

**Frame Group Limited**

P.O. Box 147-211, Ponsonby, Auckland 1144

Unit 2 Level 2, Foster's House

16 College Hill, Ponsonby, Auckland

Ph: 0-9 638-7221 Fax: 0-9 376-0513



Jane Aickin

Pae-urungi Te Waka Tai-ranga-whenua

Manager Co-governance and Auckland Domain

Parks, Sport and Recreation Department

Auckland Council

Our Ref: 17/080

Date: 30 January 2018

**Re: Pukekiwiriki Pā Track Feasibility Report****1.0 Summary**

This report summarises an investigation by Frame Group Limited into options to establish a walking track that leads to the top of Pukekiwiriki Pā in Red Hill, Papakura; and complies with the requirements outlined for a 'Short Walk' as defined in the NZ Handbook for Tracks and Outdoor Visitor Structures (SNZ HB8630:2004).

This investigation included a review of the existing track to the Pā from the southern end of the reserve and an assessment of the possibility to construct a new track that commences at the northern end of the reserve; including a check to determine any possible consent requirements.

As a result of this review, the following two options have been considered feasible to provide this track:

- Option 1 – Upgrade the existing 91m long southern route track from Red Hill Road; including re-shaping and surfacing the track, the installation of new boxed steps overtop of the existing worn out stone steps, and the installation of a new 9m long timber staircase with two flights (estimated cost for construction and professional services - \$109,000 excluding GST).
- Option 2 – Formation of a new 199m long northern route track from Tahan Maran Drive; including new track benching and surfacing, the installation of new boxed steps through vegetated areas, and the installation of a new 44m long timber staircase with nine flights (estimated cost for construction and professional services - \$332,000 excluding GST).

The next step for this project is for the Papakura Local Board and the co-governance committee to select their preferred option. Detailed drawings, specifications and consent applications can then be prepared for this option prior to tendering the construction works.

## 2.0 Objectives

Based on the information we have been provided, we have assumed the following objectives for this project:

- Provide a safe and secure track that is easily navigable and enjoyable for a range of visitors.
- Provide a track that is consistent with the 'Short Walk' classification as per SNZ HB8630:2004.
- Provide a track surface that is durable, has a low environmental impact and a low future maintenance cost.
- Develop a track that is well drained and provides good all year round use for a wide range of visitors.
- Minimise damage or disturbance to historic and natural features on this sensitive site in the vicinity of the track.

## 3.0 Standard

SNZ HB8630:2004 classifies track users into User Groups based on the type of visitor, their physical capability and their level of self-reliance in the outdoors. Due to the suburban location of this site and the users seen during the investigation, we recommend that the track in and around Pukekiwiriki Pā classified as a 'Short Walk'.

'Short Walk' users include both domestic and international tourists, as well as casual local visitors of all fitness levels. They utilise popular road edges for trips of an up to one-hour return journey for visits of short duration associated with rest stops, toilet stops, meal breaks or a natural attraction visit. Activities are usually passive to mildly active; including picnicking, photography, sightseeing, nature appreciation and short walks. These visitors require a high quality track surface. The least mobile of this group are commonly families with toddlers, younger age school parties, elderly people and in some cases people with disabilities.

The recommended design parameters for the track proposals are as shown in Table 1. These are recommended as a result of discussions with Auckland Council and from the evaluation of the likely visitor profile. These design parameters are the basis on which the proposed work and costs have been estimated.

<b>Item</b>	<b>Design Parameter</b>
Width	Typically 1200mm.
Grade	Maximum 1 in 6 on track. Maximum 37 degrees on steps/staircases.
Track Surfacing	Typical minimum of 50mm thick surfacing of compacted, well graded aggregate; increased to 100mm thick where large roots are present (including on timber boxed steps).
Batter Slopes	Maximum fill batter slope of 1 vertical to 1.5 horizontal and maximum cut batter slope of 4 vertical to 1 horizontal.
Track Drainage	Consisting of a monoslope track shape to shed any water to one side and grade dips installed in low area to divert any runoff below the track.
Steps	Timber boxed steps with a handrail on one side or a timber staircase over steeper areas with handrails on both sides.
Vegetation	Clear vegetation around the track and up to 2.5m in height.
Marking and Signage	Markers not necessary (route clearly defined by the surface). Directional signage at junctions.

#### **4.0 Description**

Pukekiwiriki Pā is located in Red Hill, Papakura and contains just over 1.5 hectares of reserve land. The steep slopes along the edges of the Pā provided natural defences for the mana whenua that were originally here. The total Pā area was approximately 9 hectares; however the majority of this area is now subdivided with only the very top of the volcanic tuff and small amount of land below the steep slopes within the reserve.

The Papakura Local Board is responsible for maintaining this Pā site, which is managed by a co-governance committee. The current entranceway is at the south end of the site, adjacent to Red Hills Road, up a steep track where natural steps have been cut into the existing rock. It is our understanding that in winter these rock steps become very slippery and concern has been raised on the safety aspect of this track due to a steep drop that is present on the downhill edge of the steps.

#### **5.0 Options**

Table 2 outlines two different options for providing pedestrian access to Pukekiwiriki Pā, including listing some of the advantages and disadvantages for each. Refer to the appended Options Plan drawing for the location of each option. Note that a third option was investigated from Tahan Maran Drive along the western boundary of the reserve; however this area has steep slopes below private residential houses with pohutukawa trees and other significant vegetation present on the bank. This option was dismissed on site due to the risk of causing stability issues during construction that may be caused by the removal of some of this vegetation and the necessary earthworks to form a track.

**Table 2 - Summary of Options**

Option	Description	Advantages	Disadvantages
1	Upgrade the existing 91m long southern route track from Red Hill Road; including re-shaping and surfacing the track, the installation of new boxed steps overtop of the existing worn out stone steps, and the installation of a new 9m long timber staircase with two flights to avoid the steepest section.	<ul style="list-style-type: none"> <li>• Lower estimated costs for both construction and professional services.</li> <li>• Minimal disturbance to vegetation.</li> <li>• No re-alignment of track bench required.</li> <li>• Recommended staircase re-alignment is on piles and will have minimal impact to the area below (easy construction possible from existing track).</li> <li>• No new track excavations are required (no new stabilisation issues).</li> <li>• Small slip that is present can be avoided (no geotechnical issues).</li> <li>• Existing parking present at reserve entrance adjacent to Red Hill Road.</li> <li>• Private encroachments issues at north end of site do not impact works.</li> <li>• Can install handrails and barriers to eliminate fall risk.</li> </ul>	<ul style="list-style-type: none"> <li>• Some impact to stone steps and known archaeological features.</li> <li>• Large roots on existing tracks (to be covered with fill).</li> </ul>
2	Formation of a new 199m long northern route track from Tahan Maran Drive; including new track benching and surfacing, the installation of new boxed steps through vegetated areas, and the installation of a new 44m long timber staircase with nine flights.	<ul style="list-style-type: none"> <li>• Avoids the exposed archaeological features that are present at the south end of the site.</li> <li>• Can install handrails and barriers to eliminate fall risk.</li> </ul>	<ul style="list-style-type: none"> <li>• Higher estimated costs for both construction and professional services.</li> <li>• New benching and vegetation removal required for new track location. Significant vegetation present (pohutukawa, etc.) in close proximity to the works.</li> <li>• Possible stability issues (Geotechnical engineering report required).</li> <li>• New staircase and benching will be visible from adjacent properties and Red Hill Road.</li> <li>• Close to private encroachment at east end of site.</li> <li>• Large staircase structure necessary with difficult construction access and specialist abseil team required.</li> <li>• The entire reserve area is noted as an archaeological site. Accidental discovery likely during excavations.</li> <li>• Limited existing parking present near Tahan Maran Drive. Street is narrow and residents will be impacted by increased user numbers.</li> <li>• Greater resource consent requirements.</li> </ul>

## 6.0 Preliminary Estimates

The estimated cost of construction and professional services for both options have been prepared.

### 6.1 Construction Cost Estimate

Detailed preliminary construction cost estimates for each option are appended to this report. They are summarised as follows:

- Option 1, Existing Southern Route - \$65,000
- Option 2, New Northern Route - \$234,000

Note that the above construction cost estimates exclude GST and include a 15% contingency. They are based on current contractor rates for similar construction projects in the Auckland area; and do not include provision for the installation of signage, plantings, viewing areas and other landscape items.

### 6.2 Professional Services Estimate

The estimated costs of professional fees that are expected to be necessary for each option are shown in Table 3 and 4 (note that these are estimates only and shall not be considered as a quote for services).

<b>Table 3 - Option 1, Estimated Cost of Professional Services</b>	
<b>Item</b>	<b>Estimated Cost</b>
Setting out, survey and design of walkway and structures	\$6,000
Consultation and mana whenua fees	\$3,000
Arborist investigation, report and monitoring	\$5,000
Archaeologist assessment, Heritage NZ Authority and monitoring	\$3,000
Resource consent application preparation, lodgement and fees	\$8,000
Building consent application preparation, lodgement and fees	\$3,000
Tender and contract management services	\$10,000
15% contingency (rounded)	\$6,000
<b>Total Estimated Cost of Professional Services:</b>	<b>\$44,000</b>

<b>Table 4 - Option 2, Estimated Cost of Professional Services</b>	
<b>Item</b>	<b>Estimated Cost</b>
Setting out, survey and design of walkway and structures	\$20,000
Consultation and mana whenua fees	\$5,000
Arborist investigation, report and monitoring	\$8,000
Geotechnical Engineer investigation	\$8,000
Archaeologist assessment, Heritage NZ Authority and monitoring	\$5,000
Resource consent application preparation, lodgement and fees	\$10,000
Building consent application preparation, lodgement and fees	\$4,000
Tender and contract management services	\$25,000
15% contingency (rounded)	\$13,000
<b>Total Estimated Cost of Professional Services:</b>	<b>\$98,000</b>

The above professional services cost estimate excludes all internal council costs and assumes that the resource consent can be lodged as a non-notified application. If a notified resource consent becomes necessary, it is expected that the estimated cost for additional professional services of either option could increase by up to \$50,000 (excluding GST).

## **7.0 Consent Requirements**

A summary of the expected resource consent requirements for this track is as follows:

### **7.1 Auckland Council Resource Consent**

A resource consent application will be necessary for both options. Refer to the appended Resource Consent Summary prepared by Southern Skies Environmental Limited for a summary of resource consent requirements from the Auckland Unitary Plan. This summary also includes a list of mana whenua that will need to be consulted with prior to logging the application.

### **7.2 Building Consents**

Under the Building Act, an Auckland Council Building Consent will be necessary for any structure that is not exempt under Schedule 1 of the Act. This means that structure from which it is possible to fall more than 1.5m will require a Building Consent. For this project, Building Consent will be required for the following works:

- Option 1 - To install a 9m long by 1.2m wide staircase with 2 flights avoiding rock steps.
- Option 2 - To install a 44m long by 1.2m wide staircase with 9 flights up steep bluff.

### **7.3 Heritage NZ Authority**

Due to the archaeological significance of this site it is likely that a Heritage NZ Authority will be required for both options. To complete this, an archaeologist shall be engaged to complete an assessment of the proposed work to determine what impact the construction works will have to any archaeological sites. Consultation with mana whenua will also be necessary to form part of this authority application.

## **8.0 Recommendation**

It is recommended to proceed with Option 1 to upgrade the existing track at the southern entrance. In addition to Option 2 having a higher construction cost, there are many issues and risks associated with Option 2 (such as instability, vegetation removals, lack of parking, greater resource consent requirements, etc.) that make Option 1 the preferred option.

Once Auckland Council has obtained the stakeholder's feedback on this report, determined the preferred option and sourced funding for this project; the recommended next action steps are as follows:

- Complete detailed setting out and a profile survey for the preferred option.
- Carry out consultation with any affected parties including Iwi, residents, etc.
- Engage an Arborist to assess any impacts to vegetation to the chosen route.
- Engage a Geotechnical Engineer to provide advice on the site stability and foundation requirements for the staircase (Option 2 only).
- Prepare design drawings, specification and construction cost estimates for the preferred option; including preparing detailed calculations and providing producer statements for the staircases.
- Engage an Archaeologist to assess any archaeological sites that may be impacted by the proposed works and apply for a Heritage NZ authority.
- Prepare and apply for all required building and resource consents.
- Tender and manage the physical works.

## **9.0 Appended Items**

- Attachment A - Option 1 and 2 Photos
- Attachment B - Example Photos
- Attachment C - Option 1 and 2 Preliminary Construction Cost Estimates
- Attachment D - Resource Consent Summary
- Attachment E - Options Plan

Drew Kenny  
Consultant, Frame Group Limited

## Option 1 Photos



Existing track entrance



Reshape track over roots



Grade track up slope



Install staircase over rock steps



Install new boxed steps over rock steps



Install boxed steps into Pa

## Option 2 Photos



Proposed track entrance at road



Encroachment on eastern side



Track through dead tree



Possible staircase up bluff



Steep slope at top of bluff



View of bluff from Red Hill Road

## Example Photos



Monoslope shaped track over roots



Track with edge board



Boxed steps with handrail one side



Boxed steps fixed to rock



Staircase with barrier both sides



Multiple flight staircase up bluff