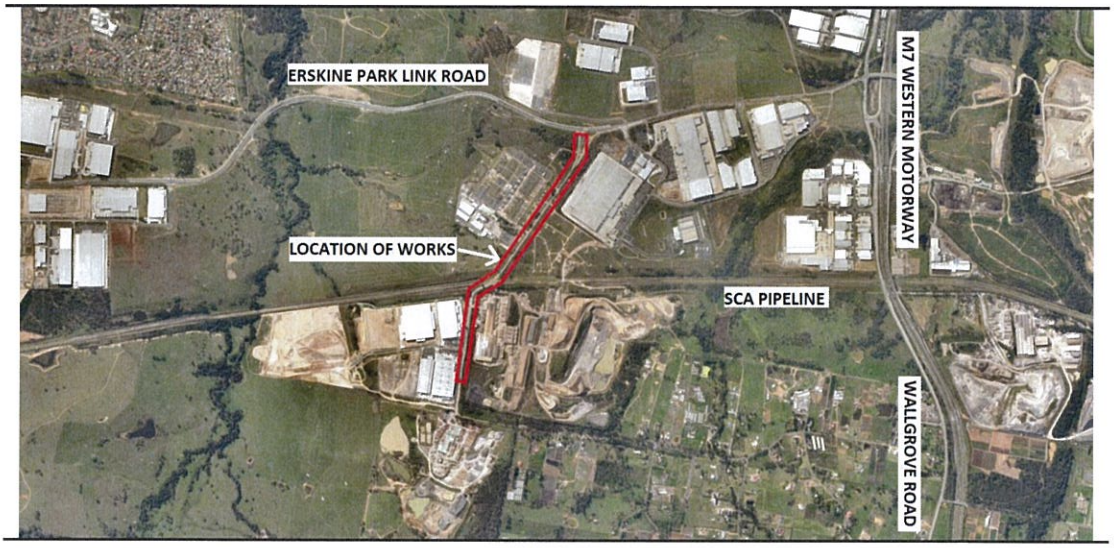
APPENDIX 2

CIVIL ROAD DESIGN REPORT

Oakdale Central Development

Regional Link Roads



OWR Upgrade - Road Design Report

Author: Dane Segail

Approver: Anthony McLandsborough

Report no: R002 **Revision:** 06 **Date:** August 2014

Document information

Suite 702, 154 Pacific Highway, St Leonards

Document registration

Document title	OWR Upgrade - Road Design Report
Document file name	13-143-R002-06-OWR Road Design Statement
Section	Civil Engineering
Document author	Dane Segail

Issue	Description	Date
01	Issued for SSDA	23/10/13
02	Re-Issued to Suit Design Changes	19/05/14
03	Re-Issued – Respond to DoP & Council comments	27/05/14
04	Re-Issued – For DoP, RMS, FCC & BCC Endorsement.	12/06/14
05	Re-Issued – For DoP, RMS, FCC & BCC Endorsement.	27/06/14
06	Amended to incorporate RMS rationalised ultimate design layout	07/08/14

Finalisation signatures

The design described in this report is considered to have been finalised.

Signature		**Date**
Peter Wark Associate Director (Author)		07/08/14
Mark Marsic Lead Designer (Road)		07/08/14
Anthony McLandsborough Director		07/08/14

Notes: The finalisation signatures shown above do not provide evidence of approval to the design. Approval signatures are shown on the title sheet of the design plans.

Authority Endorsement

The concept design of the OWR Upgrade as described in this report has been reviewed and is endorsed as suitable for progressing to detailed design.

Department of Planning

Authorised Representative (Name)	Signature	Date

Fairfield City Council

Authorised Representative (Name)	Signature	Date

Blacktown City Council

Authorised Representative (Name)	Signature	Date

Road and Maritime Services

Authorised Representative (Name)	Signature	Date

Contents

Table of Figures

Table of Tables

1 Scope

1.1 Purpose of Design Report

The purpose of this Design Report is to:

- Describe the Project Scope and Background;
- Define the Project's objectives;
- Describe those documents which make up the Design and subsequent Application;
- Describe the Design Inputs;
- Describe the Design parameters and why they were selected;
- Describe the Road Scape Allocation and how guidelines are met;
- Describe the Road Typical Cross Sections and how standards are met;
- Describe Horizontal Curves and Alignments and how standards are met;
- Describe the Geometric Design and how constraints and standards are met; and
- Describe the Design Finalisation Process.

This Design Report describes ***why things were done.*** What was done is shown on the plans. The objectives of this Design Report are to provide the reasons for design decisions.

1.2 Context/Background

The existing section of Old Wallgrove Road (OWR) between the recently completed EPLR and the Oakdale Estate, is best categorised as a rural road, comprising a variable width pavement from 7 to 8m with flush shoulders and table drains. This section of road is approximately 1600m in length. The road is unlit and is in a poor condition with numerous pavement failures along the stretch of road.

Existing features of OWR (post temporary upgrade as described below) are:

- Total length of road 1600m.
- Single carriageway variable width, average of 7m, widening at access points to circa 12m.
- Unformed shoulders - Stormwater freely drains to surrounding verge.
- Flexible pavement with flush seal.
- Significant pavement cracking and potholing.
- Sign posted speed limit - 70km/h.

- Sight distance satisfactory apart from the area directly south of the SCA crossing.

As part of the Concept Approval for the Oakdale Estate, a section of OWR was to be temporarily upgraded to provide additional road width to cater for additional heavy traffic. These works were completed in 2011. Since the completion of these roadworks, the pavement has deteriorated and potholes have developed, calling for a need to rehabilitate OWR. The drawings associated with the completed upgrade works can be found in Appendix A – GHD OWR Upgrade Drawings (Works Completed).

In addition, Goodman proposes to develop the remainder of the Oakdale Estate, which necessitates consideration of the required road connection.

The Oakdale Estate is located within the Fairfield City Council Local Government area and is bounded by the future Chandos Parkway Road Corridor to the south, the SCA(SCA) pipeline to the north, OWR to the East, and Ropes Creek to the West. The Site forms part of the Oakdale Central Precinct Concept Plan Approval (08_0065) and is approximately 61.2ha in area.

The Concept Approval approved the developed of:

- Overall the subdivision, as modified, created:
    - 15 lot subdivision (total area ~ 45.8ha).
    - 7 industrial buildings.
    - Recreation and biodiversity land (total area ~ 10.1ha)
    - Road construction and upgrades
    - Infrastructure
- Upgrade of a 1.6km section of OWR to provide a 7m wide road to provide B-Double access to the Estate, between the Estate Road entry location and a point on OWR located outside the Coles Myer Distribution Centre (Note: These works have been completed, refer above). Refer to Appendix A – GHD OWR Upgrade Drawings (Works Completed).
- Bulk earthworks

Much of the first half of the Estate is built, with the first leg of the Estate Road built, and the first three industrial buildings built and occupied. The remaining infrastructure is either under construction, or pending Development Approval from Fairfield City Council.

In addition, RMS have requested that the upgrade of OWR, south of the SCA pipeline, be developed and implemented to be compatible with the long term provision of a proposed north south link road. The objective of the future proposed north south link road will be to provide an connector route between the EPLR and the Chandos Parkway, and in addition, to support the development of lands along the corridor of the north south link road.

To support the ongoing development of the Oakdale Estate in the short term, the section of OWR north of the SCA pipeline through to the recently upgraded EPLR, is also required to be upgraded.

AT&L have been comissioned to develop and design the proposed permanent upgrade solution of OWR (including the section south of the SCA pipeline), which will ultimately support further development south of the pipeline.

The OWR road upgrade concept design resented in this report has been primarily developed through a series of design development negotiations with the Roads and Maritime Services in response to design options prepared by AT&L.

Transport for NSW and RMS indicated an objective to rationalise the project scope to provide an adequate level of capacity while providing a cost effective design in order to obtain a satisfactory return in the expenditure of funding generated by the State Infrastructure Levy.

This process and the background to the design development is documented in a letter prepared by AT&L and issued to the RMS on the 5 August 2104.

1.3 Project Objectives

1.3.1 Project Specific Objectives

The project specific objectives for the design are:

- Upgrade OWR to increase the traffic capacity, as outlined in the Traffic Impact Assessment prepared by Traffix and subsequent letter reports.
- Rehabilitate or replace existing pavement.
- Ensure the upgraded road can operate at the intended design speed of 80km/h and posted speed of 70km/h. NB: The section of Works south of the SCA Pipeline will as part of the OWR Upgrade, be designed to suit 60km/h due to the existing property constraints.
- Tie in with newly constructed/future regional link roads.
- Significantly improve the sight distance in the area directly south of the SCA crossing.
- Provide formal road shoulders – implementation of kerb and gutter/stormwater system.
- Construct under live traffic conditions.
- Provide adequate Street lighting.
- Provide adequate road verges.

1.3.2 Common Objectives

The project will also meet the following objectives that are common to road design projects:

- Develop a cost-effective solution.
- Provide appropriate levels of safety for road users.

- Minimise land acquisition.
- Minimise disruption to adjacent property owners, being Transgrid, SCA and Austral Bricks.

1.4 Road Design Scope and Deliverables

1.4.1 Type and Stage of Design

The design stage is 'Concept'.

Note: Pending Approval of the 'Concept' design, detailed design drawings will be prepared suitable for Construction. The purpose of supplying the 'Concept' drawings is to obtain Approval from the relevant authorities.

1.4.2 Deliverables

The following documentation has been prepared to accompany the State Significant Development Application:

- Digital drawings including:
    - Plan layouts.
    - Longitudinal sections.
    - Typical cross sections.
    - Construction staging sketches
- Design report

2 Design Input

2.1 Locality

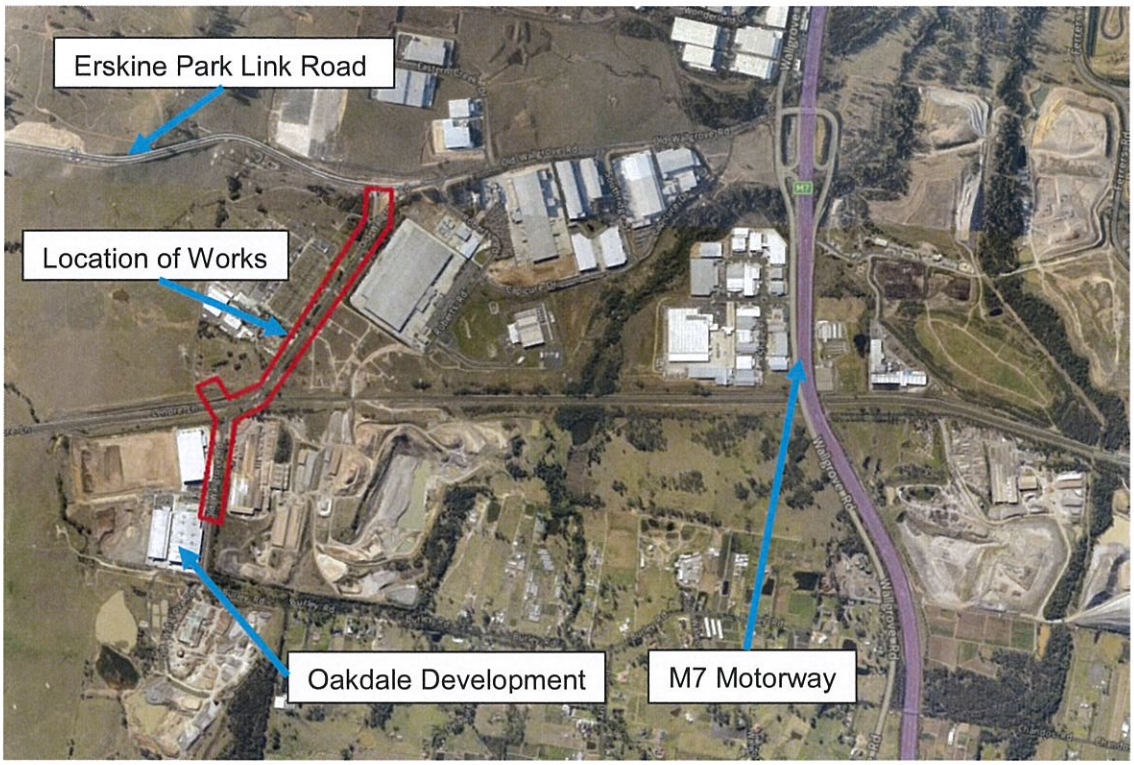


Figure 1 - Locality Sketch

The Works are located along Old Wallgrove, located between the intersection with the EPLR at the north, and the intersection with the Oakdale Estate access road (Milner Avenue) to the South.

The works span two separate LGA's, Blacktown City Council and Fairfield City Council, where by the separation occurs roughly along the northern boundary of the SCA Pipeline.

Photographs of the Site

	Photo of OWR prior to widening works completed in 2011
	Photo of OWR prior to widening works completed in 2011

	Photo of OWR showing pavement failure and potholing after widening works completed in 2011
	Photo of OWR, located at approx. CH475 looking North

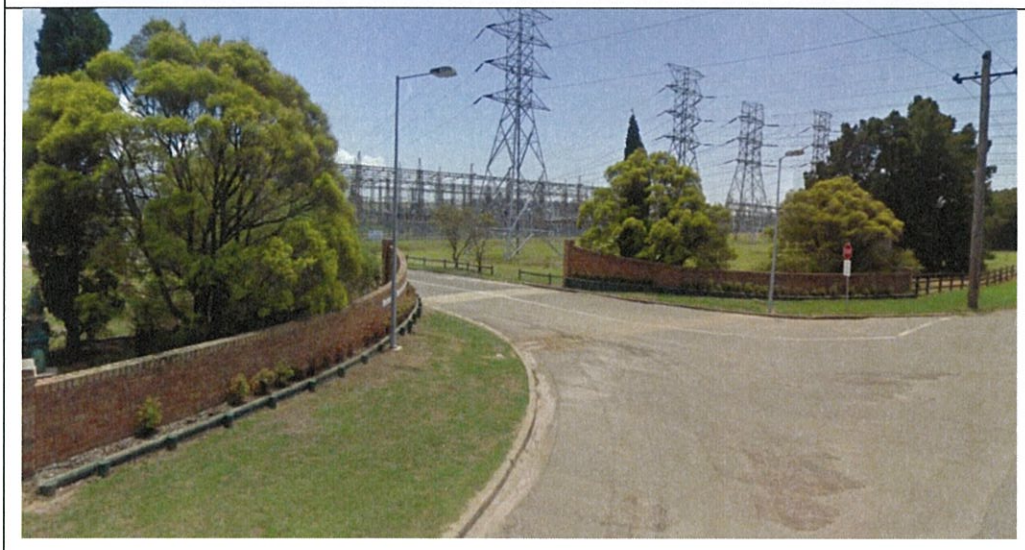
	Photo of OWR and existing access to SCA pipeline, located at approx. CH650 looking West
	Photo of OWR and existing access to SCA pipeline, located at approx. CH700 looking South
	Photo of OWR and existing access to SCA pipeline, located at approx. CH1000 facing Transgrid

	Photo of OWR, located at approx. CH1225 looking South.
	Photo of OWR, located at approx. CH1225 lookng North.

2.2 Utility Information

The entire length of OWR has been surveyed to identify all boundary information, extent of existing pavement, drainage systems, fence lines and all service information. Potholing has been undertaken to understand and identify the exact location and size of buried services. Survey has also identified the overhead electrical services.

Services identified:

- Endeavour Energy overhead 132kV electrical.
- Transgrid Energy overhead 132kV Electrical.
- Endeavour Energy underground 11kV, overhead 11Kv and overhead LV.
- Telecommunications.

- Sydney Water water supply.
- Jemena high pressure gas supply.

2.3 Community and Political Consultation

Community consultation of a localised nature will be carried out for those residences/business adjacent to OWR who may be affected by the construction or the adjusted geometric alignment. This will include:

- Pre-construction advice regarding construction work and staging.
- Monitoring of local residences/business during construction.

Other consultation specifically for the site:

- Liaison with Blacktown City Council and Fairfield City Council.
- Liaison with RMS.
- Route information signage (including VMS) usage covering all construction stages.
- Correspondence with identified transport organisations.
- SCA (SCA); SCA has provided 'In Principal' support of the proposed upgrade works to OWR. Evidence can be provided upon request.
- Transgrid: Transgrid has provided 'In Principal' support of the proposed upgrade works to OWR. Evidence can be provided upon request.
- Endeavour Energy; Endeavour Energy has provided 'In Principal' support of the proposed upgrade works to OWR. Evidence can be provided upon request.

3 Design Planning

3.1 Design Parameters

The design parameters used are listed below, in order of priority:

1. Austroads Guidelines.
2. Published RMS Supplements to Austroad Guidelines.
3. Australian Standards referenced in the Austroads Guidelines.
4. Published RMS Supplements to Australian Standards.

3.2 Variations from Original Design Constraints

Transgrid is a major property owner affected by the works. Lengthy negotiations have taken place over the last 12 months to understand what impact any widening of the existing 20.117m road reserve into their property would have.

Originally, the road reserve was proposed to be 25.7m which suggested a widening of some 5.5m into Transgrid lands (approximately CH750 to CH1600). Due to the proximity of the existing overhead structural electrical towers, the widening to this extent was not satisfactory to Transgrid. As such, the width of the overall reserve has been reduced to cater for this constraint. From these negotiations the resulting overall road reserve was 23.0m.

Through the design option review process undertaken with RMS, the road reserve width was further reduced to 21.45m. This has resulted in a reduced extent and width of the strip acquisition required along the project corridor from CH450 to Ch1600..

A localised section of 25.6m is proposed at the right hand turn into Transgrid.

Further minor encroachment into adjoining property may occur as a result of:

- cut and fill batters as a result of the final detailed vertical grading;
- requirements to accommodate drainage and/or water quality basins.

3.3 Road Function

OWR is currently the only means of road access to the Oakdale Development, Austral Brickworks and the CSR Site. A large percentage of vehicles that travel on this section of road are heavy vehicles, including B-Doubles and semi-trailers.

The section of OWR under consideration for upgrade, acts as a link between local Council Roads and other regional/state roads. By definition (as shown in section 3.4.1 below), OWR would be categorised as an interim regional road.

3.4 Road Hierarchy and Classification

3.4.1 Current Road Classification

The section of OWR proposed to be upgraded is currently not listed within the RMS 'Schedule of Classified Roads and Unclassified Regional Roads' (August 2013). It is stated that 'Local Roads are unclassified roads and therefore are not included in the Schedule'. Thus, it should be deemed that this section of OWR is currently classified as a local road, with different sections of the road under the control of both Blacktown City Council and Fairfield City Council.

3.4.2 Proposed Road Classification

The section of OWR subject to the road upgrade, from Milner Avenue to EPLR, is envisaged to be classified by TNSW as an Interim Regional Road remaining under the control of Fairfield City Council and Blacktown City Council respectively.
It understood the Depart of Planning has been in consultation with Transport for New South Wales in respect of this matter.

3.4.3 Dedication of Roads

In locations where land acquisition is undertaken to widen OWR, it is proposed this land will be dedicated as public road reserve to FCC and BCC respectively.

3.5 Road Control

3.5.1 Current Control

At present, OWR is controlled by local Council. The road is controlled by:

- CH00-CH675, Fairfield Council.
- CH675-CH1650, Blacktown Council.

3.6 Design Speed

The existing posted speed limit along OWR is 70 km/h.

The design speed for the upgraded OWR section is 80 km/h. It should be noted that OWR will be signposted at 70km/h. NB: The section of Works south of the SCA Pipeline (CH350 – CH700) will be designed to a 60km/h design speed. This is a result of constraints in acquiring sufficient land to provide horizontal alignment to comply with a design speed greater than 60 km/h. In addition the section of OWR, from approximately CH350, to approximately CH700 will become redundant in the future upon delivery of the North South Link Road.

The final location of posted speed zones and advisory speed signage along the corridor will be subject to negotiation with FCC, BCC and RMS.

Traffic modelling will specifically look at each of the intersections and tie-ins that are affected by the proposed works.

3.7 Minimum Curve Radius

The minimum curve radius is governed by the proposed design speed. The minimum curve radius will be based on a design speed of 80km/h and will be designed to conform to the relevant design standards, where possible. As noted previously, the section of Works south of the SCA Pipeline may be designed to suit 60km/h due to the property constraints, and as such, minimum curve radii will differ through this section to suit the adjusted design speed.

If required, superelevation will be used if smaller curve radii are required.

Final minimum curve radii will be determined during the detailed design stage.

3.8 Design Vehicles

Design Parameter	Design Vehicle	Purpose
Design Heavy Vehicle	B-Double	Turning Path
Design Light Vehicle	Car	Stopping Site Distance

Table 1 - Design Vehicles

The choice of design heavy vehicle was influenced by the current high level of heavy vehicle usage of this section of OWR, connecting the various industrial developments with Sydney's nearby motorways.

There is potential for an increase in these heavy vehicle movements within this section of OWR due to the additional regional industrial developments, which would utilise OWR as an access road.

The section of road from CH00 to CH350 which will become part of the future North South Link Road route, will be designed to accommodate b-triples. It is noted this criteria will only apply to the through lanes between the nominated chainages and will not apply to the turning movements at the Milner Avenue and OWR intersection.

3.9 Traffic Signal Design

The OWR Upgrade will include the following traffic signal works:

- Installation of new signals at the OWR/ Milner Avenue (Oakdale Central Estate Road) Intersection CH190. The provision of new signals at this intersection is supported by advice provided by Traffix (letters dated 6 June 2014 and dated I August 2014 – attached in Appendix E).
- Minor adjustment of existing signals at the OWR/ EPLR Intersection.
- Installation of conduits to facilitate the potential for future signalisation of intersections of OWR and the access' to SCA and Transgrid respectively (no

design and./or approval of traffic signal design are proposed to be undertake for these locations).

The design of the new signals and adjustments to existing signals will be subject to RMS approval.

4 Cross Section

4.1 Road Scape Allocation

Design Parameter	Minimum value adopted in the current design	Maximum value adopted in the current design	Within guideline limits*	Outside guideline limits	Reason for use of values that are outside guideline limits
Left carriageway (northbound)	6.8m	8.0m	Y	N	N/A
Right carriageway (southbound)	6.8m	11.5m	Y	N	N/A
Median	0.6m	5.0m	Y	N	N/A
Left Verge (western side)	3.75m	4.5m	Y	N	N/A
Right Verge (eastern side)	3.5m	4.5m	Y	N	N/A

Table 2 - Road Scape Allocation

*refer Ausroads Geometric Design Guidelines Section 3, Table 4.3

4.2 Typical Cross Sections

Please refer to AT&L's Civil Drawings, using the relevant chainages shown below, to locate where these typical sections apply.

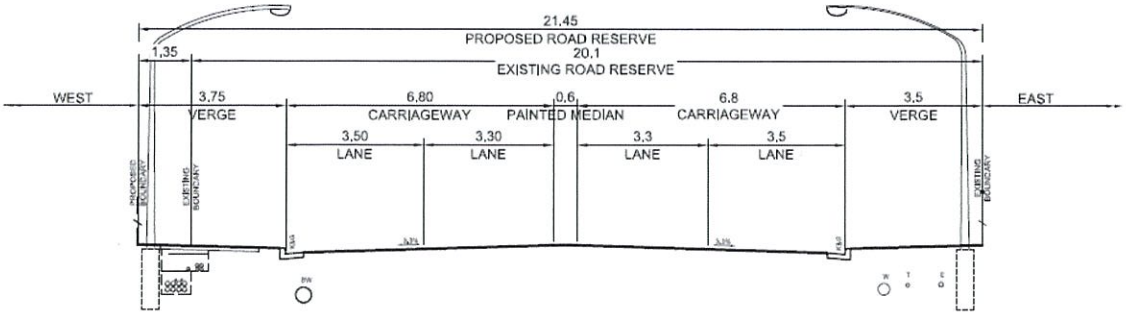


Figure 2 - OWR - Typical SectionCH700-CH1600

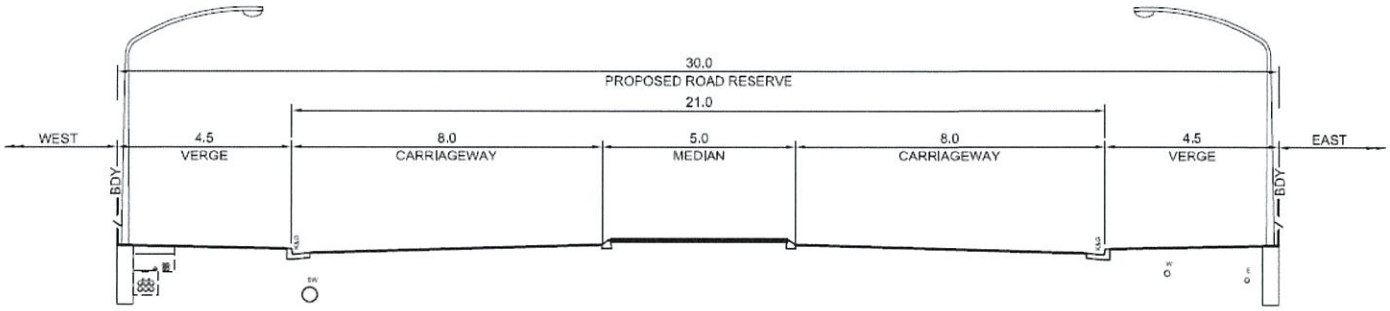


Figure 3 - OWR - Typical Section CH300

4.2.1 Lane Widths

The existing single carriageway consists of 2 x 3.5m-4.3m wide lanes. This will be upgraded to a dual carriageway, consisting of a 3.5m kerbside lane and a 3.3m median sidelane. In certain sections, lanes increase in width to a maximum of 4.5m to account for heavy vehicle turning requirements.

As part of the change to a dual carriageway, a central painted median will be included to separate the carriageways.

4.2.2 Median Type

The proposed median will vary in width, from a minimum of 0.6m to a maximum of 5.0m.

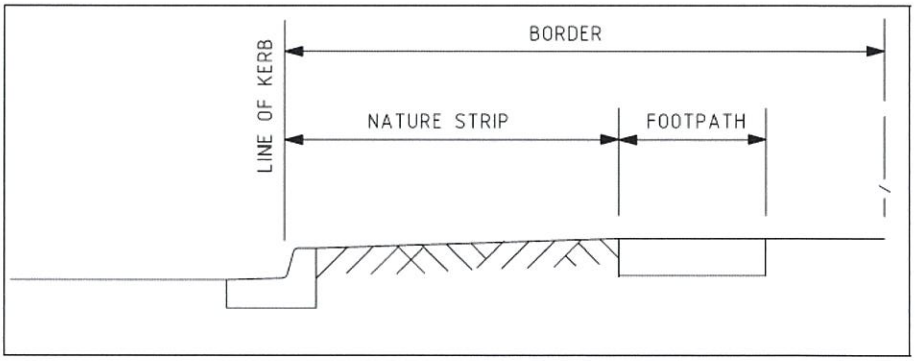
At the intersection of Milner Avenue and OWR, and Erskine Park Link road and OWR the median will be of a raised concrete type. The remainder of the median will be a painted median.

4.2.3 Allocation of road space for utilities, pedestrians and bicycles

A sufficiently wide verge has been allowed. Typically, the verge is 3.75m along the western side, and 3.5m along the eastern side of the proposed road upgrade respectively. The verge widens to 4.5m along both sides of the proposed road upgrade through CH200 to CH350, where the OWR intersects with the Oakdale Estate Access Road. It is proposed to provide a 2.5m wide shared path along the western side of OWR for the length of the project.

The verge in all areas is wide enough to include the proposed pedestrian/cycle paths and for the inclusion of all proposed services.

As per the Austroads Design Guidelines, the verge width is referred as a 'Border'. The 'Border' is described in the figure below:



Source: VicRoads (2002b).

Figure 4 – Austroads Design Guidelines - Border Diagram

The wording below is taken from the RMS Supplement to the Austroads design guidelines. The wording describes the desirable verge, or border widths and the reason by which these widths have been selected. With reference to the proposed design, all verge or border widths are above the minimum width criteria.

Urban Border

Paragraph 1
Delete "The urban border usually comprises two parts, a path for pedestrians and the nature strip. The elements of the urban border are shown on Figure 4.37. The main functions of the border are:"
and replace with:
"The urban border usually comprises the area from the face of kerb to the road boundary. Desirably the footway should be at least 3.0m wide and desirably 3.5m wide in order to contain the footpath for pedestrians and space for public utilities. Any residual road reserve should be allocated to the footway to provide additional space for landscaping and driveways. The elements of the urban border are shown on Figure 4.37. If kerbed footways are not provided then sufficient verge width should be available to enable pedestrians to walk clear of the road carriageway, e.g. lanes and shoulders. The main functions of the urban border are:" at start of paragraph.

Figure 5 - RMS Supplement to Austroad Design Guidelines - Border or Verge Widths

4.2.4 Allocation of Road Space for Landscaping

Minimal landscaping works can occur within the verges where no pedestrian/cycle paths are constructed. No formal landscaping, other than the installation of turf, is proposed for the upgrade.

4.2.5 Cut and Fill Batter Slopes

The proposed upgrade of OWR has been designed to generally maintain the existing vertical grade of the road, thus minimal/no alteration to the existing batters is anticipated. Any changes to the final pavement levels which require a batter back to the surrounding existing surface levels, will batter back to the road surface at a nominal 2:1 (H:V) (or 3:1 where possible) slope.

The table below summarises the desirable and maximum batter slopes, as per the Austroad Design Guidelines.

Table 4.12: Typical design batter slopes

	Cut		Fill	
	Desirable	Maximum	Desirable	Maximum
Earth batter	3:1	2:1	6:1	4:1 (2)
Rock batter	0.5:1	0.25:1 (1)	–	–
Median	10:1	6:1 (2)	10:1	6:1 (2)

Figure 6 - Austroad Design Guidelines - Batter Slopes

The wording below is taken from the RMS Supplement to the Austroads design guidelines, and describes how the wording in the above table is modified to suit RMS guidelines. With reference to the proposed design, proposed batter slopes are within RMS guidelines.

Batters

Paragraph 4
Delete "desirable" after "Slopes flatter than the" and before "maximum (Table 4.12) should be used where possible"

Figure 7 - RMS Supplement to Austroads Guidelines - Batter Slopes

4.2.6 Crossfall/Adverse Crossfall

Nominal crossfall along the proposed upgrade of OWR will generally be at 3.0%.

Superelevation lengths with be at 7.0% maximum, which suit the proposed curve radii.

5 Geometric Design

5.1 Horizontal Curves and Alignment

5.1.1 Horizontal Sight Distance

The horizontal alignment will remain similar to existing, retaining the currently acceptable sight distance, with the addition of an extra width adjacent to the current roadway within the central median. Any proposal for planting of the median will need to be assessed for sight distance requirements, particularly on the inside of horizontal curves although the current project scope does not propose planting other than turf.

At present, horizontal sight distance on OWR is not optimal at the crossing of the SCA pipeline. As part of the proposed upgrade of OWR, horizontal sight distance at the SCA Crossing will be improved by the works. Horizontal sight distances will be checked to comply with the RMS Supplement to the Austroad Guidelines, with reference to Section 5.4.

5.1.2 Superelevation Transitions

The majority of the works in relatively straight with no horizontal curves apart from the SCA crossing where minimum radii are used and maximum superelevation is expect to be used.

5.1.3 Lane Widening

No lane widening is required on this section of the works, although this will be determined at the detailed design stage and in accordance with the design guides.

5.2 Vertical Alignment

5.2.1 Vertical Sight Distance/Stopping Distance

Vertical stopping sight distance along the works currently complies with design guidelines, due largely to the flat grades and long straights. Where the vertical alignment has been amended in the current concept design to enable reshaping of the superelevation transition areas, vertical stopping sight distance requirements have been achieved.

As per Austroads Design Guidelines, section 5.3, stopping sight distance is calculated based on the following equation:

$$SSD = \frac{R_T V}{3.6} + \frac{V^2}{254(d + 0.01a)}$$

R_T = reaction time (sec)
V = operating speed (km/h)
d = coefficient of deceleration (longitudinal friction factor)
a = longitudinal grade (%, + for upgrades and - for downgrades).

Figure 8 - Stopping Sight Distance Calculation

It should be noted that the during the detailed design phase, stopping site distance will be checked for compliance with the above calculation to ensure that the minimum required stopping sight distance is achieved throughout the road length. The current design meets the required stopping site distance criteria.

5.3 Utilities

Utility locations were determined using Dial Before You Dig information, ground survey data and underground service potholing. The following is a summary of the existing utility assets and assumed impacts that will occur as a result of the OWR upgrade works.

5.3.1 Gas Mains

An existing Jemena high pressure 150mm diameter steel gas main is located on the eastern side verge of OWR from approximately CH100 – CH380. It is proposed to relocate this main further to the east within the proposed road reserve to accommodate the upgrade of the OWR/ Milner Avenue intersection.

5.3.2 Water Mains

There are two existing Sydney Water mains with the limit of works for the OWR Upgrade:

- 250mm diameter DICL pipe located on the western side verge of OWR between CH00–CH230. Based on the concept design, this main is not impacted by the upgrade works.
- 150mm diameter oPVC pipe located on the eastern side verge of OWR between approximately CH970-CH1600. Based on the concept design it is proposed to relocate this main between approximately CH900-CH1150 to accommodate the widened formation of the Trangsrid Access at CH1000.

5.3.3 Telecommunications

Telecommunications conduits and cables are located along the length of the OWR Upgrade.

The conduits are Telstra assets housing Telstra copper and optic fibre cables, sub-ducts for Optus, Uecomm and Pipe Networks.

Based on the concept design, it is expected that all of the existing conduits listed below will be required to be relocated along the length of the upgrade:

- CH00-CH430 – 2 x P100 conduits are located on the eastern side verge of OWR.
- CH430-CH600 – 2 x 1P100 conduits traverses between the eastern side to the western side of the road carriageway.
- CH600-CH1600 – 1 x P100 CH650-CH850, 2 x P100 CH850-CH1250, 3 x P100 CH1250-CH1450 conduits are located on the western side verge of OWR.

5.3.4 Electrical

Endeavour Energy existing assets are located as follows:

- Bank of eight underground conduits located longitudinally in western side verge CH100-CH1600.
- Bank of X conduits transverse underground road crossings at CH180, Ch200, CH1000, CH1200 and CH1300.
- Overhead electrical supply poles - eastern side CH00-CH600, western side CH660-Ch1600.

Based on the concept design it is envisaged the longitudinal underground conduits and overhead poles will be impacted and will be required to be relocated along the length of the project as part of the upgrade works.

5.3.5 Street Lighting

The upgrade includes provision of street lighting from CH00-CH1600 with light standards to be provided on both sides of the road. In accordance with Council standard's the lighting will be designed in accordance with AS1158.1 to a category V3 standard.

It is envisaged that a non standard lighting design may be required adjacent to the existing overhead 132kV and11kV road crossings.

5.4 Relationship and Proximity to Electrical Infrastructure

Both Transgrid and Endeavour require the following clearances to exiting services where possible:

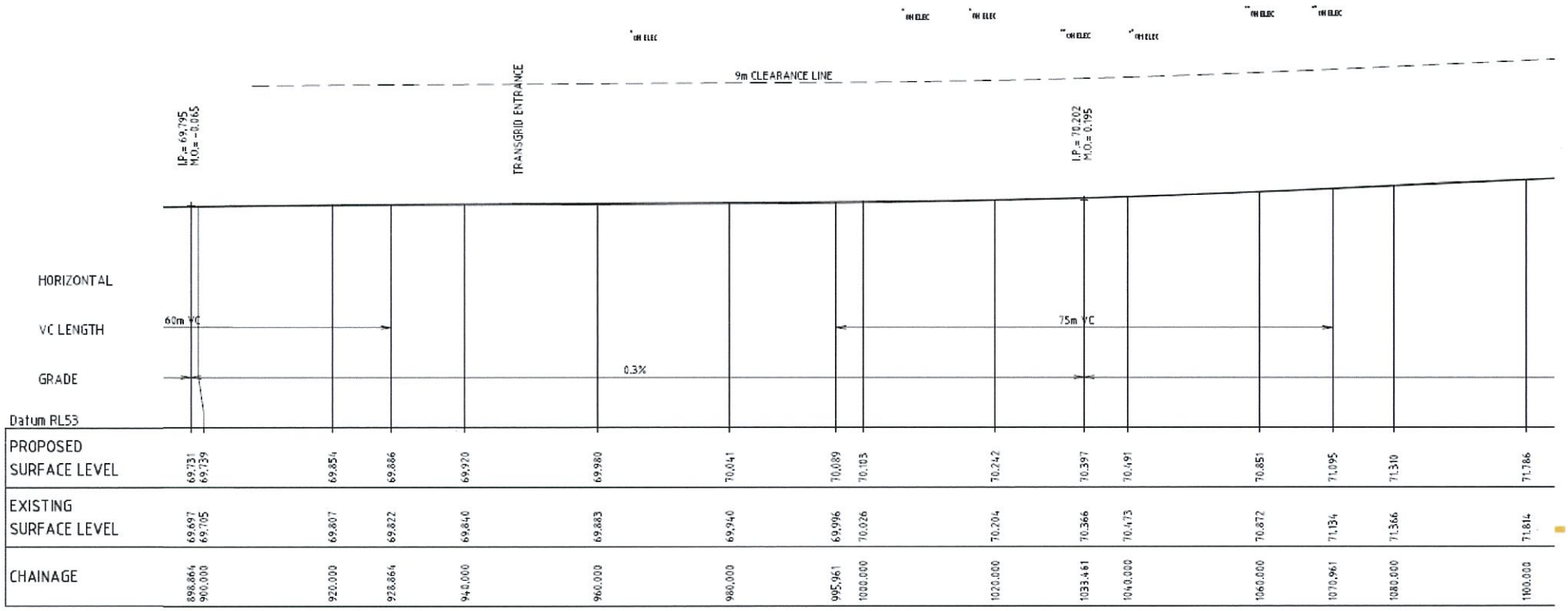
Item	Desirable Clearance	Minimum Clearance
Existing structural Stanchions (Horizontal Clearance)	30m	15m
Overhead 132kV (Vertical Clearance)		9m
Overhead 11kV (Vertical Clearance)		6m

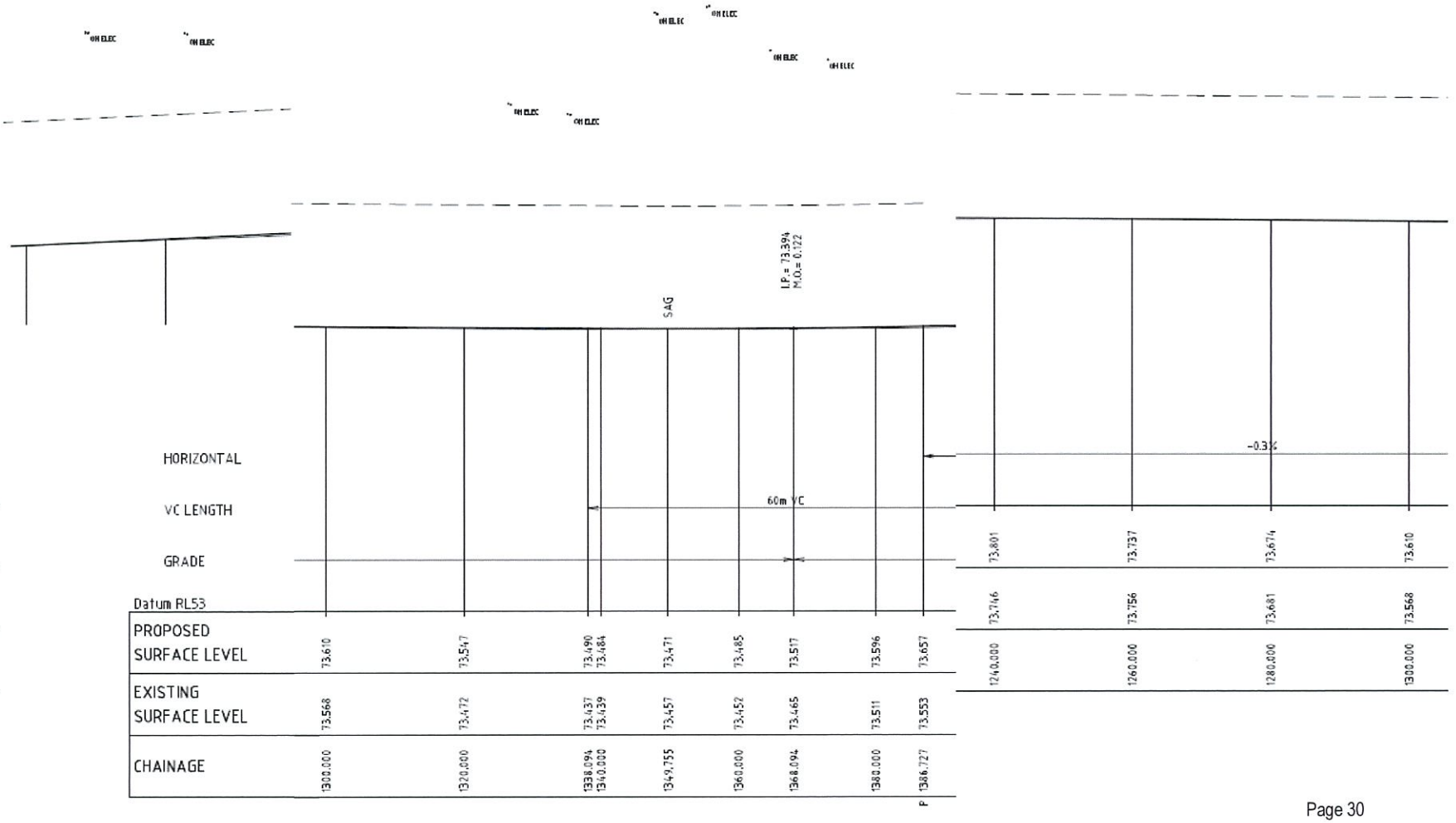
Table 3 - Electrical Horizontal and Vertical Clearances

It should be noted that many of the existing Transgrid structure lattice towers are located with horizontal clearances less than 15m. The boundary within the section of the proposed upgrade to OWR adjacent to the Transgrid infrastructure is currently designed with no change, so that current clearances to the Transgrid infrastructure are maintained, despite the existing non-conformity. Refer to AT&L's for horizontal locality of Transgrid structures and proximity to the proposed road alignment.

With respect to vertical clearances, the vertical alignment of the proposed upgrade is generally the same as the existing OWR alignment. Thus, any existing vertical clearances to cables will be retained and shall stay within permissible heights. As noted in Table 3 above, the minimum vertical clearance to any 132kV electrical is 9m. The figure below, highlights a section of the proposed long section, showing the road surface level, the 9m vertical clearance to overhead electrical, and shows the vertical location of the overhead cables. It should be noted that all overhead electrical cables are above the 9m clearance line.

Figure 9 - Proposed OWR Upgrade Longsection with 9m Electrical Clearance and Overhead Electrical Cables Shown




OH ELEC
SAG
I.P. = 73.394
M.O.= 0.122
HORIZONTAL
VC LENGTH
GRADE
Datum RL53
PROPOSED SURFACE LEVEL
EXISTING SURFACE LEVEL
CHAINAGE
60m VC
-0.3%
73.610
73.547
73.490
73.484
73.471
73.485
73.517
73.596
73.657
73.568
73.472
73.437
73.439
73.457
73.452
73.465
73.511
73.553
1300.000
1320.000
1338.094
1340.000
1349.755
1360.000
1368.094
1380.000
1386.727
73.801
73.737
73.674
73.610
73.746
73.756
73.681
73.568
1240.000
1260.000
1280.000
1300.000

5.5 Site Issues

5.5.1 Geotechnical

No geotechnical investigations have been undertaken at this stage. These works are to be undertaken at detailed design stage. It is expected boreholes and test-pits will be undertaken at regular intervals along the road. The investigation would identify the CBR of the existing subgrade, existing pavement depth and composition, ability to reuse the existing pavement, advice on a proposed pavement design etc.

5.5.2 Pavement Design

A final pavement design for both the semi-rigid and flexible pavement areas for the project is pending, subject to further analysis of the geotechnical data and a final decision on the preferred construction methodology and staging.

The section of Old Wallgrove from CH00 to approximately CH325 will be designed and constructed to the standard to adopted for the future North South Link Road. Accordingly it is envisaged this pavement may be semi-rigid pavement of similar composition to the approved pavement design for the EPLR and will be confirmed within the detailed design process.

The section of OWR from approximately CH325 to the tie in at the EPLR is proposed to be a flexible pavement which may comprise bound and unbound granular base layers. In accordance with Blacktown City Council's Engineering Guide for Development Road Design Parameters for Industrial Collector and heavy Duty roads, the adopted pavement design loading will be 1 x 10^7 ESA.

Our suggested pavement as below:

- Asphalt wearing course on,
- Granular or bound base on,
- Select Material Zone on,
- Subgrade improvements when required.

Final pavement designs will be prepared in accordance and in consultation with RMS, Council and RMS guidelines/specifications.

5.6 Property Acquisitions and Adjustments

The following property acquisitions have been identified (Refer to the Drawing C360):

Land Owner	Approximate Area of Land to Be Acquired (m2)
Transgrid	1284
SCA	814
Austral Brickworks	4,970

Table 4 - Property Acquisition Areas

Note: These areas are preliminary and are subject to confirmation during the detail design stage pending further development of the vertical grading, resulting cut and fill batter and location and dimensioning of basins. The final extent of acquisition will be subject to agreement with adjoining impacted land owners.

5.7 Tie In

5.7.1 Milner Ave (Oakdale Central Estate Road)

The existing intersection of OWR and Milner Avenue will be upgraded to accommodate the proposed upgrade cross section and proposed turn lanes. The upgrade will include the installation of new signals at the existing intersection. The provision of new signals at this intersection is supported by advice provided by Traffix (letter dated 6 June 2014).

5.7.2 Erskine Park Link Road (EPLR)

The recently completed EPLR made allowance for the future upgrade of OWR. Only minimal works are required to enable the tie-in to the intersection.

5.7.3 SCA Pipeline

It is proposed to provide adequate access to and from OWR at the SCA crossing by the inclusion of an uncontrolled protected dedicated right turn storage lane and raised median.. Through discussions with SCA, they identified their requirements and a provision has been made to satisfy SCA. Further consultation is required to ensure SCA are satisfied.

The design and construction of the intersection is such that, if required in the future, the intersection could be signalised. This would involve the installation of conduits to accommodate cabling for future signalisation.

The future design median width at this intersection proposed within the concept design is 0.6m which will require the installation of mast arms for any future traffic signals.

5.7.4 Transgrid Site Entry

Local widening has been provided at the Transgrid entrance at CH980m to enable provision of an uncontrolled protected dedicated right turn storage lane for traffic entering the site from the north. The design and construction of the intersection is such that, if required in the future, the intersection could be signalised. This would involve the installation of conduit to accommodate cabling for future signalisation.

The future design median width at this intersection proposed within the concept design is 0.6m which will require the installation of mast arms for any future traffic signals.

A second access to Transgrid on the western side of OWR at CH1540 is proposed to an uncontrolled left in/left out access only.

5.8 Stormwater Management

5.8.1 Design Information

The majority of the existing stormwater system will remain operational, with alterations to pit inlet levels and locations to accommodate the proposed finished surface levels or revised median width. New drainage lines will only be constructed where the carriageway pavement is to be shifted above an existing longitudinal drainage line.

Details of existing invert levels and pipe condition will be required prior to the detail design stage. As a means of obtaining this information, detailed survey has been undertaken; this has provided pit invert levels and pipe information.

There is an existing low point immediately to the south of the current limit of works a CH00. Works to upgrade the local drainage system at this location will be incorporated into the OWR Upgrade.

5.8.2 Hydrological Investigation

A hydrological investigation will be undertaken as part of the project, to determine the flooding effects from the works, primarily from upstream Creek catchments. A catchment plan has been prepared for the road upgrade which has been used to assess the existing cross drainage capacity.

5.8.3 Cross Drainage

The existing cross drainage is proposed to be upgraded to cater for the 100 year design storm. No additional stormwater from the upstream catchment east of the proposed OWR will be draining into the existing crossings. Confirmation has been received from Blacktown City Council that stormwater from the existing Coles Myer Distribution centre to the east of Old Walllgrove Road at approximately CH1000 does not drain through the cross drains but discharges to the east into an OSD basin within Roberts Road.

Longitudinal drainage will be directly connected to this cross drainage to minimise additional discharge points to the existing creek system.

Refer to Stormwater Catchment plan SKC04 in Appendix C for details of all catchment areas upstream of the cross drains and proposed pipe sizes of the crossings.

5.8.4 Longitudinal Drainage

Longitudinal (pavement) drainage will be directly connected to this cross drainage to minimise additional discharge points to the existing creek system. Council generally adopts the 1:20yr event criteria, while RMS generally adopts the 1:10yr event criteria.

Both scenarios will be assessed during detailed design and agreement sought with Council/RMS as to the event criteria to be adopted for the upgrade.

In addition, and as required, table drains and cut off drains will be incorporated to manage water flows at the toe of embankments and top of cut batters.

5.9 Water Sensitive Urban Design (WSUD)

5.9.1 Policy and Guidelines

The stormwater design considers the following guidelines:

- Australian Rainfall Quality (2006)
- Department of Environment and Climate Change NSW (DECC), Management Urban Stormwater: Urban Design (Consultation Draft, 2008)
- Blacktown City Council Stormwater Quality Control Policy (2001, reviewed 2009)
- Landcom Water Sensitive Urban Design Policy (2009)

5.9.2 Objectives

These stormwater management objectives were applied to treating stormwater runoff from the development to meet pollution reduction targets outlined in Table 5.

Pollutants	Retention Objectives
Total Suspended Solids (TSS)	85%
Total Phosphorus	65%
Total Nitrogen (TN)	45%
Gross Pollutants	90%
Total Hydrocarbons	90%

Table 5 Pollutant Retention

In order to achieve these reductions, a treatment train approach will be implemented into the development where the stormwater treatment flow path for runoff would generally be:

1. Runoff from the road reserve will be collected via pits and pipes and discharged into a bio-retention swale to be treated to the reduction targets as highlighted in Table 5.

5.9.3 MUSIC Analysis

The software package developed by the CRC for Catchment Hydrology termed "MUSIC" (Model for Urban Stormwater Improvement Conceptualisation) was used to assess the effectiveness of the proposed "treatment train" and therefore ensure compliance with the proposed objectives. Refer to Appendix B for MUSIC model data, results and catchment plan.

Based on the MUSIC analysis a total bio-retention area of 335m^2 will be required to treat all runoff within the Road Reserve from CH00 to CH1450.

It is proposed to locate the bio-retention swales on the western side of the carriageway to coincide with the existing low points along the corridor between approximately CH400-CH1600.

The road pavement drainage flows will be directed to the bio-swales which will then discharge into the downstream drainage system.

An indicative location for the bio-swales has been shown on the project land acquisition plan attached in Appendix F.

The location and footprint of individual basins will be developed as part of the detailed design.

5.10 Traffic Management, Staging

Generally, it is proposed to construct the works in two separate stages, maintaining the existing carriageway and constructing two of the new lanes and then switching the traffic and constructing the final two lanes. As described within drawings C370 to C376 refer Appendix D, the currently proposed construction staging and traffic management works are as follows:

Stage 1:

- Construct temporary pavement (width varies) adjacent to the existing north bound lane CH275 to CH525.
- Construct temporary pavement (width varies) adjacent to the existing south bound lane from approximately CH675 to CH1525.
- Install temporary concrete barriers from approximately CH40 to CH1550, leaving gaps to maintain access points.
    - Barriers approximately located along the existing edge of the southbound lane between CH40 and CH600.
    - Barriers approximately located along the edge of the northbound lane between CH575 and CH1550.
- Install temporary linemarking along the length of the project to provide two lane traffic (1 lane northbound, 1 lane southbound) plus turning lanes where required:
    - Temporary alignment located approximately along the existing northbound lane and new temporary pavement between CH40 and CH525.
    - Temporary alignment located approximately along the existing southbound lane and new temporary pavement between CH575 and CH550
- Shift traffic from the existing alignment, to the temporary alignment
- Construct the new roadworks behind the concrete barriers

Stage 2:

- Shift the concrete barriers to their new position, leaving gaps to maintain access points
    - Barriers approximately located along the existing edge of the southbound lane between CH100 and CH200
    - Barriers approximately located along the edge of the existing southbound lane between CH255 and CH600

    - Barriers approximately located along the edge of the existing northbound lane/centre of existing pavement between CH575 and CH1600

- Remove temporary linemarking from stage 1 and install new stage 2 temporary linemarking along the length of the project to provide two lane traffic (1 lane northbound, 1 lane southbound) plus turning lanes where required
    - Temporary alignment located approximately along the newly constructed final pavement for the full length of the project as well as along small sections of the existing pavement
- Shift traffic from the temporary stage 1 alignment to the temporary stage 2 alignment
- Construct the remaining new roadworks behind the concrete barriers
- Remove concrete barriers, remove temporary linemarking and install final linemarking

Access to existing properties will be maintained during construction and any proposed temporary access arrangements will be agreed through consultation with the adjoining property owners.

Confirmation of this general traffic management and construction staging arrangement will be confirmed during the detailed design stage.

Prior to construction, a detailed Traffic Management Plan will be prepared in accordance with the relevant RMS Traffic Management Guidelines.

6 Finalisation

Once DA approval is granted, the following is required:

- Constructability Review.
- Road Safety Audit.
- Detailed Design including:
  - Civil Design.
  - Stormwater Design.
  - Geotechnical Investigation.
  - Pavement Design.
  - Electrical Design.
  - Water Relocation design.
- Detailed Cost Estimation.
- Design reviews.
- Submission to RMS and Council for approval.

7 Conclusion

The design to date has been prepared for inclusion in the development application giving due consideration to the existing stake holders, physical features on site, design constraints and relevant design guidelines.

It is concluded the design could be further advanced through to a Detailed Design/Construction documentation level, as further design will ensure with certainty that there will be no major unknown constraints.

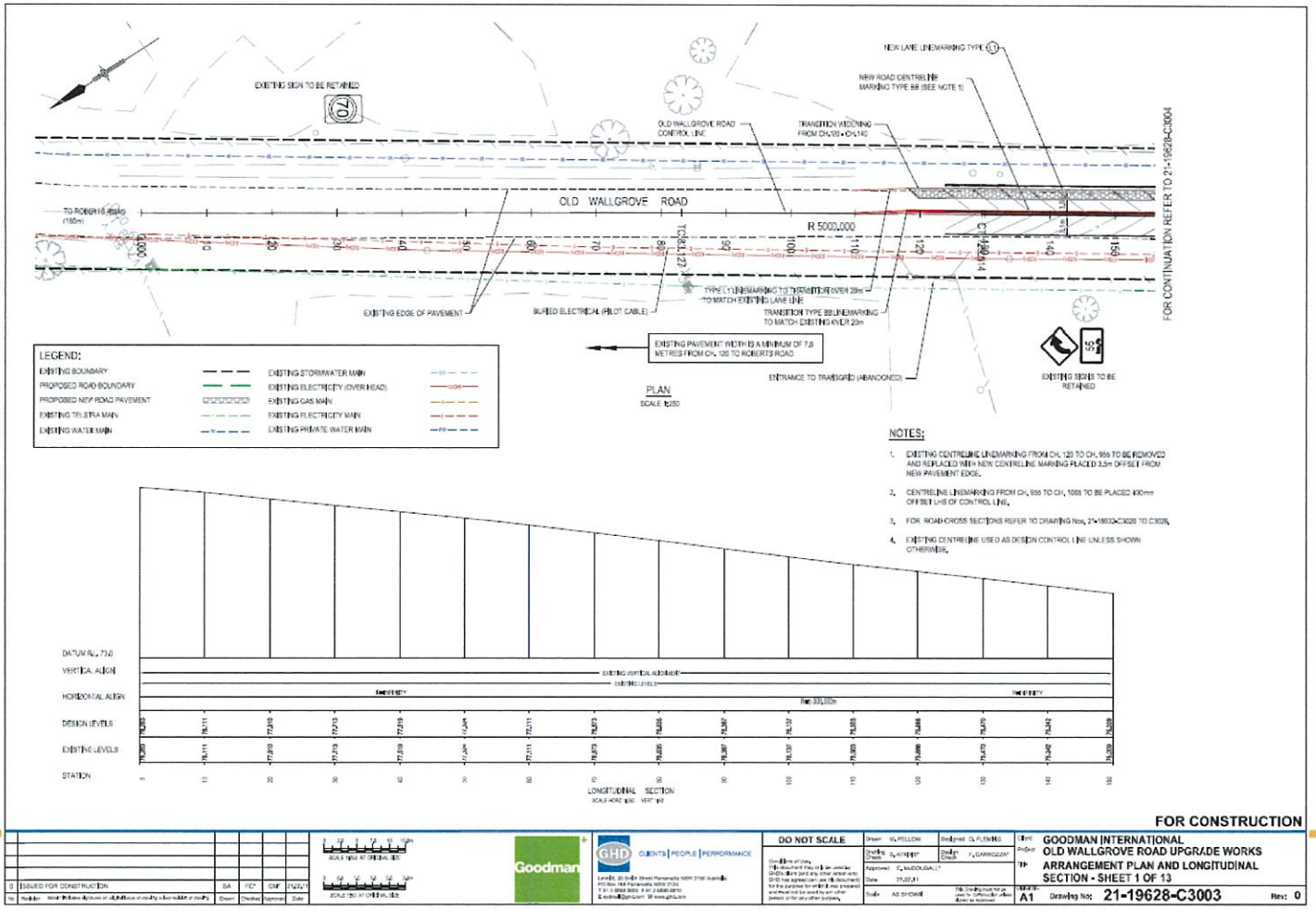
Once complete, the road will operate at the intended design speed, safely and efficiently as a regional road.

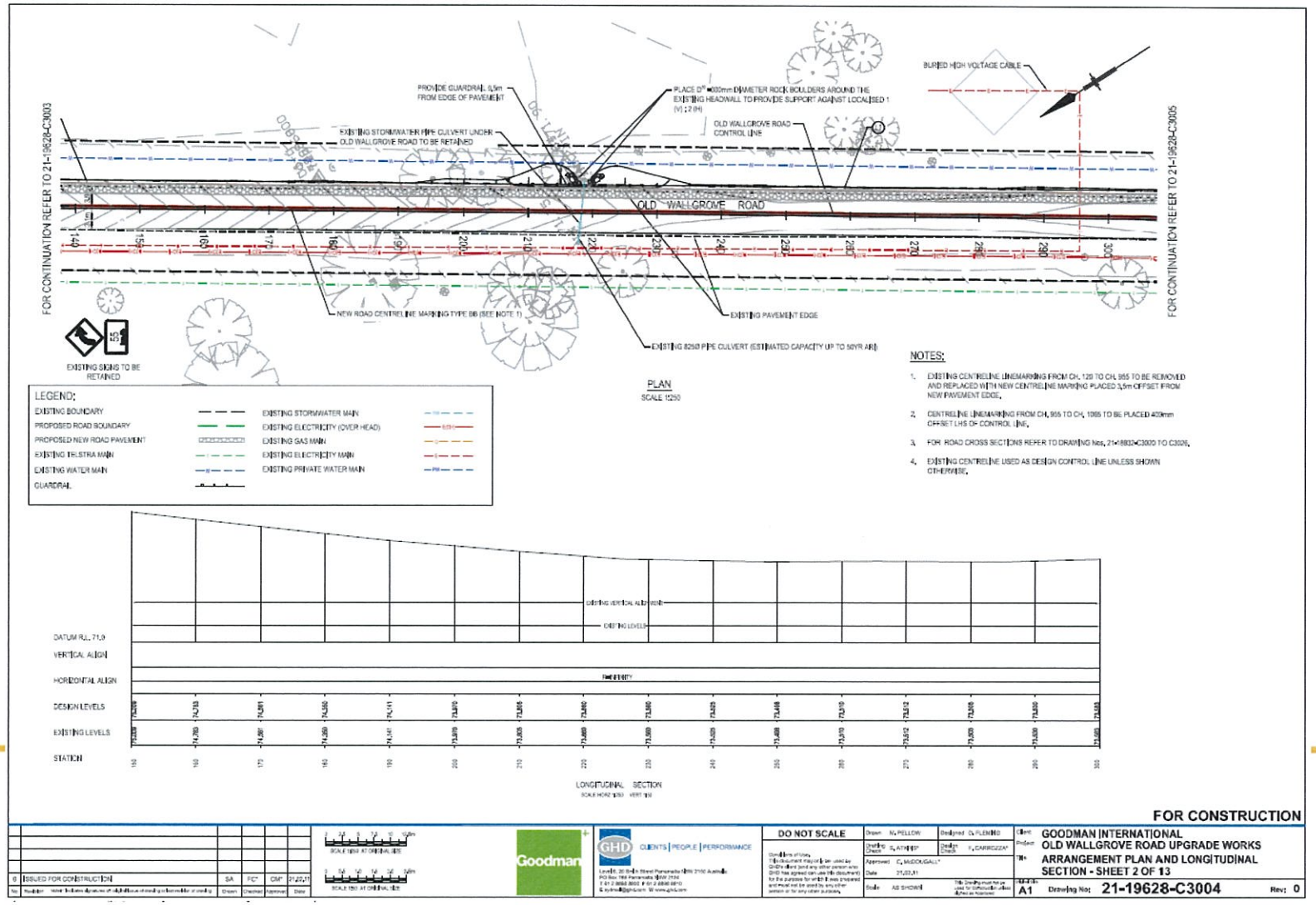
The design is generally in accordance with the relevant RMS and Austroad Design Guidelines. Upon approval, detailed design shall be completed to comply with the relevant standards and to the satisfaction of RMS, as well as any conditions of the approval.

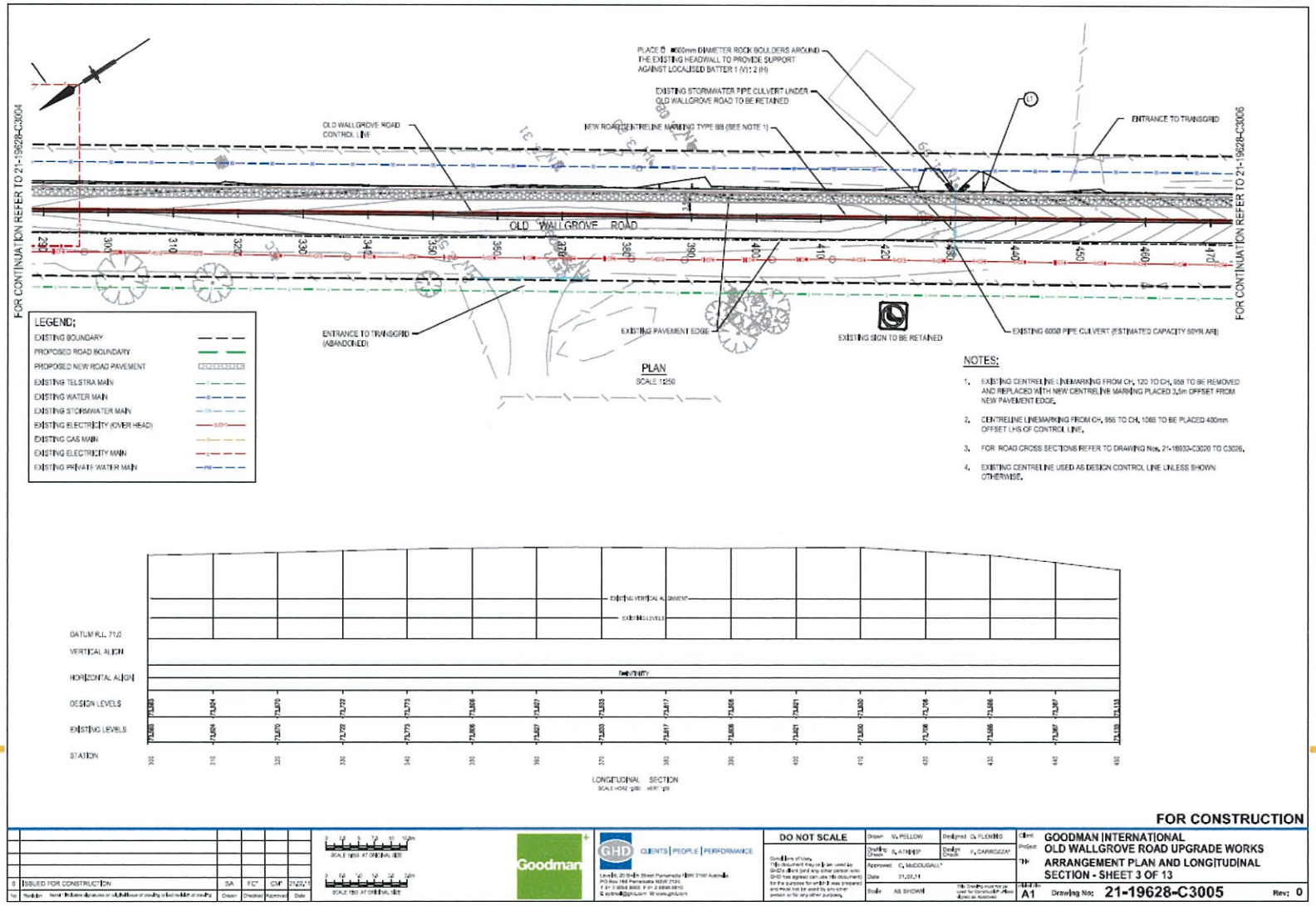
Currently, OWR acts as a link road between the local Council controlled roads and other regional/state roads controlled by RMS. Future developments within the area will further utilise OWR as a link road, providing access to additional local roads and other regional/state roads within the area. Thus, it is AT&L's considered opinion that the section of OWR described herein, should be classified as an Interim Regional Road, and therefore be controlled by Fairfield City Council and Blacktown City Council respectively.

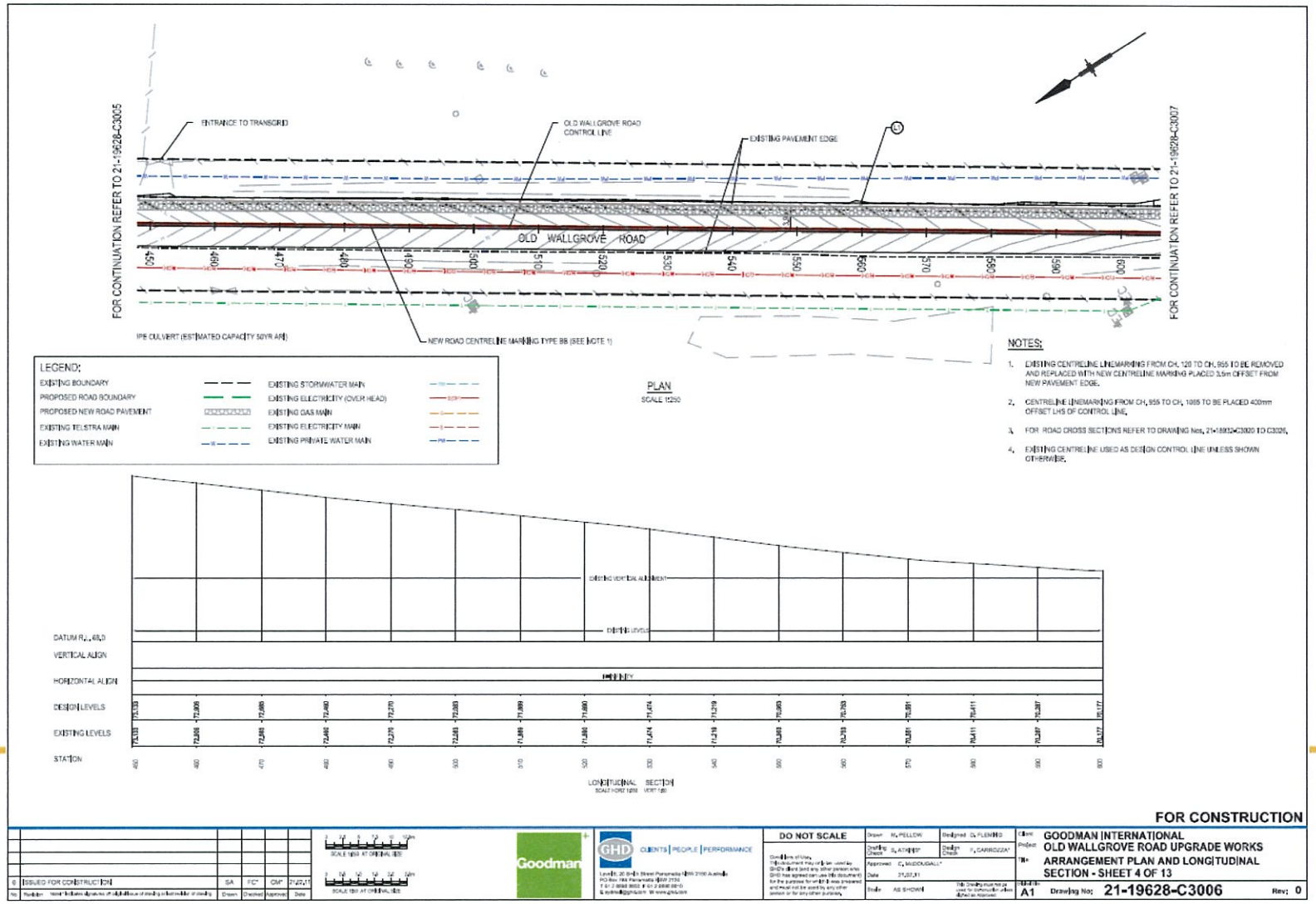
Appendices

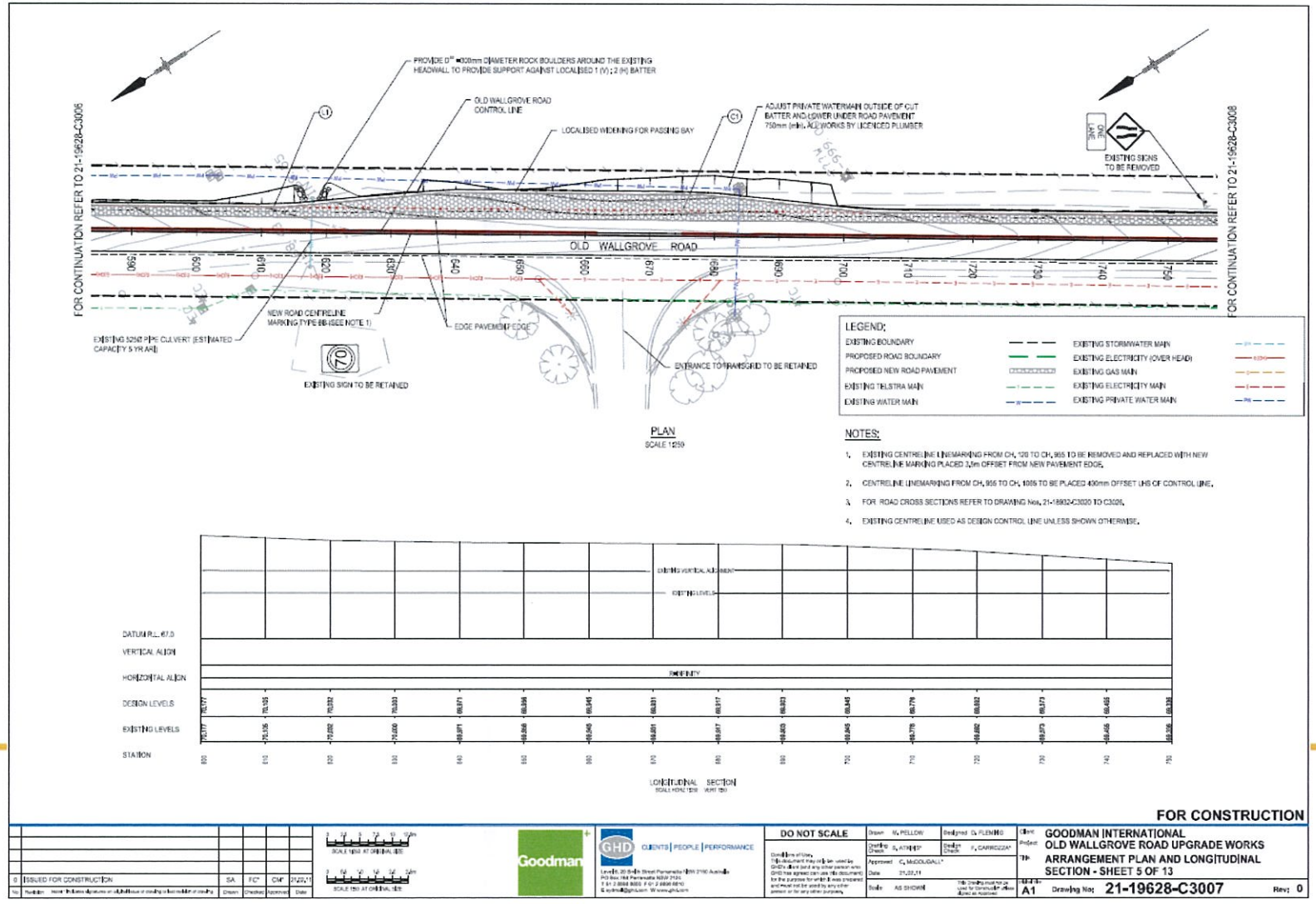
Appendix A – GHD OWR Upgrade Drawings (Works Completed)

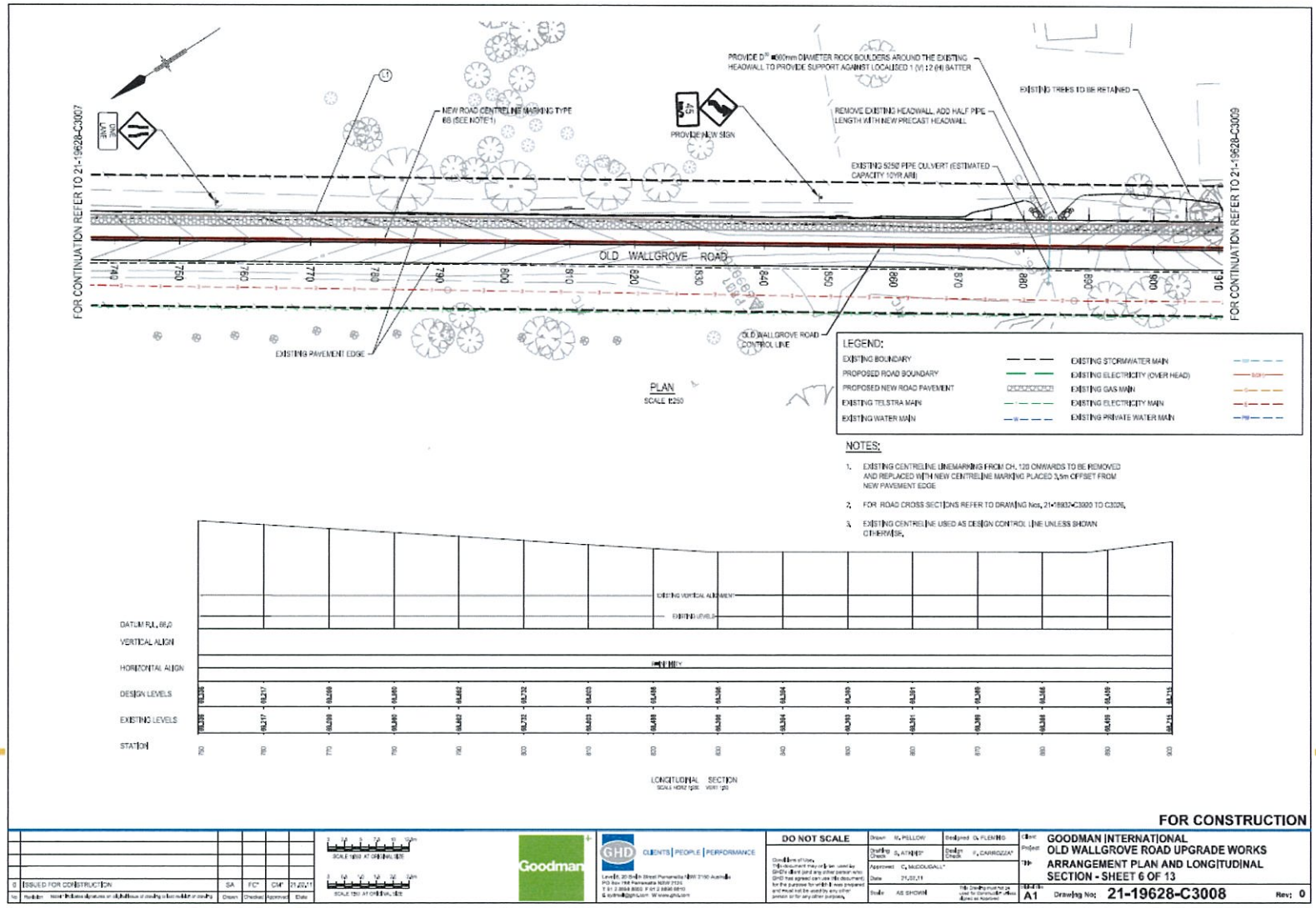

EXISTING SIGN TO BE RETAINED
NEW LANE LINEMARKING TYPE (1)
NEW ROAD CENTRELINE MARKING TYPE 8B (SEE NOTE 1)
OLD WALLGROVE ROAD CONTROL LINE
TRANSITION WIDENING FROM CH 120 - CH 140
OLD WALLGROVE ROAD
TO ROBERTS ROAD (180m)
R 5000.000
TCH 83.127
TYPE (1) LINEMARKING TO TRANSITION OVER 20m TO MATCH EXISTING LANE LINE
TRANSITION TYPE 8B LINEMARKING TO MATCH EXISTING OVER 20m
EXISTING EDGE OF PAVEMENT
BURIED ELECTRICAL (PILOT CABLE)
EXISTING PAVEMENT WIDTH IS A MINIMUM OF 7.0 METRES FROM CH. 120 TO ROBERTS ROAD
ENTRANCE TO TRANSGRID (ABANDONED)
EXISTING SIGNS TO BE RETAINED
FOR CONTINUATION REFER TO 21-19628-C3004
PLAN
SCALE 1:250
LEGEND:
EXISTING BOUNDARY
PROPOSED ROAD BOUNDARY
PROPOSED NEW ROAD PAVEMENT
EXISTING TELSTRA MAIN
EXISTING WATER MAIN
EXISTING STORMWATER MAIN
EXISTING ELECTRICITY (OVER HEAD)
EXISTING GAS MAIN
EXISTING ELECTRICITY MAIN
EXISTING PRIVATE WATER MAIN
NOTES:
1. EXISTING CENTRELINE LINEMARKING FROM CH. 120 TO CH. 956 TO BE REMOVED AND REPLACED WITH NEW CENTRELINE MARKING PLACED 3.5m OFFSET FROM NEW PAVEMENT EDGE.
2. CENTRELINE LINEMARKING FROM CH. 956 TO CH. 1088 TO BE PLACED 430mm OFFSET LHS OF CONTROL LINE.
3. FOR ROAD CROSS SECTIONS REFER TO DRAWING Nos. 21-19628-C3020 TO C3026.
4. EXISTING CENTRELINE USED AS DESIGN CONTROL LINE UNLESS SHOWN OTHERWISE.
DATUM R.L. 75.0
VERTICAL ALIGN
HORIZONTAL ALIGN
DESIGN LEVELS
EXISTING LEVELS
STATION
LONGITUDINAL SECTION
FOR CONSTRUCTION
DO NOT SCALE
GHD
CLIENTS | PEOPLE | PERFORMANCE
GOODMAN INTERNATIONAL
OLD WALLGROVE ROAD UPGRADE WORKS
ARRANGEMENT PLAN AND LONGITUDINAL SECTION - SHEET 1 OF 13
A1
Drawing No: 21-19628-C3003
Rev: 0
0 ISSUED FOR CONSTRUCTION

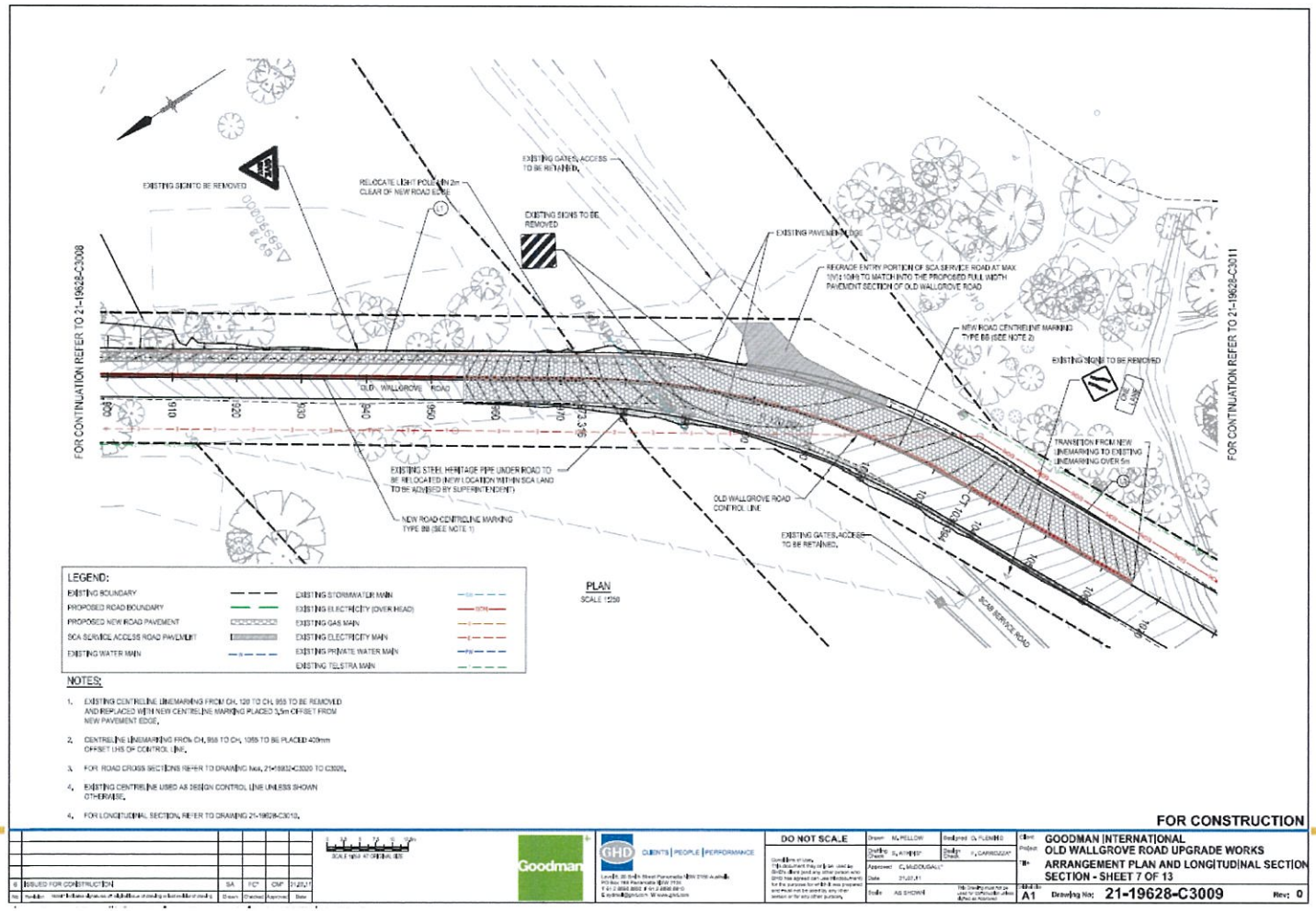

FOR CONTINUATION REFER TO 21-19628-C3003
PROVIDE GUARDRAIL (L)5m FROM EDGE OF PAVEMENT
EXISTING STORMWATER PIPE CULVERT UNDER OLD WALLGROVE ROAD TO BE RETAINED
PLACE (3) ø600mm DIAMETER ROCK BOULDERS AROUND THE EXISTING HEADWALL TO PROVIDE SUPPORT AGAINST LOCALISED 1 (V) : 2 (H)
OLD WALLGROVE ROAD CONTROL LINE
BURIED HIGH VOLTAGE CABLE
OLD WALLGROVE ROAD
FOR CONTINUATION REFER TO 21-19628-C3005
NEW ROAD CENTRELINE MARKING TYPE BB (SEE NOTE 1)
EXISTING PAVEMENT EDGE
EXISTING 825ØI PIPE CULVERT (ESTIMATED CAPACITY UP TO 50YR ARI)
EXISTING SIGNS TO BE RETAINED
PLAN
SCALE 1:250
LEGEND:
EXISTING BOUNDARY
PROPOSED ROAD BOUNDARY
PROPOSED NEW ROAD PAVEMENT
EXISTING TELSTRA MAIN
EXISTING WATER MAIN
GUARDRAIL
EXISTING STORMWATER MAIN
EXISTING ELECTRICITY (OVER HEAD)
EXISTING GAS MAIN
EXISTING ELECTRICITY MAIN
EXISTING PRIVATE WATER MAIN
NOTES:
1. EXISTING CENTRELINE LINEMARKING FROM CH. 120 TO CH. 955 TO BE REMOVED AND REPLACED WITH NEW CENTRELINE MARKING PLACED 3.5m OFFSET FROM NEW PAVEMENT EDGE.
2. CENTRELINE LINEMARKING FROM CH. 955 TO CH. 1065 TO BE PLACED 400mm OFFSET LHS OF CONTROL LINE.
3. FOR ROAD CROSS SECTIONS REFER TO DRAWING Nos. 21-19628-C3020 TO C3026.
4. EXISTING CENTRELINE USED AS DESIGN CONTROL LINE UNLESS SHOWN OTHERWISE.
DATUM RL 71.0
VERTICAL ALIGN
HORIZONTAL ALIGN
DESIGN LEVELS
EXISTING LEVELS
STATION
LONGITUDINAL SECTION
FOR CONSTRUCTION
DO NOT SCALE
GOODMAN INTERNATIONAL
OLD WALLGROVE ROAD UPGRADE WORKS
ARRANGEMENT PLAN AND LONGITUDINAL SECTION - SHEET 2 OF 13
A1
Drawing No: 21-19628-C3004
Rev: 0

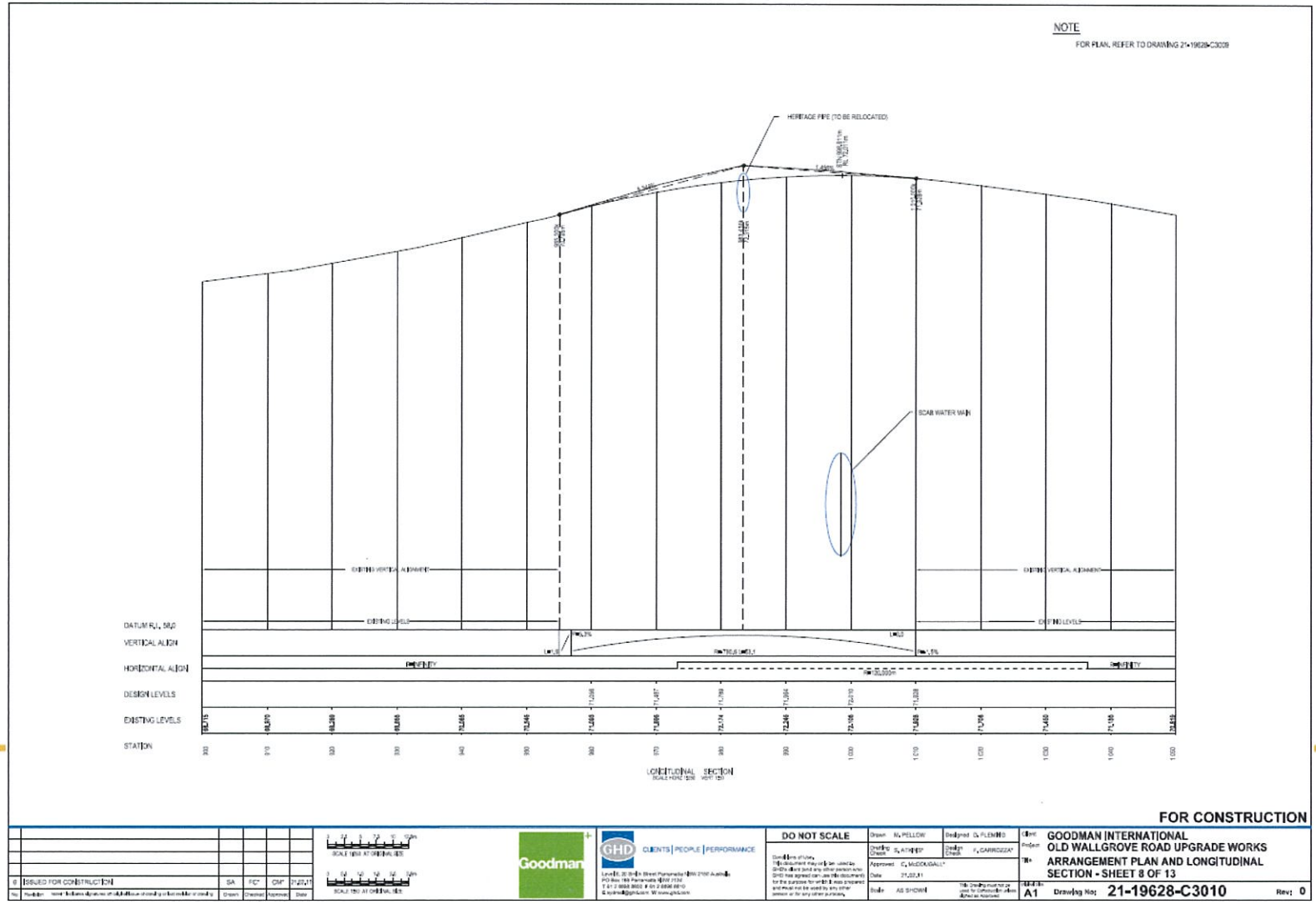

FOR CONTINUATION REFER TO 21-19628-C3004
FOR CONTINUATION REFER TO 21-19628-C3006
PLACE Ø 600mm DIAMETER ROCK BOULDERS AROUND THE EXISTING HEADWALL TO PROVIDE SUPPORT AGAINST LOCALISED BATTER 1 (V) : 2 (H)
EXISTING STORMWATER PIPE CULVERT UNDER OLD WALLGROVE ROAD TO BE RETAINED
OLD WALLGROVE ROAD CONTROL LINE
NEW ROAD CENTRELINE MARKING TYPE 9B (SEE NOTE 1)
ENTRANCE TO TRANSGRID
OLD WALLGROVE ROAD
ENTRANCE TO TRANSGRID (ABANDONED)
EXISTING PAVEMENT EDGE
EXISTING SIGN TO BE RETAINED
EXISTING 600Ø PIPE CULVERT (ESTIMATED CAPACITY 50YR ARI)
LEGEND;
EXISTING BOUNDARY
PROPOSED ROAD BOUNDARY
PROPOSED NEW ROAD PAVEMENT
EXISTING TELSTRA MAIN
EXISTING WATER MAIN
EXISTING STORMWATER MAIN
EXISTING ELECTRICITY (OVER HEAD)
EXISTING GAS MAIN
EXISTING ELECTRICITY MAIN
EXISTING PRIVATE WATER MAIN
PLAN
SCALE 1:250
NOTES:
1. EXISTING CENTRELINE LINEMARKING FROM CH, 120 TO CH, 955 TO BE REMOVED AND REPLACED WITH NEW CENTRELINE MARKING PLACED 3.5m OFFSET FROM NEW PAVEMENT EDGE.
2. CENTRELINE LINEMARKING FROM CH, 955 TO CH, 1085 TO BE PLACED 400mm OFFSET LHS OF CONTROL LINE.
3. FOR ROAD CROSS SECTIONS REFER TO DRAWING Nos, 21-19628-C3020 TO C3026.
4. EXISTING CENTRELINE USED AS DESIGN CONTROL LINE UNLESS SHOWN OTHERWISE.
EXISTING VERTICAL ALIGNMENT
EXISTING LEVELS
DATUM R.L. 71.0
VERTICAL ALIGN
HORIZONTAL ALIGN
DESIGN LEVELS
EXISTING LEVELS
STATION
LONGITUDINAL SECTION
FOR CONSTRUCTION
DO NOT SCALE
GOODMAN INTERNATIONAL
OLD WALLGROVE ROAD UPGRADE WORKS
ARRANGEMENT PLAN AND LONGITUDINAL SECTION - SHEET 3 OF 13
A1
Drawing No: 21-19628-C3005
Rev: 0

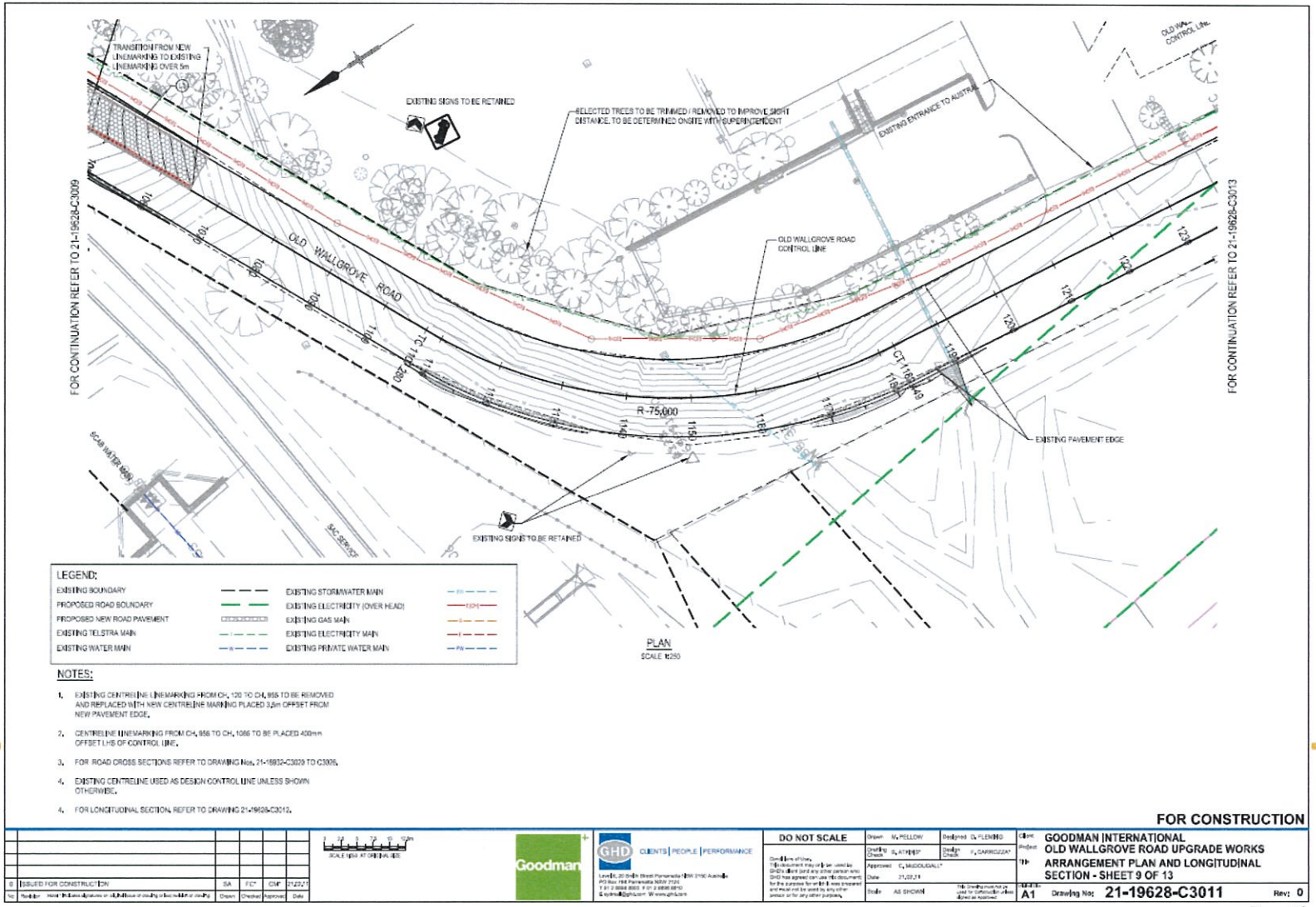

FOR CONTINUATION REFER TO 21-19628-C3005
ENTRANCE TO TRANSGRID
OLD WALLGROVE ROAD CONTROL LINE
EXISTING PAVEMENT EDGE
OLD WALLGROVE ROAD
FOR CONTINUATION REFER TO 21-19628-C3007
IPE CULVERT (ESTIMATED CAPACITY 50YR ARI)
NEW ROAD CENTRELINE MARKING TYPE BB (SEE NOTE 1)
LEGEND:
EXISTING BOUNDARY
PROPOSED ROAD BOUNDARY
PROPOSED NEW ROAD PAVEMENT
EXISTING TELSTRA MAIN
EXISTING WATER MAIN
EXISTING STORMWATER MAIN
EXISTING ELECTRICITY (OVER HEAD)
EXISTING GAS MAIN
EXISTING ELECTRICITY MAIN
EXISTING PRIVATE WATER MAIN
PLAN
SCALE 1:250
NOTES:
1. EXISTING CENTRELINE LINEMARKING FROM CH. 120 TO CH. 955 TO BE REMOVED AND REPLACED WITH NEW CENTRELINE MARKING PLACED 3.5m OFFSET FROM NEW PAVEMENT EDGE.
2. CENTRELINE LINEMARKING FROM CH. 955 TO CH. 1085 TO BE PLACED 420mm OFFSET LHS OF CONTROL LINE.
3. FOR ROAD CROSS SECTIONS REFER TO DRAWING Nos. 21-19628-C3020 TO C3026.
4. EXISTING CENTRELINE USED AS DESIGN CONTROL LINE UNLESS SHOWN OTHERWISE.
DATUM R.L. 49.0
VERTICAL ALIGN
HORIZONTAL ALIGN
DESIGN LEVELS
EXISTING LEVELS
STATION
LONGITUDINAL SECTION
FOR CONSTRUCTION
DO NOT SCALE
GOODMAN INTERNATIONAL
OLD WALLGROVE ROAD UPGRADE WORKS
ARRANGEMENT PLAN AND LONGITUDINAL SECTION - SHEET 4 OF 13
A1
Drawing No: 21-19628-C3006
Rev: 0


PROVIDE D=900mm DIAMETER ROCK BOULDERS AROUND THE EXISTING HEADWALL TO PROVIDE SUPPORT AGAINST LOCALISED 1 (V) : 2 (H) BATTER
OLD WALLGROVE ROAD CONTROL LINE
LOCALISED WIDENING FOR PASSING BAY
ADJUST PRIVATE WATERMAIN OUTSIDE OF CUT BATTER AND LOWER UNDER ROAD PAVEMENT 750mm (min). ALL WORKS BY LICENCED PLUMBER
EXISTING SIGNS TO BE REMOVED
ONE LANE
FOR CONTINUATION REFER TO 21-19628-C3005
FOR CONTINUATION REFER TO 21-19628-C3008
OLD WALLGROVE ROAD
NEW ROAD CENTRELINE MARKING TYPE BB (SEE NOTE 1)
EDGE PAVEMENT EDGE
EXISTING 525ø PIPE CULVERT (ESTIMATED CAPACITY 5 YR ARI)
EXISTING SIGN TO BE RETAINED
ENTRANCE TO FARMSGRID TO BE RETAINED
PLAN
SCALE 1:250
LEGEND:
EXISTING BOUNDARY
PROPOSED ROAD BOUNDARY
PROPOSED NEW ROAD PAVEMENT
EXISTING TELSTRA MAIN
EXISTING WATER MAIN
EXISTING STORMWATER MAIN
EXISTING ELECTRICITY (OVER HEAD)
EXISTING GAS MAIN
EXISTING ELECTRICITY MAIN
EXISTING PRIVATE WATER MAIN
NOTES:
1. EXISTING CENTRELINE LINEMARKING FROM CH, 120 TO CH, 955 TO BE REMOVED AND REPLACED WITH NEW CENTRELINE MARKING PLACED 3.5m OFFSET FROM NEW PAVEMENT EDGE.
2. CENTRELINE LINEMARKING FROM CH, 955 TO CH, 1005 TO BE PLACED 400mm OFFSET LHS OF CONTROL LINE.
3. FOR ROAD CROSS SECTIONS REFER TO DRAWING Nos, 21-19628-C3020 TO C3026.
4. EXISTING CENTRELINE USED AS DESIGN CONTROL LINE UNLESS SHOWN OTHERWISE.
DATUM R.L. 47.0
VERTICAL ALIGN
HORIZONTAL ALIGN
PROPERTY
DESIGN LEVELS
EXISTING LEVELS
STATION
LONGITUDINAL SECTION
FOR CONSTRUCTION
0 ISSUED FOR CONSTRUCTION
SCALE 1:50V AT ORIGINAL SIZE
SCALE 1:50H AT ORIGINAL SIZE
Goodman
GHD CLIENTS | PEOPLE | PERFORMANCE
DO NOT SCALE
Drawn N. PELLOW
Designed G. FLEMING
Drafting Check K. ATHERTON
Design Check P. CARROZZA*
Approved C. McDOUGALL*
Date 21.02.11
Scale AS SHOWN
CLIENT GOODMAN INTERNATIONAL
PROJECT OLD WALLGROVE ROAD UPGRADE WORKS
TITLE ARRANGEMENT PLAN AND LONGITUDINAL SECTION - SHEET 5 OF 13
Size A1
Drawing No: 21-19628-C3007
Rev: 0


PROVIDE D50 ≥600mm DIAMETER ROCK BOULDERS AROUND THE EXISTING HEADWALL TO PROVIDE SUPPORT AGAINST LOCALISED 1 (V) : 2 (H) BATTER
EXISTING TREES TO BE RETAINED
NEW ROAD CENTRELINE MARKING TYPE 6B (SEE NOTE 1)
PROVIDE NEW SIGN
REMOVE EXISTING HEADWALL, ADD HALF PIPE LENGTH WITH NEW PRECAST HEADWALL
EXISTING 5250 PIPE CULVERT (ESTIMATED CAPACITY 10YR ARI)
FOR CONTINUATION REFER TO 21-19628-C3007
FOR CONTINUATION REFER TO 21-19628-C3009
OLD WALLGROVE ROAD
OLD WALLGROVE ROAD CONTROL LINE
EXISTING PAVEMENT EDGE
PLAN
SCALE 1:250
LEGEND:
EXISTING BOUNDARY
PROPOSED ROAD BOUNDARY
PROPOSED NEW ROAD PAVEMENT
EXISTING TELSTRA MAIN
EXISTING WATER MAIN
EXISTING STORMWATER MAIN
EXISTING ELECTRICITY (OVER HEAD)
EXISTING GAS MAIN
EXISTING ELECTRICITY MAIN
EXISTING PRIVATE WATER MAIN
NOTES:
1. EXISTING CENTRELINE LINEMARKING FROM CH. 120 ONWARDS TO BE REMOVED AND REPLACED WITH NEW CENTRELINE MARKING PLACED 3.5m OFFSET FROM NEW PAVEMENT EDGE
2. FOR ROAD CROSS SECTIONS REFER TO DRAWING Nos, 21-19628-C3000 TO C3005,
3. EXISTING CENTRELINE USED AS DESIGN CONTROL LINE UNLESS SHOWN OTHERWISE.
EXISTING VERTICAL ALIGNMENT
EXISTING LEVELS
DATUM RL, 60.0
VERTICAL ALIGN
HORIZONTAL ALIGN
DESIGN LEVELS
EXISTING LEVELS
STATION
LONGITUDINAL SECTION
FOR CONSTRUCTION
DO NOT SCALE
GOODMAN INTERNATIONAL
OLD WALLGROVE ROAD UPGRADE WORKS
ARRANGEMENT PLAN AND LONGITUDINAL SECTION - SHEET 6 OF 13
A1
Drawing No: 21-19628-C3008
Rev: 0

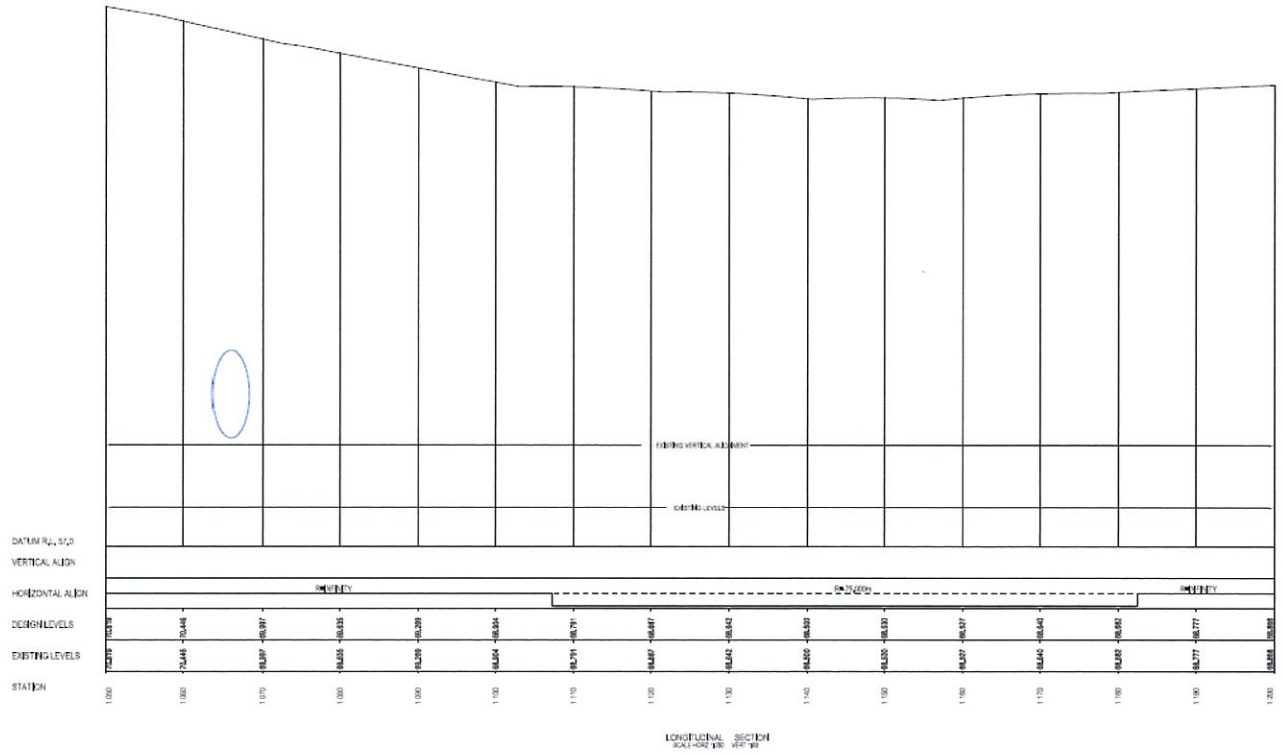

EXISTING SIGN TO BE REMOVED
RELOCATE LIGHT POLE MIN 2m CLEAR OF NEW ROAD EDGE
EXISTING GATES, ACCESS TO BE RETAINED.
EXISTING SIGNS TO BE REMOVED
EXISTING PAVEMENT EDGE
REGRADE ENTRY PORTION OF SCA SERVICE ROAD AT MAX 10%(10m) TO MATCH INTO THE PROPOSED FULL WIDTH PAVEMENT SECTION OF OLD WALLGROVE ROAD
NEW ROAD CENTRELINE MARKING TYPE BB (SEE NOTE 2)
EXISTING SIGN TO BE REMOVED
ONE WAY
TRANSITION FROM NEW LINEMARKING TO EXISTING LINEMARKING OVER 5m
FOR CONTINUATION REFER TO 21-19628-C3008
FOR CONTINUATION REFER TO 21-19628-C3011
OLD WALLGROVE ROAD
EXISTING STEEL HERITAGE PIPE UNDER ROAD TO BE RELOCATED (NEW LOCATION WITHIN SCA LAND TO BE ADVISED BY SUPERINTENDENT)
NEW ROAD CENTRELINE MARKING TYPE BB (SEE NOTE 1)
OLD WALLGROVE ROAD CONTROL LINE
EXISTING GATES, ACCESS TO BE RETAINED.
SCA SERVICE ROAD
PLAN
SCALE 1:250
LEGEND:
EXISTING BOUNDARY
PROPOSED ROAD BOUNDARY
PROPOSED NEW ROAD PAVEMENT
SCA SERVICE ACCESS ROAD PAVEMENT
EXISTING WATER MAIN
EXISTING STORMWATER MAIN
EXISTING ELECTRICITY (OVER HEAD)
EXISTING GAS MAIN
EXISTING ELECTRICITY MAIN
EXISTING PRIVATE WATER MAIN
EXISTING TELSTRA MAIN
NOTES:
1. EXISTING CENTRELINE LINEMARKING FROM CH. 120 TO CH. 955 TO BE REMOVED AND REPLACED WITH NEW CENTRELINE MARKING PLACED 3.5m OFFSET FROM NEW PAVEMENT EDGE.
2. CENTRELINE LINEMARKING FROM CH. 955 TO CH. 1055 TO BE PLACED 400mm OFFSET LHS OF CONTROL LINE.
3. FOR ROAD CROSS SECTIONS REFER TO DRAWING Nos. 21-19628-C3020 TO C3026.
4. EXISTING CENTRELINE USED AS DESIGN CONTROL LINE UNLESS SHOWN OTHERWISE.
4. FOR LONGITUDINAL SECTION, REFER TO DRAWING 21-19628-C3010.
FOR CONSTRUCTION
6 ISSUED FOR CONSTRUCTION SA FCT CMF 01.07.21
DO NOT SCALE
GHD CLIENTS | PEOPLE | PERFORMANCE
Goodman
GOODMAN INTERNATIONAL
OLD WALLGROVE ROAD UPGRADE WORKS
ARRANGEMENT PLAN AND LONGITUDINAL SECTION
SECTION - SHEET 7 OF 13
A1 Drawing No: 21-19628-C3009 Rev: 0


NOTE
FOR PLAN, REFER TO DRAWING 21-19628-C3009
HERITAGE FIRE (TO BE RELOCATED)
SCAB WATER MAIN
EXISTING VERTICAL ALIGNMENT
EXISTING LEVELS
DATUM RL, SM.0
VERTICAL ALIGN
HORIZONTAL ALIGN
DESIGN LEVELS
EXISTING LEVELS
STATION
LONGITUDINAL SECTION
FOR CONSTRUCTION
ISSUED FOR CONSTRUCTION
DO NOT SCALE
GHD
CLIENTS | PEOPLE | PERFORMANCE
Goodman
GOODMAN INTERNATIONAL
OLD WALLGROVE ROAD UPGRADE WORKS
ARRANGEMENT PLAN AND LONGITUDINAL SECTION - SHEET 8 OF 13
A1
21-19628-C3010
Rev: 0


TRANSITION FROM NEW LINEMARKING TO EXISTING LINEMARKING OVER 5m
EXISTING SIGNS TO BE RETAINED
SELECTED TREES TO BE TRIMMED / REMOVED TO IMPROVE SIGHT DISTANCE. TO BE DETERMINED ONSITE WITH SUPERINTENDENT
EXISTING ENTRANCE TO AUSTRAL
OLD WALLGROVE ROAD CONTROL LINE
OLD WALLGROVE ROAD
FOR CONTINUATION REFER TO 21-19628-C3009
FOR CONTINUATION REFER TO 21-19628-C3013
R =75.000
EXISTING PAVEMENT EDGE
EXISTING SIGNS TO BE RETAINED
SCAB WATER MAIN
SAS SERVICE
PLAN
SCALE 1:250
LEGEND:
EXISTING BOUNDARY
PROPOSED ROAD BOUNDARY
PROPOSED NEW ROAD PAVEMENT
EXISTING TELSTRA MAIN
EXISTING WATER MAIN
EXISTING STORMWATER MAIN
EXISTING ELECTRICITY (OVER HEAD)
EXISTING GAS MAIN
EXISTING ELECTRICITY MAIN
EXISTING PRIVATE WATER MAIN
NOTES:
1. EXISTING CENTRELINE LINEMARKING FROM CH, 120 TO CH, 855 TO BE REMOVED AND REPLACED WITH NEW CENTRELINE MARKING PLACED 3.5m OFFSET FROM NEW PAVEMENT EDGE.
2. CENTRELINE LINEMARKING FROM CH, 856 TO CH, 1086 TO BE PLACED 400mm OFFSET LHS OF CONTROL LINE.
3. FOR ROAD CROSS SECTIONS REFER TO DRAWING Nos. 21-19628-C3029 TO C3035.
4. EXISTING CENTRELINE USED AS DESIGN CONTROL LINE UNLESS SHOWN OTHERWISE.
4. FOR LONGITUDINAL SECTION, REFER TO DRAWING 21-19628-C3012.
FOR CONSTRUCTION
B ISSUED FOR CONSTRUCTION SA FC CM 21.09.21
DO NOT SCALE
CLIENTS | PEOPLE | PERFORMANCE
Drawn N. PELLOW
Designed D. FLEMING
Drawing Check R. ATHEY
Design Check F. CARROZZA
Approved C. McDOUGALL
Date 21.09.21
Scale AS SHOWN
Client GOODMAN INTERNATIONAL
Project OLD WALLGROVE ROAD UPGRADE WORKS
Title ARRANGEMENT PLAN AND LONGITUDINAL SECTION - SHEET 9 OF 13
Size A1
Drawing No: 21-19628-C3011
Rev: 0

NOTE

FOR PLAN, REFER TO DRAWING 21-19628-C3011



LONGITUDINAL SECTION

SCALE HORZ 1:[illegible] VERT 1:[illegible]

FOR CONSTRUCTION

No	Revision	Initials	Date
0	ISSUED FOR CONSTRUCTION	SA	21.07.11

Drawn SA | Checked FC* | Approved CMF | Date 21.07.11

SCALE 1:500 AT ORIGINAL SIZE

SCALE 1:50 AT ORIGINAL SIZE

Goodman

GHD CLIENTS | PEOPLE | PERFORMANCE

Level 3, 20 Smith Street Parramatta NSW 2150 Australia
PO Box 194 Parramatta NSW 2124
T 61 2 8848 8666 F 61 2 8848 8610
E sydmail@ghd.com W www.ghd.com

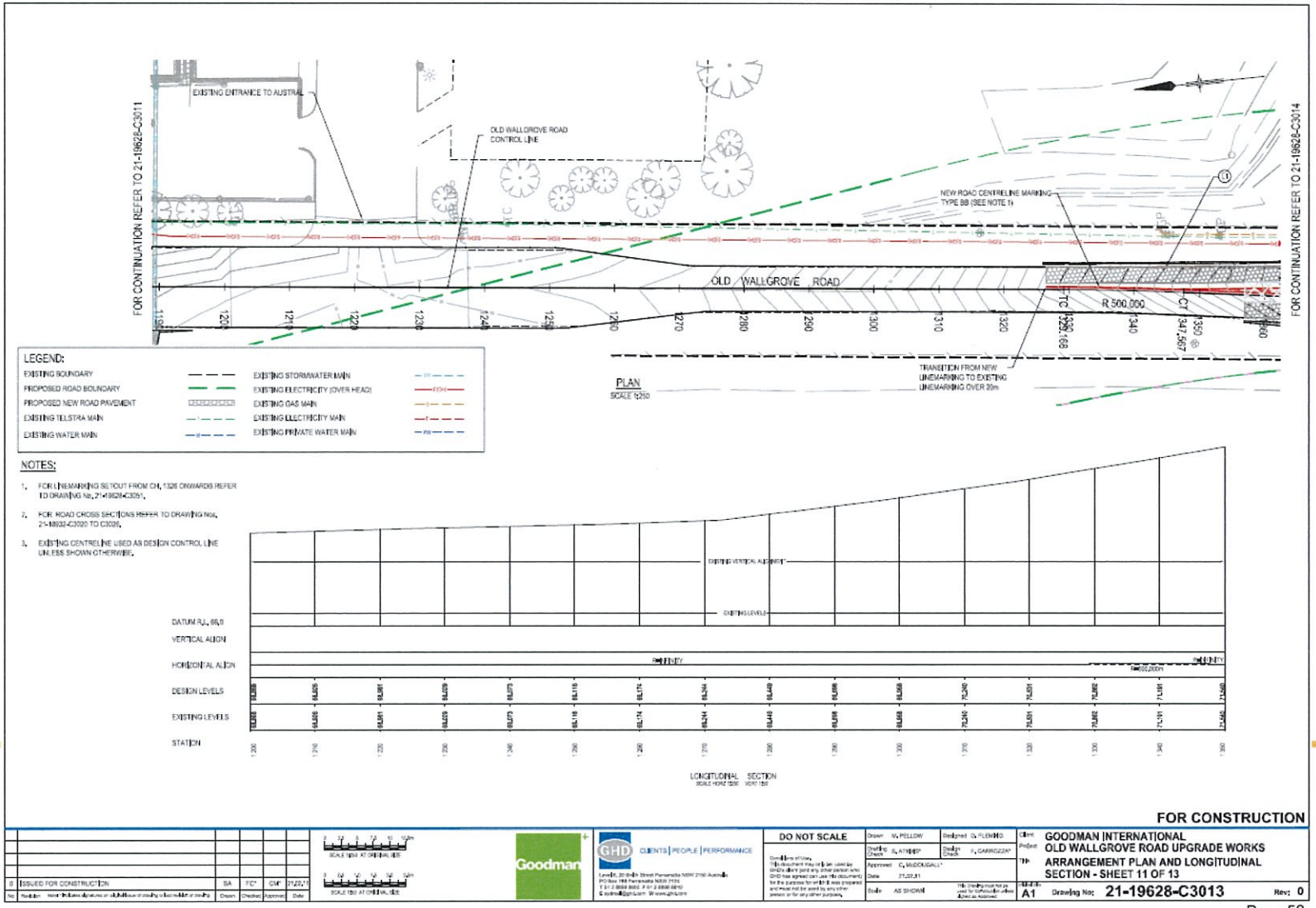
DO NOT SCALE

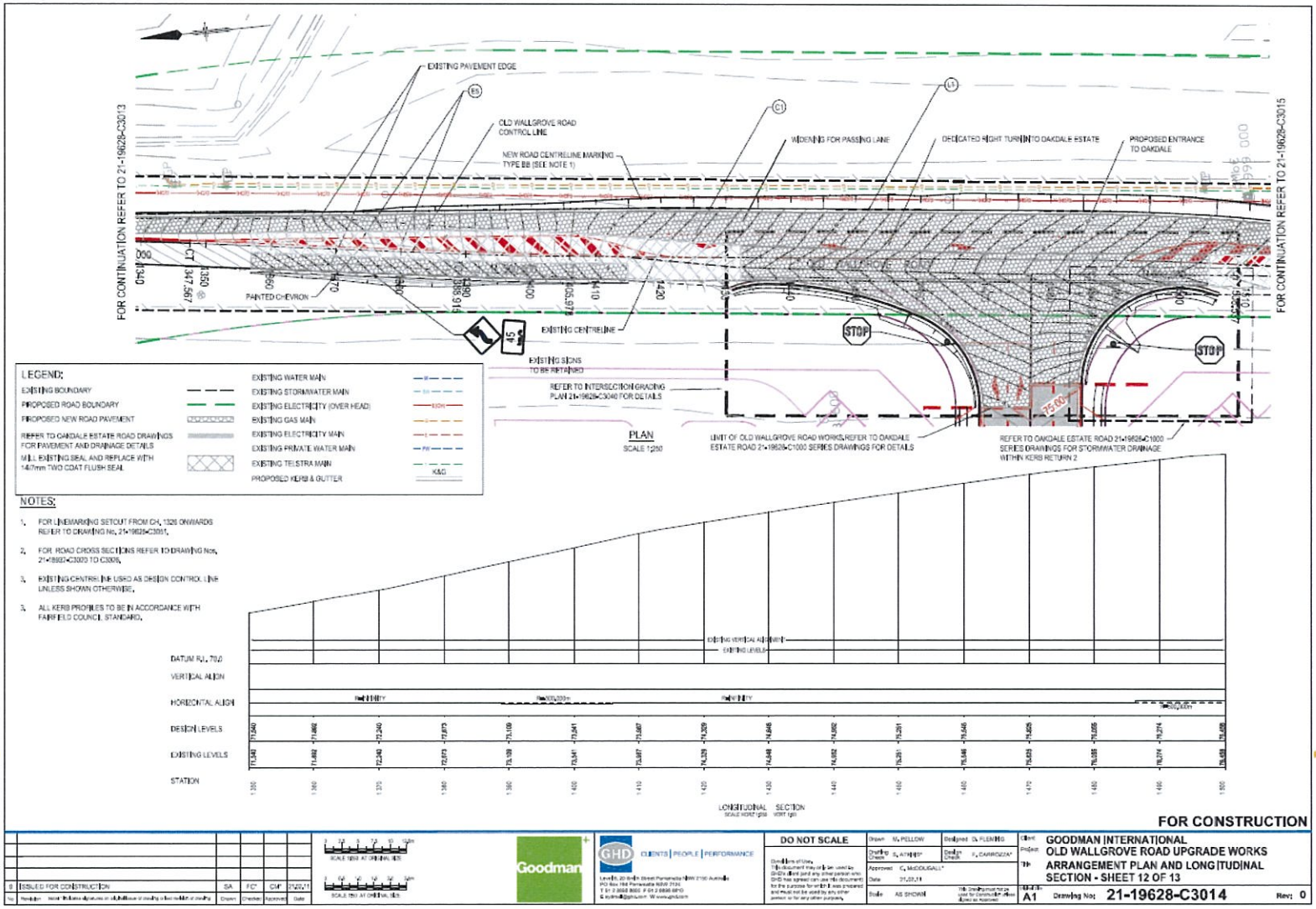
Conditions of Use
This document is only to be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and should not be used by any other person or for any other purpose.

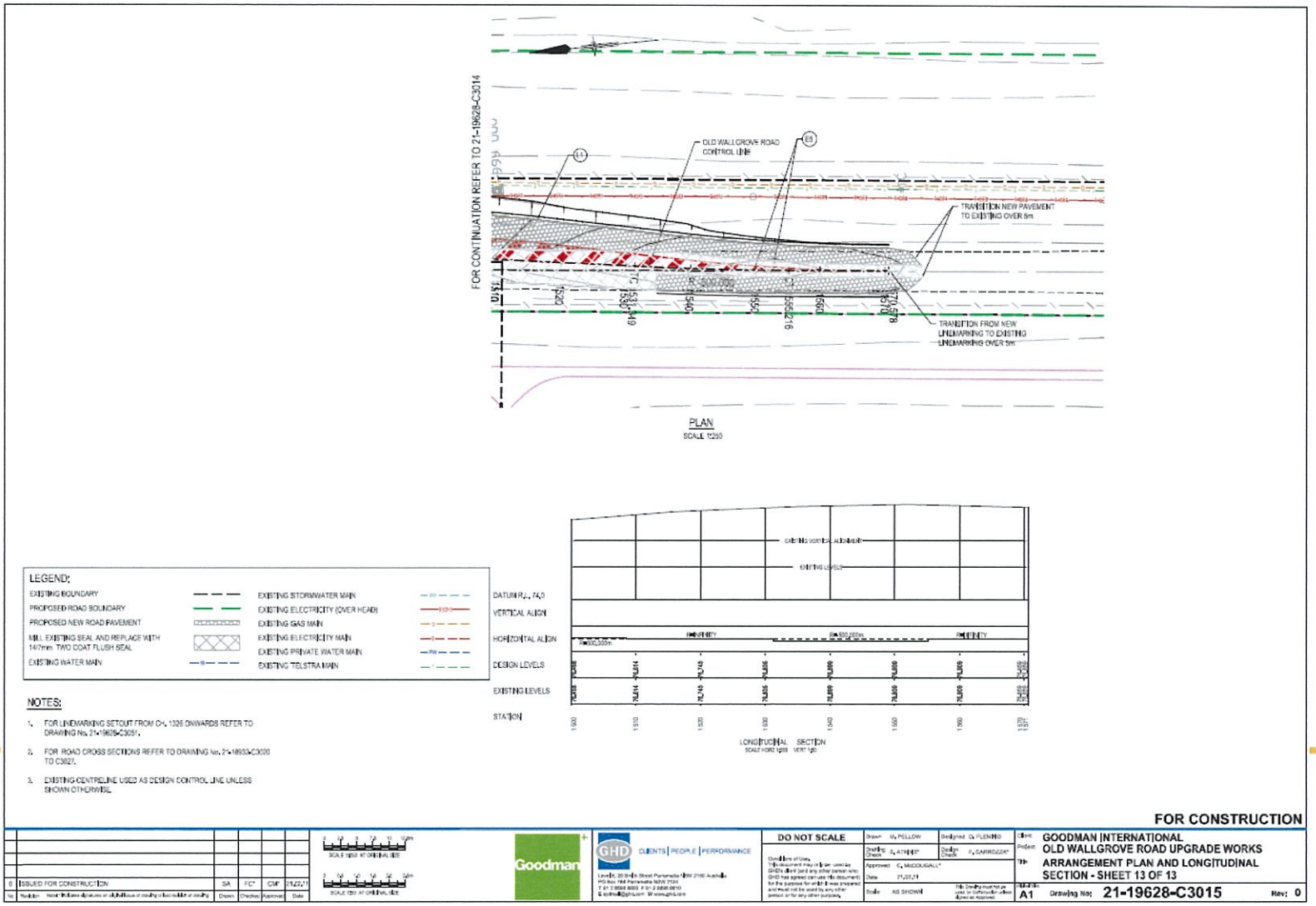
Drawn M. PELLOW | Designed G. FLEMING
Drafting Check R. ATHNEP | Design Check F. CARROZZA*
Approved C. McDOUGALL*
Date 21.07.11
Scale AS SHOWN

Only Drawings must not be used for Construction unless signed as Approved

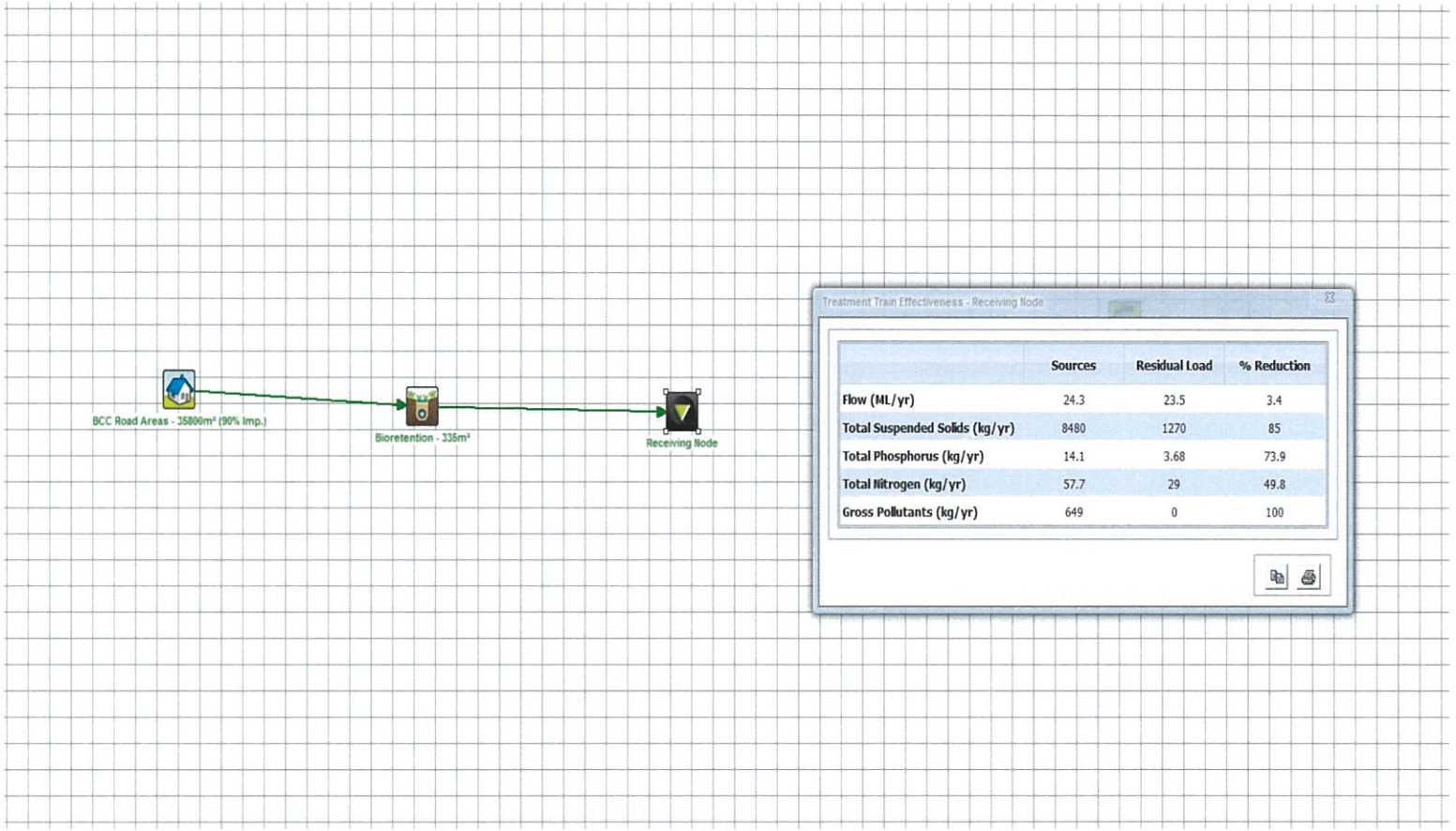
Client GOODMAN INTERNATIONAL
Project OLD WALLGROVE ROAD UPGRADE WORKS
Title ARRANGEMENT PLAN AND LONGITUDINAL SECTION - SHEET 10 OF 13
Size A1 | Drawing No: 21-19628-C3012 | Rev: 0


EXISTING ENTRANCE TO AUSTRAL
OLD WALLGROVE ROAD CONTROL LINE
NEW ROAD CENTRELINE MARKING TYPE BB (SEE NOTE 1)
OLD WALLGROVE ROAD
FOR CONTINUATION REFER TO 21-19628-C3011
FOR CONTINUATION REFER TO 21-19628-C3014
R 500.000
TRANSITION FROM NEW LINEMARKING TO EXISTING LINEMARKING OVER 20m
PLAN
SCALE 1:250
LEGEND:
EXISTING BOUNDARY
PROPOSED ROAD BOUNDARY
PROPOSED NEW ROAD PAVEMENT
EXISTING TELSTRA MAIN
EXISTING WATER MAIN
EXISTING STORMWATER MAIN
EXISTING ELECTRICITY (OVER HEAD)
EXISTING GAS MAIN
EXISTING ELECTRICITY MAIN
EXISTING PRIVATE WATER MAIN
NOTES:
1. FOR LINEMARKING SETOUT FROM CH, 1326 ONWARDS REFER TO DRAWING No, 21-19628-C3051.
2. FOR ROAD CROSS SECTIONS REFER TO DRAWING Nos, 21-19032-C3020 TO C3026.
3. EXISTING CENTRELINE USED AS DESIGN CONTROL LINE UNLESS SHOWN OTHERWISE.
DATUM R.L. 66.0
VERTICAL ALIGN
HORIZONTAL ALIGN
DESIGN LEVELS
EXISTING LEVELS
STATION
LONGITUDINAL SECTION
SCALE HORZ 1:500 VERT 1:50
FOR CONSTRUCTION
DO NOT SCALE
GHD CLIENTS | PEOPLE | PERFORMANCE
Goodman
B ISSUED FOR CONSTRUCTION
Client GOODMAN INTERNATIONAL
Project OLD WALLGROVE ROAD UPGRADE WORKS
Title ARRANGEMENT PLAN AND LONGITUDINAL SECTION - SHEET 11 OF 13
Drawing No: 21-19628-C3013
Rev: 0


EXISTING PAVEMENT EDGE
OLD WALLGROVE ROAD CONTROL LINE
NEW ROAD CENTRELINE MARKING TYPE BB (SEE NOTE 1)
WIDENING FOR PASSING LANE
DEDICATED RIGHT TURN INTO OAKDALE ESTATE
PROPOSED ENTRANCE TO OAKDALE
FOR CONTINUATION REFER TO 21-19628-C3013
FOR CONTINUATION REFER TO 21-19628-C3015
PAINTED CHEVRON
EXISTING CENTRELINE
EXISTING SIGNS TO BE RETAINED
REFER TO INTERSECTION GRADING PLAN 21-19628-C3040 FOR DETAILS
STOP
PLAN
SCALE 1:250
LIMIT OF OLD WALLGROVE ROAD WORKS,REFER TO OAKDALE ESTATE ROAD 21-19628-C1000 SERIES DRAWINGS FOR DETAILS
REFER TO OAKDALE ESTATE ROAD 21-19628-C1000 SERIES DRAWINGS FOR STORMWATER DRAINAGE WITHIN KERB RETURN 2
LEGEND:
EXISTING BOUNDARY
PROPOSED ROAD BOUNDARY
PROPOSED NEW ROAD PAVEMENT
REFER TO OAKDALE ESTATE ROAD DRAWINGS FOR PAVEMENT AND DRAINAGE DETAILS
MILL EXISTING SEAL AND REPLACE WITH 14/7mm TWO COAT FLUSH SEAL
EXISTING WATER MAIN
EXISTING STORMWATER MAIN
EXISTING ELECTRICITY (OVER HEAD)
EXISTING GAS MAIN
EXISTING ELECTRICITY MAIN
EXISTING PRIVATE WATER MAIN
EXISTING TELSTRA MAIN
PROPOSED KERB & GUTTER
NOTES:
1. FOR LINEMARKING SETOUT FROM CH. 1320 ONWARDS REFER TO DRAWING No. 21-19628-C3051.
2. FOR ROAD CROSS SECTIONS REFER TO DRAWING Nos. 21-19627-C3003 TO C3005.
3. EXISTING CENTRELINE USED AS DESIGN CONTROL LINE UNLESS SHOWN OTHERWISE.
4. ALL KERB PROFILES TO BE IN ACCORDANCE WITH FAIRFIELD COUNCIL STANDARD.
DATUM RL 70.0
VERTICAL ALIGN
HORIZONTAL ALIGN
DESIGN LEVELS
EXISTING LEVELS
STATION
LONGITUDINAL SECTION
FOR CONSTRUCTION
DO NOT SCALE
GHD
CLIENTS | PEOPLE | PERFORMANCE
Goodman
GOODMAN INTERNATIONAL
OLD WALLGROVE ROAD UPGRADE WORKS
ARRANGEMENT PLAN AND LONGITUDINAL SECTION - SHEET 12 OF 13
A1
Drawing No: 21-19628-C3014
Rev: 0


FOR CONTINUATION REFER TO 21-19628-C3014
OLD WALLGROVE ROAD CONTROL LINE
TRANSITION NEW PAVEMENT TO EXISTING OVER 5m
TRANSITION FROM NEW LINEMARKING TO EXISTING LINEMARKING OVER 5m
PLAN
SCALE 1:250
LEGEND:
EXISTING BOUNDARY
PROPOSED ROAD BOUNDARY
PROPOSED NEW ROAD PAVEMENT
MILL EXISTING SEAL AND REPLACE WITH 14/7mm TWO COAT FLUSH SEAL
EXISTING WATER MAIN
EXISTING STORMWATER MAIN
EXISTING ELECTRICITY (OVER HEAD)
EXISTING GAS MAIN
EXISTING ELECTRICITY MAIN
EXISTING PRIVATE WATER MAIN
EXISTING TELSTRA MAIN
NOTES:
1. FOR LINEMARKING SETOUT FROM CH. 1320 ONWARDS REFER TO DRAWING No. 21-19628-C3051.
2. FOR ROAD CROSS SECTIONS REFER TO DRAWING No. 21-19628-C3020 TO C3027.
3. EXISTING CENTRELINE USED AS DESIGN CONTROL LINE UNLESS SHOWN OTHERWISE.
DATUM RL. 74.0
VERTICAL ALIGN
HORIZONTAL ALIGN
DESIGN LEVELS
EXISTING LEVELS
STATION
LONGITUDINAL SECTION
FOR CONSTRUCTION
DO NOT SCALE
GOODMAN INTERNATIONAL
OLD WALLGROVE ROAD UPGRADE WORKS
ARRANGEMENT PLAN AND LONGITUDINAL SECTION - SHEET 13 OF 13
A1
Drawing No: 21-19628-C3015
Rev: 0

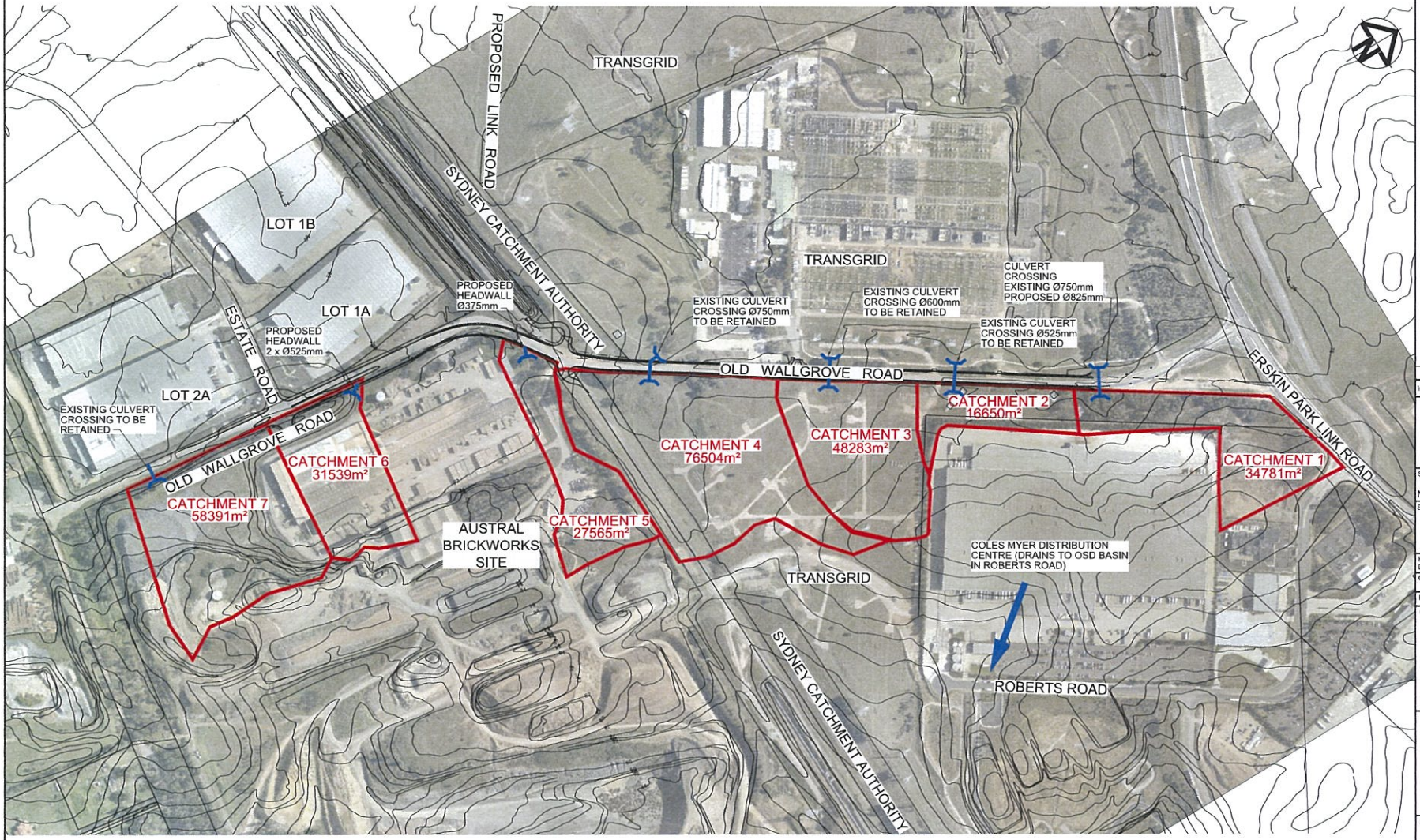
Appendix B – MUSIC Model and Results



Treatment Train Effectiveness - Receiving Node

	Sources	Residual Load	% Reduction
Flow (ML/yr)	24.3	23.5	3.4
Total Suspended Solids (kg/yr)	8480	1270	85
Total Phosphorus (kg/yr)	14.1	3.68	73.9
Total Nitrogen (kg/yr)	57.7	29	49.8
Gross Pollutants (kg/yr)	649	0	100

Appendix C – Catchment Plan



Issue	Description	Date
P1	ISSUED FOR INFORMATION	13-06-14

Status: PRELIMINARY ONLY NOT TO BE USED FOR CONSTRUCTION — A1

Scales	NTS	Drawn TS	
		Designed TS	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	

File:

Client: Goodman

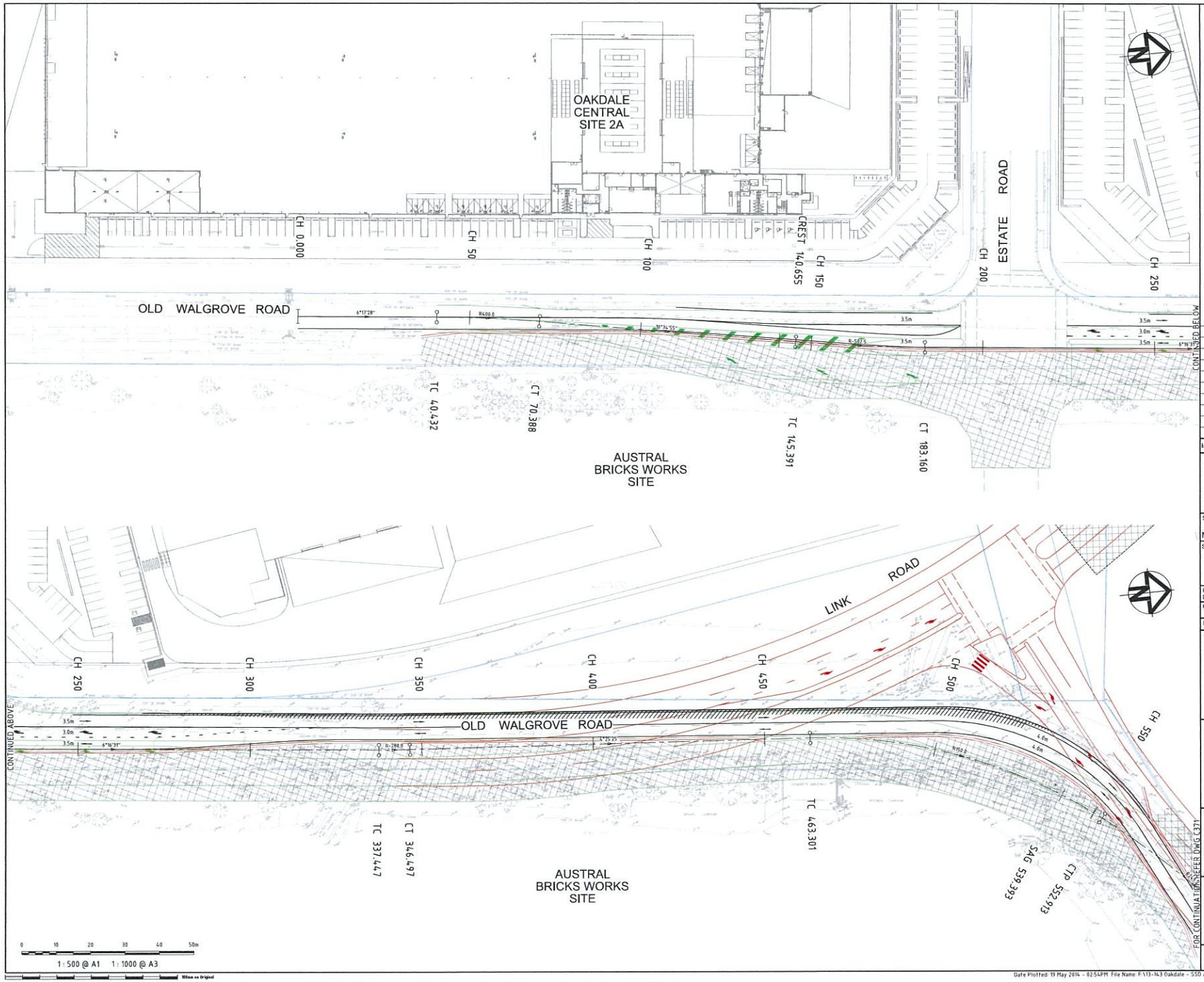
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL OLD WALGROVE ROAD UPGRADE

Title: STORMWATER CATCHMENT PLAN

Drawing No.	Project No.	Issue
SKC04	13-129	P1

Appendix D – Construction Staging Concept Plans



LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION — A1

Scales	1 : 500 @ A1	Drawn TS	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	
File:	C370.dwg		

Client: Goodman

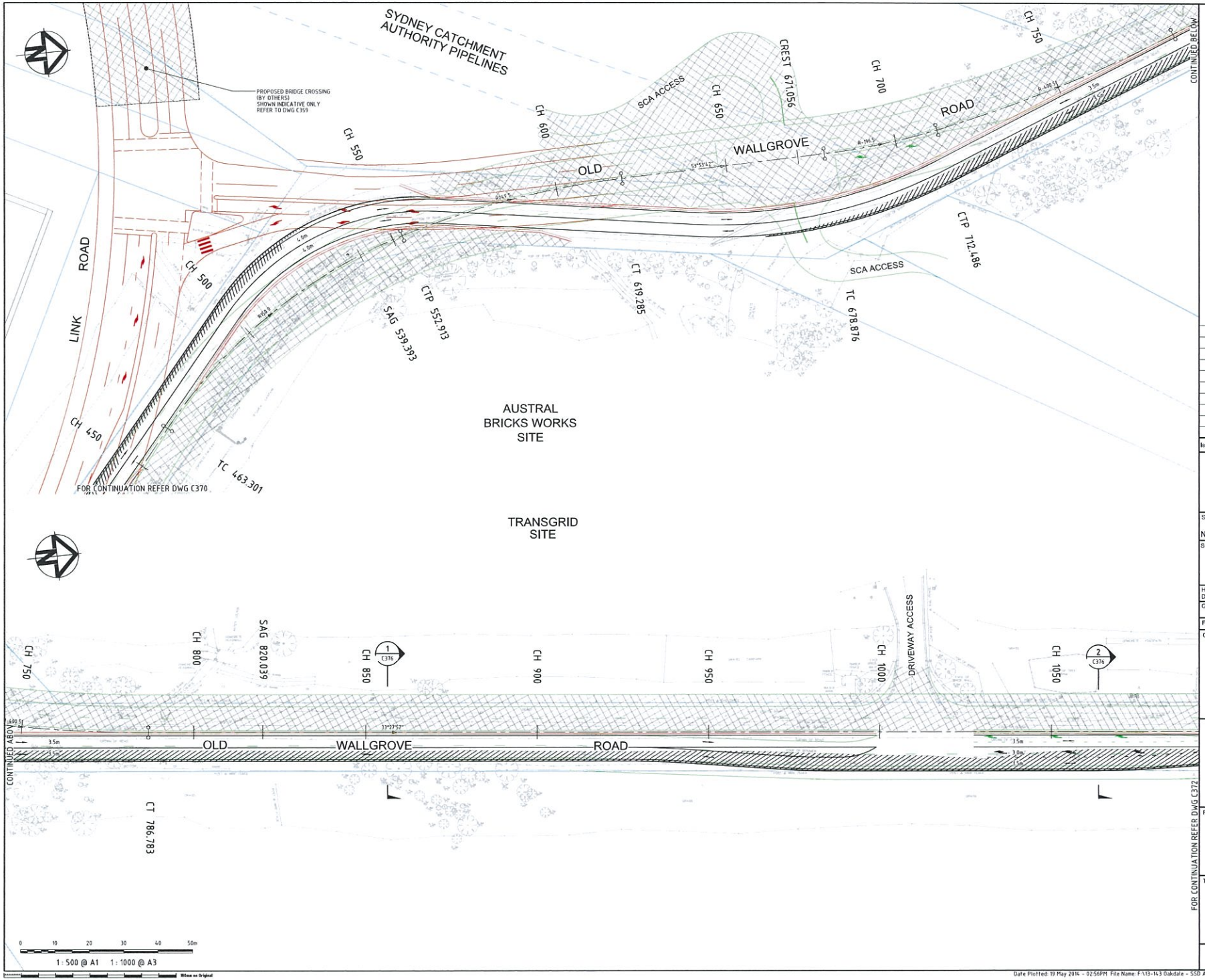
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN STAGE 1 SHEET 1 OF 3

Drawing No.	Project No.	Issue
C370	13-143	A

Date Plotted: 19 May 2014 - 02:54PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C370.dwg V1



LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 500 @ A1	Drawn TS	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	
File:	C371.dwg		

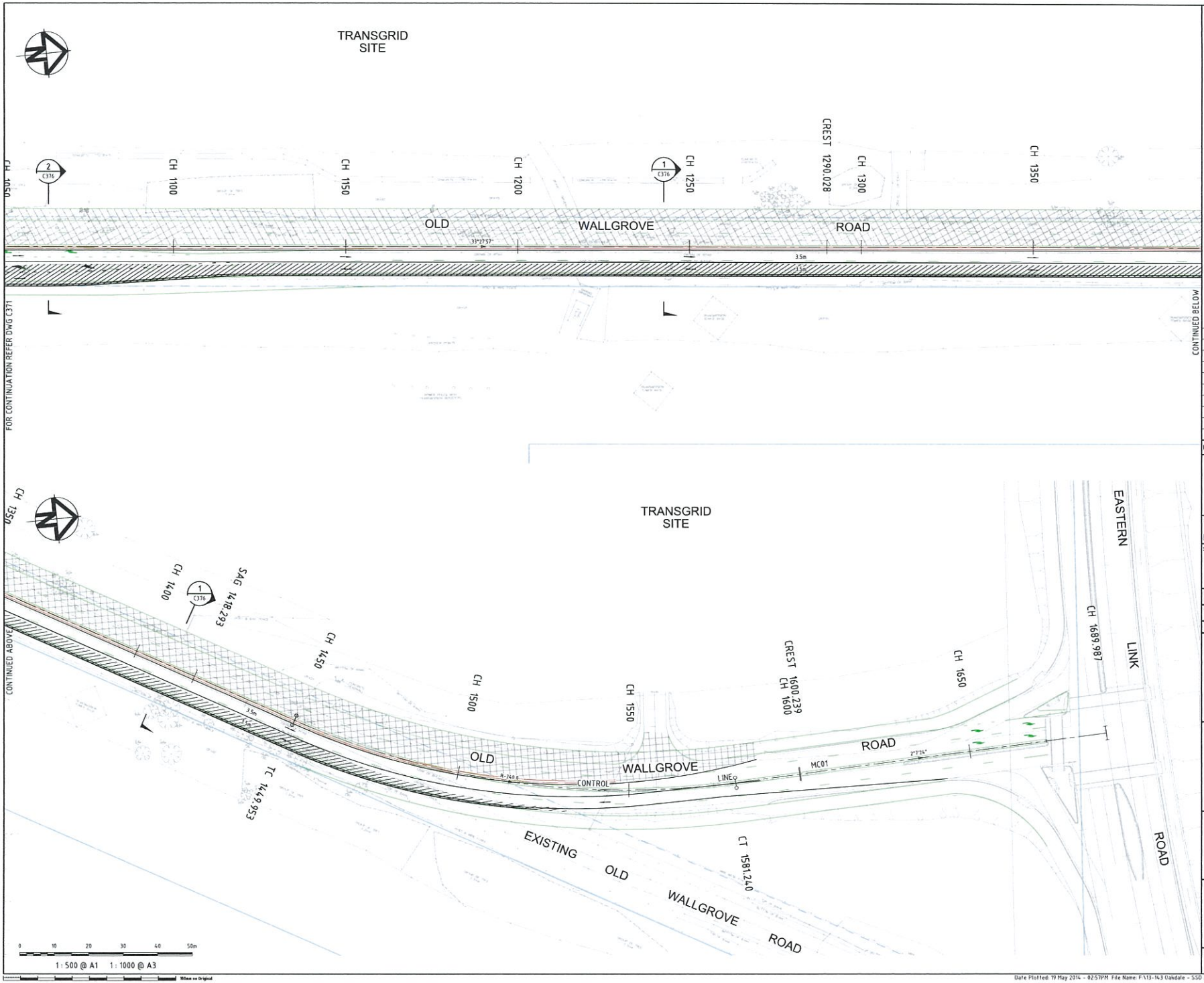
Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES
LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN
STAGE 1
SHEET 2 OF 3

Drawing No.	Project No.	Issue
C371	13-143	A



LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION — A1

Scales: 1 : 500 @ A1

Drawn: TS
Designed: MM
Checked: MM
Approved:

Height Datum: AHD
Grid: MGA
File: C372.dwg

Client: Goodman

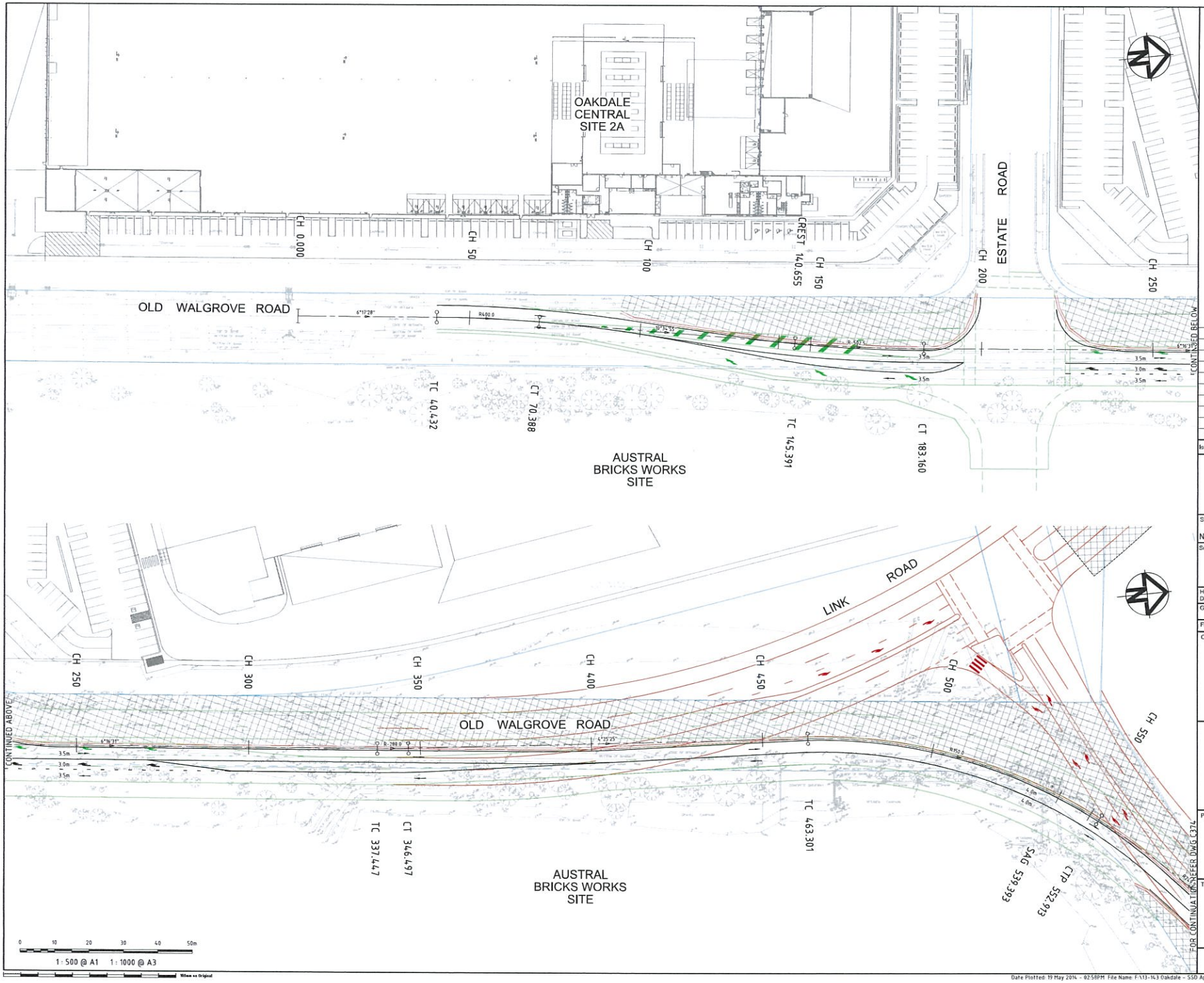
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES
LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN
STAGE 1
SHEET 3 OF 3

Drawing No.	Project No.	Issue
C372	13-143	A

Date Plotted: 19 May 2014 - 02:57PM File Name: P:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C372.dwg V1



LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION — A1

Scales: 1 : 500 @ A1

Drawn: TS
Designed: MM
Checked: MM
Approved:

Height Datum: AHD
Grid: MGA
File: C373.dwg

Client: Goodman

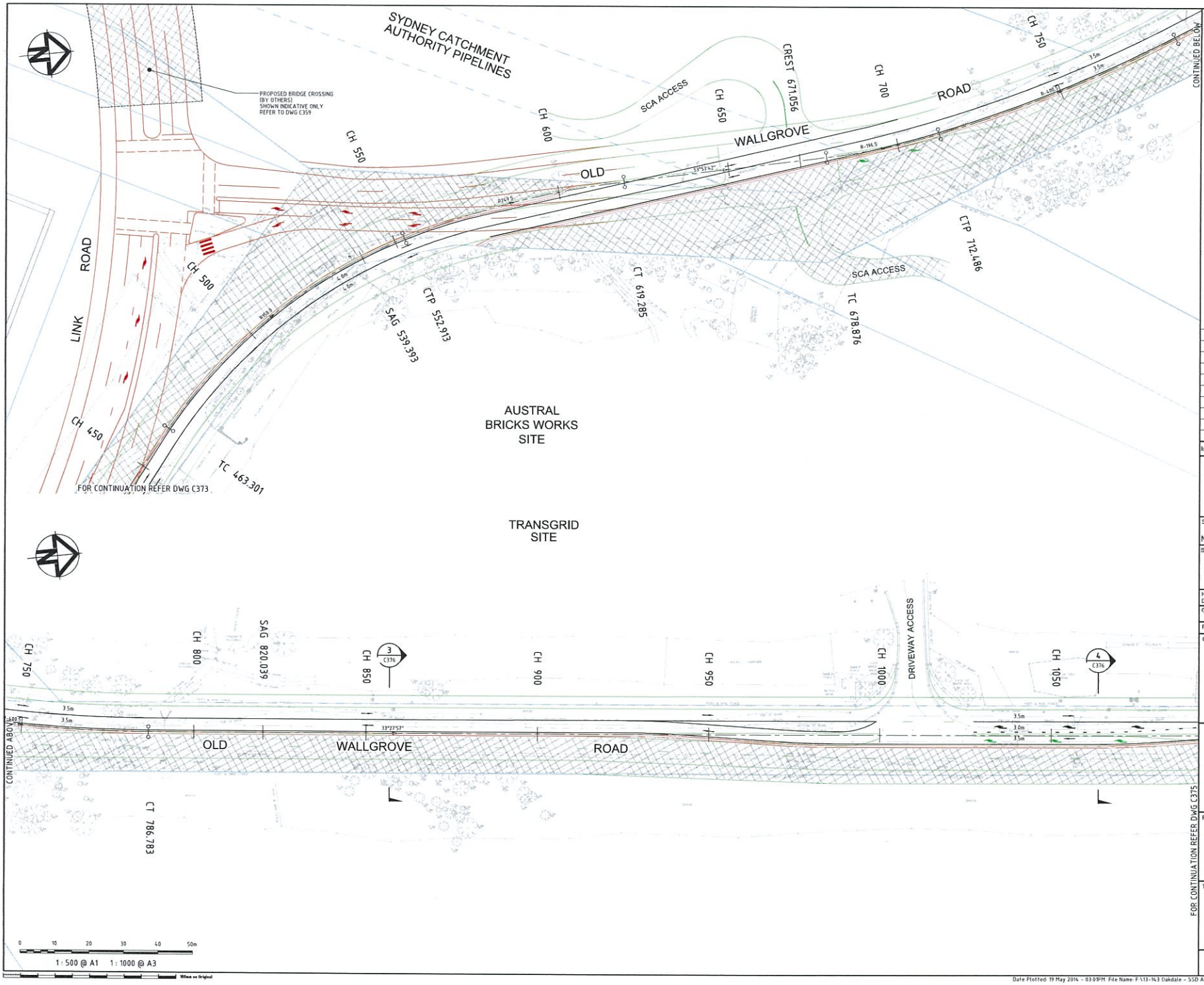
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
Info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN STAGE 2 SHEET 1 OF 3

Drawing No.	Project No.	Issue
C373	13-143	A

Date Plotted: 19 May 2014 - 02:58PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C373.dwg V1



LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION — A1

Scales	1 : 500 @ A1	Drawn	TS
		Designed	MM
Height Datum	AHD	Checked	MM
Grid	MGA	Approved	
File:	C374.dwg		

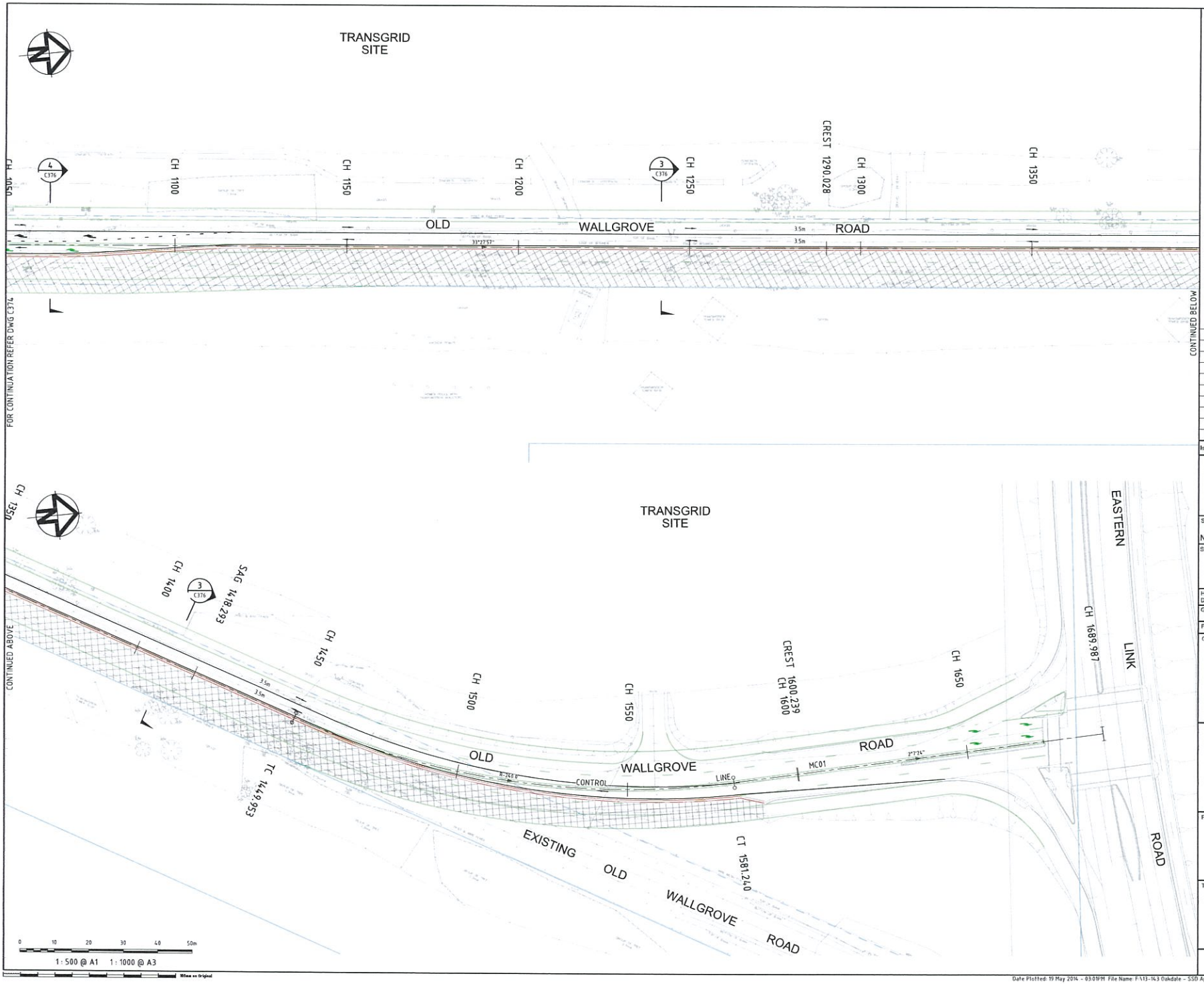
Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN STAGE 2 SHEET 2 OF 3

Drawing No.	Project No.	Issue
C374	13-143	A



LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION — A1

Scales: 1 : 500 @ A1
Height Datum: AHD
Grid: MGA
Drawn: TS
Designed: MM
Checked: MM
Approved:
File: C375.dwg

Client: Goodman

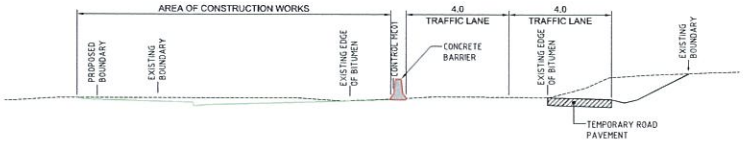
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN STAGE 2 SHEET 3 OF 3

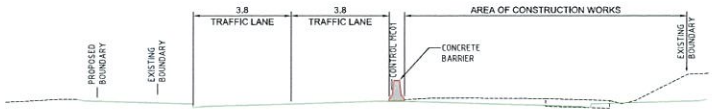
Drawing No.	Project No.	Issue
C375	13-143	A

Date Plotted: 19 May 2014 - 03:01PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C375.dwg V1



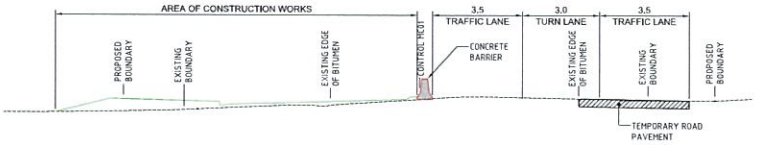
TYPICAL SECTION - STAGE 1

SECTION 1
1 : 100



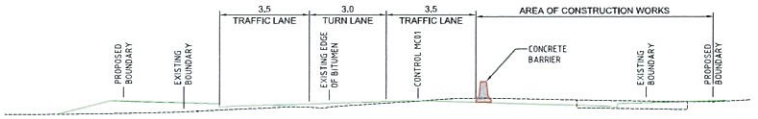
TYPICAL SECTION - STAGE 2

SECTION 3
1 : 100



TYPICAL SECTION - STAGE 1
TRANSGRID ENTRANCE APPROACH

SECTION 2
1 : 100



TYPICAL SECTION - STAGE 2
TRANSGRID ENTRANCE APPROACH

SECTION 4
1 : 100

0 2 4 6 8 10m

1 : 100 @ A1 1 : 200 @ A3

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 100 @ A1	Drawn TS	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	
File:	C376.dwg		

Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project
OAKDALE CENTRAL
INDUSTRIAL FACILITIES
LOTS 1C, 2B, 3A, 3B

Title
CONSTRUCTION TRAFFIC MANAGEMENT PLANS
TYPICAL SECTIONS

Drawing No.	Project No.	Issue
C376	13-143	A

When as Original

Appendix E – Letter from Traffix – Milner Ave TCS and Erskine Park Link Road Intersection

Ref 13.282l02

traffix
traffic & transport planners

suite 3.08
level 3 46a macleay street
potts point nsw 2011
po box 1061
potts point nsw 1335
t: +61 2 8324 8700
f: +61 2 9380 4481
w: www.traffix.com.au
director graham pindar
acn: 065132961
abn: 66065132961

6th June 2014
t

Goodman Property Services Pty Ltd
Level 17
60 Castlereagh Street
Sydney NSW 2000

Attention: Will Dwyer

Re: Oakdale Central SSD - Response to DoP

Dear Will,

We refer to the subject development and note that the Department of Planning has queries the status of the form of control at the intersection of the Estate Road with Old Wallgrove Road. As you are aware, this was not addressed in the original traffic assessment report as it was acknowledged at that time that the area was subject to ongoing strategic review and assessment.

Nevertheless, it is noted that Buildings 1, 2 and 3 alone are predicted to generate some 430 veh/hr and this traffic will traverse this intersection. This volume is well above the RMS 'warrant' volume of 200 veh/hr for the provision of traffic signals. The future connection of a fourth approach to serve the Austral site is a further complication, which will introduce additional turn movements and conflicts.

Hence, we expect that traffic signal control will be a mandatory requirement at this intersection in the reasonably near future and certainly prior to the occupancy of all these three buildings. In this context, the signal design prepared by AT&L (which is based on a previous layout prepared by GHD) is considered acceptable in principle. Subject to detailed assessment, it will provide satisfactory operation in the short and medium terms.

We trust that this responds to the issue raised by the DoP and request that you contact the undersigned should you have any questions or would like to discuss this matter further.

Yours faithfully

Graham Pindar
Director

Reference: 13.282l01v1

traffix
traffic & transport planners

suite 3.08
level 3 46a macleay street
potts point nsw 2011
po box 1061
potts point nsw 1335
t: +61 2 8324 8700
f: +61 2 9380 4481
w: www.traffix.com.au
director graham pindar
acn: 065132961
abn: 66065132961

1 August 2014

AT&L
Suite 702, 154 Pacific Highway
St Leonards NSW 2065

Attention: Mr Anthony McLandsborough

Re: Oakdale Central, Old Wallgrove Road

Dear Anthony,

As requested, as part of the planning for the upgrade of Old Wallgrove Road in conjunction with the delivery of the Oakdale Central precinct, we have investigated the following issues:

1. The need for a dedicated right turn pocket from Old Wallgrove Road into the existing Transgrid site;

2. The need for a second right turn lane from Old Wallgrove Road into Erskine Park Link Road; and

3. The need for the signalisation of the Old Wallgrove Road / Millner Avenue Intersection.

The results of these investigations are outlined following.

Right Turn Pocket into Transgrid Site

It is understood that Old Wallgrove Road is to be upgraded in accordance with the "Rationalised Ultimate" configuration as part of the delivery of the Oakdale Central. This configuration will comprise a 4-lane cross-section with 3.3m – 3.5m through lanes and a 600mm wide painted central median.

We have investigated the need for the provision of a dedicated right turn pocket from Old Wallgrove Road into the Transgrid site, which is located approximately 500m to the north of the Oakdale Central precinct, and is currently accessed from Old Wallgrove Road via a driveway crossover.

Traffic surveys were undertaken at the access to the Transgrid site to record existing volumes entering and exiting the site, as well as through traffic on Old Wallgrove Road. The results of these surveys are included as **Attachment A**, and demonstrate reasonable volumes of traffic entering and exiting the site, as summarised following:

- AM Peak: 87 arrivals and 11 departures; and
- PM Peak: 11 arrivals and 102 departures.

An assessment of the need for a right turn pocket into the Transgrid site has been undertaken, using the turn warrants outlined in Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections.

The results of this assessment are outlined in the table and graph below, and demonstrate that the current turning volumes into the Transgrid site combined with the through volumes on Old Wallgrove Road suggest that a short channelised right turn treatment (CHR(S)) into Transgrid is currently warranted.

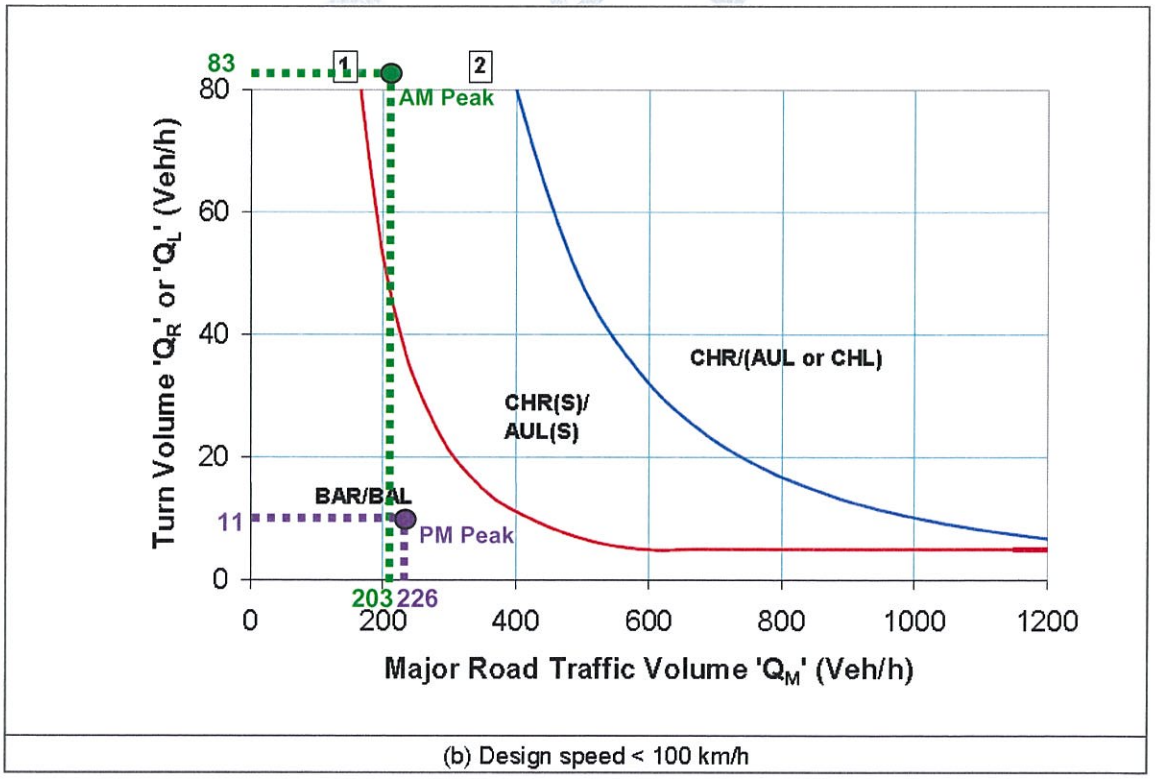
Furthermore, the development of substantial land parcels to the south of the site (including the Austral Bricks site and the CSR Bricks site) will only serve to increase the through traffic volumes on Old Wallgrove Road.

In light of the above, it is recommended that a dedicated right turn pocket from Old Wallgrove Road into the Transgrid site be constructed as part of the upgrade of Old Wallgrove Road.

Table 1: Recorded Traffic Volumes for Turn Warrants Assessment, Transgrid Access

	Major Road Traffic Volume (Q_M)	Turn Volume (Q_R)
AM Peak Hour	217/2* + 90 + 4 = 203	83
PM Peak Hour	83/2* + 184 + 0 = 226	11

* assumes a 4-lane major road cross-section, i.e. based upon the "Rationalised Ultimate" configuration of Old Wallgrove Rd



(b) Design speed < 100 km/h

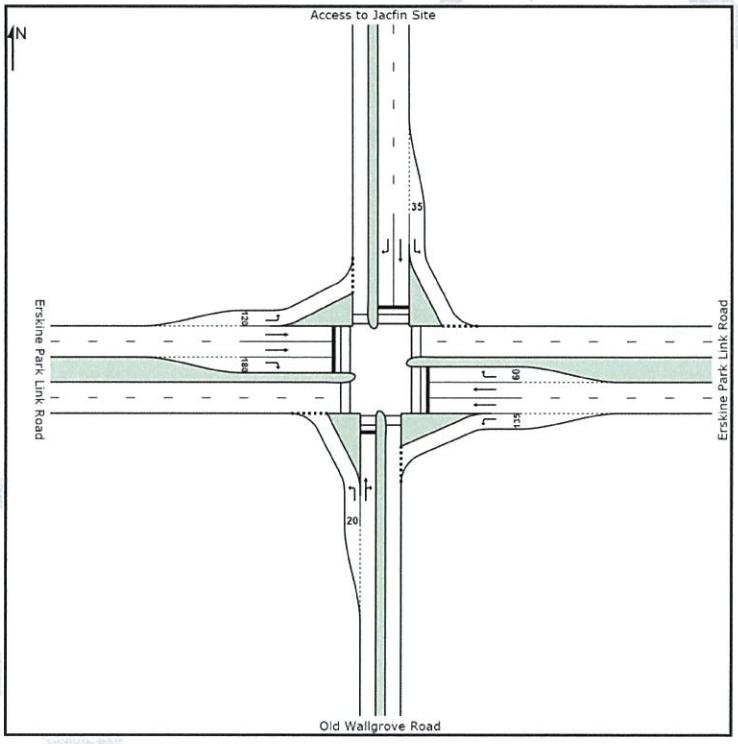
Second Right Turn Lane from Old Wallgrove Road into Erskine Park Link Road

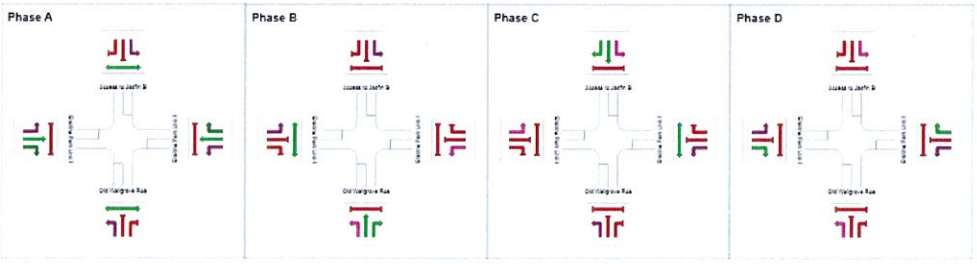
The Erskine Park Link Road / Old Wallgrove Road intersection was constructed in mid-2013 as a signalised T-intersection, as part of the delivery of the Erskine Park Link Road.

Various intersection configurations were investigated by GHD as discussed in the report "Old Wallgrove Road Extension – Traffic and Transport Analysis, Summary of Modelling Findings, 18 July 2013." The results indicate that this intersection was expected to operate acceptably as a T-intersection with a single right turn from Old Wallgrove Road into Erskine Park Link Road at 2031, at a Level of Service C (although the modelled queue for this movement was about 230m).

It is understood however that this intersection is to be upgraded to a 4-way signalised intersection, with a fourth (northern leg) to be constructed to provide access to the Jacfin land parcel to the north.

Accordingly, this intersection has been analysed as a 4-way signalised intersection, with the modelled geometry and phasing arrangement as shown below.





The modeled intersection volumes reflect those in the GHD report "Old Wallgrove Road Extension – Traffic and Transport Analysis, Summary of Modelling Findings, 18 July 2013" for the 2021 PM peak design horizon, with a nominal 50vph assumed for each movement into and out of the fourth (northern) intersection leg.

The results of these analyses indicate even with low volumes of traffic accessing the Jacfin land parcel to the north of the intersection, the intersection is expected to fail prior to 2021, with the fourth intersection leg. The table below provides the model results, which indicate a Level of Service F for the intersection, and queues on Old Wallgrove Road of approximately 500m.

Table 2: Modelled Intersection Performance, 2021 PM Peak
Single Right Turn Lane from Old Wallgrove Road

Signals - Fixed Time Cycle Time = 150 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Old Wallgrove Road											
1	L2	50	14.0	0.092	17.5	LOS B	1.5	11.5	0.44	0.65	45.9
2	T1	50	0.0	0.966	86.8	LOS F	63.7	495.0	0.97	1.08	24.0
3	R2	612	14.0	0.966	92.6	LOS F	63.7	495.0	0.97	1.08	23.7
Approach		712	13.0	0.966	86.9	LOS F	63.7	495.0	0.93	1.05	24.5
East: Erskine Park Link Road											
4	L2	442	14.0	0.358	7.7	LOS A	5.8	45.4	0.25	0.62	52.2
5	T1	653	14.0	0.903	78.5	LOS F	27.8	217.9	1.00	1.08	26.2
6	R2	50	0.0	0.393	55.6	LOS D	2.9	20.2	1.00	0.74	31.0
Approach		1145	13.4	0.903	50.2	LOS D	27.8	217.9	0.71	0.89	32.8
North: Access to Jacfin Site											
7	L2	50	0.0	0.222	39.1	LOS C	2.5	17.8	0.72	0.72	36.3
8	T1	50	0.0	0.183	61.6	LOS E	3.2	22.7	0.92	0.70	29.9
9	R2	50	0.0	0.192	67.4	LOS E	3.3	22.8	0.92	0.74	28.3
Approach		150	0.0	0.222	56.0	LOS D	3.3	22.8	0.85	0.72	31.2
West: Erskine Park Link Road											
10	L2	50	0.0	0.048	13.1	LOS A	1.1	7.8	0.37	0.64	48.8
11	T1	706	14.0	0.956	98.2	LOS F	33.6	263.4	1.00	1.23	23.0
12	R2	50	14.0	0.414	56.0	LOS D	2.9	22.9	1.00	0.74	30.6
Approach		806	13.1	0.956	90.3	LOS F	33.6	263.4	0.96	1.16	24.2
All Vehicles		2813	12.5	0.966	71.3	LOS F	63.7	495.0	0.84	1.00	27.5

Given the results of the analyses above, the intersection was modelled with a second right turn lane from Old Wallgrove Road into Erskine Park Link Road. The results (shown in the table below) indicate substantially better performance, with a Level of Service C and 95th percentile queues on for critical movements in the order of 150m.

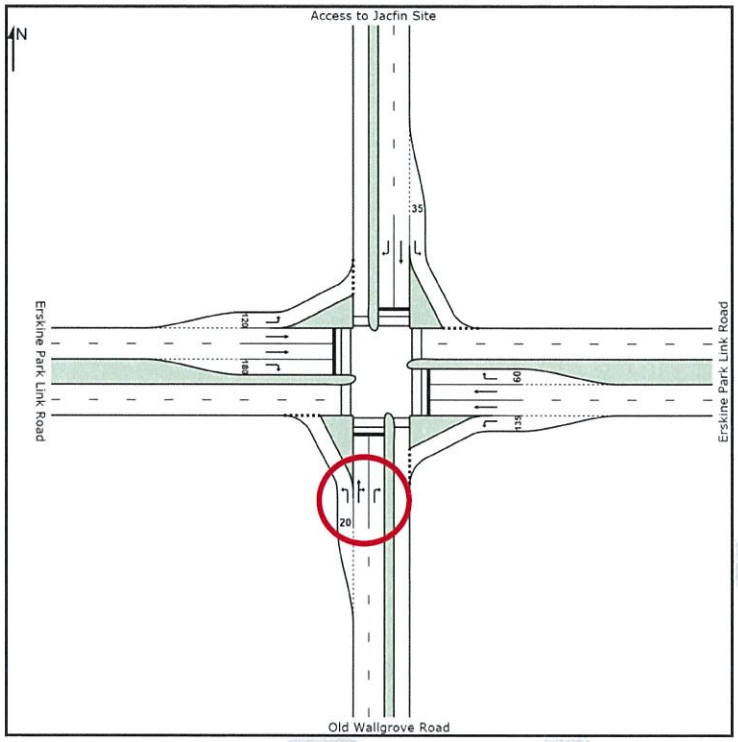


Table 3: Modelled Intersection Performance, 2021 PM Peak
Dual Right Turn from Old Wallgrove Road

Signals - Fixed Time Cycle Time = 100 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Old Wallgrove Road											
1	L2	50	14.0	0.113	17.0	LOS B	1.2	9.1	0.54	0.67	46.1
2	T1	50	0.0	0.854	47.2	LOS D	15.8	121.6	0.97	0.98	32.5
3	R2	612	14.0	0.854	53.2	LOS D	19.4	152.5	0.99	0.97	31.7
Approach		712	13.0	0.854	50.3	LOS D	19.4	152.5	0.95	0.95	32.5
East: Erskine Park Link Road											
4	L2	442	14.0	0.376	8.1	LOS A	5.1	39.9	0.33	0.65	51.9
5	T1	653	14.0	0.767	41.4	LOS C	16.0	125.2	0.99	0.91	35.7
6	R2	50	0.0	0.268	33.5	LOS C	1.7	12.1	0.94	0.73	38.2
Approach		1145	13.4	0.767	28.2	LOS B	16.0	125.2	0.73	0.80	40.8
North: Access to Jacfin Site											
7	L2	50	0.0	0.106	21.7	LOS B	1.4	9.9	0.62	0.68	43.8
8	T1	50	0.0	0.122	34.7	LOS C	2.0	13.9	0.85	0.64	38.3
9	R2	50	0.0	0.128	40.4	LOS C	2.0	14.0	0.85	0.73	35.7
Approach		150	0.0	0.128	32.2	LOS C	2.0	14.0	0.77	0.68	39.0
West: Erskine Park Link Road											
10	L2	50	0.0	0.058	16.1	LOS B	1.1	7.6	0.53	0.67	46.9
11	T1	706	14.0	0.823	44.9	LOS D	18.2	142.4	1.00	0.98	34.5
12	R2	50	14.0	0.275	33.6	LOS C	1.7	13.7	0.93	0.73	37.9
Approach		806	13.1	0.823	42.4	LOS C	18.2	142.4	0.97	0.94	35.3
All Vehicles		2813	12.5	0.854	38.1	LOS C	19.4	152.5	0.86	0.88	36.7

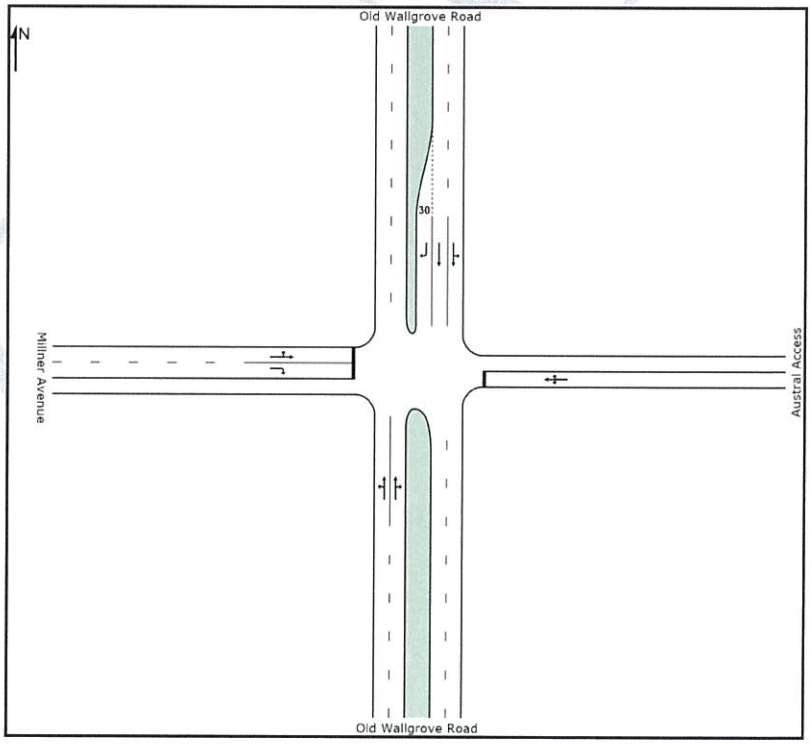
Whilst a number of assumptions were made necessarily in these analyses (regarding broader road network modifications and the level of development in the area), and alternative signal phasing arrangements which may influence the performance of the intersection are feasible, it would appear that the introduction of a fourth (northern) intersection approach at the Old Wallgrove Road / Erskine Park Link Road intersection would be likely to trigger the need for a second right turn lane from Old Wallgrove Road in the short to medium term, even with relatively low traffic volumes turning into and out of this northern leg.

Need for the signalisation of the Old Wallgrove Road / Millner Avenue Intersection

The Old Wallgrove Road / Millner Avenue Intersection currently operates as a priority-controlled T-intersection, however as part of the upgrade of Old Wallgrove Road, a fourth (eastern) intersection approach is to be constructed, which will provide access to the Austral site. The two existing access driveways to the Austral site are to be closed, with all access to this site to be via the 4-way intersection.

Traffic surveys of the Old Wallgrove Road / Millner Avenue Intersection and the two access driveways to the Austral site have been undertaken, with the results provided in **Attachment B**.

Intersection analyses have been undertaken of the Old Wallgrove Road / Millner Avenue Intersection as a 4-way intersection (assumed geometry shown below), with all traffic which currently accesses the Austral site via the driveways, instead doing so via this intersection.



The results of these analyses indicate that during the critical PM peak period, the intersection is expected to operate acceptably with existing traffic volumes on Old Wallgrove Road and turning into and out of the Austral site, with the critical movement operating at Level of Service B.

However an increase in traffic volumes on Old Wallgrove Road and into and out of the Austral site would trigger the need for the signalisation of this intersection. Sensitivity analyses have been undertaken, with a summary of the results provided following:

Table 4: Summary of Results of Sensitivity Analyses, Old Wallgrove Road / Millner Avenue Intersection

Scenario	Old Wallgrove Road – Assumed Traffic Volume Increase	Austral Access - Assumed Traffic Volume Increase	Level of Service (Critical Movement)
Existing Volumes	NA	NA	Level of Service B
Sensitivity Test 1	+100vph (northbound) +100vph (southbound)	+100vph (entering from north) +100vph (exiting to north)	Level of Service C
Sensitivity Test 2	+120vph (northbound) +120vph (southbound)	+120vph (entering from north) +120vph (exiting to north)	Level of Service D
Sensitivity Test 3	+150vph (northbound) +150vph (southbound)	+150vph (entering from north) +150vph (exiting to north)	Level of Service F

These results indicate that with just partial development of the approximately 75 ha land parcels to the south (the CSR site) and the east of the intersection (the Austral site), the intersection of Old Wallgrove Road / Millner Avenue will require signalisation.

Based upon the traffic generation rate of 10.5 trips per hectare assumed by GHD as part of previous studies, these traffic volumes equate to approximately the following level of development:

- 100vph in and out: 19 ha of development
- 120vph in and out: 23 ha of development
- 150vph in and out: 29 ha of development

In light of the results of the sensitivity analyses undertaken, it is recommended that the intersection of Old Wallgrove Road / Millner Avenue be signalised as part of the upgrade of Old Wallgrove Road.

Summary of Findings and Recommendations

In summary, based upon the results of our investigations and the assumptions outlined above, it is recommended that:

- a dedicated right turn pocket from Old Wallgrove Road into the Transgrid site be constructed as part of the upgrade of Old Wallgrove Road;
- a second right turn lane from Old Wallgrove Road to Erskine Park Link Road be provided when the fourth (northern) approach is constructed; and

- the intersection of Old Wallgrove Road / Millner Avenue be signalised as part of the upgrade of Old Wallgrove Road.

Please contact the undersigned should you have any queries or require any further information regarding the above.

Yours faithfully,

traffix

Anne Coutts
Senior Engineer

Appendix F – Land Acquisition Plan

Reference: 13.282l01v2

traffix
traffic & transport planners

suite 3.08
level 3 46a macleay street
potts point nsw 2011
po box 1061
potts point nsw 1335
t: +61 2 8324 8700
f: +61 2 9380 4481
w: www.traffix.com.au
director graham pindar
acn: 065132961
abn: 66065132961

1 August 2014

AT&L
Suite 702, 154 Pacific Highway
St Leonards NSW 2065

Attention: Mr Anthony McLandsborough

Re: Oakdale Central, Old Wallgrove Road

Dear Anthony,

As requested, as part of the planning for the upgrade of Old Wallgrove Road in conjunction with the delivery of the Oakdale Central precinct, we have investigated the following issues:

1. The need for a dedicated right turn pocket from Old Wallgrove Road into the existing Transgrid site;

2. The need for a second right turn lane from Old Wallgrove Road into Erskine Park Link Road; and

3. The need for the signalisation of the Old Wallgrove Road / Millner Avenue Intersection.

The results of these investigations are outlined following.

Right Turn Pocket into Transgrid Site

It is understood that Old Wallgrove Road is to be upgraded in accordance with the "Rationalised Ultimate" configuration as part of the delivery of the Oakdale Central. This configuration will comprise a 4-lane cross-section with 3.3m – 3.5m through lanes and a 600mm wide painted central median.

We have investigated the need for the provision of a dedicated right turn pocket from Old Wallgrove Road into the Transgrid site, which is located approximately 500m to the north of the Oakdale Central precinct, and is currently accessed from Old Wallgrove Road via a driveway crossover.

Traffic surveys were undertaken at the access to the Transgrid site to record existing volumes entering and exiting the site, as well as through traffic on Old Wallgrove Road. The results of these surveys are included as **Attachment A**, and demonstrate reasonable volumes of traffic entering and exiting the site, as summarised following:

- AM Peak: 87 arrivals and 11 departures; and
- PM Peak: 11 arrivals and 102 departures.

An assessment of the need for a right turn pocket into the Transgrid site has been undertaken, using the turn warrants outlined in Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections.

The results of this assessment are outlined in the table and graph below, and demonstrate that the current turning volumes into the Transgrid site combined with the through volumes on Old Wallgrove Road suggest that a short channelised right turn treatment (CHR(S)) into Transgrid is currently warranted.

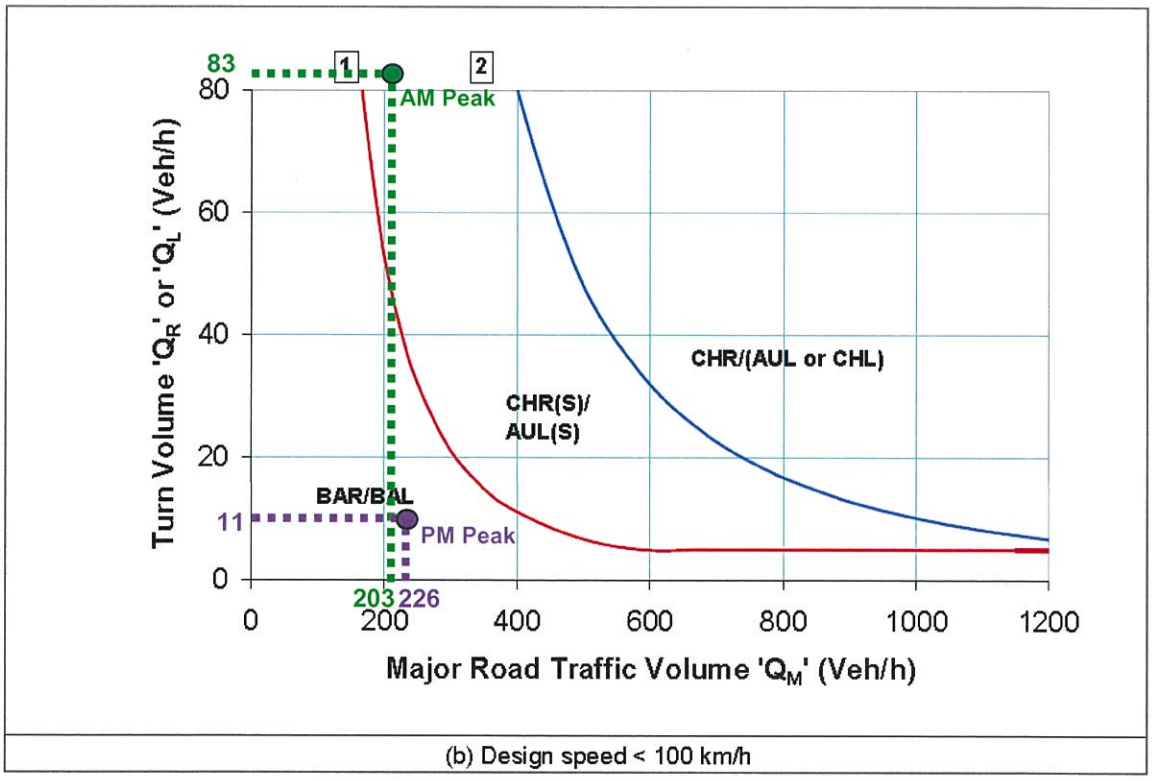
Furthermore, the development of substantial land parcels to the south of the site (including the Austral Bricks site and the CSR Bricks site) will only serve to increase the through traffic volumes on Old Wallgrove Road.

In light of the above, it is recommended that a dedicated right turn pocket from Old Wallgrove Road into the Transgrid site be constructed as part of the upgrade of Old Wallgrove Road.

Table 1: Recorded Traffic Volumes for Turn Warrants Assessment, Transgrid Access

	Major Road Traffic Volume (Q_M)	Turn Volume (Q_R)
AM Peak Hour	217/2* + 90 + 4 = 203	83
PM Peak Hour	83/2* + 184 + 0 = 226	11

* assumes a 4-lane major road cross-section, i.e. based upon the "Rationalised Ultimate" configuration of Old Wallgrove Rd



(b) Design speed < 100 km/h

Second Right Turn Lane from Old Wallgrove Road into Erskine Park Link Road

The Erskine Park Link Road / Old Wallgrove Road intersection was constructed in mid-2013 as a signalised T-intersection, as part of the delivery of the Erskine Park Link Road.

Various intersection configurations were investigated by GHD as discussed in the report "Old Wallgrove Road Extension – Traffic and Transport Analysis, Summary of Modelling Findings, 18 July 2013." The results indicate that this intersection was expected to operate acceptably as a T-intersection with a single right turn from Old Wallgrove Road into Erskine Park Link Road at 2031, at a Level of Service C (although the modelled queue for this movement was about 230m).

It is understood however that this intersection is to be upgraded to a 4-way signalised intersection, with a fourth (northern leg) to be constructed to provide access to the Jacfin land parcel to the north.

Accordingly, this intersection has been analysed as a 4-way signalised intersection, with the modelled geometry and phasing arrangement as shown below.

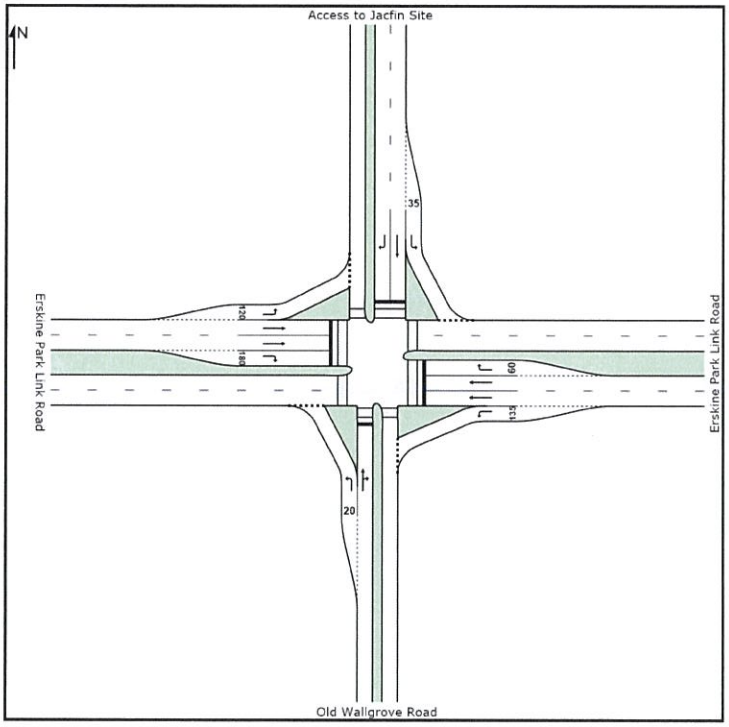
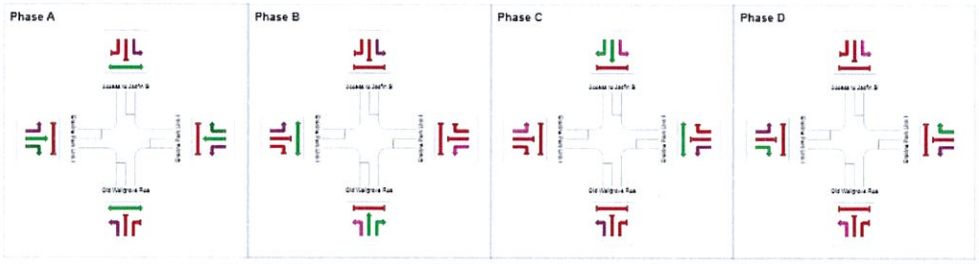


Figure 1: Erskine Park Link Road / Old Wallgrove Road Intersection (Modelled Geometry, 4-way intersection)



The modeled intersection volumes reflect those in the GHD report "Old Wallgrove Road Extension – Traffic and Transport Analysis, Summary of Modelling Findings, 18 July 2013" for the 2021 PM peak design horizon, with a nominal 50vph assumed for each movement into and out of the fourth (northern) intersection leg.

The results of these analyses indicate even with low volumes of traffic accessing the Jacfin land parcel to the north of the intersection, the intersection is expected to fail prior to 2021, with the fourth intersection leg. The table below provides the model results, which indicate a Level of Service F for the intersection, and queues on Old Wallgrove Road of approximately 500m.

Table 2: Modelled Intersection Performance, 2021 PM Peak
Single Right Turn Lane from Old Wallgrove Road

Signals - Fixed Time Cycle Time = 150 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Old Wallgrove Road											
1	L2	50	14.0	0.092	17.5	LOS B	1.5	11.5	0.44	0.65	45.9
2	T1	50	0.0	0.966	86.8	LOS F	63.7	495.0	0.97	1.08	24.0
3	R2	612	14.0	0.966	92.6	LOS F	63.7	495.0	0.97	1.08	23.7
Approach		712	13.0	0.966	86.9	LOS F	63.7	495.0	0.93	1.05	24.5
East: Erskine Park Link Road											
4	L2	442	14.0	0.358	7.7	LOS A	5.8	45.4	0.25	0.62	52.2
5	T1	653	14.0	0.903	78.5	LOS F	27.8	217.9	1.00	1.08	26.2
6	R2	50	0.0	0.393	55.6	LOS D	2.9	20.2	1.00	0.74	31.0
Approach		1145	13.4	0.903	50.2	LOS D	27.8	217.9	0.71	0.89	32.8
North: Access to Jacfin Site											
7	L2	50	0.0	0.222	39.1	LOS C	2.5	17.8	0.72	0.72	36.3
8	T1	50	0.0	0.183	61.6	LOS E	3.2	22.7	0.92	0.70	29.9
9	R2	50	0.0	0.192	67.4	LOS E	3.3	22.8	0.92	0.74	28.3
Approach		150	0.0	0.222	56.0	LOS D	3.3	22.8	0.85	0.72	31.2
West: Erskine Park Link Road											
10	L2	50	0.0	0.048	13.1	LOS A	1.1	7.8	0.37	0.64	48.8
11	T1	706	14.0	0.956	98.2	LOS F	33.6	263.4	1.00	1.23	23.0
12	R2	50	14.0	0.414	56.0	LOS D	2.9	22.9	1.00	0.74	30.6
Approach		806	13.1	0.956	90.3	LOS F	33.6	263.4	0.96	1.16	24.2
All Vehicles		2813	12.5	0.966	71.3	LOS F	63.7	495.0	0.84	1.00	27.5

Given the results of the analyses above, the intersection was modelled with a second right turn lane from Old Wallgrove Road into Erskine Park Link Road. The results (shown in the table below) indicate substantially better performance, with a Level of Service C and 95th percentile queues on for critical movements in the order of 150m.

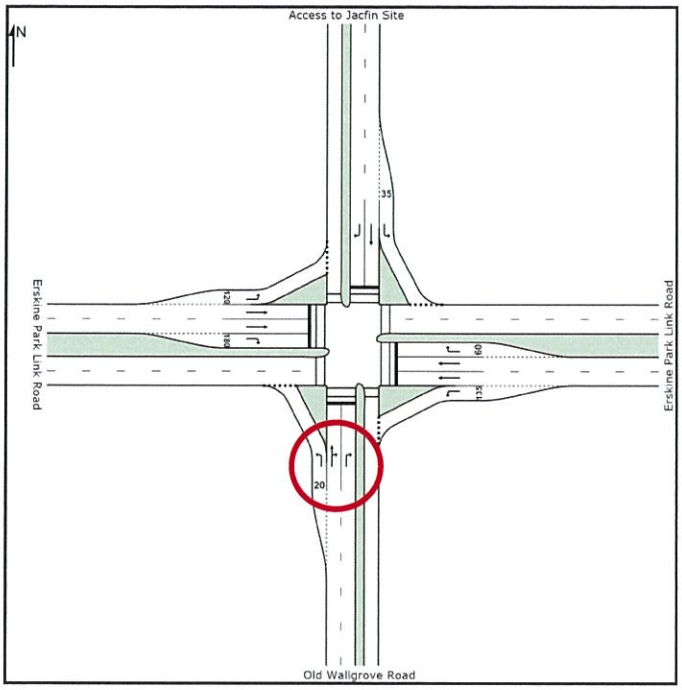


Figure 2: Erskine Park Link Road / Old Wallgrove Road Intersection
(Modelled Geometry, 4-way intersection - Dual Right Turn from Old Wallgrove Road)

Table 3: Modelled Intersection Performance, 2021 PM Peak
Dual Right Turn from Old Wallgrove Road

Signals - Fixed Time Cycle Time = 100 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Old Wallgrove Road											
1	L2	50	14.0	0.113	17.0	LOS B	1.2	9.1	0.54	0.67	46.1
2	T1	50	0.0	0.854	47.2	LOS D	15.8	121.6	0.97	0.98	32.5
3	R2	612	14.0	0.854	53.2	LOS D	19.4	152.5	0.99	0.97	31.7
Approach		712	13.0	0.854	50.3	LOS D	19.4	152.5	0.95	0.95	32.5
East: Erskine Park Link Road											
4	L2	442	14.0	0.376	8.1	LOS A	5.1	39.9	0.33	0.65	51.9
5	T1	653	14.0	0.767	41.4	LOS C	16.0	125.2	0.99	0.91	35.7
6	R2	50	0.0	0.268	33.5	LOS C	1.7	12.1	0.94	0.73	38.2
Approach		1145	13.4	0.767	28.2	LOS B	16.0	125.2	0.73	0.80	40.8
North: Access to Jacfin Site											
7	L2	50	0.0	0.106	21.7	LOS B	1.4	9.9	0.62	0.68	43.8
8	T1	50	0.0	0.122	34.7	LOS C	2.0	13.9	0.85	0.64	38.3
9	R2	50	0.0	0.128	40.4	LOS C	2.0	14.0	0.85	0.73	35.7
Approach		150	0.0	0.128	32.2	LOS C	2.0	14.0	0.77	0.68	39.0
West: Erskine Park Link Road											
10	L2	50	0.0	0.058	16.1	LOS B	1.1	7.6	0.53	0.67	46.9
11	T1	706	14.0	0.823	44.9	LOS D	18.2	142.4	1.00	0.98	34.5
12	R2	50	14.0	0.275	33.6	LOS C	1.7	13.7	0.93	0.73	37.9
Approach		806	13.1	0.823	42.4	LOS C	18.2	142.4	0.97	0.94	35.3
All Vehicles		2813	12.5	0.854	38.1	LOS C	19.4	152.5	0.86	0.88	36.7

Whilst a number of assumptions were made necessarily in these analyses (regarding broader road network modifications and the level of development in the area), and alternative signal phasing arrangements which may influence the performance of the intersection are feasible, it would appear that the introduction of a fourth (northern) intersection approach at the Old Wallgrove Road / Erskine Park Link Road intersection would be likely to trigger the need for a second right turn lane from Old Wallgrove Road in the short to medium term, even with relatively low traffic volumes turning into and out of this northern leg.

Need for the signalisation of the Old Wallgrove Road / Millner Avenue Intersection

The Old Wallgrove Road / Millner Avenue Intersection currently operates as a priority-controlled T-intersection, however as part of the upgrade of Old Wallgrove Road, a fourth (eastern) intersection approach is to be constructed, which will provide access to the Austral site. The two existing access driveways to the Austral site are to be closed, with all access to this site to be via the 4-way intersection.

Traffic surveys of the Old Wallgrove Road / Millner Avenue Intersection and the two access driveways to the Austral site have been undertaken, with the results provided in **Attachment B**.

Intersection analyses have been undertaken of the Old Wallgrove Road / Millner Avenue Intersection as a 4-way intersection (assumed geometry shown below), with all traffic which currently accesses the Austral site via the driveways, instead doing so via this intersection.

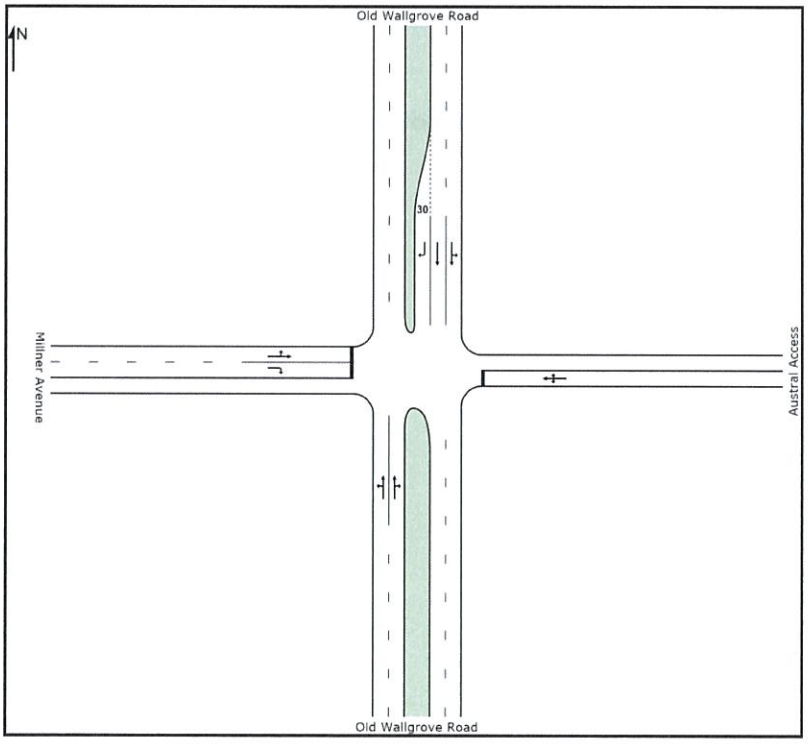


Figure 3: Old Wallgrove Road / Millner Avenue Intersection (Modelled Geometry, 4-way priority-controlled intersection)

The results of these analyses indicate that during the critical PM peak period, the intersection is expected to operate acceptably with existing traffic volumes on Old Wallgrove Road and turning into and out of the Austral site, with the critical movement operating at Level of Service B.

However an increase in traffic volumes on Old Wallgrove Road and into and out of the Austral site would trigger the need for the signalisation of this intersection. Sensitivity analyses have been undertaken, with a summary of the results provided following:

Table 4: Summary of Results of Sensitivity Analyses, Old Wallgrove Road / Millner Avenue Intersection

Scenario	Old Wallgrove Road – Assumed Traffic Volume Increase	Austral Access - Assumed Traffic Volume Increase	Level of Service (Critical Movement)
Existing Volumes	NA	NA	Level of Service B
Sensitivity Test 1	+100vph (northbound) +100vph (southbound)	+100vph (entering from north) +100vph (exiting to north)	Level of Service C
Sensitivity Test 2	+120vph (northbound) +120vph (southbound)	+120vph (entering from north) +120vph (exiting to north)	Level of Service D
Sensitivity Test 3	+150vph (northbound) +150vph (southbound)	+150vph (entering from north) +150vph (exiting to north)	Level of Service F

These results indicate that with just partial development of the approximately 75 ha land parcels to the south (the CSR site) and the east of the intersection (the Austral site), and relatively modest resulting increases in traffic movement volumes on certain movements, the intersection of Old Wallgrove Road / Millner Avenue will require signalisation.

Based upon the peak hour traffic generation rate of 10.5 trips per hectare assumed by GHD as part of previous studies, these traffic volumes equate to approximately the following level of development:

- 100vph in and 100vph out: 19 ha of development
- 120vph in and 120vph out: 23 ha of development
- 150vph in and 150vph out: 29 ha of development

In light of the results of the sensitivity analyses undertaken, and to minimise redundant works and disruption to operations during future signalisation, it is recommended that the intersection of Old Wallgrove Road / Millner Avenue be signalised as part of the upgrade of Old Wallgrove Road.

Summary of Findings and Recommendations

In summary, based upon the results of our investigations and the assumptions outlined above, it is recommended that:

- a dedicated right turn pocket from Old Wallgrove Road into the Transgrid site be constructed as part of the upgrade of Old Wallgrove Road;
- a second right turn lane from Old Wallgrove Road to Erskine Park Link Road be provided when the fourth (northern) approach is constructed; and
- the intersection of Old Wallgrove Road / Millner Avenue be signalised as part of the upgrade of Old Wallgrove Road.

Please contact the undersigned should you have any queries or require any further information regarding the above.

Yours faithfully,

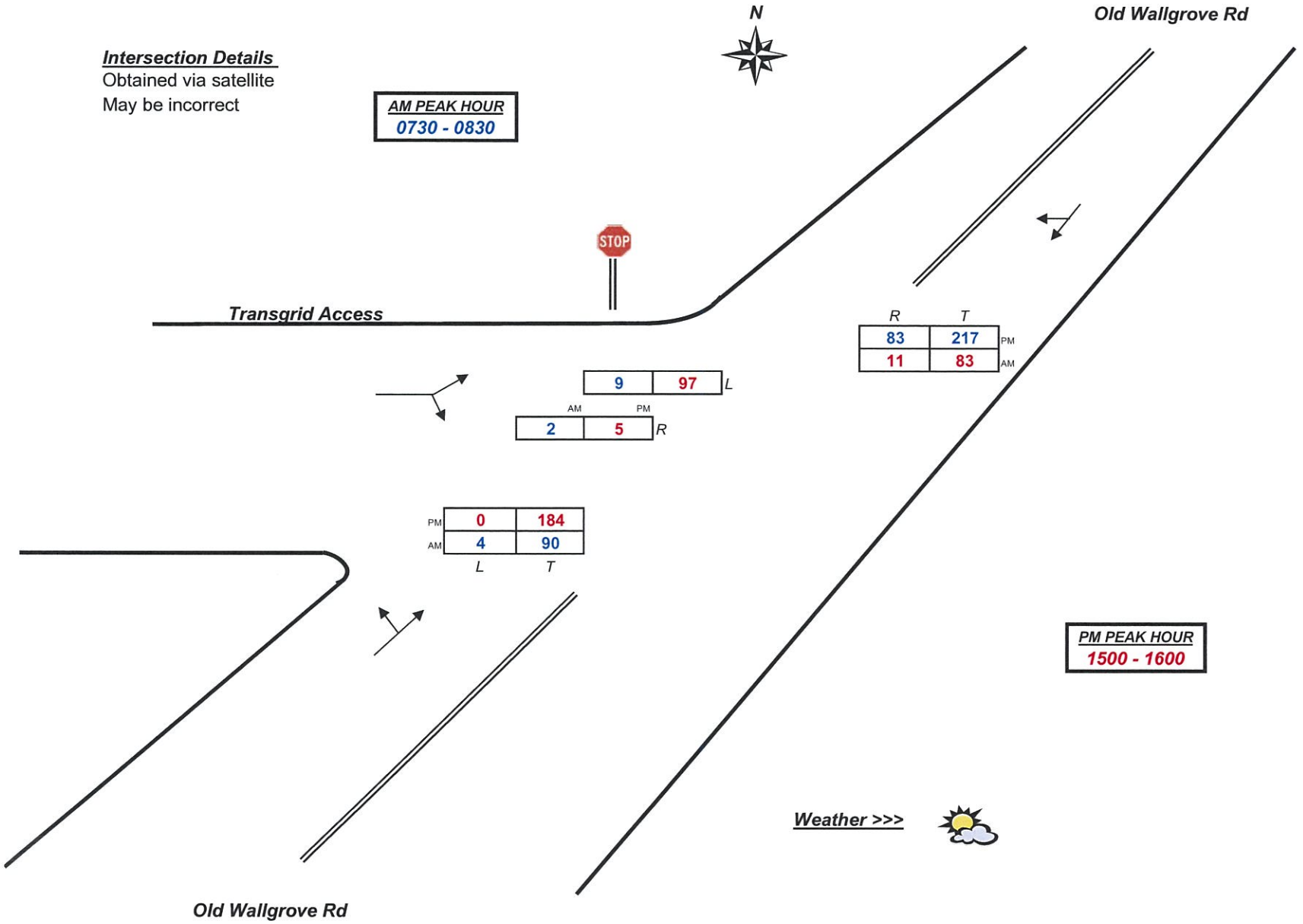
traffix

Anne Coutts
Senior Engineer

Attachment A

R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Traffix
Job No/Name : 5251 EASTERN CREEK Old Wallgrove Rd
Day/Date : Thursday 17th July 2014



Attachment B

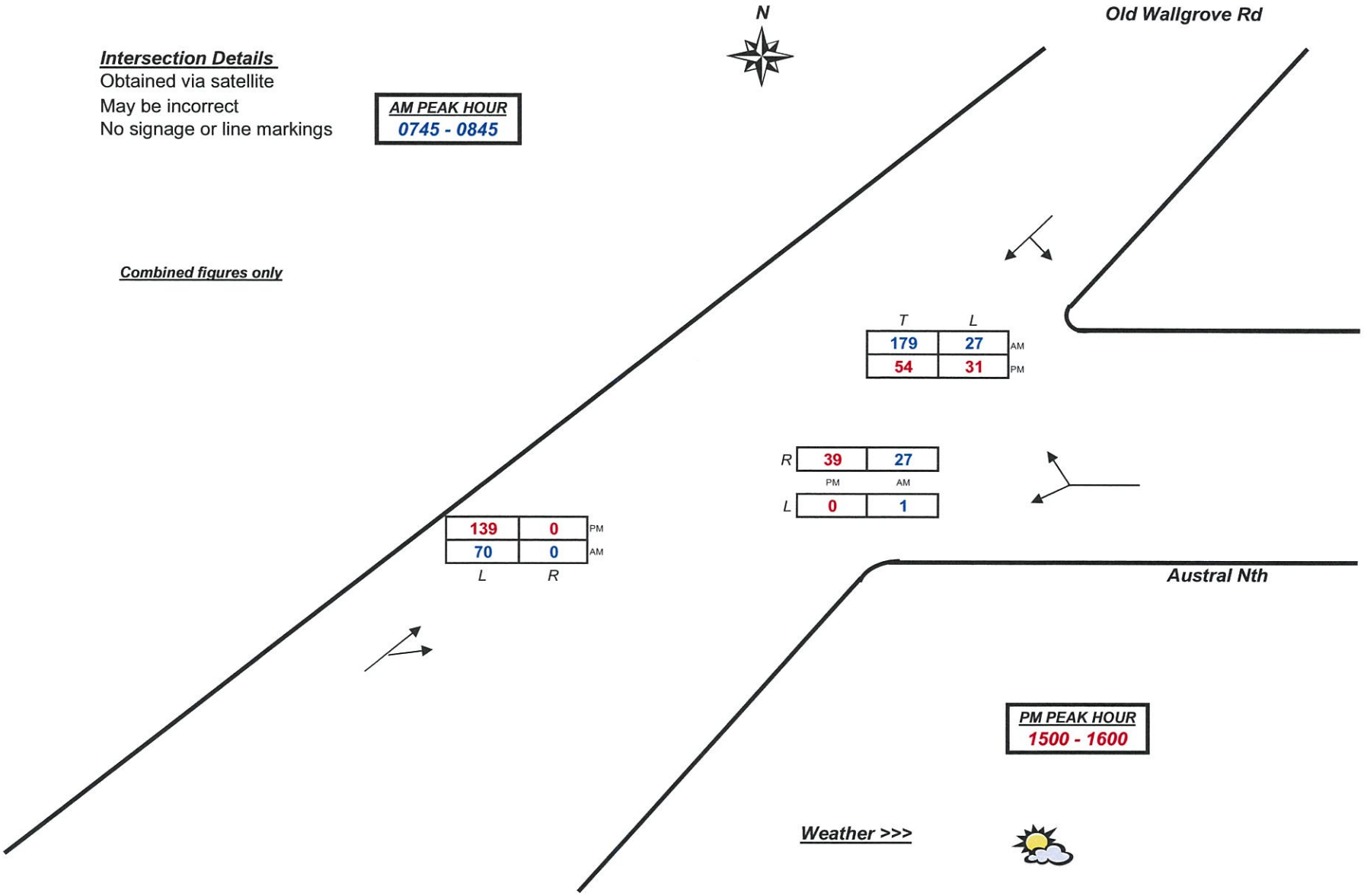
R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Traffix
Job No/Name : 5251 EASTERN CREEK Old Wallgrove Rd
Day/Date : Thursday 17th July 2014

Intersection Details
Obtained via satellite
May be incorrect
No signage or line markings

AM PEAK HOUR
0745 - 0845

Combined figures only



PM PEAK HOUR
1500 - 1600

Weather >>>

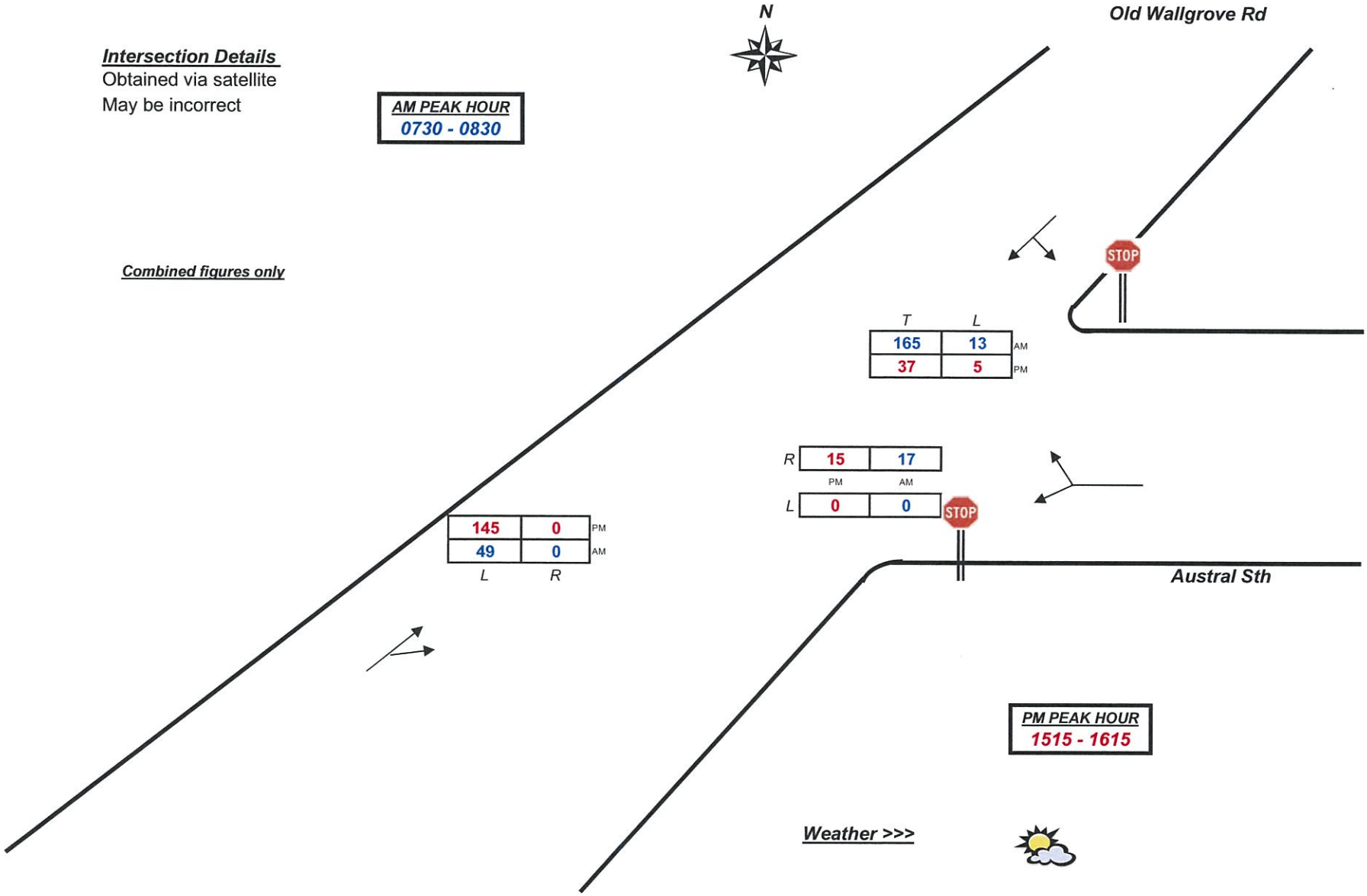
R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Traffix
Job No/Name : 5251 EASTERN CREEK Old Wallgrove Rd
Day/Date : Thursday 17th July 2014

Intersection Details
Obtained via satellite
May be incorrect

AM PEAK HOUR
0730 - 0830

Combined figures only

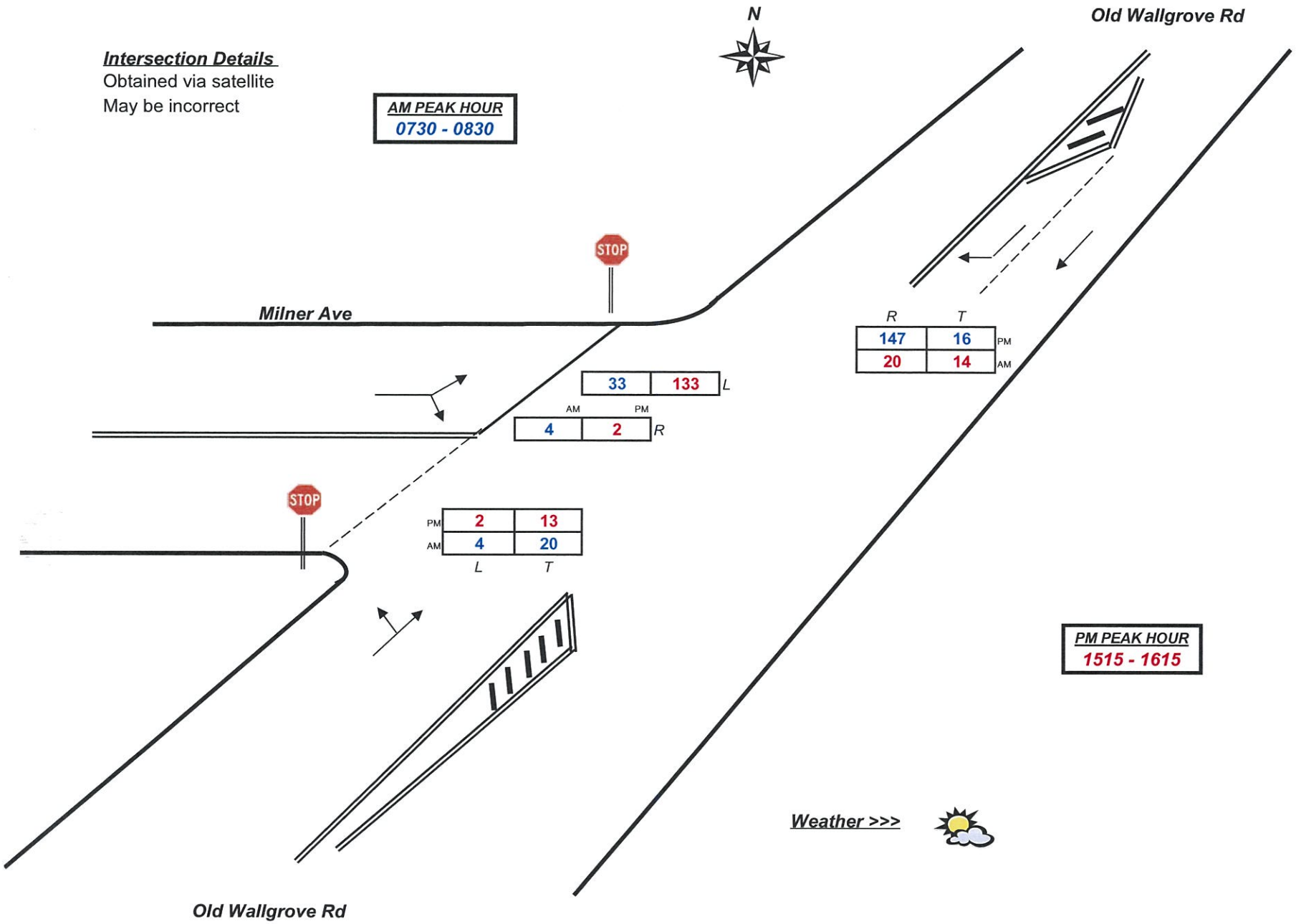


PM PEAK HOUR
1515 - 1615

Weather >>>

R.O.A.R. DATA
Reliable, Original & Authentic Results
Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Traffix
Job No/Name : 5251 EASTERN CREEK Old Wallgrove Rd
Day/Date : Thursday 17th July 2014



at&l

Suite 702
154 Pacific Highway
St Leonards NSW 2065
P 02 9439 1777
F 02 9460 8413
E info@atl.net.au
ABN 96 130 882 405
www.atl.net.au

5th August 2014

Roads and Maritime Services
Level 9
27-31 Argyle Street
Parramatta NSW 2150
Attention Colin Langford

Your Ref:
Our Ref: L001-RMS-05-08-14.docx

Direct phone: 0433 973 423

VIA EMAIL: Colin.LANGFORD@rms.nsw.gov.au

Dear Colin

RE: PROPOSED UPGRADE OF OLD WALLGROVE ROAD, BETWEEN MILLNER AVENUE AND ERKSINE PARK LINK ROAD

In response to your request, we have provided the following summary of the design review process that has been undertaken with the RMS over the past 4 weeks to determine the most appropriate and cost effective cross sectional design for the upgrade of the above mentioned roadway.

The Project;

The proposed upgrade to Old Wallgrove Road (OWR) forms part of the State Significant Development Application (SSDA) that was lodged with the Department of Planning (DoP) in late 2013 by Goodman Property (Aust) Pty Ltd. The SSDA seeks approval for the construction of three large warehouse facilities along with the upgrade of OWR.

The existing OWR carriageway is in poor condition and requires a significant upgrade to cater for existing traffic and the future growth within the area. The proposed four (4) lane upgrade is from the recently constructed Erskine Park Link Road to the north stretching 1.65km south to Millner Avenue. In general terms the following works are proposed:

- Property acquisitions and adjustment;
- Utility services relocations;
- Demolition of existing pavements and structures;
- Stormwater infrastructure works – cross drainage and pavement drainage;
- Pavements and kerb and gutter;
- Street lighting;
- Intersection works including new traffic signals; and
- Landscaping.

It is proposed for the upgrades works to be funded by State Infrastructure Contributions (SIC).

Purpose of Review;

The initial scope of works has received in principle approval from both Blacktown & Fairfield Council for the full 4 lane upgrade (**Original Green Ultimate**) as part of the SSDA consultation process and Goodman has been in negotiations with the Department of Planning to enter into a Voluntary Planning Agreement to deliver the proposed upgrade as 'Works in Kind' with the SIC contributions payable from the Oakdale Central and Oakdale South estates.

In June 2014, Transport NSW (TfNSW) provided in principle support for the application of SIC contributions to two lanes of the proposed upgrade (stage 1) with the remainder to be constructed at a later point in time following an agreed traffic 'trigger' event (stage 2). They also requested that the RMS conduct a design review of the proposed upgrade to determine the most cost effective design.

RMS Meetings and Outcomes;

On the *26 June 2014* a meeting was held with Roads and Maritime Services (RMS) and the Goodman Development team to discuss the proposed upgrade options. AT&L provided a briefing to the RMS on the proposed upgrade and the extent of works to be undertaken. At the meeting AT&L provided a set of drawings for RMS to review and a subsequent email containing all of the relevant drawings that had been prepared to date. **See attachment 1**

On the *11 July 2014* a subsequent meeting was held to discuss the review that RMS had undertaken of the above submission. The focus of the meeting was firstly for RMS to provide an update on the review with discussion centering on constructing the road in two stages, Stage 1 a single lane in each direction and Stage 2, widening to accommodate 2 lanes in each direction, this is known the **Interim Option**. A number of design constraints were discussed with the RMS Design section and with that, it was agreed to prepare a new concept design layout and cross section showing the upgrade being built in the two stages to a minimum stage 1 scope that was acceptable to the RMS. In addition to the two stages, we also agreed to look at a **Rationalised Ultimate** 4 lane option based on the RMS advised cross section. AT&L agreed to obtain a full strategic cost estimate be prepared for all options.

Following the meeting, AT&L issued an email on the *13 July 2014* summarising the outcome of the meeting and the proposed cross sectioned to be adopted for the purpose of providing a revised cost estimates. **See attachment 2**. Subsequent to that email, RMS made recommendations to optimise the scope of the project by reducing the carriageway cross section geometry for both the Interim and Rationalised Ultimate Options respectively.

On the *20th July 2014*, AT&L issued via email (**See attachment 3**) to the RMS the revised concept design for both the **Interim Option** and the **Rationalised Ultimate** option along with cost estimates for those options. Included within the cost estimate was the estimate for the SSDA submission (**Original Green Ultimate**). The cost estimates were prepared by Raven North, a quantity surveying company pre-qualified on the RMS estimating panel who prepared cost estimates for the EPLR Upgrade project for RMS' consultant team.

In summary the estimates were as follows;

1.	Original Green Ultimate option Inc. Contingency	$24,275,973
2.	Rationalized Ultimate option Inc. Contingency	$23,417,733
3.	Interim Stage 1 Inc. Contingency	$20,374,851
4.	Interim Stage 2 Inc. Contingency	$4,128,993
	Total (3 + 4) combined Interim works	**$24,503,844** (extra over of $1,086,111 to item 2 or extra over of $227,871 to item 1)

As illustrated above, the expected cost premium for delivering the road in two stages is $1,086,111 with 85% of the costs being incurred in the initial stage of works. This excludes any cost escalation associated with deferring the commencement of the stage 2 works. On the other hand, the rationalised ultimate option is expected to result in a reduction of the total cost of $858,240 from that originally proposed.

On the *30th July 2014* a further meeting was held with RMS to discuss the **Interim** and **Rationalised Ultimate** options along with the findings of the respective cost estimates made in the 20th July submission. RMS provided a brief summary of their review and then indicated they would be supporting the construction of the **Rationalised Ultimate** option and as such, would be providing a recommendation to TfNSW on this basis.

Traffic Modelling;

As part of the ongoing discussion with the DoP, additional traffic modelling has been completed for OWR to assess the need for the following three items:

- Dedicated right turn lane at the Transgrid access;
- Potential duel right turn travelling northbound into the Erskine Park Link Road;
- Proposed traffic signals at the intersection of OWR and Millner Avenue.

The findings of the draft report have indicated that the above intersection treatments are warranted although the proposed duel right turn east into the EPLR requires further discussion with RMS, which is proposed to occur during the detailed design phase. The final report will be issued to the DoP as addendum to the SSDA submission. **(See attachment 4)**

Program;

A significant amount of work is required over the next 12 months to enable the road to be completed by 1st August 2015 including design, utility services Authority approvals, Section 138 Approvals from both Blacktown City Council and Fairfield City Council, RMS approval for the signal works (delivered via an RMS WAD) and physical construction works.

The project target dates for the upcoming 6 months are illustrated below along with a more detailed program in **attachment 5**.

Task Name	Finish
Prepare 50% detailed design	22/08/14
Prepare 100% detailed design	19/09/14
Obtain for Council Section 138 Approval	17/10/14
Prepare Utility Design	19/09/14
Utility Design Approval	31/10/14
Prepare Tender Documentation	19/09/14
Issue RFT & Tender Close	10/10/14
Commence Construction	01/11/14

Design Documentation and Approval;

We understand the approval process as follows;

- RMS — 80% design submission for review only
- RMS — WAD for Signal works
- Blacktown City Council — Section 138 Approval
- Fairfield City Council — Section 138 Approval
- Sydney Catchment Authority — No approval required although information submission will be made
- Transgrid — No approval required although information submission will be made

We trust this has sufficiently outlined the process to date and also captures the process going forward. Should you have any questions, please don't hesitate to contact the undersigned.

Yours sincerely

Anthony McLandsborough
Director

Attachments;

1	Email dated 27 June 2014	
2	Email dated 13 July 2014	
3	Email dated 20 July 2014	
4	Traffix draft report	
5	Draft program	
6	Original SSDA drawings	

CC.	DoP	Bruce Coleman	bruce.colman@planning.nsw.gov.au
	DoP	Pascal Van De Walle	Pascal.VanDeWalle@planning.nsw.gov.au
	DoP	Aaron Nangle	Aaron.Nangle@planning.nsw.gov.au
	RMS	Matty Mathivanar	Matty.MATHIVANAR@rms.nsw.gov.au
	RMS	Ruhul Chowdhury	Ruhul.CHOWDHURY@rms.nsw.gov.au
	RMS	Pahee Rathan	Pahee.RATHAN@rms.nsw.gov.au
	RMS	Gordon Trotter	Gordon.Trotter@rms.nsw.gov.au
	RMS	Ahmad Mangal	Ahmad.MANGAL@rms.nsw.gov.au
	Goodman	Will Dwyer	Will.Dwyer@goodman.com
	Goodman	Richard Seddon	Richard.Seddon@goodman.com
	Goodman	Kym Dracopoulos	Kym.Dracopoulos@goodman.com

at&l

Attachment 1

Email dated 27th June 2014

From:	Anthony McLandsborough
To:	"SAMY Shibree"
Cc:	LANGFORD Colin W (Colin.LANGFORD@rms.nsw.gov.au); "Bruce Colman"; "Richard Seddon"; Aaron Nangle (Aaron.Nangle@planning.nsw.gov.au); "Kym Dracopoulos"; "Suresh.Surendran@rms.nsw.gov.au"; Matty.MATHIVANAR@rms.nsw.gov.au; "Will Dwyer"
Subject:	OWR Upgrade Files
Date:	Friday, 27 June 2014 4:06:37 p.m.
Attachments:	image001.png 13-143-R002-05-Old Wallgrove Road Road Design Statement low res.pdf SSDA OWR Upgrade.pdf

Shibree, attached is the current OWR upgrade drawings along with the design report for the proposed works. This all forms part of the SSDA which was submitted to the Department.

Below is a link to the presentation files which you saw yesterday. We look forward to your design sections, advice by this time next week.

Should you have any questions, please call.

https://atl.sharefile.com/d/sdfe687abdaf4636a

Regards

Anthony McLandsborough
Director

Suite 702, 154 Pacific Highway
St Leonards NSW 2065

P 02 9439 1777
M 0433 973 423
F 02 9460 8413
anthony@atl.net.au
www.atl.net.au

at&l

Attachment 2

Email dated 13th July 2014

From:	Anthony McLandsborough
To:	Ahmad Mangal (Ahmad.MANGAL@rms.nsw.gov.au)
Cc:	LANGFORD Colin W; CHOWDHURY Ruhul; RATHAN Pahee; MATHIVANAR Matty; ADAMS David C; ANTONY Saverimuthu L; "Aaron.Nangle@planning.nsw.gov.au"; "Will Dwyer"; "Richard Seddon"; "Kym Dracopoulos"; Peter Wark; Brendon Quinn (Brendon.Quinn@goodman.com); graham.pindar@traffix.com.au; Josh Barnett
Subject:	OWR Upgrade - Meeting outcome
Date:	Sunday, 13 July 2014 12:46:43 p.m.
Attachments:	SKC110[P2].PDF image001.png

Ahmad, further to our meeting on Friday, we have moved quickly to ratify the '**Interim**' Stage 1 Cross Section along with the '**Rationalised Ultimate**' Option.

In summary, the discussion on Friday;

1. RMS provided their initial proposed 'Interim' Stage 1 option. 2m hard shoulder, 3.3m lane, 0.6m painted, 3.3m lane, 1m verge (table drains either side)
2. The need for the Transgrid RTL was discussed. AM noted that we were undertaking traffic counts next week and will include the traffic in/out of Transgrid. Once known further discussion with regards to the ultimate option. RS did note that as part of the negotiations with Transgrid, a commitment had been made to the future RTL. The 'Interim' option should only allow for a BAR type intersection
3. Discussion regarding speed limit. The road is to be design to **80km/hr**, sign posted on the interim option at 60km/hr, 'Ultimate' Option to be sign posted 80km/hr (as 70km/hr is no longer used by RMS) Speed advisory signage to be installed at the bends
4. Proposed intersection works at the EPLR/OWR was discussed and the Jacfin proposal for the fourth leg. Due to the forth leg it will be difficult to allow for the duel RT from OWR to the EPLR without significant works to the EPLR. It was agreed to wait for the traffic numbers (due within 3 weeks) to understand the impact of a single RT vs a duel RT. David Adams made note that the design of the duel RT would need to accommodate duel B-doubles turning. (this is the case for the EPLR)
5. It was agreed we need to minimise the extent of works for both the interim and ultimate options
6. It was agreed the property acquisition should occur as part of the interim
7. It was agreed the services relocations should be relocated to suit the 'Ultimate' option.
8. It was agreed street light is required. The extent of and category of the street lighting will be later determined by Council. (Note to date we have allow for V3. i.e. 9m poles at 40m staggered for the length of the road)
9. The Shared path was discussed. AM noted Council had previously requested this. It was generally agreed the shared path should be constructed in the 'Interim' option
10. Colin Langford noted irrespective of the 'Interim' option, the 'Ultimate' option needs to be rationalised. David Adams provided two options;
    i. 21m road reserve – 3.5 verge, K&G, 3.5 lane, 3.5 lane, BB Line, 3.5 lane, 3.5 lane, K&G, 3.5 verge
    ii. 21.2m road reserve – 3.5 verge, K&G, 3.5 lane, 3.3 lane, 0.6 Painted median, 3.3 lane, 3.5 lane, K&G, 3.5 verge
11. AM noted that with the narrower reserve, more consideration needs to be given to the construction methodology and the cost implications.
12. It was agreed the following would occur to move forward;

- AT&L to review all of the comments and discussion points of the meeting and provide a new 'Interim' and 'Ultimate' option cross section by Monday
- Assuming the sections are generally acceptable, AT&L to finalise concept plans and section for re-pricing by Mark Raven. Revised estimates to be issued by Friday 18th July. (Note we will show on the plans in colour the extent of the existing pavement)
- RMS to review revised plans and cost estimate and provide direction on how to proceed by Friday 25th July
- Once we have this direction, a meeting with the Councils to be arranged to inform them of the outcome.

Post Meeting

We have now taken on board all of the points above and the meeting as a whole and make the following comments;

13. Design Considerations 'Interim' Stage 1
    - We are of the opinion the Share path should be constructed as part of the 'Interim' stage
    - We agreed any services relocations need to be located in their ultimate level and alignment
    - Street lighting will be installed on one side of the road
    - If the above occurs, K&G is required along the western side
    - With a 2.5m shared path, we have allocated 3.75 as the verge width to accommodate the lighting and reasonable offset of 700mm from the face of kerb
    - We have allocated 2.5m shoulder for breakdown area, 3.3m travel lanes, 0.6 painted median and 2m shoulder with a table drain along the east side of the road
14. Design Considerations 'Rationalised Ultimate' option
    - Adopting the RMS option above and incorporating the 3.75m verge, we have proposed 3.75m verge, K&G, 3.5 lane, 3.3m lane, 0.6 PM, 3.3 lane, 3.5 lane, K&G, 3.5 verge
15. We note that while the above options vary from the RMS proposed, the minor changes will have little impact on the estimate. Ultimately we're comparing one option vs the other to understand the percentage difference. The minor changes will have a very minor impact on this.
16. When we present our estimate on Friday, we will include 3 summarised options;
    i. Original 23m Full option
    ii. 'Interim' Stage 1 option
    iii. 'Rationalised Ultimate' option

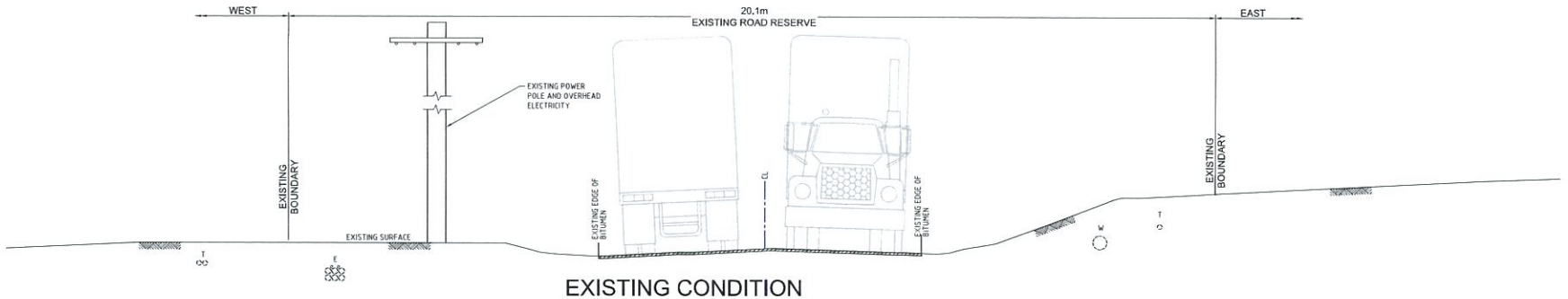
Should you have any comments, please don't hesitate to call to disucss.

Regards

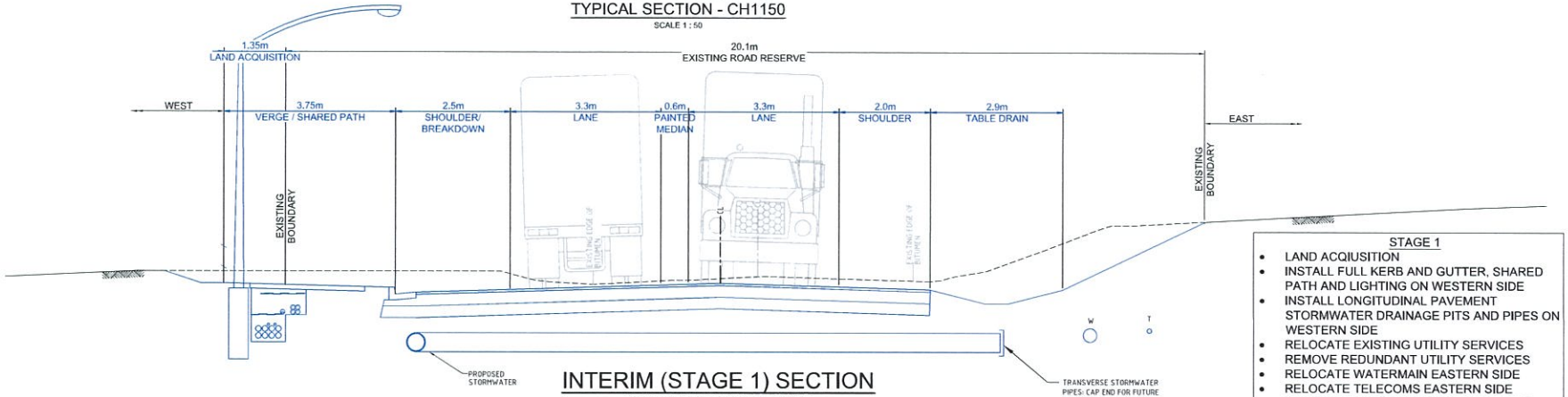
Anthony McLandsborough
Director

Suite 702, 154 Pacific Highway
St Leonards NSW 2065

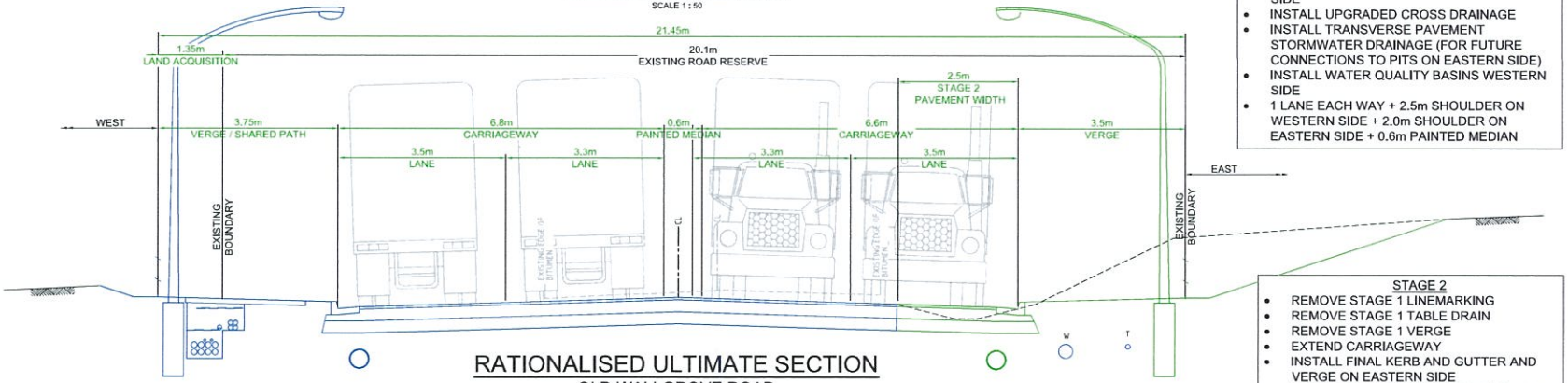
P 02 9439 1777
M 0433 973 423
F 02 9460 8413
anthony@atl.net.au
www.atl.net.au



EXISTING CONDITION
OLD WALLGROVE ROAD
TYPICAL SECTION - CH1150
SCALE 1 : 50



INTERIM (STAGE 1) SECTION
OLD WALLGROVE ROAD
TYPICAL SECTION - CH1150
SCALE 1 : 50



RATIONALISED ULTIMATE SECTION
OLD WALLGROVE ROAD
TYPICAL SECTION - CH1150
SCALE 1 : 50

STAGE 1

- LAND ACQUISITION
- INSTALL FULL KERB AND GUTTER, SHARED PATH AND LIGHTING ON WESTERN SIDE
- INSTALL LONGITUDINAL PAVEMENT STORMWATER DRAINAGE PITS AND PIPES ON WESTERN SIDE
- RELOCATE EXISTING UTILITY SERVICES
- REMOVE REDUNDANT UTILITY SERVICES
- RELOCATE WATERMAIN EASTERN SIDE
- RELOCATE TELECOMS EASTERN SIDE
- INSTALL TABLE DRAIN ON EASTERN SIDE
- RELOCATE PROPERTY FENCING WESTERN SIDE
- INSTALL UPGRADED CROSS DRAINAGE
- INSTALL TRANSVERSE PAVEMENT STORMWATER DRAINAGE (FOR FUTURE CONNECTIONS TO PITS ON EASTERN SIDE)
- INSTALL WATER QUALITY BASINS WESTERN SIDE
- 1 LANE EACH WAY + 2.5m SHOULDER ON WESTERN SIDE + 2.0m SHOULDER ON EASTERN SIDE + 0.6m PAINTED MEDIAN

STAGE 2

- REMOVE STAGE 1 LINEMARKING
- REMOVE STAGE 1 TABLE DRAIN
- REMOVE STAGE 1 VERGE
- EXTEND CARRIAGEWAY
- INSTALL FINAL KERB AND GUTTER AND VERGE ON EASTERN SIDE
- INSTALL FINAL STORMWATER PITS AND PIPES ON EASTERN SIDE
- INSTALL SUBSOIL DRAINAGE ON EASTERN SIDE
- INSTALL STREET LIGHTING EASTERN SIDE
- RELOCATE PROPERTY FENCING EASTERN SIDE

0 1 2 3 4 5m
1 : 50

KEY
- EXISTING
- STAGE 1
- STAGE 2

Issue	Description	Date
P2	ISSUED FOR INFORMATION	12-07-14
P1	ISSUED FOR INFORMATION	26-06-14

Status: PRELIMINARY ONLY
NOT TO BE USED FOR CONSTRUCTION
A1

Scales	1 : 50 @ A1	Drawn	JB
		Designed	JB
Height Datum	AHD	Checked	AM
Grid	MGA	Approved	
File:	SKC110.dwg		

Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL
OLD WALLGROVE ROAD
UPGRADE

Title: TYPICAL CROSS SECTIONS PLAN OPTION 1

Drawing No.	Project No.	Issue
SKC110	13-129	P2

Date Plotted: 12 Jul 2014 - 02:51PM File Name: F:\13-129 OWR Upgrade\Drgs\Civil\Sketches\SKC110.dwg V1

at&l

Attachment 3

Email dated 20th July 2014

From:	Anthony McLandsborough
To:	Ahmad Mangal (Ahmad.MANGAL@rms.nsw.gov.au)
Cc:	"LANGFORD Colin W"; "CHOWDHURY Ruhul"; "RATHAN Pahee"; "MATHIVANAR Matty"; "ADAMS David C"; "ANTONY Saverimuthu L"; "Aaron.Nangle@planning.nsw.gov.au"; "Will Dwyer"; "Richard Seddon"; "Kym Dracopoulos"; Peter Wark; Brendon Quinn (Brendon.Quinn@goodman.com); graham.pindar@traffix.com.au; Josh Barnett
Subject:	RE: OWR Upgrade - Meeting outcome
Date:	Sunday, 20 July 2014 2:38:41 p.m.
Attachments:	image001.png Stage 2 Rationalised Ultimate Cost Estimate.pdf GoodmanATLUltimate Cost Estimate.pdf Rationalised Ulitmate Cost Estimate.pdf Rationalised Ulitmate DWGs.pdf Stage 1 and 2 DWGs.pdf Stage 1 Interim Cost Estimate.pdf

---

Ahmad as committed to below, we have now finalized the preparation of the **Interim Stage 1 and 2** concept design along with the **Rationalized Ultimate** concept design. These have also been costed by Mark Raven as setout below;

1. Original Green Ultimate option inc. Contingency $24,275,973
2. Rationalized Ultimate option inc. Contingency $23,417,733
3. Interim Stage 1 inc. Contingency $20,374,851
4. Stage 2 inc. Contingency $4,128,993
    a. Total combined Interim works $24,503,844 (extra over of $1,086,111 to item 2 or extra over of $227,871 to item 1)

We would like to meet next Friday afternoon at 3pm. Could you confirm if this time is suitable.

Regards

Anthony McLandsborough
Director

Suite 702, 154 Pacific Highway
St Leonards NSW 2065

P 02 9439 1777
M 0433 973 423
F 02 9460 8413
anthony@atl.net.au
www.atl.net.au

From: Anthony McLandsborough
Sent: Sunday, 13 July 2014 12:47 p.m.
To: Ahmad Mangal (Ahmad.MANGAL@rms.nsw.gov.au)
Cc: LANGFORD Colin W; CHOWDHURY Ruhul; RATHAN Pahee; MATHIVANAR Matty; ADAMS David C; ANTONY Saverimuthu L; 'Aaron.Nangle@planning.nsw.gov.au'; 'Will Dwyer'; 'Richard Seddon'; 'Kym Dracopoulos'; Peter Wark; Brendon Quinn (Brendon.Quinn@goodman.com);

graham.pindar@traffix.com.au; Josh Barnett
Subject: OWR Upgrade - Meeting outcome

Ahmad, further to our meeting on Friday, we have moved quickly to ratify the '**Interim**' Stage 1 Cross Section along with the '**Rationalised Ultimate**' Option.

In summary, the discussion on Friday;

1. RMS provided their initial proposed 'Interim' Stage 1 option. 2m hard shoulder, 3.3m lane, 0.6m painted, 3.3m lane, 1m verge (table drains either side)
2. The need for the Transgrid RTL was discussed. AM noted that we were undertaking traffic counts next week and will include the traffic in/out of Transgrid. Once known further discussion with regards to the ultimate option. RS did note that as part of the negotiations with Transgrid, a commitment had been made to the future RTL. The 'Interim' option should only allow for a BAR type intersection
3. Discussion regarding speed limit. The road is to be design to **80km/hr**, sign posted on the interim option at 60km/hr, 'Ultimate' Option to be sign posted 80km/hr (as 70km/hr is no longer used by RMS) Speed advisory signage to be installed at the bends
4. Proposed intersection works at the EPLR/OWR was discussed and the Jacfin proposal for the fourth leg. Due to the forth leg it will be difficult to allow for the duel RT from OWR to the EPLR without significant works to the EPLR. It was agreed to wait for the traffic numbers (due within 3 weeks) to understand the impact of a single RT vs a duel RT. David Adams made note that the design of the duel RT would need to accommodate duel B-doubles turning. (this is the case for the EPLR)
5. It was agreed we need to minimise the extent of works for both the interim and ultimate options
6. It was agreed the property acquisition should occur as part of the interim
7. It was agreed the services relocations should be relocated to suit the 'Ultimate' option.
8. It was agreed street light is required. The extent of and category of the street lighting will be later determined by Council. (Note to date we have allow for V3. i.e. 9m poles at 40m staggered for the length of the road)
9. The Shared path was discussed. AM noted Council had previously requested this. It was generally agreed the shared path should be constructed in the 'Interim' option
10. Colin Langford noted irrespective of the 'Interim' option, the 'Ultimate' option needs to be rationalised. David Adams provided two options;
    i. 21m road reserve – 3.5 verge, K&G, 3.5 lane, 3.5 lane, BB Line, 3.5 lane, 3.5 lane, K&G, 3.5 verge
    ii. 21.2m road reserve – 3.5 verge, K&G, 3.5 lane, 3.3 lane, 0.6 Painted median, 3.3 lane, 3.5 lane, K&G, 3.5 verge
11. AM noted that with the narrower reserve, more consideration needs to be given to the construction methodology and the cost implications.
12. It was agreed the following would occur to move forward;
    - AT&L to review all of the comments and discussion points of the meeting and provide a new 'Interim' and 'Ultimate' option cross section by Monday
    - Assuming the sections are generally acceptable, AT&L to finalise concept plans and section for re-pricing by Mark Raven. Revised estimates to be issued by Friday 18th July. (Note we will show on the plans in colour the extent of the existing pavement)

- RMS to review revised plans and cost estimate and provide direction on how to proceed by Friday 25th July
- Once we have this direction, a meeting with the Councils to be arranged to inform them of the outcome.

Post Meeting

We have now taken on board all of the points above and the meeting as a whole and make the following comments;

13. Design Considerations 'Interim' Stage 1
    - We are of the opinion the Share path should be constructed as part of the 'Interim' stage
    - We agreed any services relocations need to be located in their ultimate level and alignment
    - Street lighting will be installed on one side of the road
    - If the above occurs, K&G is required along the western side
    - With a 2.5m shared path, we have allocated 3.75 as the verge width to accommodate the lighting and reasonable offset of 700mm from the face of kerb
    - We have allocated 2.5m shoulder for breakdown area, 3.3m travel lanes, 0.6 painted median and 2m shoulder with a table drain along the east side of the road
14. Design Considerations 'Rationalised Ultimate' option
    - Adopting the RMS option above and incorporating the 3.75m verge, we have proposed 3.75m verge, K&G, 3.5 lane, 3.3m lane, 0.6 PM, 3.3 lane, 3.5 lane, K&G, 3.5 verge
15. We note that while the above options vary from the RMS proposed, the minor changes will have little impact on the estimate. Ultimately we're comparing one option vs the other to understand the percentage difference. The minor changes will have a very minor impact on this.
16. When we present our estimate on Friday, we will include 3 summarised options;
    i. Original 23m Full option
    ii. 'Interim' Stage 1 option
    iii. 'Rationalised Ultimate' option

Should you have any comments, please don't hesitate to call to disucss.

Regards

Anthony McLandsborough
Director

Suite 702, 154 Pacific Highway
St Leonards NSW 2065

P 02 9439 1777
M 0433 973 423
F 02 9460 8413
anthony@atl.net.au
www.atl.net.au

PROJECT:OLD WALLGROVE RD UPGRADE - OAKDALE CENTRAL

Prepared by: T.Yildirim

CLIENT: Goodman

OPTION: STAGE 1 - INTERIM

Project Summary

Rev A

Project No: 14046 **DATE: Jul-14** **Estimate Stage: Concept**

Item	Estimate (excluding contingency)	Contingency %	Contingency Amount	Estimate (including contingency)	% of Total Estimate	Comments/Assumptions
1. Project Development						
1 (a) Survey/Potholing	$61,189	0%	$0	$61,189		Actual cost incurred by GPS. 80% allocated
1 (b) Concept Road Design/ Project Management	$77,811	0%	$0	$77,811		Actual cost incurred by GPS. 80% allocated
1 (c) Environmental/Contamination Assessment	$23,600	0%	$0	$23,600		Actual cost incurred by GPS. 80% allocated
Sub total	**$162,600**	**0%**	**$0**	**$162,600**	**0.8%**	
2. Investigation and Design						
2 (a) Investigation and Design	$990,935	20%	$198,187	$1,189,122		AT&L Fee extra over for production of two sets
2 (b) Project Management Services	$0	0%	$0	$0		incl. in 2 (a)
Sub total	**$990,935**	**20%**	**$198,187**	**$1,189,122**	**5.8%**	
3. Property Acquisitions						
3 (a) Acquire Property	$1,750,500	40%	$700,200	$2,450,700		Based onGPC advice of $250/m2
3 (b) Professional Services for Property	$122,535	40%	$49,014	$171,549		
3 (c) Project Management Services	$0	0%	$0	$0		incl. in 2 (a)
Sub total	**$1,873,035**		**$749,214**	**$2,622,249**	**12.9%**	
4. Public Utility Adjustments						
4 (a) Adjust Utilities	$0	35%	$0	$0		Included in SOR
4 (b) Project Management Services	$0	35%	$0	$0		9% of Utilities cost
4 (c) Client Representation	$0	35%	$0	$0		10% of Project Management Cost
Sub total	**$0**		**$0**	**$0**	**0.0%**	
5. Construction						
5(a) Schedule of Rates						
- General	$1,020,211	37%	$375,674	$1,396,085		
- Services	$3,009,029	38%	$1,157,412	$4,166,441		
- Traffic Control	$1,185,043	35%	$414,765	$1,599,808		
- Drainage and Kerbing	$912,540	37%	$334,807	$1,247,347		
- Earthworks	$1,523,868	35%	$538,778	$2,062,646		
- Pavements	$2,396,216	35%	$838,676	$3,234,892		
- Road furniture	$1,473,267	34%	$495,414	$1,968,681		
	$11,520,176	**36%**	**$4,155,725**	**$15,675,900**		
5 (b) Primary Testing						Included in SOR
5 (c) Insurance	$63,361	36%	$22,856	$86,217		0.55% of infrastructure costs
5 (d) Project Management Tender Process/Construction/ Handover	$280,000	35%	$98,000	$378,000		AT&L Fee. 80% Allocated (inc extra over for 2 stages
5 (e) Independent Verification Construction	$77,040	35%	$26,964	$104,004		AT&L Fee. 80% Allocated
Sub total	**$11,940,576**	**36%**	**$4,303,545**	**$16,244,121**	**79.7%**	
6. Handover						
6 (a) Handover and Finalisation	$	%	$	$		Excluded
6 (b) Project data and conformance	$115,202	36%	$41,557	$156,759		1% of infrastructure costs
6 (c) Project Management Services	$0	36%	$0	$0		9% of Project data & Performance Review
Sub total	**$115,202**	**36%**	**$41,557**	**$156,759**	**0.8%**	
TOTAL	$15,082,348	35%	$5,292,503	$20,374,851	100%	RMS require 25% to 40%
Project Management	$357,811		$98,000	$455,811	2.2%	

Reality Checks	Excluding Contingency Rate	Unit	Qty	Including Contingency Rate	Unit
1. Project Cost (incl Contingency)/ km	$9,426,467	/cway-km	1.6	$12,734,262	/cway-km
2. Project Cost / lane-km	$2,356,617	/lane-km	6.4	$3,183,571	/lane-km
Earthworks-Cut/Fill	$26	/m3	10,000	$35	/m3
Earthworks-Import	$0	/m3	0	$0	/m3
Pavement-Main	$118	/m2	12,720	$159	/m2

PROJECT:OLD WALLGROVE RD UPGRADE - OAKDALE CENTRAL

Prepared by: T.Yildirim

CLIENT: Goodman

OPTION: RATIONALISED ULTIMATE FULL CONSTRUCTION

Project Summary Rev A

Project No: 14046 **DATE: Jul-14** **Estimate Stage: Concept**

Item	Estimate (excluding contingency)	Contingency %	Contingency Amount	Estimate (including contingency)	% of Total Estimate	Comments/Assumptions
1. Project Development						
1 (a) Survey/Potholing	$76,486	0%	$0	$76,486		Actual cost incurred by GPS
1 (b) Concept Road Design/ Project Management	$97,264	0%	$0	$97,264		Actual cost incurred by GPS
1 (c) Environmental/Contamination Assessment	$29,500	0%	$0	$29,500		Actual cost incurred by GPS
Sub total	**$203,250**	**0%**	**$0**	**$203,250**	**0.9%**	
2. Investigation and Design						
2 (a) Investigation and Design	$870,935	20%	$174,187	$1,045,122		AT&L Fee
2 (b) Project Management Services	$0	0%	$0	$0		incl. in 2 (a)
Sub total	**$870,935**	**20%**	**$174,187**	**$1,045,122**	**4.5%**	
3. Property Acquisitions						
3 (a) Acquire Property	$1,750,500	40%	$700,200	$2,450,700		Based onGPC advice of $250/m2
3 (b) Professional Services for Property	$122,535	40%	$49,014	$171,549		
3 (c) Project Management Services	$0	0%	$0	$0		incl. in 2 (a)
Sub total	**$1,873,035**		**$749,214**	**$2,622,249**	**11.2%**	
4. Public Utility Adjustments						
4 (a) Adjust Utilities	$0	35%	$0	$0		Included in SOR
4 (b) Project Management Services	$0	35%	$0	$0		9% of Utilities cost
4 (c) Client Representation	$0	35%	$0	$0		10% of Project Management Cost
Sub total	**$0**		**$0**	**$0**	**0.0%**	
5. Construction						
5(a) Schedule of Rates						
- General	$1,086,851	67%	$730,602	$1,817,454		
- Services	$3,245,746	28%	$920,694	$4,166,441		
- Traffic Control	$1,102,147	35%	$385,752	$1,487,899		
- Drainage and Kerbing	$1,271,071	36%	$463,552	$1,734,623		
- Earthworks	$1,960,290	35%	$693,042	$2,653,332		
- Pavements	$2,979,880	35%	$1,042,958	$4,022,838		
- Road furniture	$2,129,092	35%	$736,828	$2,865,920		
	$13,775,077	**36%**	**$4,973,429**	**$18,748,506**		
5 (b) Primary Testing						Included in SOR
5 (c) Insurance	$75,763	36%	$27,354	$103,117		0.55% of infrastructure costs
5 (d) Project Management Tender Process/Construction/ Handover	$280,000	35%	$98,000	$378,000		AT&L Fee
5 (e) Independent Verification Construction	$96,300	35%	$33,705	$130,005		AT&L Fee
Sub total	**$14,227,139**	**36%**	**$5,132,488**	**$19,359,627**	**82.7%**	
6. Handover						
6 (a) Handover and Finalisation	$	%	$	$		Excluded
6 (b) Project data and conformance	$137,751	36%	$49,734	$187,485		1% of infrastructure costs
6 (c) Project Management Services	$0	36%	$0	$0		9% of Project data & Performance Review
Sub total	**$137,751**	**36%**	**$49,734**	**$187,485**	**0.8%**	
TOTAL	**$17,312,110**	**35%**	**$6,105,623**	**$23,417,733**	**100%**	RMS require 25% to 40%
Project Management	$377,264		$98,000	$475,264	2.0%	

Reality Checks	Excluding Contingency Rate	Unit	Qty	Including Contingency Rate	Unit
1. Project Cost (Incl Contingency)/ km	$10,820,069	/cway-km	1.6	$14,636,083	/cway-km
2. Project Cost / lane-km	$2,705,017	/lane-km	6.4	$3,659,021	/lane-km
Earthworks-Cut/Fill	$26	/m3	10,000	$35	/m3
Earthworks-Import	$0	/m3	0	$0	/m3
Pavement-Main	$118	/m2	16,960	$159	/m2

PROJECT:OLD WALGROVE RD UPGRADE - OAKDALE CENTRAL

Prepared by: Mark Raven

CLIENT: Goodman

Project Summary

Rev C

Project No: 14046 **DATE: May-14** **Estimate Stage: Concept**

Item	Estimate (excluding contingency)	Contingency %	Contingency Amount	Estimate (including contingency)	% of Total Estimate	Comments/Assumptions
1. Project Development						
1 (a) Survey/Potholing	$76,486	0%	$0	$76,486		Actual cost incurred by GPS
1 (b) Concept Road Design/ Project Management	$131,580	0%	$0	$131,580		Actual cost incurred by GPS
1 (c) Environmental/Contamination Assessment	$29,500	0%	$0	$29,500		Actual cost incurred by GPS
Sub total	**$237,566**	**0%**	**$0**	**$237,566**	**1.0%**	
2. Investigation and Design						
2 (a) Investigation and Design	$700,935	20%	$140,187	$841,122		AT&L Fee
2 (b) Project Management Services	$150,000	20%	$30,000	$180,000		AT&L Fee
Sub total	**$850,935**	**20%**	**$170,187**	**$1,021,122**	**4.2%**	
3. Property Acquisitions						
3 (a) Acquire Property	$2,077,750	40%	$831,100	$2,908,850		Based on GPC advice of $250/m2
3 (b) Professional Services for Property	$145,443	30%	$43,633	$189,075		
3 (c) Project Management Services	$0	0%	$0	$0		incl. in 2 (a)
Sub total	**$2,223,193**		**$874,733**	**$3,097,925**	**12.8%**	
4. Public Utility Adjustments						
4 (a) Adjust Utilities	$0	35%	$0	$0		Included in SOR
4 (b) Project Management Services	$0	35%	$0	$0		Included in 5d)
Sub total	**$0**		**$0**	**$0**	**0.0%**	
5. Construction						
5(a) Schedule of Rates						
- General	$1,331,893	37%	$496,799	$1,828,691		Refer to Scope Definition
- Utility Relocations & Traffic Signals	$3,009,029	38%	$1,157,412	$4,166,441		For Breakdown
- Traffic Control	$1,051,789	35%	$368,126	$1,419,915		of Coverage for these
- Drainage and Kerbing	$1,293,561	34%	$445,987	$1,739,547		Item headings
- Earthworks	$2,105,226	35%	$744,317	$2,849,543		
- Pavements	$3,237,863	30%	$987,119	$4,224,982		
- Road furniture	$2,131,584	29%	$624,491	$2,756,076		
	$14,160,945	**34%**	**$4,824,251**	**$18,985,196**		
5 (b) Primary Testing						Included in SOR
5 (c) Insurance	$77,885	34%	$26,533	$104,419		0.55% of infrastructure costs
5 (d) Project Management Tender Process/Construction/ Handover	$305,000	35%	$106,750	$411,750		AT&L Fee
5 (e) Independent Verification Construction	$96,300	35%	$33,705	$130,005		AT&L Fee
Sub total	**$14,640,130**	**34%**	**$4,991,239**	**$19,631,369**	**80.9%**	
6. Handover						
6 (a) Handover and Finalisation	$	%	$	$		Excluded
6 (b) Project data and conformance	$141,609	34%	$48,243	$189,852		1% of infrastructure costs
6 (c) Project Management Services	$73,201	34%	$24,937	$98,138		0.5% of construction cost
Sub total	**$214,810**	**34%**	**$73,180**	**$287,990**	**1.2%**	
TOTAL	**$18,166,634**	**34%**	**$6,109,339**	**$24,275,973**	**100%**	**RMS require 25% to 40%**
Project Management	$659,781		$161,687	$821,468	3.4%	

Reality Checks	Excluding Contingency Rate	Unit	Qty	Including Contingency Rate	Unit
1. Project Cost (Incl Contingency)/ km	$11,354,146	/cway-km	1.6	$15,172,483	/cway-km
2. Project Cost / lane-km	$2,838,537	/lane-km	6.4	$3,793,121	/lane-km
Earthworks-Cut/Fill	$26	/m3	10,000	$35	/m3
Earthworks-Import	$0	/m3	0	$0	/m3
Pavement-Main	$118	/m2	18,430	$157	/m2

PROJECT:OLD WALLGROVE RD UPGRADE - OAKDALE CENTRAL

Prepared by: T.Yildirim

CLIENT: Goodman

OPTION: STAGE 2 - RATIONALISED ULTIMATE

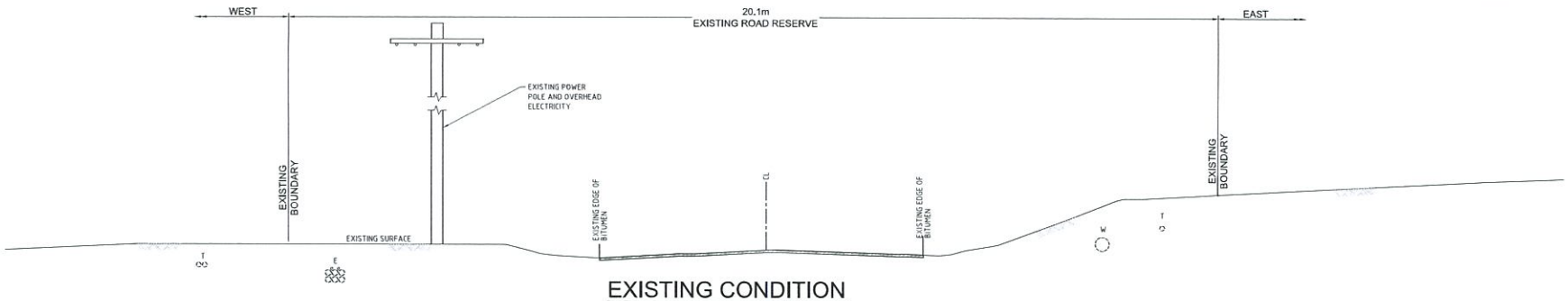
Project Summary

Rev A

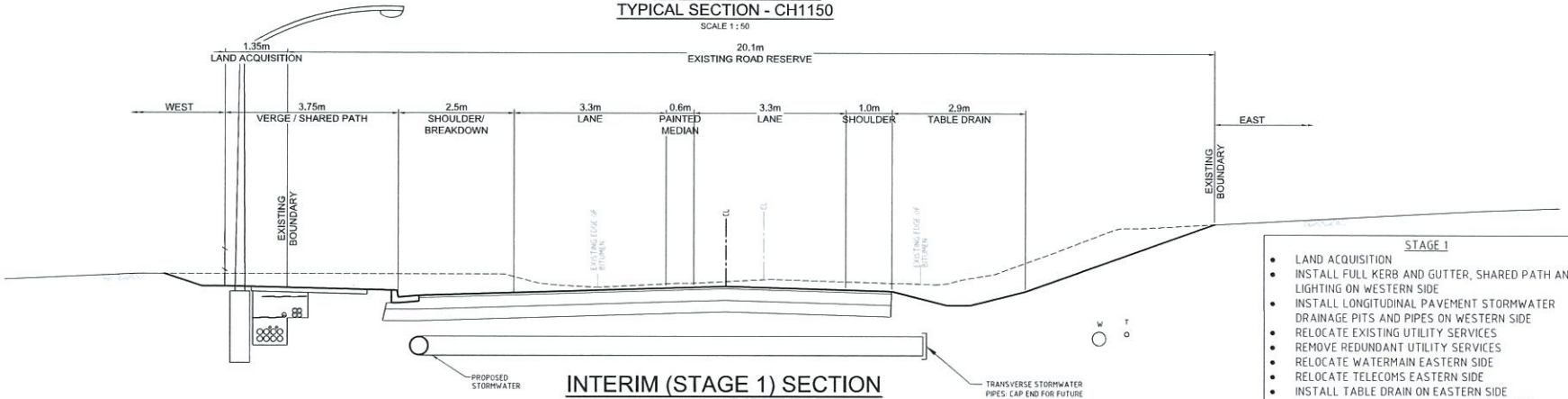
Project No: 14046 **DATE: Jul-14** **Estimate Stage: Concept**

Item	Estimate (excluding contingency)	Contingency %	Contingency Amount	Estimate (including contingency)	% of Total Estimate	Comments/Assumptions
1. Project Development						
1 (a) Survey/Potholing	$15,297	0%	$0	$15,297		Actual cost incurred by GPS. 20% Allocated
1 (b) Concept Road Design/ Project Management	$19,453	0%	$0	$19,453		Actual cost incurred by GPS
1 (c) Environmental/Contamination Assessment	$5,900	0%	$0	$5,900		Actual cost incurred by GPS
Sub total	**$40,650**	**0%**	**$0**	**$40,650**	**1.0%**	
2. Investigation and Design						
2 (a) Investigation and Design	$0	0%	$0	$0		completed in Stage 1 Interim Proposal
2 (b) Project Management Services	$75,000	0%	$0	$75,000		Additional contract docs
Sub total	**$75,000**	**0%**	**$0**	**$75,000**	**1.8%**	
3. Property Acquisitions						
3 (a) Acquire Property	$0	40%	$0	$0		Based onGPC advice of $250/m2
3 (b) Professional Services for Property	$0	40%	$0	$0		
3 (c) Project Management Services	$0	0%	$0	$0		incl. in 2 (a)
Sub total	**$0**		**$0**	**$0**	**0.0%**	
4. Public Utility Adjustments						
4 (a) Adjust Utilities	$0	35%	$0	$0		Included in SOR
4 (b) Project Management Services	$0	35%	$0	$0		9% of Utilities cost
4 (c) Client Representation	$0	35%	$0	$0		10% of Project Management Cost
Sub total	**$0**		**$0**	**$0**	**0.0%**	
5. Construction						
5(a) Schedule of Rates						
- General	$440,787	38%	$166,111	$606,898		
- Services	$0		$0	$0		
- Traffic Control	$310,411	35%	$108,644	$419,055		
- Drainage and Kerbing	$305,838	42%	$128,045	$433,883		
- Earthworks	$386,981	35%	$136,960	$523,941		
- Pavements	$661,559	35%	$231,546	$893,105		
- Road furniture	$704,955	36%	$251,587	$956,541		
	$2,810,531	**36%**	**$1,022,893**	**$3,833,424**		
5 (b) Primary Testing						Included in SOR
5 (c) Insurance	$15,458	36%	$5,626	$21,084		0.55% of infrastructure costs
5 (d) Project Management Tender Process/Construction/ Handover	$70,000	35%	$24,500	$94,500		AT&L Fee. 20% Allocated, includes extra over for 2 stages
5 (e) Independent Verification Construction	$19,260	35%	$6,741	$26,001		AT&L Fee. 20% Allocated
Sub total	**$2,915,249**	**36%**	**$1,059,760**	**$3,975,009**	**96.3%**	
6. Handover						
6 (a) Handover and Finalisation	$	%	$	$		Excluded
6 (b) Project data and conformance	$28,105	36%	$10,229	$38,334		1% of infrastructure costs
6 (c) Project Management Services	$0	36%	$0	$0		9% of Project data & Performance Review
Sub total	**$28,105**	**36%**	**$10,229**	**$38,334**	**0.9%**	
TOTAL	**$3,059,004**	**35%**	**$1,069,989**	**$4,128,993**	**100%**	**RMS require 25% to 40%**
Project Management	$164,453		$24,500	$188,953	4.6%	

Reality Checks	Excluding Contingency Rate	Unit	Qty	Including Contingency Rate	Unit
1. Project Cost (Incl Contingency)/ km	$1,911,878	/cway-km	1.6	$2,580,621	/cway-km
2. Project Cost / lane-km	$477,969	/lane-km	6.4	$645,155	/lane-km
Earthworks-Cut/Fill	$0	/m3	0	$0	/m3
Earthworks-Import	$0	/m3	0	$0	/m3
Pavement-Main	$137	/m2	4,240	$185	/m2

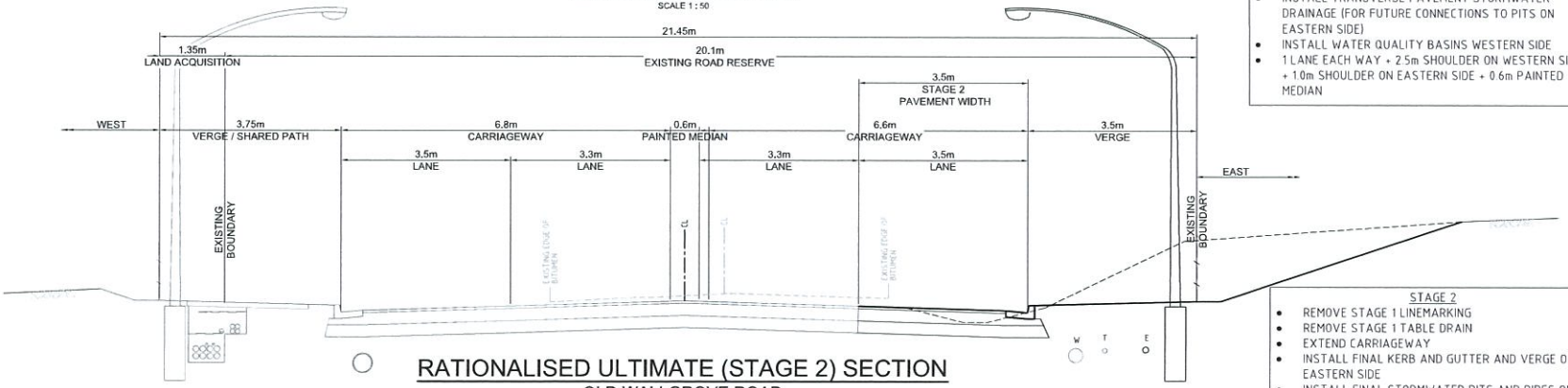


EXISTING CONDITION
OLD WALLGROVE ROAD
TYPICAL SECTION - CH1150
SCALE 1 : 50



INTERIM (STAGE 1) SECTION
OLD WALLGROVE ROAD
TYPICAL SECTION - CH1150
SCALE 1 : 50

STAGE 1
- LAND ACQUISITION
- INSTALL FULL KERB AND GUTTER, SHARED PATH AND LIGHTING ON WESTERN SIDE
- INSTALL LONGITUDINAL PAVEMENT STORMWATER DRAINAGE PITS AND PIPES ON WESTERN SIDE
- RELOCATE EXISTING UTILITY SERVICES
- REMOVE REDUNDANT UTILITY SERVICES
- RELOCATE WATERMAIN EASTERN SIDE
- RELOCATE TELECOMS EASTERN SIDE
- INSTALL TABLE DRAIN ON EASTERN SIDE
- RELOCATE PROPERTY FENCING WESTERN SIDE
- INSTALL UPGRADED CROSS DRAINAGE
- INSTALL TRANSVERSE PAVEMENT STORMWATER DRAINAGE (FOR FUTURE CONNECTIONS TO PITS ON EASTERN SIDE)
- INSTALL WATER QUALITY BASINS WESTERN SIDE
- 1 LANE EACH WAY + 2.5m SHOULDER ON WESTERN SIDE + 1.0m SHOULDER ON EASTERN SIDE + 0.6m PAINTED MEDIAN



RATIONALISED ULTIMATE (STAGE 2) SECTION
OLD WALLGROVE ROAD
TYPICAL SECTION - CH1150
SCALE 1 : 50

STAGE 2
- REMOVE STAGE 1 LINEMARKING
- REMOVE STAGE 1 TABLE DRAIN
- EXTEND CARRIAGEWAY
- INSTALL FINAL KERB AND GUTTER AND VERGE ON EASTERN SIDE
- INSTALL FINAL STORMWATER PITS AND PIPES ON EASTERN SIDE
- INSTALL SUBSOIL DRAINAGE ON EASTERN SIDE
- INSTALL STREET LIGHTING EASTERN SIDE
- RELOCATE PROPERTY FENCING EASTERN SIDE

0 1 2 3 4 5m
1 : 50

Issue	Description	Date
B	ISSUED FOR CLIENT REVIEW	18-07-14
A	ISSUED FOR COSTING	15-07-14

Status: FOR COSTING
NOT TO BE USED FOR CONSTRUCTION
A1

Scales	1 : 50 @ A1	Drawn	JB
		Designed	JB
Height Datum	AHD	Checked	PW
Grid	MGA	Approved	

File: PC53.dwg

Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

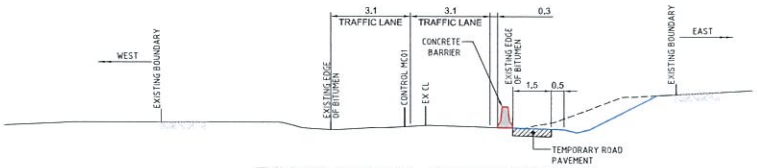
Project: OAKDALE CENTRAL
OLD WALLGROVE ROAD
UPGRADE

Title: TYPICAL ROAD
CROSS SECTIONS

Drawing No.	Project No.	Issue
PC53	13-129	B

When on Original

Date Plotted: 18 Jul 2014 - 05:21PM File Name: F:\13-129 OWR Upgrade\Dngs\Civil\Final\PC53.dwg V1

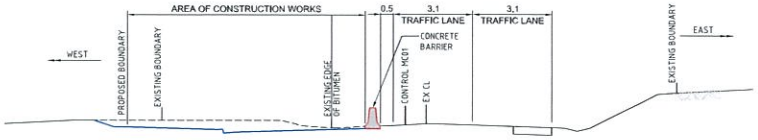


TYPICAL SECTION - INTERIM (STAGE 1)

CH 1150

SCALE 1 : 100

CONSTRUCTION STAGE 1 - CONSTRUCT TEMPORARY PAVEMENT WIDENDING

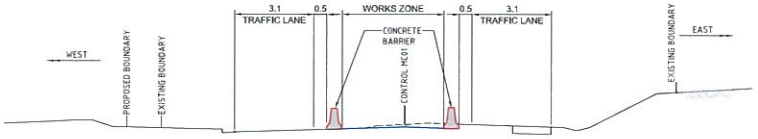


TYPICAL SECTION - INTERIM (STAGE 1)

CH 1150

SCALE 1 : 100

CONSTRUCTION STAGE 2 - CONSTRUCT NEW PAVEMENT WESTERN SIDE

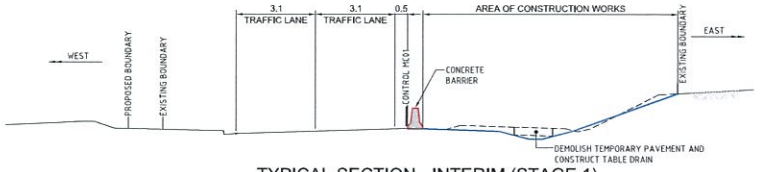


TYPICAL SECTION - INTERIM (STAGE 1)

CH 1150

SCALE 1 : 100

CONSTRUCTION STAGE 3 - CONSTRUCT NEW PAVEMENT CENTRE

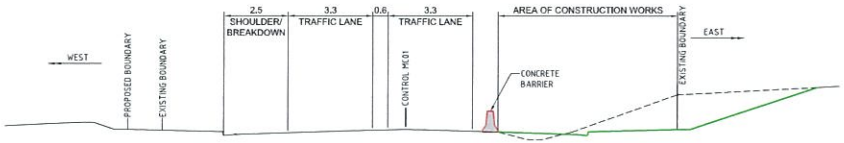


TYPICAL SECTION - INTERIM (STAGE 1)

CH 1150

SCALE 1 : 100

CONSTRUCTION STAGE 4 - CONSTRUCT NEW PAVEMENT EASTERN SIDE



TYPICAL SECTION - RATIONALISED ULTIMATE (STAGE 2)

CH 1150

SCALE 1 : 100

CONSTRUCTION STAGE 5 - CONSTRUCT FULL WIDTH EASTERN SIDE

LEGEND

- EXISTING
- TEMPORARY ENABLING WORKS
- INTERIM (STAGE 1) WORKS
- RATIONALISED ULTIMATE (STAGE 2) WORKS
- TO BE DEMOLISHED / REMOVED

Issue	Description	Date
A	ISSUED FOR CLIENT REVIEW	18-07-14

Status: FOR COSTING
NOT TO BE USED FOR CONSTRUCTION

A1

Scales: AS SHOWN

Height Datum: AHD

Grid:

Drawn: JB
Designed: JB
Checked: PW
Approved:

File: PC85.dwg

Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL
OLD WALLGROVE ROAD
UPGRADE

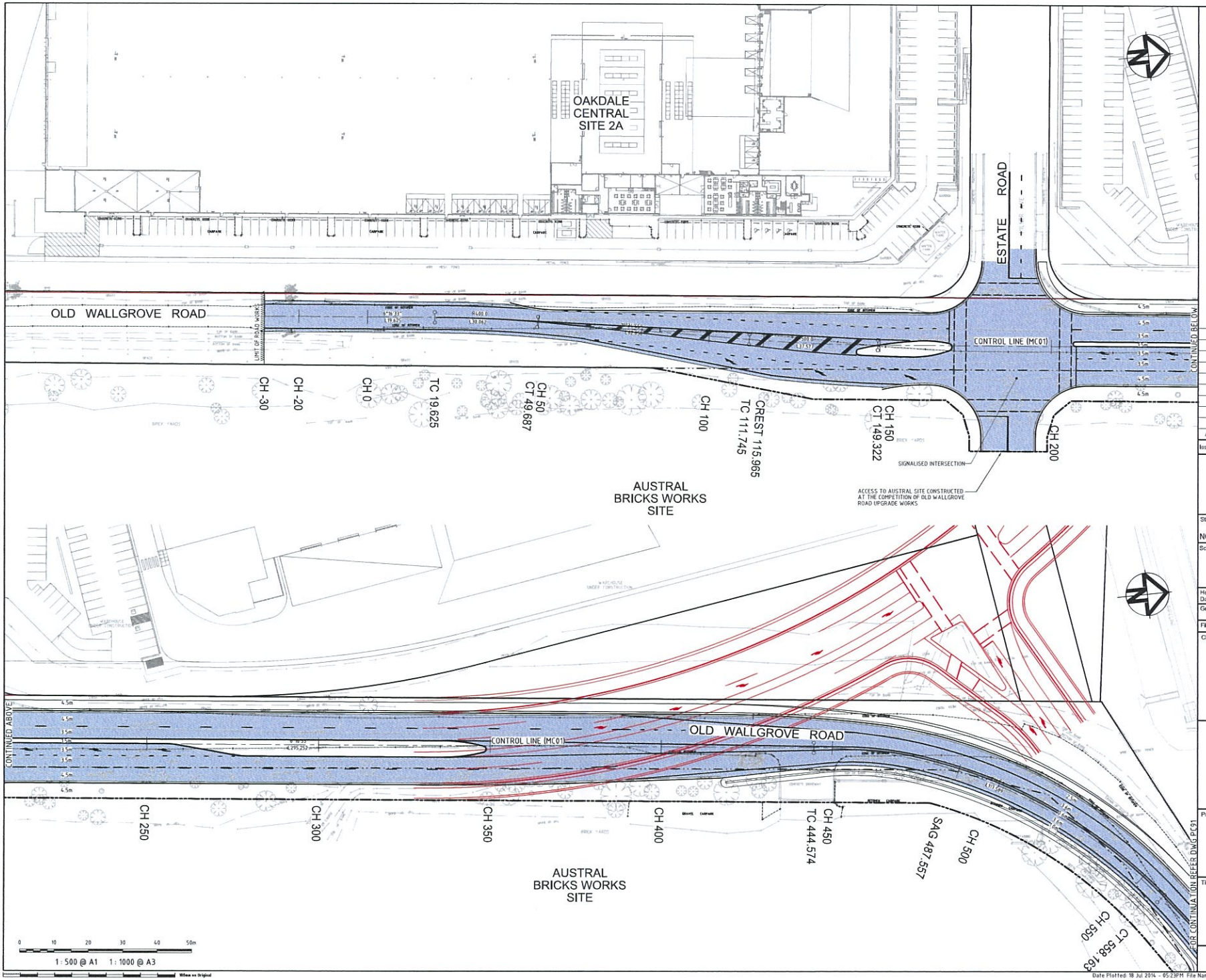
Title: INTERIM
STAGING SECTIONS

Drawing No.	Project No.	Issue
PC85	13-129	A

0 2 4 6 8 10m

1 : 100 @ A1 1 : 200 @ A3

When as Original



LEGEND

INTERIM (STAGE 1) ROADWORKS EXTENT

Issue	Description	Date
A	ISSUED FOR CLIENT REVIEW	18-07-14

Status: FOR COSTING
NOT TO BE USED FOR CONSTRUCTION — A1

Scales	1 : 500 @ A1	Drawn JB	
		Designed JB	
Height Datum	AHD	Checked PW	
Grid	MGA	Approved	
File:	PC90.dwg		

Client: Goodman

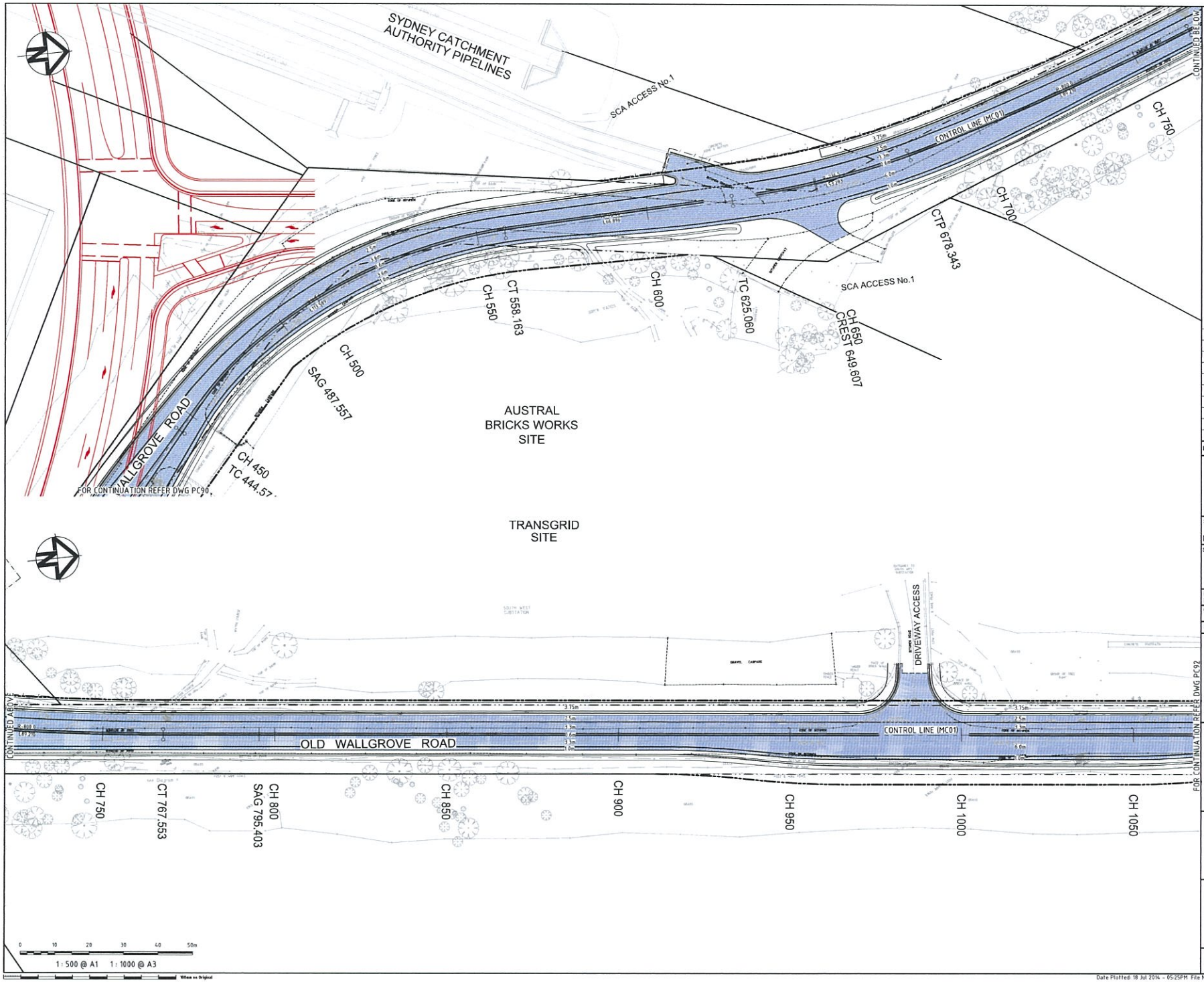
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL OLD WALLGROVE ROAD UPGRADE

Title: INTERIM (STAGE 1) ROADWORKS EXTENT PLAN SHEET 1

Drawing No.	Project No.	Issue
PC90	13-129	A

Date Plotted: 18 Jul 2014 - 05:23PM File Name: F:\13-129 OWR Upgrade\Drgs\Civil\Final\PC90.dwg V1



LEGEND

INTERIM (STAGE 1) ROADWORKS EXTENT

Issue	Description	Date
A	ISSUED FOR CLIENT REVIEW	18-07-14

Status: FOR COSTING
NOT TO BE USED FOR CONSTRUCTION — A1

Scales	1 : 500 @ A1	Drawn	JB
		Designed	JB
Height Datum	AHD	Checked	PW
Grid	MGA	Approved	
File:	PC91.dwg		

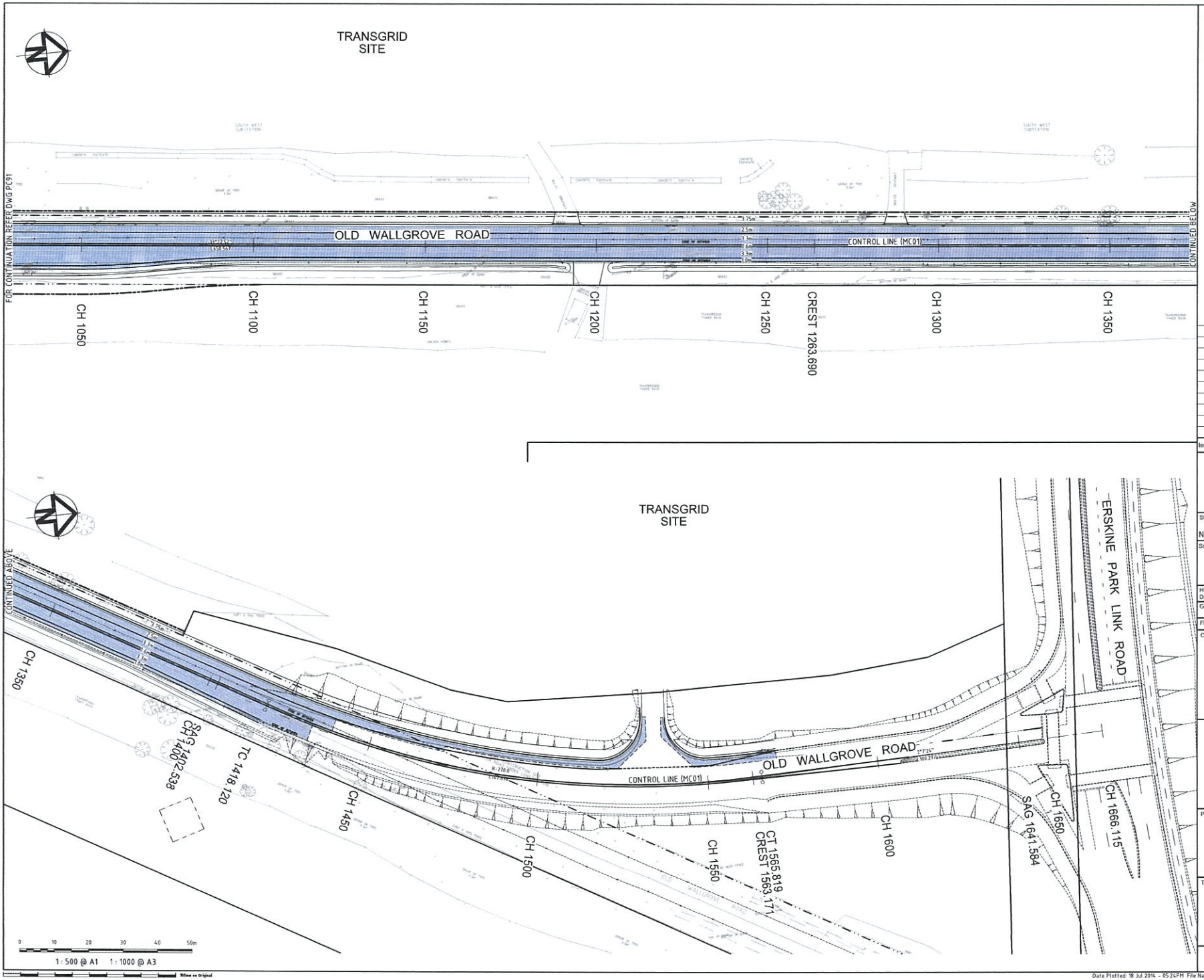
Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL
OLD WALLGROVE ROAD
UPGRADE

Title: INTERIM (STAGE 1)
ROADWORKS EXTENT
PLAN
SHEET 2

Drawing No.	Project No.	Issue
PC91	13-129	A



LEGEND

INTERIM (STAGE 1) ROADWORKS EXTENT

Issue	Description	Date
A	ISSUED FOR CLIENT REVIEW	18-07-14

Status: FOR COSTING
NOT TO BE USED FOR CONSTRUCTION — A1

Scales	1 : 500 @ A1	Drawn	JB
		Designed	JB
Height Datum	AHD	Checked	PW
Grid	MGA	Approved	
File:	PC92.dwg		

Client: Goodman

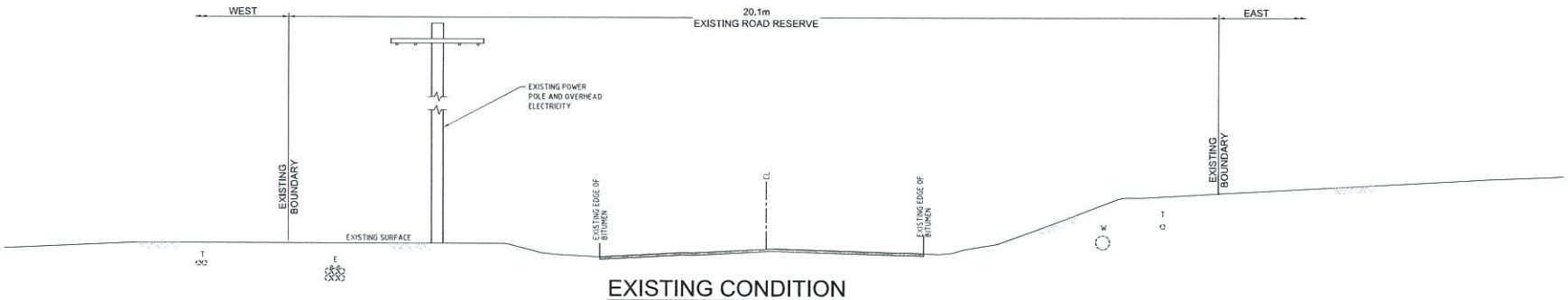
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL
OLD WALLGROVE ROAD
UPGRADE

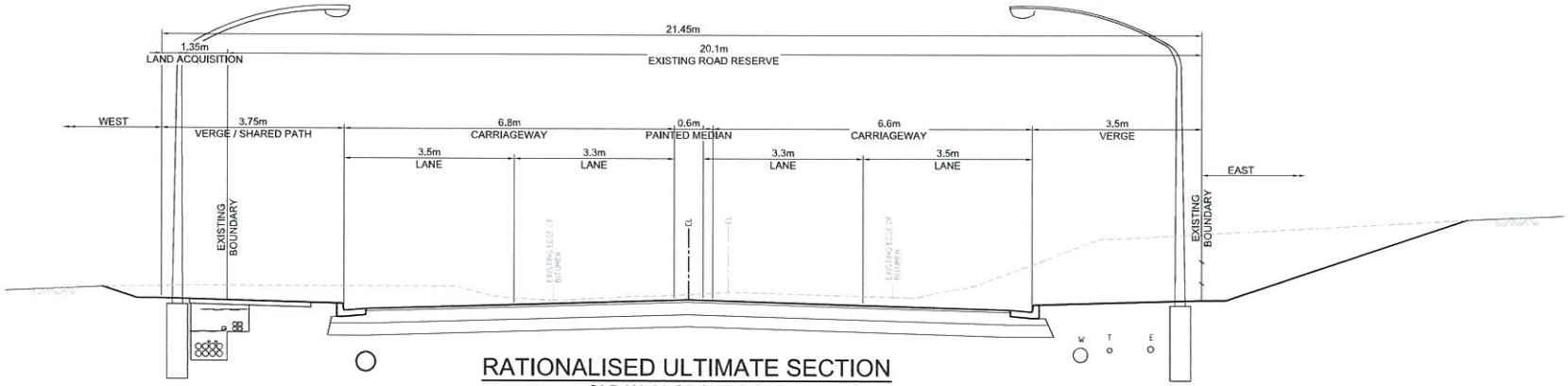
Title: INTERIM (STAGE 1)
ROADWORKS EXTENT
PLAN
SHEET 3

Drawing No.	Project No.	Issue
PC92	13-129	A

Date Plotted: 18 Jul 2014 - 05:24PM File Name: F:\13-129 OWR Upgrade\Drgs\Civil\Final\PC92.dwg V1



EXISTING CONDITION
OLD WALLGROVE ROAD
TYPICAL SECTION - CH1150
SCALE 1 : 50



RATIONALISED ULTIMATE SECTION
OLD WALLGROVE ROAD
TYPICAL SECTION - CH1150
SCALE 1 : 50

0 1 2 3 4 5m
1 : 50

Issue	Description	Date
A	ISSUED FOR CLIENT REVIEW	18-07-14

Status: FOR COSTING
NOT TO BE USED FOR CONSTRUCTION
A1

Scales	1 : 50 @ A1	Drawn	JB
		Designed	JB
Height Datum	AHD	Checked	PW
Grid	MGA	Approved	

File: PC103.dwg

Client: Goodman

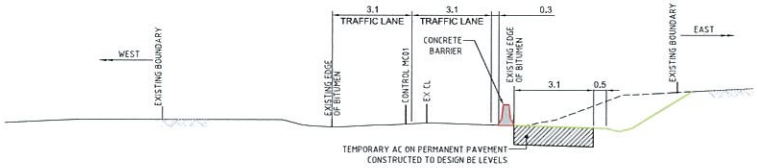
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project
OAKDALE CENTRAL
OLD WALLGROVE ROAD
UPGRADE

Title
RATIONALISED ULTIMATE
OVERALL TYPICAL ROAD
CROSS SECTIONS

Drawing No.	Project No.	Issue
PC103	13-129	A

When on Original

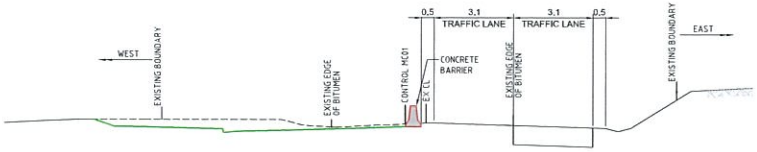


TYPICAL SECTION - RATIONALISED ULTIMATE

CH 1150

SCALE 1 : 100

CONSTRUCTION STAGE 1 - CONSTRUCT TEMPORARY PAVEMENT WIDENDING

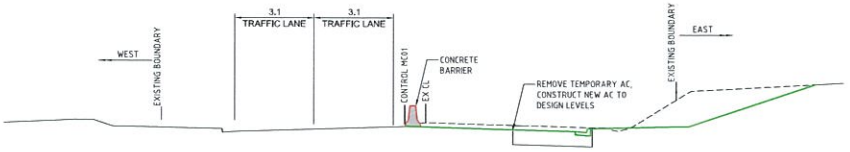


TYPICAL SECTION - RATIONALISED ULTIMATE

CH 1150

SCALE 1 : 100

CONSTRUCTION STAGE 2 - CONSTRUCT NEW PAVEMENT WESTERN SIDE



TYPICAL SECTION - RATIONALISED ULTIMATE

CH 1150

SCALE 1 : 100

CONSTRUCTION STAGE 3 - CONSTRUCT NEW PAVEMENT EASTERN SIDE

0 1 2 3 4 5m

1 : 50

LEGEND

- EXISTING
- TEMPORARY ENABLING WORKS
- RATIONALISED ULTIMATE WORKS
- TO BE DEMOLISHED / REMOVED

Issue	Description	Date
A	ISSUED FOR CLIENT REVIEW	18-07-14

Status: FOR COSTING
NOT TO BE USED FOR CONSTRUCTION

A1

Scales: 1 : 50 @ A1

Drawn: JB

Designed: JB

Height Datum: AHD

Checked: PW

Grid: MGA

Approved:

File: PC145.dwg

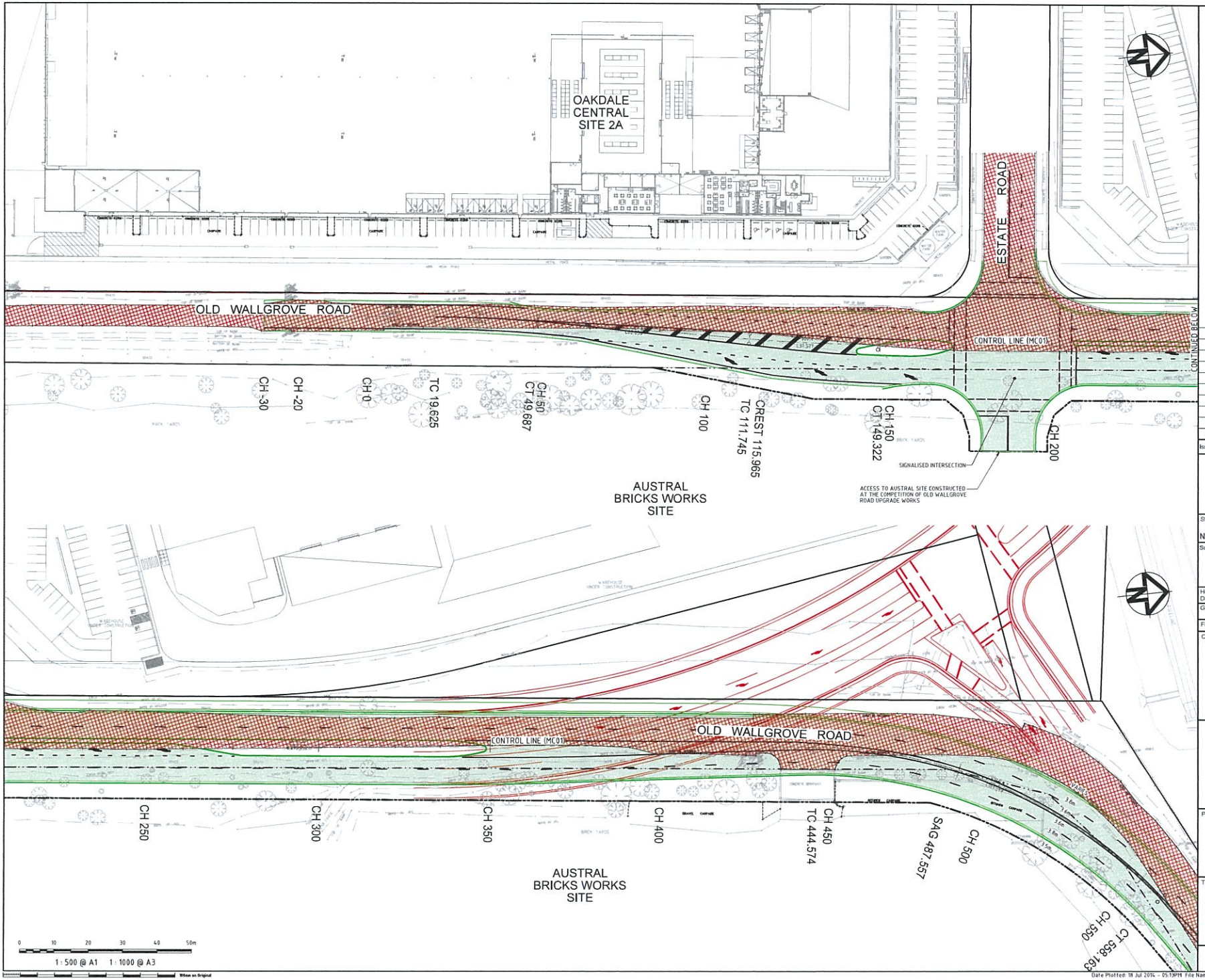
Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL
OLD WALLGROVE ROAD
UPGRADE

Title: RATIONALISED ULTIMATE
OVERALL
STAGING SECTIONS

Drawing No.	Project No.	Issue
PC145	13-129	A



LEGEND

- EXTENT OF EXISTING ROADWAY
- RATIONALISED ULTIMATE OVERALL ROADWORKS EXTENT

Issue	Description	Date
A	ISSUED FOR CLIENT REVIEW	18-07-14

Status: FOR COSTING
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 500 @ A1	Drawn JB	
		Designed JB	
Height Datum	AHD	Checked PW	
Grid	MGA	Approved	
File	PC150.dwg		

Client: Goodman

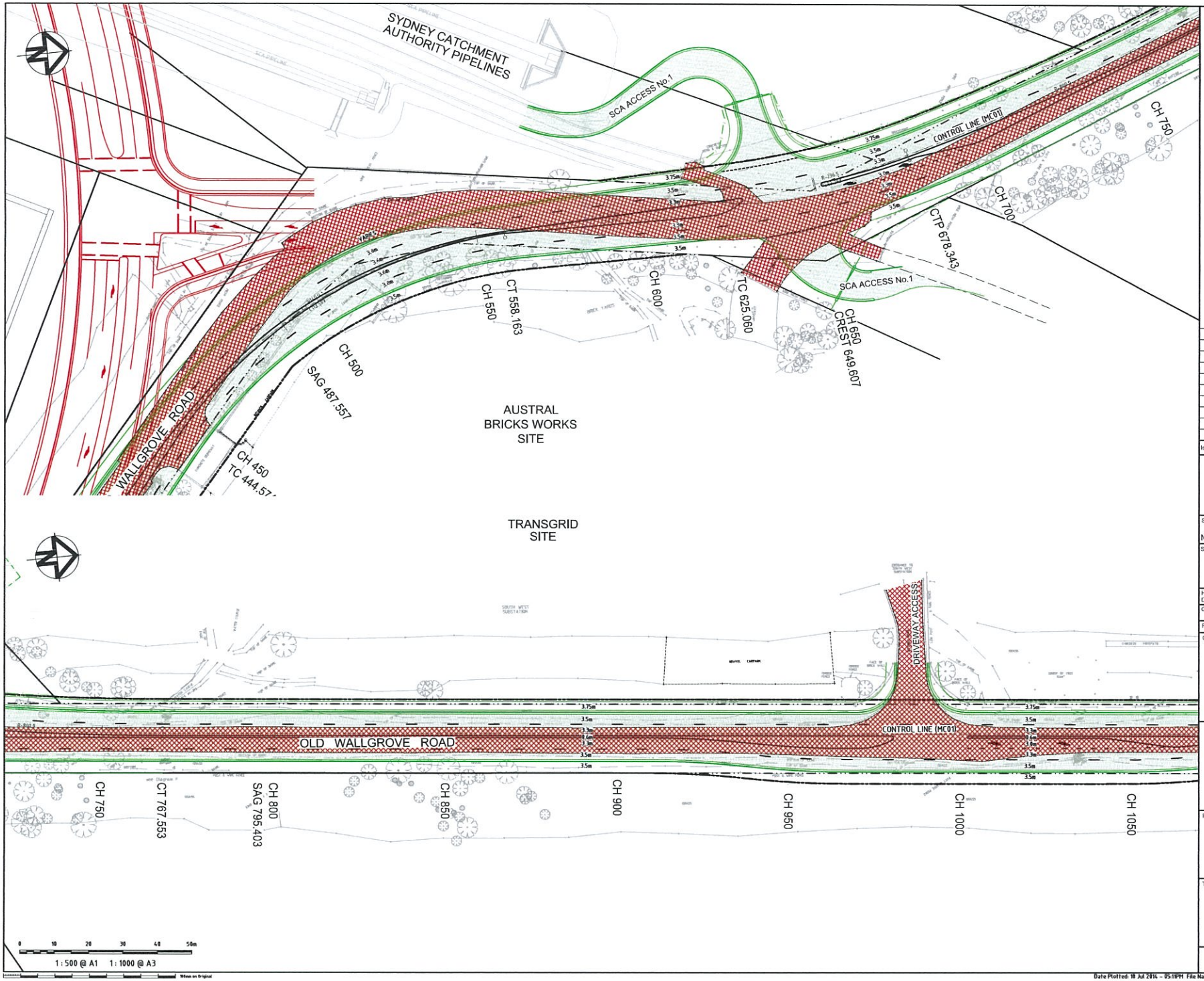
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 150 882 405
Tel 02 9439 1777
Fax 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL OLD WALLGROVE ROAD UPGRADE

Title: RATIONALISED ULTIMATE OVERALL WORKS EXTENT PLAN SHEET 1

Drawing No.	Project No.	Issue
PC150	13-129	A

Date Plotted: 18 Jul 2014 - 05:19PM File Name: F:\13-129 OWR Upgrade\Dwgs\Civil\Final\PC150.dwg V1



LEGEND

- EXTENT OF EXISTING ROADWAY
- RATIONALISED ULTIMATE OVERALL ROADWORKS EXTENT

Issue	Description	Date
A	ISSUED FOR CLIENT REVIEW	18-07-14

Status: FOR COSTING
NOT TO BE USED FOR CONSTRUCTION — A1

Scales	1 : 500 @ A1	Drawn JB	
		Designed JB	
Height Datum	AHD	Checked PW	
Grid	MGA	Approved	
File	PC151.dwg		

Client: Goodman

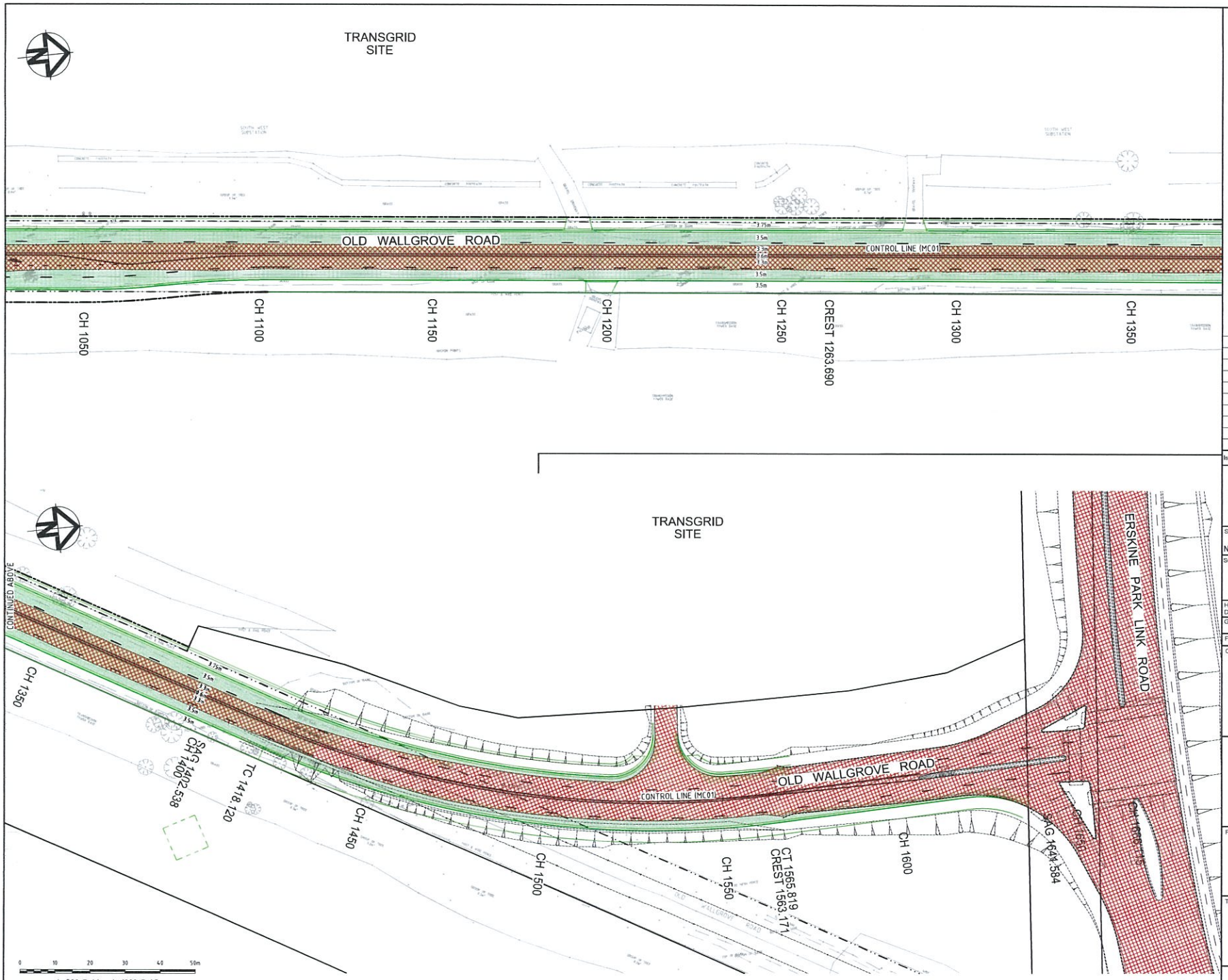
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL OLD WALLGROVE ROAD UPGRADE

Title: RATIONALISED ULTIMATE OVERALL WORKS EXTENT PLAN SHEET 2

Drawing No.	Project No.	Issue
PC151	13-129	A

Date Plotted: 18 Jul 2014 – 05:18PM File Name: F:\13-129 OWR Upgrade\Drgs\Civil\Final\PC151.dwg V1



LEGEND

- EXTENT OF EXISTING ROADWAY
- RATIONALISED ULTIMATE OVERALL ROADWORKS EXTENT

Issue	Description	Date
A	ISSUED FOR CLIENT REVIEW	18-07-14

Status: FOR COSTING
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 500 @ A1	Drawn	JB
		Designed	JB
Height Datum	AHD	Checked	PW
Grid	MGA	Approved	
File:	PC152.dwg		

Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel 02 9439 1777
Fax 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL
OLD WALLGROVE ROAD UPGRADE

Title: RATIONALISED ULTIMATE OVERALL WORKS EXTENT PLAN
SHEET 3

Drawing No.	Project No.	Issue
PC152	13-129	A

Date Plotted: 18 Jul 2014 - 05:12PM File Name: F:\13-129 OWR Upgrade\Drgs\Civil\Final\PC152.dwg V1

at&l

Attachment 4

Draft Traffic Report

Reference: 13.282l01v1

traffix
traffic & transport planners

suite 3.08
level 3 46a macleay street
potts point nsw 2011
po box 1061
potts point nsw 1335
t: +61 2 8324 8700
f: +61 2 9380 4481
w: www.traffix.com.au
director graham pindar
acn: 065132961
abn: 66065132961

1 August 2014

AT&L
Suite 702, 154 Pacific Highway
St Leonards NSW 2065

Attention: Mr Anthony McLandsborough

Re: Oakdale Central, Old Wallgrove Road

Dear Anthony,

As requested, as part of the planning for the upgrade of Old Wallgrove Road in conjunction with the delivery of the Oakdale Central precinct, we have investigated the following issues:

1. The need for a dedicated right turn pocket from Old Wallgrove Road into the existing Transgrid site;

2. The need for a second right turn lane from Old Wallgrove Road into Erskine Park Link Road; and

3. The need for the signalisation of the Old Wallgrove Road / Millner Avenue Intersection.

The results of these investigations are outlined following.

Right Turn Pocket into Transgrid Site

It is understood that Old Wallgrove Road is to be upgraded in accordance with the "Rationalised Ultimate" configuration as part of the delivery of the Oakdale Central. This configuration will comprise a 4-lane cross-section with 3.3m – 3.5m through lanes and a 600mm wide painted central median.

We have investigated the need for the provision of a dedicated right turn pocket from Old Wallgrove Road into the Transgrid site, which is located approximately 500m to the north of the Oakdale Central precinct, and is currently accessed from Old Wallgrove Road via a driveway crossover.

Traffic surveys were undertaken at the access to the Transgrid site to record existing volumes entering and exiting the site, as well as through traffic on Old Wallgrove Road. The results of these surveys are included as **Attachment A**, and demonstrate reasonable volumes of traffic entering and exiting the site, as summarised following:

- AM Peak: 87 arrivals and 11 departures; and
- PM Peak: 11 arrivals and 102 departures.

An assessment of the need for a right turn pocket into the Transgrid site has been undertaken, using the turn warrants outlined in Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections.

The results of this assessment are outlined in the table and graph below, and demonstrate that the current turning volumes into the Transgrid site combined with the through volumes on Old Wallgrove Road suggest that a short channelised right turn treatment (CHR(S)) into Transgrid is currently warranted.

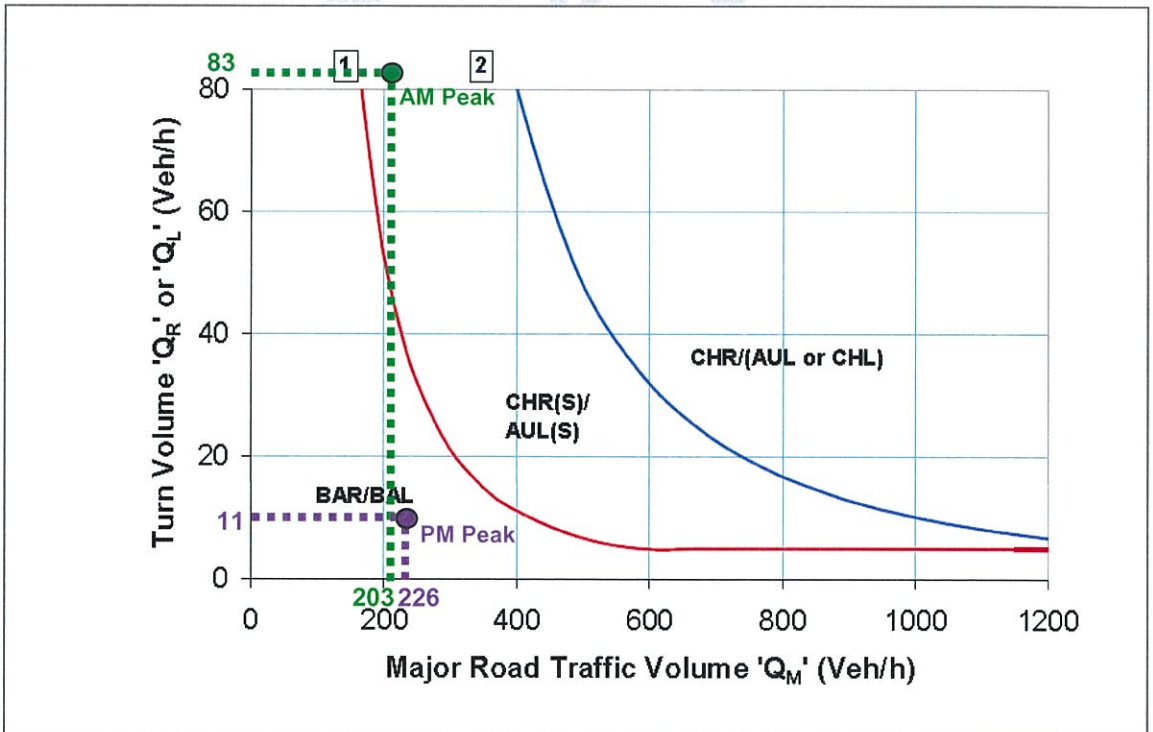
Furthermore, the development of substantial land parcels to the south of the site (including the Austral Bricks site and the CSR Bricks site) will only serve to increase the through traffic volumes on Old Wallgrove Road.

In light of the above, it is recommended that a dedicated right turn pocket from Old Wallgrove Road into the Transgrid site be constructed as part of the upgrade of Old Wallgrove Road.

Table 1: Recorded Traffic Volumes for Turn Warrants Assessment, Transgrid Access

	Major Road Traffic Volume (Q_M)	Turn Volume (Q_R)
AM Peak Hour	217/2* + 90 + 4 = 203	83
PM Peak Hour	83/2* + 184 + 0 = 226	11

* assumes a 4-lane major road cross-section, i.e. based upon the "Rationalised Ultimate" configuration of Old Wallgrove Rd



(b) Design speed < 100 km/h

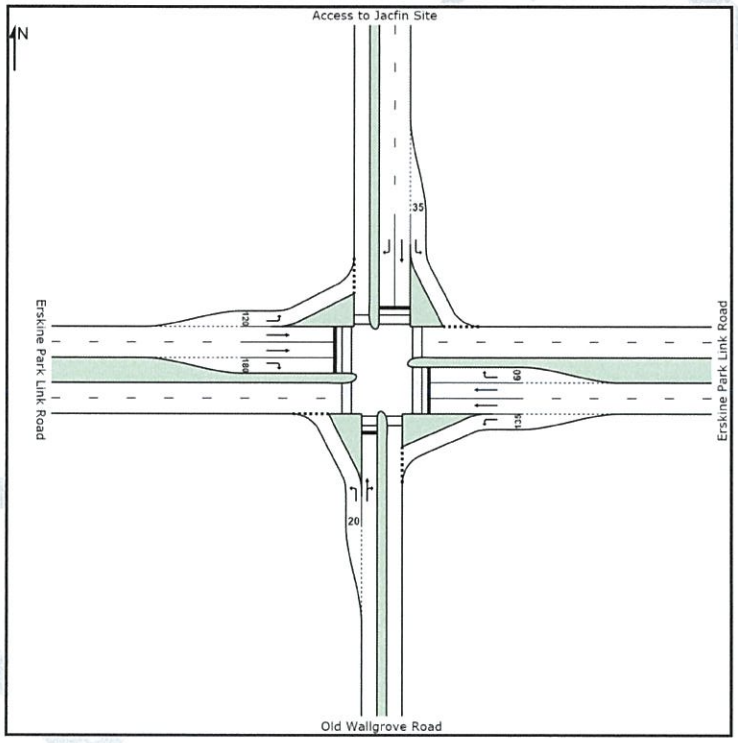
Second Right Turn Lane from Old Wallgrove Road into Erskine Park Link Road

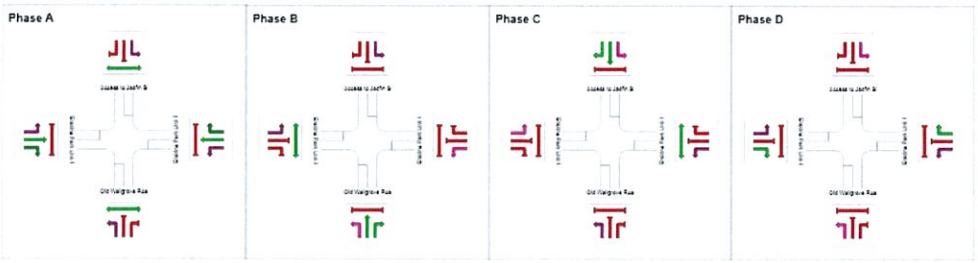
The Erskine Park Link Road / Old Wallgrove Road intersection was constructed in mid-2013 as a signalised T-intersection, as part of the delivery of the Erskine Park Link Road.

Various intersection configurations were investigated by GHD as discussed in the report "Old Wallgrove Road Extension – Traffic and Transport Analysis, Summary of Modelling Findings, 18 July 2013." The results indicate that this intersection was expected to operate acceptably as a T-intersection with a single right turn from Old Wallgrove Road into Erskine Park Link Road at 2031, at a Level of Service C (although the modelled queue for this movement was about 230m).

It is understood however that this intersection is to be upgraded to a 4-way signalised intersection, with a fourth (northern leg) to be constructed to provide access to the Jacfin land parcel to the north.

Accordingly, this intersection has been analysed as a 4-way signalised intersection, with the modelled geometry and phasing arrangement as shown below.





The modeled intersection volumes reflect those in the GHD report "Old Wallgrove Road Extension – Traffic and Transport Analysis, Summary of Modelling Findings, 18 July 2013" for the 2021 PM peak design horizon, with a nominal 50vph assumed for each movement into and out of the fourth (northern) intersection leg.

The results of these analyses indicate even with low volumes of traffic accessing the Jacfin land parcel to the north of the intersection, the intersection is expected to fail prior to 2021, with the fourth intersection leg. The table below provides the model results, which indicate a Level of Service F for the intersection, and queues on Old Wallgrove Road of approximately 500m.

Table 2: Modelled Intersection Performance, 2021 PM Peak
Single Right Turn Lane from Old Wallgrove Road

Signals - Fixed Time Cycle Time = 150 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Old Wallgrove Road											
1	L2	50	14.0	0.092	17.5	LOS B	1.5	11.5	0.44	0.65	45.9
2	T1	50	0.0	0.966	86.8	LOS F	63.7	495.0	0.97	1.08	24.0
3	R2	612	14.0	0.966	92.6	LOS F	63.7	495.0	0.97	1.08	23.7
Approach		712	13.0	0.966	86.9	LOS F	63.7	495.0	0.93	1.05	24.5
East: Erskine Park Link Road											
4	L2	442	14.0	0.358	7.7	LOS A	5.8	45.4	0.25	0.62	52.2
5	T1	653	14.0	0.903	78.5	LOS F	27.8	217.9	1.00	1.08	26.2
6	R2	50	0.0	0.393	55.6	LOS D	2.9	20.2	1.00	0.74	31.0
Approach		1145	13.4	0.903	50.2	LOS D	27.8	217.9	0.71	0.89	32.8
North: Access to Jacfin Site											
7	L2	50	0.0	0.222	39.1	LOS C	2.5	17.8	0.72	0.72	36.3
8	T1	50	0.0	0.183	61.6	LOS E	3.2	22.7	0.92	0.70	29.9
9	R2	50	0.0	0.192	67.4	LOS E	3.3	22.8	0.92	0.74	28.3
Approach		150	0.0	0.222	56.0	LOS D	3.3	22.8	0.85	0.72	31.2
West: Erskine Park Link Road											
10	L2	50	0.0	0.048	13.1	LOS A	1.1	7.8	0.37	0.64	48.8
11	T1	706	14.0	0.956	98.2	LOS F	33.6	263.4	1.00	1.23	23.0
12	R2	50	14.0	0.414	56.0	LOS D	2.9	22.9	1.00	0.74	30.6
Approach		806	13.1	0.956	90.3	LOS F	33.6	263.4	0.96	1.16	24.2
All Vehicles		2813	12.5	0.966	71.3	LOS F	63.7	495.0	0.84	1.00	27.5

Given the results of the analyses above, the intersection was modelled with a second right turn lane from Old Wallgrove Road into Erskine Park Link Road. The results (shown in the table below) indicate substantially better performance, with a Level of Service C and 95th percentile queues on for critical movements in the order of 150m.

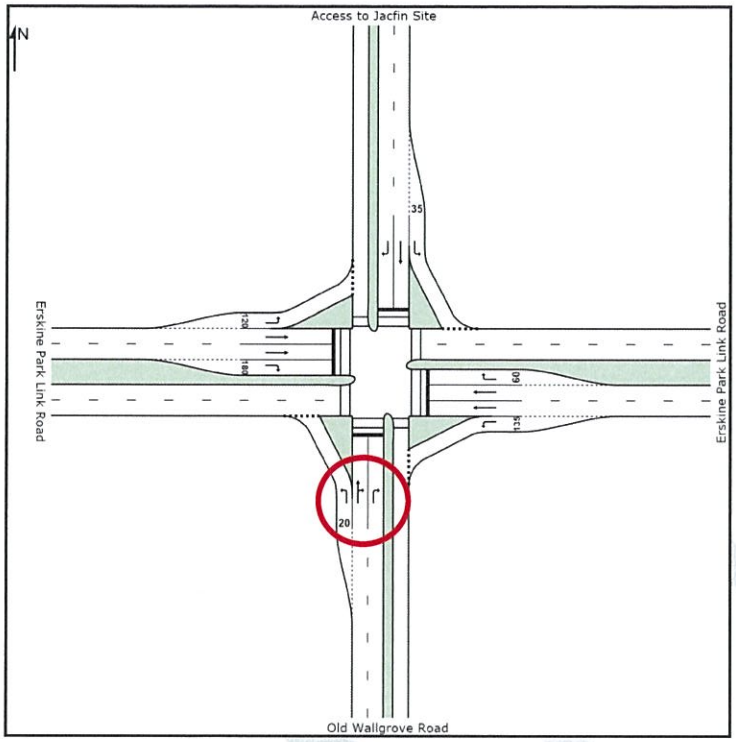


Table 3: Modelled Intersection Performance, 2021 PM Peak
Dual Right Turn from Old Wallgrove Road

Signals - Fixed Time Cycle Time = 100 seconds (Practical Cycle Time)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Old Wallgrove Road											
1	L2	50	14.0	0.113	17.0	LOS B	1.2	9.1	0.54	0.67	46.1
2	T1	50	0.0	0.854	47.2	LOS D	15.8	121.6	0.97	0.98	32.5
3	R2	612	14.0	0.854	53.2	LOS D	19.4	152.5	0.99	0.97	31.7
Approach		712	13.0	0.854	50.3	LOS D	19.4	152.5	0.95	0.95	32.5
East: Erskine Park Link Road											
4	L2	442	14.0	0.376	8.1	LOS A	5.1	39.9	0.33	0.65	51.9
5	T1	653	14.0	0.767	41.4	LOS C	16.0	125.2	0.99	0.91	35.7
6	R2	50	0.0	0.268	33.5	LOS C	1.7	12.1	0.94	0.73	38.2
Approach		1145	13.4	0.767	28.2	LOS B	16.0	125.2	0.73	0.80	40.8
North: Access to Jacfin Site											
7	L2	50	0.0	0.106	21.7	LOS B	1.4	9.9	0.62	0.68	43.8
8	T1	50	0.0	0.122	34.7	LOS C	2.0	13.9	0.85	0.64	38.3
9	R2	50	0.0	0.128	40.4	LOS C	2.0	14.0	0.85	0.73	35.7
Approach		150	0.0	0.128	32.2	LOS C	2.0	14.0	0.77	0.68	39.0
West: Erskine Park Link Road											
10	L2	50	0.0	0.058	16.1	LOS B	1.1	7.6	0.53	0.67	46.9
11	T1	706	14.0	0.823	44.9	LOS D	18.2	142.4	1.00	0.98	34.5
12	R2	50	14.0	0.275	33.6	LOS C	1.7	13.7	0.93	0.73	37.9
Approach		806	13.1	0.823	42.4	LOS C	18.2	142.4	0.97	0.94	35.3
All Vehicles		2813	12.5	0.854	38.1	LOS C	19.4	152.5	0.86	0.88	36.7

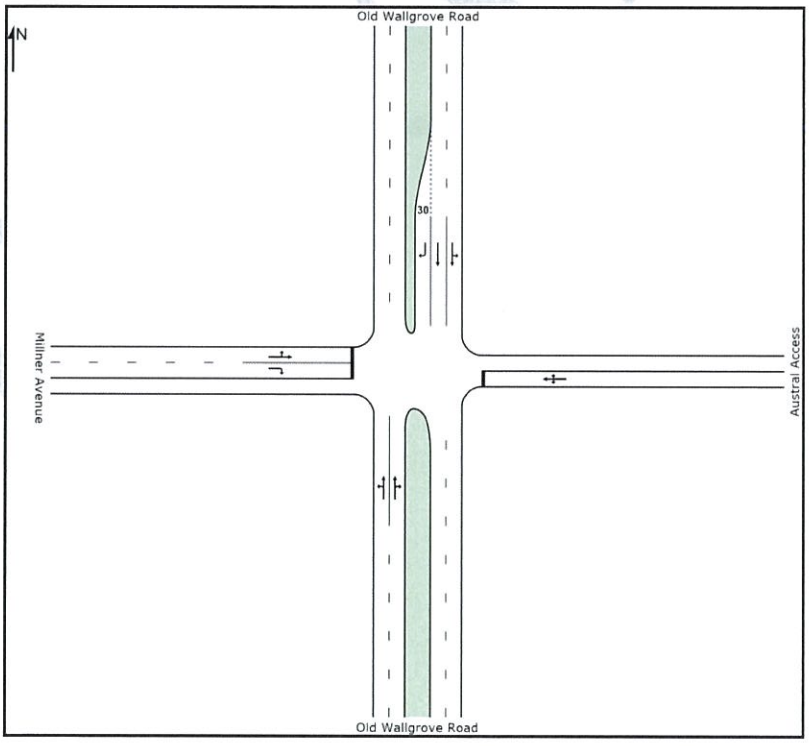
Whilst a number of assumptions were made necessarily in these analyses (regarding broader road network modifications and the level of development in the area), and alternative signal phasing arrangements which may influence the performance of the intersection are feasible, it would appear that the introduction of a fourth (northern) intersection approach at the Old Wallgrove Road / Erskine Park Link Road intersection would be likely to trigger the need for a second right turn lane from Old Wallgrove Road in the short to medium term, even with relatively low traffic volumes turning into and out of this northern leg.

Need for the signalisation of the Old Wallgrove Road / Millner Avenue Intersection

The Old Wallgrove Road / Millner Avenue Intersection currently operates as a priority-controlled T-intersection, however as part of the upgrade of Old Wallgrove Road, a fourth (eastern) intersection approach is to be constructed, which will provide access to the Austral site. The two existing access driveways to the Austral site are to be closed, with all access to this site to be via the 4-way intersection.

Traffic surveys of the Old Wallgrove Road / Millner Avenue Intersection and the two access driveways to the Austral site have been undertaken, with the results provided in **Attachment B**.

Intersection analyses have been undertaken of the Old Wallgrove Road / Millner Avenue Intersection as a 4-way intersection (assumed geometry shown below), with all traffic which currently accesses the Austral site via the driveways, instead doing so via this intersection.



The results of these analyses indicate that during the critical PM peak period, the intersection is expected to operate acceptably with existing traffic volumes on Old Wallgrove Road and turning into and out of the Austral site, with the critical movement operating at Level of Service B.

However an increase in traffic volumes on Old Wallgrove Road and into and out of the Austral site would trigger the need for the signalisation of this intersection. Sensitivity analyses have been undertaken, with a summary of the results provided following:

Table 4: Summary of Results of Sensitivity Analyses, Old Wallgrove Road / Millner Avenue Intersection

Scenario	Old Wallgrove Road – Assumed Traffic Volume Increase	Austral Access - Assumed Traffic Volume Increase	Level of Service (Critical Movement)
Existing Volumes	NA	NA	Level of Service B
Sensitivity Test 1	+100vph (northbound) +100vph (southbound)	+100vph (entering from north) +100vph (exiting to north)	Level of Service C
Sensitivity Test 2	+120vph (northbound) +120vph (southbound)	+120vph (entering from north) +120vph (exiting to north)	Level of Service D
Sensitivity Test 3	+150vph (northbound) +150vph (southbound)	+150vph (entering from north) +150vph (exiting to north)	Level of Service F

These results indicate that with just partial development of the approximately 75 ha land parcels to the south (the CSR site) and the east of the intersection (the Austral site), the intersection of Old Wallgrove Road / Millner Avenue will require signalisation.

Based upon the traffic generation rate of 10.5 trips per hectare assumed by GHD as part of previous studies, these traffic volumes equate to approximately the following level of development:

- 100vph in and out: 19 ha of development
- 120vph in and out: 23 ha of development
- 150vph in and out: 29 ha of development

In light of the results of the sensitivity analyses undertaken, it is recommended that the intersection of Old Wallgrove Road / Millner Avenue be signalised as part of the upgrade of Old Wallgrove Road.

Summary of Findings and Recommendations

In summary, based upon the results of our investigations and the assumptions outlined above, it is recommended that:

- a dedicated right turn pocket from Old Wallgrove Road into the Transgrid site be constructed as part of the upgrade of Old Wallgrove Road;
- a second right turn lane from Old Wallgrove Road to Erskine Park Link Road be provided when the fourth (northern) approach is constructed; and

- the intersection of Old Wallgrove Road / Millner Avenue be signalised as part of the upgrade of Old Wallgrove Road.

Please contact the undersigned should you have any queries or require any further information regarding the above.

Yours faithfully,

traffix

Anne Coutts
Senior Engineer

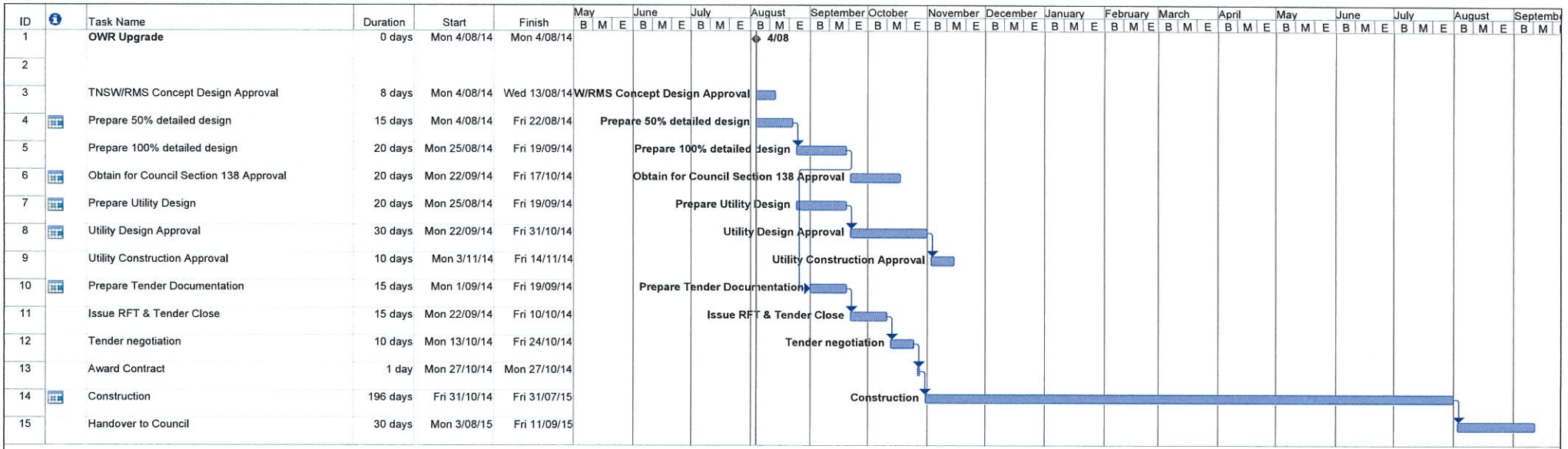
Attachment 1

Attachment 2

at&l

Attachment 5

Draft Program

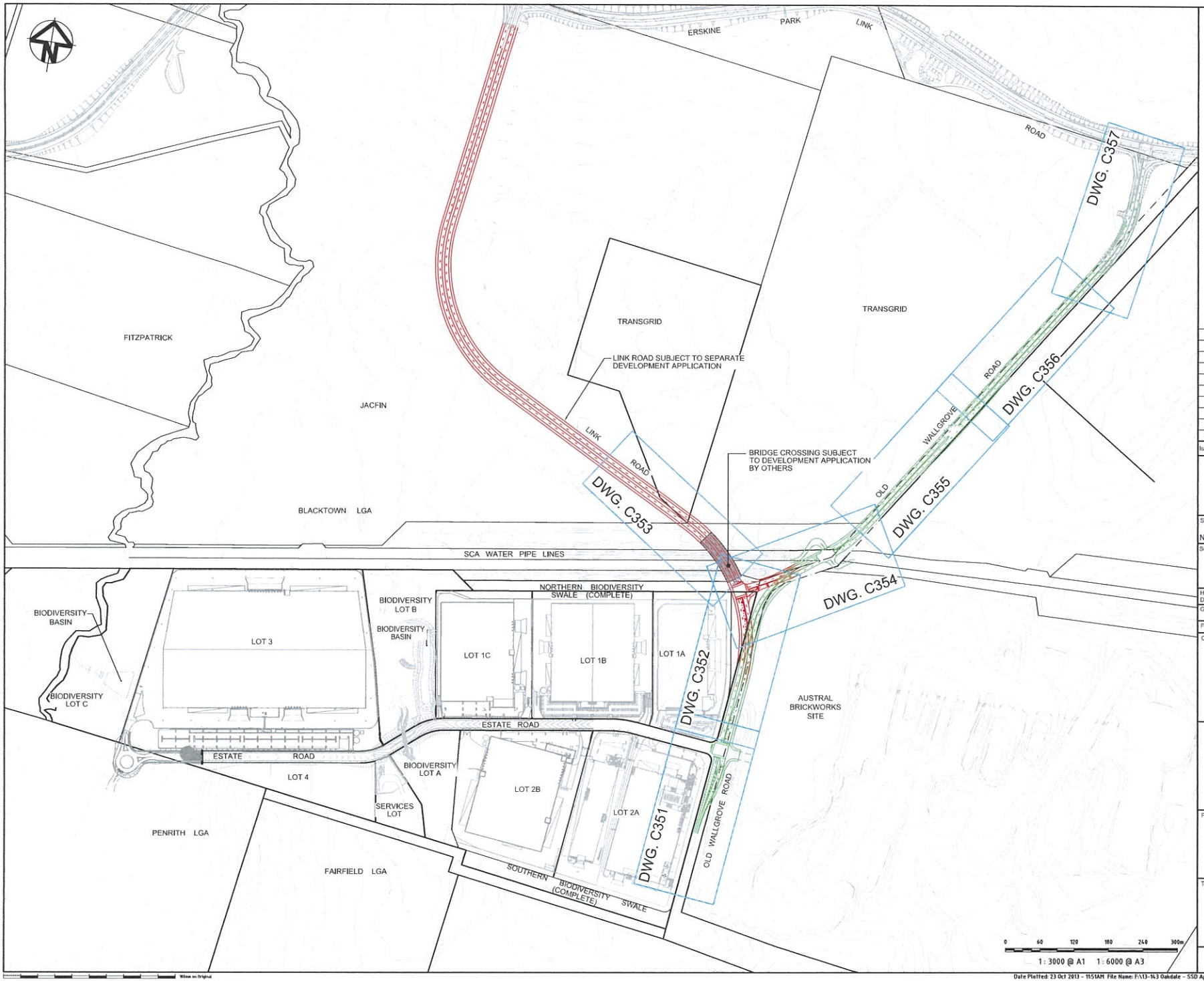


Project: OWR Indicative Project Progra
Date: Mon 4/08/14

Task	Project Summary	Inactive Task	Duration-only	Finish-only	
Split	External Tasks	Inactive Milestone	Manual Summary Rollup	Progress	
Milestone	External Milestone	Inactive Summary	Manual Summary	Deadline	
Summary	Inactive Task	Manual Task	Start-only		

Attachment 6

SSDA Drawings



Issue	Description	Date
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 3000 @ A1	Drawn	TS
		Designed	MM
Height Datum	AHD	Checked	MM
Grid	MGA	Approved	
File:	C350.dwg		

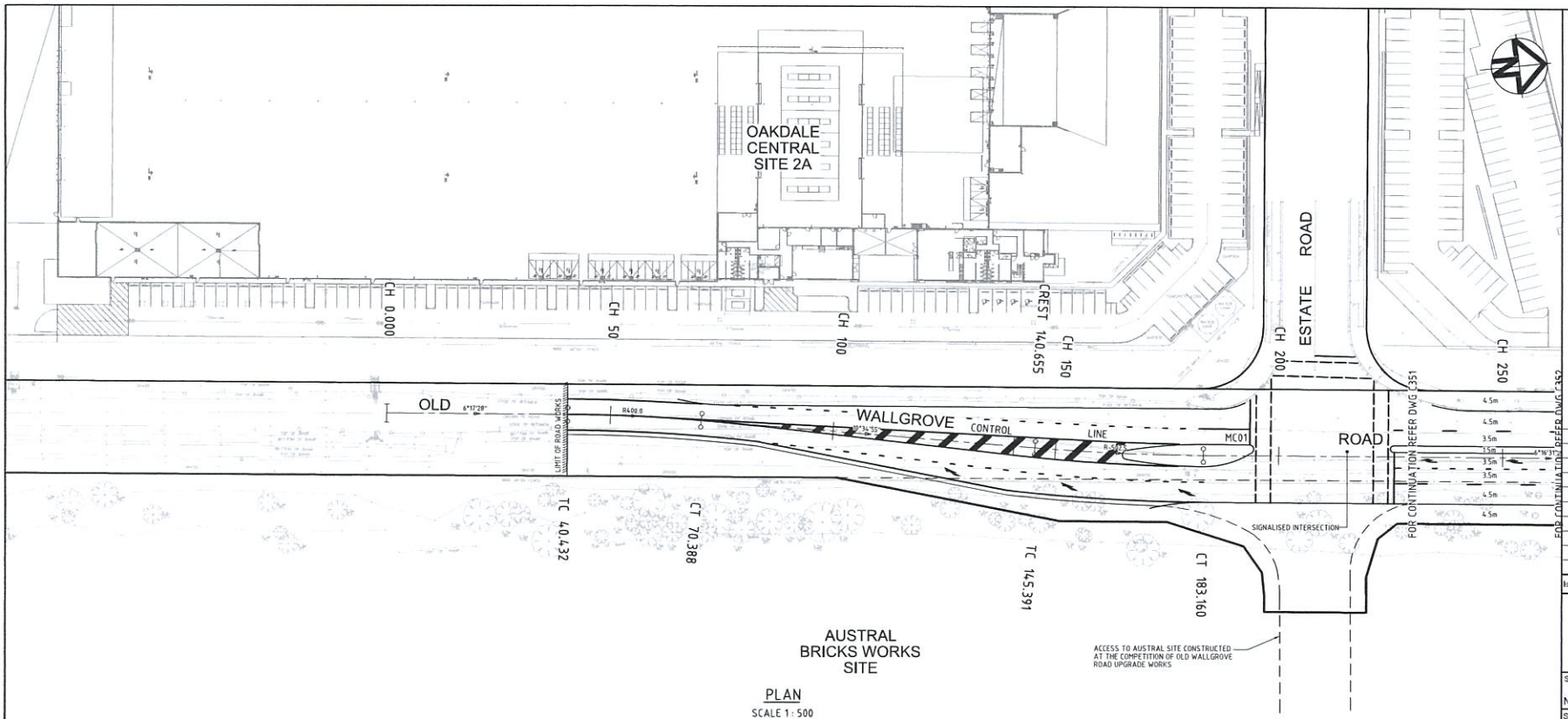
Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

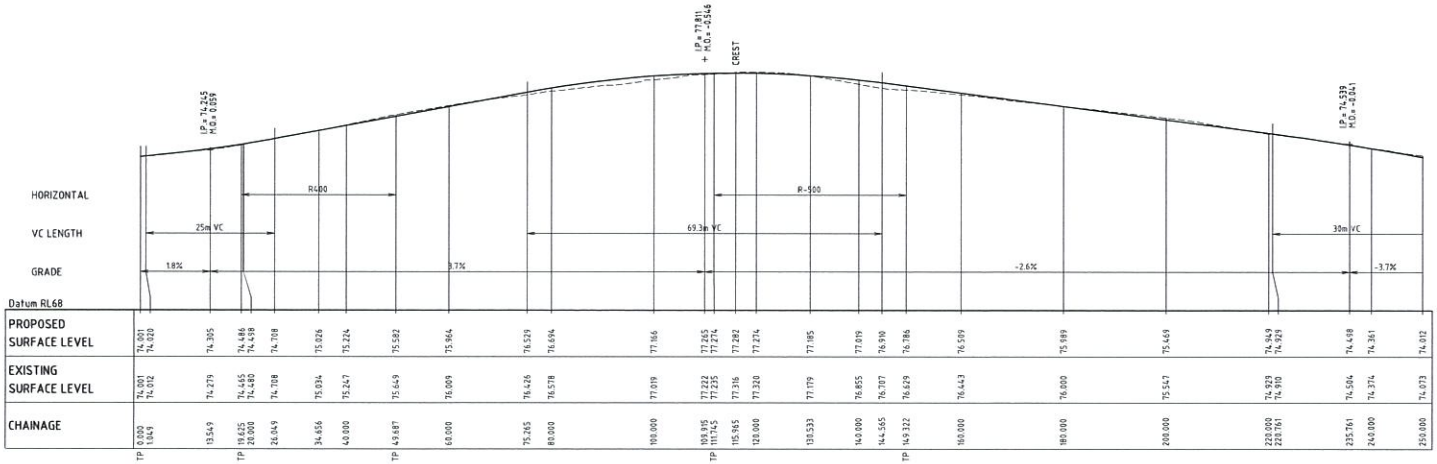
Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: OLD WALLGROVE ROAD UPGRADE GENERAL ARRANGEMENT PLAN

Drawing No.	Project No.	Issue
C350	13-143	B



PLAN
SCALE 1 : 500



CONTROL LINE MC01 LONGITUDINAL SECTION
SCALE 1:500 HORI
1:250 VERT.

0 5 10 15 20 25m
1 : 250 @ A1 1 : 500 @ A3
0 10 20 30 40 50m
1 : 500 @ A1 1 : 1000 @ A3

Issue	Description	Date
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION
A1

Scales	AS SHOWN	Drawn	TS
		Designed	MM
Height Datum	AHD	Checked	MM
Grid	MGA	Approved	
File:	C351.dwg		

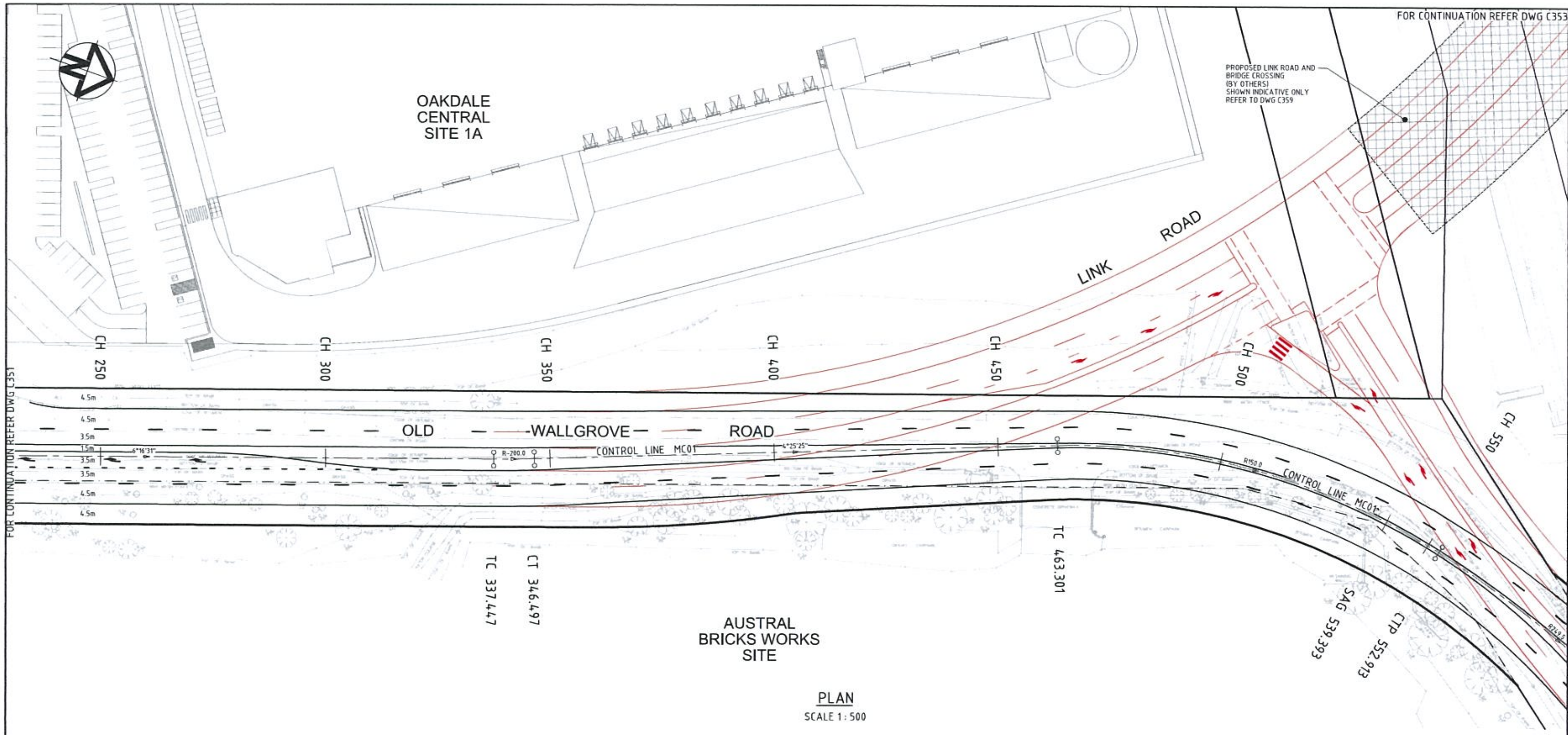
Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

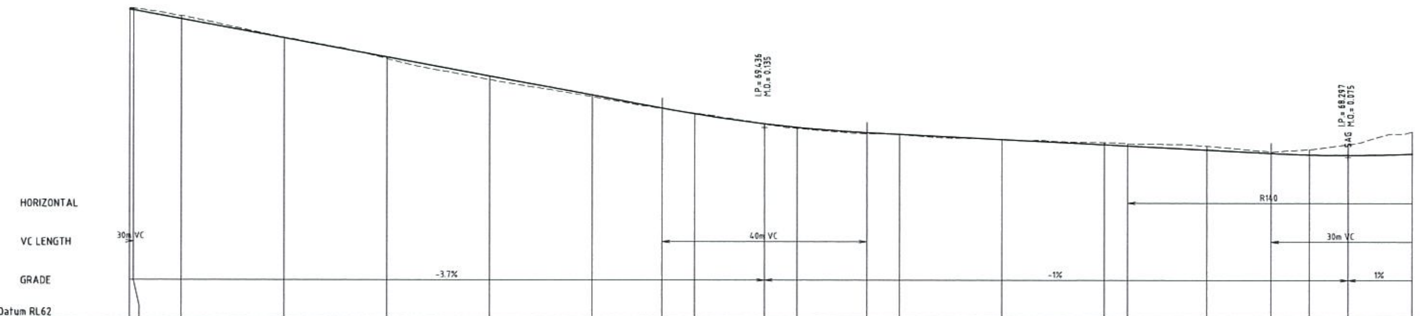
Title: OLD WALLGROVE ROAD (MC01) PLAN AND LONGITUDINAL SECTION SHEET 1

Drawing No.	Project No.	Issue
C351	13-143	C



PLAN

SCALE 1 : 500



CHAINAGE	PROPOSED SURFACE LEVEL	EXISTING SURFACE LEVEL
250.000	74.012	74.073
250.761	73.984	74.051
260.000	73.642	73.761
280.000	72.902	72.922
300.000	72.162	72.097
320.000	71.422	71.287
340.000	70.682	70.616
353.677	70.176	70.166
360.000	69.955	69.988
373.677	69.571	69.562
380.000	69.436	69.403
393.677	69.236	69.197
400.000	69.173	69.160
420.000	68.973	68.967
440.000	68.773	68.855
TP 444.574	68.727	68.814
460.000	68.573	68.720
472.557	68.447	68.516
480.000	68.391	68.593
487.557	68.372	68.768
500.000	68.424	69.284

CONTROL LINE MC01 LONGITUDINAL SECTION

SCALE 1:500 HORI.
1:250 VERT.

0 5 10 15 20 25m
1 : 250 @ A1 1 : 500 @ A3
0 10 20 30 40 50m
1 : 500 @ A1 1 : 1000 @ A3

Issue	Description	Date
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL — NOT TO BE USED FOR CONSTRUCTION — A1

Scales: AS SHOWN
Drawn: TS
Designed: MM
Checked: MM
Approved:
Height Datum: AHD
Grid: MGA
File: C352.dwg

Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

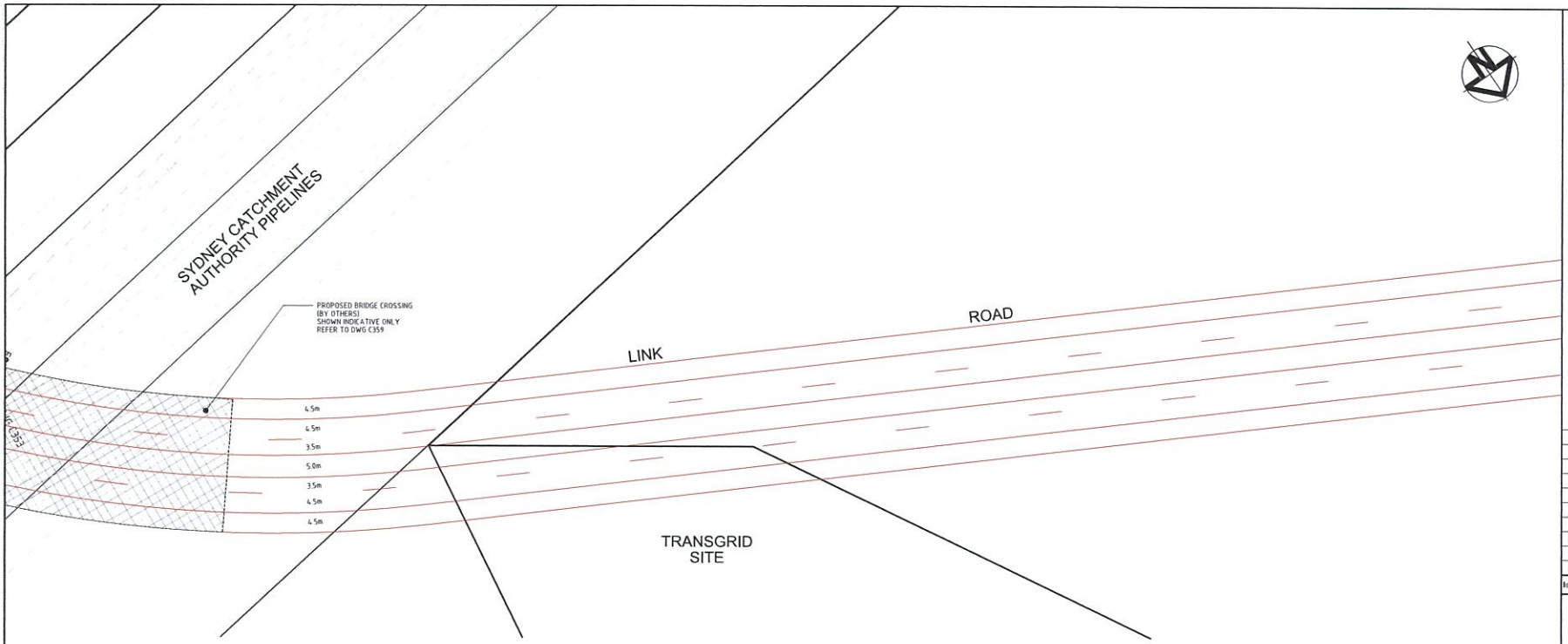
Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: OLD WALLGROVE ROAD (MC01) PLAN AND LONGITUDINAL SECTION SHEET 2

Drawing No.: C352 | Project No.: 13-143 | Issue: C

100mm on Original

Date Plotted: 20 May 2014 - 04:29PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C352.dwg V1



PLAN
SCALE 1 : 500

0 10 20 30 40 50m
1 : 500 @ A1 1 : 1000 @ A3

Issue	Description	Date
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION
A1

Scales	AS SHOWN	Drawn TS	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	
File:	C353.dwg		

Client: Goodman

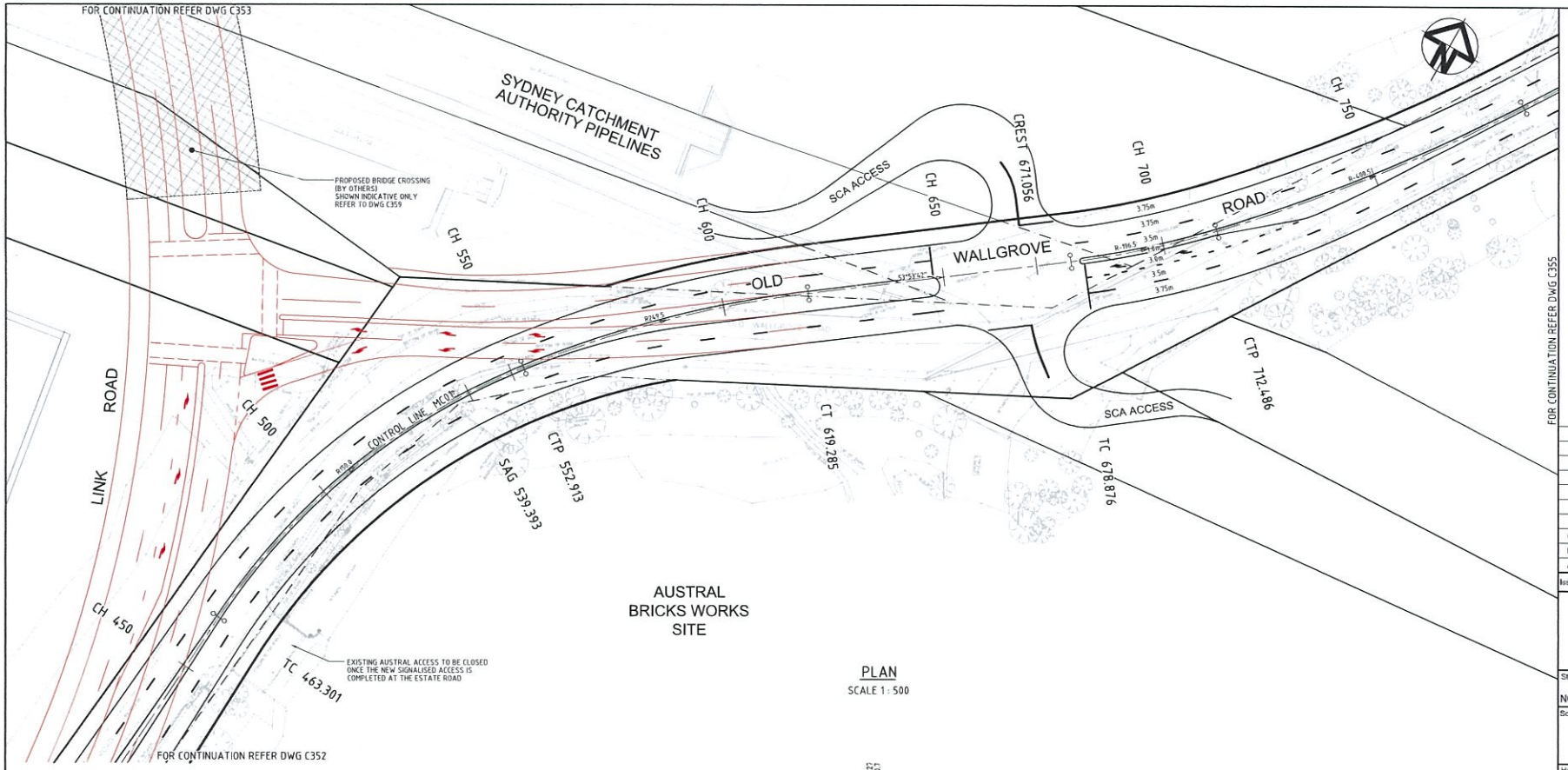
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

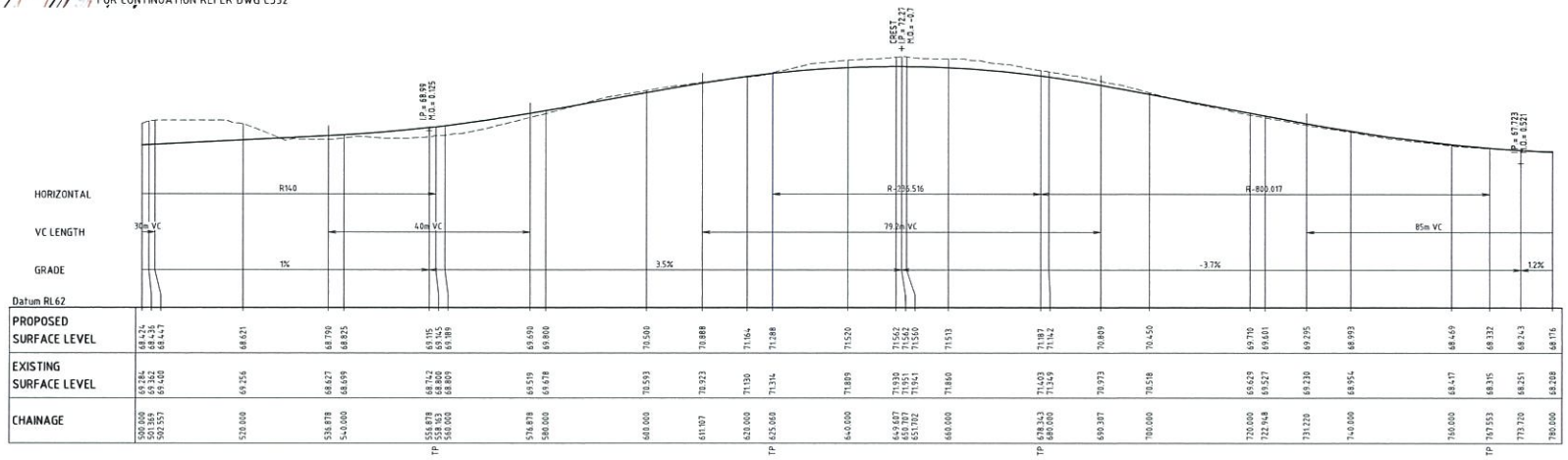
Title: LINK ROAD (MC01) PLAN AND LONGITUDINAL SECTION SHEET 3

Drawing No.	Project No.	Issue
C353	13-143	C

When as Original



PLAN
SCALE 1 : 500



CONTROL LINE MC01 LONGITUDINAL SECTION
SCALE 1:500 HORI.
1:250 VERT.

0 5 10 15 20 25m
1 : 250 @ A1 1 : 500 @ A3
0 10 20 30 40 50m
1 : 500 @ A1 1 : 1000 @ A3

Issue	Description	Date
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION
A1

Scales	AS SHOWN	Drawn	TS
		Designed	MM
Height Datum	AHD	Checked	MM
Grid	MGA	Approved	
File:	C354.dwg		

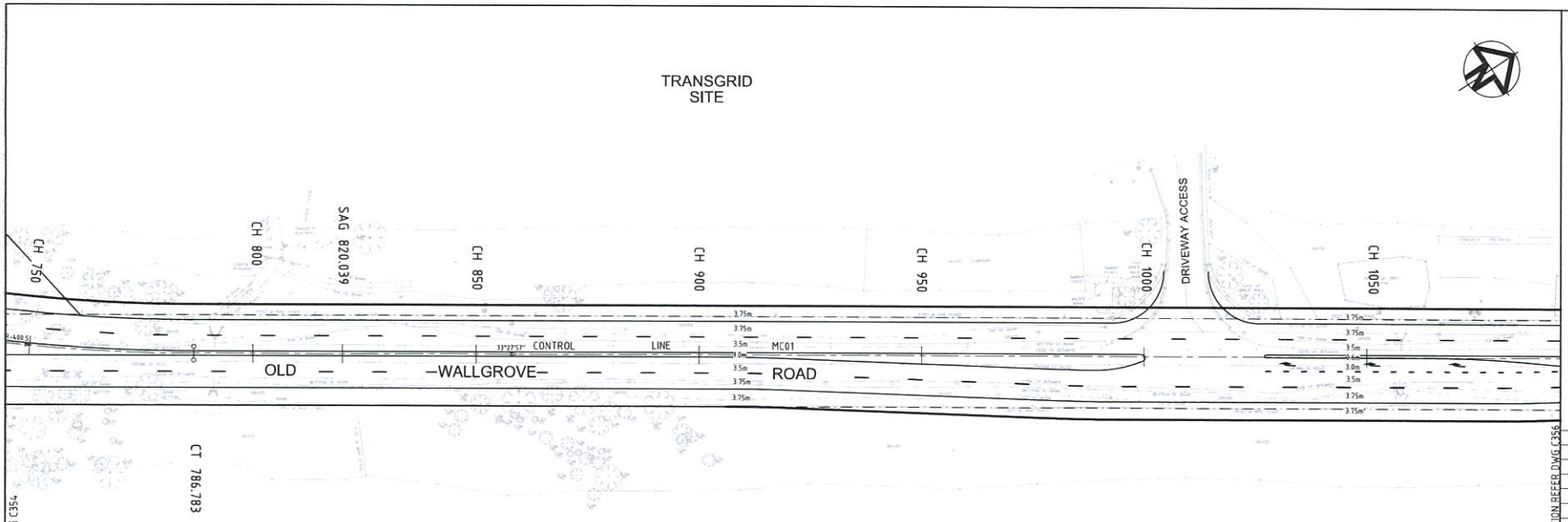
Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

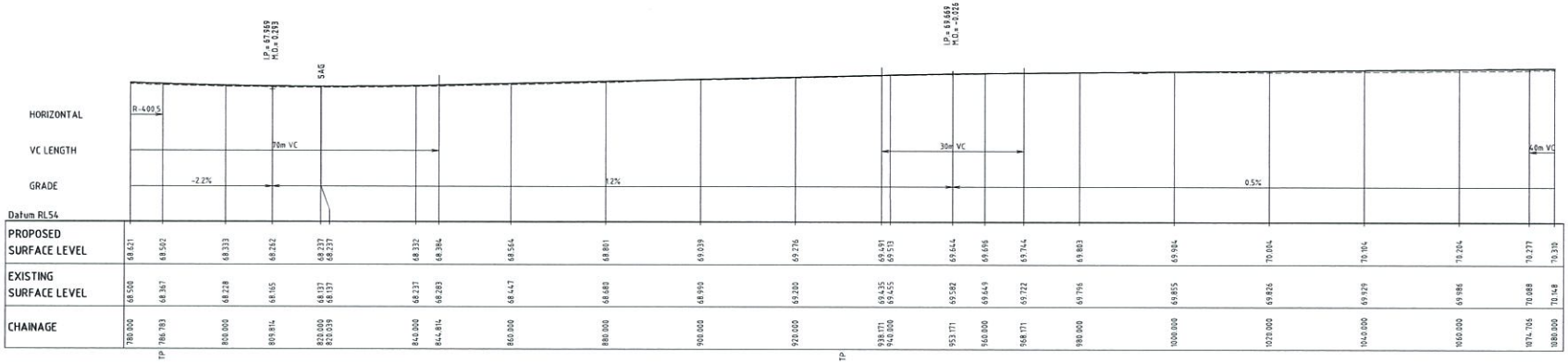
Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: OLD WALLGROVE ROAD PLAN AND LONGITUDINAL SECTION SHEET 4

Drawing No.	Project No.	Issue
C354	13-143	C



PLAN
SCALE 1 : 500



CONTROL LINE MC01 LONGITUDINAL SECTION
SCALE 1:500 HORI.
1:250 VERT.

1 : 250 @ A1 1 : 500 @ A3

1 : 500 @ A1 1 : 1000 @ A3

Issue	Description	Date
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION
A1

Scales	AS SHOWN	Drawn TS	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	
File:	C355.dwg		

Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

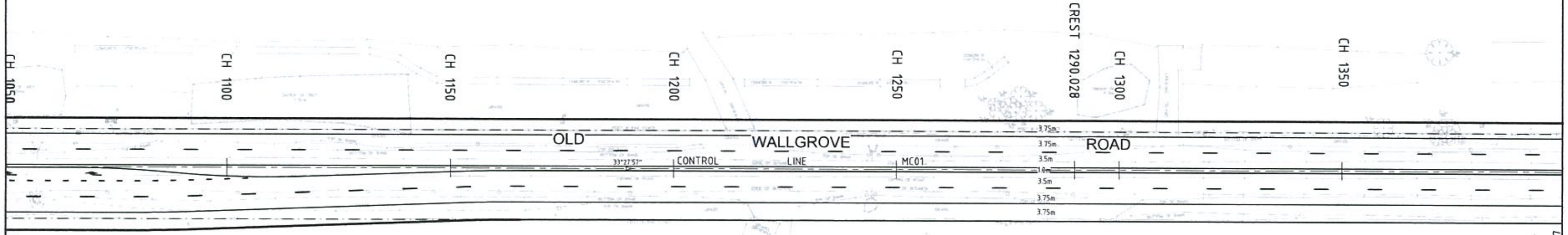
Title: OLD WALLGROVE ROAD PLAN AND LONGITUDINAL SECTION SHEET 5

Drawing No.	Project No.	Issue
C355	13-143	C

When on Original

Date Plotted: 20 May 2014 - 03:14PM File Name: F:\13-143 Oakdale - SSD Application\Dwgs\Civil\Final\Lots 1C 2B 3A 3B\C355.dwg V1

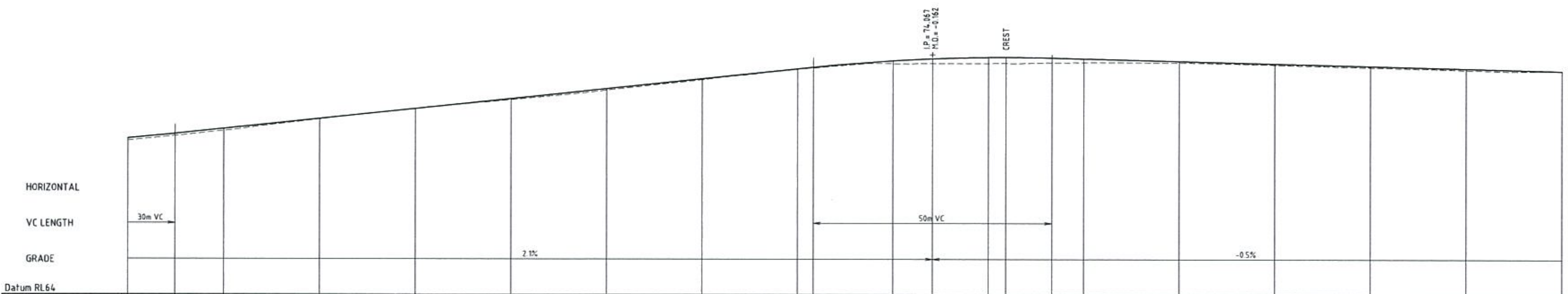
TRANSGRID SITE



FOR CONTINUATION REFER DWG C355

FOR CONTINUATION REFER DWG C357

PLAN
SCALE 1 : 500



PROPOSED SURFACE LEVEL	70.556	70.740	70.953	71.373	71.793	72.213	72.633	73.053	73.473	73.542	73.820	73.904	73.962	73.966	73.942	73.908	73.808	73.708	73.608	73.508	73.408
EXISTING SURFACE LEVEL	70.461	70.655	70.869	71.350	71.798	72.170	72.574	73.015	73.461	73.513	73.701	73.710	73.715	73.717	73.745	73.756	73.752	73.663	73.555	73.446	73.399
CHAINAGE	1080.000	1089.861	1100.000	1120.000	1140.000	1160.000	1180.000	1200.000	1220.000	1223.306	1240.000	1248.306	1260.000	1263.690	1273.306	1280.000	1300.000	1320.000	1340.000	1360.000	1380.000

CONTROL LINE MC01 LONGITUDINAL SECTION
SCALE 1:500 HORI.
1:250 VERT.

Issue	Description	Date
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION
A1

Scales: AS SHOWN
Drawn: TS
Designed: MM
Height Datum: AHD
Checked: MM
Grid: MGA
Approved
File: C356.dwg
Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

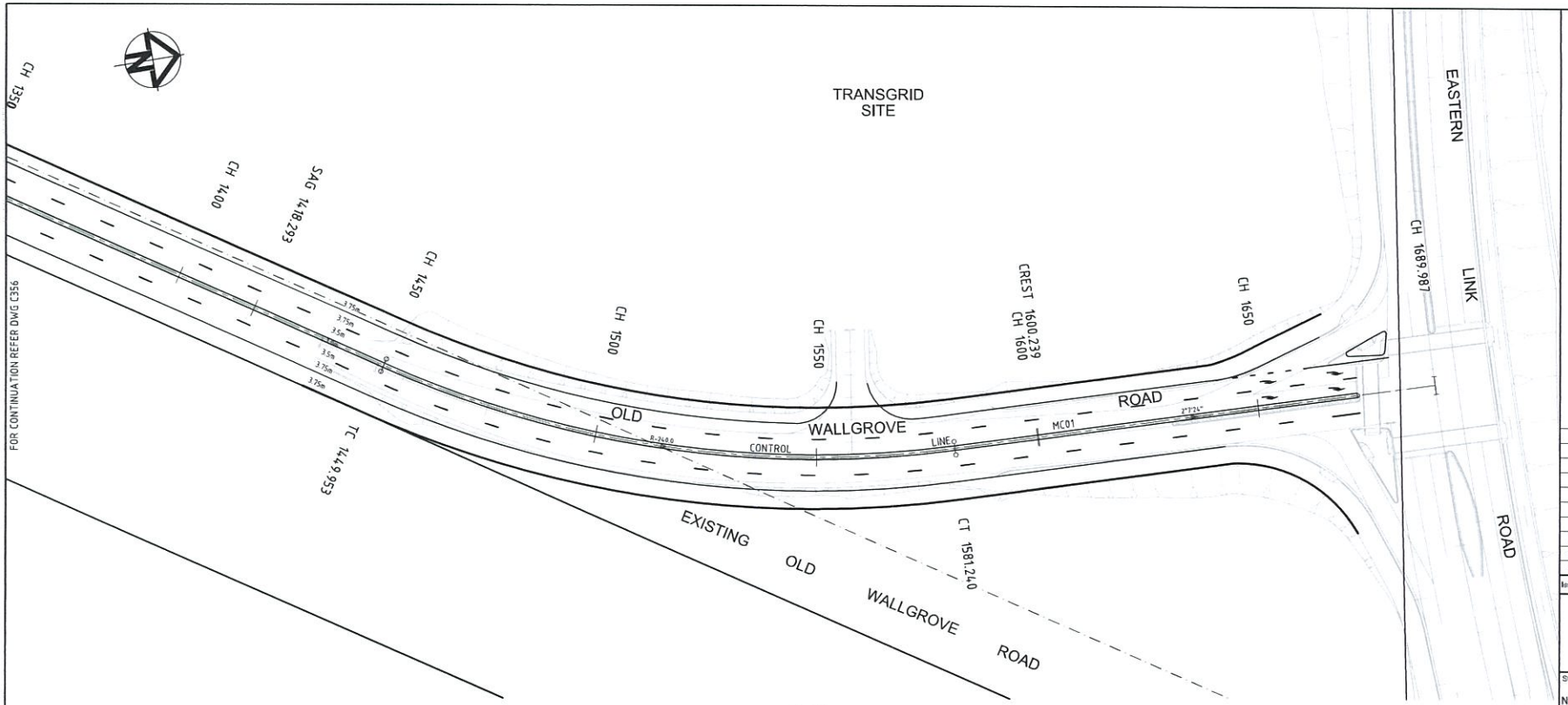
Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: OLD WALLGROVE ROAD PLAN AND LONGITUDINAL SECTION SHEET 6

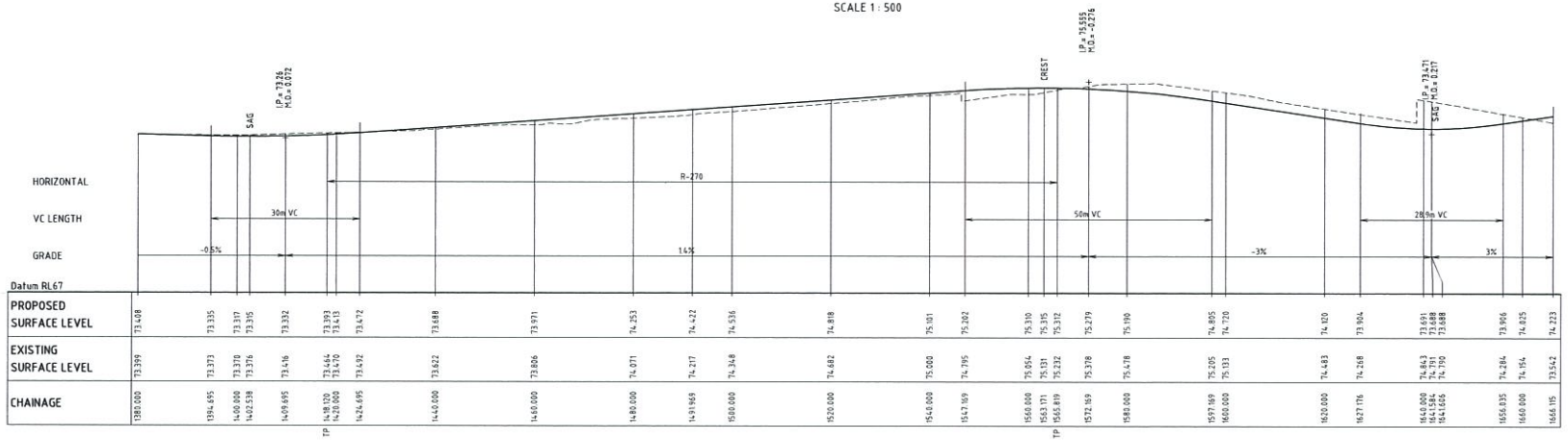
1 : 250 @ A1 1 : 500 @ A3
1 : 500 @ A1 1 : 1000 @ A3

Drawing No. C356 | Project No. 13-143 | Issue C

Date Plotted: 20 May 2014 - 03:14PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C356.dwg V1



PLAN
SCALE 1 : 500



CONTROL LINE MC01 LONGITUDINAL SECTION
SCALE 1:500 HORI.
1:250 VERT.

1 : 250 @ A1 1 : 500 @ A3

1 : 500 @ A1 1 : 1000 @ A3

When as Original

Date Plotted: 20 May 2014 - 03:14PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C357.dwg V1

Issue	Description	Date
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION
A1

Scales: AS SHOWN
Drawn: TS
Designed: MM
Height Datum: AHD
Checked: MM
Grid: MGA
Approved:
File: C357.dwg

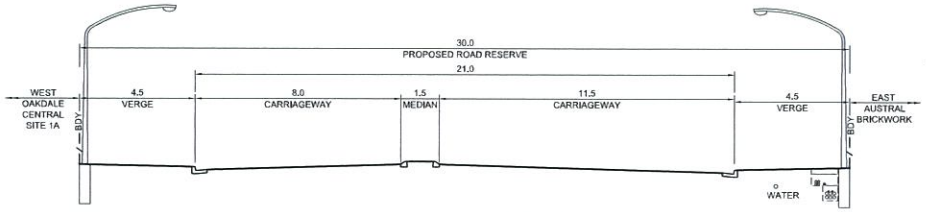
Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9438 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

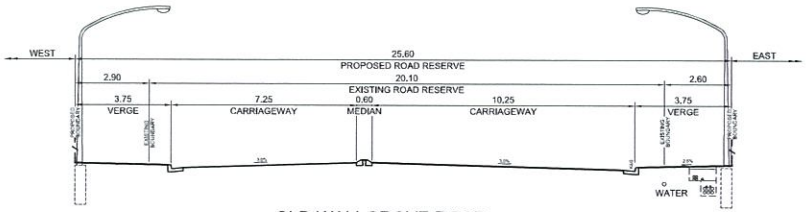
Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: OLD WALLGROVE ROAD PLAN AND LONGITUDINAL SECTION SHEET 7

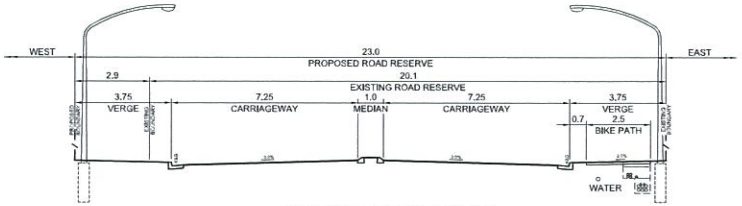
Drawing No.	Project No.	Issue
C357	13-143	C



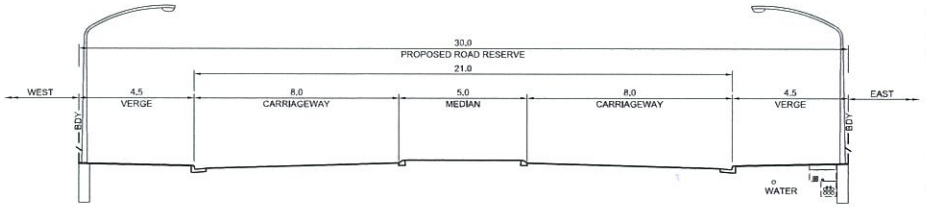
OLD WALLGROVE ROAD
TYPICAL SECTION (CH200 - CH270)
SCALE 1:100



OLD WALLGROVE ROAD
TYPICAL SECTION
CH 1050
SCALE 1:100



OLD WALLGROVE ROAD
TYPICAL SECTION
SCALE 1:100



LINK ROAD
TYPICAL SECTION
SCALE 1:100

0 2 4 6 8 10m
1 : 100 @ A1 1 : 200 @ A3

Issue	Description	Date
D	CROSS SECTIONS UPDATED	20-05-14
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION
A1

Scales	1 : 100 @ A1	Drawn	TS
		Designed	MM
Height Datum	AHD	Checked	MM
Grid	MGA	Approved	
File:	C358.dwg		

Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project
OAKDALE CENTRAL
INDUSTRIAL FACILITIES
LOTS 1C, 2B, 3A, 3B

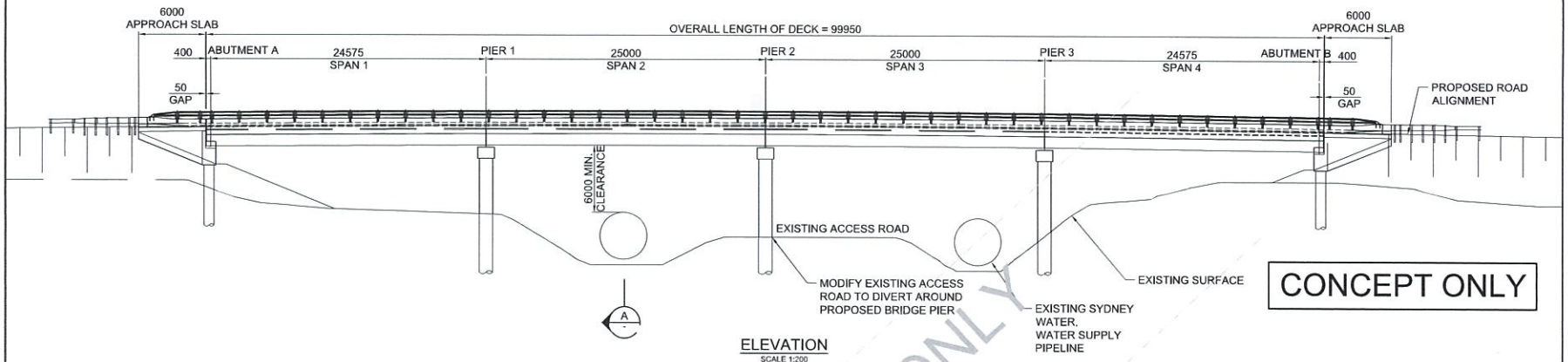
Title
TYPICAL
SECTIONS

Drawing No.	Project No.	Issue
C358	13-143	D

Date Plotted: 20 May 2014 - 05:02PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C358.dwg V1

FROM MINCHINBURY

TO OLD WALLGROVE ROAD

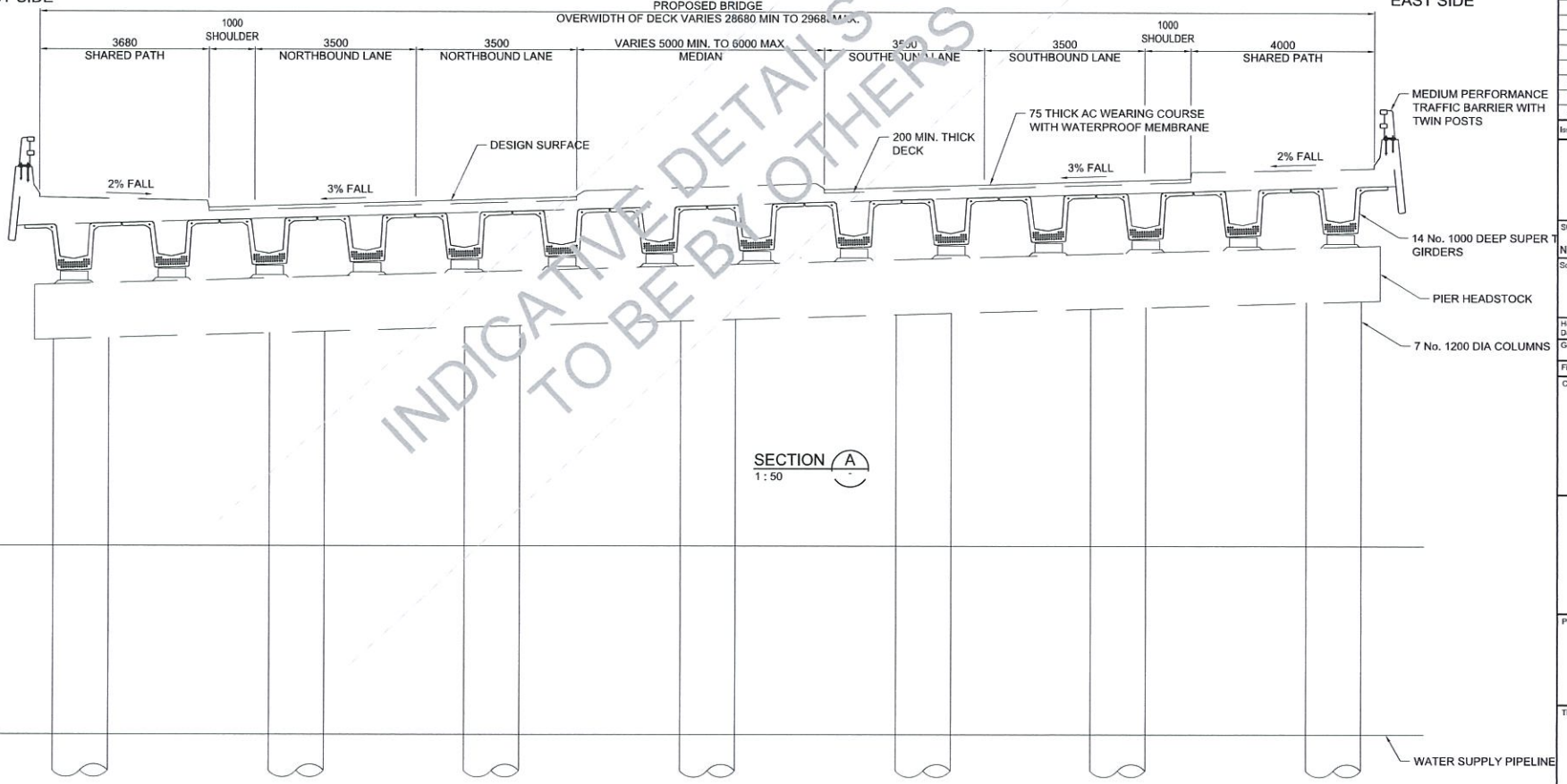


ELEVATION
SCALE 1:200

CONCEPT ONLY

WEST SIDE

EAST SIDE



SECTION A
1 : 50

0 1 2 3 4 5m
1 : 50 @ A1 1 : 100 @ A3

0 5 10 15 20m
1 : 200 @ A1 1 : 400 @ A3

When as Original

Issue	Description	Date
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION
A1

Scales: 1 : 50 @ A1
1 : 200 @ A1

Drawn: TS
Designed: MM
Checked: MM
Approved:

Height Datum: AHD
Grid: MGA

File: C359.dwg

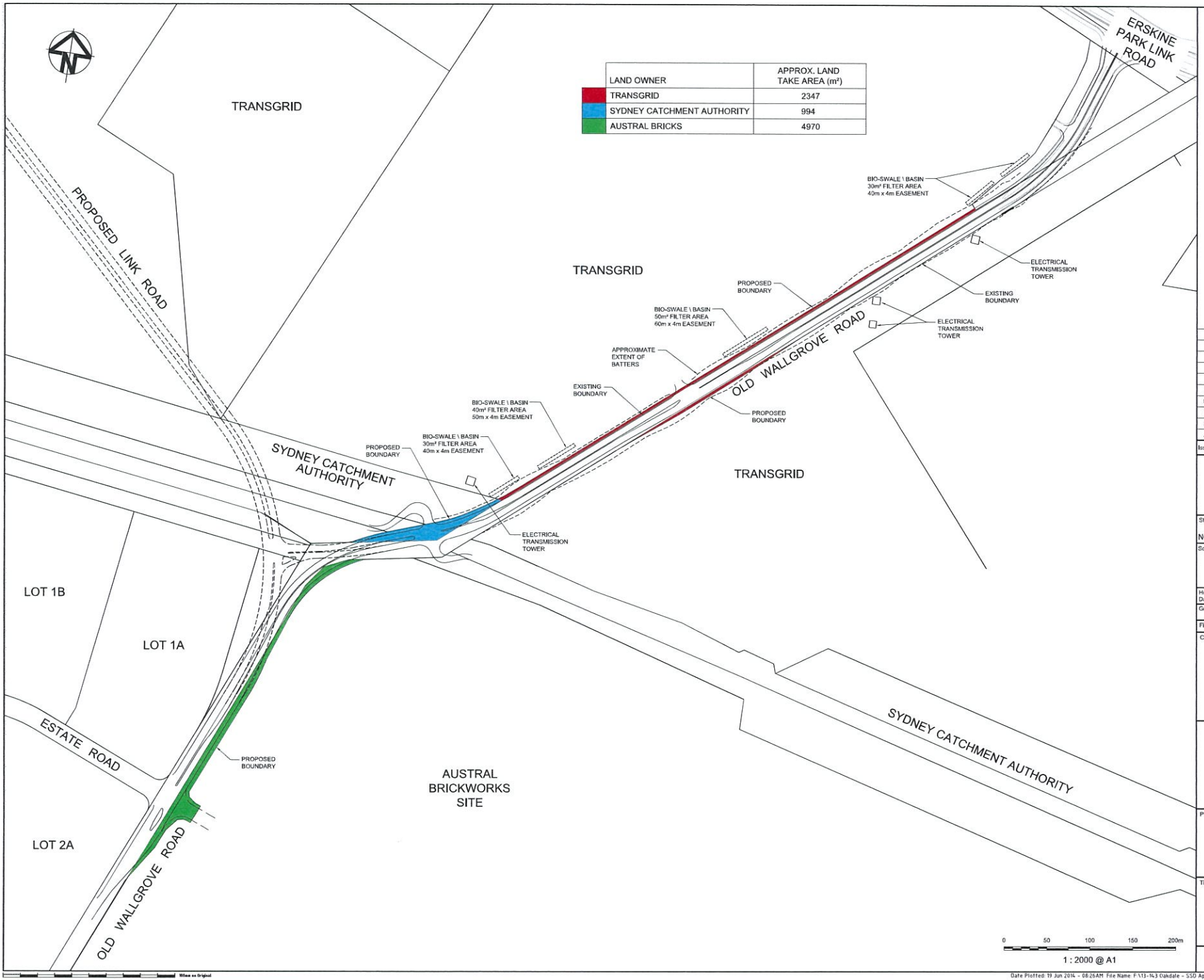
Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project:
OAKDALE CENTRAL
INDUSTRIAL FACILITIES
LOTS 1C, 2B, 3A, 3B

Title:
TYPICAL
BRIDGE CROSSING
SECTION

Drawing No.	Project No.	Issue
C359	13-143	C



LAND OWNER	APPROX. LAND TAKE AREA (m²)
TRANSGRID	2347
SYDNEY CATCHMENT AUTHORITY	994
AUSTRAL BRICKS	4970

Issue	Description	Date
E	BIO SWALES \ BASINS SHOWN	19-06-14
D	EXTENT OF BATTERS SHOWN	30-05-14
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

A1

Scales: 1 : 2000 @ A1

Drawn: TS
Designed: MM
Checked: MM
Approved:

Height Datum: AHD
Grid: MGA
File: C360.dwg

Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

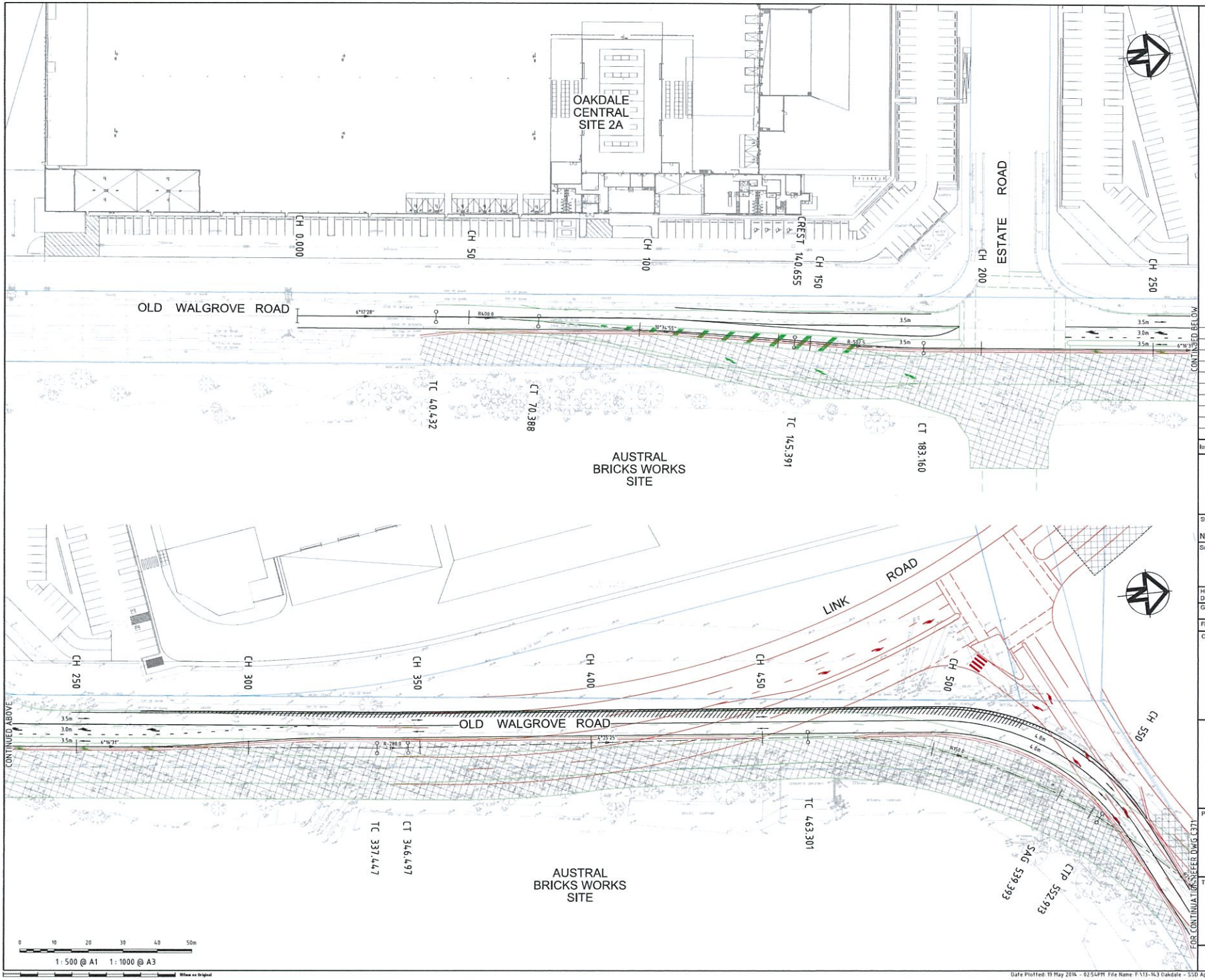
Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: LAND ACQUISITION PLAN

Drawing No.	Project No.	Issue
C360	13-143	E

When as Original

Date Plotted: 19 Jun 2014 - 08:26AM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C360.dwg V1



LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 500 @ A1	Drawn	TS
		Designed	MM
Height Datum	AHD	Checked	MM
Grid	MGA	Approved	
File:	C370.dwg		

Client: Goodman

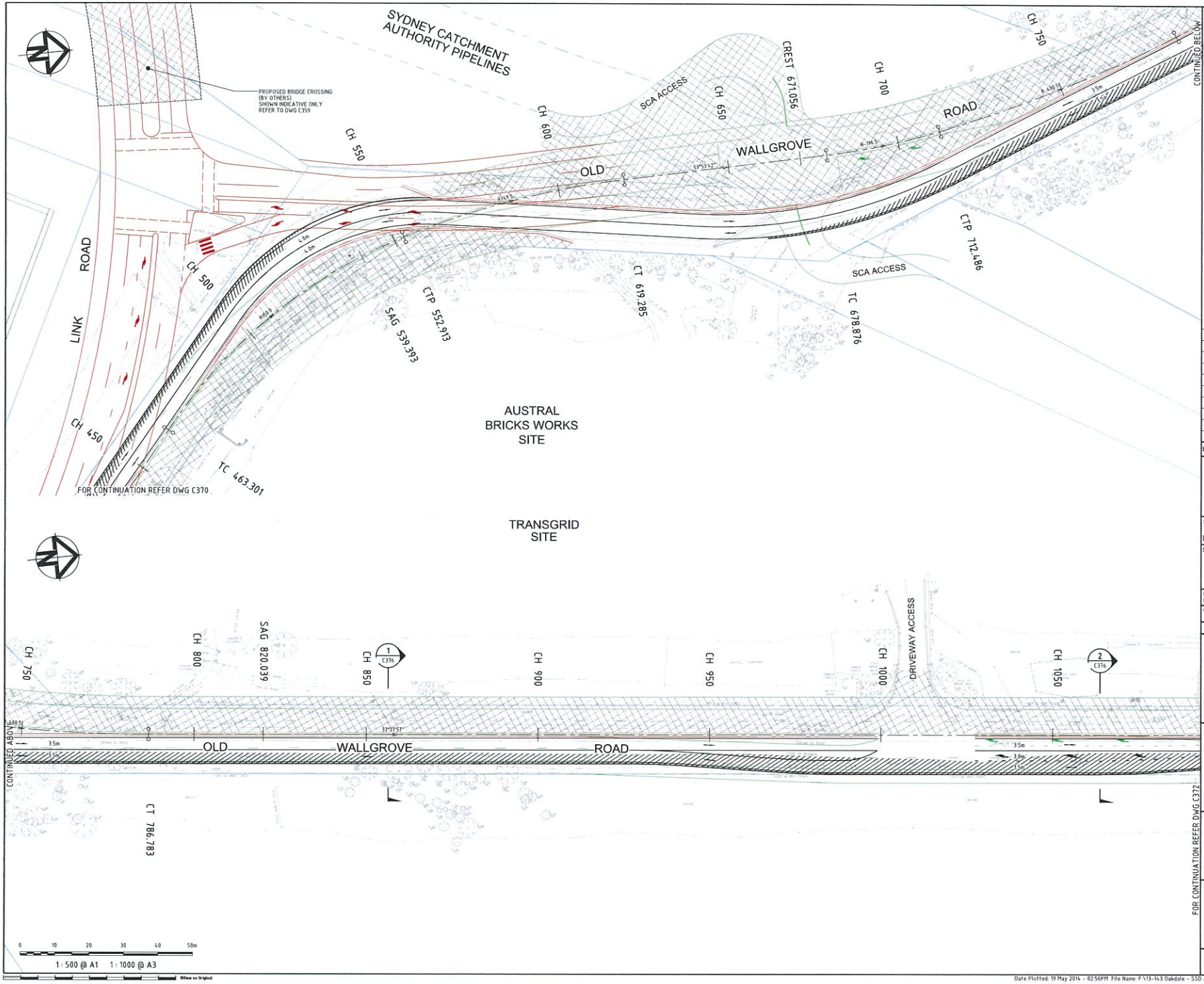
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN STAGE 1 SHEET 1 OF 3

Drawing No.	Project No.	Issue
C370	13-143	A

Date Plotted: 19 May 2014 - 02:54PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C370.dwg V1



LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION — A1

Scales	1 : 500 @ A1	Drawn TS	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	
File:	C371.dwg		

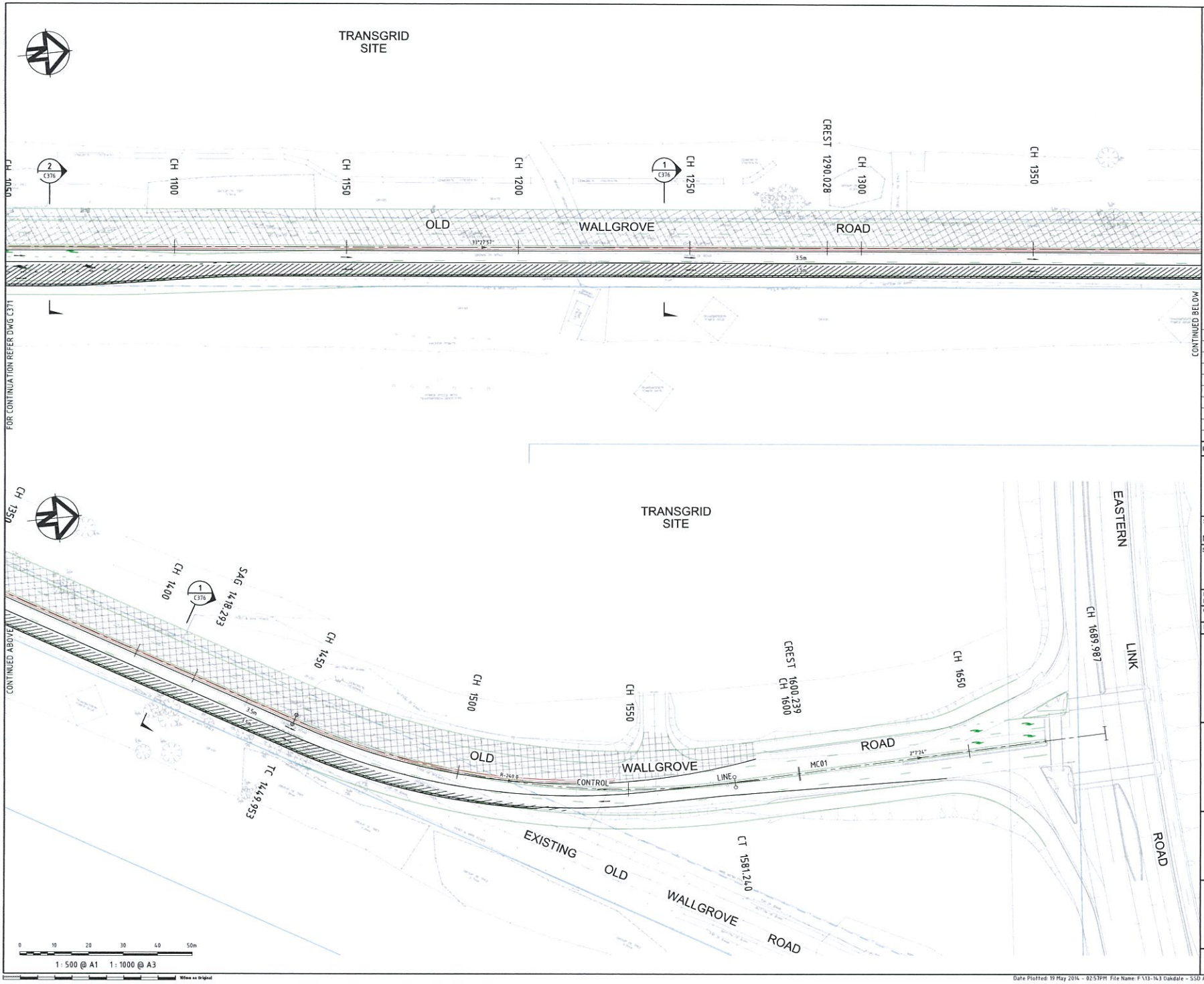
Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN STAGE 1 SHEET 2 OF 3

Drawing No.	Project No.	Issue
C371	13-143	A



LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION — A1

Scales	1 : 500 @ A1	Drawn TS	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	
File:	C372.dwg		

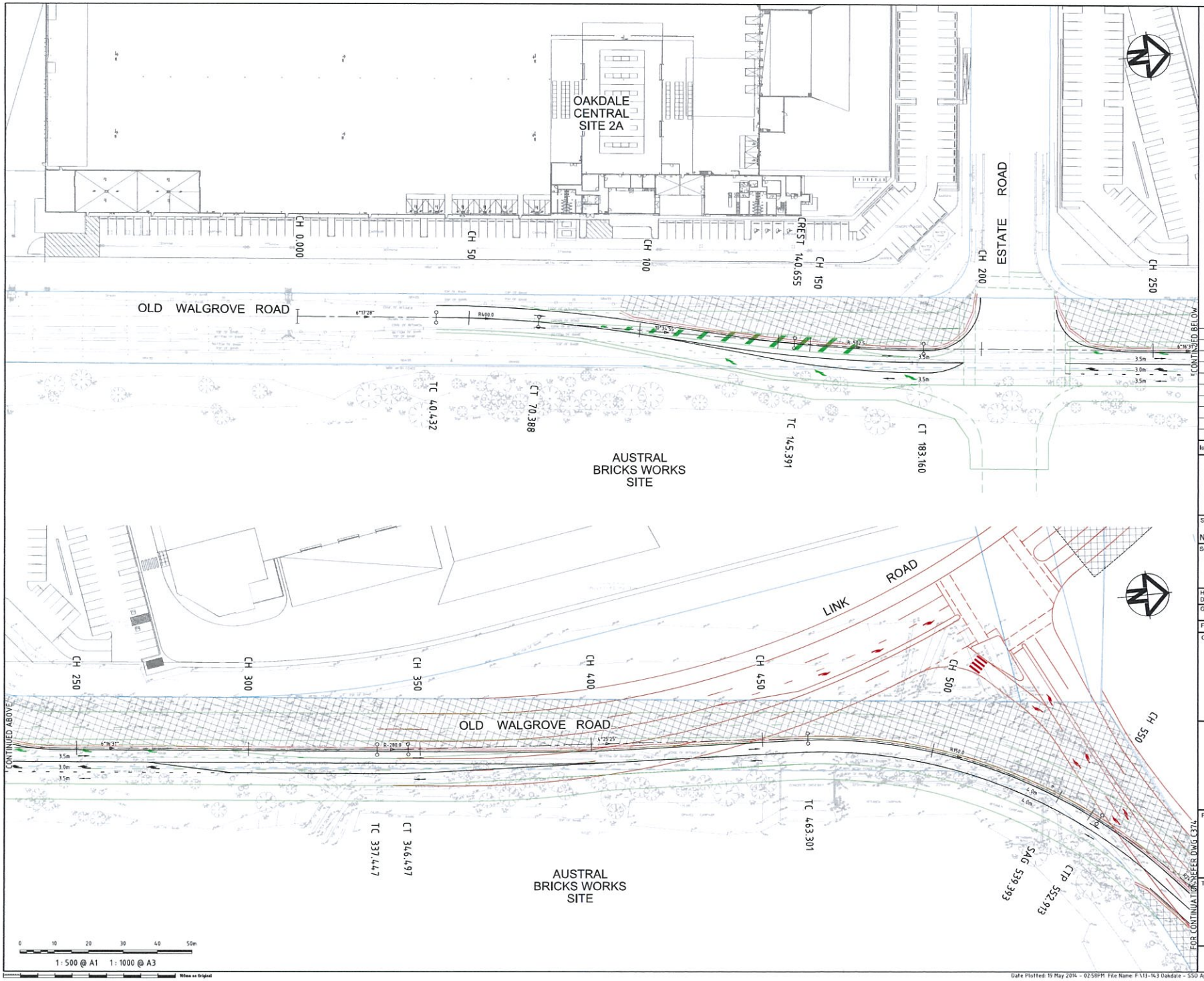
Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN: 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN STAGE 1 SHEET 3 OF 3

Drawing No.	Project No.	Issue
C372	13-143	A



LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 500 @ A1	Drawn	TS
		Designed	MM
Height Datum	AHD	Checked	MM
Grid	MGA	Approved	
File:	C373.dwg		

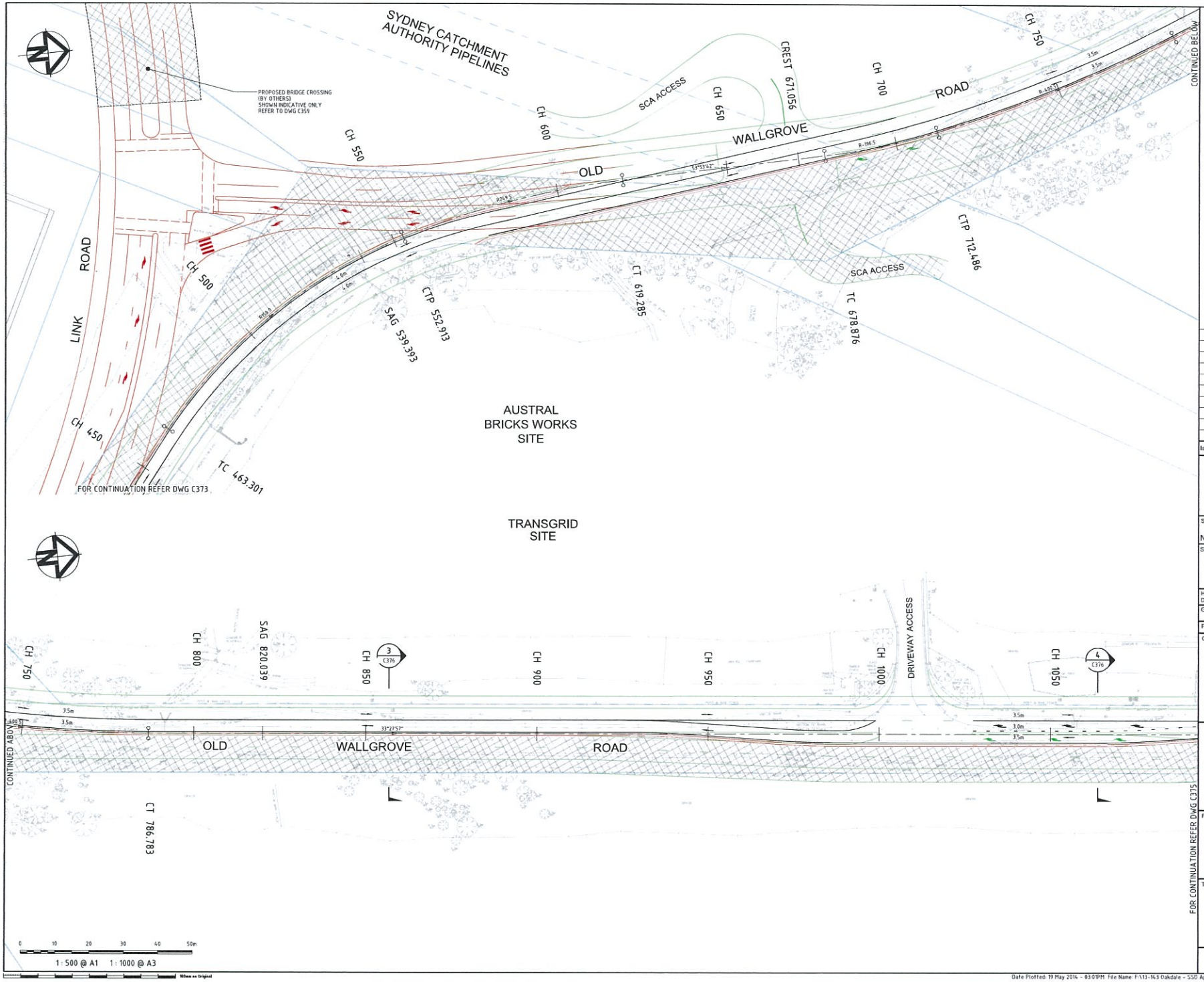
Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atlnet.au
info@atlnet.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN STAGE 2 SHEET 1 OF 3

Drawing No.	Project No.	Issue
C373	13-143	A



LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 500 @ A1	Drawn	TS
		Designed	MM
Height Datum	AHD	Checked	MM
Grid	MGA	Approved	
File:	C374.dwg		

Client: Goodman

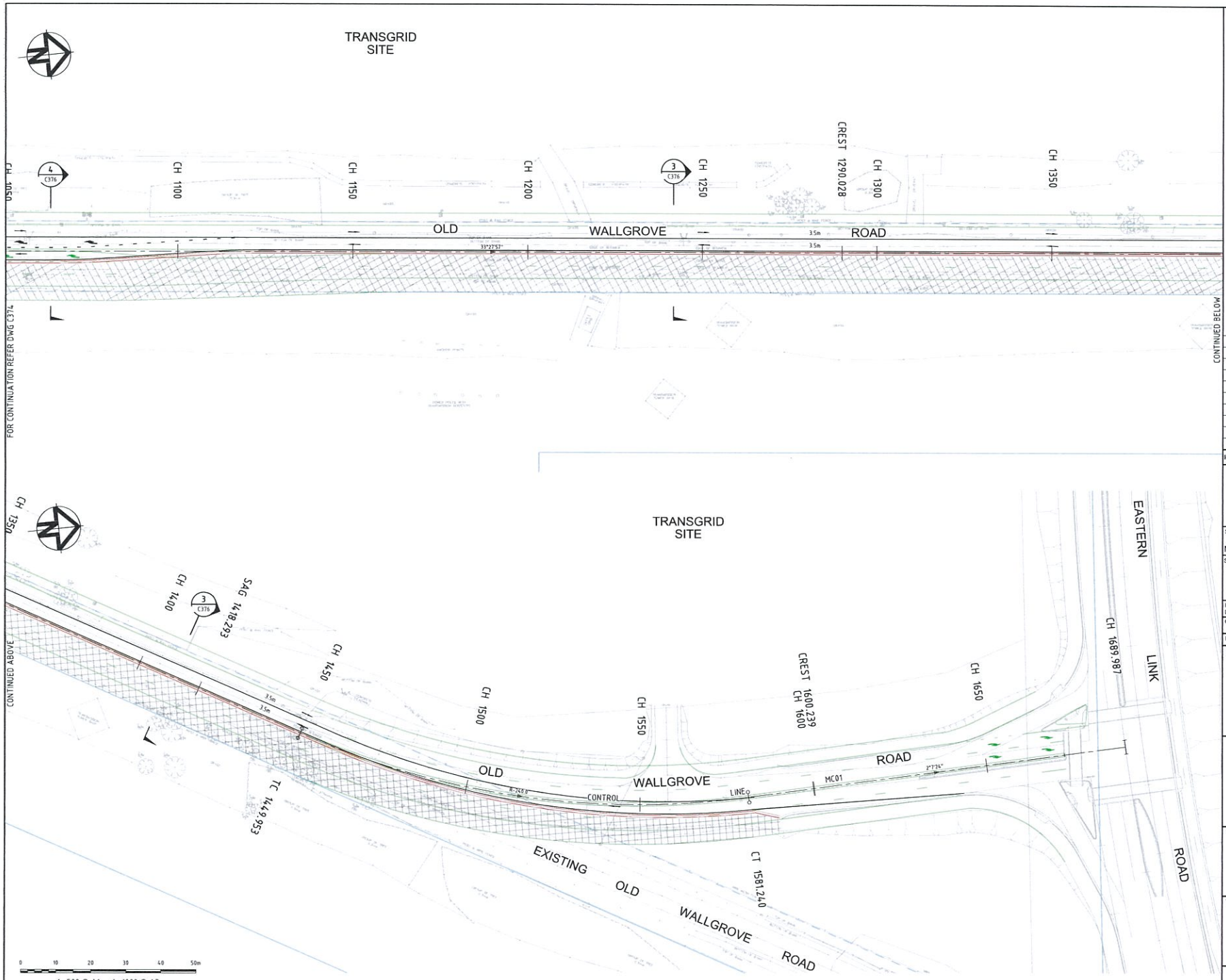
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES
LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN
STAGE 2
SHEET 2 OF 3

Drawing No.	Project No.	Issue
C374	13-143	A

When as Original
Date Plotted: 19 May 2014 - 03:01PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C374.dwg V1



LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION — A1

Scales	1 : 500 @ A1	Drawn	TS
		Designed	MM
Height Datum	AHD	Checked	MM
Grid	MGA	Approved	
File:	C375.dwg		

Client: Goodman

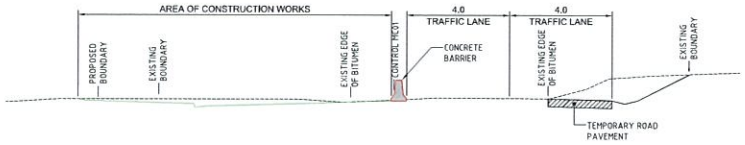
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES
LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN
STAGE 2
SHEET 3 OF 3

Drawing No.	Project No.	Issue
C375	13-143	A

Date Plotted: 19 May 2014 - 03:01PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C375.dwg V1

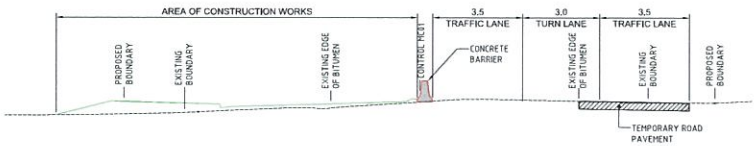


TYPICAL SECTION - STAGE 1

SECTION 1
1 : 100

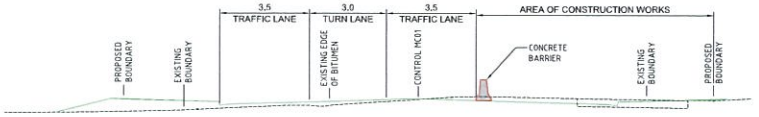
TYPICAL SECTION - STAGE 2

SECTION 3
1 : 100



TYPICAL SECTION - STAGE 1
TRANSGRID ENTRANCE APPROACH

SECTION 2
1 : 100



TYPICAL SECTION - STAGE 2
TRANSGRID ENTRANCE APPROACH

SECTION 4
1 : 100

0 2 4 6 8 10m

1 : 100 @ A1 1 : 200 @ A3

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 100 @ A1	Drawn	TS
		Designed	MM
Height Datum	AHD	Checked	MM
Grid	MGA	Approved	
File:	C376.dwg		

Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9438 1777
Fax: 02 9460 8413
www.atlnet.au
info@atlnet.au

Project
OAKDALE CENTRAL
INDUSTRIAL FACILITIES
LOTS 1C, 2B, 3A, 3B

Title
CONSTRUCTION TRAFFIC
MANAGEMENT PLANS
TYPICAL SECTIONS

Drawing No.	Project No.	Issue
C376	13-143	A

ERSKINE PARK LINK ROAD

FITZPATRICK

JACFIN

TRANSGRID

TRANSGRID

LINK ROAD SUBJECT TO SEPARATE DEVELOPMENT APPLICATION

BRIDGE CROSSING SUBJECT TO DEVELOPMENT APPLICATION BY OTHERS

DWG. C357

DWG. C356

DWG. C355

DWG. C354

DWG. C353

DWG. C352

DWG. C351

LINK ROAD

WALLGROVE ROAD

OLD WALLGROVE ROAD

BLACKTOWN LGA

SCA WATER PIPE LINES

NORTHERN BIODIVERSITY SWALE (COMPLETE)

BIODIVERSITY BASIN

BIODIVERSITY LOT B

BIODIVERSITY BASIN

BIODIVERSITY LOT C

LOT 3

LOT 1C

LOT 1B

LOT 1A

AUSTRAL BRICKWORKS SITE

ESTATE ROAD

ESTATE ROAD

LOT 4

BIODIVERSITY LOT A

SERVICES LOT

LOT 2B

LOT 2A

PENRITH LGA

FAIRFIELD LGA

SOUTHERN BIODIVERSITY SWALE (COMPLETE)

0 60 120 180 240 300m

1 : 3000 @ A1 1 : 6000 @ A3

100mm on Original

Issue	Description	Date
E	STATE SIGNIFICANT DEVELOPMENT APPLICATION	08-08-14
D	RSA ISSUE	07-08-14
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 3000 @ A1	Drawn JB	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	
File:	C350.dwg		

Client: Goodman

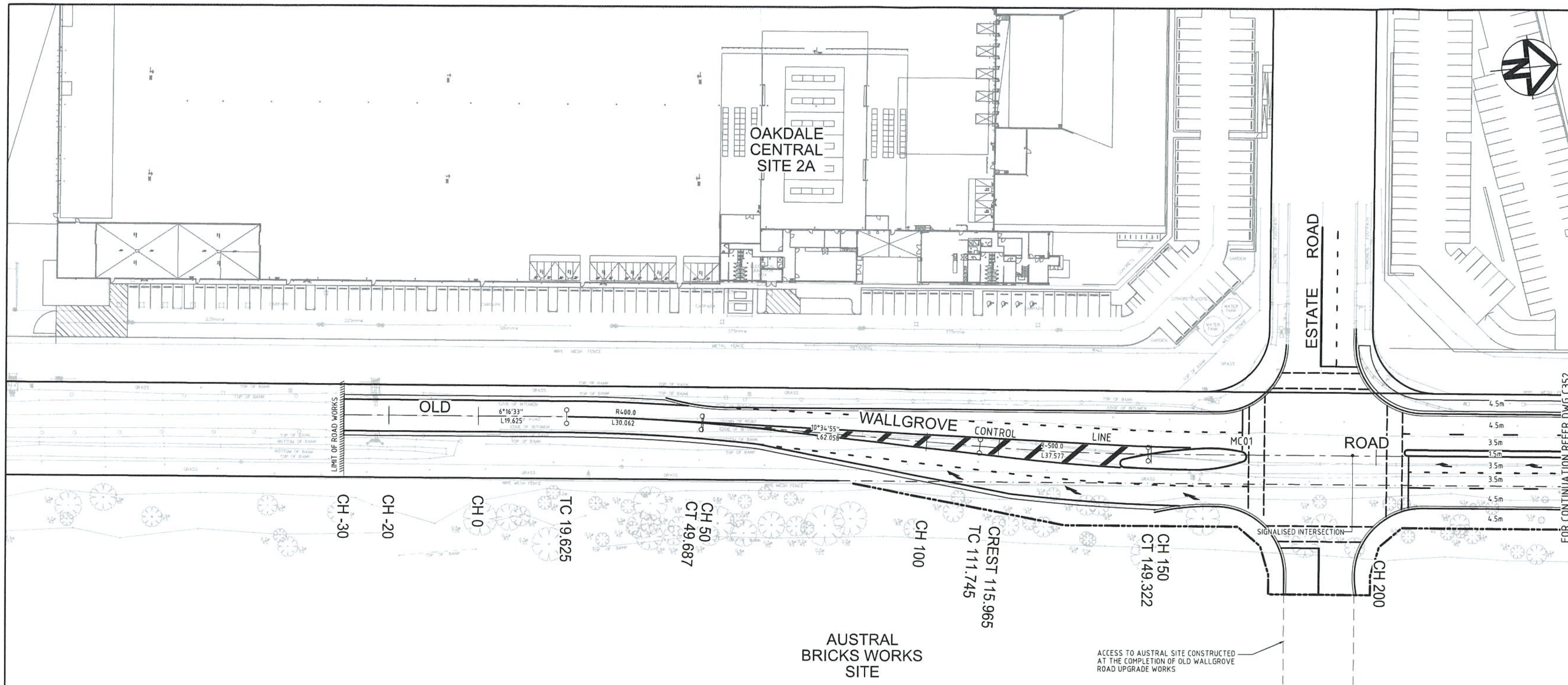
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: OLD WALLGROVE ROAD UPGRADE GENERAL ARRANGEMENT PLAN

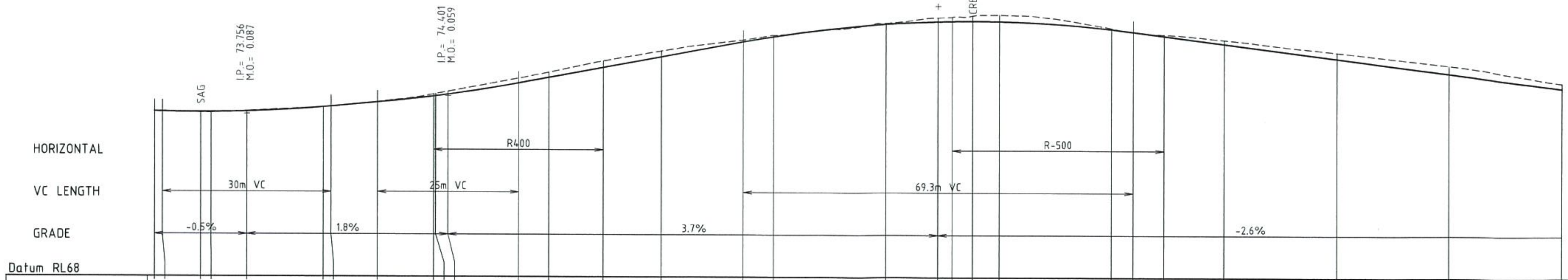
Drawing No.	Project No.	Issue
C350	13-143	E

Date Plotted: 7 Aug 2014 - 05:49PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C350.dwg V1



PLAN

SCALE 1 : 500



CHAINAGE	PROPOSED SURFACE LEVEL	EXISTING SURFACE LEVEL
TP -30.000	73.843	73.843
-28.607	73.836	73.836
-21.799	73.818	73.799
-20.000	73.819	73.794
-13.607	73.844	73.861
0.000	74.002	74.001
1.393	74.026	74.016
9.681	74.176	74.193
TP 19.620	74.392	74.465
20.000	74.402	74.480
22.181	74.460	74.562
34.681	74.863	75.035
40.000	75.060	75.247
TP 49.682	75.418	75.648
60.000	75.800	76.009
74.602	76.340	76.409
80.000	76.527	76.578
100.000	76.987	77.019
109.252	77.076	77.217
TP 111.744	77.087	77.235
115.302	77.093	77.290
120.000	77.083	77.320
140.000	76.816	76.855
143.902	76.721	76.727
TP 149.322	76.580	76.629
160.000	76.303	76.443
180.000	75.783	76.000
200.000	75.263	75.547
220.000	74.743	74.929

CONTROL LINE MC01 LONGITUDINAL SECTION

SCALE 1:500 HORI.
1:100 VERT.

0 5 10 15 20 25m
1 : 250 @ A1 1 : 500 @ A3
0 10 20 30 40 50m
1 : 500 @ A1 1 : 1000 @ A3

Issue	Description	Date
E	STATE SIGNIFICANT DEVELOPMENT APPLICATION	08-08-14
D	RSA ISSUE	07-08-14
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL — NOT TO BE USED FOR CONSTRUCTION | A1

Scales	AS SHOWN	Drawn JB	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	
File:	C351.dwg		

Client: Goodman

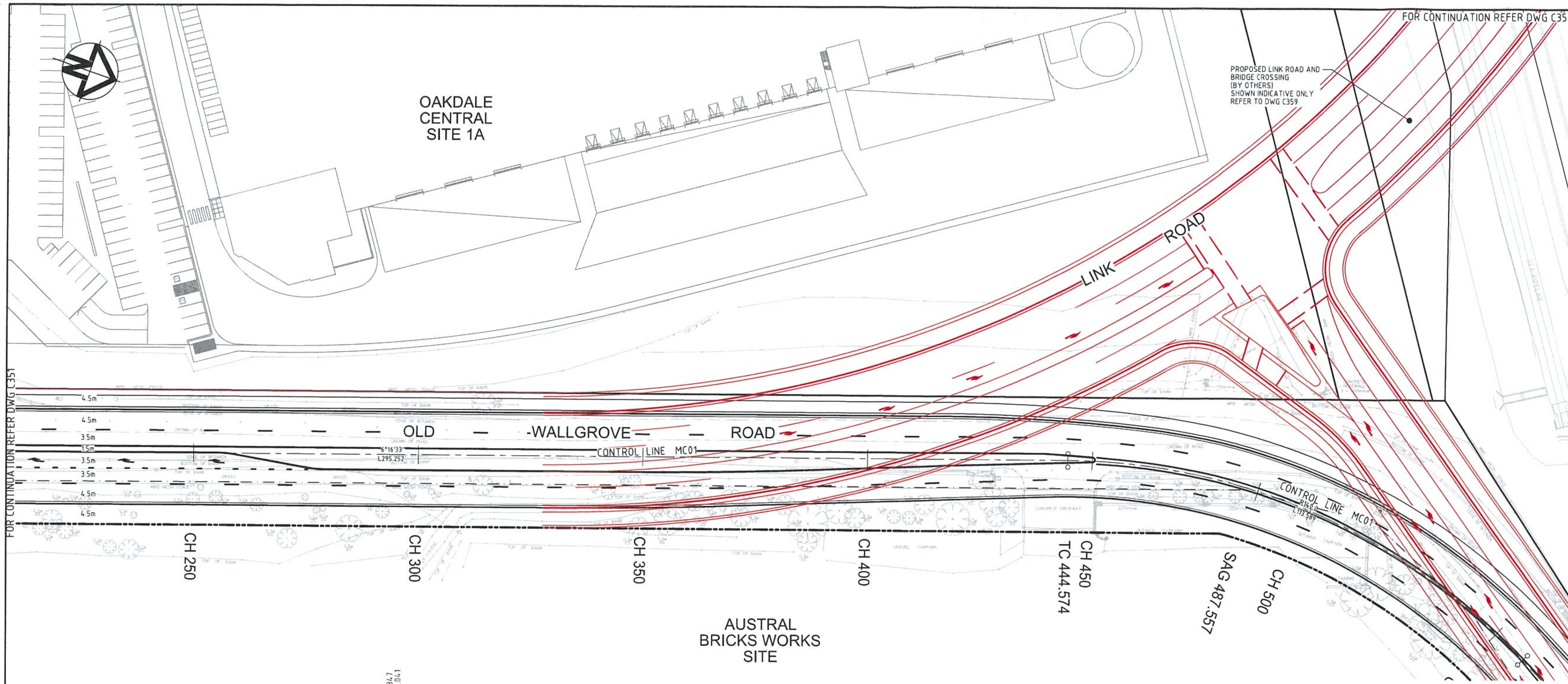
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: OLD WALLGROVE ROAD PLAN AND LONGITUDINAL SECTION SHEET 1

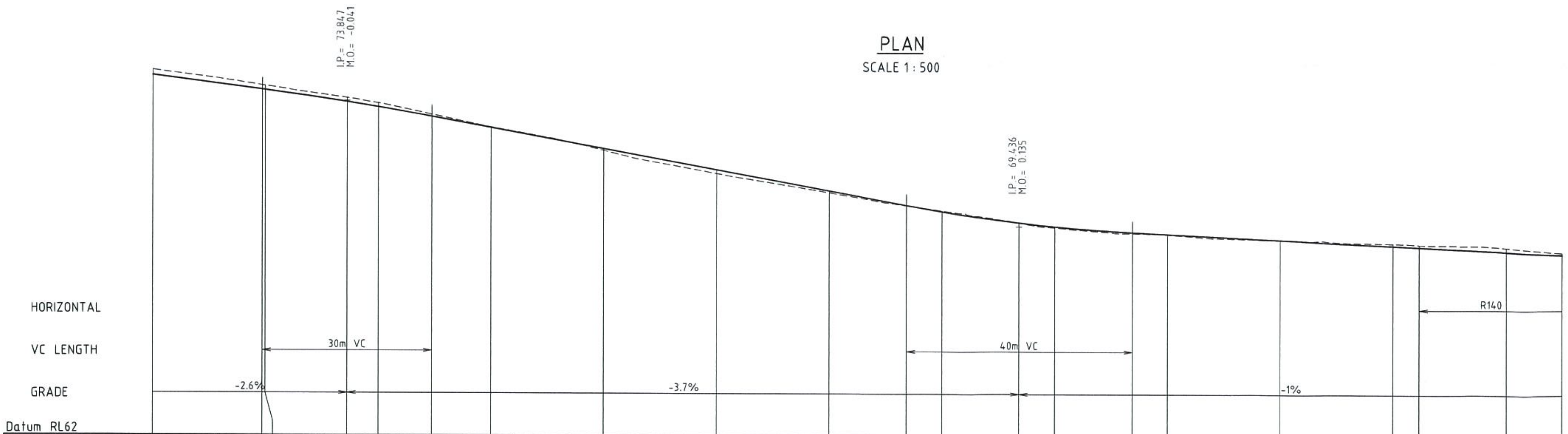
Drawing No.	Project No.	Issue
C351	13-143	E

100mm on Original



PLAN

SCALE 1 : 500



CHAINAGE	220.000	239.468 / 240.000	254.468	260.000	269.468	280.000	300.000	320.000	340.000	353.677	360.000	373.677
PROPOSED SURFACE LEVEL	74.743	74.237 / 74.223	73.805	73.625	73.292	72.902	72.162	71.422	70.682	70.176	69.955	69.571
EXISTING SURFACE LEVEL	74.929	74.389 / 74.374	73.946	73.761	73.364	72.922	72.097	71.287	70.616	70.166	69.988	69.562

CHAINAGE	380.000	393.677	400.000	420.000	440.000	TP 444.574	460.000	470.000
PROPOSED SURFACE LEVEL	69.436	69.236	69.173	68.973	68.773	68.727	68.573	68.473
EXISTING SURFACE LEVEL	69.403	69.197	69.160	68.967	68.855	68.814	68.720	68.546

CONTROL LINE MC01 LONGITUDINAL SECTION

SCALE 1:500 HORI.
1:100 VERT.

0 5 10 15 20 25m
1 : 250 @ A1 1 : 500 @ A3
0 10 20 30 40 50m
1 : 500 @ A1 1 : 1000 @ A3

Issue	Description	Date
E	STATE SIGNIFICANT DEVELOPMENT APPLICATION	08-08-14
D	RSA ISSUE	07-08-14
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION
A1

Scales: AS SHOWN
Drawn: JB
Designed: MM
Height Datum: AHD
Checked: MM
Grid: MGA
Approved:
File: C352.dwg

Client: Goodman

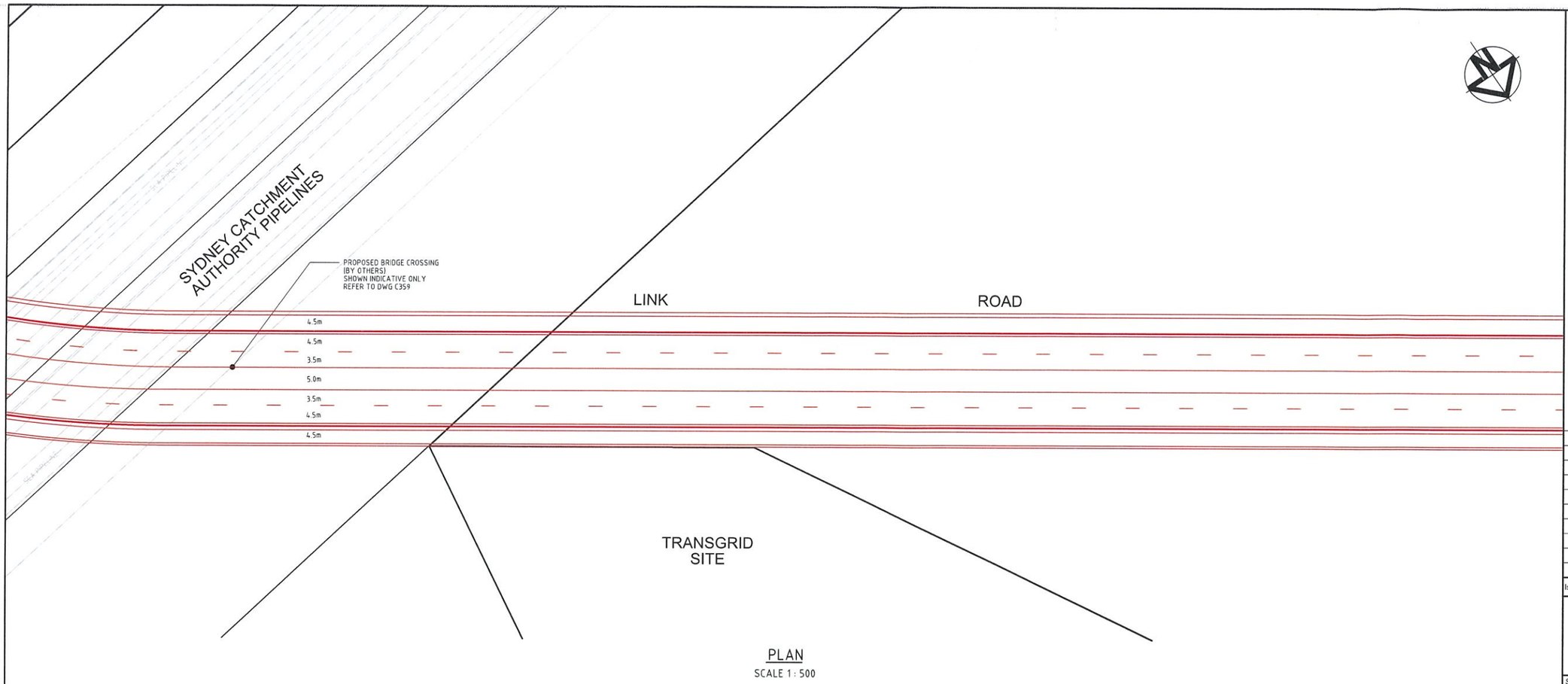
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: OLD WALLGROVE ROAD PLAN AND LONGITUDINAL SECTION SHEET 2

Drawing No. C352 | Project No. 13-143 | Issue E

100mm on Original



PLAN
SCALE 1 : 500

0 10 20 30 40 50m

1 : 500 @ A1 1 : 1000 @ A3

100mm on Original

Issue	Description	Date
D	STATE SIGNIFICANT DEVELOPMENT APPLICATION	08-08-14
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION — A1

Scales	AS SHOWN	Drawn JB	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	

File: C353.dwg

Client: Goodman

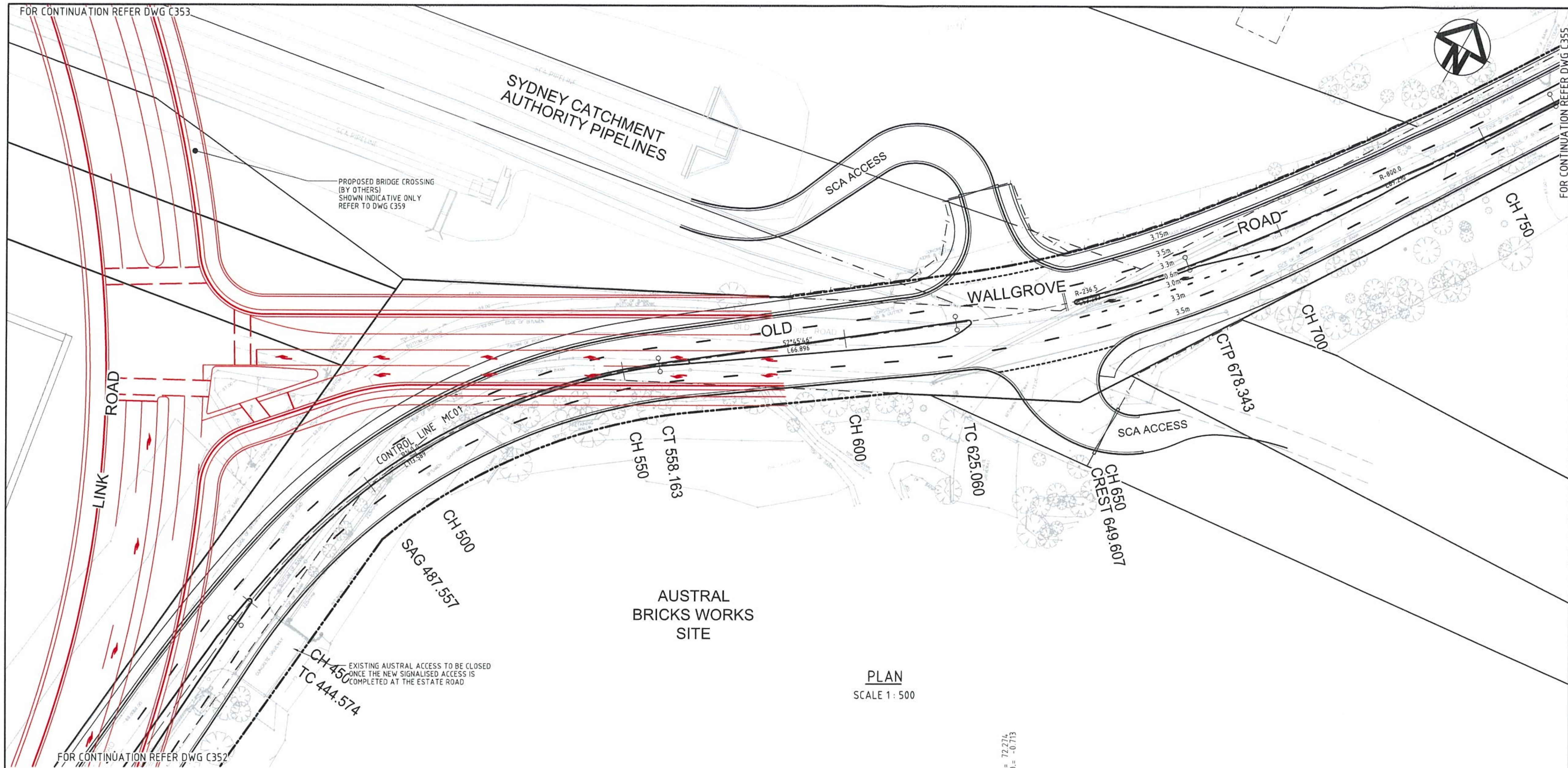
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

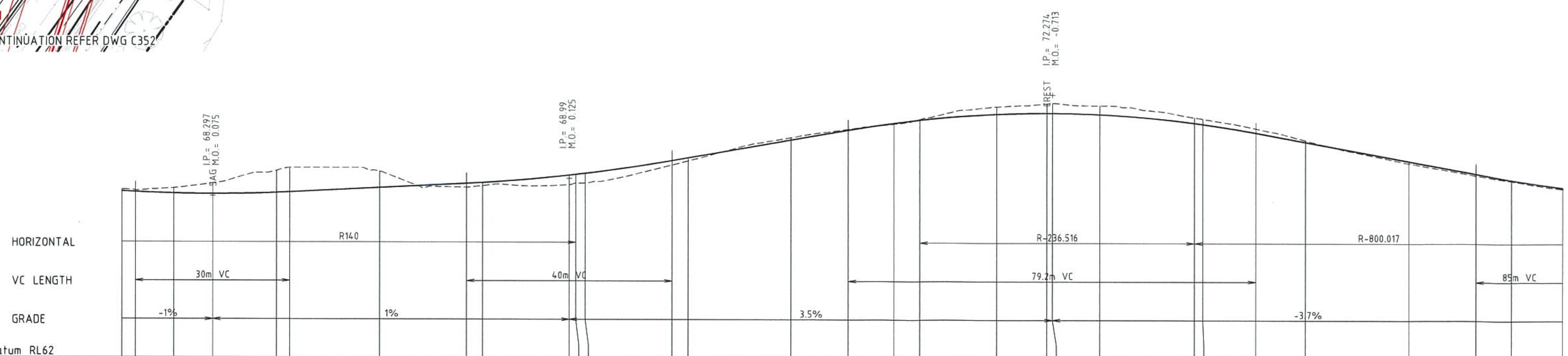
Title: LINK ROAD PLAN AND LONGITUDINAL SECTION SHEET 3

Drawing No.	Project No.	Issue
C353	13-143	D

Date Plotted: 8 Aug 2014 - 08:11AM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C353.dwg V1



PLAN
SCALE 1 : 500



CHAINAGE	PROPOSED SURFACE LEVEL	EXISTING SURFACE LEVEL
470.000	68.473	68.546
472.557	68.447	68.516
480.000	68.391	68.593
487.557	68.372	68.768
500.000	68.424	69.284
502.557	68.447	69.400
520.000	68.621	69.256
536.878	68.790	68.627
540.000	68.825	68.699
556.878	69.115	68.742
TP 558.163	69.145	68.800
560.000	69.189	68.809
576.878	69.690	69.519
580.000	69.800	69.678
600.000	70.500	70.593
611.107	70.888	70.923
620.000	71.164	71.130
TP 625.060	71.288	71.314
640.000	71.520	71.809
649.607	71.562	71.930
650.707	71.562	71.951
660.000	71.513	71.860
TP 678.343	71.187	71.403
680.000	71.142	71.349
690.307	70.809	70.973
700.000	70.450	70.518
720.000	69.710	69.629
733.080	69.227	69.164
740.000	68.984	68.954
750.000	68.683	68.644

CONTROL LINE MC01 LONGITUDINAL SECTION
SCALE 1:500 HORI.
1:100 VERT.

0 5 10 15 20 25m
1 : 250 @ A1 1 : 500 @ A3
0 10 20 30 40 50m
1 : 500 @ A1 1 : 1000 @ A3

Issue	Description	Date
E	STATE SIGNIFICANT DEVELOPMENT APPLICATION	08-08-14
D	RSA ISSUE	07-08-14
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION — A1

Scales: AS SHOWN
Drawn: JB
Designed: MM
Height Datum: AHD
Checked: MM
Grid: MGA
Approved:
File: C354.dwg

Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

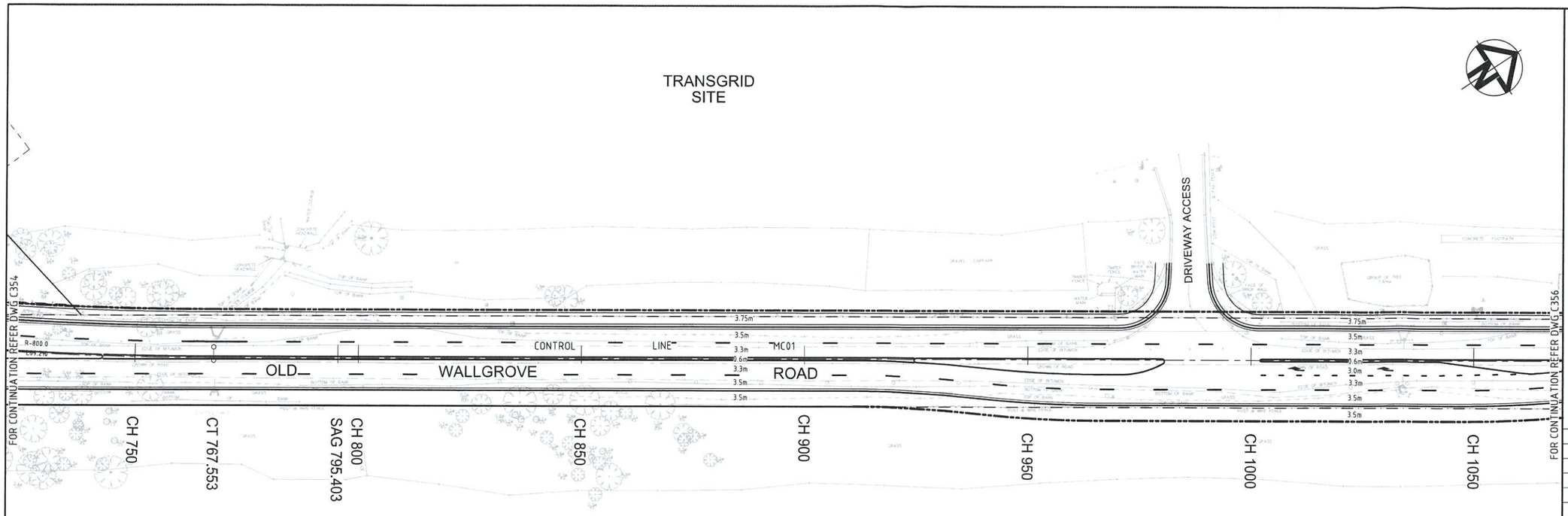
Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: OLD WALLGROVE ROAD PLAN AND LONGITUDINAL SECTION SHEET 4

Drawing No.: C354 | Project No.: 13-143 | Issue: E

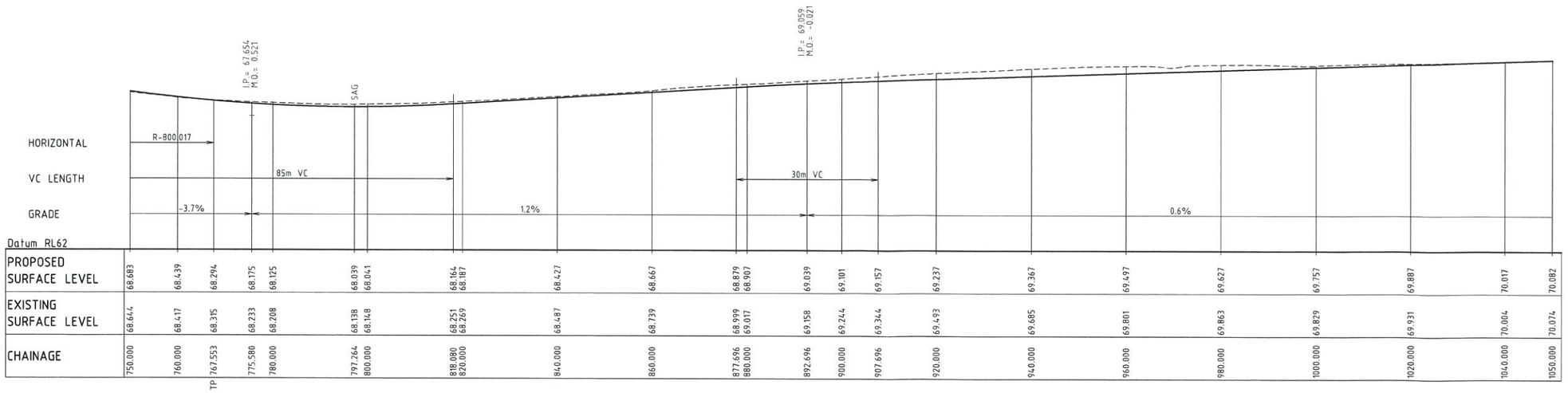
100mm on Original

Date Plotted: 8 Aug 2014 - 11:49AM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C354.dwg V1



PLAN

SCALE 1 : 500



CONTROL LINE MC01 LONGITUDINAL SECTION

SCALE 1:500 HORI.
1:100 VERT.

0 5 10 15 20 25m

1 : 250 @ A1 1 : 500 @ A3

0 10 20 30 40 50m

1 : 500 @ A1 1 : 1000 @ A3

100mm on Original

Issue	Description	Date
E	STATE SIGNIFICANT DEVELOPMENT APPLICATION	08-08-14
D	RSA ISSUE	07-08-14
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION — A1

Scales	AS SHOWN	Drawn JB	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	

File: C355.dwg

Client: Goodman

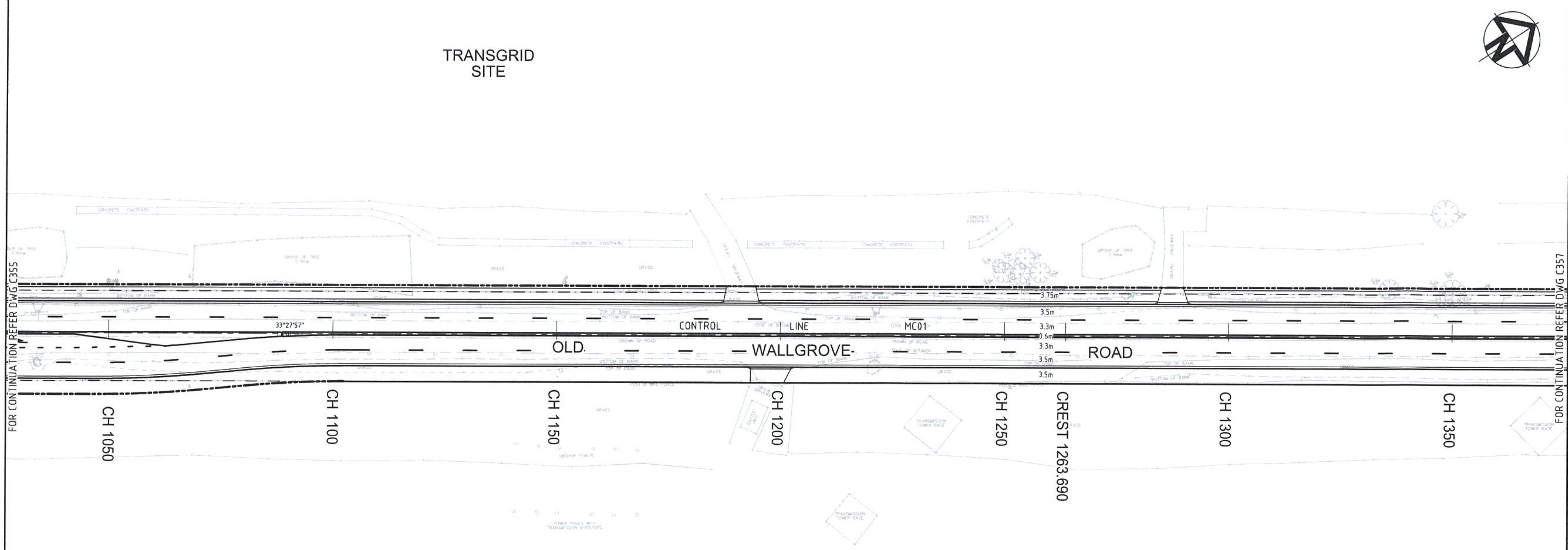
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: OLD WALLGROVE ROAD PLAN AND LONGITUDINAL SECTION SHEET 5

Drawing No.	Project No.	Issue
C355	13-143	E

Date Plotted: 7 Aug 2014 - 05:50PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C355.dwg V1



PLAN

SCALE 1 : 500

PROPOSED SURFACE LEVEL	70.082	70.131	70.148	70.283	70.398	70.544	70.805	71.225	71.645	72.065	72.485	72.905
EXISTING SURFACE LEVEL	70.074	70.158	70.183	70.346	70.461	70.605	70.869	71.350	71.798	72.170	72.574	73.015
CHAINAGE	1050.000	1057.570	1060.000	1072.570	1080.000	1087.570	1100.000	1120.000	1140.000	1160.000	1180.000	1200.000

PROPOSED SURFACE LEVEL	73.325	73.388	73.670	73.751	73.809	73.812	73.788	73.754	73.654	73.554	73.454	73.404
EXISTING SURFACE LEVEL	73.461	73.508	73.701	73.710	73.715	73.717	73.744	73.756	73.752	73.663	73.555	73.502
CHAINAGE	1220.000	1223.035	1240.000	1248.035	1260.000	1263.419	1273.035	1280.000	1300.000	1320.000	1340.000	1350.000

CONTROL LINE MC01 LONGITUDINAL SECTION

SCALE 1:500 HORI.
1:100 VERT.

0 5 10 15 20 25m
1 : 250 @ A1 1 : 500 @ A3
0 10 20 30 40 50m
1 : 500 @ A1 1 : 1000 @ A3

100mm on Original

Issue	Description	Date
E	STATE SIGNIFICANT DEVELOPMENT APPLICATION	08-08-14
D	RSA ISSUE	07-08-14
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION
A1

Scales: AS SHOWN
Drawn: JB
Designed: MM
Checked: MM
Approved:
Height Datum: AHD
Grid: MGA
File: C356.dwg

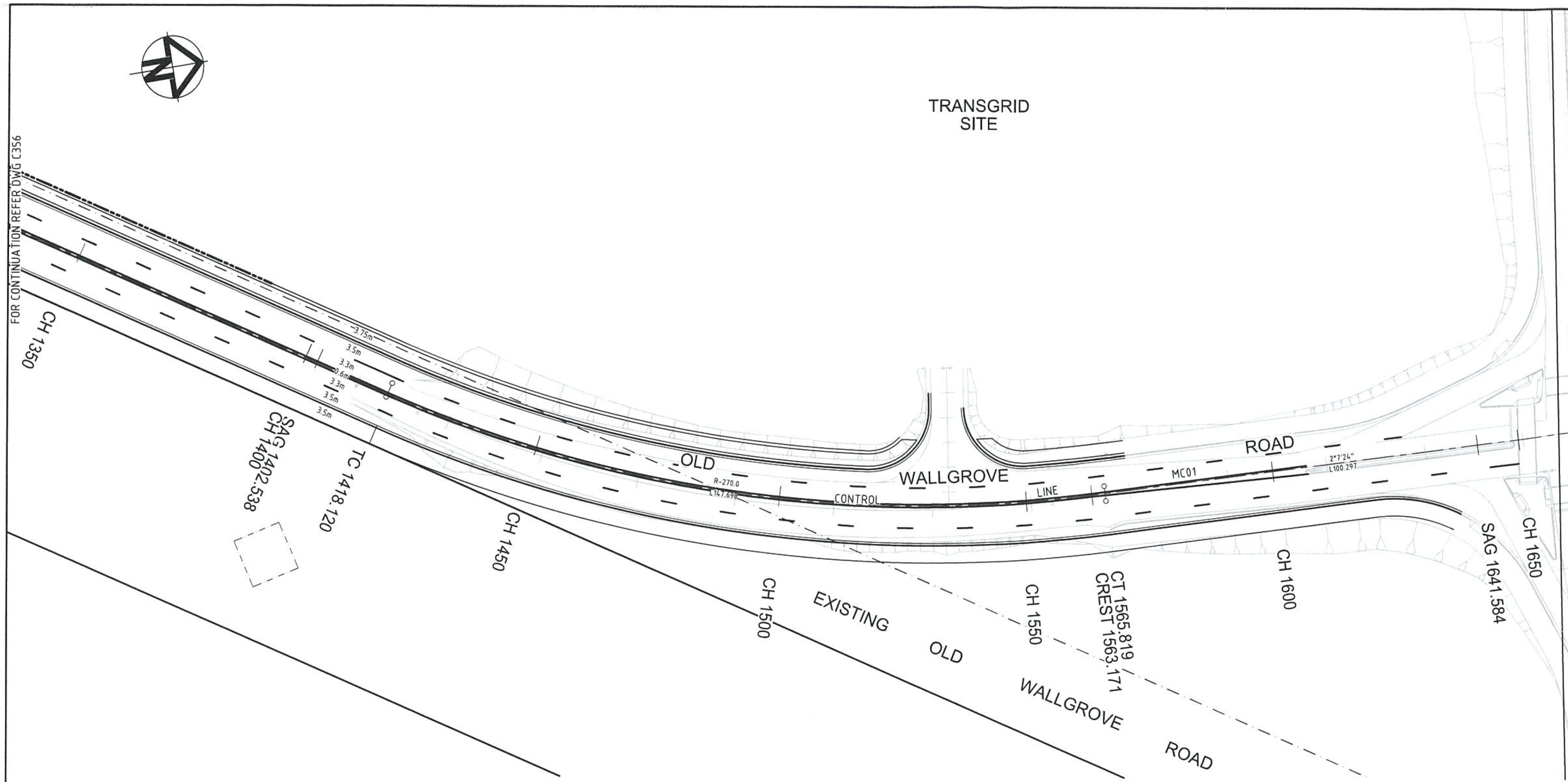
Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

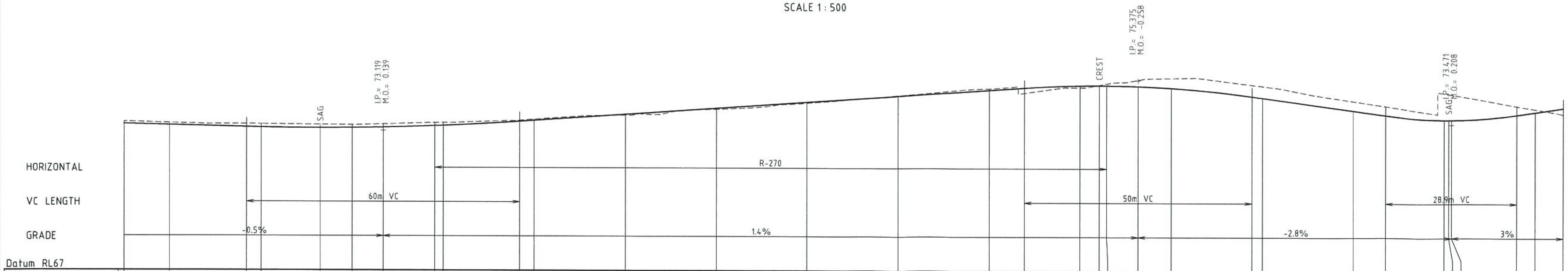
Title: OLD WALLGROVE ROAD PLAN AND LONGITUDINAL SECTION SHEET 6

Drawing No.	Project No.	Issue
C356	13-143	E



PLAN

SCALE 1 : 500



CHAINAGE	PROPOSED SURFACE LEVEL	EXISTING SURFACE LEVEL
1350.000	73.404	73.502
1360.000	73.354	73.446
1376.826	73.269	73.405
1380.000	73.255	73.399
1392.958	73.229	73.377
1400.000	73.237	73.370
1406.826	73.259	73.399
TP 1418.120	73.327	73.464
1420.000	73.342	73.470
1436.826	73.527	73.577
1440.000	73.570	73.622
1460.000	73.842	73.806
1480.000	74.114	74.071
1500.000	74.386	74.348
1520.000	74.658	74.682
1540.000	74.930	75.000
1547.714	75.035	74.795
1560.000	75.140	75.054
1564.203	75.147	75.131
TP 1565.818	75.146	75.232
1572.714	75.117	75.378
1580.000	75.044	75.478
1597.714	74.684	75.205
1600.000	74.621	75.133
1620.000	74.068	74.483
1627.176	73.870	74.268
1640.000	73.680	74.843
1640.989	73.679	74.791
1641.606	73.679	74.790
1656.035	73.906	74.284
1660.000	74.025	74.154
1666.115	74.209	73.542

CONTROL LINE MC01 LONGITUDINAL SECTION

SCALE 1:500 HORI.
1:100 VERT.

1 : 250 @ A1 1 : 500 @ A3

1 : 500 @ A1 1 : 1000 @ A3

Issue	Description	Date
E	STATE SIGNIFICANT DEVELOPMENT APPLICATION	08-08-14
D	RSA ISSUE	07-08-14
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL — NOT TO BE USED FOR CONSTRUCTION — A1

Scales: AS SHOWN
Drawn: JB
Designed: MM
Checked: MM
Approved:
Height Datum: AHD
Grid: MGA
File: C357.dwg

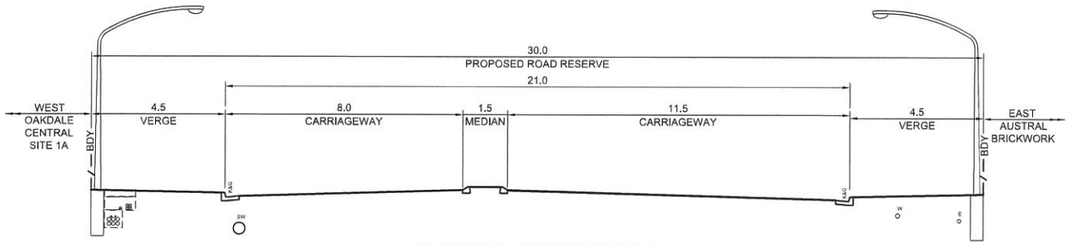
Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

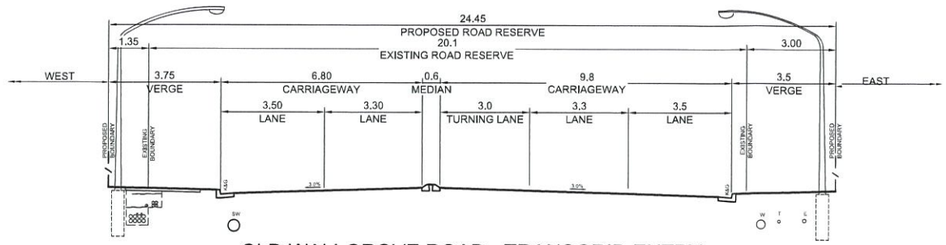
Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: OLD WALLGROVE ROAD PLAN AND LONGITUDINAL SECTION SHEET 7

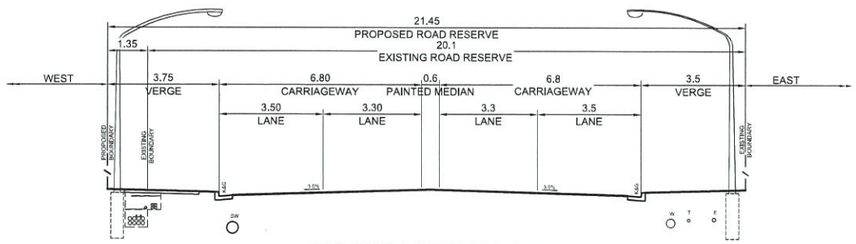
Drawing No.	Project No.	Issue
C357	13-143	E



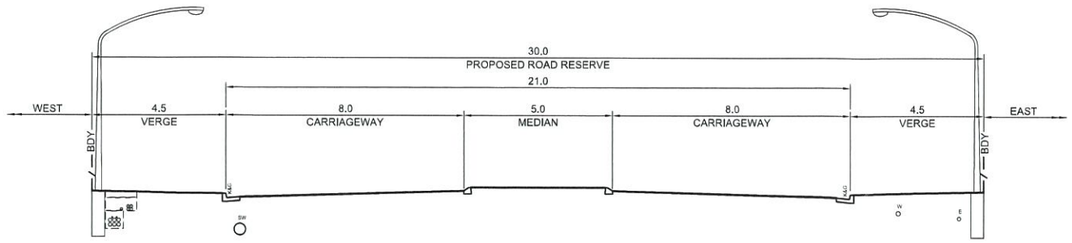
OLD WALLGROVE ROAD
TYPICAL SECTION (CH200 - CH270)
SCALE 1:100



OLD WALLGROVE ROAD - TRANSGRID ENTRY
TYPICAL SECTION (CH 1000 - CH1050)
SCALE 1:100



OLD WALLGROVE ROAD
TYPICAL SECTION
SCALE 1:100



LINK ROAD
TYPICAL SECTION
SCALE 1:100

0 2 4 6 8 10m
1 : 100 @ A1 1 : 200 @ A3

Issue	Description	Date
F	STATE SIGNIFICANT DEVELOPMENT APPLICATION	08-08-14
E	RSA ISSUE	07-08-14
D	CROSS SECTIONS UPDATED	20-05-14
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION — A1

Scales: 1 : 100 @ A1
Drawn: JB
Designed: MM
Height Datum: AHD
Checked: MM
Grid: MGA
Approved:
File: C358.dwg

Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL
INDUSTRIAL FACILITIES
LOTS 1C, 2B, 3A, 3B

Title: TYPICAL SECTIONS

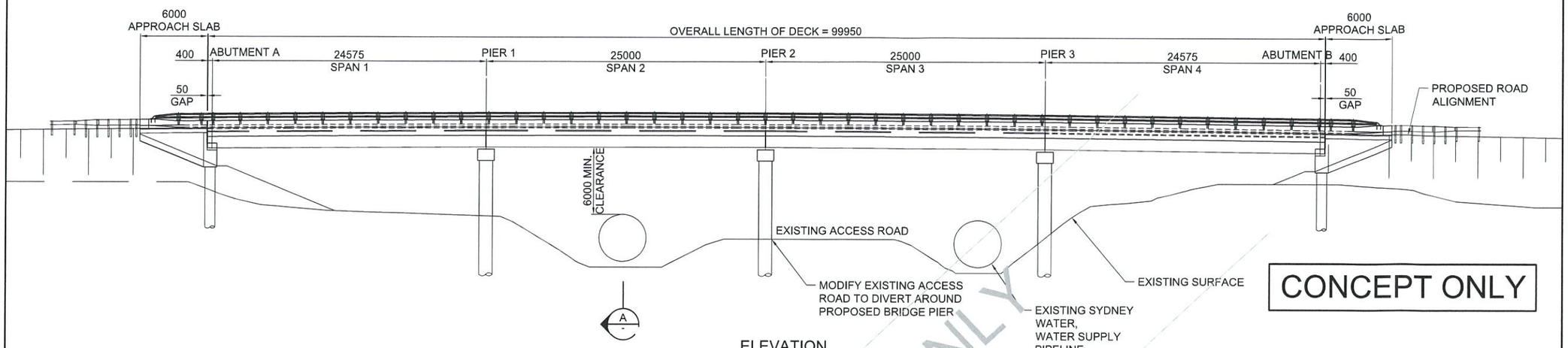
Drawing No.	Project No.	Issue
C358	13-143	F

100mm on Original

Date Plotted: 8 Aug 2014 - 11:49AM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C358.dwg V1

FROM MINCHINBURY

TO OLD WALLGROVE ROAD

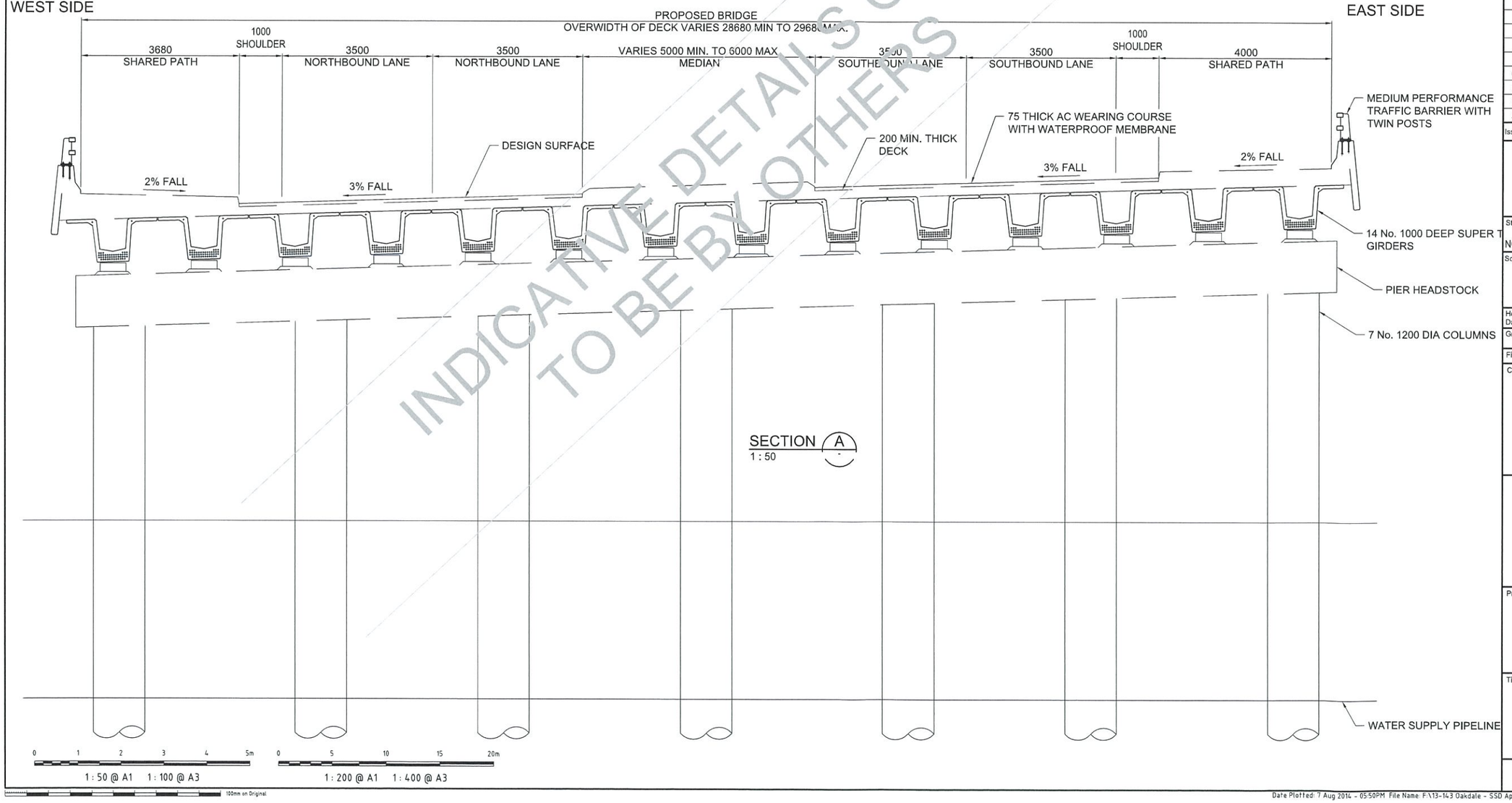


ELEVATION
SCALE 1:200

CONCEPT ONLY

WEST SIDE

EAST SIDE



SECTION A
1 : 50

0 1 2 3 4 5m
1 : 50 @ A1 1 : 100 @ A3

0 5 10 15 20m
1 : 200 @ A1 1 : 400 @ A3

100mm on Original

Issue	Description	Date
D	STATE SIGNIFICANT DEVELOPMENT APPLICATION	08-08-14
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION
A1

Scales	1 : 50 @ A1 1 : 200 @ A1	Drawn JB	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	

File: C359.dwg

Client: Goodman

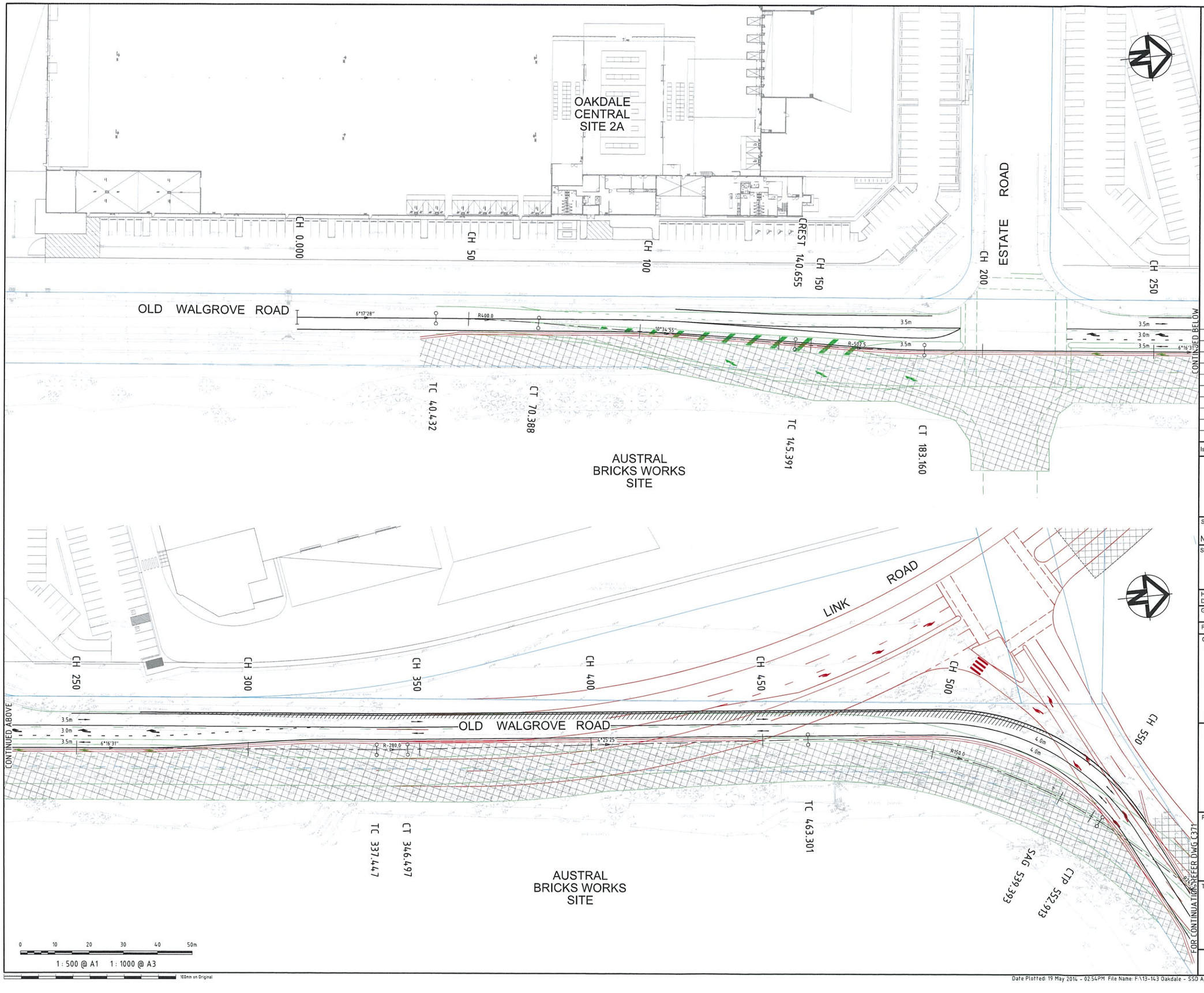
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES
LOTS 1C, 2B, 3A, 3B

Title: TYPICAL BRIDGE CROSSING SECTION

Drawing No.	Project No.	Issue
C359	13-143	D

Date Plotted: 7 Aug 2014 - 05:50PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C359.dwg V1



LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION — A1

Scales	1 : 500 @ A1	Drawn TS	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	

File: C370.dwg

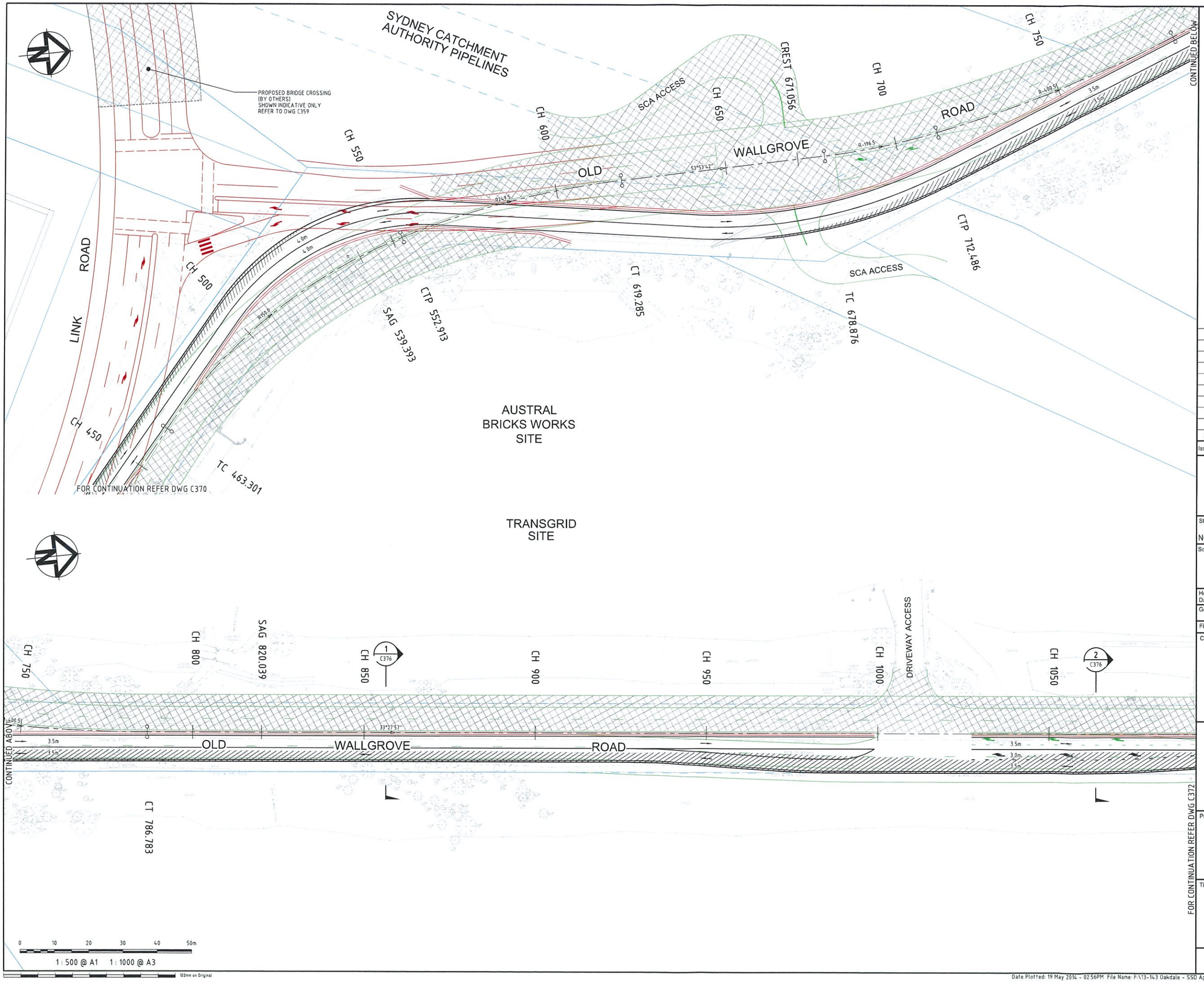
Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN STAGE 1 SHEET 1 OF 3

Drawing No.	Project No.	Issue
C370	13-143	A



LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 500 @ A1	Drawn TS	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	
File:	C371.dwg		

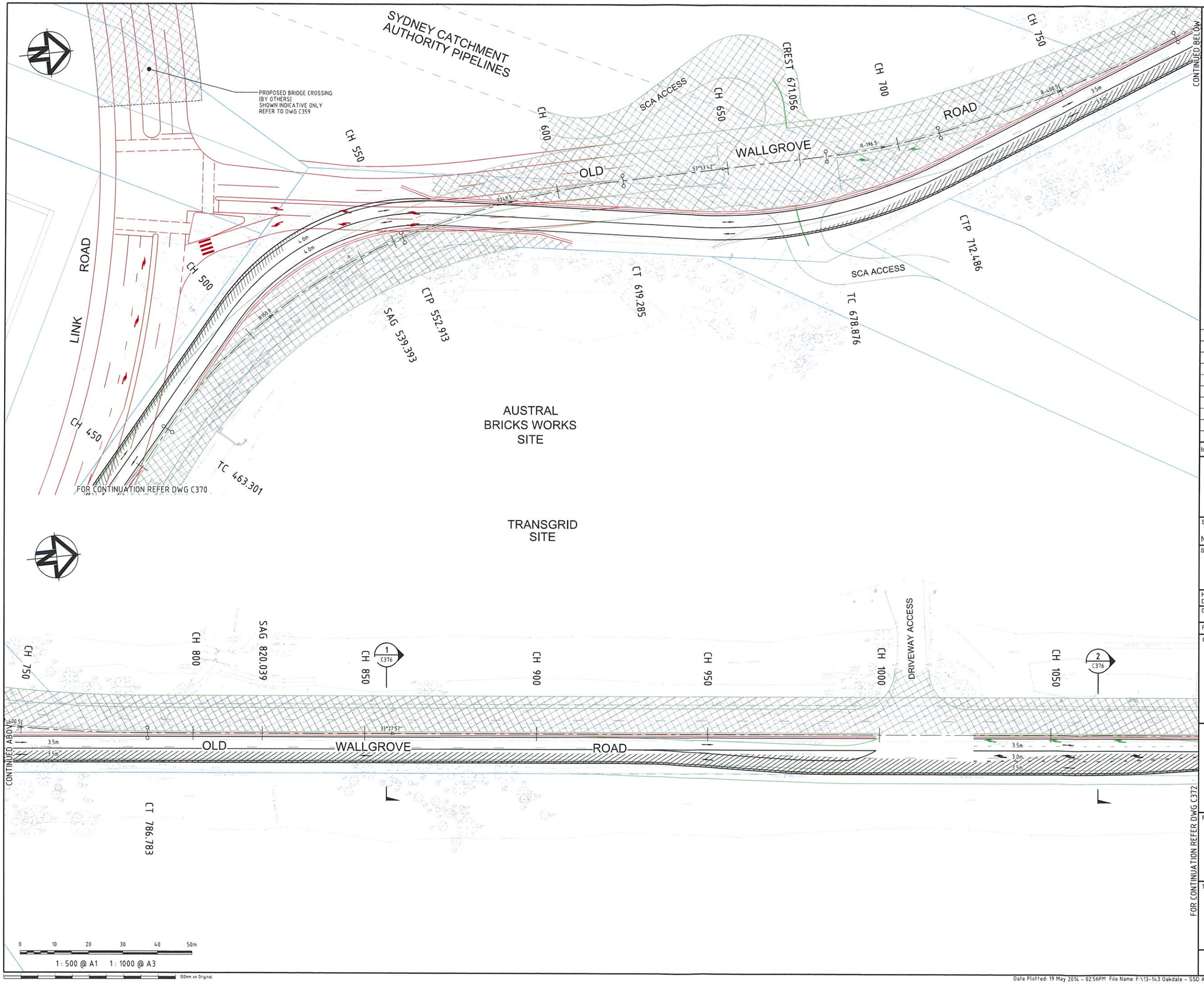
Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN STAGE 1 SHEET 2 OF 3

Drawing No.	Project No.	Issue
C371	13-143	A



LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 500 @ A1	Drawn TS	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	

File: C371.dwg

Client: Goodman

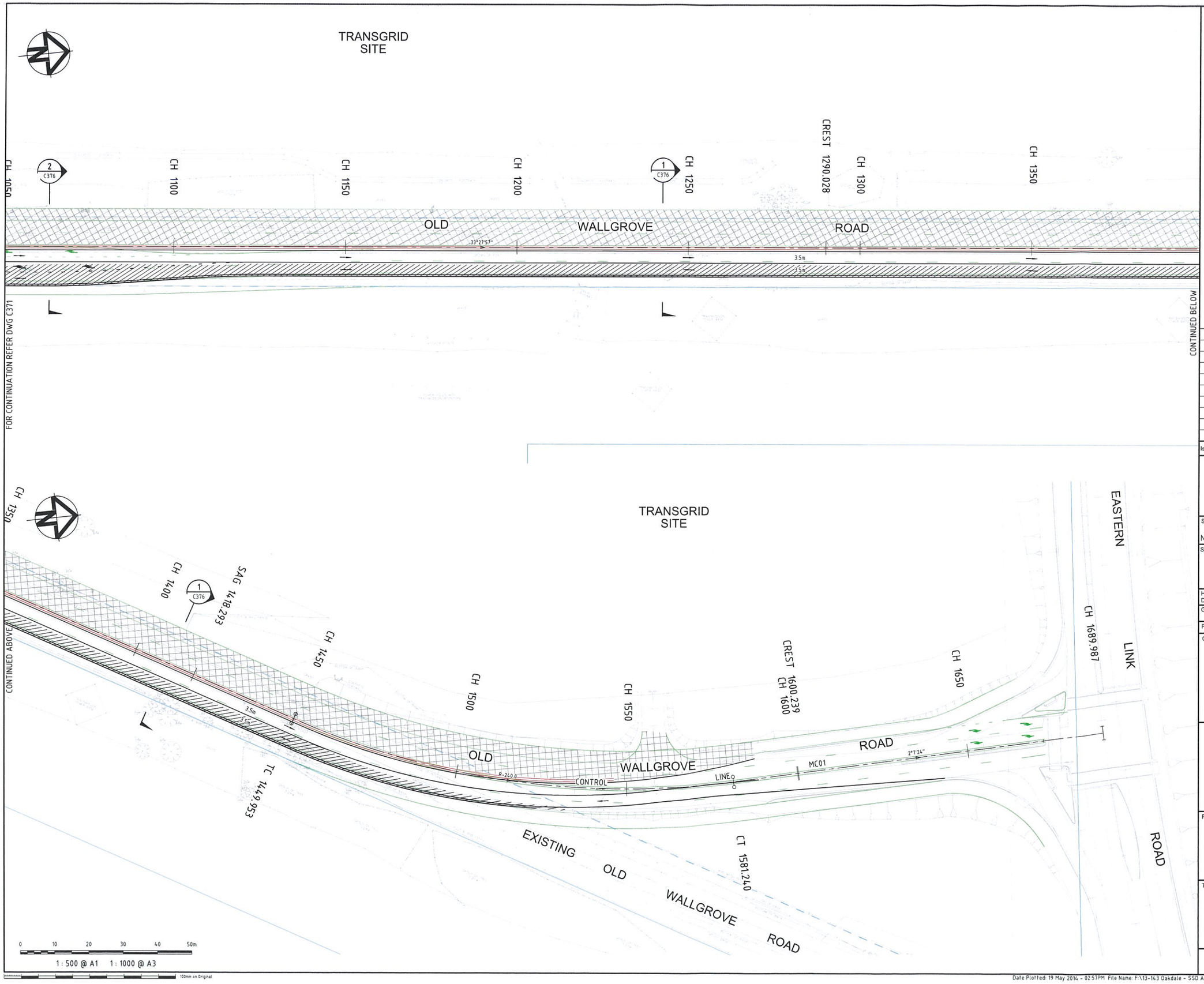
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN STAGE 1 SHEET 2 OF 3

Drawing No.	Project No.	Issue
C371	13-143	A

Date Plotted: 19 May 2014 - 02:56PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C371.dwg V1



Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION — A1

Scales	1 : 500 @ A1	Drawn TS	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	

File: C372.dwg

Client: Goodman

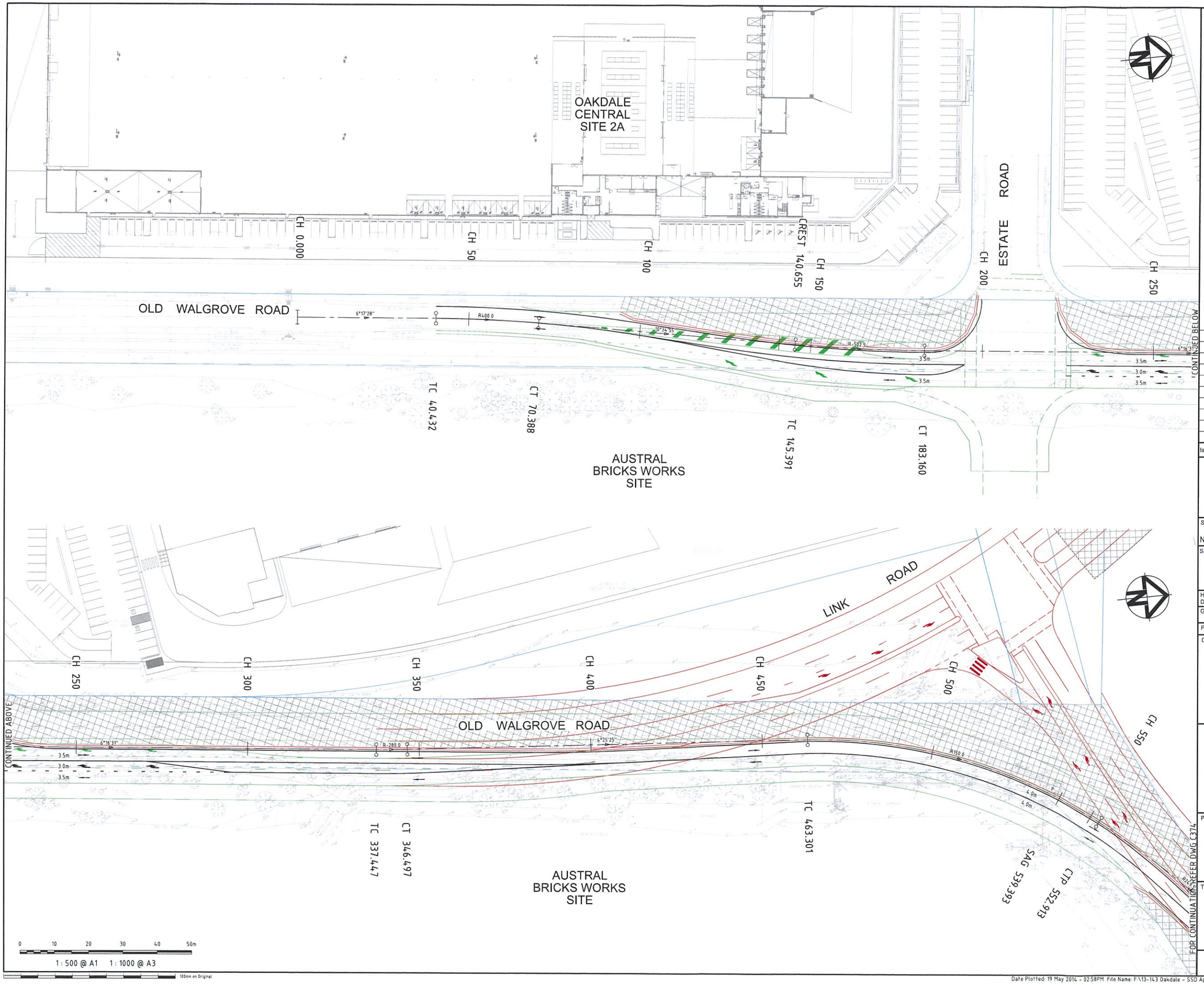
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN STAGE 1 SHEET 3 OF 3

Drawing No.	Project No.	Issue
C372	13-143	A

Date Plotted: 19 May 2014 - 02:57PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C372.dwg V1



LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 500 @ A1	Drawn TS	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	

File: C373.dwg

Client: Goodman

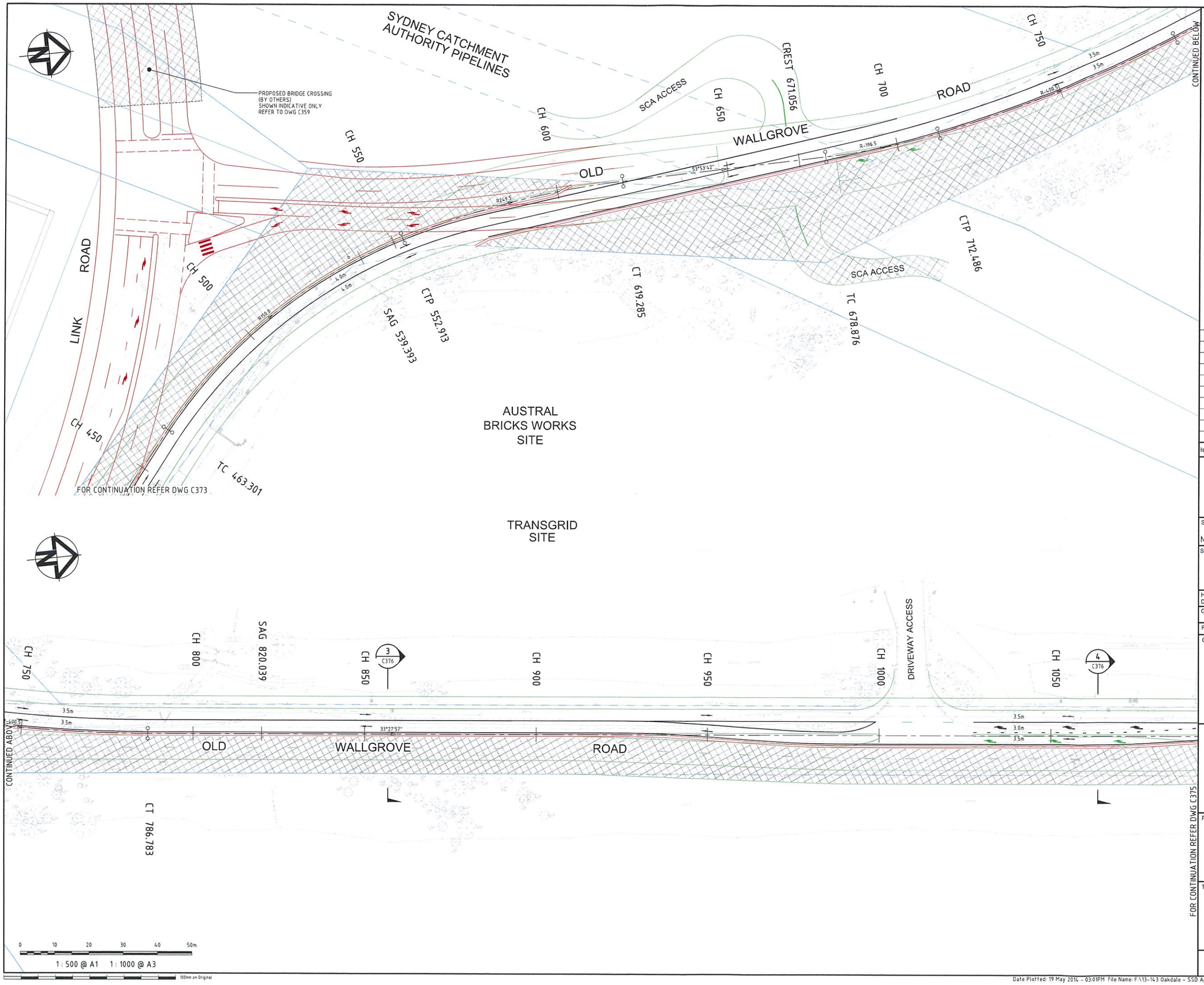
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
Info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN STAGE 2 SHEET 1 OF 3

Drawing No.	Project No.	Issue
C373	13-143	A

Date Plotted: 19 May 2014 - 02:58PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C373.dwg V1



LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

A1

Scales	1 : 500 @ A1	Drawn TS	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	

File: C374.dwg

Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN STAGE 2 SHEET 2 OF 3

Drawing No.	Project No.	Issue
C374	13-143	A

TRANSGRID
SITE

CH 1050

4
C376

CH 1100

CH 1150

CH 1200

3
C376

CH 1250

CREST 1290.028

CH 1300

CH 1350

OLD WALLGROVE ROAD

3.5m

33°27'57"

3.5m

FOR CONTINUATION REFER DWG C374

CONTINUED BELOW

CH 1350

TRANSGRID
SITE

CH 1400

3
C376

SAG 1418.293

CH 1450

CH 1500

CH 1550

CREST 1600.239
CH 1600

CH 1650

EASTERN

CH 1689.987

LINK

ROAD

CONTINUED ABOVE

3.5m

3.5m

TC 1449.953

OLD WALLGROVE ROAD

R=240.0

CONTROL LINE

MC01

2°3'24"

EXISTING OLD WALLGROVE ROAD

CT 1581.240

0 10 20 30 40 50m

1 : 500 @ A1 1 : 1000 @ A3

100mm on Original

LEGEND

- BARRIER KERB
- EXTENT OF TEMPORARY ROAD PAVEMENT
- AREA OF CONSTRUCTION WORKS

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION — A1

Scales	1 : 500 @ A1	Drawn	TS
		Designed	MM
Height Datum	AHD	Checked	MM
Grid	MGA	Approved	

File: C375.dwg

Client: Goodman

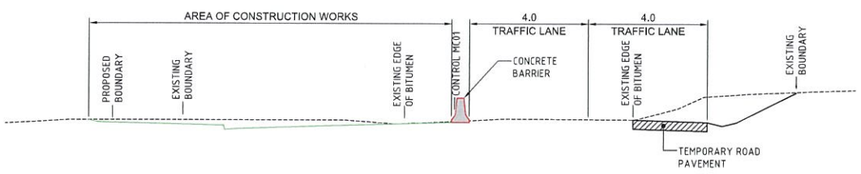
Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLAN STAGE 2 SHEET 3 OF 3

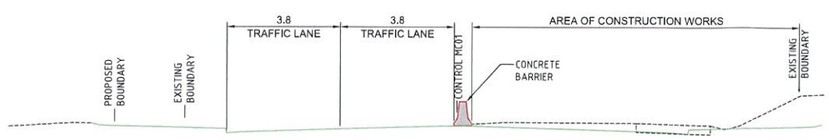
Drawing No.	Project No.	Issue
C375	13-143	A

Date Plotted: 19 May 2014 - 03:01PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C375.dwg V1



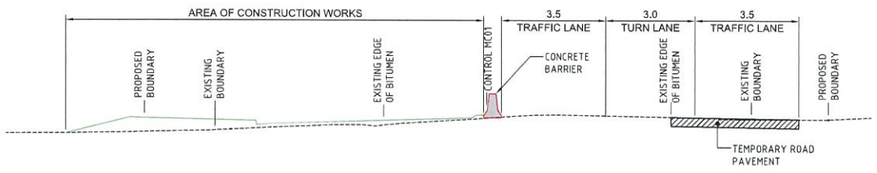
TYPICAL SECTION - STAGE 1

SECTION 1 - 1 : 100



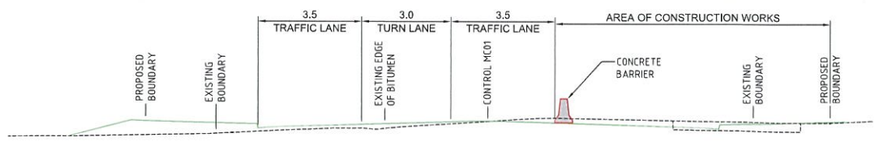
TYPICAL SECTION - STAGE 2

SECTION 3 - 1 : 100



TYPICAL SECTION - STAGE 1 TRANSGRID ENTRANCE APPROACH

SECTION 2 - 1 : 100



TYPICAL SECTION - STAGE 2 TRANSGRID ENTRANCE APPROACH

SECTION 4 - 1 : 100

0 2 4 6 8 10m

1 : 100 @ A1 1 : 200 @ A3

100mm on Original

Issue	Description	Date
A	STATE SIGNIFICANT DEVELOPMENT APPLICATION	19-5-14

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION — A1

Scales	1 : 100 @ A1	Drawn TS	
		Designed MM	
Height Datum	AHD	Checked MM	
Grid	MGA	Approved	

File: C376.dwg

Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: CONSTRUCTION TRAFFIC MANAGEMENT PLANS TYPICAL SECTIONS

Drawing No.	Project No.	Issue
C376	13-143	A

Date Plotted: 19 May 2014 - 02:35PM File Name: P:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C376.dwg V1

	LAND OWNER	APPROX. LAND TAKE AREA (m²)
	TRANSGRID	1284*
	SYDNEY CATCHMENT AUTHORITY	814*
	AUSTRAL BRICKS	4970*

*AREA SUBJECT TO FINAL DESIGN

TRANSGRID

PROPOSED LINK ROAD

ERSKINE PARK LINK ROAD

BIO-SWALE \ BASIN
30m² FILTER AREA
40m x 4m EASEMENT

ELECTRICAL TRANSMISSION TOWER

EXISTING BOUNDARY

PROPOSED BOUNDARY

BIO-SWALE \ BASIN
50m² FILTER AREA
60m x 4m EASEMENT

ELECTRICAL TRANSMISSION TOWER

APPROXIMATE EXTENT OF BATTERS

OLD WALLGROVE ROAD

EXISTING BOUNDARY

BIO-SWALE \ BASIN
40m² FILTER AREA
50m x 4m EASEMENT

PROPOSED BOUNDARY

BIO-SWALE \ BASIN
30m² FILTER AREA
40m x 4m EASEMENT

PROPOSED BOUNDARY

SYDNEY CATCHMENT AUTHORITY

TRANSGRID

ELECTRICAL TRANSMISSION TOWER

LOT 1B

LOT 1A

ESTATE ROAD

PROPOSED BOUNDARY

AUSTRAL BRICKWORKS SITE

LOT 2A

OLD WALLGROVE ROAD

SYDNEY CATCHMENT AUTHORITY

0 50 100 150 200m

1 : 2000 @ A1

100mm on Original

Issue	Description	Date
G	STATE SIGNIFICANT DEVELOPMENT APPLICATION	08-08-14
F	ISSUE FOR INFORMATION	07-08-14
E	BIO SWALES \ BASINS SHOWN	19-06-14
D	EXTENT OF BATTERS SHOWN	30-05-14
C	STATE SIGNIFICANT DEVELOPMENT APPLICATION	06-02-14
B	STATE SIGNIFICANT DEVELOPMENT APPLICATION	21-10-13
A	ISSUED FOR CLIENT REVIEW	11-10-13

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION

A1

Scales: 1 : 2000 @ A1

Drawn: JB
Designed: MM
Checked: MM
Approved:

Height Datum: AHD
Grid: MGA

File: C360.dwg

Client: Goodman

Civil Engineers and Project Managers
at&l
Suite 702, 154 Pacific Hwy
St Leonards NSW 2065
ABN 96 130 882 405
Tel: 02 9439 1777
Fax: 02 9460 8413
www.atl.net.au
info@atl.net.au

Project: OAKDALE CENTRAL INDUSTRIAL FACILITIES LOTS 1C, 2B, 3A, 3B

Title: LAND ACQUISITION PLAN

Drawing No.	Project No.	Issue
C360	13-143	G

Date Plotted: 7 Aug 2014 - 05:51PM File Name: F:\13-143 Oakdale - SSD Application\Drgs\Civil\Final\Lots 1C 2B 3A 3B\C360.dwg