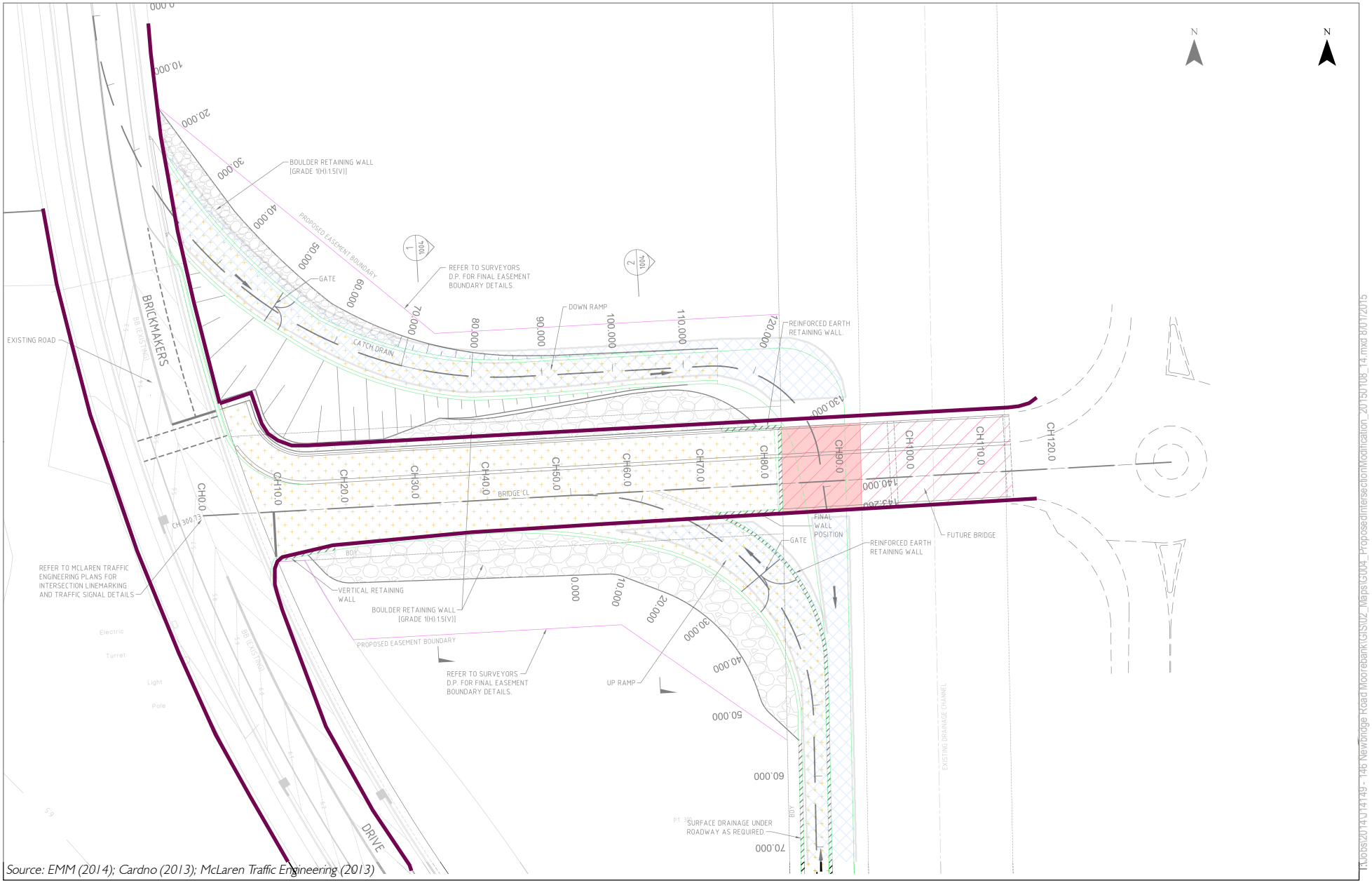

Source: EMM (2014); Cardno (2013); McLaren Traffic Engineering (2013)

Approved link road and intersection with Brickmakers Drive

Georges Core Marina Development
Planning Proposal - Transport Planning Assessment

Figure 4.1

4.3 Impacts at intersections

The future effects of the externally generated project traffic at the Brickmakers Drive and link road intersection have been assessed for the Marina site traffic movements (including residential traffic).

The SIDRA intersection analysis program has been used to analyse the future peak hour operating conditions of the proposed intersection in accordance with RMS intersection Level of Service standards. The performance of either traffic signal controlled or un-signalised intersections is normally quantified in terms of the Level of Service (LOS), which is based on the average delay per vehicle at the intersection. LOS ranges from A = very good to F = highly congested travel conditions (Table 4.5).

Table 4.5 Intersection Level of Service definitions

Description	LOS (RMS definition)	Average Vehicle Delay (s)
Very Good	A	<14.5
Good	B	14.5 to ≤28.5
Satisfactory	C	28.5 to ≤42.5
Near Capacity	D	42.5 to ≤56.5
At Capacity	E	56.5 to ≤70.5
Over Capacity	F	≥70.5

The existing performance of assessed intersections is also quantified in terms of the following factors:

- Degree of Saturation (DOS) which is the ratio of the traffic volume to the capacity of the intersection;
- the Average Vehicle Delay (AVD) in seconds per vehicle for each traffic movement at the intersection; and
- the length of the maximum traffic queue (95th percentile traffic queue) for each traffic movement at the intersection.

In the SIDRA analysis for the morning and afternoon peak traffic hours, the existing base surveyed traffic volumes on Brickmakers Drive surveyed in March 2013 were increased by 142 vehicles per hour (mainly travelling northbound) during the morning peak hour and by 124 vehicles per hour (mainly travelling southbound) during the afternoon peak hour. These increases represent the future base traffic growth which would occur from additional residential traffic using Brickmakers Drive at the northern end, when the adjacent Georges Fair residential development is completed.

The intersection analysis results are summarised in Table 4.6 and detailed output results are included in Appendix B.

At the future link road intersection on Brickmakers Drive, the busiest times will generally be the weekday afternoon peak hour traffic periods. At these times, the traffic signal intersection will require a longer intersection cycle time (120 seconds typically) compared to the morning peak period when a shorter intersection cycle time (60 seconds typically) would be feasible.

Table 4.6 Summary of future SIDRA intersection performance

Intersection	Peak hour	Operation	Traffic growth from Georges Fair and the proposed Marina including residential apartments and townhouses
Brickmakers Drive/ Link Road	Weekday am peak hour	DOS	0.630
		LOS	A
		Average delay	10.7 s
		Maximum queue length	98 m
	Weekday pm peak hour	DOS	0.659
		LOS	A
		Average delay	12.5 s
		Maximum queue length	199 m

During both the weekday morning and afternoon traffic peak hours, the signalised intersection assessment results in Table 4.6 show the intersection will be operating at Level of Service A with the base locality traffic growth and proposed development traffic included.

The intersection will be operating with average traffic delays of between 10.7 to 12.5 seconds for all traffic movements at the intersection during the weekday morning and afternoon traffic peak hours.

The maximum morning and afternoon traffic peak hour queue lengths will be 98 and 199 m respectively in the northbound and southbound directions respectively on Brickmakers Drive. However, the maximum intersection traffic queues will be much shorter (eg between 9.5 and 31.2 m) on the link road approach.

The intersection degrees of saturation will be 0.630 and 0.659 during the weekday morning and afternoon traffic peak hours respectively. This indicates that the intersection will have spare capacity to accommodate the additional future peak hourly traffic movements from the other developments which are listed in Sections 1.3 and 0. These developments are not specifically assessed in this intersection traffic analysis for the Marina as they will be subject to separate development assessment and approval independently from the Marina development proposal.

4.4 Site car parking

The available car parking for the non residential components of the site (about 600 spaces) has increased from the 490 car parking spaces for the approved Georges Cove Marina. As this car parking was considered to be adequate for the marina berths and non-residential land uses with the approved development, it will also be adequate for these land uses with the amended development as the proposed numbers of marina berths and commercial floor areas have not generally increased.

There will be more than sufficient general parking within the site to provide 49 spaces for residential visitor car parking. This will effectively meet the minimum car park provision rate (two per dwelling, ie 250 spaces for 125 dwellings) for the site residential buildings under the Liverpool DCP 2008 (Part 2.10).

Some of the car parking spaces will be designated as accessible car parking spaces, with a vacant area adjacent to the car parking space, of equivalent width to a normal car parking space, as described in AS 2890.6. This will reduce the nominal site car parking capacity by one parking space for every two accessible car parking spaces which are provided. The total number of accessible car parking spaces will be determined as part of the development application process.

All the off-street car parking spaces will have minimum dimensions 2.5 m by 5.5 m clear of columns which will comply with the relevant car park design standards for residential buildings under the Liverpool DCP 2008 (Part 2.10) and also with the car park design standards for residential and commercial buildings in the AS 2890.1.

4.5 Pedestrian and cycling access

A combined pedestrian and cycle access path along the northern side of the link road will be 2.5 m wide and the joining path along the entire foreshore will be 3.0 m wide. These will meet the Liverpool DCP 2008 (Part 2.10) requirements. Site footpaths will be at least 1.5 m wide to meet the DCSP requirements. The proposed site footpath widths will be adequate for the anticipated future level of pedestrian access and circulation within the Marina site.

Bicycle parking for residential or non-residential use, designed in accordance with RMS, Austroads or Australian Standard design guidelines, will be considered as part of the development application.

4.6 Public transport services

The future residential buildings within the site will be 600 to 800 m walking distance from the nearest existing bus stops on Newbridge Road and will provide appropriate public transport to and from the development.

5 Summary and conclusions

5.1 Site access and traffic circulation

Access to the Marina site will be via the link road. This will be constructed between the site and Brickmakers Drive, where an intersection will be constructed 300 m south of Newbridge Road. All internal site roads will comply with the Council's design standards (DCP 2008 Part 2.10) and AS 2890.1. As such, internal site access arrangements will be efficient and safe.

5.2 Impacts on road traffic

The proposed development of 125 dwellings in addition to the various currently approved Marina site land uses (boat storage, boat showroom, function centre, cafe, clubhouse and boat repair workshop area) will generate approximately 1,472 additional daily traffic movements.

There will be 135 additional hourly car movements during the weekday morning traffic peak hours and 180 additional hourly car movements during the weekday afternoon traffic peak hours.

The background traffic volumes on Brickmakers Drive, Newbridge Road and Governor Macquarie Drive were resurveyed in March 2013. These traffic surveys indicate that the peak hour traffic volumes on these roads are approximately:

- 54,000 vehicle movements daily for Newbridge Road east of Governor Macquarie Drive;
- 40,000 vehicle movements daily for Newbridge Road west of Governor Macquarie Drive;
- 16,000 vehicle movements daily for Governor Macquarie Drive north of Newbridge Road; and
- 9,000 vehicle movements daily for Brickmakers Drive south of Newbridge Road.

The traffic volumes on Newbridge Road are anticipated to reduce now widening of the M5 West Motorway between Liverpool and King Georges Road has been completed.

With the completion of the Georges Fair residential development, the future base daily traffic volumes using Brickmakers Drive (not including the Marina site traffic) will grow by about 15%.

The assessment of daily traffic volumes on Newbridge Road, Governor Macquarie Drive and the section of Brickmakers Drive south of the link road intersection shows that the proposed Georges Cove Marina (including the residential development) will have minimal traffic growth impacts, being of the order of +1% to +2%. These traffic increases will have negligible impacts on traffic flows, traffic safety and residential amenity along all affected routes. There would generally be little difference between the traffic impacts of the approved Georges Cove Marina and the proposed residential within the Marina site.

On the 300 m section of Brickmakers Drive, north of the link road intersection, the Marina site daily traffic increases will be more noticeable, being about +15% for the Marina site. However, these daily traffic increases will remain within the daily traffic capacity for Brickmakers Drive as an urban two lane collector/distributor type road and would not require additional traffic calming or other traffic management measures.

5.3 Impacts on intersections

Recent NSW Land and Environment Court proceedings (No 30141 of 2013) approved an intersection design prepared by Cardno (2013) for the link road intersection on Brickmakers Drive. This included the potential provision of traffic signals as detailed in a plan of the intersection prepared by McLaren (2013). The proposed access to the Georges Cove Marina (ie the link road and its intersection with Brickmakers Road) will be physically identical as that approved by the NSW Land and Environment Court (ie the layout prepared by Cardno).

It is proposed to install the traffic signals during construction of the intersection. While these are not required for the Georges Cove Marina (including the proposed dwellings), the intersection is likely to require traffic signals in the longer term due to background traffic growth on Brickmakers Drive and future developments, such as the Mirvac residential development that will use the link road. Installing these signals during the initial intersection construction will provide greater certainty regarding the adequacy of the intersection to cater for traffic from future developments and will be less disruptive than installing signals at a later date when the link road is opened to traffic.

The locations of the traffic signals, intersection signage and line markings will be determined as part of detailed design of the intersection.

The effects of the proposed additional traffic on the link road and Brickmakers Drive intersection have been assessed using estimated weekday peak hourly development traffic volumes, which also included additional traffic on Brickmakers Drive from the completion of the Georges Fair residential development. This showed that the morning and afternoon peak hourly intersection traffic operations will be Level of Service A (average intersection traffic delay for all movements being 10.7 and 12.5 seconds respectively).

The future intersection peak hour degrees of saturation will be between 0.630 and 0.659 and the maximum intersection queue lengths will be between 9.5 and 31.2 m on the link road approach.

5.4 Assessment of car parking

The total proposed car parking capacity of the site is 851 car parking spaces. This is 201 residential car parking spaces and 650 other car parking spaces for use by site employees, customers and other visitors.

There will be more than sufficient general parking within the site to provide 49 spaces for residential visitor car parking. This will effectively meet the minimum car park provision rate (two per dwelling, ie 250 spaces for 125 dwellings) for residential buildings under the Liverpool DCP 2008 (Part 2.10).

Bicycle parking for residential or non-residential use, designed in accordance with RMS, Austroads or Australian Standard design guidelines, will be considered as part of the development application.

5.5 Pedestrian and cycling access

The site footpaths along the main site access roadway will comply with the DCP requirements and will be adequate for the anticipated volumes of pedestrian movement and circulation between relevant locations within the site.

Cyclists will also be able to use the proposed link road to Brickmakers Drive pedestrian/cycle path and the riverfront pedestrian/cycle path. These paths will be 2.5 m or 3.0 m wide and will meet the DCP design width standard (2.5 m) to permit use by both pedestrians and cyclists.

The proposed uses will include provision of bicycle parking within the site according to Council's requirements

5.6 Public transport

There is appropriate public transport access to and from the development for residents and visitors.

References

NPC 2015, *Georges Cove Marina, Modifications to Development Consent Flood Impact Assessment* Report prepared by NPC Consultants for Benedict Industries Pty Ltd, 7 January 2015.

Cardno 2013, *Site Plan* Drawing showing Brickmakers Drive access easement and intersection, prepared at the Completion of Land & Environment Court Proceedings No 30141 of 2013, for Concrete Recyclers, June 2013.

McLaren Traffic Engineering 2013, *Signalised intersection LT Bay* Drawing showing Brickmakers Drive access signalised intersection, prepared for Land & Environment Court Proceedings No 30141 of 2013, for Moorebank Concrete Recyclers, 23 May 2013.

Roads and Traffic Authority (RTA) 2002, *Guide to Traffic Generating Developments.*

Appendix A

Site plans