management Plan (CMP)

Prior to the commencement of work, a Construction Management Plan is to be prepared by a suitably qualified professional. The Construction Management Plan is to be submitted to Council for approval and is to address, but not be limited to, the following:

- a. the management of loading and unloading of construction materials on site;
- b. material stockpiling/storage;
- c. identify parking for construction worker vehicles;
- d. dust mitigation measures; and
- e. complaint management and contingency measures.

The construction management measures specified in the approved Construction Management Plan shall be implemented for duration of construction.

5. (AMENDED) POC1924 Traffic Management Plan (TMP)

Prior to the commencement of work, a Traffic Management Plan is to be prepared by a suitably qualified professional. The Traffic Management Plan shall be reviewed in consultation with the relevant road authorities (Council and Roads and Maritime Services) to ensure that key traffic related issues associated with the development have been addressed. The appointed transport contractor shall be involved in the preparation of this plan. The plan shall address all light and heavy traffic generation to the development site and detail the potential impacts associated with the development, the mitigation measures to be implemented, and the procedures to monitor and ensure compliance. This plan shall address, but not necessarily be limited to the following;

- a. Require that all vehicular access to the site be via the approved access route.
- b. Maximum size of vehicle is 19 metre semi-trailer,
- c. Details of traffic routes to be used by heavy and light vehicles, and any associated impacts and any road-specific mitigation measures.
- d. Details of measures to be employed to ensure safety of road users and minimise potential conflict with project generated traffic,
- e. Proposed hours for construction activities, as night time construction presents additional traffic related issues to be considered.
- f. The management and coordination of the movement of vehicles for construction and worker related access to the site and to limit disruption to other motorists, emergency vehicles, school bus timetables and school zone operating times,
- g. loads, weights and lengths of haulage and construction related vehicles and the number of movements of such vehicles,
- h. procedures for informing the public where any road access will be restricted as a result of the project,
- i. any proposed precautionary measures such as signage to warn road users such as motorists about the construction activities for the project,
- j. a Driver Code of Conduct to address such items as; appropriate driver behaviour including adherence to all traffic regulations and speed limits, safe overtaking and maintaining appropriate distances between vehicles, etc and appropriate penalties for infringements of the Code,
- k. details of procedures for receiving and addressing complaints from the community concerning traffic issues associated with truck movements to and from the site,

6. PCW1507 Traffic Control Plan (TCP)

A traffic control plan is to be submitted to Council satisfying the provisions of Australian Standard 1742.3, for acceptance **prior to the commencement of work within Council's road reserve**. Strict compliance to the traffic control plan is to be maintained throughout the duration of the construction work.

Where it is not practical to provide sufficient width for heavy vehicles to pass each other (due to a narrow irrigation canal bridge located on Bob Irvin Road near the intersection of the irrigation Way) the traffic control plan shall be implemented to ensure that heavy vehicles turning right from the Irrigation Way into Bob Irvin Road encounter no obstruction from oncoming vehicles. The traffic control plan shall be developed and implemented so as to minimise delay on Irrigation Way. Any storage or stacking of vehicles shall occur within Bob Irvin Road

7. (BLANK) PCW1591 Road Upgrade Prior to Construction

Prior to the commencement of construction works on-site, the Proponent must undertake all works to upgrade any road, its associated road reserve and any public infrastructure in that road reserve, to a standard suitable for use by heavy vehicles to meet any reasonable requirements that may be specified by the relevant roads authority. The design and specifications, and construction, of these works must be completed and certified by an appropriately qualified person. On Classified Roads the geometric road design and pavement design must be to the satisfaction of the Roads and Maritime Services

8. (BLANK) ON2191 Management of Glint and Glare from Solar Panels

Glint and glare from the solar panels shall not cause a nuisance, disturbance or hazard to the travelling public on the public road network. In the event of glint or glare from the solar plant being evident from a public road, the proponent shall immediately implement glare mitigation measures such as construction of a barrier (e.g. fence) or other approved device to remove any nuisance, distraction and/or hazard caused as a result of glare from the solar panels.

9. (BLANK) PCCW1691 Section 138 Approval

Any works within the road reserve of the Irrigation Way requires approval under Section 138 of the Roads Act, 1993 from the road authority (Council) and concurrence from Roads and Maritime Services **prior to commencement of any such works**. The developer is responsible for all public utility adjustment/relocation works, necessitated by the development and as required by the various public utility authorities and/or their agents.

Onsite Detention

10. CCB1233 Onsite detention

Stormwater detention is to be created onsite for the critical storm event. The maximum developed stormwater discharge shall not exceed the pre-development stormwater discharge from the site. Design and details including hydraulic calculations are to be submitted to Council for approval in accordance with *Council's Engineering Guidelines – Subdivision and Development Standards*, Council's *Onsite Detention Policy (CS-CP-404)* and Council's *Stormwater Drainage & Disposal Policy (CS-CP-310)* **prior to the issue of a Construction Certificate for Building Works.**

A qualified Civil Engineer with experience in Hydraulic Analysis shall design and certify the Onsite Detention System, which shall be maintained for the life of the project. The consultant is to sign off all drawings and calculations and provide details of Professional Indemnity Insurance.

11. PSC1802 Discharge of water into Murrumbidgee Irrigation drainage channel

Any proposal to discharge water into Murrumbidgee Irrigation's drainage channel system must be supported by written approval from Murrumbidgee Irrigation (MI). A copy of MI's approval and conditions must be submitted to Council **prior to the issue of a Construction Certificate for Building Works.**

Accessway

12. (AMENDED) CCB1225 Turning path diagrams to justify suitable access tapers

Prior to the issue of a Construction Certificate for Building Work, an amended accessway plan with turning path diagrams is to be submitted to Council to justify suitable tapers connecting to the road carriageway to accommodate a Semi-Trailer Vehicle for the proposed accessways. This is to justify the width of the proposed access and the tapers at the connection point of the access to the Bob Irvin Road carriageway. Turning path diagrams are to be in accordance with Austroads *Design Vehicles and Turning Path Templates Guide 2013*.

13. (AMENDED) POC1932 Accessway construction

One (1) additional accessway is permitted to be constructed off Bob Irvine Road to service the proposed development. **Prior to the issue of an Occupation Certificate**, the proposed accessway is to be constructed to an all-weather standard in accordance with Council's *Engineering Guidelines – Subdivisions and Development Standards*. The accessway is to include concrete culverts with concrete headwalls and guideposts.

14. (AMENDED) ON2135 Ongoing access to site

The following conditions will apply for the lifetime of the subject development:

- a. All vehicles are required to enter and leave the development in a forward direction to ensure traffic/pedestrian safety.
- b. All vehicular loading and unloading is to be carried out within the site to prevent interference with the use of the public road by vehicles and pedestrians.
- c. Vehicles accessing the development are to be limited to Semi-Trailer Vehicles as specified in *Austroads Design Vehicles and Turning Path Templates Guide 2013*.

15. ON2136 Access maintenance

The property owner remains responsible for the upkeep and maintenance of the accessway and associated facilities for the lifetime of the proposed development.

Roads

16. (AMENDED) CACW1406 Road upgrade

The intersection of Irrigation Way and Bob Irvine Road is to be upgraded and the roadside is to be maintained to the satisfaction of Roads and Maritime Services to the following standard:

- a. Bob Irwin Road shall be sealed for at least 50 metres from its intersection with the Irrigation Way.
- b. Bob Irwin Road shall be constructed to provide for 2 travel lanes for at least 50 metres from its intersection with Irrigation Way except at the existing culvert.
- c. The intersection shall be designed and constructed so that vehicles turning between the Irrigation Way and Bob Irvin Road are not required to cross to the opposing travel lane on Irrigation Way in order to perform a turn manoeuvre. The intersection shall be line marked in accordance with Australian standards.

Prior to the issue of a Construction Approval (Civil Works), detailed engineering design drawings for the roadworks shall be completed in accordance with Council's Engineering *Guidelines – Subdivisions and Development Standards* and *Austroads Guide to Road Design* as amended by the technical directions issued by the NSW Roads and Maritime Services. Design plans are to be submitted to Council for approval.

17. (BLANK) DC1791**Maintenance of Road Infrastructure**

For the duration of on-site construction works relating to the proposed development, the applicant will be responsible for ensuring Bob Irvin Road from the southernmost access to the proposed development up to, and including the intersection with Irrigation Way is maintained. Any pot-holes, corrugation or pavement deterioration during the onsite construction works associated with the solar farm is to be repaired by the applicant to the standards outlined in Council's Engineering *Guidelines – Subdivisions and Development Standards* and *Austroads Guide to Road Design* as amended by the technical directions issued by the NSW Roads and Maritime Services.

**ERIN COTTER****ASSISTANT DEVELOPMENT ENGINEER****JOE RIZZO****ENGINEERING DESIGN AND APPROVALS MANAGER**



5 February 2019

The General Manager
Griffith City Council
PO Box 485
GRIFFITH NSW 2680

Attention: Joanne Tarbit

DA291/2018 – PROPOSED SOLAR FARM - LOT 140 DP751709 – 41 BOB IRVIN ROAD, YOOGALI.

I refer to your correspondence regarding the subject Application which was referred to Roads and Maritime Services for assessment and comment.

Roads and Maritime Services has reviewed the Statement of Environmental Effects (SEE) prepared by Zenith Town Planning Pty Ltd for the Yoogali Solar project. From the information provided it is understood that the proposal is for the establishment and operation of a 15MW solar farm and associated infrastructure on the subject site. The subject site is located on the south east corner of the intersection of Bob Irvin Road and Irrigation Way. The subject site has frontage and access to Bob Irvin Road, which is classed as a local road. The speed limit on the Irrigation Way at the intersection of Bob Irvin Road is 100km/h.

Access to the site will be via the intersection of Bob Irvin Road with Irrigation Way during both the construction and operational phases of the project. The Irrigation Way is an approved B-Double route whereas Bob Irvin Road is restricted to general access vehicles (up to and including semi-trailers). As access to the site is proposed from Bob Irvin Road any access driveway should be consistent with the requirements of Council.

From the documentation provided, the development will comprise of a series of photovoltaic (PV) modules (approximately 50,000) erected on the site. The PV Modules will be mounted on rotating support structures designed to track the sun. The potential height of the mounting structures will be up to 3.9m metres.

It is understood that the anticipated construction period will be up to 10 weeks. Due to the characteristics of such a development the significant proportion of traffic generation (for both light and heavy vehicles) occurs during the construction and decommissioning stages of the development with the operational phase of the development generating limited traffic. The submitted documentation considers the heavy and light vehicle traffic generation for construction of the facility. The documentation addresses the delivery of the components to the site but does not finalise the preferred route for the delivery of other materials, such as the aggregate, water and sand required for civil works.

Turning path templates have been provided that indicate the existing intersection layout is not appropriate for heavy vehicles. To address this and the potential traffic generation the development includes works to the intersection and implementation of a Traffic Management Plan for the construction phase. Consultation with Council and Roads and Maritime will be required to ensure that the Traffic Management Plan addresses key traffic issues associated with the project for both light and heavy vehicles. The TMP* shall be developed and implemented to minimise any delay on Irrigation Way and to restrict access during peak hour and school bus times.

Currently Bob Irvin Road is an unsealed road. To address dust generation and loose material being dragged onto the Irrigation Way, particularly during the construction phase of the development, Bob Irvin Road is to be sealed for at least 50 metres from its intersection with the sealed carriageway of Irrigation Way.

It is proposed that approximately 50 construction personnel would be required on site during the construction period. The submitted documentation indicates that the construction workforce is proposed to be housed within the local area with the majority commuting to the site from Griffith. The submitted documentation refers to buses being organised to transport personnel between the development site and Griffith.

The development site is adjacent to the Irrigation Way however the development proposes to address any perceived impact on visual amenity or glint/glare for motorists by the establishment of plantings to screen the development from view from the Irrigation Way. Whilst the landscaping is establishing the development shall implement measures to address glare should these become an issue. This is proposed to shield the facility from the most frequent and direct views from the irrigation Way and will minimise distraction of the motorist.

Roads and Maritime is mainly concerned with the provision of safe access between the subject site and the public road network and the impact of the development on the safety and efficiency of the road network. Roads and Maritime emphasises the need, particularly during the construction phase of this development, to minimise the impacts on the existing road network. As the subject site is to be accessed via an intersection with the Riverina Highway which is located within a 100 km/h speed zone the following conditions are proposed for road safety reasons.

Roads and Maritime Services has assessed the Development Application based on the documentation provided and would raise no objection to the development proposal subject to the Consent Authority ensuring that the development is undertaken in accordance with the information submitted as amended by the inclusion of the following as conditions of consent (if approved):-

1. The submitted Traffic Management Plan shall be reviewed in consultation with the relevant road authorities (Council and Roads and Maritime Services) to ensure that key traffic related issues associated with the development have been addressed, particularly during the construction and decommission processes. The appointed transport contractor shall be involved in the preparation of this plan. The plan shall address all light and heavy traffic generation to the development site and detail the potential impacts associated with the development, the mitigation measures to be implemented, and the procedures to monitor and ensure compliance. This plan shall address, but not necessarily be limited to the following;
 - i) Require that all vehicular access to the site be via the approved access route.
 - ii) Maximum size of vehicle is 19 metre semi trailer,
 - iii) Details of traffic routes to be used by heavy and light vehicles, and any associated impacts and any road-specific mitigation measures.
 - iv) Details of measures to be employed to ensure safety of road users and minimise potential conflict with project generated traffic,
 - v) Proposed hours for construction activities, as night time construction presents additional traffic related issues to be considered.
 - vi) The management and coordination of the movement of vehicles for construction and worker related access to the site and to limit disruption to other motorists, emergency vehicles, school bus timetables and school zone operating times,
 - vii) loads, weights and lengths of haulage and construction related vehicles and the number of movements of such vehicles,
 - viii) procedures for informing the public where any road access will be restricted as a result of the project,
 - ix) any proposed precautionary measures such as signage to warn road users such as motorists about the construction activities for the project,

- x) a Driver Code of Conduct to address such items as; appropriate driver behaviour including adherence to all traffic regulations and speed limits, safe overtaking and maintaining appropriate distances between vehicles, etc and appropriate penalties for infringements of the Code,
 - xi) details of procedures for receiving and addressing complaints from the community concerning traffic issues associated with truck movements to and from the site,
2. Prior to the commencement of construction on-site, the Proponent must undertake all works to upgrade any road, its associated road reserve and any public infrastructure in that road reserve, to a standard suitable for use by heavy vehicles to meet any reasonable requirements that may be specified by the relevant roads authority. The design and specifications, and construction, of these works must be completed and certified by an appropriately qualified person to be to a standard to accommodate the traffic generating requirements of the project. On Classified Roads the geometric road design and pavement design must be to the satisfaction of the Roads and Maritime Services.
 3. As a minimum the intersection of the Irrigation Way and Bob Irvin Road is to be constructed and the roadside maintained to the satisfaction of Roads and Maritime Services to comply with the following:
 - i) Bob Irvin Road shall be sealed for at least 50 metres from its intersection with the Irrigation Way.
 - ii) Bob Irvin Road shall be constructed to provide for 2 travel lanes for at least 50 metres from its intersection with Irrigation Way except at the existing culvert.
 - iii) The intersection shall be designed and constructed so that vehicles turning between the Irrigation Way and Bob Irvin Road are not required to cross to the opposing travel lane on Irrigation Way in order to perform a turn manoeuvre. The intersection shall be line marked in accordance with Australian standards.
 4. Where it is not practical to provide sufficient width for heavy vehicles to pass each other (due to a narrow irrigation canal bridge located on Bob Irvin Road near the intersection of the irrigation Way) a traffic control plan shall be implemented to ensure that heavy vehicles turning right from the Irrigation Way into Bob Irvin Road encounter no obstruction from oncoming vehicles. The traffic control plan shall be developed and implemented so as to minimise delay on Irrigation Way. Any storage or stacking of vehicles shall occur within Bob Irvin Road.
 5. A management plan to provide measures to suppress dust generation from the development site and the transportation route shall be prepared and implemented to the satisfaction of Council and Roads and Maritime Services.
 6. Glint and glare from the solar panels shall not cause a nuisance, disturbance or hazard to the travelling public on the public road network. In the event of glint or glare from the solar plant being evident from a public road, the proponent shall immediately implement glare mitigation measures such as construction of a barrier (e.g. fence) or other approved device to remove any nuisance, distraction and/or hazard caused as a result of glare from the solar panels.
 7. Any works within the road reserve of the Irrigation Way requires approval under Section 138 of the Roads Act, 1993 from the road authority (Council) and concurrence from Roads and Maritime Services prior to commencement of any such works. The developer is responsible for all public utility adjustment/relocation works, necessitated by the development and as required by the various public utility authorities and/or their agents.
 8. All works associated with the project shall be at no cost to the Roads and Maritime Services.

Under the provisions of the Environmental Planning & Assessment Act the Consent Authority is responsible to consider any likely impacts on the natural or built environment. Depending on the level of environmental assessment undertaken to date and nature of the works it may be necessary for the developer to undertake further environmental assessment for any ancillary road works required as a condition on the development.

Any enquiries regarding this correspondence may be referred to the Manager, Land Use for Roads and Maritime Services (South West Region), Maurice Morgan, phone (02) 6923 6611.

Please forward a copy of the Notice of Determination for this Development Application to the Roads and Maritime Services at the same time as advising the applicant.

Yours faithfully



Per:
Lindsay Tanner
Director
South West NSW

ENGINEERING ASSESSMENT



From: James Tomarchio – Trainee Engineer – Traffic and Civil

File: DA 291/2018

Date: 5 February 2019

**Re: PROPOSED 15MW SOLAR FARM – LOT 140 & 141 DP 751709 – 41 BOB
IRVIN ROAD, GRIFFITH NSW 2680**

This engineering assessment relates to the above development and addresses the following issues:

Access, Traffic and Transport

Existing Accessway(s)/Driveway(s)

The subject allotment is currently serviced by one accessway located approximately 400 metres southwest of Irrigation Way along Bob Irvin Road. The driveway is approximately 6.5 metres wide and is constructed to an all-weather gravel standard. At present, all ingress and egress movements are facilitated via this access to the existing residential dwelling and farm machinery sheds.

Proposed Accessway(s)/Driveway(s)

Two new property accessways are proposed as part of this development. The first accessway is proposed to be located approximately 100m southwest of Irrigation Way along Bob Irvin Road. The second accessway is proposed to be located approximately 500m southwest of Irrigation Way along Bob Irvin Road.

The proposed accessways shall be constructed as a “Rural Property Access” type treatment in accordance with the Austroads Guide to Road Design and cater for the largest sized vehicle accessing the site. This caters for the left turn movements into and out of the property. These accessways are required to be constructed to an all-weather standard in accordance with Council’s *Engineering Guidelines – Subdivision and Development Standards* between the road carriageway and the property boundary.

Existing Road Network

The subject allotment is located off Bob Irvin Road.

Bob Irvin Road is a two (2) lane, two (2) way gravel road with gravel shoulders along both sides of the road. Bob Irvin Road is classified as an “rural access road” as specified on Council’s *Road Hierarchy Plan*.

Bob Irvin Road is an unsealed gravel road, therefore the speed limit of the road is default 100km/h fronting the proposed development. Bob Irvin Road at this location is limited to general access vehicles only.

Council conducted a traffic count along Bob Irvin Road between 200 metres southwest of Irrigation Way in December 2006; the average daily traffic count for that period was 103 vehicles per day. Of the 103 vehicles per day 90 were light vehicles, 11 were medium to heavy rigid vehicles and 2 were 19-metre semi-trailers. Bob Irvin Road had an average peak of approximately 13 vehicles per hour.

Bob Irvin Road intersects Irrigation Way (Main Road 80) at the north-eastern most end of the road. Irrigation Way is a two (2) lane, two (2) way bitumen sealed road with gravel shoulders along both sides of the road. Irrigation Way is classified as an “arterial road” as specified on Council’s *Road Hierarchy Plan*.

Council conducted a traffic count along Irrigation Way east of Murray Road in May 2018; the average daily traffic count for that period was 1970 vehicles per day. Of the 1970 vehicles per day 1741 were light vehicles, 129 were medium to heavy rigid vehicles, 73 were 19-metre semi-trailers and 27 were B-Doubles. Irrigation Way had an average peak of approximately 207 vehicles per hour.

Council has referred the Development Application to the Roads and Maritime Services (RMS) for recommendations associated with the use of the intersection of Irrigation Way and Bob Irvin Road to access the site.

Type of Traffic Expected to the Site

The subject site has an existing residence and has previously been used for horticultural purposes. The subject site would most likely have generated standard passenger vehicles and vehicles associated with farming activities.

The type of traffic expected to the site as part of the proposed development will be standard passenger vehicles.

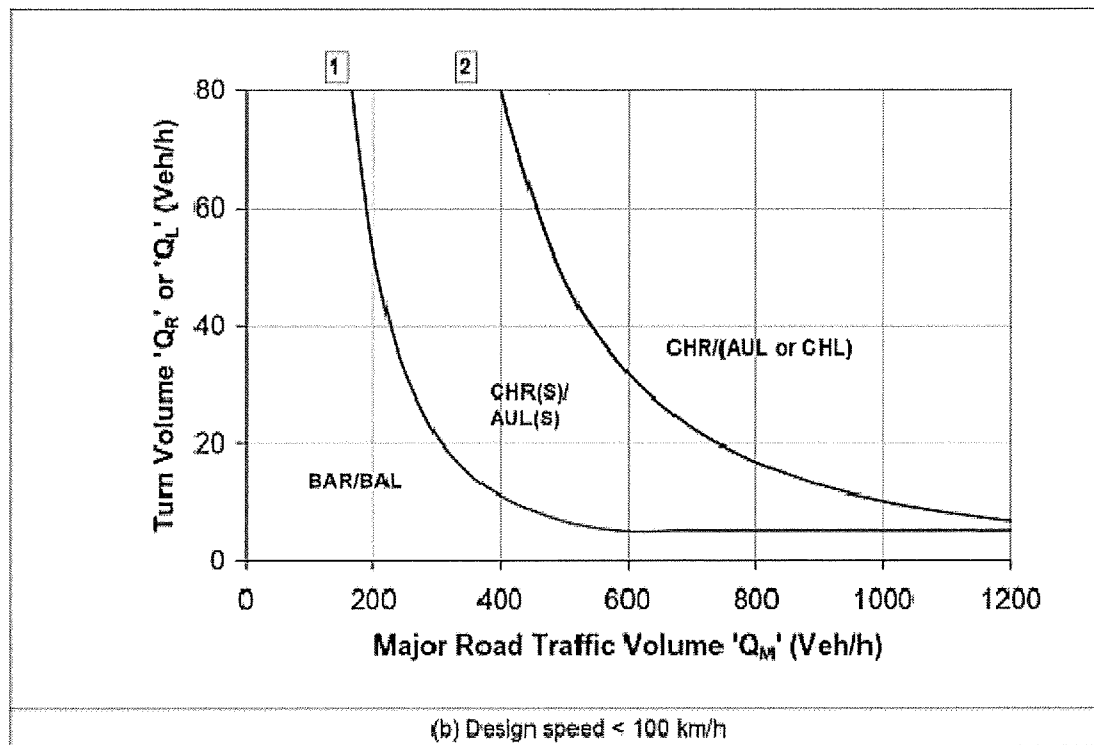
Increase in Traffic to the Site

As part of the submitted documentation, the applicant has engaged ML Traffic Engineers to prepare a Traffic Impact Assessment Report and a Construction Traffic Management Plan (Received by Council on 19 December 2018). ML Traffic Engineers has indicated the following;

- on completion of the construction period it is expected that the site will be unmanned with traffic generation associated with the site reduced to quarterly maintenance vehicles only with a crew of 2 to 3 people
- that approximately 170 semi-trailer vehicles will access the site during a 10-week construction period (maximum 5 per day). **It should be noted that inconsistencies within the report outline conflicting construction period times however Council's assessment will be based on the worst case scenario of a construction period of 18 months as indicated in the submitted Construction Traffic Management Plan.**
- that a maximum of 6 construction vehicles will accessing the site daily during peak construction periods.
- approximately 50 staff will be on-site during the construction phase with parking available for up to 40 staff vehicles in the area surrounding the existing house.
- the documentation submitted by ML Traffic Engineers identifies 19m semi-trailers require the use of both lanes when entering Bob Irvin Road. To avoid major upgrades, ML traffic engineers have proposed to use traffic management at the intersection to eliminate the conflict between 19m semi-trailers entering and existing Bob Irvin Road. Therefore minor upgrades are required at the intersection of Irrigation Way and Bob Irvin Road to allow for these traffic control devices to be implemented. The proposed upgrades outlined in the reports identified the need for the resealing of the intersection.

The *RTA's Guide to Traffic Generating Developments* does not provide an indication of anticipated vehicle movements associated with solar farms. Currently there is minimal traffic to the site as it is used for farming activities and a place of residence.

The *Austroads Guide to Road Design - Part 4: Intersections and Crossings* - Appendix A.8 details the warrants for the basic, auxiliary and channelised intersection treatments off major roads based upon the traffic volumes through an intersection and the design speed of the major road. Detailed below is Figure A.10 (a) which is used to select the appropriate turn treatments on roads with a design speed of 100km/h or greater.



Austroads Guide to Road Design - Part 4: Intersections and Crossings - Figure A.10(b): Warrants for Turn Treatments on the Major Road at Unsignalised Intersections - Design Speed > 100km/h

Therefore, based upon the existing traffic volume of Irrigation Way and the proposed increase in traffic along Bob Irvin Road, the intersection of Irrigation Way and Bob Irvin Road is required to incorporate Basic Right Turn (BAR) and Basic Left Turn (BAL) intersection treatments as a minimum.

Pre-lodgement discussion with both RMS and the applicant for the Development Application regarding road work requirements deemed major upgrades (BAR/BAL) were not necessary. Given that the increase in traffic to the site is for a construction period only, the increase in traffic to the site can be managed by traffic control. As such, **the Traffic Management Plan shall be reviewed in consultation with RMS to ensure that all key traffic related issues associated with the development are addressed.**

Further to this, RMS have provided correspondence relating to dust generation and loose material being dragged onto the Irrigation Way. Therefore to address these concerns, **Bob Irvin Road is to be upgraded for 50 metres southwest from Irrigation Way. The upgrades will include; widening, bitumen sealing, line marking and signage.**

Design drawings for the roadworks shall be submitted to Council for approval prior to the lodgement of a Construction Certificate (Civil Works) application. Such plans shall include designs and specifications for all proposed works as required for approval by Council. The requirements must conform to *Council's Engineering Guidelines - Subdivisions and Development Standards*, the Austroads Guide to Road Design as amended by the supplements adopted by Roads and Maritime Services for the prevailing speed limit and RMS Technical Directions.

All roadworks specified within this Development Application are to be completed in accordance with *Council's Engineering Guidelines – Subdivisions and Development Standards* and the Austroads *Guide to Road Design* as amended by the supplements adopted by Roads and Maritime Services for the prevailing speed limit and RMS Technical Directions and approved by Council prior to the lodgement of a Subdivision Certificate application.

Through the implementation of a Traffic Management Plan, the road network will cater for the increase in traffic to the site relating to the construction of the proposed development.

Loading/Unloading Arrangements

The applicant has stated that all loading and unloading will be carried out on site. The applicant is proposing to utilise the car parking area around the residence as well as the internal roadways as part of the unloading and loading areas.

It will be conditioned as part of this Development Application that all loading/unloading is to be carried out onsite to prevent interference with the use of the public road by vehicles and pedestrians.

Carparking Arrangements

The applicant is proposing to "create" a parking and laydown area within the area of the site currently accommodating a single dwelling. The applicant has stated that this area will accommodate a minimum of 40 on-site car parking spaces, which is anticipated to cater for the number of vehicles that are likely to be present at the facility at any one point in time.

The proposed development is to comply with the requirements of AS 2890.

Through the conditions of consent the development will be able to comply with the requirements of AS 2890: 2004, Part 1: 'Off-street car parking' and Part 2: 'Off-street commercial vehicle facilities' and Council's Development Control Plan 20 (DCP20) – 'Off-Street Parking Policy'. The conditions of consent were justified by the following:

All parking spaces are required to be line marked in accordance with AS 2890.1:2004 and AS 2890.6:2009. Council's Development Control Plan 20 specifies car park dimensions are to be 2.6m wide x 5.5m long (excluding disabled parking spaces); this slightly exceeds the Australian Standard and will be conditioned accordingly.

The requirements for the development to comply with AS2890 will be reflected in the conditions of consent.

Pedestrian Services

The proposed development has not been identified on Council's adopted *Griffith Pedestrian and Bicycle Strategy*; as such, the development will not be required to provide pedestrian facilities.