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Ms. B. Inglis
Senior Town Planner
The Hills Shire Council
3 Columbia Court
Baulkham Hills
NSW 2153

TDG Ref: 13561-5
13 November 2017

Issued via email: **binglis@thehills.nsw.gov.au**

Dear Bronwyn,

Old Northern Road / Francis Street Intersection Upgrade
Amended Concept Design

TDG has prepared this letter on behalf of Merc Capital, in response to the email sent by Bronwyn Inglis to Tony Merhi and Andrew Wilson at Merc Capital on 25 October 2017, regarding the Old Northern Road / Francis Street intersection upgrade.

1. Background

TDG has recently provided traffic and transport engineering advice to Merc Capital in regard to a proposed residential development at 97-103 Cecil Avenue and 9-10 Roger Avenue, Castle Hill (the Cecil Avenue development).

The Parking and Traffic Study (**PTS**) dated June 2017 indicated that traffic signals were required at the intersection of Old Northern Road / Francis Street in Castle Hill in its current state, in order to alleviate the large delays that the intersection currently experiences during peak traffic periods.

Further analysis has indicated that the intersection will continue to operate at a poor level of service upon completion of the Cecil Avenue development. The installation of traffic signals, in addition to the provision of an exclusive right turn lane in the northbound direction, would considerably improve traffic conditions at the intersection and the surrounding road network.

A TDG memorandum to Merc Capital dated 6 July 2017, detailed the proposed concept layout of the intersection based on the traffic demands expected to be generated by the Cecil Avenue development. The intersection was identified as requiring a northbound right turn storage length of about 40 metres in order to accommodate the 95th percentile queue length during the morning peak hour.

Subsequently and separately, TDG was engaged by The Hills Shire Council (Council) to undertake a traffic study for the Castle Hill South area (Castle Hill South Report), which assessed the traffic effects that the redevelopment of the Castle Hill South area would have on the local road network. The area of the study included the Cecil Avenue development, and as such the traffic generation for this development was included in the traffic study.

Analysis of the Old Northern Road / Francis Street intersection in the Castle Hill South Report revealed that with an upgraded and signalised intersection, the 95th percentile queue for the northbound right turning vehicles was approximately 130 metres.

Council has therefore requested that the initial concept intersection design be modified to accommodate the additional Castle Hill South development traffic. Specifically, in the email from Bronwyn Inglis to Tony Merhi and Andrew Wilson at Merc Capital on 25 October 2017, Council requested the following:

- *An assessment of the overall capital cost of the proposed road works (the revised intersection concept);*
- *Amend the concept intersection layout to show:*
    - *A longer right turn lane that will accommodate the anticipated 'Castle Hill South' traffic generation;*
    - *Footpath widths of 3.5 metres on both sides of the road;*
    - *The extent of all land (if any) to be acquired in order to accommodate all road works / signalisation / medians etc. As discussed in our recent meeting, please note that there is a State-listed heritage item located on the corner of Old Northern Road and Francis Street. There are also a number of other heritage items in the vicinity of this intersection that should be considered in any proposed road widening.*

2. Concept Road Design for Intersection

A concept plan for the upgrade of Old Northern Road and the Old Northern Road / Francis Street intersection has been prepared by TDG to address the specified requirements, adhering to the dimensions specified in *Austroads Guide to Road Design – Part 4A* (Austroads Guide) for urban channelised right-turn treatments (short deceleration length).

Drawings detailing the plan are shown in **Appendix A**.

The following design process has been undertaken, and assumptions made in creating this concept design:

- The eastern road / site boundary has been shifted east approximately two metres at the Old Northern Road / Francis Street intersection, in line with the Alan Drew Funerals building on the south-east corner of the intersection. This does not have any direct physical impact on the existing buildings that are on the heritage properties.
- No properties on the western side of Old Northern Road that are designated as heritage properties are affected.
- The road has been widened between Francis Street and Church Street to accommodate a carriageway width of 15.8 metres, comprising of four 3.2 metre wide through lanes and one 3.0 metre wide right turn lane.
- Old Northern Road tapers back to its current alignment between Kerrs Road and Church Street, which is approximately 60 metres in length, the lateral movement length required in the Austroads Guide.
- The western road boundary is determined by a line offset 3.5m from the edge of the western kerb line.
- The Old Northern Road / Parsonage Road intersection will be required to be converted into a left-in/left-out intersection, and an indicative layout can be seen in **Figure 5**.
- Pedestrian crossings have been provided on the eastern and northern legs of the Old Northern Road / Francis Street intersection. Currently the closest pedestrian crossings to Francis Street are located approximately 200 metres to the south (at the Old Northern Road / Kerrs Road intersection) and 300 metres to the north (at the Old Northern Road / Cecil Avenue intersection).

A second concept design has also been prepared with a total verge width of 2.5m on both sides of Old Northern Road. This is considered as a potentially viable alternative option. It has the effect of reducing the amount of land required to be acquired. This concept design is detailed in **Appendix B**.

3. Required Land Acquisition

By widening the road boundary as described, approximately 400 m^2 of property would need to be acquired in total, with some of this land falling on either side of Old Northern Road, as shown in **Figure 3** within **Appendix A**.

In the alternative option with 2.5m wide verges, approximately 200m^2 of property would need to be acquired on the eastern side only of Old Northern Road, as shown in **Figure 7** within **Appendix B**.

4. Estimated Costing

A provisional cost estimate has been prepared for the concept design works as shown Appendix A and outlined above. This is a preliminary estimate based on the concept design. It is subject to a range of broad based assumptions and exclusions as have been indicated.

On these bases, it is estimated that the total cost of the upgrade of Old Northern Road and the Old Northern Road / Francis Street intersection (as shown in Appendix A) could be in the order of $3,000,000 and $3,500,000, excluding GST. An indicative cost breakdown of this estimate is included within **Appendix C**.

Similarly, a costing estimate for the alternative design concept (as shown in Appendix B) is expected to cost between $2,800,000 and $3,300,000, excluding GST.

5. Heritage Item Consideration

An extract from Council's Local Environment Plan (LEP) 2012 Heritage Map is shown in **Figure 1** below, and shows four heritage items in the vicinity of the intersection of Old Northern Road and Francis Street. The four heritage items are the former St. Paul's Anglican Church at 221–225 Old Northern Road (I59) (also listed on the State Heritage Register); Castle Hill House at 6-10 Francis Street (I50); Wansbrough House at 230 Old Northern Road (I60); and The Parsonage at 210 Old Northern Road (I58).

Figure 1: The Hills Shire Local Environment Plan 2012 Heritage Map (figure supplied by Merc Capital)

The intersection design concepts indicate a potential need for the acquisition of a narrow strip of the Old Northern Road frontage of two of the heritage properties, being the former St. Paul's Anglican Church at 221-225 Old Northern Road (I59), to a depth of approximately 2.0m. It also shows widening over the Castle Hill House property at 6-10 Francis Street (I50), to a depth of approximately 1.0m to 1.5m. Neither the intersection performance improvements nor the acquisition of land is expected to impact the main historic building structures on these properties.

Further, the intersection design concepts are not expected to impact either of the two heritage listed properties being the Wansbrough House at 230 Old Northern Road (I60) or the Old Parsonage at 210 Old Northern Road (I58).

6. Conclusion

As mentioned in the Parking and Traffic Study that TDG have previously prepared for the Cecil Avenue Development, the intersection of Old Northern Road / Francis Street was identified to be currently operating at very poor level of service conditions. The Cecil Avenue development is expected to only have a minor impact on the operation of the intersection, increasing the critical delay slightly.

The Castle Hill South traffic study revealed that in order to support the planned developments within the Castle Hill South area, the intersection is required to be upgraded to a signalised intersection, and an exclusive northbound right-turn lane on Old Northern Road is also required.

In this regard, the cost of the intersection upgrade is assessed as reasonable to apportion between developments planned across the Castle Hill South area as well as existing traffic, with a proportion of the cost being attributed to development in the Cecil Avenue Planning Proposal.

As such, it is concluded that sufficient information has been provided to Council and Roads and Maritime Services in order for the Planning Proposal for the Cecil Avenue development to progress without further delay from this matter.

Yours sincerely
Traffic Design Group Ltd

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Fred Gennaoui
Principal Traffic Engineer
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Attached: **Appendix A (Intersection Concept Design (3.5m wide verges))**
Appendix B (Alternative Intersection Concept Design (2.5m wide verges))
Appendix C (Cost Estimation Summary)

Appendix A

Intersection Concept Design
3.5m Wide Verge

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OLD NORTHERN ROAD / FRANCIS STREET INTERSECTION UPGRADE

CONCEPT DESIGN

AS PER COUNCIL COMMENTS - 3.5M FOOTPATHS

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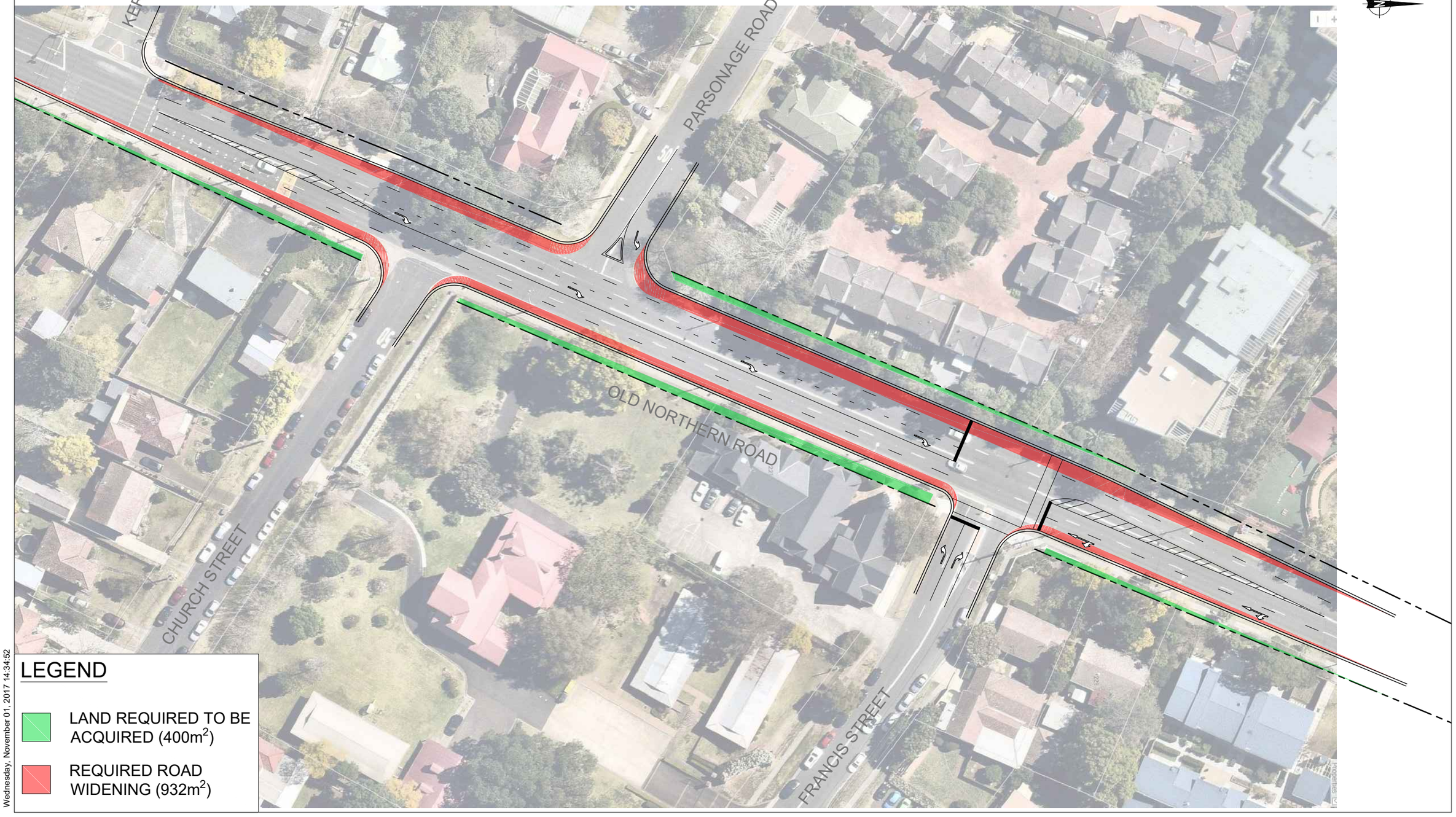

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OLD NORTHERN ROAD / FRANCIS STREET INTERSECTION UPGRADE

CONCEPT DESIGN - REQUIRED WIDENING

AS PER COUNCIL COMMENTS - 3.5M FOOTPATHS

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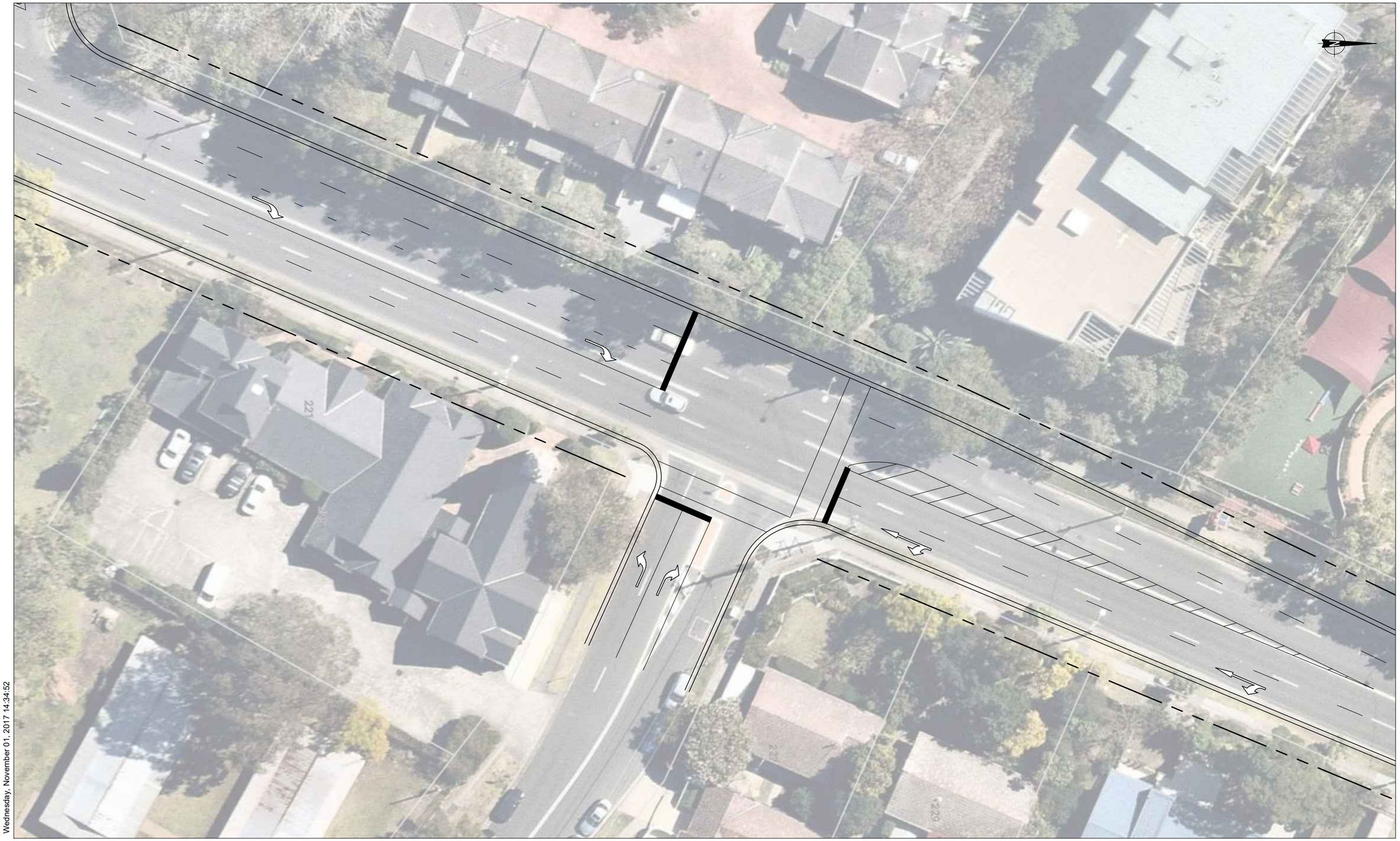

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OLD NORTHERN ROAD / FRANCIS STREET INTERSECTION UPGRADE

CONCEPT DESIGN - OLD NORTHERN ROAD / FRANCIS STREET INTERSECTION

AS PER COUNCIL COMMENTS - 3.5M FOOTPATHS

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OLD NORTHERN ROAD / FRANCIS STREET INTERSECTION UPGRADE

CONCEPT DESIGN - ONR / PARSONAGE ROAD AND CHURCH STREET INTERSECTIONS

AS PER COUNCIL COMMENTS - 3.5M FOOTPATHS

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Appendix B

Alternative Intersection Concept Design
2.5m Wide Verge

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OLD NORTHERN ROAD / FRANCIS STREET INTERSECTION UPGRADE

CONCEPT DESIGN

AS PER COUNCIL COMMENTS - 2.5M FOOTPATHS

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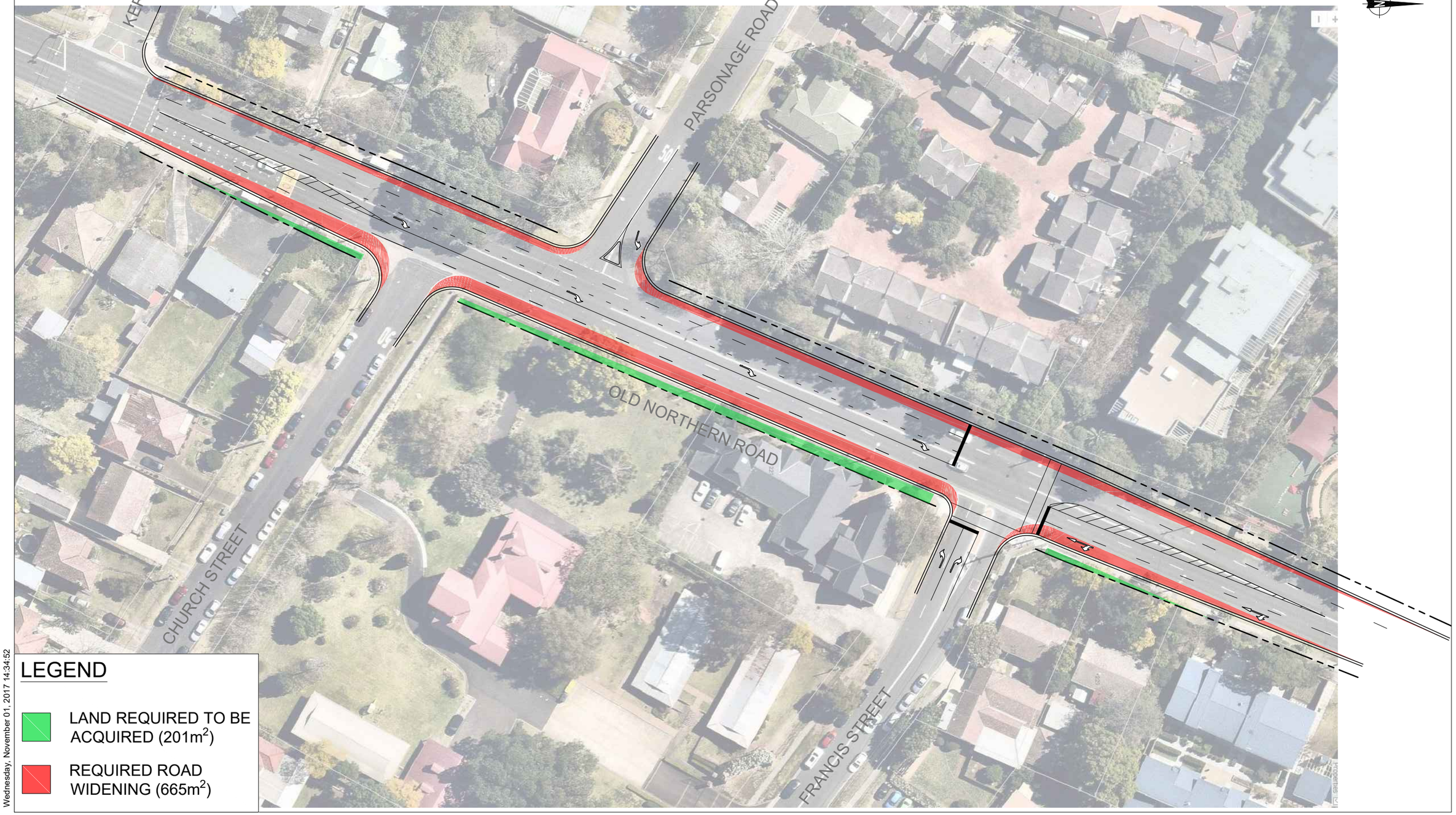

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OLD NORTHERN ROAD / FRANCIS STREET INTERSECTION UPGRADE

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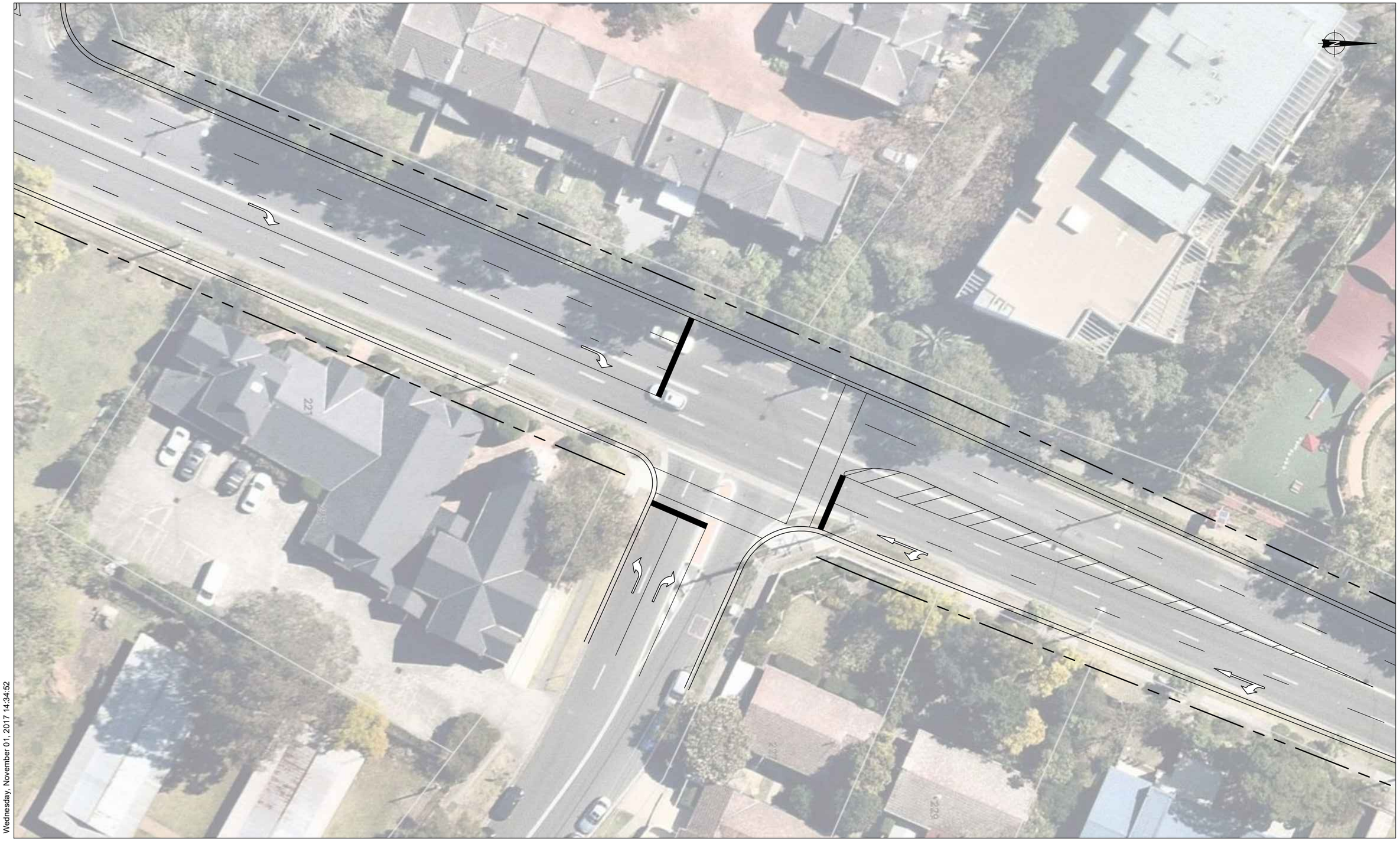

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CONCEPT DESIGN - OLD NORTHERN ROAD / FRANCIS STREET INTERSECTION

AS PER COUNCIL COMMENTS - 2.5M FOOTPATHS

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OLD NORTHERN ROAD / FRANCIS STREET INTERSECTION UPGRADE

CONCEPT DESIGN - ONR / PARSONAGE ROAD AND CHURCH STREET INTERSECTIONS

AS PER COUNCIL COMMENTS - 2.5M FOOTPATHS

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Appendix C

Cost Estimation Summary

SCHEDULE OF PRICES - ESTIMATE SUMMARY SHEET	
Project Number :	13561-5
Project Description:	Merc - Francis Street - Old Northern Road Signals - Concept Only
Drawing Reference Number :	13561-5S1A
Date Prepared :	9 November 2017

ITEM	DESCRIPTION		TOTAL
1	PRELIMINARY AND GENERAL WORKS, INCLUDING STORMWATER	$	160,000.00
2	PAVEMENT AND BERM WORKS	$	420,000.00
3	GENERAL UTILITIES EXCLUDING STORMWATER (PROVISIONAL LUMP SUM ESTIMATE)	$	760,000.00
4	STREET LIGHTING, FURNITURE AND ASSETS	$	70,000.00
5	LAND ACQUISTION	$	1,000,000.00
6	TRAFFIC SIGNALS	$	150,000.00
	SUB TOTAL $ (EXCL GST)	$	2,560,000.00
10	CONTINGENCY	$	640,000.00
11	PROFESSIONAL FEES	$	180,000.00
	TOTAL $ (EXCL GST)	$	3,380,000.00

DESCRIPTION OF COSTING APPROACH	
	General item includes: Establishment/Disestablishment, Traffic Management Plan, On Site Traffic Control, Survey Control and Setting Out, and As-builts
	Earthworks item based on cut to waste
	Stormwater Construction item based on installation of a new sump
	Pavement Works based on M4 basecourse
	Kerbing Construction based on mountable kerb and channel and mountable concrete nib
	First Coat Sealing based on 40mm asphalt
	Footpath Construction based on 75mm thick concrete
	Berm Construction based on 75mm thick topsoil and grassing
	Fencing works based on residential fencing replacement
	Road Marking based on new centreline, edgelines, stop limit lines as shown on the plans
	Signs works based on 9 new signs
	All other underground and overhead utility services including but not limited to the following (power, phone, gas, communications, water, sewer, etc), not otherwise shown has only been provided for as a provisional lump sum estimate
	All services to be marked on site before excavation
	A contingency has been allowed for.
	Topographical survey costs have not been allowed for.
	Pavement sampling and testing costs have not been allowed for.
	Land acquisition included as provisionally shown