



Waikato District Council

Sunset Beach (Okarahia)

Preferred Options for Managed Retreat

March 2016

Table of contents

1.	Introduction	1
1.1	Purpose of this report	1
1.2	Background	1
1.3	Scope and limitations	2
2.	Proposed options summary	3
2.1	Option One – Ocean View Road (Parking for Sunset beach and community hall).....	3
2.2	Option Two – Cordyline Road (Parking for Sunset beach and community hall).....	4
2.3	Option Three – Centreway Road (Parking for Sunset beach and community hall).....	5
2.4	Option Four – Health Camp (Community hall).....	6
2.5	Option Five – Maraetai Bay (Community hall)	7
2.6	Option Six – Port Waikato Rugby Grounds (Parking for Sunset beach and community hall)	8
3.	Survey and findings.....	10
3.1	Response to survey.....	10
3.2	Survey findings.....	12
4.	Taking forward the preferred options	15

Figure index

Figure 1: Location of options	3
Figure 2: Cordyline Road Option	5
Figure 3: Centreway Road Option	6
Figure 4: Health Camp Option.....	7
Figure 5: Maraetai Bay Option.....	8
Figure 6: Port Waikato Rugby Grounds Options	9
Figure 7: Residential status of submitters	10
Figure 8: Method of submission.....	11
Figure 9: Age of submitters	11
Figure 10: Preferred car parking.....	12
Figure 11: Preferred Hall Location.....	13
Figure 12: Option breakdown	16
Figure 13: Dune plants (Coast Care Brochure, Bay of Plenty Regional Council)	16
Figure 14: Centreway Road Stage One	17
Figure 15: Centreway Road Stage Two	18
Figure 16: Port Waikato Rugby Fields Example 1	19

Figure 17: Recommended Port Waikato Rugby Fields Option 2.....20

Appendices

Appendix A – Approximate Option Costs

1. Introduction

1.1 Purpose of this report

The purpose of this report is to present final options for managed retreat based on the feedback received from the community on options presented to manage risk to public assets, specifically the community hall and car park, from erosion at Sunset Beach, Port Waikato.

Section 1 of this report provides background leading up to consultation on options for managed retreat.

Section 2 of this report outlines the proposed options put forward to the community in the survey.

Section 3 assesses the information received from the survey including the quantitative data and qualitative data.

Section 4 uses the information received and outlines the preferred options for managed retreat at Sunset Beach.

The assumptions of this report are based on feedback received from the community through the surveys undertaken during January 2016 and community meetings held in the same month.

1.2 Background

GHD Ltd (GHD) was engaged by Waikato District Council, in 2014, to undertake an assessment of options for managing issues resulting from erosion affecting public assets at Okariha (of Sunset Beach) in Port Waikato. An initial report on potential options was undertaken by GHD in December 2014. The four options explored were:

1. Do nothing
2. Defend
3. Adapt
4. Managed retreat

The assessment identified managed retreat as the most appropriate action in response to existing and potential coastal erosion issues affecting public assets at Sunset Beach.

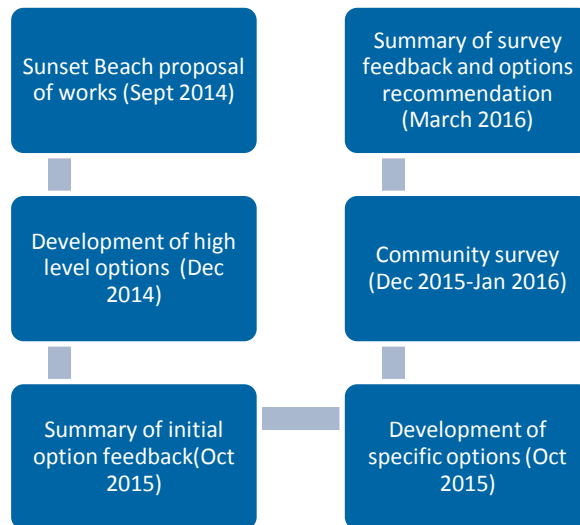
A focus group of partner organisations was established in response to this report to work with the Port Waikato residents and ratepayers and wider community to provide advice on solutions for managed retreat. Partner organisations include the Waikato District Council, Department of Conservation (DoC), Iwi, Waikato Regional Council, and the Sunset Beach Surf Lifesaving Club.

On Saturday 5 September, a community engagement workshop was held at Sunset Beach Surf Lifesaving Club. Around 100 people attended this event. The intent of the workshop was to discuss with the community their thoughts on the managed retreat of community assets and gain directions on when, where and how they would like to see this completed.

Following the meeting, a survey was created to gain further feedback on options for managed retreat. The survey sought to consult on options to manage public assets should erosion continue, including the community hall and car parking options.

Consultation sought feedback on potential locations for car parking for Sunset Beach, being Cordyline Road, Centreway Road, Ocean View Road or the rugby grounds. Submitters were asked to rank the proposed options from one to four. One being the most preferred option and four being the least preferred option.

In addition the consultation sought feedback on potential locations for the community hall. The locations proposed were Cordyline Road, Centreway Road, Ocean View Road, the rugby ground, the health camp or Maraetai Bay. As with the beach access, submitters were requested to rank their preferred option from one to six.



This report explores the findings of the community survey and recommends future options for Sunset Beach based on the information. The outcomes of this consultation are to be used to inform the long term planning of the community assets should erosion force retreat from the current location.

1.3 Scope and limitations

This report: has been prepared by GHD for Waikato District Council and may only be used and relied on by Waikato District Council for the purpose agreed between GHD and the Waikato District Council as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Waikato District Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

2. Proposed options summary

Waikato District Council working with a focus group that included the Department of Conservation, the Waikato Regional Council, residents and ratepayers, surf club and local business owners to identify sites for the managed retreat of public assets, should that be required. Each site had a specific design that was presented to the local community for further feedback. A brief description of each proposal has been provided below.

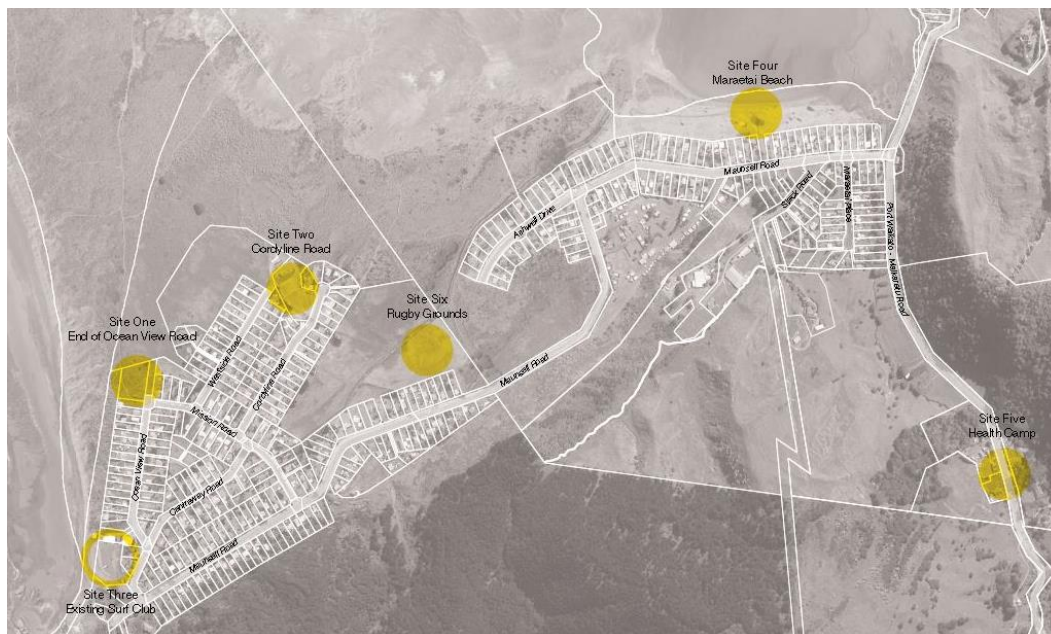
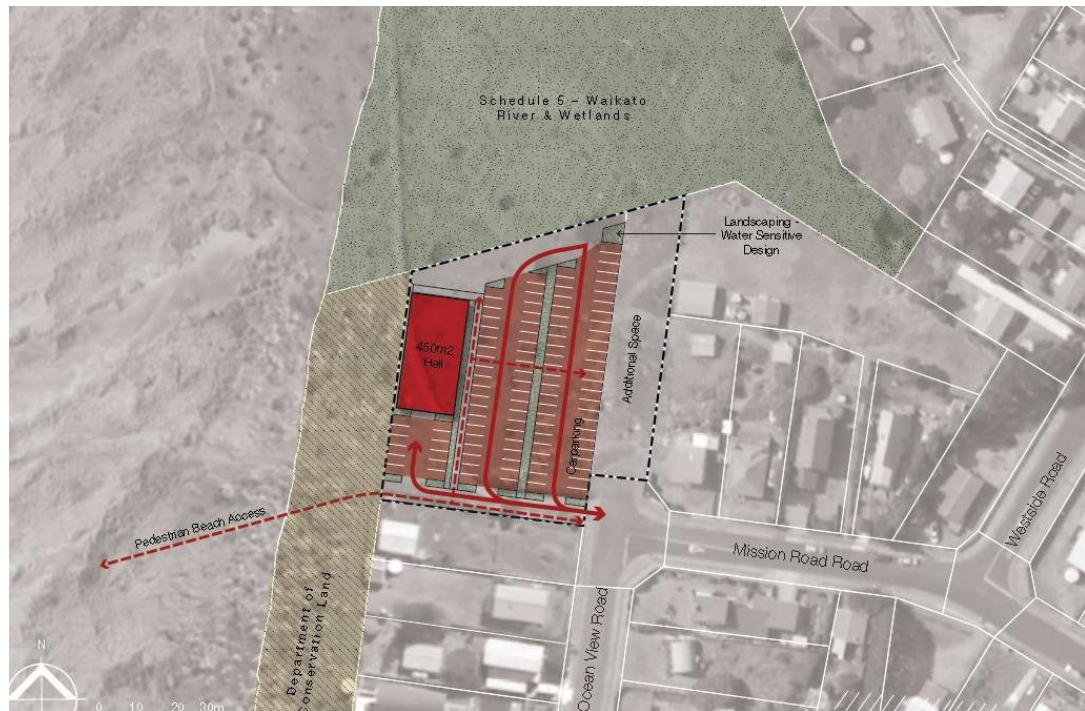


Figure 1: Location of options

2.1 Option One – Ocean View Road (Parking for Sunset beach and community hall)

The subject site is located at the end of Ocean View Road and Mission Road and covers Lots 10 and 40 DPS 17714. These two titles encompass a total of 0.482 hectares. Currently these sites are vacant and are owned by the Waikato District Council.



The proposed redevelopment will allow for up to 103 car parks and will enable pedestrian access to Sunset Beach. To mitigate the increased paved impermeable area, vegetated swales were included in the design that also serves as stormwater mitigation. The site design allows for a larger community hall to be established within the corner of the site closest to the beach, away from residential properties.

Beach access from the carpark is not possible due to the topography of the dune system and the potential negative effects on vegetation and habitat.

2.2 Option Two – Cordyline Road (Parking for Sunset beach and community hall)

The subject site is located at the end of Cordyline Road, a cul-de-sac, and is legally described as Lot 43 DPS 26669. The lot is approximately 0.712 hectares and is also known as Albie Phillips Memorial Reserve. A playground, public toilets, tennis court, tennis pavilion, and a public library currently occupy the site. Waikato District Council owns the site.

Due to the location of the site, it would need to be redeveloped in conjunction with another site to provide beach access. The site is able to accommodate a larger community hall and up to 46 car parks on site, without removing the existing amenities.

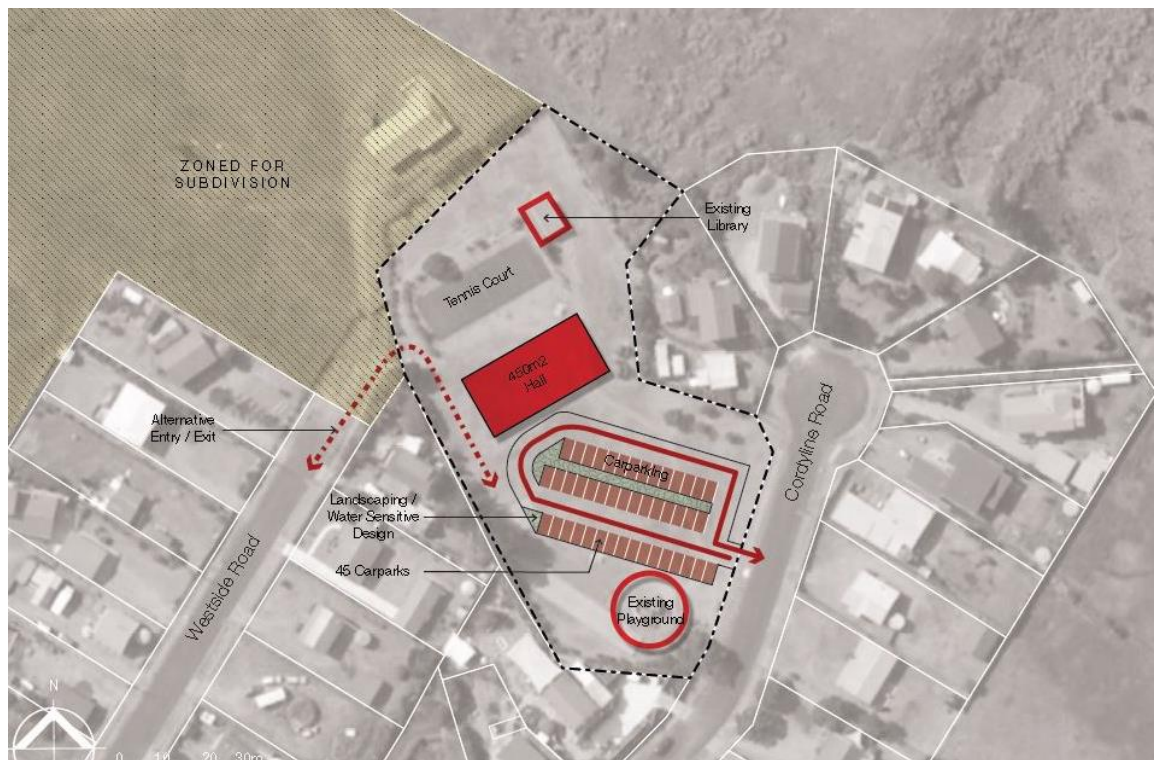


Figure 2: Cordyline Road Option

The hall has been located to the rear of the site, away from the road to reduce potential effects on adjacent residential sites. Proposed car parking has been located within the centre of the site with landscaping along the eastern side of the site to reduce potential noise and visual effects.

2.3 Option Three – Centreway Road (Parking for Sunset beach and community hall)

The subject site is located at the intersection of Centreway Road and Maunsell Road. This encompasses Lot 4 DPS 8872, Lot 54 DP 8872 and Lot 57 DP 8872, and is a total area of 0.7786 hectares. Combined, these lots form the Sunset Beach Reserve which contains the existing community hall, public toilets and Sunset Beach Carpark. The adjoining sites (1 Ocean View Road and 3 Centreway Road) are privately owned and occupied by the Port Waikato Surf Life Saving Club.

The proposed option for Centreway Road assumes that the existing carpark and community hall area will not be useable due to erosion. It was proposed to construct a new carpark and public toilets on the western corner of Centreway Road and Maunsell Road. The surf club will be able to remain in its current position; however, the community hall will need to be relocated. This option will require the acquisition of up to three properties for future use as a community hall, commercial centre or carparking. 100 carpark spaces are possible in this location, if the private land can be acquired.

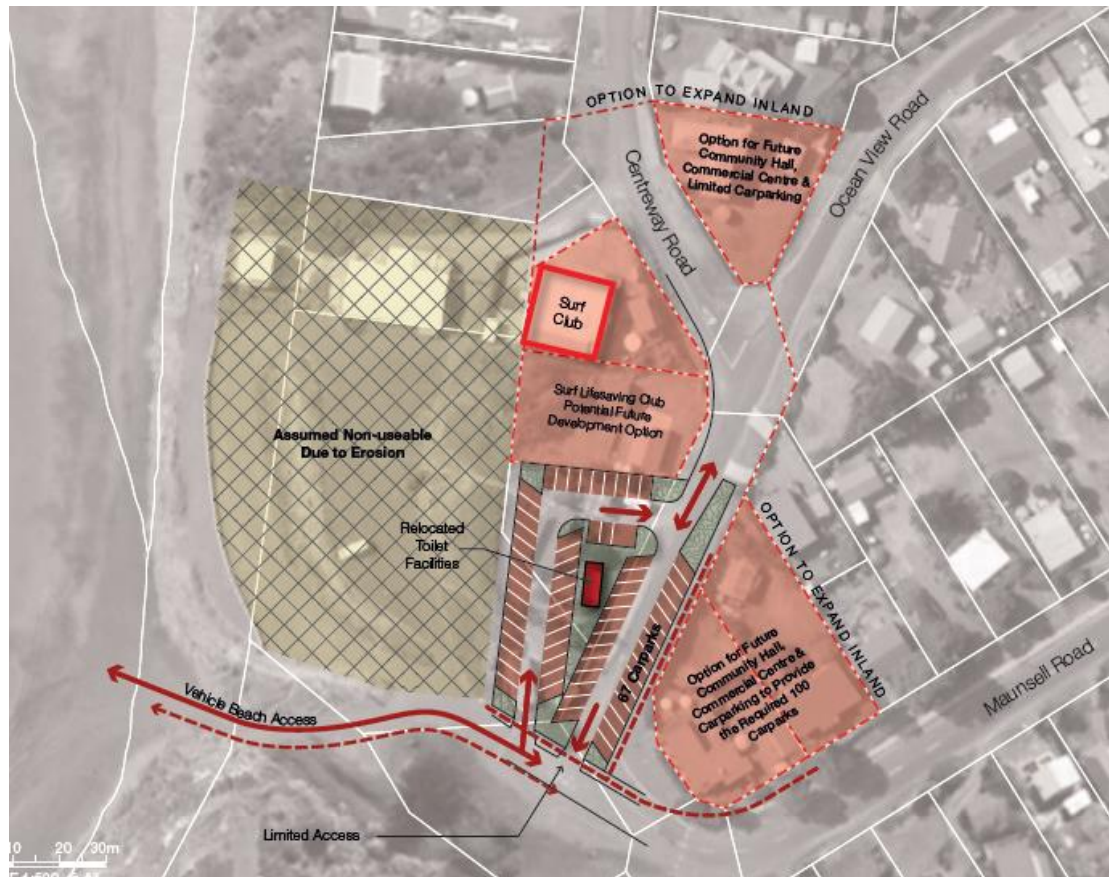


Figure 3: Centreway Road Option

2.4 Option Four – Health Camp (Community hall)

The subject site is located at 67 and 68 Port Waikato-Waikaretu Road and covers Lots 1 and 2 DPS 9063 to be a total area of 12 hectares. Currently the site is occupied by the health camp also known as the Port Waikato School Camp. The site is owned by the Ministry of Education and provides a location for school to provide outdoor education. Due to the location, this option is for the sole purpose of a new community hall.



Figure 4: Health Camp Option

The existing development on 68 Port Waikato-Waikaretu Road prevents the ability to locate a new hall on site, however there is sufficient space on 67 Port Waikato-Waikaretu Road. The proposed location is close to the road and increases accessibility to and from the site. Locating the hall in the proposed position allows for the school/health camp and hall to function as separate entities.

The proposal can cater up to 46 car parks, which will incorporate proposed vegetated swales within the centre of the carpark to manage increased stormwater runoff from the sealed area. The lack of footpaths and separation distance from the main township prevents pedestrian access to the site. There are also a number of environmental considerations for this site, including impact on natural forested areas.

2.5 Option Five – Maraetai Bay (Community hall)

The subject site is located at the Maraetai Bay Reserve, legally described as Lot 13 DPS 1186 and is owned and managed by Waikato District Council. The total area of the site is 4.14 hectares and is currently occupied by a playground and public toilets. Vehicular access to the site is gained through a formed access way connecting to Maunsell Road. Pedestrian access is also gained at this location; however addition access points exist to the east and west also connecting to Maunsell Road.



Figure 5: Maraetai Bay Option

Due to the location of the site in relation to Sunset Beach the site will need to be developed in conjunction with another site. The large open space enables the site to be developed with a substantial community hall and carpark without the removal of the existing amenities (as shown above). The proposed carpark can cater for up to 46 car parks with land available for more car parks if required. The picture above shows two options for the community hall. One near the existing playground, the other within the open land. Both options will maintain the existing pedestrian and vehicle access from Maunsell Road.

2.6 Option Six – Port Waikato Rugby Grounds (Parking for Sunset beach and community hall)

As with the Cordyline Road option, the Port Waikato Rugby Ground are located on Albie Phillips Memorial Reserve but is accessed via Maunsell Road. The site encompasses Pt Lot 1 DPS 3625 and Lot 9 DPS 23881 with a total area of 4.14 hectares. The site is owned and managed by Waikato District Council and is currently used as the Port Waikato Rugby Grounds. Three options for the configuration of the rugby grounds were proposed. Each of these are summarised below.

2.6.1 Option A

This option involves the hall and associated 46 car parks being located within the south western corner of the site (Figure 8). The carpark has been designed to include swales to avoid potential adverse stormwater effects. The proposed hall location will be located directly behind residential properties to the north west and south west therefore having potential adverse noise effects. Locating the hall at this end of the reserve will also reduce the visibility of the rugby field at the other north east end of the reserve.

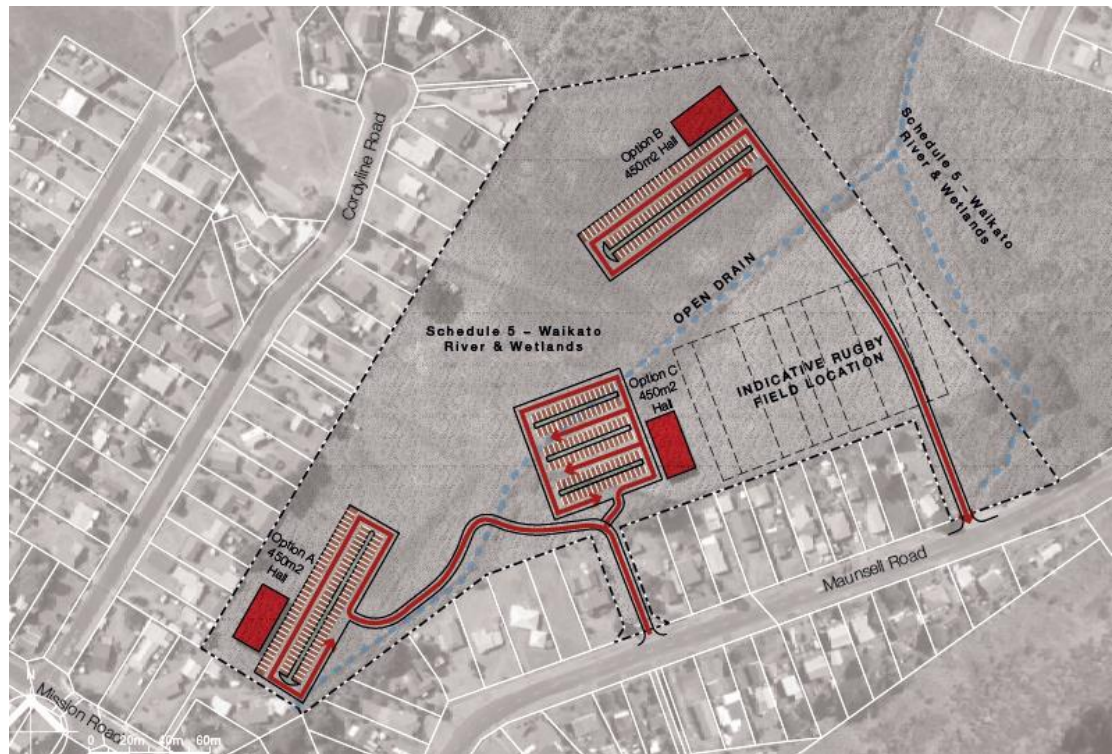


Figure 6: Port Waikato Rugby Grounds Options

2.6.2 Option B

The second option for the rugby fields will result in the construction of the community hall and car park within the north corner of the site

The southern and western boundary adjoins the residential zone whereas the eastern boundary adjoins land zoned as coastal. The site is considered to be in a central location, this being an aspect highlighted by the community as important to ensure that the hall continues to be the 'hub' of the community.

2.6.3 Option C

The third option for the proposed hall at the rugby fields is located near the southern boundary close to the existing access way between residential properties. The hall would back onto the rugby field location to the east and the proposed parking to the west. The parking would be located across the open drain that bisects the property. Works would need to be undertaken to prepare the area for the construction of the car park including the construction of a culvert.

3. Survey and findings

The survey was open for submissions from late December 2015 until January 2016 and accessed via Waikato District Council's website. Posters, flyers and media releases informed the local community of the survey. A public open day was held at the Port Waikato Community Hall on Saturday 16th January where various options were displayed for the public and representatives were on site to answer any questions.

Below is an analysis of the survey, including the demographics of respondents, preferred options results, and general feedback.

3.1 Response to survey

A total of 93 people took the opportunity to provide feedback on the proposed options. Of the 93 submitters, 50 (54%) submitted during the open day event held on January 16th. The majority of submitters were local residents being 44%, followed by non-resident ratepayers (27%) and ratepayers (24%).

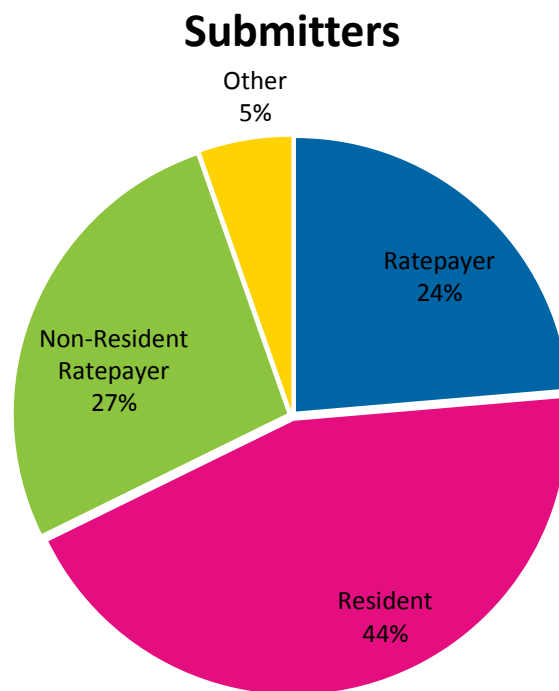


Figure 7: Residential status of submitters

Whilst the survey was live from December 2015 until the end of January 2016, over half of the submitters (54%) opted to provide feedback via the public open day held of January 16th 2016. Online submissions accounted for 40% of the total submissions, followed by over the counter (4%), followed by post and email, both with 1%.

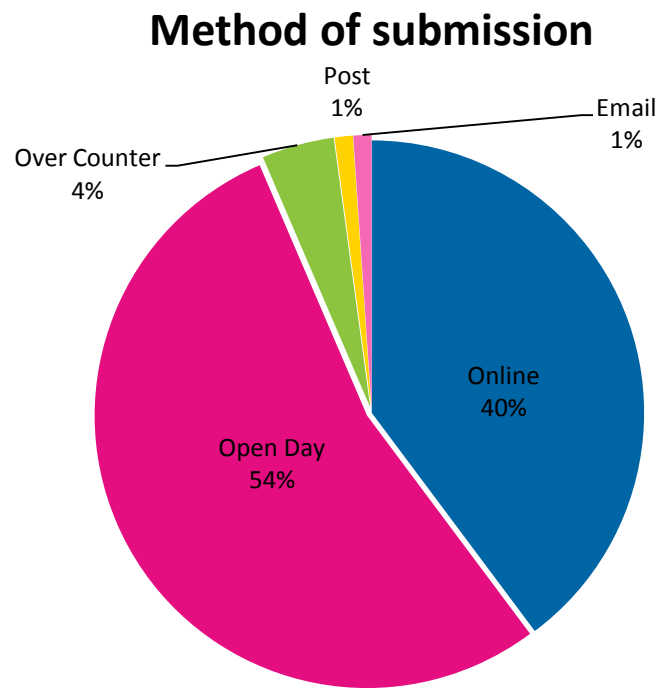


Figure 8: Method of submission

The survey attracted a variety of ages, however the most predominant age range of submitters was between 51 and 65, a total of 37 (40%) submitters.

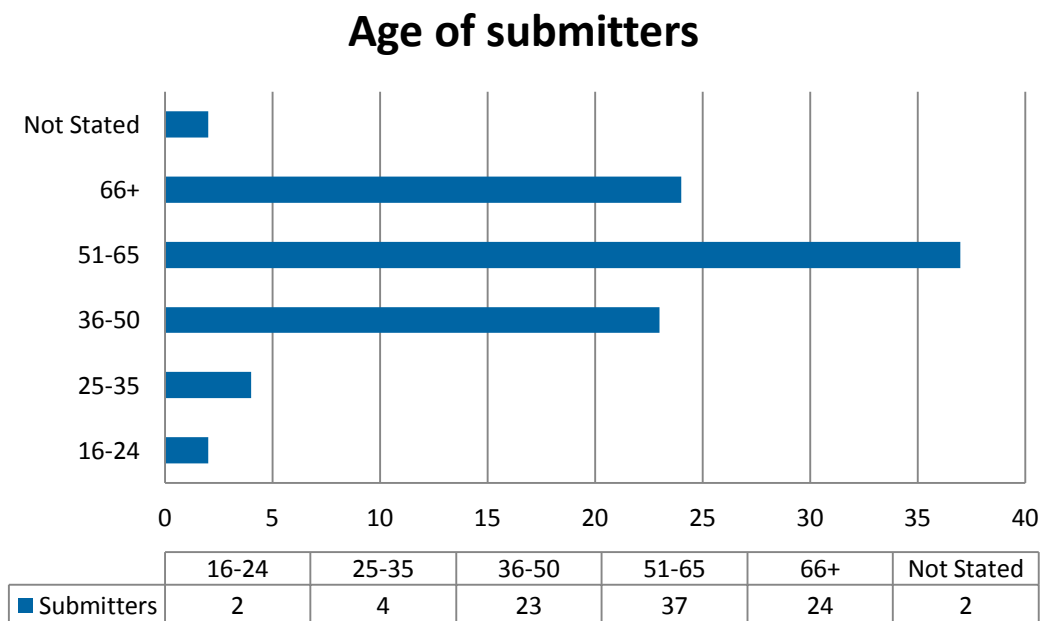


Figure 9: Age of submitters

3.2 Survey findings

3.2.1 Which option do you prefer for beach access parking?

The first question asked as part of the Sunset Beach options survey was for submitters to rank their preferred car parking options for Sunset beach from one to four. One being the most preferred option and four being the least preferred option. Figure 14, below, shows the results to the question.

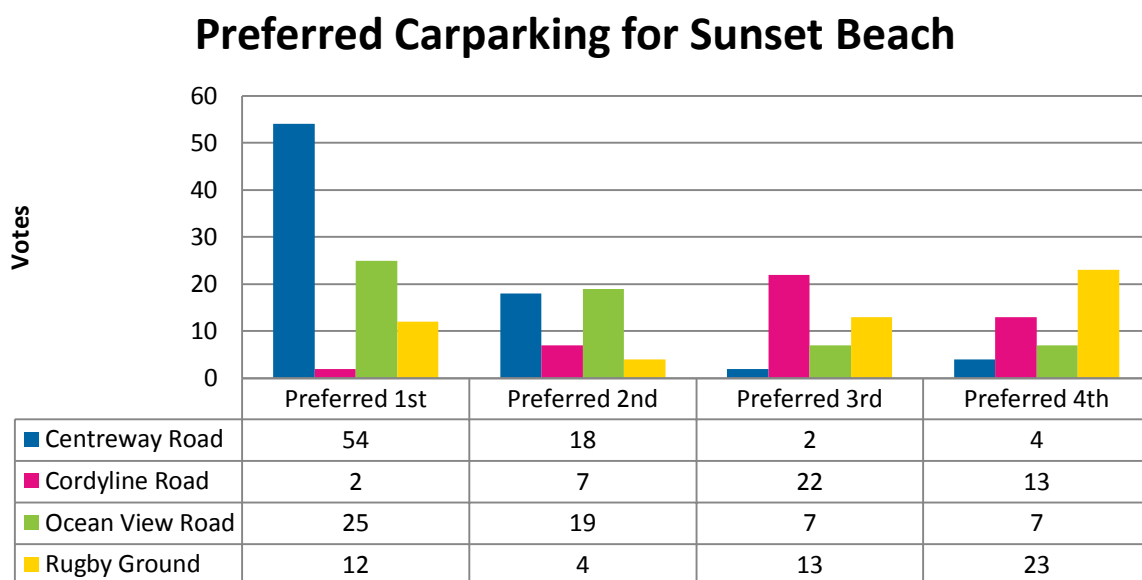


Figure 10: Preferred car parking

Of the 93 respondents, 54 (56.38%) preferred Centreway Road as the proposed car parking option. Ocean View Road was the second most popular option for beach access car parking with 25 (26.88%) votes, then Rugby ground with 12 (12.9%) and Cordyline Road with 2 (2.15%).

The Rugby ground topped the least preferred option (as 4th preference) for beach access car parking. 47 respondents voted for their least preferred option, approximately half of the total respondents. Of the 47, just under half (23 respondents, 48.94%) sited the rugby grounds as their least preferred option for beach access car parking.

Comments received from the survey and community workshop support the quantitative findings, including:

- Centreway Road is the closest option to the primary section of the beach and life guard tower. A number of respondents noted that having parking at Centreway Road will keep beach users in one location which will make it easier for lifeguards to monitor.
- A common theme in the responses focussed on the fact that the rugby grounds and Cordyline Road were located too far away from the beach.
- Many respondents liked the idea of using the existing beach car park and community hall area (at Centreway Road) for future development rather than developing other bare sites.
- A number of respondents commented on the importance of vehicle beach access at Centreway Road. A number commented on the existing issues of pedestrian access to the beach at this site.

3.2.2 Which option do you prefer for the community hall site?

The second question posed in the survey was for the submitters to rank their preferred location for the community hall, if it had to be in another location. Six options were put forward, those included in the first question and the addition of the Health Camp and Maraetai Bay.

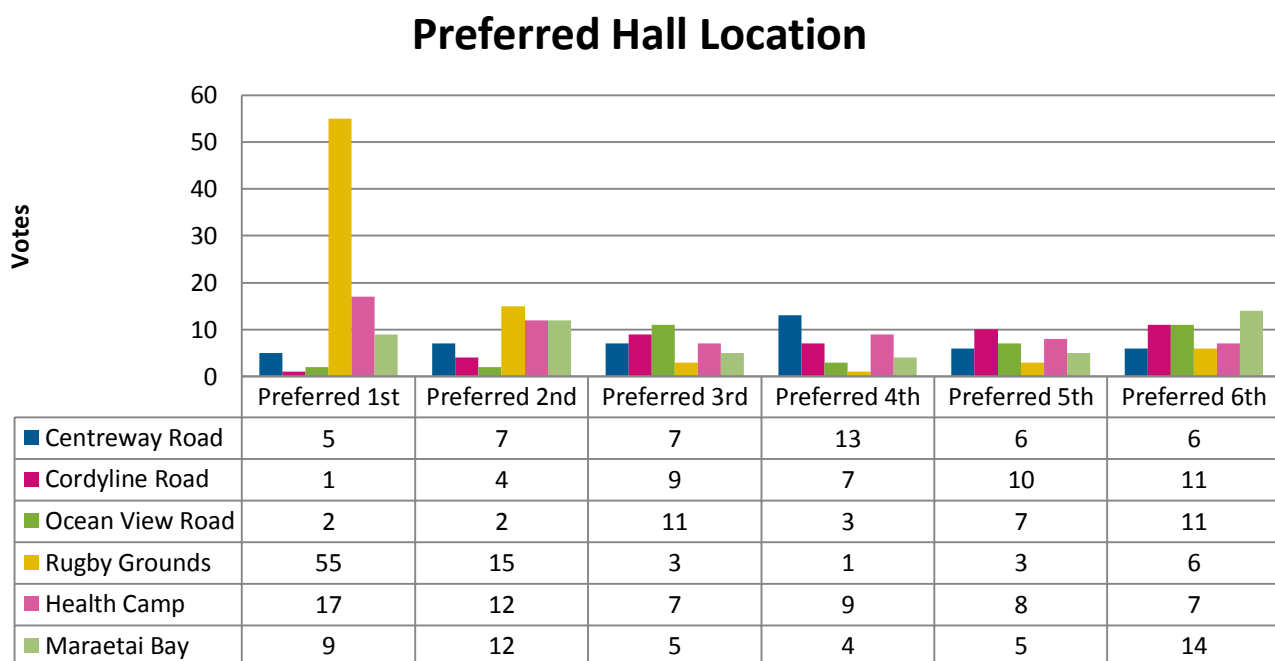


Figure 11: Preferred Hall Location

92 respondents answered the second question in comparison to 93 for the first question. Of the 92 respondents the clear number 1 preferred location for the community hall was at the Port Waikato Rugby Grounds with a total of 55 respondents (59.72%), see figure 11. As with the previous question, the submitters were requested to provide comments and feedback on the question to provide further information on the option proposed. The key points raised include:

- That the Albie Phillips Memorial Reserve was gifted to Council with the intention of being retained as a reserve and that it should not be developed. If accurate, this would restrict development of both the Port Waikato Rugby Grounds.
- Contrary to the above, the rugby grounds were preferred over all other options as the location for the community hall. The primary reasons for this being that the grounds are located within the centre of the township and that the location could accommodate future development and expansion without affecting the residents.
- It was felt that not only would the community use the hall, but it could also be utilised by the rugby club for functions during the season. If the hall were to be located at the rugby grounds, the preference is to separate it from adjacent residential properties to avoid potential adverse effects.
- One respondent suggested adding additional facilities such as netball or basketball court. It is acknowledged that a tennis, netball or basket court facility already exists at Cordyline Road.

- Disruption to the locals was a theme raised by a number of submitters and that this should be minimised where possible.

Another submitter stated that Centreway Road was their preferred option because the area is currently being utilised for this purpose and therefore would result in minimal disruption to the locals.

Notwithstanding that the health camp was the second most preferred option, although many respondents highlighted that its location was too far away from the township.

4. Taking forward the preferred options

Recommendations have been prepared on the basis of the feedback received from the community survey and options report prepared in October 2015. The following assumptions have been made in confirming the preferred:

- Waikato District Council will continue to monitor hazards from any continued erosion and undertake action as it deems necessary.
- Based on feedback received, the Surf Lifesaving club facilities will not be relocated from the existing location. There is the potential to develop the site in the future. The surf club are investigating this.
- The recycling facilities will not be located at the existing location.
- Waikato District Council will undertake redevelopment on the basis that erosion/accretion is to occur.
- Waikato District Council may acquire property on Centreway Road for redevelopment if required.
- Waikato District Council will attempt to keep access way to the beach for vehicles and pedestrians.
- A cultural impact assessment will be undertaken for all preferred options.

Figure 12 outlines the process to triggering the development of options based on planned managed retreat. For example, if erosion is to continue to the suggested trigger point then assets should be retreated from the coastline. A description of each option and an estimated cost to deliver each option is provided. What is not provided are detailed designs or costs.

It is anticipated and recommended that the status quo does not remain at Sunset Beach and that steps are taken to move forward options before the summer of 2016/17. Stakeholders have identified that increased development in nearby towns including Pukekohe, Tuakau and Pokeno will increase potential visitors to the beach in the future. There is a strong desire to increase the number of carparks to alleviate summer congestion and parking issues. It is recommended that regardless of the final option chosen, redevelopment of Centreway Road should be undertaken to accommodate for the anticipated demand for parking spaces. Redevelopment will alleviate potential safety risks for vehicle users and pedestrians and the opportunity exists to develop this site alongside redevelopment of the neighbouring site owned by the Surf Lifesaving club. Figure 14 details the potential option that will address current and future parking issues whilst allowing for either future erosion or accretion options to be implemented. Implementation will require relocation of the public toilet facilities.

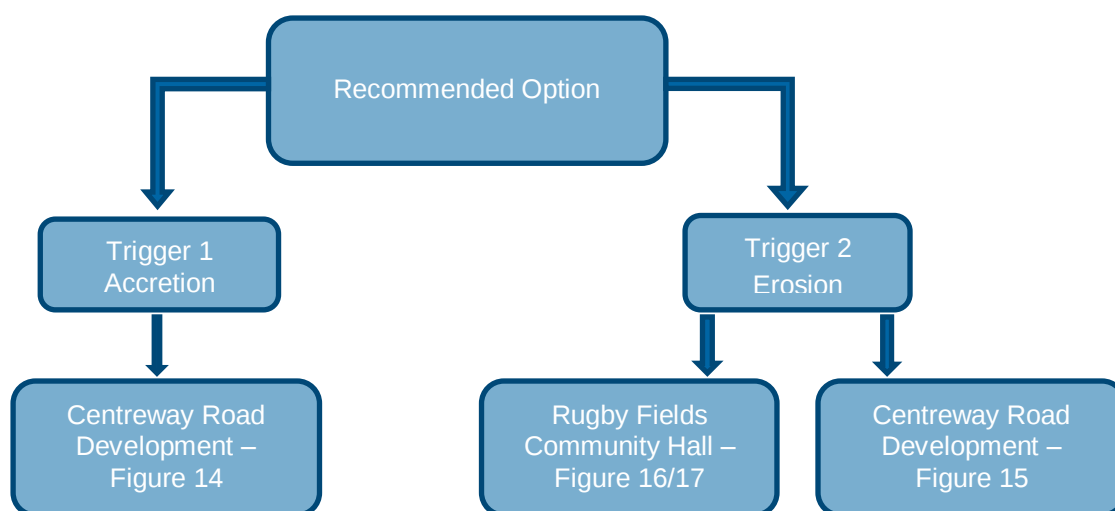


Figure 12: Option breakdown

4.1.1 Trigger 1 – Accretion along Sunset Beach

Should accretion occur for a prolonged period, it is recommended that Council undertake a beach re-establishment programme focussing on replanting the dunes. It should be noted that a significant build-up of sand would be required, and is sustained over high wave energy periods such as a winter season. Planting will include shrub cover, shrubs and sand binding grasses, as shown in Figure 13 below and would need to be fenced off, maintained and take into account sea level rise

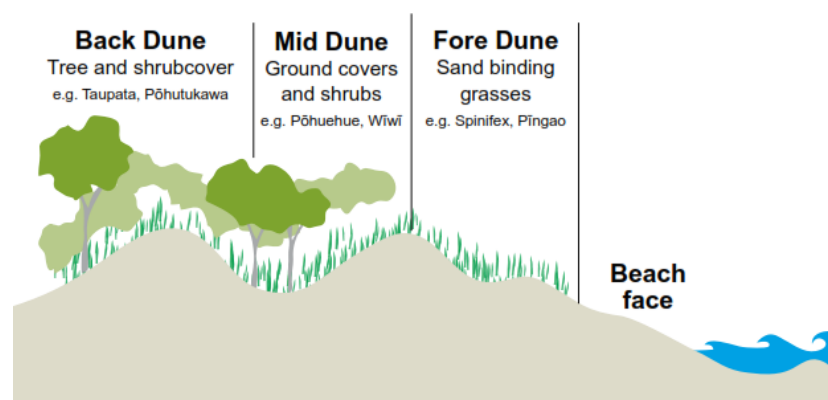


Figure 13: Dune plants (Coast Care Brochure, Bay of Plenty Regional Council)

The staged development is shown in Figure 14 whereby the first stage of the development would be to plant out the fore dune with suitable native dune species to initiate further accretion. Once this has been established and shows signs of further accretion then it is possible to undertake significant dune planting within the mid- and back-dune. It is assumed that overtime this section of the beach would slowly re-establish a formed beach if accretion of sand continues. Ongoing maintenance and monitoring of the beach will be required for this option to ensure ongoing management of fore dunes along the coastline. This could be done in association with the existing beachcare group.

It is also recommended that Council further investigates the development of additional car parking at this site even if a prolonged period of accretion were to occur. This is to accommodate the need for additional parking during peak summer periods and would manage

any longer term risk of erosion should the trend reverse in the medium or long term. Acquisition of land would be required to provide additional parking as indicated in figure 14. No objections were raised on these sites during consultation but direct discussion with affected parties is strongly recommended.

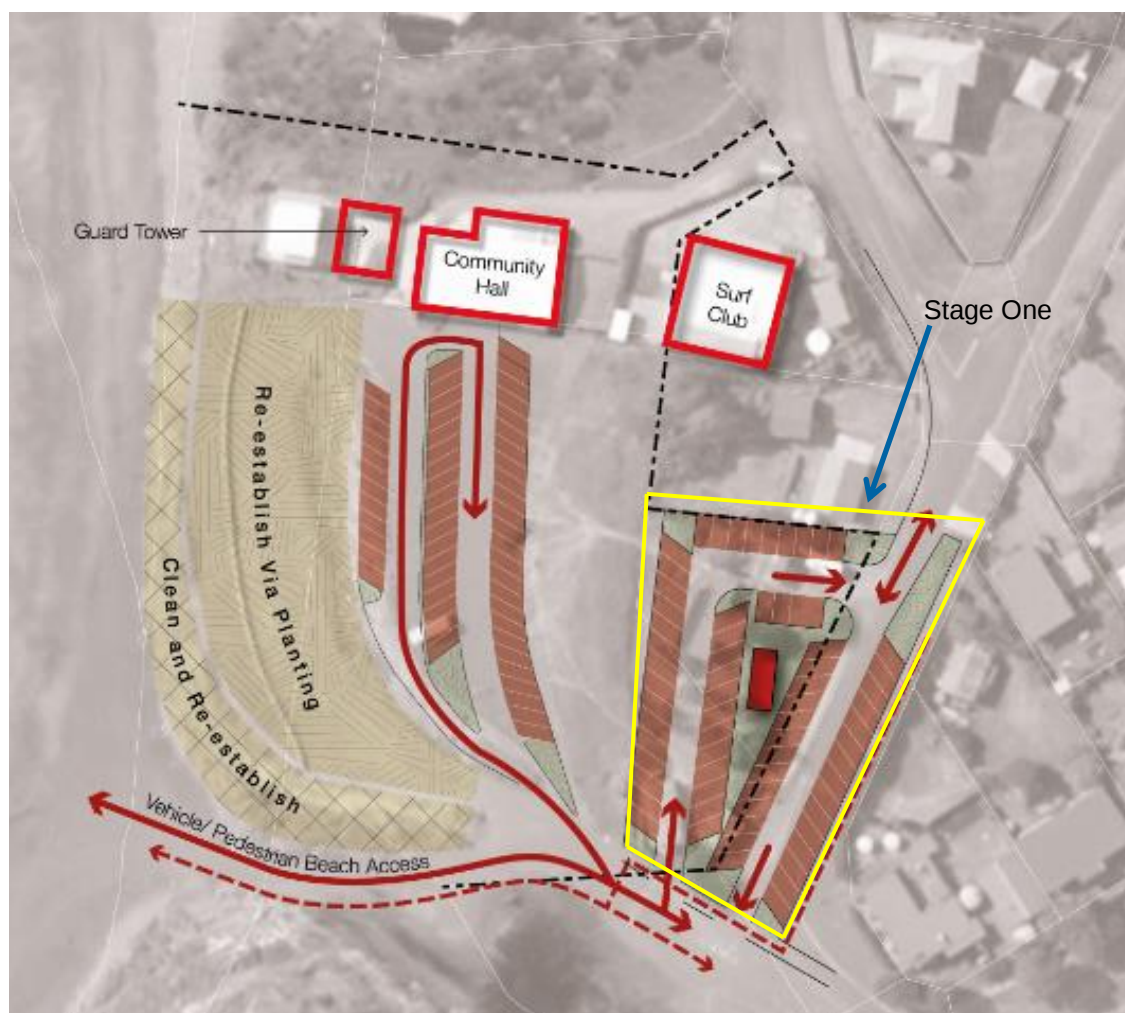


Figure 14: Centreway Road Stage One

Works	Approximate Cost
Centreway Road – Accretion Option	\$717,114.13
Estimated land acquisition cost	\$700,000
Re-establishment of vegetation	\$30,000
Total	\$1,447,114.13

**It is assumed that the upper carpark will be left as is.*

**property acquisitions costs include an annual 2% multiplier up to 2020*

4.1.2 Trigger 2 – Continued erosion along Sunset Beach

If erosion continues to occur along Sunset Beach and into the existing carpark and community hall there is general acceptance from the community for planned retreat. The community hall would be relocated to the rugby ground (Figures 16 and 17) and the area around Centreway Road would need to be further developed to allow for additional car parking to compensate for the parks lost in the existing upper car park.

The suggested trigger point for planned retreat in this way is erosion compromising the existing tyre wall, which is the final defence for the remaining upper carpark.

Car parking for Sunset Beach – Centreway Road

If significant erosion were to occur, the proposed next stage of development of Centreway Road is shown in figure 15. Private property would need to be acquired to allow for additional car parking. One of the owners has indicated that they are not willing to move or sell their property to develop Centreway Road. Council would need to investigate the use of the Public Works Act (1981) or liaise directly with the affected land owner to find a resolution should this option be taken forward.

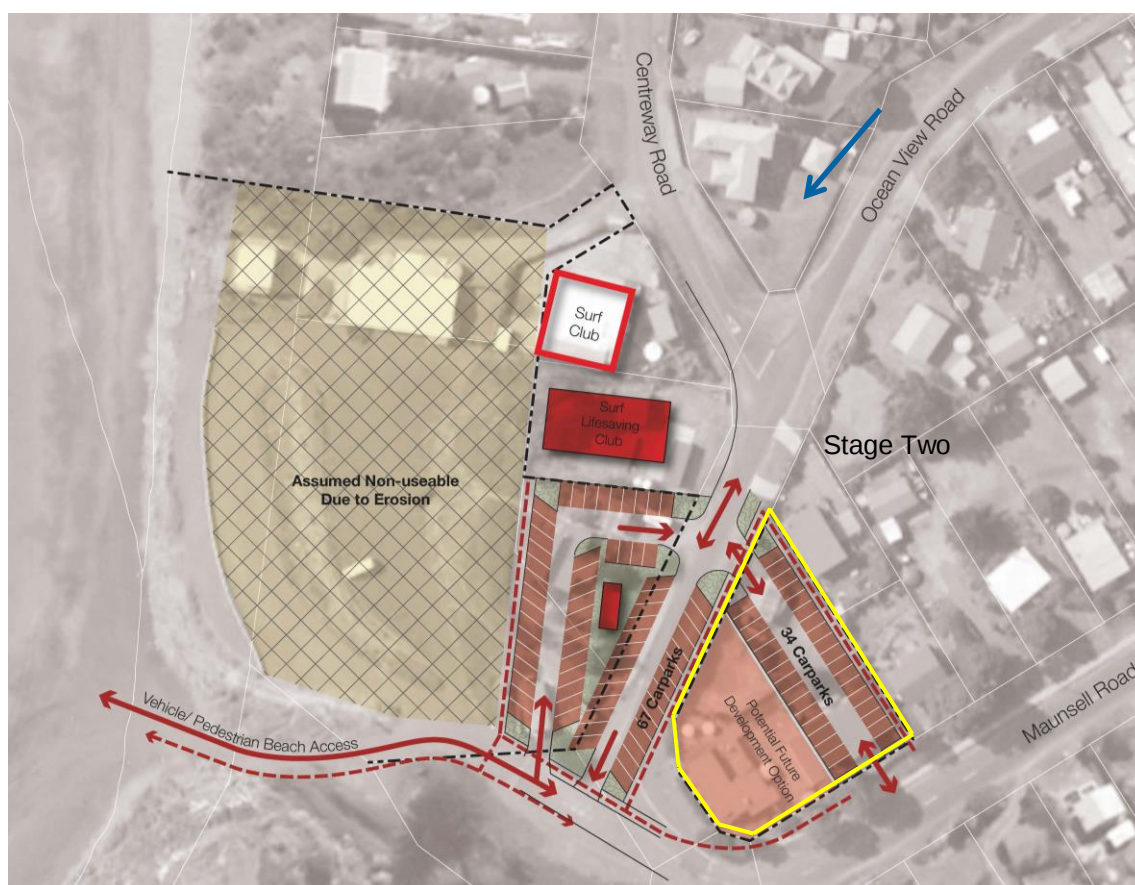


Figure 15: Centreway Road Stage Two

Works	Approximate Cost
Centreway Road – Erosion Stage Two	\$454,202.13
Land acquisition cost	\$700,000
Total	\$1,154,202.13

**It is assumed that Stage 1 is complete. Remediation costs for the upper carpark or vegetation re-establishment costs have not been included.*

**property acquisitions costs include an annual 2% multiplier up to 2020*

Community Hall – Rugby Grounds

Figures 16 and 17 demonstrate possible options for the relocation of the community hall to the Port Waikato Rugby Grounds. These layouts reflect comments received from the community during consultation.

A common theme in the feedback was to locate the hall away from residential properties to avoid potential adverse noise and visual amenity effects. Figure 17 shows one way you could achieve this by allowing space for noise control measures such as planting between the proposed hall location and existing residents. Locating the hall within the centre of the site will allow for the current use of the land whilst providing for future opportunities to expand the site for future community facilities.



Figure 16: Port Waikato Rugby Fields Example 1

Option	Approximate Cost
Port Waikato Rugby Fields Civil Costs	\$1,359,575.43
Construction of Community Hall	\$1,200,000*
Total	\$2,559,575.43

**Based on square metre rates from Rawlinsons New Zealand Construction Handbook 2013*

Locating the hall within the centre of the site creates a community hub that local residents can plan to use for multiple uses. Figures 16 and 17 show it is possible to accommodate up to three

rugby/football/hockey fields and also a basketball court or playground near the carpark. The new community hall at the Port Waikato Rugby Fields could be seen as the foundation of potential future development.

Both options show the carpark or hall located within or near the existing open stormwater drain that runs north to south in the centre of the site. It is anticipated that engineering works will need to be undertaken to prepare the site for development. This may include the installation of a sensitive drainage network or pipe network to allow continued stormwater and runoff management. It is anticipated that this will be incorporated into the design and construction of the new carpark and community hall. Detailed designs for stormwater management, including the opportunity for sensitive or sustainable drainage options will need to be developed before progressing this option.

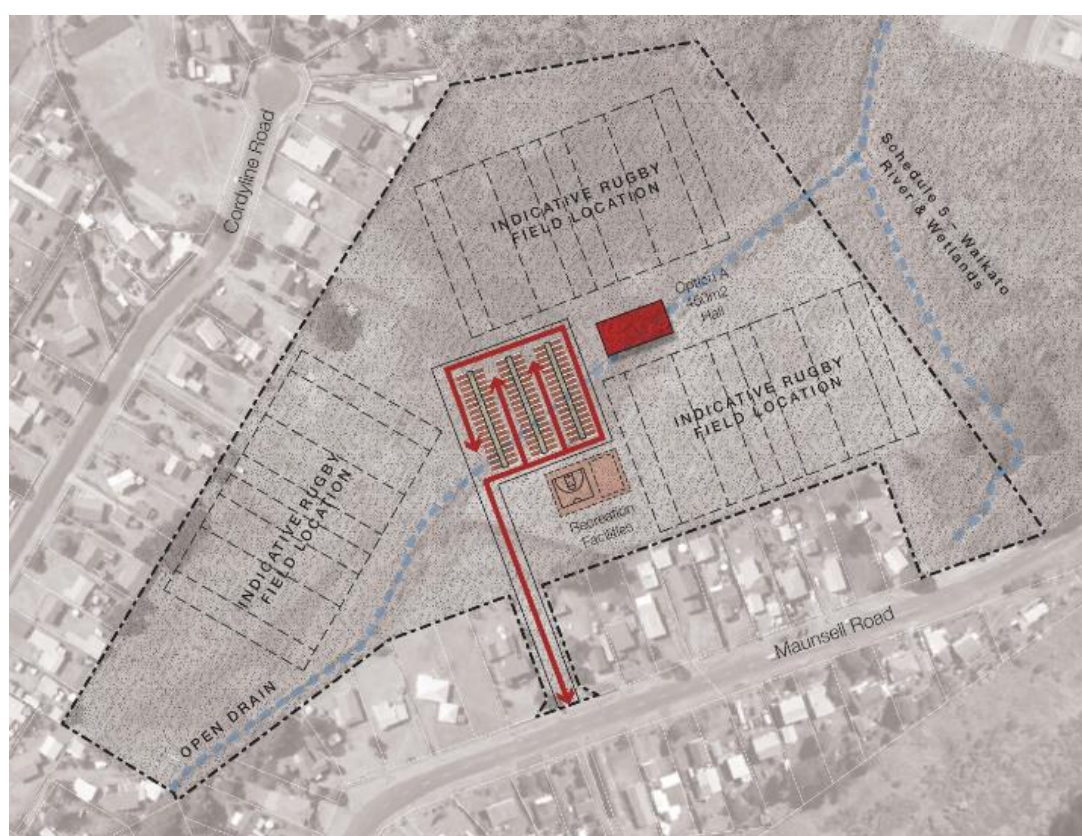


Figure 17: Recommended Port Waikato Rugby Fields Option 2

Option	Approximate Cost
Port Waikato Rugby Fields Civil Costs	\$1,216,817.88
Construction of Community Hall	\$1,200,000*
Total	\$2,416,817.88

**Based on Rawlinsons New Zealand Construction Handbook 2013*

. Next Steps

- As the kaitiaki of the natural environment, it is integral that the local hapu are able to input into continued management of the foreshore and options for managed retreat. A cultural impact assessment of the final options presented in this report should be undertaken to

identify if there are any issues or opportunities when looking to develop these sites in the future.

- Early engagement with affected land owners at Centreway Road is strongly recommended before taking any further steps to discuss short term, and medium or longer term risk and trigger points for managed retreat. Council may want to consider compulsory purchase in the first instance to secure a number or all of the sites for future development and protection works.
- Look to update the management plan for the Albie Phillips Memorial Reserve in consultation with the community to agree the long-term plan for this reserve in light of findings from this report. This will help with decisions on final hall locations in relation to future planned use of the reserve.
- Detail design and costs should be progressed for both sites. For Centreway Road this could initially focus on establishment of the dune system and access to the beach should a long period of accretion ensue. The opportunity exists to develop the site further with the Surf lifesaving club with the view of providing additional parking for beach access; any shared community facilities; and the community hall should it continue to be located at Centreway Road.
- It is recommended that ongoing education and engagement is undertaken on erosion at Sunset Beach, specifically with private land owners immediately adjacent to the foreshore.
- That ownership of the foreshore be continually encouraged, including monitoring of erosion, trigger points for managed retreat, condition of dunes and actions to protect dunes. The opportunity is for existing community group, including residents and ratepayers, beach care groups, the surf lifesaving club to take an active role in foreshore management.

Appendices

Appendix A – Approximate Option Costs

SUMMARY				
	Centreway Stage 1	Centreway Stage 2	Rugby Fields Option 1	Rugby Fields Option 2
PRELIMINARY AND GENERAL	\$71,951.25	\$45,311.25	\$136,412.25	\$122,088.75
SITE PREPARATION	\$2,000.00	\$3,000.00	\$6,000.00	\$5,000.00
EARTHWORKS	\$150,000.00	\$93,125.00	\$177,250.00	\$236,250.00
STORMWATER DRAINAGE	\$34,700.00	\$20,100.00	\$234,705.00	\$127,155.00
STREET DRAINAGE	\$9,000.00	\$3,000.00	\$9,000.00	\$9,000.00
SEWER DRAINAGE				
PAVEMENT CONSTRUCTION	\$54,000.00	\$33,570.00	\$98,910.00	\$85,050.00
SERVICES				
KERB AND CHANNEL AND CONCRETE WORK	\$67,300.00	\$36,180.00	\$91,300.00	\$79,970.00
ROAD PAVEMENT SURFACING	\$120,000.00	\$74,250.00	\$219,750.00	\$189,000.00
ROADMARKING	\$2,675.00	\$850.00	\$2,500.00	\$2,500.00
CARRIAGEWAY AND AMENITY LIGHTING	\$40,000.00	\$40,000.00	\$70,000.00	\$80,000.00
CONSTRUCTION TOTAL	\$551,626.25	\$349,386.25	\$1,045,827.25	\$936,013.75
CONSTRUCTION CONTINGENCY (30%)	\$165,487.88	\$104,815.88	\$313,748.18	\$280,804.13
Vegetation re-establishment	\$30,000.00			
Land Acquisition Cost	\$700,000.00	\$700,000.00		
Community Hall Construction Cost			\$1,200,000	\$1,200,000
TOTAL (exclusive GST)	\$1,447,114.13	\$1,154,202.13	\$2,559,575.43	\$2,416,817.88

GHD

Level 3, 27 Napier Street
Freemans Bay

T: 64 9 370 8000 F: 64 9 370 8001 E: aklmail@ghd.co.nz

© GHD 2016

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

N:\NZ\Auckland\Projects\51\32796\Findings Report - March 2016\Preferred Options for Managed Retreat DRAFT RevC.docx

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
	A Gysberts	M.Hoban		M.Hoban		18/03/2016

www.ghd.com

