TOONDAH HARBOUR

APPENDIX 1 - N

TRAFFIC GENERATION REPORT

PSA CONSULTING

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01 December 2020

Walker Corporation
Level 18
150 Charlotte Street
Brisbane QLD 4000

Attention: Craig Addley/Kelli Thomas

Dear Craig/Kelli,

RE: TRAFFIC ENGINEERING ADVICE IN RELATION TO THE PROPOSED TOONDAH HARBOUR EIS

1. INTRODUCTION

PSA Consulting has been engaged by Walker Corporation to provide traffic engineering advice and prepare a Traffic Impact Assessment (TIA) to assist in the submission of an Environmental Impact Statement (EIS) for the Toondah Harbour Priority Development Area (PDA). This report provides traffic engineering advice for the Toondah Harbour Project specifically including preliminary traffic generation, assessment of link traffic volumes, intersection pinch points, car parking and street and movement network advice. This advice has been prepared to assist in the submission of the federal EIS and will also inform Stage 2 of the project which will see the preparation of a full TIA in accordance with the Department of Transport and Main Roads (TMR)'s *Guide to Traffic Impact Assessments* (GTIA).

1.1. BACKGROUND

The Toondah Harbour PDA was declared on 21 June 2013 by the Queensland Government and Redland City Council (RCC) and is being managed by Economic Development Queensland (EDQ). The Toondah Harbour PDA is located in Cleveland within the RCC local government area (LGA). The PDA covers approximately 67 ha which includes 17.5 ha of land and 49.5 ha of water within the Moreton Bay Marine Park. Toondah Harbour is well known for providing vehicle ferry and water taxi services between the mainland and North Stradbroke Island.

The PDA is bounded by Shore Street East in the north and Wharf Street in the east as shown in Figure 1.

Figure 1: PDA locality (Source: Economic Development Queensland, 2014)

2. EXISTING CONDITIONS

2.1. EXISTING SITE

As outlined above, the PDA covers a total area of 67 ha (17.5 ha on land and 49.5 ha of water) on the east coast of Cleveland. The PDA currently includes a mix of low and medium density residential housing, commercial, industry and community facilities. The RCC zoning map shows the existing land to include medium density residential, neighbourhood centre and community facilities.

2.2. EXISTING TRAFFIC VOLUMES

Traffic counts were undertaken on both Saturday 3 October 2020 and Tuesday 6 October 2020 to obtain a baseline understanding of existing traffic volumes on roads within and surrounding the study area. Intersection turning movement volumes were collected (for use in detailed analysis as part of Stage 2 of the traffic and transport analysis, which will entail detailed traffic assessment to support the future PDA development application) and from these, link volumes have been calculated for the purposes of this preliminary assessment. For consistency across the study area, the AM peak hour for weekday traffic was taken to be 8-9am, the PM peak hour for weekday traffic was taken to be 3-4pm, and the weekend peak hour was taken to be 11am-12pm. Hourly traffic volumes were converted to approximate daily traffic volumes on the assumption that 10% of daily traffic occurs within the peak hour.

To understand the potential impact that additional traffic may have on the existing number of vehicles travelling to, from and within the PDA, PSA have considered the RCC road hierarchy and design standards which provide maximum traffic volumes for vehicles per day (vpd) (the road design standards are included in the RCC Planning Scheme Policy 2 – Infrastructure Works Table 4).

Table 1 shows the roads within and surrounding the study area, the existing volumes of traffic on these roads, their RCC hierarchy classification and the expected maximum traffic volumes associated with the classification. Figure 2 shows the locality of these streets.

Table 1: Redland City Council road hierarchy desired standards and existing traffic volumes (Source: Redland City Council, 2020)

	EXISTING TRAFFIC VOLUMES				RCC DESIRED STANDARDS	
ROAD NAME	AM PEAK HOUR (WEEKDAY)	PM PEAK HOUR (WEEKDAY)	WEEKEND PEAK HOUR	DAILY TRAFFIC VOLUME	MAX. TRAFFIC VOLUMES (VPD)	RCC CLASSIFICATION
Shore Street West	740	768	916	7,680	15,000 – 20,000	Sub Arterial
North Street	281	401	593	4,013	1,000*	Local Street
Shore Street East	32	32	67	315	1,000	Local Street
Middle Street	348	337	360	3,370	1,000^	Local Street
Passage Street	346	347	318	3,465	10,000	Trunk Collector
Wharf Street	86	58	87	580	1,000	Local Street

* It is noted that North Street is classified as a local street and within the road design standards an access street has a maximum of 1,000 vpd and provides access to 100 lots. Existing traffic volumes along this road are higher as North Street provides access to a more than 100 residential lots, the Cleveland Point which includes a mix of retail and open space traffic generators, the Cleveland Boat Ramp and other uses related to the Shore Street North foreshore. See further commentary below.

^ It is noted that Middle Street is classified as a local street and within the road design standards an access street has a maximum of 1,000 vpd and provides access to 100 lots. Existing traffic volumes along this road are higher as Middle Street provides access to the existing Toondah Harbour ferry terminal, boat ramp and medium density residential lots.

Figure 2: Road hierarchy (Source: Redland City Council, 2020)

Existing traffic volumes on both North Street and Middle Street currently exceed the maximum traffic flow associated with the road hierarchy designation for these roads.

3. PROPOSED DEVELOPMENT, SITE YIELD AND TIMING

The proposed development will integrate a modern coastal village with a harbourside precinct, foreshore parklands, and walking and cycling trails. Toondah Harbour will become a sustainable new coastal destination for the Redlands Coast and present sustainable transport consistent with the *Redland Coast Transport Strategy* vision:

'Redlands Coast has an efficient, accessible and integrated transport system which sustainably facilitates the movement of people and goods'.

Along with the vision and themes for the transport network, the targets include:

- Increase walkability and access to key public transport nodes;
- Increase in walking and cycling for all trips; and
- Implement successful travel behaviour change and road safety programs.

Toondah Harbour presents an opportunity to bring forward sustainable transport for the Redlands Coast including pedestrian and cycle infrastructure to fulfil strategic movements between Cleveland Point, Eddie Santagiuliana Way and Cleveland CBD via Middle Street. To achieve sustainable outcomes, the development proposes to reduce private vehicle travel and promote public and active transport travel to the site. Use of an autonomous shuttle bus between Cleveland CBD, Cleveland Rail Station and the proposed ferry terminal will be explored. RCC and the RACQ trialled Stage 1 of an autonomous shuttle bus service on Karragarra Island in 2019, and has brought the vehicle to Cleveland for the next stage of the trial, which will run until June 2021. During Stage 2, the shuttle will travel between Raby Bay Harbour and Raby Bay Foreshore Park during off peak periods.

The proposed development includes the development of the PDA and a number of key features including:

- Upgraded port facility and ferry terminal (including new car park – 1010 car spaces the design of the ferry terminal will allow for future increases in car parking spaces if required)
- Foreshore parklands including a lagoon pool
- Conservation parkland
- Boardwalks and promenades
- New marina with approximately 210 wet berths (half associated with residential land use for traffic generation purposes, i.e. assume people will not drive to the berths as they live there), public pontoon and boat ramp (including associated car parking)
- Retail and commercial facilities (including hotel and convention facilities)
- Residential dwellings.

The proposed land use plan is included in Appendix 1 and details of the development are included in Table 2. The details in the below table demonstrate the timing of development stages. This demonstrates that the increase in traffic will be gradual across 14 years. The 5 year incrementation increase in Section 4.2 demonstrates the gradual nature of the traffic due to the development.

Table 2: Proposed development details (Source: Walker Corporation, PSA Consulting, 2020)

LOT/STAGE	YIELD	LAND USE TYPE	TIMING	GFA (m^2)		WET BERTH
				R	C	
1	7	terrace townhouse	2026			
2	7	detached townhouse	2024			
3	105	apartment	2025	500		
4	18	terrace townhouse	2024			
5	38	apartment	2026			8
6	70	apartment	2027			8
7	225	apartment	2027			20
8	180	apartment	2028			25
9	230	apartment	2030	1,000	1,000	
10	195	apartment	2031	1,000		
11	300	apartment	2039	1,000	500	16
12	290	apartment	2032	1,500	1,000	6
Hotel	200	hotel rooms	2031			105^
13	95	apartment	2037			
14	140	apartment	2035			
15	365	apartment	2034			15
16	265	apartment	2035			
17	465	apartment	2036			7
18	405	apartment	2038			
Berths	210 total*	wet berths	as per stage			

LOT/STAGE	YIELD	LAND USE TYPE	TIMING	GFA (m^2)		WET BERTH
				R	C	
Foreshore	340	car spaces	2025#			
Ferry terminal	1,010 (increase in 343 from existing)	car spaces	2028#			
Boat ramp	50	car spaces	2025#			

^main marina
*see wet berth column #assumed timing based on surrounding development

4. TRAFFIC GENERATION

4.1. METHODOLOGY

In accordance with the TMR's *Guide to Traffic Impact Assessments* (GTIA), the estimated site traffic has been calculated for the proposed development using trip generation rates from:

- New South Wales (NSW) Roads and Traffic Authority (RTA)'s *Guide to Traffic Generating Developments*
- Institute of Transportation Engineers (ITE)'s *Trip Generation Manual 10th Edition*

Table 3 outlines the estimated trip generation rates and expected trip generation for each land use type. As identified in Section 2.2, the AM and PM peak hours were identified during the traffic count survey as 8-9am and 3-4pm respectively, and 11am-12pm for weekend peak hour.

It is noted that the trip generation provided below is very conservative as the nature of the proposed development will likely see a greater uptake of active travel and public transport travel than what has been included within the generation rates. As outlined in Section 3, the proposed development will include a coastal village feel which will promote sustainable use of transport, reflect the existing demographics of Cleveland with a higher retiree population, and have visitors staying in motels for the coastal location and bay/island attractions. Therefore, it is expected that the below outlined trips, especially the residential trips, would be considerably lower as Toondah Harbour is a destination in itself. The estimated total 20,905 trips is therefore a very conservative assessment of the maximum vehicle trips.

Table 3: Estimated ultimate trip generation rates (Source: Various)

LAND USE	GENERATION USE	DEVELOPMENT YIELD	DAILY		PEAK HOUR (AM & PM)		REFERENCE
			Trip generation rate	Trips generated (veh/day)	Trip generation rate	Trips generated (veh/h)	
Residential development							
terrace townhouse	smaller units and flats	25 dwellings	4.5 trips per dwelling	113	0.45 trips per dwelling	11	RTA
terrace townhouse	larger units and townhouses	7 dwellings	5.5 trips per dwelling	39	0.55 trips per dwelling	4	RTA
apartment	high density residential flat buildings	3,368 units	2.9 trips per unit	9,767	0.29 trips per unit	977	RTA
hotel room	motels	200 rooms	3 trips per unit	600	0.4 trips per unit	80	RTA
		SUB-TOTAL	**10,518 trips**		**1,072 trips**		
Commercial and retail							

LAND USE	GENERATION USE	DEVELOPMENT YIELD	DAILY		PEAK HOUR (AM & PM)		REFERENCE
			Trip generation rate	Trips generated (veh/day)	Trip generation rate	Trips generated (veh/h)	
commercial	commercial premises	2,500m^2 GFA	10 trips per 100m^2 GFA	250	2 trips per 100m^2 GFA	50	RTA
retail	mixed use*^	2,500m^2 GFA	91 trips per 100m^2 GFA	1,713^	7 trips per 100m^2 GFA	138^	ITE
retail	convenience store^	500m^2 GFA	821 trips per 100m^2 GFA	3,077^	58 trips per 100m^2 GFA	218^	ITE
retail	restaurant / café^	2,000m^2 GFA	183 trips per 100m^2 GFA	2,751^	30 trips per 100m^2 GFA	455^	ITE
		SUB-TOTAL	**7,792 trips**		**861 trips**		
Other uses							
marina	berths	105 wet berths%	2.4 trips per berth	253	0.16 trips per berth%	17	ITE
ferry terminal#	car park	343 car parks	2 trips per park	686	0.2 trips per park	69	Assumed based on car parks
ferry terminal@	vehicle ferry trips			876		88	Based on existing data with future growth
foreshore#	car park	340 car parks	2 trips per park	680	0.2 trips per park	68	Assumed based on car parks
boat ramp#	car park	50 car parks	2 trips per park	100	0.2 trips per park	10	Assumed based on car parks
		SUB-TOTAL	**2,595 trips**		**251 trips**		
		TOTAL	**20,905 trips**		**2,184 trips**		

*mixed use was calculated based on an average of multiple land uses including hair salon, bookstore , apparel store, pharmacy, liquor store.

^trip generation includes trip chaining for retail uses only and as such a 25% reduction has been applied to retail uses.

#based on designated car parking bays provided within the project masterplan the traffic generation for these uses do not truly reflect the expected traffic generation. By using the proposed car parking numbers as the traffic generation rates, this is more likely to reflect the expected traffic and shape the desired travel behaviour of those travelling to and from the development.

@based on existing vehicle ferry trip movements being 200,000 annually with a conservative prediction of 2.5% future growth rate.

%assumed that all wet berths associated with apartments are catered for in residential vehicle trips. Due to this, it is unlikely for wet berth trips to coincide with typical weekday residential trips.

It is noted that this is a first principles assessment and the detailed assessment to accompany the microsimulation model development in Stage 2 will validate these assumptions.

Further to the above, Figure 3 provides a diagram of traffic generation by stage.

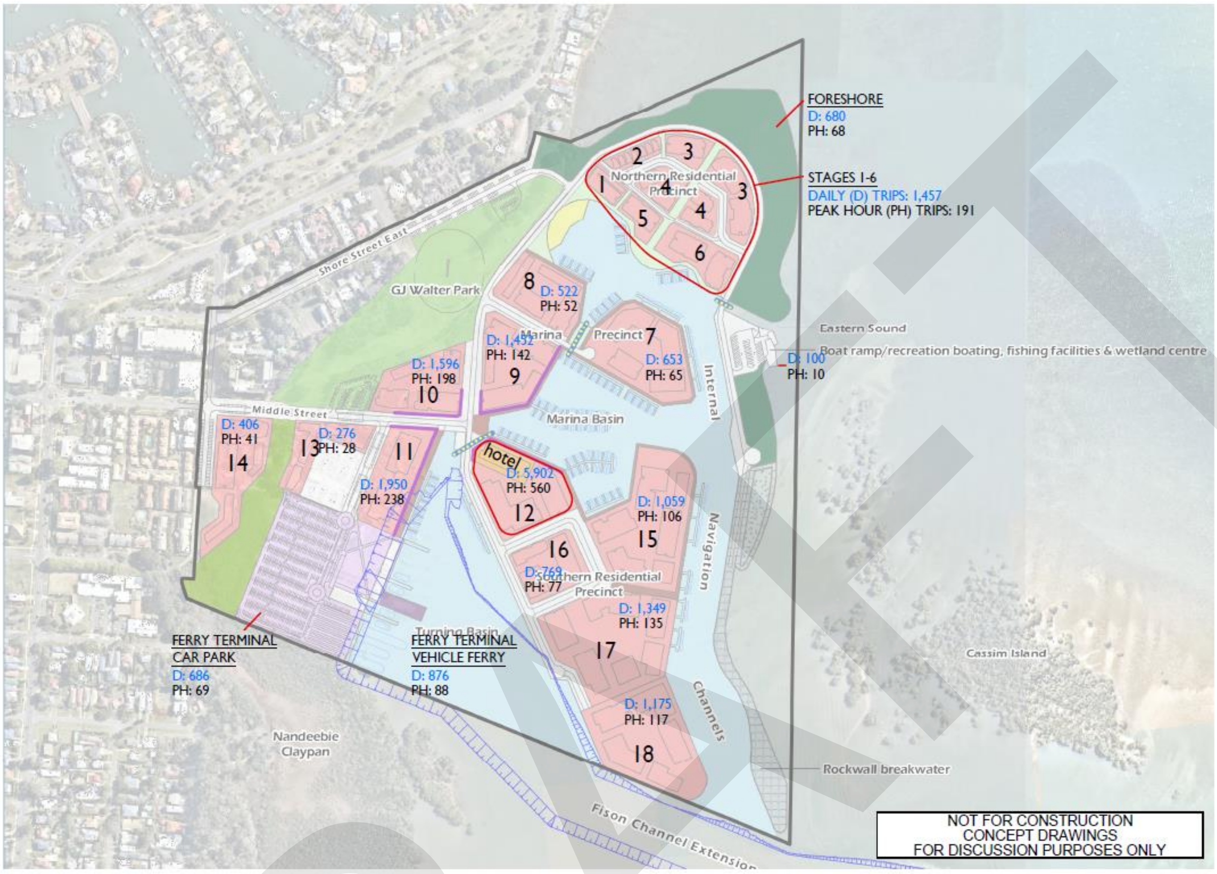


Figure 3: Traffic generation by staging (Source: Walker Corporation, PSA Consulting, 2020) (See Attachment 2 for greater detail)

4.2. DEVELOPMENT STAGING

As outlined in Table 2 the development is planned to be implemented in stages between 2024 and 2039. The following assessment relates the traffic generation with staging at 5 years into the development and 10 years into the development to show the scaled increase in traffic in the study area.

- Development year: 5 (2028)
  - Stages: 1-8
  - Type: Townhouse, apartment, 500m^2 GFA retail, foreshore, boat ramp, ferry terminal
  - Estimated traffic: 4,097 daily trips and 543 peak hour trips
- Development year: 10 (2033)
  - Stages: 1-8 + 9-10, 12
  - Type: Apartment, hotel, wet berths, 3,500m^2 GFA retail, 2,000m^2 GFA commercial
  - Estimate traffic: 17,391 daily trips and 1,832 peak hour trips
  - Estimated increase from 2028 to 2033: 13,294 daily trips and 1,290 peak hour trips.

4.3. TRAFFIC DISTRIBUTION

High-level traffic distribution has been considered for this assessment to determine likely link traffic volumes accessing the external road network (note: assessment of distribution on internal links to be undertaken in micro-simulation model). For this assessment it has been assumed that:

- 90% of traffic generated from stages 1-6 will travel in/out of the development at Shore Street East and 10% at Middle Street;
- 50% of traffic generated from stages 7-9 will travel in/out of the development at Shore Street East and 50% at Middle Street;
- 90% of traffic generated from stages 10-18 will travel in/out of the development at Middle Street and 10% at Shore Street East.

Detailed traffic distribution will be undertaken within the micro-simulation model in Stage 2.

4.4. CONSTRUCTION TRAFFIC

It is noted that construction traffic typically occurs outside of general AM and PM peak times due to the nature of trade work hours. Unlike the ultimate development, the construction traffic will have a greater impact on the external peak in the PM peak rather than the AM peak. The ultimate AM and PM peaks and daily traffic generated by the development will have greater traffic volumes than construction traffic.

The following details are anticipated traffic movements in the construction peak time:

- Import material truck movements:
    - 30 trucks per day within import phases- 2 phases of 3 months each (rock) (60 vehicle trips per day).
    - 30 truck per day within import phases- 2 phases of 4 months each (lime) (60 vehicle trips per day).
    - Generally the above imports will be separate, however for worst case assessment it has been assumed at the same time (120 vehicle trips per day).
- 5 trucks per day outside of import phases (10 vehicle trips per day).
- Construction worker vehicle movements:
    - An average construction rate of 1 worker per unit is expected; therefore, for this analysis it has been assumed that if 200 dwellings are constructed in two years it would be expected to see 200 workers on site per day (400 vehicle trips per day).

In peak construction time, it is expected that approximately 520 construction related vehicles trips per day would occur. It is noted that construction traffic may be reduced from that proposed above by transporting materials to site by barge and unloading at the temporary dock which will be created for delivery of dredge material.

Full impact analysis will be undertaken within the TIA for timing including development and construction traffic.

4.5. POTENTIAL IMPACTS

COMPARISON OF EXISTING AND FUTURE TRAFFIC VOLUMES

Considering the above traffic generation and distribution, the estimated traffic increase on Middle Street is as follows:

- Development year: 5 (2028)
    - Estimated increase in traffic: 2,561 daily trips and 339 peak hour trips
    - Estimated total traffic: 5,931 daily trips and 682 peak hour trips
- Development year: 10 (2033)
    - Estimated increase in traffic from 2028: 8,308 daily trips and 806 peak hour trips
    - Estimate total traffic: 14,239 daily trips and 1,488 peak hour trips.

The ultimate increase link traffic volumes for roads within the PDA are as shown in Figure 4. It is anticipated that Middle Street will increase by approximately 15,827 vehicles per day in the ultimate year and approximately 1,642 vehicles in the AM and PM peak hours. As outlined previously, Middle Street has a current daily traffic volume of 3,370 vehicles.

While the addition of this traffic is proportionately high, the microsimulation exercise to be undertaken during Stage 2 of the Traffic Impact Assessment will consider mitigation strategies for the road network, including Middle Street, which are not solely focused on providing additional capacity for private vehicles. It is the intent for the Toondah Harbour development to adhere to the vision set out in the *Redlands Coast Transport Strategy* to reduce reliance on private vehicle travel, and therefore the provision of a streetscape that is attractive to pedestrians, bike riders and public transport passengers will be a key consideration in the ultimate design and the capacity for the roads within and providing access to the development.

Toondah Harbour presents an opportunity to bring forward sustainable transport for the Redlands Coast including pedestrian and cycle infrastructure to fulfil strategic movements between Cleveland Point, Eddie Santagiuliana Way and Cleveland CBD via Middle Street. To achieve sustainable outcomes, the development proposes to reduce private vehicle travel and promote public and active transport travel to the site. Use of an autonomous shuttle bus between Cleveland CBD, Cleveland Rail Station and the proposed ferry terminal will be explored.

With consideration to the proposed higher uptake of public and active transport in accordance with the *Redlands Coast Transport Strategy*, the trip generation assumptions contained in this assessment are considered to be highly conservative and the ultimate impact will be scenario tested using the microsimulation during Stage 2. Scenario test of differing cross-sections, car parking provision and public and active transport uptake will all be undertaken to identify a recommended transport network internally and mitigation to the external transport network.

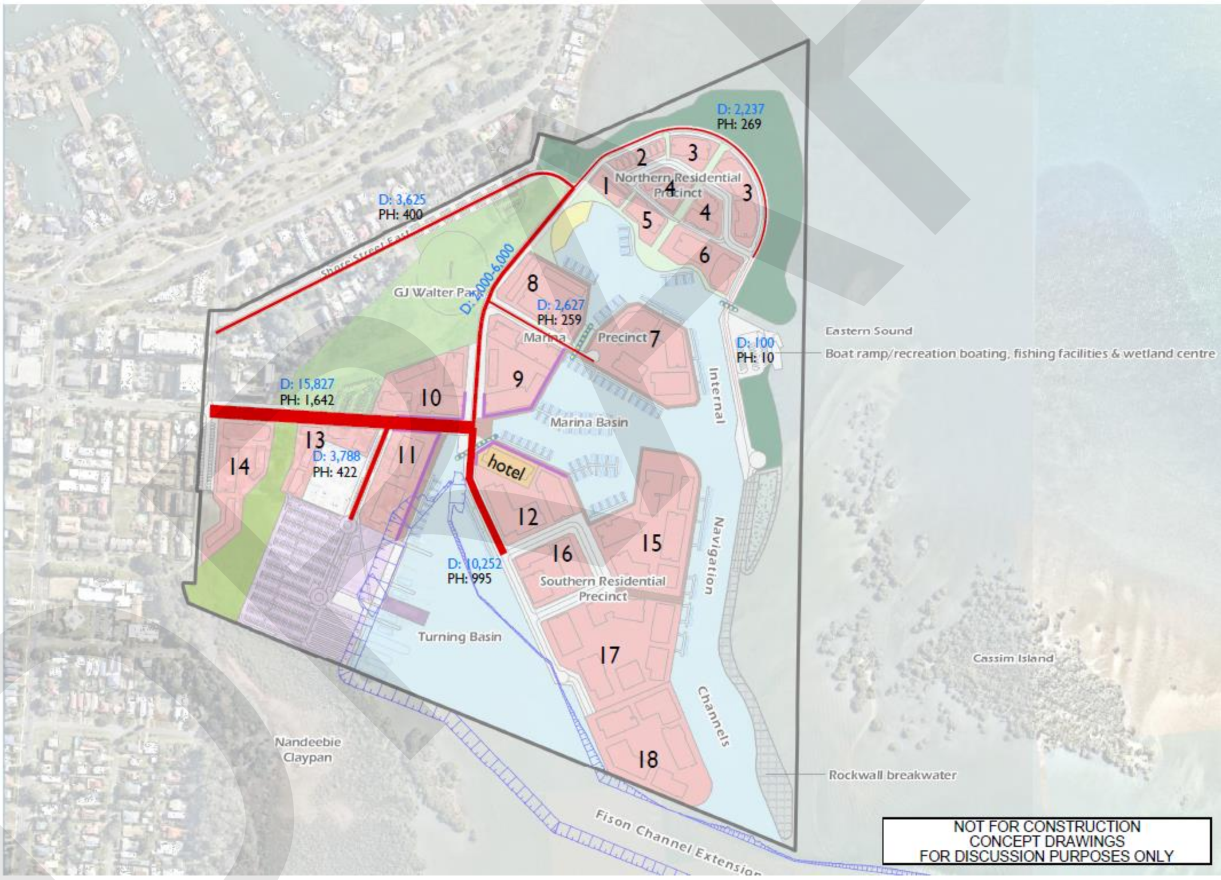


Figure 4: Approximate link volume increase (Source: Walker Corporation, PSA Consulting, 2020) (See Attachment 2 for greater detail)

FERRY TERMINAL GENERATION

The existing ferry terminal provides 667 spaces. The proposal is to increase this to 1,010 (addition 343 spaces). It is noted that in the traffic generation calculation it was assumed that traffic generation for the ferry terminal and foreshore would be based on the number of car parking spaces provided. This was undertaken as this is more likely to reflect the expected traffic generated by the site and assist to shape the desired travel behaviour of those travelling to and from the development.

Within the full TIA there will be an opportunity to investigate the potential for a public transport service connecting to the PDA from the Cleveland Rail Station (this may include the modification of an existing bus service which travels to Toondah Harbour). As outlined in Section 3, Toondah Harbour presents an opportunity to bring forward sustainable transport options and promote the vision and targets set out in the *Redlands Transport Strategy* by reducing reliance on private vehicle travel, and also promote public and active travel to the area.

INTERNAL INTERSECTION IMPACTS

The anticipated link volumes are included in Figure 4. These link volumes indicate that the intersection of Middle Street and the proposed road which carries the catchment from Stages 12, 15-18 carry very large volumes. Upon initial review it is likely that this intersection would be required to be a roundabout or signals due to the volumes. Similarly, the intersection of Middle Street and the road which will carry traffic from the ferry terminal will have relatively high volumes undertaking turning movements (although most likely left turns) and will also be required to have some additional intersection controls than a standard giveway or stop sign.

PEDESTRIAN IMPACTS

Pedestrian impacts due to high traffic volumes can occur if pedestrians are required to wait for extended periods of time to cross a road. Pedestrians are more likely to walk further to their destination if the infrastructure and surrounding environment is attractive. It is a requirement in the PDA road design standards that active transport infrastructure (i.e. footpaths and bicycle lanes) is provided. This should include footpaths on both sides of the road and cycle lanes where there are high vehicle, pedestrian and cyclist traffic volumes. This proposal incorporated boardwalks and promenades to assist in making the site more attractive to move around the development by walking or riding bikes or other mobility devices.

OVERALL NETWORK IMPACTS

External network impacts for the wider transport network include tying in the pedestrian and cyclist pathways with the development at key locations by modifying cross sections or upgrading external network paths if required.

Intersection impacts to the external network are expected to be seen at:

- North Street / Wharf Street;
- Wharf Street / Middle Street;
- Middle Street / Passage Street; and
- North Street / Shore Street West and Passage Street.

Similarly some external roads may be required to be upgraded to cater for the additional traffic.

The above intersections will all require intersection performance analysis to be undertaken as part of the traffic modelling which will be undertaken for the full TIA being undertaken in Stages 2.

It is noted that road hierarchy, cross section designation and development will be undertaken in Stage 2 when micro-simulation has been undertaken.

5. CAR PARKING

Off-street car parking is proposed to be located as consistent with the Structure Plan included in the Toondah Harbour PDA Development Scheme including GJ Walter Park, north of Middle Street and the ferry terminal.

Car parking for the development is proposed as shown in Table 4.

A car parking analysis and plan will be undertaken in accordance with EDQ *PDA Practice Note No.11: Parking analysis plans* as part of the Stage 2 TIA process, as required in EDQ *PDA Guideline No.05: Neighbourhood planning and design*.

EDQ *PDA Guideline No.09: Centres* notes that *the MEDQ encourages development that reduces the total number of on-site spaces required through approaches including:*

- *Sharing of car parking between activities with different patterns of parking use in mixed use developments*
- *Provision of on-street spaces*
- *Maximising accessibility by public and active transport*
- *Matching provision to specific demands (e.g. housing targeted for the elderly).*

The nature of mixed use development in Toondah Harbour will assist in car parking sharing. On-street parking is recommended to be provided in accordance EDQ *PDA Guideline No.06*. Investigation into maximising public transport will occur within the full TIA in Stage 2.

Table 4: Proposed car parking numbers

LOT/STAGE	YIELD	LAND USE TYPE	GFA (m^2)		WET BERTH	RESIDENTIAL CAR PARK	RETAIL, COMMERCIAL CAR PARK	WET BERTH CAR PARK
			R	C				
1	7	terrace townhouse				28		
2	7	detached townhouse				28		
3	105	apartment	500			204	25	
4	18	terrace townhouse				72		
5	38	apartment			8	65		5
6	70	apartment			8	119		5
7	225	apartment			20	383		12
8	180	apartment			25	306		15
9	230	apartment	1,000	1,000		461	70	
10	195	apartment	1,000			382	50	
11	300	apartment	1,000	500	16	570	60	10
12	290	apartment	1,500	1,000	6	588	95	4
Hotel	200	hotel rooms			105^	100		63^
13	95	apartment				162		
14	140	apartment				238		
15	365	apartment			15	621		9
16	265	apartment				451		
17	465	apartment			7	791		5
18	405	apartment				689		
Berths*	210 total	wet berths						
Foreshore	340	car spaces					340	
Ferry terminal	1,510	car spaces					1,150	
Boat ramp	50	car spaces					50	

^main marina

*Parking for wet berths should be provided at a rate of 0.6 spaces per wet berth (as per the RTA *Guide to Traffic Generation Developments*) where accessible by the public.

Should you wish to discuss these items further, please do not hesitate to give me a call on (07) 3220 0288.

Yours sincerely,

Kirstin Palmer
Traffic and Transport Engineer
PSA Consulting (Australia) Pty Ltd

Revision History:

VERSION	DATE	DETAILS	AUTHORISATION
4	1 December 2020	FINAL	Hannah Richardson RPEQ: 17016

Appendices:

Appendix 1 – Land use plan

Appendix 2 – PSA figures

Figure 2-2: Toondah Harbour Project Master Plan

Legend

- Toondah Harbour PDA (Project Area)
- Residential
- Ferry terminal and car park
- Hotel & convention
- Marine services
- Foreshore park
- Pocket Parks
- Boardwalks
- Beach
- Basin
- Activated edges - retail & commercial
- Culvert
- Harbour turning basin & fison channel extension

TOONDAH HARBOUR

walker

0 50 100 150 200 250 m

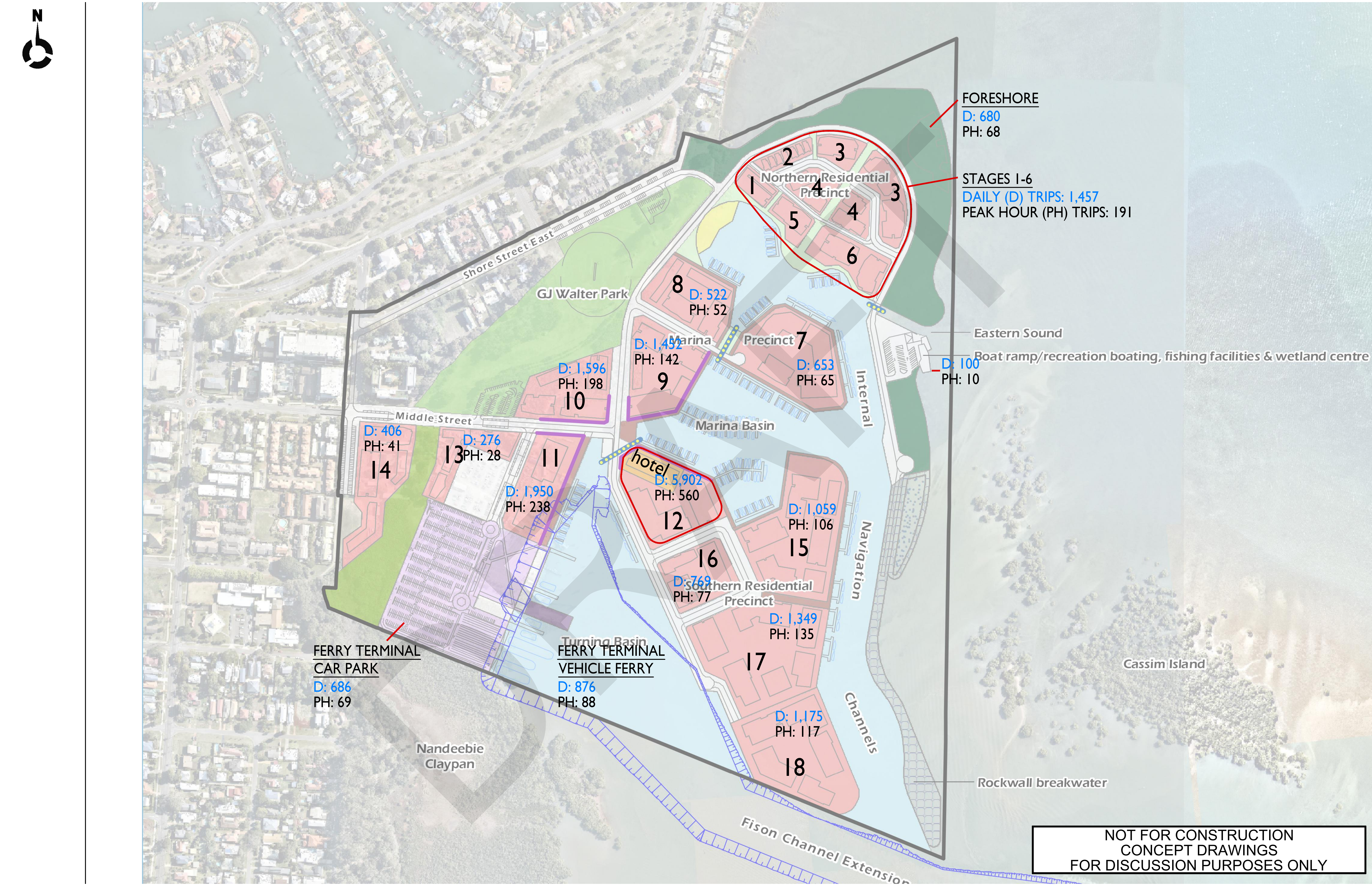
GDA 1994 MGA zone 56 Scale (A3): 1:5,250

N

DATE: 1/10/2020

Layer Source: © State of Queensland Datasets (Department of Natural Resources, Mines and Energy 2020), Aerial Imagery (Nearmap.com 2020)

FILE REF. 9858 E Figure 2_2 Toondah Harbour Master Plan A



NOT FOR CONSTRUCTION
CONCEPT DRAWINGS
FOR DISCUSSION PURPOSES ONLY

REVISION	DESCRIPTION	BY	DATE
1	ORIGINAL ISSUE	K.P.	18.09.2020
2	UPDATE TO TRAFFIC GENERATION	K.P.	16.10.2020

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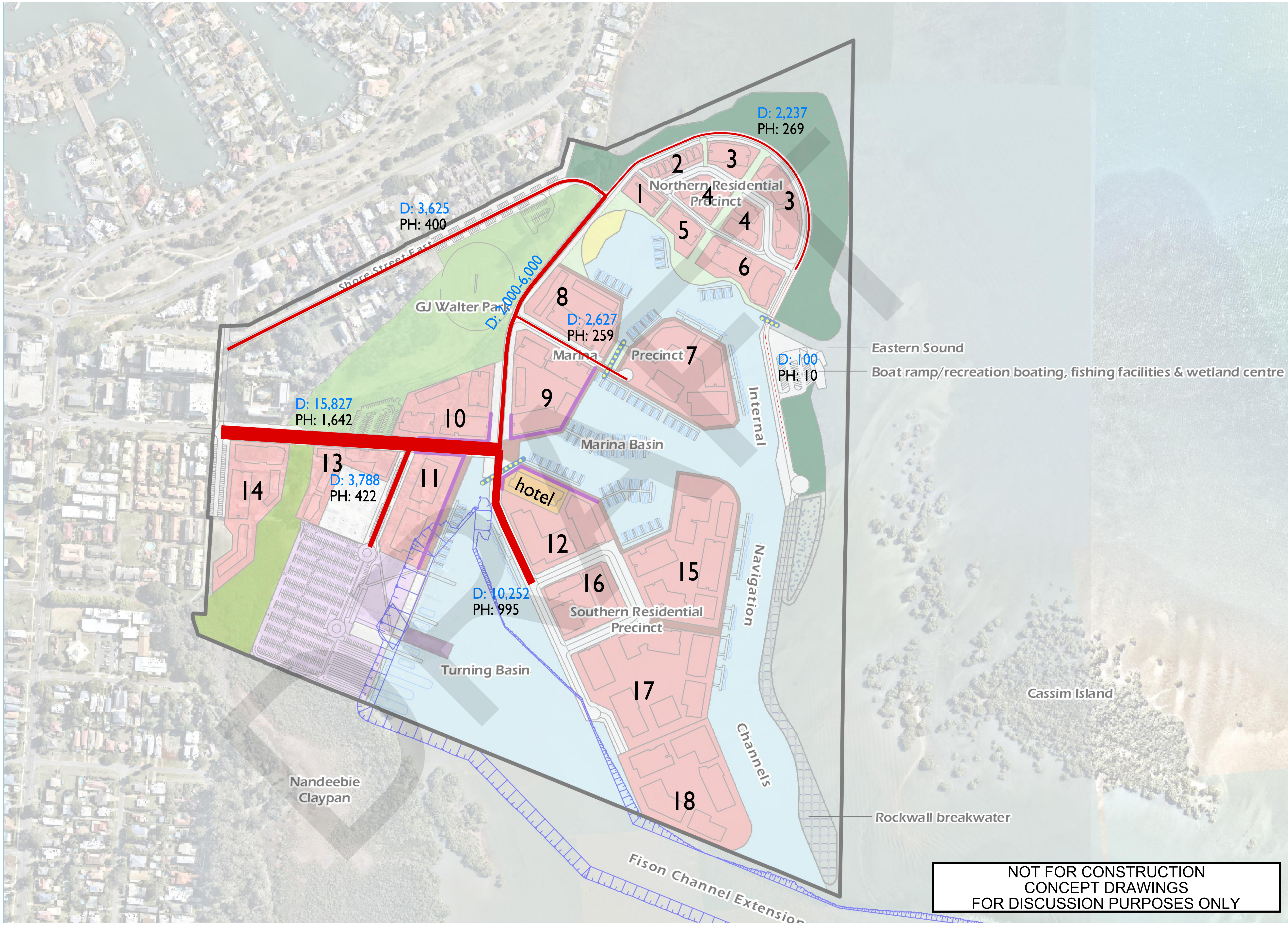
TOWN PLANNING | TRAFFIC ENGINEERING | TRANSPORT PLANNING | PROGRAM MANAGEMENT | INFRASTRUCTURE

DRAWING TITLE	TRAFFIC GENERATION BY STAGES
CLIENT	WALKER CORPORATION
PROJECT	TOONDAH HARBOUR EIS TRAFFIC IMPACT ASSESSMENT
LOCATION	TOONDAH HARBOUR, CLEVELAND

DRAWING DATE	16 OCTOBER 2020	DRAWN BY	K.P.
ORIGINAL SIZE A1	SCALE A3: 1:5000	CHECKED BY	H.R.
SCALE	0 50 100 150m	APPROVED BY	H.R.
SCALE 1:2500 (A1)	PROJECT NO. 0971	DRAWING NO. SK01	REVISION 2

N



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TOWN PLANNING | TRAFFIC ENGINEERING | TRANSPORT PLANNING | PROGRAM MANAGEMENT | INFRASTRUCTURE

DRAWING TITLE	LINK TRAFFIC VOLUME INCREASE
CLIENT	WALKER CORPORATION
PROJECT	TOONDAH HARBOUR EIS TRAFFIC IMPACT ASSESSMENT
LOCATION	TOONDAH HARBOUR, CLEVELAND

DRAWING DATE	16 OCTOBER 2020
ORIGINAL SIZE.	A1
SCALE A3:	1:5000
SCALE	0 50 100 150m SCALE 1:2500 (A1)
DRAWN BY	K.P.
CHECKED BY	H.R.
APPROVED BY	H.R.
PROJECT NO.	0971
DRAWING NO.	SK02
REVISION	2