From: Marcus Hill <marcus.hill@twproperty.co.nz>
Sent: Monday, 29 April 2019 11:19 AM
To: Paul O'Shaughnessy <Paulo@napier.govt.nz>; Bridget Lambess <Bridget@wdcl.co.nz>
Cc: Cam Drury <cam@stradegy.co.nz>
Subject: s92 response 35 Kenny Road

Hi Paul

Please see attached responses to the s92 request for 35 Kenny Road, Te Awa.

1. Traffic Impact Assessment
2. Urban Design
    a. Plans formulated post meetings with NCC Urban Designers (see dropbox link due to file size)

Concept Plan Set Architectural
https://www.dropbox.com/s/kc6ekg8gnd2bc00/Kenny%20Road%20RC%20Rev%201%2020170420 18.pdf?dl=0

3. Stormwater modelling

If you have any questions please contact me directly, as Cam D is away.

Thanks in advance, look forward to wrapping this up ASAP.

Regards

Marcus Hill
General Manager
Mob: +64 21 671 223
74 Tennyson Street
Napier, 4110 | New Zealand

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URBAN CONNECTION
local and connected

Te Awa Land Development Company Limited

35 Kenny Road, Napier

Transport Impact Assessment

April 2019

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1. Introduction

1.1. Background

Urban Connection Ltd has been commissioned by Te Awa Land Development Company Limited to examine and assess the transportation planning issues in relation to a commercial activity development at 35 Kenny Road, Napier.

The proposed development site (the Site) is approximately 4.39 hectares in area and is currently zoned Residential under the City of Napier District Plan.

Based on the scale of the proposed development and the immediate surrounding environment, the primary transport considerations are as follows:

- The level of traffic that is likely to be generated by the proposed suburban commercial development;
- The likely effect traffic generation will have on the surrounding transport network;
- The ability of the site and its surrounds to meet the access demands created by the development;
- The ability of the site to accommodate the expected parking demand;
- Address any road safety issues created by the proposed development

These and other matters are addressed in the body of the report.

2. Existing Transport Infrastructure

2.1. Site Location

The site is located within a semi rural area, in the suburb of Te Awa, to the south of Napier City. The site address is 35 Kenny Road, Napier and is shown below in Figure 1. It is located within the Main Residential Zone within the Napier District Plan and the site is currently occupied by one residential dwelling.

A recently consented development for a retirement village is located immediately to the east of this site, also bounded by Kenny and Eriksen Roads. This is illustrated in Figure 1 (blue star).

Figure 1 Site Location

The site fronts Kenny Road to the north and Eriksen Road to the east. Both roads are classified as Secondary Collector Roads under the Napier City Council Road Hierarchy. The road hierarchy is shown in Figure 2.

Figure 2 Road Hierarchy

2.2. Existing Road Layout

2.2.1. Eriksen Road

Eriksen Road is a secondary collector road to the south of Napier City CBD. It runs in a largely north-south alignment, running parallel with both Te Awa Avenue and State Highway 2 (SH2). It has an open road speed limit of 100 km/h except through the intersection with Kenny Road, where the speed limit reduces to 70 km/h. To the north of the Kenny Road intersection, Eriksen Road reduces to a temporary 50km/h posted speed limited as it approaches the Waimakariri Drive development.

The measured cross-section of Eriksen Road, fronting the development is 5.3m, however this is due to be widened to 6.5m as part of the Summerset Retirement Village.

Eriksen Road has a rural cross-section, with no formed kerb and channel. The cross-section contains grass verge and swale on both sides of the road between rural fencing. The road corridor is typically 20m wide. An overhead power line with power poles run down the western verge of Eriksen Road.

Eriksen Road connects to Awatoto Road to the south and intersects with Kenny Road to the north of the site, which crosses at right angles in an east-west direction. Eriksen Road provides further connections to the Waimakariri Drive Development before terminating at a no exit intersection with Willowbank Road.

A general view of Eriksen Road is shown below in Figure 3.

Figure 3 View looking south along Eriksen Road

2.2.2. Kenny Road

Kenny Road is also a secondary collector road and runs east-west, between Te Awa Avenue and Willowbank Avenue. It has an existing speed limit of 70 km/h.

The measured cross-section on Kenny Road is 8.8m.

The majority of Kenny Road has a rural cross-section, with no formed kerb and channel. The cross-section contains grass verge and swale on both sides, contained between rural fencing on the road boundary. An overhead power corridor runs along the north side of Kenny Road.

The eastern end of Kenny Road contains formed kerb and channel, where residential development has recently occurred.

Kenny Road connects to Te Awa Avenue in the west and Willowbank Avenue to the east. Both intersections operate as a give way priority control.

A general view of Kenny Road is shown below in Figure 4

Figure 4 View looking west along Kenny Road

2.3. Walking

The footpath network currently terminates within Kenny Road to the east of the site. There is no formed footway fronting the site on either Kenny Road or Eriksen Road.

The Te Awa Structure Plan will promote safe pedestrian access and includes proposals for future footpaths along both Kenny Road and Eriksen Road, along with proposed off road pedestrian linkages. Refer to Appendix A and further discussion in Section 3.4 of this report.

2.4. Cycling

There are currently no specific on-road or off-road cycling infrastructure in the vicinity of the site. However, there are on-road cycle lanes provided along Te Awa Avenue providing a direct route into Napier.

A review of the Proposed Te Awa Structure Plan shows that there are indicative on road cycle facilities planned for both Kenny Road and Eriksen Road in the future.

Until such time as this infrastructure is carried out, less confident cyclists can make use of the wide verges and existing concrete footpath along Kenny Road which provides a direct link to the Te Awa Avenue cycle lanes. More confident cyclists are more likely to cycle along the road given the low vehicle volumes along Kenny Road.

2.5. Public transport

The GoBay public transport bus network is managed by the Hawkes Bay Regional Council and provides services connecting Hastings, Flaxmere, Havelock North, Taradale and Napier as shown in Figure 5 below. The star on the above figure indicates the location of the site.

Figure 5 GoBay Bus Services (source: Hawkes Bay Regional Council Website)

The main bus terminuses are located in both Hastings and Napier. In Napier the primary boarding and alighting bus stops for all services is located along Dalton Street, opposite the Hawkes Bay Regional Council offices.

From Napier, the only bus stops located near the site are serviced by the Commuter Express (Route 11) to Havelock North, and are located at 138A Te Awa Avenue (Stop N197) and 136B Te Awa Avenue, being some 750m from the site.

The Chartered Institute of Highways and Transportation (Uk) provides Guidelines for journeys on foot and has indicated that a 10 minute walking distance should reflect the upper limit an average person would be inclined to walk to access a Bus Stop. An average adult walking speed is 1.3m/s, giving a range of up to 800m being covered in a 10 minute period.

Both the inbound and outbound commuter service bus stops are located within this range.

Most of the GoBay bus fleet is fitted with bike racks which can accommodate two bicycles at any one time, enabling a restricted number of commuters to transport bicycles using the bus service.

3. Travel Patterns

3.1. Daily Traffic Volumes

The latest available traffic count data for the surrounding network was obtained from the Napier City Council database (via Mobile Road) and is provided in **Error! Reference source not found.**.

Table 1 Daily Traffic Volumes

Road Name	Annual Daily Traffic (Veh/day)
Erikson Road	336
Kenny Road	217
Te Awa Avenue	2,100
Willowbank Avenue	3,600

3.2. Peak Hour Traffic Volumes

Peak hour turning counts have not been undertaken for this specific project. However, count information has been provided for a TIA prepared in November 2018 for the site directly opposite this proposal on the corner of Eriksen and Kenny Roads. The TIA was prepared for Summerset, for the proposed Te Awa Retirement Village development.

A summary of the traffic counts from the retirement village TIA are summarised below and shown in Figure 6.

- The traffic count was undertaken on Wednesday 25 July 2018 at the intersection of Eriksen Road and Kenny Road
- The AM peak period was recorded as being 0800-0900 am and the PM peak period was 1630-1730 pm
- 2% heavy vehicle proportion (in comparison 10% heavy vehicle proportion is recorded in MobileRoads)
- Dominant vehicle movements are for the east-west movement along Kenny Road in both the am and pm peak periods

- Overall, both roads are carrying low volumes of existing traffic and the traffic counts compare well to the AADT recorded

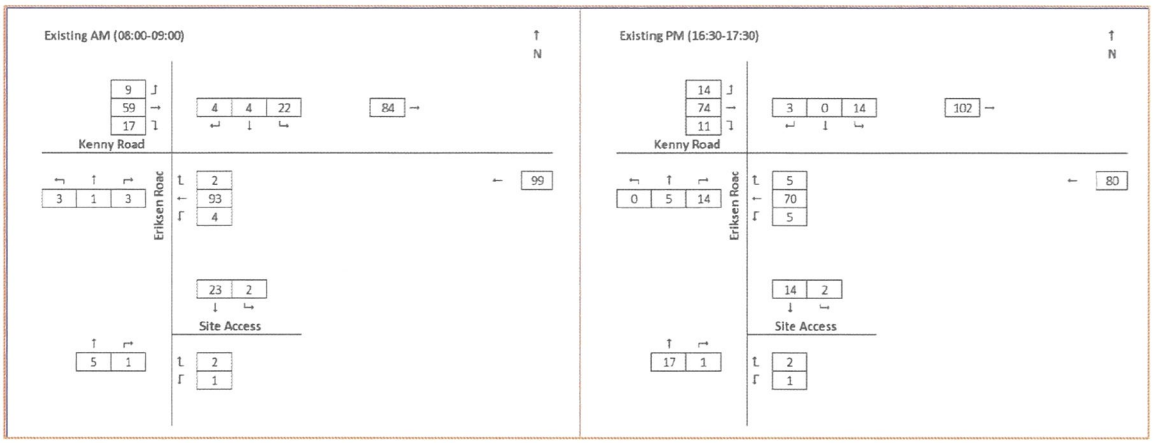


Figure 6 Existing Traffic Volumes (source: Stantec Report, Figure 5, Summerset TIA, Nov 2018)

3.3. Committed Development

It is understood that resource consent has been granted for the Summerset Retirement Village and construction was observed on site. Therefore the level of expected development traffic, as set out within the Stantec Report, in addition to the existing network traffic above is now considered to represent the baseline traffic conditions on the network. This is shown below in Figure 7.

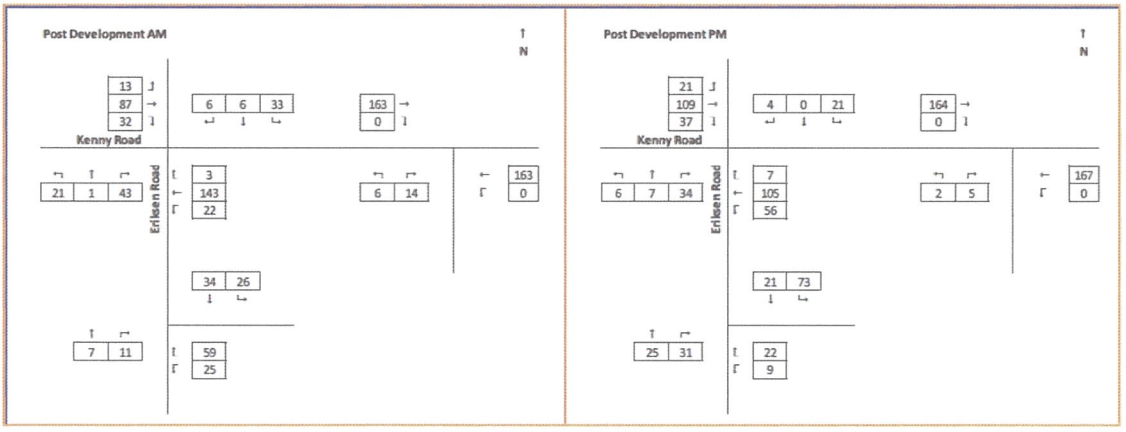


Figure 7 Network Baseline (source: Stantec Report, Figure 7, Summerset TIA, Nov 2018)

3.4. Committed Infrastructure

It is understood that the following infrastructure will be provided as part of the Summerset Retirement Village development [refer also to Figure 8 below]:

- Northern road frontage: Widening along the southern side of Kenny Road along the site boundary, extend the existing kerb and channel along Kenny Road and terminating at the left turn slip onto Eriksen Road, and extending the footpath from the eastern boundary to the main driveway into the proposed retirement village
- Western Road frontage: Widening along the eastern side of Eriksen Road along the site boundary, and kerb and channel provided either side of the proposed Eriksen Road access

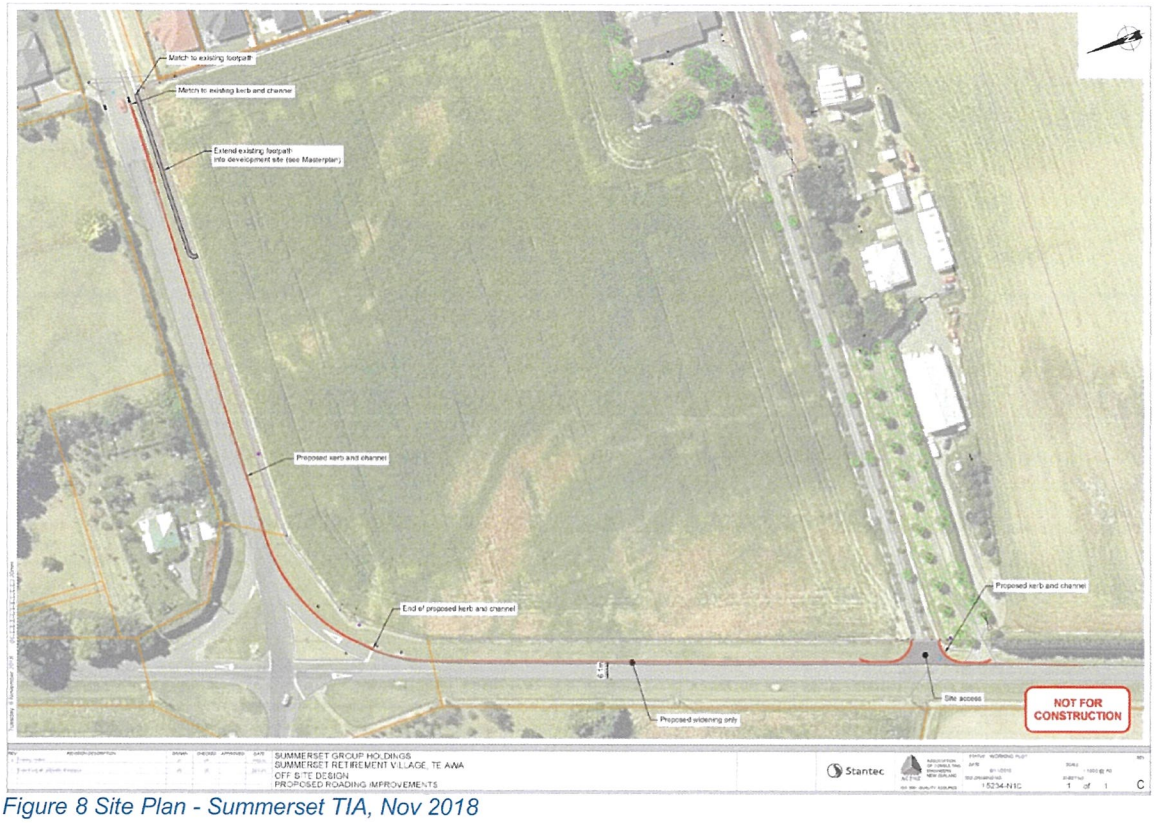


Figure 8 Site Plan - Summerset TIA, Nov 2018

Potential infrastructure being provided as other adjacent developments are consented and as part of the Napier City Council Te Awa Structure Plan, include:

- Kenny Road – 10 m carriageway with cycle lanes, pedestrian footpaths, car park / landscaped berm areas, verge
- Eriksen Road – 10 m carriageway with cycle lanes, pedestrian footpaths, car park / landscaped berm areas, verge
- Single lane roundabout provided at Eriksen Road / Kenny Road intersection
- Street design shall provide for consistent landscaping treatment that contributes to urban amenity and landscape

The Te Awa Structure Plan is provided in Appendix A - (NCC Te Awa Structure Plan – Appendix 29B of City of Napier District Plan).

4. Road Safety

A review of the current safety performance was undertaken to determine the nature of crash types and severity in the immediate vicinity of the proposed site. The New Zealand Transport Agency's Crash Analysis System (CAS) was used, with a 10-year period assessed from 2009-2018. A further check of any crashes to date on 2019 was also checked.

The extent of the assessment included a radius of 500 m from the intersection of Kenny Road and Eriksen Road. This also extended to and included the intersection of Kenny Road with Te Awa Avenue and Willowbank Avenue.

An illustration of the crashes and extent of the assessment is shown in Figure 9 below.

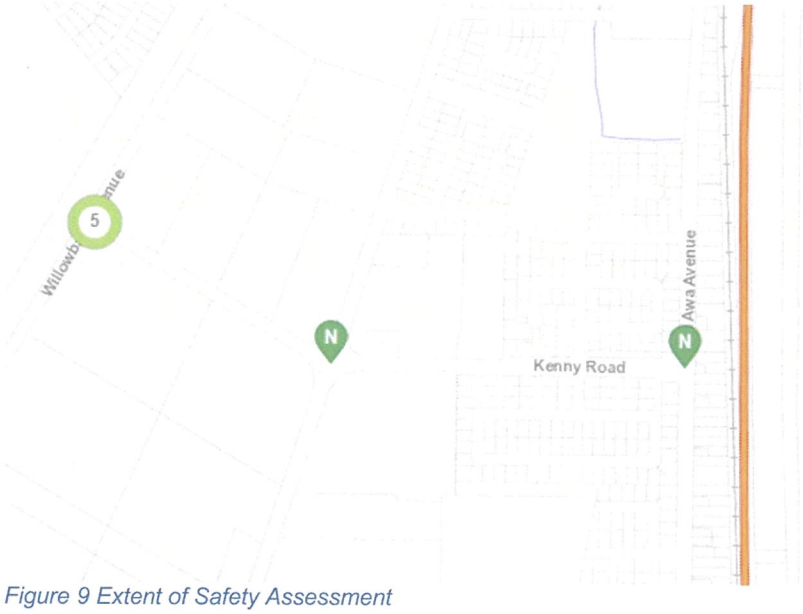


Figure 9 Extent of Safety Assessment

A summary of the crash history is as follows:

- A total of 7 crashes were recorded within the search area, all non-injury crashes
- Five crashes occurred at the intersection of Willowbank Avenue / Kenny Road - four single vehicle crashes lost control and one head-on located on Kenny Road
- One crash involving two vehicles at the intersection of Kenny Road and Eriksen Road – northbound vehicle on Eriksen Road failing to give way
- One single vehicle crash at the intersection of Kenny Road and Te Awa Avenue – eastbound vehicle on Kenny Road lost control turning left

The recorded crash history demonstrates that the intersection of Kenny Road and Eriksen Road is currently performing satisfactorily, with only one recorded crash in the past 10 years. Furthermore, there are no recorded crashes along the site frontage along Kenny Road or Eriksen Road.

Notwithstanding, the intersection is a cross roads layout with a current posted speed limit of 70 km/h. A formal left turn slip lane is provided from Kenny Road turning left into Eriksen Road, for traffic heading south on Eriksen Road. There is also an informal slip lane from Eriksen Road turning left into Kenny Road (eastbound) which also serves as an access to the driveway for 120 Kenny Road.

Both of these slip lanes provide acute angles of entry with limited visibility for entering drivers. Fortunately, these are infrequently used, however, present a risk to road users. The recommended infrastructure upgrade to a roundabout at this location is welcomed to address this safety deficiency.

Furthermore, a proposed reduction in speed limit for both Kenny Road and Eriksen Road is fully supported. It is understood that NCC are reviewing the existing speed limits for these roads and that 50 km/h would be more appropriate for the proposed development intentions under the Te Awa Structure Plan and for the safe and efficient operation of the proposed single lane roundabout.

Further road safety issues around access spacing and sight distance is discussed further in Section 6.2 of this report.

5. The proposal

5.1. Overview

The proposal is to establish a suburban commercial area of up to 8 tenancies and anticipated to include a small local supermarket, childcare facility, medical centre and other retail shops. A total of 77 car parks and 3 accessible car parks will be provided on site with a two way entry/exit into the development from both Kenny and Eriksen Roads.

Architectural plans and proposed layouts are shown in Figure 10 below:

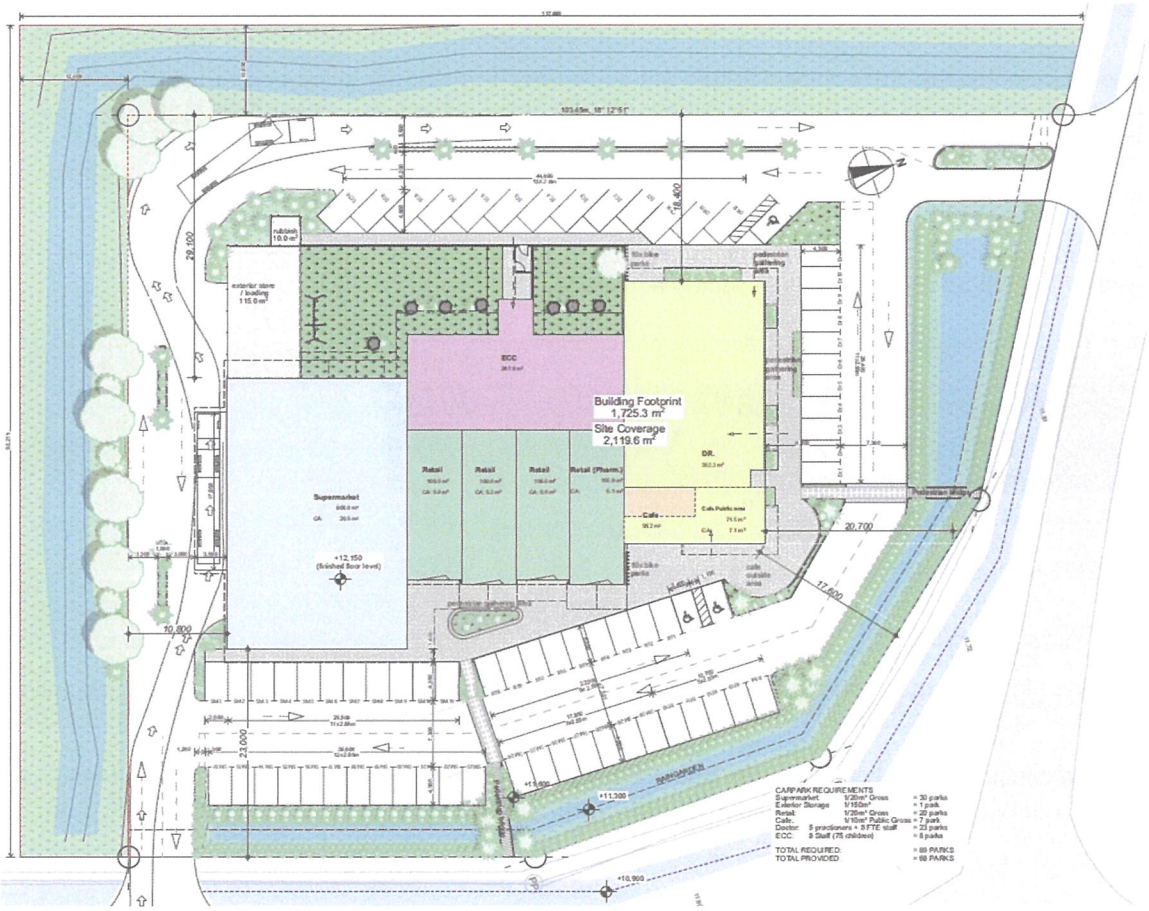


Figure 10 Proposed development sketch and layout

5.2. Traffic Generation Assessment

Published data on the expected traffic generation of various land use activities is available from the NZTA Research Report 'Trips and Parking related to Landuse November 2011'. The applied trip rates derived using this research is outlined in Table 2 below.

Table 2 Trip Rate Generation

Trip rate	GFA	Peak Hour Trips	Daily Trips	Peak Hour Rate	Daily Rate
Pre School / ECC	75 Children	1.4 / child	4.1 / child	105	308
Supermarket	600	17.9 / 100	129 / 100	107	774
External Storage	150	0	0	0	0
Shopping / Retail	400	18.9 / 100	141 / 100	76	564
Café / Bar	166	15.6 / 100	92 / 100	26	153
medical Centre	5 Doctors	11.6 / Proff staff	79.4 / Proff Staff	58	397
	Total			**372**	**2196**

It should be noted that the compact nature of the site and location from other similar facilities suggests that there will be a moderate degree of linked trips at the site. For example it can be assumed that of the 105 vehicles which arrive in the AM peak to drop children at the ECC, a proportion of them will also make up the 107 who are expected to visit the supermarket during the same time period. Similar relationships will exist when visiting the medical centre and retail.

For these reasons it is considered reasonable to update the total calculated trip rate by a factor of 0.8 to reflect the nature of linked trips expected at the site.

Table 3 Trip rate generation updated to account for linked trips to site

Trip rate	Peak Hour Rate	Daily Rate
Individually Aggregated Trip Rate	372	2196
Modified Site Trip Rate	298	1756

5.3. Mode Split

Given the planned urban location of the site, (being integrated centrally within the Te Awa Residential Structure Plan), public transport, planned walking infrastructure and cycling network, the site is more than likely to benefit from a degree of mode share (i.e. not all trips will be motorised). On this basis it would be considered likely that the modified trip rate could be further reduced, however the traffic network impact assessment is conducted conservatively with the assigned peak hour trip rate (298) remaining unchanged to test robustness.

5.4. Traffic Distribution

Using the traffic surveys performed at key intersections in the 2018 Stantec Report, for both the AM and PM periods, diagrammatic representations of the network traffic distributions have been provided in Figure 6 and Figure 7, for each peak assessment period.

The observed movements within the area and illustrated in these diagrams are considered to be representative of the trip distribution likely to be experienced by the proposed development site. Furthermore, the trip rate generated by the site has been analysed to determine the arrival and departure rates of traffic during both the AM and PM period, as set out below in Table 4.

Table 4 AM and PM arrival and departure rates

Period	Site Arrival Rate	Site Departure Rate
AM	55%	45%
PM	45%	55%

This approach is based on a proportion of onsite staff arriving to site during the AM and departing during the PM period. All other trips are assumed to arrive and depart within the hour.

The estimated network traffic volumes following completion of the development are illustrated in Figure 11 and Figure 12 respectively.

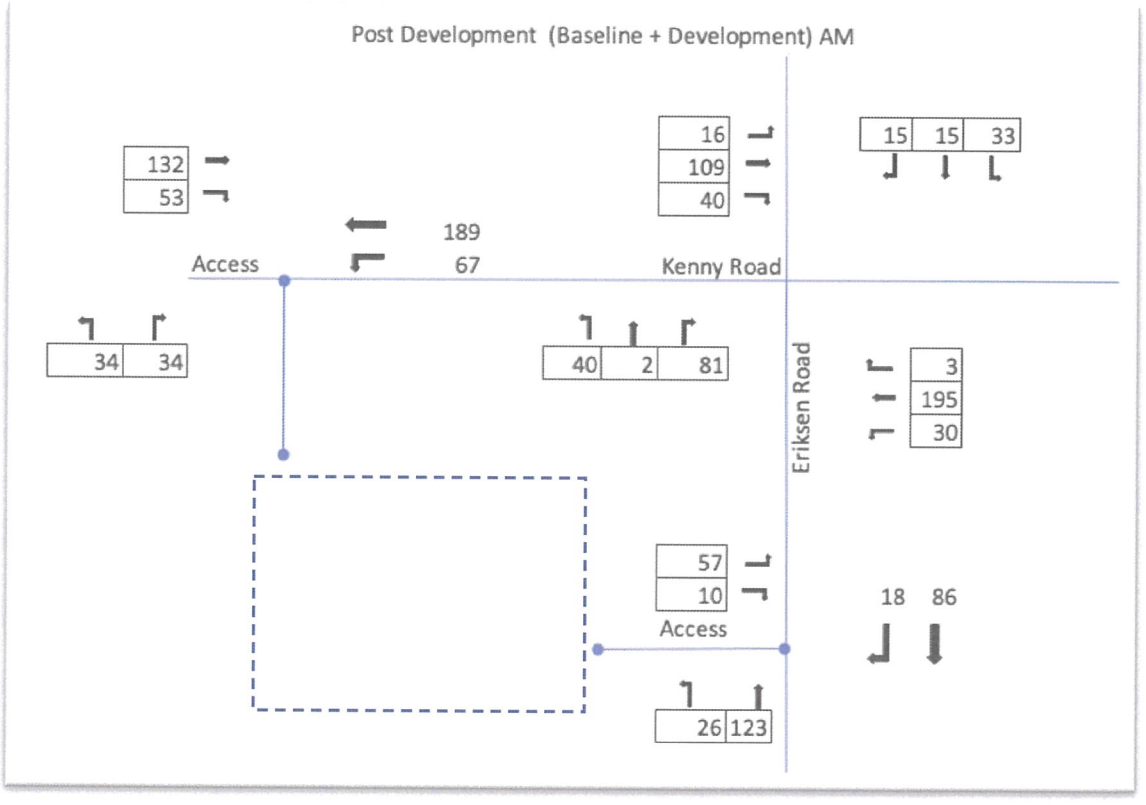


Figure 11 Post development AM traffic volumes

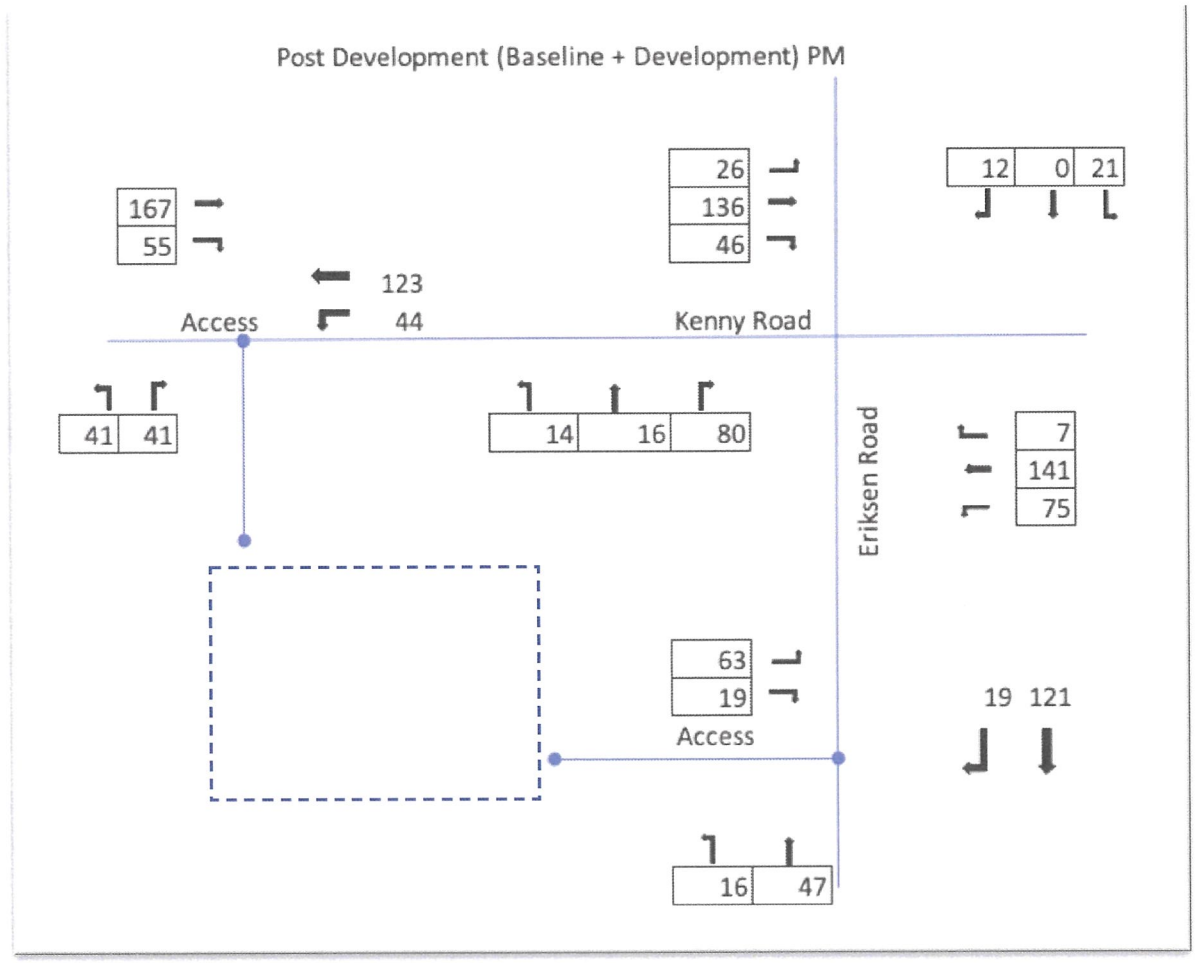


Figure 12 Post development PM traffic volumes

6. Traffic Effects

6.1. Intersection Performance

The impact of the expected traffic generated by the proposed development has been assessed to determine the Practical Absorption Capacity in both the AM and PM peak periods. (i.e. the ability of the intersection to absorb the traffic generated by the proposed development).

Austroads Part 5, Intersections at Grade has been used to assess the intersections ability to absorb the traffic generated by the proposed development. Noting that the traffic associated with the Summerset Retirement Village has also been included as part of the baseline conditions.

This assessment has covered the following intersections;

- Kenny Road and Eriksen Road Intersection
- Site Access with Kenny Road
- Site Access with Eriksen Road

6.1.1. Kenny Road and Eriksen Road Intersection

Based on the capacity of a single lane unsignalised intersection, the typical limit is assessed as 1500 vph.

Kenny Road and Eriksen Road Intersection has 579 and 574 entering vehicles within the AM and PM periods respectively. This is significantly below the typical limit and is therefore deemed to have adequate capacity. This is further supported by the Sidra Intersection assessment that was completed within the Stantec Report, which demonstrated a Level of Service A on all approaches.

Furthermore, this intersection is identified for a single lane roundabout upgrade within the Te Awa Structure Plan which would further increase the typical capacity limit to 2600 vph.

6.1.2. Site Access with Kenny Road

At present the road environment is semi urban and operates with a 70km/ h speed environment. Based on the level of right turning traffic (>50 veh /h) and the opposing volume (>150 veh/ h) it is recommended that a right turn bay be installed to support the safe and efficient operation of the accessway into the site.

6.1.1. Site Access with Eriksen Road

The through lane traffic approaching the right turn into the site is assessed as having a 50km/h operating speed environment, despite the 100km/h Posted Speed Limited. Based on the level of right turning traffic (<20 veh/h) and the opposing volume (<130 veh/h) a standard access in accordance with the Napier Code of Practice for Subdivision and Land Development is considered adequate.

6.2. Access Arrangements

The site has direct vehicular access onto both Kenny Road to the north and Eriksen Road to the east.

The Napier City Council Code of Practice for Subdivision and Land Development sets out the performance criteria for Vehicle Crossings and access In Section B11.

Specifically the location of the access must ensure;

(a) Adequate distance is maintained from road intersections
(b) Adequate pedestrian refuge is provided between crossings
(c) Safe sight distance is provided for the prevailing speed environment
(d) Minimum geometric standards are met

Each access has been specifically assessed against this performance criteria with regards to the design and construction standards outlined within Part F of the Code.

Section F1.6.14.1 of the Code requires that safe sightline distances are provided for all new intersections and accessways in accordance with RTS 6 guidelines for visibility at driveways.

6.2.1. Spacings between access points

Section 4.2 of RTS 6 provides limited parameters for minimum separation distances between intersections and accesses. In this instance reference has been made to Appendix 5B of the Transit Planning Policy Manual which provides the following;

Table 5 Recommended minimum accessway spacings

Posted Speed (km/hr)	Recommended minimum distance between a local road accessway and an intersection (m)
50	20
60	20
70	45
80	45
90	60
100	60

The proposed site access on Kenny Road is situated approximately 85m to the west of the Eriksen Road/ Kenny Road intersection and exceeds the recommended minimum 45m required for the speed environment.

The proposed site access on Eriksen Road is situated approximately 110m to the south of the Eriksen Road/ Kenny Road intersection and exceeds the recommended minimum 60m required for the speed environment.

Furthermore the approved entrance to the Summerset Retirement Village which has direct access onto Eriksen Road is situated a further 115m to the south of the proposed access, which provides suitable separation.

6.2.2. Visibility Assessment

Safe Intersection Sight Distance (SISD) is the desirable visibility standard which should be provided on a major road at any intersection. It provides sufficient distance for a driver of a vehicle on the major road to observe a vehicle on a minor road approach moving into a collision situation (e.g. in the worst case, stalling across the traffic lanes), and to decelerate to a stop before reaching the collision point. It is generally sufficient to enable cars to cross a major road safely from a side road. It is measured along the carriageway from the approaching vehicle to the conflict point.

There are various speed environments which apply when assessing the various development access points. Based on a 2 second reaction time, the minimum SISD values used for the assessment are tabled below.

Table 6 Safe Intersection Stopping Distances

Speed (km/hr)	Minimum Distance (m)
30	52
50	97
70	151
100	248

6.2.3. Kenny Road and Site Access Intersection

The speed limit along the entire length of Kenny Road is 70km/hr. The speed environment is assessed as the same.

View looking west along Kenny Road towards Willowbank Ave from the site access. Visibility is unrestricted providing in excess of 300m.

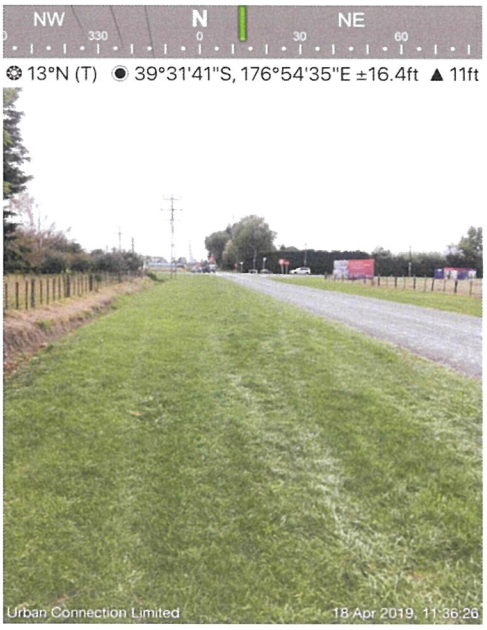
View looking east along Kenny Road, towards Eriksen Road from the site access. Visibility is impeded to approximately 190m, due to the gentle curve alignment through the Kenny Road, Eriksen Road intersection.

6.2.4. Eriksen Road and Site Access Intersection

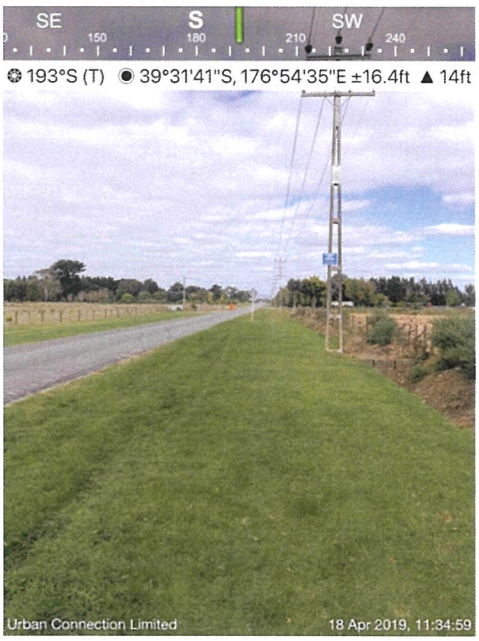
The speed limit along Eriksen Road, to the south of its intersection with Kenny Road is derestricted and infers a 100km/h speed environment.

All traffic proceeding south on Eriksen Road would have been required to yield or slow significantly when negotiating the Kenny Road intersection. For these reasons the speed environment for southbound traffic travelling along Eriksen Road is assessed as 50km/h.

Northbound traffic, approaching the site from the south are unimpeded and therefore this approach is assessed as a 100km/h speed environment.



View looking north along Eriksen Road towards Kenny Road Intersection from the site access. Visibility continues along Eriksen Road through the intersection, however visibility of 110m is available between the access and the intersection.



View looking south along Eriksen Road, towards Awatoto Road from the site access. Visibility is unimpeded and provides in excess of 250m.

7. District Plan Requirements

7.1. Car parking

The district plan provisions as set out within Section 61.14A stipulates the minimum number of carparking spaces required for various land uses. Of particular relevance are the requirements for Commercial Activities, specifically Early learning childhood centres, Supermarkets and retail activities as well as hospitality (Café) and healthcare services (Doctors) as set out in Table 7 below.

Table 7 District Plan Car Parking Requirements

Land Use	Minimum Carparking provision spaces	Required Parking
Day Care Centre (8 Staff + 75 Children)	1 parking space per full time equivalent staff member	8
Supermarket	1 park per 20m^2 gross floor area,	30
Retail	1 park per 20m^2 gross floor area.	20
Café (71.5m public area)	1 park per 10 m^2 gross public floor area.	7
Doctors (8 Practitioners + 8 FTE)	3 spaces per practitioner and 1 per full time equivalent staff member (FTE)	23
External Storage Area	1 park per 100m^2 gross floor area.	1
Total		89

On-site parking provision of 68 car parks is provided, resulting in a shortfall of 21 car parks compared with the District Plan Provision. Given the expected level of linked trips and mode share at the site, a 24% reduction in total parking provision is considered appropriate at this location.

There is site frontage along three sides of the development with car parking spread evenly throughout. Parking is accessed by an internal road network measuring 7.3 m in width, allowing space for two-way movement and manoeuvring into and out of parking spaces.

7.2. Bicycle Spaces

The district plan provisions as set out within Section 61.14B require 1 bicycle stand per 5 car parks.

Based on the assessed District plan provision of car parking as outlined in Section 7.1, this requires a minimum bicycle space provision of 18 spaces. 20 bicycle parks are provided on site.

7.3. Bicycle Facilities

The District Plan stipulates that commercial activities having more than 15 full time equivalent staff members shall provide one male and one female shower and changing facilities for staff to encourage the use of alternative transport modes.

Whilst the site as a whole would generate more than 15 full time equivalent staff, it is understand that this rule applies to individual site activities, which no individual unit exceeds.

7.4. Loading Spaces and Internal Layout

The internal road configuration is illustrated in Figure 10 earlier in the report.

There is provision / design for a service access along the southern wall, meaning heavy vehicle / delivery access is separated and does not conflict with customer traffic. On-site loading and

manoeuvring for a semi-trailer design vehicle has been provided for, as per Appendix 20 of the District Plan.

The day care facility is designed to be accessed along the western side, providing separate access to the main commercial tenancies safe and efficient pick up and drop off of children.

8. Conclusion

On the basis of the assessment detailed above, it is concluded that the proposed development can be accommodated within the local traffic and transportation environment with no more than minor effects.

The expected traffic generation of the proposed development is up to 1756 veh/day with a peak hour of up to 298 veh/h.

While the peak hour traffic flows at the site are likely to coincide with the surrounding network peak, the expected effects from this traffic on the surrounding intersections have been assessed as no more than minor, and traffic effects beyond these intersections have been assessed as negligible.

Notwithstanding, some minor improvements are proposed to improve connectivity and overall integration between the development and the surrounding network. These are detailed under Section 9.

Accordingly, it is concluded that the traffic associated with the proposed development is able to be accommodated on the adjacent road network and can be supported from a transportation perspective.

9. Recommendations

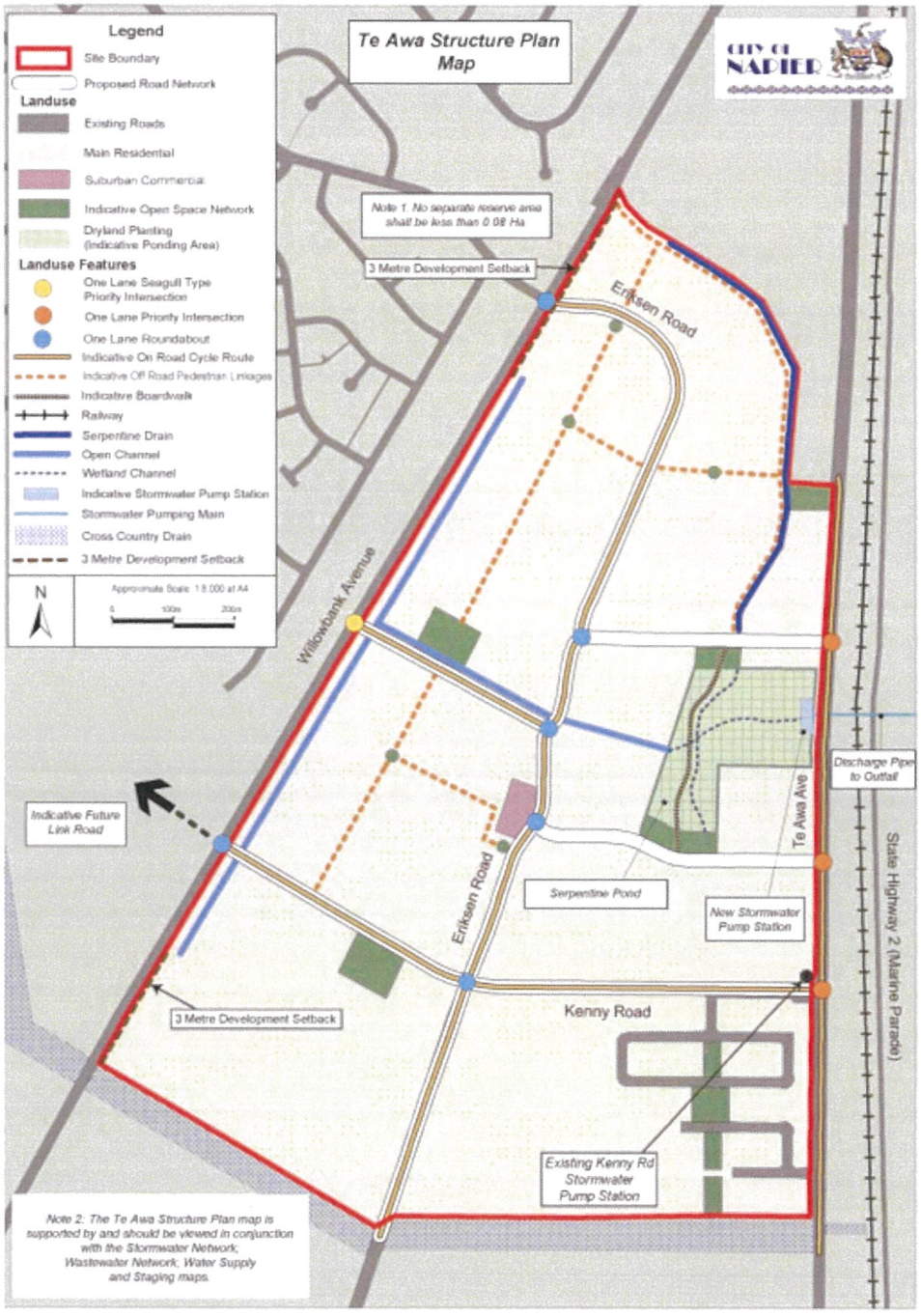
Based on the findings of this report and the associated conclusions, it is recommended that;

- The Kenny Road footpath be extended along the southern side of Kenny Road, to the boundary of the site, to provide an all-weather footpath connection from the site to the existing footpath network. This shall require a suitably designed crossing provision at Eriksen Road.
- The Kenny Road and Site Access Intersection be designed to include a right turn bay to support the safe and efficient operation of the intersection.
- Consideration be given by Napier City Council to reviewing the safe and appropriate speed limits within the vicinity of the site, with particular regard given to the 100km/h posted speed limit on Eriksen Road immediately fronting the site and the adjacent Summerset Retirement Village.

Appendices

Appendix A - (NCC Te Awa Structure Plan – Appendix 29B of City of Napier District Plan)

Appendix 29B Te Awa Structure Plan Map



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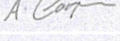
Document Status – FINAL ISSUED

Revision	Date of issue	Author	Reviewer	
			Name	Signature
1	April 2019	Jonno Fletcher	Aaron Campion	
2	April 2019	Jonno Fletcher	Aaron Campion	

File: J19105

25 March 2019

Stradegy Planning
PO Box 239
NAPIER 4140

ATTENTION: CAMERON DRURY

Dear Cam

J19105 - KENNY ROAD COMMERCIAL - SECTION 92(1) RESPONSE - STORMWATER

This letter is in response to the request for additional information under section 92(1) of the Resource Management Act 1991 (RMA). This information was requested by the Napier City Council via letter dated 11 March 2019 regarding a stormwater assessment on the impact to the storage options and storage volumes versus duration in regard to the local area.

The required stormwater storage volumes for stormwater events ranging from 6-hours to 72-hours duration and attenuating flows to pre-development rates of runoff corresponding to 6-hours to 72-hours critical storm duration events are shown below:

Critical storm duration	6-hours	12-hours	24-hours	48-hours	72-hours
Storage required to attenuate runoff to baseline rate of release	m^3	m^3	m^3	m^3	m^3
6-hour	**325**	405	466	528	549
12-hour	294	**454**	575	701	743
24-hour	50	370	612	863	947
48-hour	-721	-81	404	**905**	1072
72-hour	-1617	-657	70	822	**1073**

This table is based on the parameters shown below:

	i_{100}	Hours	Pre-development	Post-development	Increase	Baseline rate of release of stormwater to the environment (L/s)				
	mm	*hr*				*6-hour*	*12-hour*	*24-hour*	*48-hour*	*72-hour*
cA			**2,353**	**5,228**						
			m^3	m^3	m^3	*L/s*	*L/s*	*L/s*	*L/s*	*L/s*
Runoff$_{6\text{-hour}}$ (m^3)	113	6	266	591	325	12.3	8.6	5.8	2.9	1.9
Runoff$_{12\text{-hour}}$ (m^3)	158	12	372	826	454	12.3	8.6	5.8	2.9	1.9
Runoff$_{24\text{-hour}}$ (m^3)	213	24	501	1114	612	12.3	8.6	5.8	2.9	1.9
Runoff$_{48\text{-hour}}$ (m^3)	269	48	633	1406	773	12.3	8.6	5.8	2.9	1.9
Runoff$_{72\text{-hour}}$ (m^3)	301	72	708	1574	865	12.3	8.6	5.8	2.9	1.9

cA values were derived from:

			Area	Area	cA	cA
	$C_{Existing}$	$C_{Developed}$	Pre-development	Post-development	Pre-development	Post-development
Building	0.3	0.9	683	1723	615	1,551
Footpath	0.3	0.9	0	435	0	392
Parking	0.3	0.9	0	3317	0	2,985
Garden / Rain garden	0.3	1	5795	1003	1,739	301
TOTAL			**6478**	**6478**	**2,353**	**5,228**

The report adopted a critical storm duration of 24-hours because it corresponds with the approach that was taken by the Te Awa Structure Plan 3-Waters Report, as noted in Section 3.4 of the Servicing Report. The required storage volume is 612m^3 and water should be released from the storage basin at a rate of 5.8L/s.

If a critical storm duration of 12-hours was adopted, required storage would reduce to 454m^3 and the rate of release would increase to 8.6L/s. On the other hand, if a critical storm duration of 48-hours was adopted, required storage would increase to 905m^3 and the rate of release would reduce to 2.9L/s.

As noted in the Report, a critical storm duration period is considered appropriate for this development in this area because it corresponds with the approach that was taken for the Te Awa Structure Plan modelling and it is a generous length of time for a site that is relatively close to the point of discharge of the wider stormwater system.

I trust this provides the relevant additional stormwater information that was requested by the Napier City Council under section 92(1) of the Resource Management Act 1991 (RMA).

If you have any questions, please contact me.

Yours sincerely

Johan Ehlers, MIPENZ, CPEng, IntPE
DIRECTOR/PRINCIPAL ENGINEER